EXTERNAL SCIENTIFIC REPORT

Scientific services to support EFSA systematic reviews: Lot 5 Extensive literature search and reviews as preparatory work for the update of the Guidance of EFSA on the Risk Assessment for Birds and Mammals with regards to dermal and inhalation exposure (Tender specifications RC/EFSA/PRAS/2013/02)[1]

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ABSTRACT

Birds and mammals may be exposed to pesticides through various routes including diet, drinking water, and contact with contaminated environments, overspray or inhalation of sprayed pesticides or volatile compounds. While dietary exposure and risk is well accounted for in current risk assessments this is not the case for other routes of exposure. The aim of this study was to conduct an electronic literature search (ELS) to identify information that would assist with the development of models of dermal and inhalation in birds and mammals in agricultural habitats. Search terms were based around a core requirement to obtain information that contained (bird or mammal) and (pesticide) and (dermal or inhalation) and (dermal toxicity or inhalation toxicity or dermal exposure or inhalation exposure). The majority of the information found concerned the toxicity and uptake of pesticides by dermal or inhalation routes. Little information was identified that would assist with exposure estimation other than uptake into the body. The data obtained was collated in spreadsheets and Tables.

KEY WORDS

Bird, Mammal, Dermal, Inhalation, Toxicity, Exposure

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SUMMARY

The aim of this study was to conduct a literature search to identify information useful for developing models of exposure of birds and mammals to pesticides in agricultural environments via dermal and inhalation routes. The search was designed to retrieve information on both toxicity and exposure to pesticides via these routes.

An electronic literature search was conducted by the Fera Information Centre using search terms that had been agreed with EFSA during the course of an initial start-up project. The output of the search was downloaded to and EndNote database for screening.

In the first screening step, the titles and abstracts in the database were examined to identify those that appeared suitable for full text screening. This was conducted by two experts to reduce the risk of bias with both producing a list of studies to be included in the next stage. These lists were compared to identify any disagreements which were then discussed for each item before coming to an agreed final list.

Once the full text of items identified in the first phase had been obtained, full text screening was again conducted by two experts to identify those experimental studies of suitable quality for inclusion. Other types of material containing information considered useful were also highlighted for inclusion. Again, both reviewers' lists were compared and any disparities resolved by discussion often including re-examination of the material in question. Information was then extracted into a spreadsheet and Tables for the final report.

The bulk of the material identified related to toxicity and uptake (e.g. dermal absorption) for laboratory mammals although some studies were found involving the effects of dermal exposure to pesticides on birds. Little information was identified that would allow estimation of dermal or inhalation exposure other than uptake information for mammals.

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BACKGROUND AS PROVIDED BY EFSA

Study aims

The aim of the desk study is to produce a report for EFSA that will address:

Extensive literature search and reviews as preparatory work for the update of the Guidance of EFSA on the Risk Assessment for Birds and Mammals.

Short description of study

In 2009 the European Food Safety Authority published a guidance document on the risk assessment for birds and mammals (EFSA, 2009). It was highlighted in the Guidance Document that it should be revised taking into account experience from using it. The need for an update of the Guidance Document has also been identified by the Pesticide Steering Committee. Non-dietary routes of exposure are not covered in the current Guidance Document. In order to address these routes of exposure in future updates of the Guidance Document it would be necessary to collect information on dermal and inhalation exposure of birds and mammals. An extensive literature review should be conducted to collect information which can be used as input parameters for exposure models for non-dietary exposure.

TERMS OF REFERENCE AS PROVIDED BY EFSA

This contract/grant was awarded by EFSA to:

The Food and Environment Research Agency

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Contract title: Scientific services to support EFSA systematic reviews: Lot 5 Extensive literature search and reviews as preparatory work for the update of the Guidance of EFSA on the Risk Assessment for Birds and Mammals

Contract number: RC/EFSA/PRAS/2013/02

INTRODUCTION AND OBJECTIVES

The overall objective of this project was to perform an extensive literature search on exposure of birds and mammals to pesticides via non-dietary routes such as dermal and inhalation and to evaluate whether these non-dietary routes of exposure are to be considered relevant and to retrieve information which can aid the development of risk assessment procedures for these exposure routes.

Specific objectives:

a) Studies which investigated the dermal exposure to plant protection products of birds and mammals focusing on all those parameters which might be useful as input for an exposure model. Recommendations should be given on the development of such a model.

b) Studies which investigated the inhalation exposure to plant protection products of birds and mammals focusing on all those parameters which might be useful as input for an exposure model. Recommendations should be given on the development of such a model.

MATERIALS AND METHODS

1. Literature Search

The first part of the project involved a literature search using the search terms agreed previously with EFSA in the definitive protocol for the study. This search was initially carried out on the Web of Knowledge databases:

- CABI
- MEDLINE®
- Zoological Record®
- BIOSIS Citation Index
- Current Contents Connect
- FSTA® - the food science resource
- Web of Science®

Terms for dermal or inhalation exposure pathways were used (see search statements #4 to #7 below) combined with both general terms for birds and mammals, but also specific names of species likely to be of relevance to the study – see statements #9 to #13.

As the database searched index extensively the medical literature, it provided necessary to exclude various Web of Knowledge 'Research Areas' related to human health – note qualifiers shown below in statements #16 to #18.

This approach, arrived at after numerous iterations, and discussions with scientific staff, appeared to result in a reasonable compromise between recall and precision, and the 1455 items were therefore downloaded for evaluation.

# 18	1455 (items downloaded)	#14 AND #8 AND #3 Refined by: [excluding] Research Areas=(SURGERY OR GERIATRICS GERONTOLOGY OR INFECTIOUS DISEASES OR ENGINEERING OR PHARMACOLOGY PHARMACY OR ANTHROPOLOGY OR ANESTHESIOLOGY OR HISTORY OR GEOLOGY) AND Languages=(ENGLISH)

# 17	133 (items downloaded)	#14 AND #8 AND #3 Refined by: [excluding] Research Areas=(SURGERY OR GERIATRICS GERONTOLOGY OR INFECTIOUS DISEASES OR ENGINEERING OR PHARMACOLOGY PHARMACY OR ANTHROPOLOGY OR ANESTHESIOLOGY OR HISTORY OR GEOLOGY) AND [excluding] Languages=(ENGLISH)
# 16	1587	#14 AND #8 AND #3 Refined by: [excluding] Research Areas=(SURGERY OR GERIATRICS GERONTOLOGY OR INFECTIOUS DISEASES OR ENGINEERING OR PHARMACOLOGY PHARMACY OR ANTHROPOLOGY OR ANESTHESIOLOGY OR HISTORY OR GEOLOGY)
# 15	Approximately 6356	#14 AND #8 AND #3
# 14	Approximately 11112001	#13 OR #12 OR #11 OR #10 OR #9
# 13	Approximately 9747792	Topic=(RABBIT OR HARE OR MOUSE OR MICE OR HARVESTMOUSE OR DORMOUSE OR VOLE OR RAT OR MOLE OR SHREW OR SHREWS OR HEDGEHOG)
# 12	Approximately 534090	Topic=("SMALL MAMMAL*" or "wild MAMMAL*" or "SMALL animal*")
# 11	Approximately 68424	Topic=("Black Redstart" or "Phoenicurus ochruros" or “Blackcap*” or "Sylvia atricapilla" or "Blue tit" or "Parus caeruleus" or “Chaffinch” or "Fringilla coelebs" or "Collared Pratincole*" or "Glareola pratincola" or "Corvus brachyrhynchos" or Dunnock or "Prunella modularis" or "Fan tailed warbler*" or “Goldfinch*” or "Carduelis carduelis" or "Greylag goose" or "Anser anser" or "House sparrow" or "Passer domesticus" or “Linnet” or "Carduelis cannabina" or “Partridge” or "Perdix perdix" or "Pink-foot goose" or "Anser brachyrhynchus" or “Robin” or "Erithacus rubecula" or “Serin” or "Serinus serinus" or "Song Thrush" or "Turdus philomelos" or “Starling*” or "Sturnus vulgaris" or "Willow warbler" or "Phylloscopus trochilus" or “Woodlark*” or "Lullula arborea" or "Wood pigeon" or "Columba palumbus" or "Yellow wagtail" or "Motacilla flava" or Yellowhammer or "Emberiza citronella")
# 10	Approximately 201225	Topic=(“Blackcap” or “Bunting” or “Crow” or “Dunnock” or “Finch” or “Gamebird*” or “Goose” or “Lark” or “Passerine” or “Pigeon*” or “Pratincole” or “Redstart” or “Sparrow*” or “Starling*” or “Thrush” or “Tit” or “Wagtail” or “Warbler”)
# 9	Approximately 1137021	Topic=(BIRD OR BIRDS OR AVES OR AVIAN)
# 8	Approximately 2342991	#7 OR #6 OR #5 OR #4
# 7	Approximately 29215	Topic=((respiratory near/3 (toxicology or exposure or uptake)))
# 6	Approximately 290550	Topic=(INHALATION OR INHALED)

# 5	Approximately 14155	Topic=("NON-ORAL*" or "non-diet*" or "exposure route*" or "exposure pathway*" or "uptake route*" or "uptake pathway*")
# 4	Approximately 2031972	Topic=(skin or dermal or transdermal or percutaneous or transcutaneous)
# 3	Approximately 1347894	#2 OR #1
# 2	Approximately 38889	Topic=("PLANT PROTECTION PRODUCT*" OR "SEED TREATMENT*")
# 1	Approximately 1327490	Topic=(PESTICIDE OR INSECTICIDE OR HERBICIDE OR FUNGICIDE OR ACARICIDE OR AGROCHEMICAL)

It had been agreed that the study would, in addition to making use of the databases listed above, also exploit those on the ProQuest Dialog host. Therefore similar search logic was adopted, limited to databases not already covered, and resulting in the download of 563 English language and 11 non-English language references.

Set#	Searched for	Databases	Results
S20	(s3 and s8 and s14) AND (ccl.exact("Pesticides and Drugs General" OR "Toxicology - General and methods" OR "Pesticides and Drugs Control (New March 2000)" OR "Toxicology - Environment and industry" OR "Metabolism - General metabolism and metabolic pathways" OR "Animal Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Respiratory system - Pathology" OR "Animal Physiology and Biochemistry Excluding Nutrition" OR "Integumentary system - Pathology" OR "Toxicology" OR "Techniques and Methodology" OR "Nervous system - Pathology" OR "Respiratory system - Physiology and biochemistry" OR "Pesticide and Drug Residues and Ecotoxicology (New March 2000)" OR "Toxicologie des pesticides, engrais et autres produits chimiques à usage agricole" OR "Human Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Toxicology - Antidotes and	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus These databases are searched for part of your query.	11°

	prevention" OR "Human Toxicology and Poisoning (New March 2000)" OR "Mathematical biology and statistical methods") NOT la.exact("ENG") NOT fdb(10000129 1008436 10000127))		
S19	(S16 NOT S17) NOT fdb(10000129 1008436 10000127)	AGRICOLA, AGRIS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	563°
S18	S16 NOT S17	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	6018*
S17	(s3 and s8 and s14) AND (ccl.exact("Pesticides and Drugs General" OR "Toxicology - General and methods" OR "Pesticides and Drugs Control (New March 2000)" OR "Toxicology - Environment and industry" OR "Metabolism - General metabolism and metabolic pathways" OR "Animal Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Respiratory system - Pathology" OR "Animal Physiology and Biochemistry Excluding Nutrition" OR "Integumentary system - Pathology" OR "Toxicology" OR "Techniques and Methodology" OR "Nervous system - Pathology" OR "Respiratory system - Physiology and biochemistry" OR "Pesticide and Drug Residues and Ecotoxicology (New March 2000)" OR "Toxicologie des pesticides, engrais et autres produits chimiques à usage agricole" OR "Human Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Toxicology - Antidotes and prevention" OR "Human Toxicology and Poisoning (New March 2000)" OR "Mathematical biology and statistical methods") NOT la.exact("ENG"))	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	2177°

S16	(s3 and s8 and s14) AND ccl.exact("Pesticides and Drugs General" OR "Toxicology - General and methods" OR "Pesticides and Drugs Control (New March 2000)" OR "Toxicology - Environment and industry" OR "Metabolism - General metabolism and metabolic pathways" OR "Animal Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Respiratory system - Pathology" OR "Animal Physiology and Biochemistry Excluding Nutrition" OR "Integumentary system - Pathology" OR "Toxicology" OR "Techniques and Methodology" OR "Nervous system - Pathology" OR "Respiratory system - Physiology and biochemistry" OR "Pesticide and Drug Residues and Ecotoxicology (New March 2000)" OR "Toxicologie des pesticides, engrais et autres produits chimiques à usage agricole" OR "Human Toxicology Poisoning and Pharmacology (Discontinued March 2000)" OR "Toxicology - Antidotes and prevention" OR "Human Toxicology and Poisoning (New March 2000)" OR "Mathematical biology and statistical methods")	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	8453*
S15	s3 and s8 and s14	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	11627*
S14	S9 OR S10 OR S11 OR S12 OR S13	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	16061039*
S13	RABBIT OR HARE OR MOUSE OR MICE OR HARVESTMOUSE OR DORMOUSE OR VOLE OR RAT OR MOLE OR SHREW OR SHREWS OR HEDGEHOG	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	12801091*
S12	"SMALL MAMMAL*" or "wild MAMMAL*" or "SMALL	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®,	697516*

	animal*"	GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	
S11	"Black Redstart" or "Phoenicurus ochruros" or "Blackcap*" or "Sylvia atricapilla" or "Blue tit" or "Parus caeruleus" or "Chaffinch" or "Fringilla coelebs" or "Collared Pratincole*" or "Glareola pratincola" or "Corvus brachyrhynchos" or Dunnock or "Prunella modularis" or "Fan tailed warbler*" or "Goldfinch*" or "Carduelis carduelis" or "Greylag goose" or "Anser anser" or "House sparrow" or "Passer domesticus" or "Linnet" or "Carduelis cannabina" or "Partridge" or "Perdix perdix" or "Pink-foot goose" or "Anser brachyrhynchus" or "Robin" or "Erithacus rubecula" or "Serin" or "Serinus serinus" or "Song Thrush" or "Turdus philomelos" or "Starling*" or "Sturnus vulgaris" or "Willow warbler" or "Phylloscopus trochilus" or "Woodlark*" or "Lullula arborea" or "Wood pigeon" or "Columba palumbus" or "Yellow wagtail" or "Motacilla flava" or Yellowhammer or "Emberiza citronella"	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	227509*
S10	Blackcap or Bunting or Crow or Dunnock or Finch or Gamebird* or Goose or Lark or Passerine or Pigeon* or Pratincole or Redstart or Sparrow* or Starling* or Thrush or Tit or Wagtail or Warbler	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	362971*
S9	BIRD OR BIRDS OR AVES OR AVIAN	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	2980916*
S8	S4 OR S5 OR S6 OR S7	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	3568251*
S7	respiratory near/3 (toxicology or exposure or uptake)	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	83974*
S6	INHALATION OR INHALED	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®,	427748*

		GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	
S5	"NON-ORAL*" or "non-diet*" or "exposure route*" or "exposure pathway*" or "uptake route*" or "uptake pathway*"	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	18515*
S4	skin or dermal or transdermal or percutaneous or transcutaneous	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	3079699*
S3	S1 OR S2	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	2340102*
S2	"PLANT PROTECTION PRODUCT*" OR "SEED TREATMENT*"	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	58851*
S1	PESTICIDE OR INSECTICIDE OR HERBICIDE OR FUNGICIDE OR ACARICIDE OR AGROCHEMICAL	AGRICOLA, AGRIS, BIOSIS® Toxicology, BIOSIS Previews®, CAB ABSTRACTS, Embase®, GEOBASE™, MEDLINE®, PASCAL, Toxfile®, Zoological Record Plus	2311265*

* Duplicates are removed from your search, but included in your result count.
° Duplicates are removed from your search and from your result count.

Details of the retrieved literature (WoK English – 1455, WoK Non-English – 133, ProQuest English - 563, Proquest Non-English – 11) were then downloaded to an EndNote database containing 2162 references. After removing duplicates this database contained 1803 references.

2. Screening of titles and abstracts

Two independent reviewers were used at this stage be used for this stage to try to reduce pre-formed bias of the subject area. Studies will be selected according to the following criteria:

BIRD OR MAMMAL

AND

PESTICIDE

AND

DERMAL EXPOSURE OR INHALATION EXPOSURE OR DERMAL TOXICITY OR INHALATION TOXICITY

AND

APPEARS TO CONTAIN PRIMARY DATA

Where there was too little information to determine whether the item contained primary data (e.g. no abstract) the item would have been included at this stage.

In addition to the main criteria the screening also attempted to identify other sources of information such as models or reviews that may contain useful information related tom the aims of the study. Where found, these items were also included for the full text screening stage.

Following the screening, the two lists produced by the reviewers were compared to identify any disparities. A face to face meeting was then held to discuss any items that had been scored differently and come to a final agreement. As part of this discussion, the available information in the EndNote database was reviewed by both reviewers before a decision was made. The results of this process are summarised in Appendix A. Of 95 initial differences, final agreement was to include 60 and reject the remaining 35 at this stage. Following this first screening, 687 items were selected for full text screening.

Original papers identified for full text screening were obtained from Fera's stock of 10,000 books and monographs, and subscriptions to over 200 current journals. Where publications were not available in-house, these were obtained from inter-library loans or via the range of contacts and reciprocal agreements that Fera has with other special libraries relevant to Fera's areas of business.

3. Full text screening

Of the 687 papers selected in the EndNote screening phase, we were unable to obtain 21 leaving 666 for full text review. Two independent reviewers were used for this stage to try to reduce preformed bias of a subject area / authors. Studies already selected according to the criteria in Section 1.2 were assessed for reliability of data and the type of information included. It was clear from the initial screening that the material was varied in nature with little in the way of standardisation (e.g. following internationally agreed test guidelines. Information was therefore assessed on the type of material as follows:

Full study with data
Short paper with little detail
Meeting abstract
Model
Other

For studies with data, these were included if they contained enough data to be repeatable. Reasons for exclusion were;

Methods not adequately described
No control groups where appropriate (e.g. toxicity studies)
No statistical analysis where appropriate
Variability not sufficiently addressed
Conclusions not supported by results

Meeting abstracts were excluded as they did not contain sufficient information to determine whether they met the desired repeatability criteria. Studies identified as models were included if they seemed to contain information pertinent to the objectives.

As for the initial screening step, the items were also screened for other information that may be relevant to the aims of the study. The main information types considered were:

Contains behavioural information
Contains surface area information
Contains contact area information

Contains inhalation volume information
Contains respiration rate information
Contains information on permeability
Other

During the initial screening it was determined that there were some categories of experimental studies that were not relevant to the aims of the project which was to determine the risk to wildlife. These included studies of carcinogenicity, tumour promotion, skin irritation, skin sensitivity or skin corrosion. Inhalation studies include some concerned with asthma and these were also rejected. Other papers dealt entirely with human exposure or risk assessment. Where this information was identified as the only content of the reference, these were rejected. Some studies involved intratracheal instillation rather than inhaled toxicant and these were also rejected.

Several studies concerned the inhalation of fumes from mosquito coils or vapour from mosquito mats. These sources contain a mixture of substances and often the pesticide component is not well defined. This combined with the absence of any exposure dose information make this data unusable for comparisons of toxicity. These studies were also highlighted for rejection.

Following the screening, the two lists produced by the reviewers were compared to identify any disparities. A face to face meeting was then held to discuss any items that had been scored differently and come to a final agreement. As part of this discussion, the information in the full text material was reviewed by both reviewers before a decision was made. The results of this process are summarised in Appendix B. Of 63 initial differences, final agreement was to include 30 and reject the remaining 33 at this stage. Following this second screening, 320 items were selected for inclusion in the report.

4. Extraction of study data

Toxicity data was extracted into a spreadsheet from which the Tables in this report were generated. This contained the same information as included in this report along with other information such as CAS number for each pesticide, an outline of the exposure method and any other information such as the availability of oral exposure data from the same study.

References identified as containing uptake information (e.g. dermal absorption) were summarised in Tables identifying the pesticide, species, type of study (in vivo or in vitro) and the type of information available. This included dermal absorption, dermal penetration (in vitro studies) and residues in blood, tissues or organs.

The content of other papers selected not fitting in the main categories but potentially containing useful information were also summarised.

At this stage it was necessary to reject a further 13 papers based on content or duplication. These are listed in Appendix C along with reasons for rejection.

RESULTS

The information found in the ELS fell into five main categories (1) Dermal toxicity data, (2) Inhalation toxicity data, (3) Sources of information on dermal uptake, (4) Sources of information on inhalation uptake, and (5) Other potentially relevant information. The findings are summarised below.

5. DERMAL TOXICITY

5.1. Dermal toxicity values (LD50)

Dermal toxicity data was extracted from 18 studies although three of the studies appeared to contain the same data (533/743/819). This yielded 141 values all of which were for rats, mice and rabbits and are summarised below (Table 1) with more detail available in Appendix D.

Table 1: Dermal toxicity (LD50)

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
2,4,5-T	T	Rat	M	-	1974	1410
2,4,5-T	T	Rat	F	-	1535	1410
2,4_D dimethylamine salt	-	Rabbit	-	24h	2244	1350
2,4_D isobutyl ester	-	Rabbit	-	24h	>2000	1350
2,4-D	-	Rabbit	-	24h	>2000	1350
2,4-D butoxyethanol ester	-	Rabbit	-	24h	>2000	1350
2,4-D butyl ester	-	Rabbit	-	24h	>2000	1350
2,4-D isocytol ester	-	Rabbit	-	24h	>2000	1350
2,4-D sodium salt	-	Rabbit	-	24h	>2000	1350
Acephate	T	Rat	M	-	>2500	1410
Acephate	T	Rat	F	-	>2500	1410
Ametryn	T	Rat	M	-	>3000	1410
Ametryn	T	Rat	F	-	>3000	1410
Amitrole	T	Rat	M	-	>2500	1410
Amitrole	T	Rat	F	-	>2500	1410
Amitrole	P'	Rat	M	14d	>2500	1572
Amitrole	P	Rat	F	14d	>2500	1572
Atrazine	T	Rat	M	-	>2500	1410
Atrazine	T	Rat	F	-	>2500	1410
Azinphos-methyl	A	Mouse	M	24h	6000	1485
Bromacil	T	Rat	M	-	>2500	1410
Bromacil	T	Rat	F	-	>2500	1410
Bufencarb	T	Rat	M	-	237	1410
Bufencarb	T	Rat	F	-	163	1410
Carbanolate	T	Rat	M	-	>1200	1410
Carbanolate	T	Rat	F	-	>1200	1410
Carbofuran	T	Rat	M	-	>1000	1410
Carbofuran	T	Rat	F	-	>1000	1410
Chlordimeform	T	Rat	M	-	337	1410
Chlordimeform	T	Rat	F	-	263	1410
Chlorfenprop-methyl	T	Rat	M	4h	>1000	1575
Chlorfenprop-methyl	T	Rat	M	7d	>750	1575
Chlorfenprop-methyl	F	Rat	M	7d	>1000 formulation	1575
Chlorothalonil	T	Rat	M	-	>2500	1410

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
Chlorothalonil	T	Rat	F	-	>2500	1410
Cycloate	T	Rat	M	-	2467	1410
Cycloate	T	Rat	F	-	2502	1410
Cyhexatin	T	Rat	M	-	767	1410
Cyhexatin	T	Rat	F	-	446	1410
Cypermethrin/Chlorpyrifos	F	Rat	M	-	2125.64	170
Dalapon	T	Rat	M	-	>5000	1410
Dalapon	T	Rat	F	-	>5000	1410
Decamethrin	T	Rat	F	5d	>800	1510
Dialifos	T	Rat	M	-	45	1410
Dialifos	T	Rat	F	-	28	1410
Di-allate	T	Rat	M	-	2175	1410
Di-allate	T	Rat	F	-	2124	1410
Diazinon	A	Mouse	M	24h	2750	1485
Diazinon	F	Rat	M	24h	>1000	1582
Diazinon	F	Rat	M	24h	500	1582
Diazinon	F	Rat	M	4h	>1000	1582
Diazinon	F	Rat	M	4h	c.1000-1200	1582
Dichlofenthion	T	Rat	M	-	576	1410
Dichlofenthion	T	Rat	F	-	355	1410
Dichlorvos	-	Rat	F	24h	41.4	802
Dichlorvos	-	Rat	F	24h	386.5	802
Dimethoate	F	Rat	M	24h	770	1582
Dimethoate	F	Rat	M	24h	353	1582
Dimethoate	F	Rat	M	4h	>1100	1582
Dimethoate	F	Rat	M	4h	1000	1582
Dinoseb amine	F	Rat	M	24h	113	1582
Dinoseb amine	F	Rat	M	24h	67	1582
Diquat	-	Rabbit	M/F	24h	>400	1580
Diquat	T	Rat	M	-	433	1410
Diuron	T	Rat	M	-	>2500	1410
Diuron	T	Rat	F	-	>2500	1410
Dodine	T	Rat	M	14d	894.32	1215
Dodine	T	Rat	F	14d	1122.01	1215
Endothall	T	Rat	M	-	>1000	1410
Endothall	T	Rat	F	-	>1000	1410
Famphur	T	Rat	M	-	400	1410
Famphur	T	Rat	F	-	533	1410
Fenthion	A	Rat	F	4h	271	1252
Fluorodifen	T	Rat	M	-	>2800	1410
Fluorodifen	T	Rat	F	-	>2800	1410
Formothion	F	Rat	M	24h	600	1582
Formothion	F	Rat	M	24h	353	1582

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
Kitazin	T	Rat	-	20h	2400	533/743/819
Leptophos	T	Rat	M	-	103	1410
Leptophos	T	Rat	F	-	44	1410
Linuron	T	Rat	M	-	>2500	1410
Linuron	T	Rat	F	-	>2500	1410
Methamidophos	T	Rat	M	-	179	1410
Methamidophos	T	Rat	F	-	151	1410
Methazole	T	Rat	M	-	>2500	1410
Methazole	T	Rat	F	-	>2500	1410
Methidathion	T	Rat	M	-	94	1410
Methidathion	T	Rat	F	-	85	1410
Methomyl	T	Rat	M	-	>2400	1410
Methomyl	T	Rat	F	-	>2400	1410
Methyl parathion	A	Mouse	M	24h	1200	1485
Mevinphos	A	Mouse	M	24h	12	1485
Monuron	T	Rat	M	-	>2500	1410
Monuron	T	Rat	F	-	>2500	1410
Nitrofen	T	Rat	M	-	>5000	1410
Nitrofen	T	Rat	F	-	>5000	1410
Oxamyl	F	Rabbit	M	24h	740	1433
Oxamyl	F	Rat	-	24h	>1200	1433
Oxamyl	F	Rat	-	24h	>1200	1433
Parathion	A	Mouse	M	24h	400	1485
Parathion	F	Rat	M	-	310	991
Parathion	F	Rat	M	-	242	991
Parathion	T	Rat	F	24h	18	1582
Parathion	T	Rat	F	4h	c.25-30	1582
Parathion	T	Rat	F	24h	39	1582
Parathion	T	Rat	F	4h	60	1582
Parathion	T	Rat	F	24h	4.4	1582
Parathion	T	Rat	F	4h	8.8	1582
Parathion	T	Rat	F	24h	41	1582
Parathion	T	Rat	F	4h	41	1582
Parathion	T	Rat	F	24h	18	1582
Parathion	T	Rat	F	4h	18	1582
Parathion	F	Rat	F	24h	16	1582
Parathion	F	Rat	F	24h	76	1582
Parathion	F	Rat	F	24h	8	1582
Parathion	F	Rat	F	24h	46	1582
Parathion	F	Rat	F	24h	21	1582
Pentachlorophenol	T	Rat	F	24h	149	1582
Pentachlorophenol	T	Rat	F	24h	105	1582
Phoxim	T	Rat	M	-	1276	1410

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
Phoxim	T	Rat	F	-	1224	1410
Piprotal	T	Rat	M	-	>5000	1410
Piprotal	T	Rat	F	-	>5000	1410
Prometon	T	Rat	M	-	>2500	1410
Prometon	T	Rat	F	-	>2500	1410
Prometryne	T	Rat	M	-	>2500	1410
Prometryne	T	Rat	F	-	>2500	1410
Propazin	T	Rat	M	-	>2500	1410
Propazin	T	Rat	F	-	>2500	1410
Propham	T	Rat	M	-	>4000	1410
Propham	T	Rat	F	-	>4000	1410
Pyrazon	T	Rat	M	-	>2500	1410
Pyrazon	T	Rat	F	-	>2500	1410
Quintozene	T	Rat	M	-	>5000	1410
Quintozene	T	Rat	F	-	>5000	1410
Resmethrin	T	Rat	M	-	>2500	1410
Resmethrin	T	Rat	F	-	>2500	1410
Simazine	T	Rat	M	-	>2500	1410
Simazine	T	Rat	F	-	>2500	1410
TCPE (fenteracol)	'Pure'	Rat	-	4h	>7100	1545
TCPE (fenteracol)/Aktinit PK (atrazine)	F	Rat	-	4h	>2100	1545

5.2. Dermal toxicity values (ED50)

Dermal ED50 data for blood cholinesterase activity (dose leading to 50% inhibition) was extracted from 4 studies although three of the studies appeared to contain the same data (533/743/819). This yielded 19 values all of which were for rats or mice and are summarised below (Table 2) with more detail available in Appendix E

Table 2: Dermal toxicity (ED50 blood cholinesterase activity)

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
Azinphos-methyl	A	Mouse	M	24h	1500	1485
Azinphos-methyl	A	Mouse	M	24h	600	1485
Carbofuran	A	Rat	M	24h	9.33	1478
Carbosulfan	A	Rat	M	24h	11.02	1478
Diazinon	A	Mouse	M	24h	20	1485
Diazinon	A	Mouse	M	24h	40	1485
Ethoprop	T	Rat	M	72h	13	1367
Ethoprop	F	Rat	M	72h	13.1	1367
Methyl parathion	A	Mouse	M	24h	950	1485
Methyl parathion	A	Mouse	M	24h	550	1485

Pesticide name	Grade	Species	Sex	Duration	Effect dose (mg/kg)	Ref.
Mevinphos	A	Mouse	M	24h	39	1485
Mevinphos	A	Mouse	M	24h	3	1485
Parathion	A	Mouse	M	24h	290	1485
Parathion	A	Mouse	M	24h	260	1485
Parathion	T	Rat	M	72h	5.6	1367
Parathion	A	Rat	M	72h	2.4	1654
Parathion	A	Rat	M	72h	2.9	1654
Parathion	A	Rat	F	72h	1.4	1654
Parathion	A	Rat	F	72h	1.8	1654

5.3. Dermal toxicity – other effects

Studies of the effects of dermal exposure to pesticides were found for both birds and mammals and are summarised in Appendices F and G respectively.

5.3.1. Birds

Data from studies of effects on birds were extracted from 11 studies involving a range of species including domestic fowl (hen, chicken) and several wild species. These were Chukar partridge (*Alectoris graeca*), Pheasant (*Phasianus colchicus*), Pigeon (*Columba livia*), Mallard (*Anas platyrhynchos*), Black-crowned night-heron (*Nycticorax nycticorax*) and Starling (*Sturnus vulgaris*). Some of these studies included what might be described as more realistic exposures such as swimming (mallard) or wading (Black-crowned night-heron) in contaminated water, overspray (Chukar partridge) or foot contact with contaminated perches (starlings).

5.3.2. Mammals

Data from studies of effects on mammals were extracted from 89 studies although three of the studies appeared to contain the same data (533/743/819). These studies almost entirely involved laboratory mice and rats with a few rabbit studies and one on the little brown bat (*Myotis lucifugus*). Effects included mortality, clinical signs, bodyweight, organ weight, cholinesterase inhibition, behavioural effects, electrophysiology, gross necropsy, histopathology and biochemical changes.

6. INHALATION TOXICITY

6.1. Inhalation toxicity (LD50, LC50)

Inhalation toxicity data was extracted from 16 studies. This yielded 51 values, 41 of which were for rats, seven for mice and one each for the guinea pig and rabbit. These are summarised below (Table 3) with more detail available in Appendix H.

Table 3: Inhalation toxicity (LD50, LC50)

Pesticide name	Grade	Species	Sex	Duration	Endpoint	Effect dose	Ref.
Cacodylic acid	F	Mouse	M	2h	LC50	>6.4 mg/L	1509
Cacodylic acid	F	Mouse	F	2h	LC50	>6.4 mg/L	1509
Cacodylic acid	F	Rat	F	2h	LC50	3.9 mg/L	1509

Pesticide name	Grade	Species	Sex	Duration	Endpoint	Effect dose	Ref.
Cacodylic acid	F	Rat	M	2h	LC50	>6.9 mg/L	1509
Chlorfenprop-methyl	T	Guinea pig	M	4h	LD50	>929 mg/m^3	1575
Chlorfenprop-methyl	T	Mouse	M	4h	LD50	>1425 mg/m^3	1575
Chlorfenprop-methyl	T	Mouse	M	4h	LD50	>929 mg/m^3	1575
Chlorfenprop-methyl	T	Rabbit	M	4h	LD50	>929 mg/m^3	1575
Chlorfenprop-methyl	T	Rat	M	1h	LD50	>1425 mg/m^3	1575
Chlorfenprop-methyl	T	Rat	M	4h	LD50	>1383 mg/m^3	1575
Chlorfenprop-methyl	T	Rat	M	4h/d (5 days)	LD50	>1150 mg/m^3	1575
Chlorfenprop-methyl	F	Rat	M	4h	LD50	>1070 mg/m^3	1575
Chlorfenprop-methyl	F	Rat	M	4h/d (5 days)	LD50	>1520 mg/m^3	1575
Chlorfenprop-methyl	T	Rat	M	4h	LD50	>929 mg/m^3	1575
Chlorfenvinphos	T	Rat	M	4h	LC50	0.34 mg/L	1412
Chlorfenvinphos	T	Rat	M	4h	LC50	0.072 mg/L	1412
Chlorfenvinphos	T	Rat	M	4h	LC50	0.094 mg/L	1351
Chlorfenvinphos	T	Rat	M	4h	LC50	0.128 mg/L	1351
Chlorfenvinphos	T	Rat	M	4h	LC50	0.093 mg/L	1351
Chlorfenvinphos	T	Rat	M	4h	LC50	0.34 mg/L	1351
Chlorfenvinphos	T	Rat	M	4h	LC50	0.52 mg/L	1351
Chlorfenvinphos	T	Rat	M	4h	LC50	0.51 mg/L	1351
Chlorfenvinphos	NR	Rat	M	4h	LC50	0.133 mg/L	1051
Chlorfenvinphos	NR	Rat	M	4h	LC50	0.509 mg/L	1051
Chloropicrin	NR	Rat	M	4h	LC50	11.9 ppm	1378
Chloropicrin	NR	Rat	M	4h	LC50	6.6 ppm	1029
Chloropicrin	NR	Rat	M	4h	LC50	14.4 ppm	1209
Decamethrin	T	Rat	M	120-150 min	LC50	940 mg/m^3	1510
Decamethrin	T	Rat	F	120-150 min	LC50	785 mg/m^3	1510
Diazinon	NR	Rat	M	4h	LD50	3.5 mg/L	898
DSMA	F	Mouse	M	2h	LC50	>6.9 mg/L	1509
DSMA	F	Mouse	F	2h	LC50	>6.9 mg/L	1509
DSMA	F	Rat	M	2h	LC50	>6.1 mg/L	1509
DSMA	F	Rat	F	2h	LC50	>6.1 mg/L	1509
Fenthion	T	Rat	M	4h	LC50	1.39 mg/L	1351
Fenthion	T	Rat	M	4h	LC50	1.72 mg/L	1351
Fenthion	T	Rat	M	4h	LC50	1.35 mg/L	1351
Fenthion	T	Rat	M	4h	LC50	0.22 mg/L	1327
Fenthion	T	Rat	M	4h	LC50	1.84 mg/L	1327
Fenvalerate	F	Rat	M	4h	LC50	32376 mg/m^3	1820
Methyl bromide	NR	Rat	M	4h	LC50	780 ppm	1748
Monocrotophos	NR	Rat	M	4h	LD50	0.08 mg/L	898
Oxamyl	T	Rat	M	4h	LC50	0.064 mg/L	1433

Pesticide name	Grade	Species	Sex	Duration	Endpoint	Effect dose	Ref.
Oxamyl	T	Rat	F	1h	LC50	0.12 mg/L	1433
Oxamyl	T	Rat	M	1h	LC50	0.17 mg/L	1433
Parathion	NR	Rat	M	4h	LD50	0.01 mg/L	898
Pentachlorophenol	NR	Rat	M	28-44 mins	LD50	11.7 mg/kg	1532
Phosphamidon	NR	Rat	M	4h	LD50	0.18 mg/L	898
Phosphine	P	Mouse	M	1h	LC50	>59.2 ppm	1009
Phosphine	P	Mouse	M	4h	LC50	26.5-33.4 ppm	1009
TCPE (fenteracol)/Aktinit PK (atrazine)	F	Rat	NR	4h	LD50	>1070 mg/kg	1545

6.2. Inhalation toxicity – other effects

Other effects of inhalation toxicity were extracted from 66 references. As for dermal effects the majority of these involved laboratory mice and rats with some on rabbits and one on the cynomolgus monkey (*Macaca fascicularis*). Only one study was found (1207 – Driver et al 1991) that investigated the effects of inhalation exposure to pesticides on birds and this study is discussed below in the next section. The data extracted is summarised in Appendix I.

7. DERMAL UPTAKE

Information relating to dermal uptake such as skin absorption, blood residues, organ residues, tissue residues or excretion data was identified in 98 studies. These included in vitro studies of penetration through skin in diffusion cells. Again, most of these studies involved laboratory rodents or rabbits although some involved pigs, Rhesus monkeys (*Macaca mulatta*) and human skin grafted onto mice. Two studies contained data on birds, one with data on tissue/organ residues in broiler chickens (982 - Majumder et al 1997) and another containing information on dermal absorption in Japanese quail (1477 – Shah et al 1983). This information is summarised in Appendix J where the type of information available in each reference is indicated.

8. INHALATION UPTAKE

The information found on uptake from inhalation studies was more limited with 12 in vivo studies identified as containing data. These were mainly rat studies with one study on mice and another on Cynomolgus monkeys (*Macaca fascicularis*). This information is summarised in Appendix K where the type of information available in each reference is indicated.

9. OTHER INFORMATION IDENTIFIED

Of the other studies identified as containing potentially useful information, five appear to relate to models or guidance for human exposure assessment. Four studies describe field exposure evidence that identify the potential risk from non-oral routes of exposure. Two studies highlight the lack of avian dermal toxicity data and how this might be overcome and indicate sources of data not identified by the ELS. Four papers describe studies of exposure via all routes.

9.1. Human exposure

Wei et al (2013) [146] describes a physiologically based pharmacokinetic (PBPK) model for studying permethrin exposure in humans (flight attendants) via all routes of exposure which was then compared with urinary excretion levels of metabolites. The input parameters described included bodyweight, cardiac output, alveolar ventilation, fraction of cardiac output, volume and partition coefficients for different organs and tissues, clearance constants for liver and blood, uptake rate constants and elimination rate constants for both rats and man. Exposure parameters in this case included exposed dermal area, transferable factor from surface to dermal, cumulative dermal absorption, fingertip area, transferable factor from hand to mouth, oral absorption, finger number touching mouth, hand mouth contact frequency and exposure duration. These parameters are clearly related to human contact but similar consideration would need to be applied to wildlife where dermal exposure may lead to oral exposure following grooming or preening. The model was used to make predictions of relative contributions to exposure via dermal, oral and inhalation routes. Median contributions for residual treatment were 83.5% dermal, 16.1% oral and 0.4% inhalation. For the pre-flight spray scenario these were 5.3% dermal, 5.0% oral and 89.7% inhalation.

Heredia-Ortiz et al (2013) [148] describe a toxicokinetic model for Folpet and its ring-biomarkers in humans for prediction of exposure in humans. Knaak et al (2012) [223] provides extensive information on parameters for pyrethroid insecticide QSAR and PBPK/PD models for human risk assessment. The paper includes information on skin absorption and appears to be a valuable resource of information suitable for models involving this class of compounds. The most useful information is stated to have been obtained from rat toxicokinetic studies (absorption, distribution and excretion), metabolism studies using labelled pyrethroids and the use of chiral isomers in metabolism studies.

Thongsinthusak et al. (1999) [900] describes a model for dermal absorption based on excretion data from human volunteer studies They also discuss the issue of bound skin residues in estimations of absorption and provide skin, blood, carcass, urine and faeces residues in rats following dermal absorption in rats (Thongsinthusak and Ross 1998).

> Thongsinthusak T and Ross JH, 1998. Dermal Absorption of amitraz, azinphos-methyl, metam-sodium, tralomethrin, and tribufos in rats, Technical Report HS-1770. Worker Health and Safety Branch, Department of Pesticide Regulation, Sacramento, CA.

Duff and Kissel (1996) [1002] describes the impact of soil loading on the absorption of lindane and 2,4-D into human skin in in-vitro studies with human skin. EFSA (2012) [232] is guidance on performing and interpreting dermal absorption studies for human risk assessment.

9.2. Examples of potential exposure

Hunt et al. (1995) [1027] describes an analysis of brain cholinesterase activity as a diagnosis of poisoning in the carcasses of Great egrets (*Casmerodius albus*), great blue Helens (*Ardea herodias*), and black-crowned night herons (*Nycticorax nyctocorax*). It is assumed that the birds were exposed dermally while wading or through contaminated water. Shlosberg et al. (1994) [1057] describes a case study of a poisoned Griffon vulture (*Gyps fulvus*) with zero blood cholinesterase activity that appeared to have been dermally exposed to ethyl parathion. Ernst et al. (1981) [1494] discusses the exposure of birds after a forest spray and the potential for inhalation and dermal exposure. The data presented is for cholinesterase activity and is therefore not route specific. The paper references a further publication concerning dermal exposure studies not highlighted in the ELS.

> Farage-Elawar M and Francis BM, 1988. The effect of three organophosphorus esters on brain and blood neurotoxic esterase and acetylcholinesterase. Pesticide Biochemistry and Physiology, Volume 31, Issue 2, June 1988, Pages 175–181.

Keith et al (1994) [1063] describes the environmental effects of the use of Queletox (Fenthion) on ploceid roosts and the examination of a number of birds found dead. Residues on dead ploceids were determined although in this study the main concern regarding external residues is the possibility of secondary poisoning of predators.

9.3. Avian dermal toxicity

The relative lack of dermal toxicity for birds relative to that for mammals is highlighted by Mineau (2002) [718] and Mineau (2012) [185]. Mineau (2002) [718] reviewed the results of field studies for a range of OP and carbamate pesticides. It was found that while oral exposure was a very good indicator of the risk of mortality, these estimates were improved if the dermal and inhalation toxicity was also taken into account. Avian dermal toxicity index (DTI) was estimated from rat DTI, log K_{ow}, molecular weight and molecular volume for a range of compounds. This paper references sources of information on pesticide residues on plants (Hoerger and Kenaga 1972), avian dermal toxicity (Schafer et al. 1973, Hudson et al.1979) and a field study (Mullie and Keith 1993) not found in the ELS.

Hoerger F and Kenaga EE, 1972. Pesticide residues on plants: Correlation of representative data as a basis for estimation of their magnitude in the environment. In Coulston F, Korte F, eds, Environmental Quality and Safety Vol 1—Global Aspects of Chemistry, Toxicology, and Technology as applied to the Environment. Academic, New York, NY, USA, pp 9–29.

Schafer Jr E.W, Brunton RB, Lockyer N.F and DeGrazio JW, 1973. Comparative toxicity of seventeen pesticides to the quelea, house sparrow and red-winged blackbird. Toxicol. Appl. Pharmacol. 26, 154–157.

Hudson RH, Haegele MA and Tucker RK, 1979. Acute oral and percutaneous toxicity of pesticides to mallards: correlations with mammalian toxicity data. Toxicol. Appl. Pharmacol. 47, 451–460.

Mullie´ WC and Keith JO, 1993. The effects of aerially applied Fenitrothion and chlorpyrifos on birds in the savannah of northern Senegal. J Appl Ecol 30:536–550.

Mineau (2012) [185] describes a comprehensive re-analysis of pesticide dermal toxicity in birds and analyses all of the known dermal toxicity for birds and references a further source of such data not revealed by the ELS (Schafer et al 2004). This information was used to calculate DTI values for comparison of chemicals, exposure method and with DTI values for rats. It was found that the DTI values were chemical specific and applied to any bird, that the site of testing (foot or underwing) had more effect than the exact method of testing, and that there was a good correlation between avian and rat DTI for compounds not requiring metabolic activation (direct acting compounds). On the basis of these data for the 13 direct acting cholinesterase compounds examined it is suggested that mammalian data on dermal penetration can be used to estimate the risk to birds.

Schafer Jr EW and Bowles Jr W.A., 2004. Toxicity, repellency or phytotoxicity of 979 chemicals to birds, mammals and plants. U.S. Dept. of Agriculture Animal and Plant Inspection Service, National Wildlife Research Center, Research Report 04-01.

9.4. Studies of all exposure routes in birds

Driver et al. (1991) [1207] investigated the contributions of exposure by four possible routes (1) inhalation, (2) direct ingestion through feeding, (3) dermal absorption and (4) indirect ingestion through preening in bobwhite quail (*Colinus virginianus*) exposed to a simulated aerial application of methyl parathion. A simulated crop environment was created in a wind tunnel to deliver the exposure. Inhalation exposure was measured by placing birds in body bags and covering their heads with plastic helmets such that only the beak was exposed to the contaminated environment. Dermal uptake was determined by measuring the cholinesterase inhibition in free-ranging quail and subtracting the

contributions from other routes. Feet were isolated by coating them in PVA. The rate of dermal uptake was assessed by applying a drop of formulation to a $1cm^2$ area of the right foot. The uptake of pesticide caused by preening was determined by fitting a neck collar that prevented feather grooming. The preening contribution was calculated by comparing these data with those for birds with no collar fitted. The oral route contribution was by determining cholinesterase activity in birds allowed to feed on contaminated food. At 1h after exposure inhalation and preening made the greatest contribution to exposure with preening and ingestion most important after 4h. However, at 8h, 24h and 48h the dermal route was most important with relative contributions ranked as follows - dermal > ingestion $\geq$ preening > inhalation. The paper references the toxicity data available in Hudson et al. (1979) and a study on topical application of malathion in fowl (Srivastava and Paraser 1971).

Srivastava DN and Paraser GC, 1971. Studies on toxic effects of malathion in fowl. Indian J. Anim. Sci. 41, 1154-1158.

Mineau (2011) [268] describes an earlier study of the effects of spraying on cholinesterase activity in finches (Mineau et al. 1990) and briefly outlines two recent experiments aimed at understanding and modelling the risk from non-dietary exposure. One was a spray chamber study involving coturnix quail (*Coturnix coturnix*) exposed to field only (contaminated soil and barley), field plus feed (adds contaminated food) and field plus overspray. Another "finch in a pot" method is described where zebra finches are housed with a treated or untreated ornamental shrub as a perch and either contaminated or clean food on a field at spraying. Birds could be positioned at the edge of the field to mimic the move to the boundary during operations on the field, or directly oversprayed. The final results are not reported but interim results are stated as supporting the findings of Driver et al. (1991) above. The paper references earlier examination of field study data (Mineau 2007).

Mineau P, Sundaram KMS, Sundaram A, Feng C, Busby DG, Pearce PA. 1990. An improved method to study the impact of pesticide sprays on small song birds. J Environ Sci Health B25:105–135.

Mineau P. 2007. Developing risk-based rankings for pesticides in support of standard development at Environment Canada: Risk-based approach for terrestrial biota continued – incorporating dermal exposure in pesticide risk assessments for birds. National Agri-Environmental Standards Initiative Technical Series Report No. 3-32. Ottawa: Environment Canada. 112 p.

Vyas et al (2006) [549] describes a test of the US EPA's deterministic risk assessment model for evaluating the potential of adverse effects in the field. Both laboratory dietary tests (treated diet) and an outdoor subacute dietary (sprayed grass) were conducted using Canada goose (*Branta canadensis*) goslings. Mortality, brain AChE activity and residues on feet and skin plus feathers and in the gastrointestinal tract were determined. The mortality found in the outdoor test was greater than would be predicted on the basis of laboratory dietary tests and foot/skin/feather residues indicated the possibility of other routes of exposure. The authors refer to a similar study (Matz et al. 1998) that was not identified in the ELS.

Matz AG, Bennett RS, Landis WG, 1998. Effects of azinphosmethyl on Northern bobwhite: A comparison of laboratory and field results. Environ. Toxicol. Chem. 17, 1364–1370.

Vyas et al. (2007) [498] describes a study conducted in an apple orchard where a tree was enclosed to form an aviary. After spraying the tree with azinphos-methyl, brown-headed cowbirds (*Molothrus ater*) were placed in the aviary for different periods before residues were measured on skin plus feathers, foot clippings or footwashes. This provided values for the change in residues over time for up to 7 days post-spray which confirmed the potential risk from dermal exposure.

CONCLUSIONS

The main information identified from the ELS related to dermal and inhalation toxicity and dermal absorption. As would be expected the vast majority of the toxicity data found in the ELS was for laboratory mammals. The ELS did not identify any source of dermal toxicity data for birds although three further sources were identified (Schafer et al., Hudson et al. 1979, Schafer and Bowles 2004) in some of the reviewed material.

Little information was found in the ELS that would aid in the development of models of exposure such as total surface, area for interception, surface area in contact with contaminated surfaces, inhalation rate etc.

Models of dermal and inhalation exposure are under development by the US EPA e.g.

http://www.epa.gov/oppefed1/ecorisk/fifrasap/rra_chap_three.htm#IIIF

Input parameters for dermal and inhalation exposures of birds include:

Parameter	Units	Description	Recommended Value
SA_{total}	m^2	total bird surface area	SA_{total}= (body weight*1,000)$^{0.667}$ / 1,000
$SA_{intercept}$	m^2	exposed surface area of bird intercepting applied pesticide	$SA_{intercept}$ = 0.5 (SA_{total})
$SA_{foliar\ contact}$	m^2	surface area of bird for foliar contact (assumed to be foot and lower leg)	$SA_{foliar\ contact}$ = (SA_{total}) (0.07)
R_{rate} (respiration rate)	L/min	Field respiration rate	rate = [(284*bodyweight(kg)$^{0.77}$)*3)] / 1,000

These values are based on those available in the Wildlife Exposure Factors Handbook (WEFH – USEPA 1993) available at:

http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=2799#Download

Similar data is available for mammals and this could be a useful source of information in the absence of other data.

No information was found on the behaviour of birds or mammals pertinent to the estimation of dermal or inhalation exposure or the groups most at risk. Much of the literature on the risks posed by spray applications relate to forestry rather than farmland where the species at risk and potential for interception will be markedly different.

REFERENCES

27 Pazarbasi A, Kasap M, et al. 1999. Dermal efficacy of bendiocarb on mammals, used for mosquito control in Cukurova. Turkish Journal of Zoology 23(SUPPL. 1), 303-308.

93 Antov G, K. H. Zajkov KH, et al. 1986. Hygienic-toxicological characteristics of alachlor III. inhalation toxicity. Khigiena i Zdraveopazvane 29(6), 31-37.

94 Oh BY, Shim JW, et al. 1986. Effect of some adhesive on the physio-chemical properties and

inhalation toxicity of carbofuran granule. Research Reports of the Rural Development Administration (Suweon) 28(Plant Environ Mycol Farm Prod Util), 86-89.

113 Goncharenko NG. 1975. Toxicity of abate after inhalation. Vrachebnoe delo(9), 130-133.

131 Henneberg, M. 1966. Absorption of DNBP (4,6-dinitro-2-sec-butylphenol) and DNPP (4,6-dinitro-2-isopropylphenol) through the skin of rats. Acta poloniae pharmaceutica 23(4), 371-378.

141 George J and Shukla Y, 2013. Early changes in proteome levels upon acute deltamethrin exposure in mammalian skin system associated with its neoplastic transformation potential. Journal of Toxicological Sciences 38(4), 629-642.

146 Wei B, Isukapalli SS, et al. 2013. Studying permethrin exposure in flight attendants using a physiologically based pharmacokinetic model. Journal of Exposure Science and Environmental Epidemiology 23(4), 416-427.

148 Heredia-Ortiz R, Berthet A, et al. 2013. Toxicokinetic modeling of folpet fungicide and its ring-biomarkers of exposure in humans. Journal of Applied Toxicology 33(7), 607-617.

170 Noaishi MA, Allah AAA, et al. 2013. Oral and dermal exposure of chlorpyrifos and cypermethrin mixture induced cytogenetic, histopathological damage and oxidative stress in rats. The Journal of American Science 9(3), 56-65.

185 Mineau P, 2012. A comprehensive re-analysis of pesticide dermal toxicity data in birds and comparison with the rat. Environmental Toxicology and Pharmacology 34(2), 416-427.

186 Chaklader M, Das P, et al. 2012. Altered canonical hedgehog-gli signalling axis in pesticide-induced bone marrow aplasia mouse model. Arhiv Za Higijenu Rada I Toksikologiju 63(3), 271-282.

201 Kim E, Kim M, et al. 2012. Effect of Topical Dimethylarsinic Acid on the Expression of Apoptosis-Related Proteins in Mouse Skin. Bulletin of Environmental Contamination and Toxicology 88(5), 672-677.

206 Krishnan K, Mitra NK, et al. 2012. A comparison of neurotoxicity in cerebellum produced by dermal application of chlorpyrifos in young and adult mice. Journal of Neural Transmission 119(3), 345-352.

207 Gammon DW, Liu Z, et al. 2012. Carbofuran occupational dermal toxicity, exposure and risk assessment. Pest Management Science 68(3), 362-370.

218 Garron C, Knopper LD, et al. 2012. Assessing the Genotoxic Potential of Chlorothalonil Drift from Potato Fields in Prince Edward Island, Canada. Archives of Environmental Contamination and Toxicology 62(2), 222-232.

223 Knaak JB, Dary CC, et al. 2012. Parameters for Pyrethroid Insecticide QSAR and PBPK/PD Models for Human Risk Assessment. Reviews of Environmental Contamination and Toxicology, Vol 219. D. M. Whitacre. 219, 1-114.

226 Solati A, Tavasoly A, et al. 2012. Effects of dermal exposure to chlorpyrifos on liver and brain structures and biochemical parameters in rabbits. Comparative Clinical Pathology 21(6), 1211-1217.

232 Products, E. P. o. P. P. and R. their 2012. Guidance on dermal absorption. EFSA Journal 10(4), 2665-2665.

255 Abdel-Rahim GA. and Mahmoud GI, 2011. Protective effects of a wheat germ rich diet against the toxic influence of profenofos on rat tissue lipids and oxidative pentose phosphate shunt enzymes. Grasas Y Aceites 62(3), 344-352.

256 Uboh FE, Asuquo EN, et al. 2011. Endosulfan-induced hepatotoxicity is route of exposure independent in rats. Toxicology and Industrial Health 27(6), 483-488.

267 Popov A, Mirkov I, et al. 2011. Local Proinflammatory Effects of Repeated Skin Exposure to Warfarin, An Anticoagulant Rodenticide in Rats. Biomedical and Environmental Sciences 24(2), 180-189.

268 Mineau P, 2011. Barking up the wrong perch: why we should stop ignoring non-dietary routes of pesticide exposure in birds. Integrated Environmental Assessment and Management 7(2, Sp. Iss. SI), 297-299.

273 Galbiati Tercariol PR and Godinho AF, 2011. Behavioral effects of acute exposure to the insecticide fipronil. Pesticide Biochemistry and Physiology 99(3), 221-225.

280 Mancebo A, Molier T, et al. 2011. Acute oral, pulmonary and intravenous toxicity/pathogenicity testing of a new formulation of Bacillus thuringiensis var israelensis SH-14 in rats. Regulatory Toxicology and Pharmacology 59(1), 184-190.

301 Lim KL, Tay A, et al. 2011. The effect of consequent exposure of stress and dermal application of low doses of chlorpyrifos on the expression of glial fibrillary acidic protein in the hippocampus of adult mice. Journal of Occupational Medicine and Toxicology 6.

303 Reifenrath WG, Ross JH, et al. 2011. Experimental methods for determining permethrin dermal absorption. Journal of Toxicology and Environmental Health-Part a-Current Issues 74(5), 325-335.

312 Xue M, Shen G, et al. 2010. Dynamic changes of alpha-hexachlorocyclohexane and its enantiomers in various tissues of Japanese Rabbits (Oyctolagus cuniculus) after oral or dermal exposure. Chemosphere 81(11), 1486-1491.

319 Da Silva FR, Erdtmann B, et al. 2010. Effects of Dermal Exposure to Nicotiana tabacum (Jean Nicot, 1560) Leaves in Mouse Evaluated by Multiple Methods and Tissues. Journal of Agricultural and Food Chemistry 58(17), 9868-9874.

320 Barfod KK, Poulsen SS, et al. 2010. Sub-chronic lung inflammation after airway exposures to Bacillus thuringiensis biopesticides in mice. Bmc Microbiology 10.

336 Hughes MF and Edwards BC, 2010. In vitro dermal absorption of pyrethroid pesticides in human and rat skin. Toxicology and Applied Pharmacology 246(1-2), 29-37.

338 Nawaz SK, Batool R, et al. 2010. Alpha Tocopherol May Reduce Endosulfan Induced Toxicity in Mice. Pakistan Journal of Zoology 42(3), 205-210.

350 Mitra NK, Lee MS, et al. 2010. Evaluation of difference in the neurotoxicity produced by dermal application of chlorpyrifos on the neonatal and adult mice. Tropical Biomedicine 27(1), 19-29.

352 Yavuz O, Aksoy A, et al. 2010. Repeated-dose 14-day dermal toxicity of different combinations of some synthetic pyrethroid insecticides, piperonyl butoxide, and tetramethrin in rats. Cutaneous and Ocular Toxicology 29(1), 16-25.

376 Raina R, Verma PK, et al. 2010. Protective role of L-ascorbic acid against cypermethrin-induced oxidative stress and lipid peroxidation in Wistar rats. Toxicological and Environmental Chemistry 92(5), 947-953.

388 Tayebati S K, Di Tullio MA, et al. 2009. Influence of dermal exposure to the pyrethroid insecticide deltamethrin on rat brain microanatomy and cholinergic/dopaminergic neurochemistry. Brain Research 1301, 180-188.

395 Raina R, Verma PK, et al. 2009. Induction of oxidative stress and lipid peroxidation in rats chronically exposed to cypermethrin through dermal application. Journal of Veterinary Science 10(3), 257-259.

408 Nemec M, Sloter E, et al. 2009. Prenatal developmental toxicity studies of inhaled methyl iodide vapor in rabbits reveal a susceptible window of exposure inducing late gestational fetotoxicity.

Inhalation Toxicology 21(5-7), 449-461.

432 Mitra NK, Nadarajah VD, et al. 2009. Effect of concurrent application of heat, swim stress and repeated dermal application of chlorpyrifos on the hippocampal neurons in mice. Folia Neuropathologica 47(1), 60-68.

441 Mitra NK, Siong HH, et al. 2008. Evaluation of neurotoxicity of repeated dermal application of chlorpyrifos on hippocampus of adult mice. Annals of Agricultural and Environmental Medicine 15(2), 211-216.

457 Boudry I., Blanck O, et al. 2008. Percutaneous penetration and absorption of parathion using human and pig skin models in vitro and human skin grafted onto nude mouse skin model in vivo. Journal of Applied Toxicology 28(5), 645-657.

477 Kataranovski M, Mirkov I, et al. 2008. Percutaneous toxicity of anticoagulant warfarin in rats. Cutaneous and Ocular Toxicology 27(1), 29-40.

493 Muhammad F, Riaz A, et al. 2008. Estimation of Atrazine in the Stratum Corneum and its Toxic Effects in Skin Following Topical Application to Rabbits. Toxicology Mechanisms and Methods 18(9), 697-703.

497 Rojo AI, Cavada C, et al. 2007. Chronic inhalation of rotenone or paraquat does not induce Parkinson's disease symptoms in mice or rats. Experimental Neurology 208(1), 120-126.

498 Vyas NB, Spann JW, et al. 2007. Dermal insecticide residues from birds inhabiting an orchard. Environmental Monitoring and Assessment 133(1-3), 209-214.

506 Mani U, Lal K, et al. 2007. Inhalation exposure of formulated fenvalerate (20% EC), Toxicologic alterations in kidney of rats. Bulletin of Environmental Contamination and Toxicology 79(1), 15-19.

510 Capt A, Luzy AP, et al. 2007. Comparison of the human skin grafted onto nude mouse model with in vivo and in vitro models in the prediction of percutaneous penetration of three lipophilic pesticides. Regulatory Toxicology and Pharmacology 47(3), 274-287.

522 Kataranovski M, Kataranovski D, et al. 2007. Epicutaneous exposure to anticoagulant rodenticide warfarin modulates local skin activity in rats. Cutaneous and Ocular Toxicology 26(1), 1-13.

523 Brand RM, Charron AR, et al. 2007. Moisturizing lotions can increase transdermal absorption of the herbicide 2,4-dichlorophenoxacetic acid across hairless mouse skin. Cutaneous and Ocular Toxicology 26(1), 15-23.

525 Brand RM, McMahon L, et al. 2007. Transdermal absorption of the herbicide 2,4-dichlorophenoxyacetic acid is enhanced by both ethanol consumption and sunscreen application. Food and Chemical Toxicology 45(1), 93-97.

528 Emara AM and Draz EI, 2007. Immunotoxicological study of one of the most common over-the-counter pyrethroid insecticide products in Egypt. Inhalation Toxicology 19(12), 997-1009.

533 Ranvir GD, Vadlamudi VP, et al. 2007. Short term dermato-toxicological evaluation of kitazin - a new fungicide in rats. Journal of Plant Disease Sciences 2(2), 148-149.

547 Brand RM, Jendrzejewski JL, et al. 2006. A single oral dose of ethanol can alter transdermal absorption of topically applied chemicals in rats. Toxicological Sciences 92(2), 349-355.

549 Vyas NB, Spann JW et al. 2006. Field evaluation of an avian risk assessment model. Environmental Toxicology and Chemistry 25(7), 1762-1771.

558 Erdogan S, Zeren EH, et al. 2006. Pulmonary effects of deltamethrin inhalation: an experimental study in rats. Ecotoxicology and Environmental Safety 63(2), 318-323.

559 D'Souza UJA, Narayana K, et al. 2006. Dermal exposure to the herbicide-paraquat results in

genotoxic and cytotoxic damage to germ cells in the male rat. Folia Morphologica 65(1), 6-10.

574 Mendrala AL, Markham DA, et al. 2005. Rapid uptake, metabolism, and elimination of inhaled sulfuryl fluoride fumigant by rats. Toxicological Sciences 86(2), 239-247.

583 Min KJ, Cha CG, et al. 2005. Determination of urinary metabolites of phosalone, methidathion, and IBP after oral administration and dermal application to rats. Bulletin of Environmental Contamination and Toxicology 74(5), 809-816.

585 Morvai V, Szakmary E, et al. 2005. The effects of carbon disulfide and ethanol on the circulatory system of rats. Journal of Toxicology and Environmental Health-Part a-Current Issues 68(10), 797-809.

588 D'Souza UJA, Zain A, et al. 2005. Genotoxic and cytotoxic effects in the bone marrow of rats exposed to a low dose of paraquat via the dermal route. Mutation Research-Genetic Toxicology and Environmental Mutagenesis 581(1-2), 187-190.

630 Abdel-Rahman A, Dechkovskaia AM, et al. 2004. Maternal exposure to nicotine and chlorpyrifos, alone and in combination, leads to persistently elevated expression of glial fibrillary acidic protein in the cerebellum of the offspring in late puberty. Archives of Toxicology 78(8), 467-476.

641 Mehrani H, 2004. Protective effect of polyurethane immobilized human butyrylcholinesterase against parathion inhalation in rat. Environmental Toxicology and Pharmacology 16(3), 179-185.

644 Pont AR, Charron AR, et al. 2004. Active ingredients in sunscreens act as topical penetration enhancers for the herbicide 2,4-dichlorophenoxyacetic acid. Toxicology and Applied Pharmacology 195(3), 348-354.

649 Abdel-Rahman A, Dechkovskaia AM, et al. 2004. Neurological deficits induced by malathion, deet, and permethrin, alone or in combination in adult rats. Journal of Toxicology and Environmental Health-Part a-Current Issues 67(4), 331-356.

654 Brand RM, Charron AR, et al. 2004. Effects of chronic alcohol consumption on dermal penetration of pesticides in rats. Journal of Toxicology and Environmental Health-Part a-Current Issues 67(2), 153-161.

667 Abdel-Rahman A, Dechkovskaia AM, et al. 2003. Increased expression of glial fibrillary acidic protein in cerebellum and hippocampus: Differential effects on neonatal brain regional acetylcholinesterase following maternal exposure to combined chlorpyrifos and nicotine. Journal of Toxicology and Environmental Health-Part A 66(21), 2047-2066.

677 Liu KH and Kim JH, 2003. In vitro dermal penetration study of carbofuran, carbosulfan, and furathiocarb. Archives of Toxicology 77(5), 255-260.

680 Pauluhn J and Rosenbruch M, 2003. Inhalation toxicity of propineb. Part I: Results of subacute inhalation exposure studies in rats. Inhalation Toxicology 15(5), 411-434.

692 Tos-Luty S, Obuchowska-Przebirowska D, et al. 2003. Dermal and oral toxicity of malathion in rats. Annals of Agricultural and Environmental Medicine 10(1), 101-106.

696 Prater MR, Gogal RM, et al. 2003. Cis-urocanic acid increases immunotoxicity and lethality of dermally administered permethrin in C57BL/6N mice. International Journal of Toxicology 22(1), 35-42.

699 Ma TG, Kramer RE, et al. 2003. Effects of chronic dermal exposure to nonlethal doses of methyl parathion on brain regional acetylcholinesterase and muscarinic cholinergic receptors in female rats. Journal of Neuroscience Research 71(1), 138-145.

701 Pont AR, Charron AR, et al. 2003. Effects of active sunscreen ingredient combinations on the topical penetration of the herbicide 2,4-dichlorophenoxyacetic acid. Toxicology and Industrial

Health 19(1), 1-8.

702 Brand RM, Pike J, et al. 2003. Sunscreens containing physical UV blockers can increase transdermal absorption of pesticides. Toxicology and Industrial Health 19(1), 9-16.

707 Prater MR, Gogal RM, et al. 2002. Single-dose topical exposure to the pyrethroid insecticide, permethrin in C57BL/6N mice: effects on thymus and spleen. Food and Chemical Toxicology 40(12), 1863-1873.

710 Navidi WC and Bunge AL, 2002. Uncertainty in measurements of dermal absorption of pesticides. Risk Analysis 22(6), 1175-1182.

711 Mani U, Islam F, et al. 2002. Steroidogenic alterations in testes and sera of rats exposed to formulated Fenvalerate by inhalation. Human & Experimental Toxicology 21(11), 593-597.

712 Tsuji R, Kobayashi K, et al. 2002. Lack of changes in brain muscarinic receptor and motor activity of mice after neonatal inhalation exposure to d-allethrin. Journal of Applied Toxicology 22(6), 423-429.

718 Mineau P, 2002. Estimating the probability of bird mortality from pesticide sprays on the basis of the field study record. Environmental Toxicology and Chemistry 21(7), 1497-1506.

719 Kramer RE, Wellman SE, et al. 2002. Pharmacokinetics of methyl parathion: A comparison following single intravenous, oral or dermal administration. Journal of Biomedical Science 9(4), 311-320.

720 Brand RM and Mueller C, 2002. Transdermal penetration of atrazine, alachlor, and trifluralin: Effect of formulation. Toxicological Sciences 68(1), 18-23.

732 Cnubben NHP, Elliott GR, et al. 2002. Comparative in vitro-in vivo percutaneous penetration of the fungicide ortho-phenylphenol. Regulatory Toxicology and Pharmacology 35(2), 198-208.

734 Meher SM, Bodhankar SL, et al. 2002. Toxicity studies of microbial insecticide Bacillus thuringiensis var. kenyae in rats, rabbits, and fish. International Journal of Toxicology 21(2), 99-105.

735 Kramer RE, Wellman SE, et al. 2002. A comparison of cholinesterase activity after intravenous, oral or dermal administration of methyl parathion. Journal of Biomedical Science 9(2), 140-148.

740 Tos-Luty S, Tokarska-Rodak M, et al. 2002. Distribution of dermally absorbed C-14 DDT in the organs of Wistar rats. Annals of Agricultural and Environmental Medicine 9(2), 215-223.

743 Ranvir GD, Vadlamudi VP, et al. 2002. Toxicity evaluation of kitazin, an organophosphate pesticide. Indian Journal of Toxicology 9(1), 39-42.

744 Brand RM, Spalding M, et al. 2002. Sunscreens can increase dermal penetration of 2,4-dichlorophenoxyacetic acid. Journal of Toxicology-Clinical Toxicology 40(7), 827-832.

746 Liu KH, Sung HJ, et al. 2002. Dermal pharmacokinetics of the insecticide furathiocarb in rats. Pest Management Science 58(1), 57-62.

751 Atiy S, Comelekoglu U, et al. 2002. Electrophysiological and histopathological evaluation of respiratory tract. Inhalation Toxicology 14(2), 199-215.

755 Mani U, Islam F, et al. 2001. Pulmonary toxicity of a formulated preparation of fenvalerate in rats subchronically exposed by nose only inhalation for 90 days. Biomedical and Environmental Sciences 14(4), 333-340.

756 Dary CC, Blancato JN, et al. 2001. Chemomorphic analysis of malathion in skin layers of the rat: Implications for the use of dermatopharmacokinetic tape stripping in exposure assessment to pesticides. Regulatory Toxicology and Pharmacology 34(3), 234-248.

757 Abu-Qare AW and Abou-Donia MB, 2001. DEET (N,N-diethyl-m-toluamide) alone and in combination with permethrin increased urinary excretion of 6 beta-hydroxycortisol in rats, a marker of hepatic CYP3A induction. Journal of Toxicology and Environmental Health-Part A 64(5), 373-384.

758 Abdel-Rahman A, Shetty AK, et al. 2001. Subchronic dermal application of N,N-diethyl m-toluamide (DEET) and permethrin to adult rats, alone or in combination, causes diffuse neuronal cell death and cytoskeletal abnormalities in the cerebral cortex and the hippocampus, and purkinje neuron loss in the cerebellum. Experimental Neurology 172(1), 153-171.

759 Zhu H, Rockhold RW, et al. 2001. Effects of single or repeated dermal exposure to methyl parathion on behavior and blood cholinesterase activity in rats. Journal of Biomedical Science 8(6), 467-474.

769 Kansal DK and Chakrabarti A, 2001. Neurobehavioural study of subchronic administration of oxydemeton-methyl (insecticide and acaricide) in rats. Indian Journal of Physiology and Pharmacology 45(3), 329-336.

771 Abu-Qare AW and Abou-Donia MB, 2001. Inhibition and recovery of maternal and fetal cholinesterase enzyme activity following a single cutaneous dose of methyl parathion and diazinon, alone and in combination, in pregnant rats. Journal of Applied Toxicology 21(4), 307-316.

777 Abu-Qare AW, Abdel-Rahman A, et al. 2001. Inhibition of cholinesterase enzymes following a single dermal dose of chlorpyrifos and methyl parathion, alone and in combination, in pregnant rats. Journal of Toxicology and Environmental Health-Part A 63(3), 173-189.

786 Abou-Donia MB, Goldstein LB, et al. 2001. Effects of daily dermal application of DEET and permethrin, alone and in combination, on sensorimotor performance, blood-brain barrier, and blood-testis barrier in rats. Journal of Toxicology and Environmental Health-Part A 62(7), 523-541.

791 Abou-Donia MB, Goldstein LB, et al. 2001. Locomotor and sensorimotor performance deficit in rats following exposure to pyridostigmine bromide, DEET, and permethrin, alone and in combination. Toxicological Sciences 60(2), 305-314.

800 Punareewattana K, Smith BJ, et al. 2001. Topical permethrin exposure inhibits antibody production and macrophage function in C57B1/6N mice. Food and Chemical Toxicology 39(2), 133-139.

802 Knezevic D, Tadic V, et al. 2001. Combined decontamination and parenteral therapy improve the chances of survival in rats percutaneously poisoned with organophosphorus insecticides. Acta Veterinaria-Beograd 51(2-3), 187-195.

803 Tos-Luty S, Przebirowska D, et al. 2001. Histological and ultrastructural studies of rats exposed to carbaryl. Annals of Agricultural and Environmental Medicine 8(2), 137-144.

804 Latuszynska J, Luty S, et al. 2001. Neurotoxic effect of dermally-applied chlorpyrifos and cypermethrin in wistar rats. Annals of Agricultural and Environmental Medicine 8(2), 163-170.

819 Ranvir GD, Vadlamudi VP, et al. 2001. Evaluation of acute dermal toxicity of kitazin in rats. Journal of Bombay Veterinary College 9(1/2), 35-36.

822 Li WF, Costa LG, et al. 2000. Catalytic efficiency determines the in-vivo efficacy of PON1 for detoxifying organophosphorus compounds. Pharmacogenetics 10(9), 767-779.

827 van de Sandt JJM, Meuling WJA, et al. 2000. Comparative in vitro-in vivo percutaneous absorption of the pesticide propoxur. Toxicological Sciences 58(1), 15-22.

832 Abu-Qare AW and Abou-Donia MB, 2000. Urinary excretion of metabolites following a single dermal dose of C-14 methyl parathion in pregnant rats. Toxicology 150(1-3), 119-127.

833 Moorman WJ, Cheever KL, et al. 2000. Male adolescent exposure to endocrine-disrupting pesticides: vinclozolin exposure in peripubertal rabbits. Andrologia 32(4-5), 285-293.

834 Suwalsky M, Villena F, et al. 2000. Plasma absorption and ultrastructural changes of rat testicular cells induced by lindane. Human & Experimental Toxicology 19(9), 529-533.

840 Hewitt PG, Perkins J, et al. 2000. Metabolism of fluroxypyr, fluroxypyr methyl ester, and the herbicide fluroxypyr methylheptyl ester. I: During percutaneous absorption through fresh rat and human skin in vitro. Drug Metabolism and Disposition 28(7), 748-754.

855 Panemangalore M. and Bebe FN, 2000. Dermal exposure to pesticides modifies antioxidant enzymes in tissues of rats. Journal of Environmental Science and Health Part B-Pesticides Food Contaminants and Agricultural Wastes 35(4), 399-416.

858 Saleh MA, El-Demerdash A, et al. 2000. Detection of malathion in dermally treated rats using electronic autoradiography and FT-IR microscopy. Journal of Trace and Microprobe Techniques 18(1), 121-135.

865 Abu-Qare AW, Abdel-Rahman AA, et al. 2000. Placental transfer and pharmacokinetics of a single dermal dose of C-14 methyl parathion in rats. Toxicological Sciences 53(1), 5-12.

878 Tuler SM and Bowen JM, 1999. Chronic fenthion toxicity in laying hens. Veterinary and Human Toxicology 41(5), 302-307.

898 Sabaitis CP, Leong BKJ, et al. 1999. Validation of intratracheal instillation as an alternative for aerosol inhalation toxicity testing. Journal of Applied Toxicology 19(2), 133-140.

900 Thongsinthusak T, Ross JH, et al. 1999. Estimation of dermal absorption using the exponential saturation model. Regulatory Toxicology and Pharmacology 29(1), 37-43.

903 Latuszynska J, Luty S, et al. 1999. Studies of toxicity of dermally-absorbed nurelle D 550 EC preparations. Annals of agricultural and environmental medicine : AAEM 6(2), 151-159.

924 Kumar R, Pant N, et al. 1998. Hexachlorocyclohexane and its isomers: Regional brain levels in the rat after dermal exposure. Archives of Environmental Contamination and Toxicology 35(4), 674-679.

926 Heatherington AC, Fisher HL, et al. 1998. Percutaneous absorption and disposition of C-14 Chlordecone in young and adult female rats. Environmental Research 79(2), 138-155.

934 Pauluhn J and Machemer LH, 1998. Assessment of pyrethroid-induced paraesthesias: comparison of animal model and human data. Toxicology Letters 96-7, 361-368.

944 Moorman MP, Sills RC, et al. 1998. Carbon disulfide neurotoxicity in rats: II. Toxicokinetics. Neurotoxicology 19(1), 89-97.

945 Gollapudi BB, Cieszlak FS, et al. 1998. Dominant lethal test with rats exposed to 1,3-dichloropropene by inhalation. Environmental and Molecular Mutagenesis 32(4), 351-359.

958 Dick IP, Blain PG, et al. 1997. The percutaneous absorption and skin distribution of lindane in man. II. In vitro studies. Human & Experimental Toxicology 16(11), 652-657.

960 Saleh MA, Ahmed AE, et al. 1997. Determination of the distribution of malathion in rats following various routes of administration by whole-body electronic autoradiography. Toxicology and Industrial Health 13(6), 751-758.

962 Wrzesinski CL, Feeney WP, et al. 1997. Dermal penetration of 4 "-(epi-methylamino)-4 "-deoxyavermectin B-1a benzoate in the Rhesus monkey. Food and Chemical Toxicology 35(10-11), 1085-1089.

963 Clark L, 1997. Dermal contact repellents for starlings: Foot exposure to natural plant products. Journal of Wildlife Management 61(4), 1352-1358.

969 Baynes RE, Halling KB, et al. 1997. The influence of diethyl-m-toluamide (DEET) on the

percutaneous absorption of permethrin and carbaryl. Toxicology and Applied Pharmacology 144(2), 332-339.

970 Moody RP and Nadeau B, 1997. In vitro dermal absorption of two commercial formulations of 2,4-dichlorophenoxyacetic acid dimethylamine (2,4-D amine) in rat, guinea pig and human skin. Toxicology in Vitro 11(3), 251-262.

971 Adam A, Marzuki A, et al. 1997. The oral and intratracheal toxicities of roundup and its components to rats. Veterinary and Human Toxicology 39(3), 147-151.

980 Bast GE, Taeschner D, et al. 1997. Permethrin absorption not detected in single-pass perfused rabbit ear, and absorption with oxidation of 3-phenoxybenzyl alcohol. Archives of Toxicology 71(3), 179-186.

982 Majumder S, Chakraborty AK, et al. 1997. Effect of short term dermal toxicity of fenvalerate on residue, cell architecture and biochemical profiles in broiler chicks. Indian Journal of Experimental Biology 35(2), 162-167.

989 Pauluhn J, 1996. Risk assessment of pyrethroids following indoor use. Toxicology Letters 88(1-3), 339-348.

991 Puga FR and Rodrigues MAL, 1996. Evaluation of the role of formulation on parathion toxicity. Ecotoxicology and Environmental Safety 35(1), 38-40.

1002 Duff RM and Kissel JC, 1996. Effect of soil loading on dermal absorption efficiency from contaminated soils. Journal of Toxicology and Environmental Health 48(1), 93-106.

1009 Omae K, Ishizuka C, et al. 1996. Acute and subacute inhalation toxicity of highly purified phosphine (PH-3) in male ICR mice. Journal of Occupational Health 38(1), 36-42.

1011 Nakano E, RabelloGay MN, et al. 1996. Evaluation of the genotoxic potential of flumethrin in mouse bone marrow by chromosomal analysis and micronucleus test. Teratogenesis Carcinogenesis and Mutagenesis 16(1), 37-48.

1021 Hughes MF, Mitchell CT, et al. 1995. In-vitro percutaneous-absorption of dimethylarsinic acid in mice. Journal of Toxicology and Environmental Health 45(3), 279-290.

1023 Prasad AK, Pant N, et al. 1995. Effect of dermal application of hexachlorocyclohexane (HCH) on male reproductive-system of rat. Human & Experimental Toxicology 14(6), 484-488.

1024 Bernier J, Girard D, et al. 1995. Immunotoxicity of aminocarb .3. Exposure route-dependent immunomodulation by aminocarb in mice. Toxicology 99(1-2), 135-146.

1027 Hunt KA, Hooper MJ, et al. 1995. Carbofuran poisoning in herons - diagnosis using cholinesterase reactivation techniques. Journal of Wildlife Diseases 31(2), 186-192.

1035 Srivastava SC, Kumar R, et al. 1995. Effect of hexachlorocyclohexane (HCH) on testicular plasma-membrane of rat. Toxicology Letters 75(1-3), 153-157.

1039 Moody RP and Nadeau B, 1994. In-vitro dermal absorption of pesticides .4. In-vivo and in-vitro comparison with the organophosphorus insecticide diazinon in rat, guinea-pig, pig, human and tissue-cultured skin. Toxicology in Vitro 8(6), 1213-1218.

1040 Moody RP, Nadeau B, et al. 1994. In-vitro dermal absorption of pesticides .5. In-vivo and in-vitro comparison of the herbicide 2,4-dichlorophenoxyacetic acid in rat, guinea-pig, pig, human and tissue-cultured skin. Toxicology in Vitro 8(6), 1219-1224.

1041 Moody RP, Nadeau B, et al. 1994. In-vitro dermal absorption of pesticides .6. In-vivo and in-vitro comparison of the organochlorine insecticide DDT in rat, guinea-pig, pig, human and tissue-cultured skin. Toxicology in Vitro 8(6), 1225-1232.

1046 Hilton J, Woollen BH, et al. 1994. Vehicle effects on in-vitro percutaneous-absorption through rat and human skin. Pharmaceutical Research 11(10), 1396-1400.

1048 Ramsey JD, Woollen BH, et al. 1994. The predictive accuracy of in-vitro measurements for the dermal absorption of a lipophilic penetrant (fluazifop-butyl) through rat and human skin. Fundamental and Applied Toxicology 23(2), 230-236.

1051 Takahashi H, Yoshida M, et al. 1994. Different inhalation lethality between micron-sized and submicron-sized aerosols of organophosphorus insecticide, chlorfenvinphos, in rats. Toxicology Letters 73(2), 103-111.

1052 Rawlings JM, Hilton J, et al. 1994. Effect of dosing vehicle on the dermal absorption of fluazifop-butyl and fomesafen in rats in-vivo. Fundamental and Applied Toxicology 23(1), 93-100.

1055 Ladics GS, Smith C, et al. 1994. Evaluation of the humoral immune-response of cd rats following a 2-week exposure to the pesticide carbaryl by the oral, dermal, or inhalation routes. Journal of Toxicology and Environmental Health 42(2), 143-156.

1056 Deamer NJ, Ocallaghan JP, et al. 1994. Olfactory toxicity resulting from dermal application of 2,6-dichlorobenzonitrile (dichlobenil) in the C57BL mouse. Neurotoxicology 15(2), 287-293.

1057 Shlosberg A, Lublin A, et al. 1994. Percutaneous exposure to ethyl parathion in a feral griffon vulture (Gyps-fulvus). Veterinary and Human Toxicology 36(3), 224-226.

1058 Henderson JD, Yamamoto JT, et al. 1994. Oral and dermal toxicity of organophosphate pesticides in the domestic pigeon (columba-livia). Bulletin of Environmental Contamination and Toxicology 52(5), 633-640.

1059 Raizada RB, Srivastava MK, et al. 1994. Dermal toxicity of hexachlorocyclohexane and pirimiphos-methyl in female rats. Veterinary and Human Toxicology 36(2), 128-130.

1063 Keith JO, Ngondi JG, et al. 1994. Environmental-effects on wetlands of queletox(r) applied to ploceid roosts in Kenya. Environmental Toxicology and Chemistry 13(2), 333-341.

1067 Dary CC, Blancato JN, et al. 1994. Dermal absorption and disposition of formulations of malathion in sprague-dawley rats and humans. Biomarkers of Human Exposure to Pesticides. M. A. Saleh, J. N. Blancato and C. H. Nauman. 542, 231-263.

1083 Vandesandt JJM, Rutten A, et al. 1993. Species-specific cutaneous biotransformation of the pesticide propoxur during percutaneous-absorption in-vitro. Toxicology and Applied Pharmacology 123(1), 144-150.

1102 Auton TR, Ramsey JD, et al. 1993. Modeling dermal pharmacokinetics using invitro data .1. fluazifop-butyl in the rat. Human & Experimental Toxicology 12(3), 199-206.

1111 Clark NWE, Scott RC, et al. 1993. Fate of fluazifop butyl in rat and human skin invitro. Archives of Toxicology 67(1), 44-48.

1116 Raizada RB, Srivastava MK, et al. 1993. Interaction of technical hexachlorocyclohexane and oxydemeton methyl 25 EC to female rats after dermal application. Indian Journal of Experimental Biology 31(2), 142-146.

1118 Chevalier G, Boudreau J, et al. 1993. Acute pulmonary toxicity of aerosolized oil-based aminocarb insecticide - early responses of the pulmonary surfactant. Inhalation Toxicology 5(1), 55-75.

1120 Zeid MMA, Elbarouty G, et al. 1993. Malathion disposition in dermally and orally treated rats and its impact on the blood-serum acetylcholine esterase and protein profile. Journal of Environmental Science and Health Part B-Pesticides Food Contaminants and Agricultural Wastes 28(4), 413-430.

1121 Moody RP, 1993. Invitro dermal absorption of pesticides - a cross-species comparison including

testskin. Journal of Toxicology-Cutaneous and Ocular Toxicology 12(2), 197-202.

1140 Hotchkiss SAM, Hewitt P, et al. 1992. Percutaneous-absorption of nicotinic-acid, phenol, benzoic-acid and triclopyr butoxyethyl ester through rat and human skin invitro - further validation of an invitro model by comparison with invivo data. Food and Chemical Toxicology 30(10), 891-899.

1146 Hall LL, Fisher HL, et al. 1992. Age-related percutaneous penetration of 2-sec-butyl-4,6-dinitrophenol (dinoseb) in rats. Fundamental and Applied Toxicology 19(2), 258-267.

1150 Fisher HL, Hall LL, et al. 1992. Dermal penetration of C-14 captan in young and adult-rats. Journal of Toxicology and Environmental Health 36(3), 251-271.

1155 Wester RC, Maibach HI, et al. 1992. Percutaneous-absorption of C-14 chlordane from soil. Journal of Toxicology and Environmental Health 35(4), 269-277.

1159 Knopp D and Schiller F, 1992. Oral and dermal application of 2,4-dichlorophenoxyacetic acid sodium and dimethylamine salts to male-rats - investigations on absorption and excretion as well as induction of hepatic mixed-function oxidase activities. Archives of Toxicology 66(3), 170-174.

1161 Snodgrass HL, 1992. Permethrin transfer from treated cloth to the skin surface - potential for exposure in humans. Journal of Toxicology and Environmental Health 35(2), 91-105.

1162 Gupta KP and Mehrotra NK, 1992. Status of ornithine decarboxylase activity and dna-synthesis in mancozeb-exposed mouse skin. Carcinogenesis 13(1), 131-133.

1163 Nebeker AV, Griffis WL, et al. 1992. Effects of aqueous and dietary exposure of dieldrin on survival, growth and bioconcentration in mallard ducklings. Environmental Toxicology and Chemistry 11(5), 687-699.

1168 Moody RP and Ritter L, 1992. An automated invitro dermal absorption procedure .2. comparative invivo and invitro dermal absorption of the herbicide fenoxaprop-ethyl (hoe-33171) in rats. Toxicology In Vitro 6(1), 53-59.

1184 Graham MJ, Williams FM, et al. 1991. Metabolism of aldrin to dieldrin by rat skin following topical application. Food and Chemical Toxicology 29(10), 707-711.

1185 Chang SK and Riviere JE, 1991. Percutaneous-absorption of parathion invitro in porcine skin - effects of dose, temperature, humidity, and perfusate composition on absorptive flux. Fundamental and Applied Toxicology 17(3), 494-504.

1192 Gansewendt B, Foest U, et al. 1991. Formation of Dna adducts in F344 rats after oral-administration or inhalation of (C-14) methyl-bromide. Food and Chemical Toxicology 29(8), 557-563.

1193 Gomes MD, Bernardi MM, et al. 1991. Pyrethroid insecticides and pregnancy - effect on physical and behavioral-development of rats. Veterinary and Human Toxicology 33(4), 315-317.

1196 Scott RC, Corrigan MA, et al. 1991. The influence of skin structure on permeability - an intersite and interspecies comparison with hydrophilic penetrants. Journal of Investigative Dermatology 96(6), 921-925.

1202 Dikshith TSS, Raizada RB, et al. 1991. Repeated dermal toxicity of technical HCH and methyl parathion (50EC) to female rats (Rattus-norvegicus). Indian Journal of Experimental Biology 29(2), 149-155.

1204 Macpherson SE, Scott RC, et al. 1991. Fate of carbaryl in rat skin. Archives of Toxicology 65(7), 594-598.

1205 Macpherson SE, Scott RC, et al. 1991. Percutaneous-absorption and metabolism of aldrin by rat skin in diffusion cells. Archives of Toxicology 65(7), 599-602.

1207 Driver CJ, Ligotke MW, et al. 1991. Routes of uptake and their relative contribution to the

toxicologic response of northern bobwhite (Colinus-virginianus) to an organophosphate pesticide. Environmental Toxicology and Chemistry 10(1), 21-33.

1209 Yoshida M, Murao N, et al. 1991. Effects of mode of exposure on acute inhalation toxicity of chloropicrin vapor in rats. Journal of Pesticide Science 16(1), 63-69.

1215 Masood KJ, Rahman MF, et al. 1991. Haematological and biochemical alterations in rats subjected to dermal application of dodine. Indian Journal of Comparative Animal Physiology 9(1), 27-31.

1222 Schop RN, Hardy MH, et al. 1990. Comparison of the activity of topically applied pesticides and the herbicide 2,4-d in 2 short-term invivo assays of genotoxicity in the mouse. Fundamental and Applied Toxicology 15(4), 666-675.

1227 Dikshith TSS, Raizada RB, et al. 1990. Dermal toxicity to rats of isoproturon technical and formulation. Veterinary and Human Toxicology 32(5), 432-434.

1244 Di Nucci A, Gregotti C, et al. 1990. 1 2 dichloropropane hepatotoxicity in rats after inhalation exposure. Journal of Applied Toxicology 10(6), 391-394.

1246 Pelletier O, Ritter L, et al. 1990. Effects of skin preapplication treatments and postapplication cleansing agents on dermal absorption of 2,4-dichlorophenoxyacetic acid dimethylamine by Fischer-344 RATS. Journal of Toxicology and Environmental Health 31(4), 247-260.

1247 Moody RP, Franklin CA, et al. 1990. Dermal absorption of the phenoxy herbicides 2,4-D, 2,4-D amine, 2,4-D isoocytl, and 2,4,5-T in rabbits, rats, rhesus-monkeys, and humans - a cross species comparison. Journal of Toxicology and Environmental Health 29(3), 237-245.

1249 Scott RC and Corrigan MA, 1990. The invitro percutaneous-absorption of diquat - a species comparison. Toxicology In Vitro 4(2), 137-141.

1252 Chenglong B, Cibing Q, et al. 1990. A study of the pesticide fenthion toxicity mutagenicity and influence on tissue enzymes. Biomedical and Environmental Sciences 3(3), 262-275.

1258 Khasawinah AM, 1989. Chlordane residues in rat and monkey tissues following subchronic inhalation exposure to technical chlordane. Bulletin of Environmental Contamination and Toxicology 43(3), 459-466.

1260 Hanley TR, Calhoun LL, et al. 1989. The effects of inhalation exposure to sulfuryl fluoride on fetal development in rats and rabbits. Fundamental and Applied Toxicology 13(1), 79-86.

1262 Bronaugh RL, Stewart RF, et al. 1989. Extent of cutaneous metabolism during percutaneous-absorption of xenobiotics. Toxicology and Applied Pharmacology 99(3), 534-543.

1266 Eisenbrandt DL and Nitschke KD, 1989. Inhalation toxicity of sulfuryl fluoride in rats and rabbits. Fundamental and Applied Toxicology 12(3), 540-557.

1269 Dikshith TSS, Raizada RB, et al. 1989. Dermal toxicity of hexachlorocyclohexane (Hch) in rabbit. Indian Journal of Experimental Biology 27(3), 252-257.

1270 Mathew R, Verghese J, et al. 1989. Effect of inhalation of insecticide spray on learning and memory in rats. Indian Journal of Experimental Biology 27(3), 258-260.

1271 Warheit DB, Kelly DP, et al. 1989. A 90-day inhalation toxicity study with benomyl in rats. Fundamental and Applied Toxicology 12(2), 333-345.

1274 Shah PV, Fisher HL, et al. 1989. Dermal absorption and pharmacokinetics of pesticides in rats. Acs Symposium Series 382, 169-187.

1278 Breslin WJ, Kirk HD, et al. 1989. 1,3-dichloropropene - 2-generation inhalation reproduction study in Fischer-344 rats. Fundamental and Applied Toxicology 12(1), 129-143.

1280 Moody RP and Ritter L, 1989. Dermal absorption of the insecticide lindane (1-delta, 2-delta, 3-beta,

4-delta, 5-delta, 6-beta-hexachlorocyclohexane) in rats and rhesus-monkeys - effect of anatomical site. Journal of Toxicology and Environmental Health 28(2), 161-169.

1281 Pelletier O, Ritter L, et al. 1989. Disposition of 2,4-dichlorophenoxyacetic acid dimethylamine salt by Fischer-344 rats dosed orally and dermally. Journal of Toxicology and Environmental Health 28(2), 221-234.

1282 Moody RP, Grayhurst M, et al. 1989. Evaluation of the rat tail model for estimating dermal absorption of lindane. Journal of Toxicology and Environmental Health 28(3), 317-326.

1283 Khasawinah AM, Hardy CJ, et al. 1989. Comparative inhalation toxicity of technical chlordane in rats and monkeys. Journal of Toxicology and Environmental Health 28(3), 327-347.

1285 Hoffer E, Tzipiniuk A, et al. 1989. Skin versus blood distribution of paraquat in experimental-animals during percutaneous-absorption. Journal of Toxicology-Cutaneous and Ocular Toxicology 8(2), 179-182.

1287 Mitchell JA, Long SF, et al. 1989. The behavioral-effects of pesticides in male-mice. Neurotoxicology and Teratology 11(1), 45-50.

1291 Huckle KR, Morrison BJ, et al. 1989. The percutaneous fate of the rodenticide flocoumafen in the rat - role of non-biliary intestinal excretion. Xenobiotica 19(1), 63-74.

1295 Knaak JB, Al-Bayati MA, et al. 1989. Mixer-loader-applicator exposure and percutaneous absorption studies involving EPTC herbicide.

1310 Stott WT, Young JT, et al. 1988. Subchronic toxicity of inhaled technical grade 1,3-dichloropropene in rats and mice. Fundamental and Applied Toxicology 11(2), 207-220.

1311 Fisher GD and Kilgore WW, 1988. Mercapturic acid excretion by rats following inhalation exposure to 1,3-dichloropropene. Fundamental and Applied Toxicology 11(2), 300-307.

1314 Hurtt ME, Thomas DA, et al. 1988. Degeneration and regeneration of the olfactory epithelium following inhalation exposure to methyl-bromide - pathology, cell-kinetics, and olfactory function. Toxicology and Applied Pharmacology 94(2), 311-328.

1316 Dikshith TSS, Raizada RB, et al. 1988. Effect of repeated dermal application of endosulfan to rats. Veterinary and Human Toxicology 30(3), 219-224.

1320 Hurtt ME and Working PK, 1988. Evaluation of spermatogenesis and sperm quality in the rat following acute inhalation exposure to methyl-bromide. Fundamental and Applied Toxicology 10(3), 490-498.

1322 Mitchell JA, Wilson MC, et al. 1988. Behavioral-effects of pydrin and ambush in male-mice. Neurotoxicology and Teratology 10(2), 113-119.

1323 Mattsson JL, Albee RR, et al. 1988. Subchronic neurotoxicity in rats of the structural fumigant, sulfuryl fluoride. Neurotoxicology and Teratology 10(2), 127-133.

1324 Linnett SL, Clark DG, et al. 1988. Effects of subchronic inhalation of d-d (1,3-dichloropropene/1,2-dichloropropane) on reproduction in male and female rats. Fundamental and Applied Toxicology 10(2), 214-223.

1327 Iwasaki M, Yoshida M, et al. 1988. Comparison of whole-body versus snout-only exposure in inhalation toxicity of fenthion. Japanese Journal of Veterinary Science 50(1), 23-30.

1328 Shivanandappa T, Joseph P, et al. 1988. Response of blood and brain cholinesterase to dermal exposure of bromophos in the rat. Toxicology 48(2), 199-208.

1331 Mohamed ZA, 1988. Changes in rat blood profile and blood chemistry after repeated dermal application of fenvalerate and decamethrin. Egyptian Journal of Food Science 16(1-2), 79-86.

1335 Fisher GD and Kilgore WW, 1988. Tissue-levels of glutathione following acute inhalation of 1,3-dichloropropene. Journal of Toxicology and Environmental Health 23(2), 171-182.

1336 Sidon EW, Moody RP, et al. 1988. Percutaneous-absorption of cis-permethrin and trans-permethrin in rhesus-monkeys and rats - anatomic site and interspecies variation. Journal of Toxicology and Environmental Health 23(2), 207-216.

1349 Pauluhn J, Machemer L, et al. 1987. Effects of inhaled cholinesterase-inhibitors on bronchial tonus and on plasma and erythrocyte acetylcholine esterase-activity in rats. Toxicology 46(2), 177-190.

1350 Gorzinski SJ, Kociba RJ, et al. 1987. Acute, pharmacokinetic, and subchronic toxicological studies of 2,4-dichlorophenoxyacetic acid. Fundamental and Applied Toxicology 9(3), 423-435.

1351 Ikeda T, Yoshida M, et al. 1987. Effects of temperature during exposure on inhalation toxicities of chlorfenvinphos and fenthion in rats. Japanese Journal of Veterinary Science 49(5), 929-931.

1354 Honma T, Miyagawa M, et al. 1987. Methyl-bromide alters catecholamine and metabolite concentrations in rat-brain. Neurotoxicology and Teratology 9(5), 369-375.

1356 Hurtt ME, Morgan KT, et al. 1987. Histopathology of acute toxic responses in selected tissues from rats exposed by inhalation to methyl-bromide. Fundamental and Applied Toxicology 9(2), 352-365.

1357 Scott RC and Ramsey JD, 1987. Comparison of the invivo and invitro percutaneous-absorption of a lipophilic molecule (cypermethrin, a pyrethroid insecticide). Journal of Investigative Dermatology 89(2), 142-146.

1360 Grissom RE, Brownie C, et al. 1987. Invivo and invitro dermal penetration of lipophilic and hydrophilic pesticides in mice. Bulletin of Environmental Contamination and Toxicology 38(6), 917-924.

1367 Knaak JB, Albayati M, et al. 1987. Safety related to exposure - dermal dose-red cell cholinesterase response relationships for ethoprop and Mocap 6EC. Bulletin of Environmental Contamination and Toxicology 38(5), 834-839.

1368 Hanley TR, Johngreene JA, et al. 1987. Evaluation of the effects of inhalation exposure to 1,3-dichloropropene on fetal development in rats and rabbits. Fundamental and Applied Toxicology 8(4), 562-570.

1370 Tanaka I, Igisu H, et al. 1987. Cumulative toxicity potential of methomyl aerosol by repeated inhalation. American Industrial Hygiene Association Journal 48(4), 330-334.

1378 Yoshida M, Ikeda T, et al. 1987. Acute inhalation toxicity of chloropicrin vapor in rats. Journal of Pesticide Science 12(2), 237-244.

1379 Shah PV, Fisher HL, et al. 1987. Dermal penetration of carbofuran in young and adult fischer 344 rats. Journal of Toxicology and Environmental Health 22(2), 207-223.

1380 Moody RP, Riedel D, et al. 1987. The effect of deet (N,N-diethyl-meta-toluamide) on dermal persistence and absorption of the insecticide fenitrothion in rats and monkeys. Journal of Toxicology and Environmental Health 22(4), 471-479.

1381 Shah PV, Fisher HL, et al. 1987. Comparison of the penetration of 14 pesticides through the skin of young and adult-rats. Journal of Toxicology and Environmental Health 21(3), 353-366.

1382 Moody RP and Franklin CA, 1987. Percutaneous-absorption of the insecticides fenitrothion and aminocarb in rats and monkeys. Journal of Toxicology and Environmental Health 20(1-2), 209-218.

1385 Amer SM and Sayed MA, 1987. Cytogenetic effects of the insecticide methamidophos in mouse bone-marrow and cultured mouse spleen-cells. Zeitschrift Fur Naturforschung C-a Journal of Biosciences 42(1-2), 21-30.

1394 Yoshida M, Ikeda T, et al. 1987. Subchronic inhalation toxicity of chloropicrin vapor in rats. Journal of Pesticide Science 12(4), 673-681.

1396 Knaak JB, Schreider JP, et al. 1987. The percutaneous absorption of oxadiazon in the adult female rat.

1399 Igwe OJ, Hee SSQ, et al. 1986. Inhalation pharmacokinetics of 1,2-dichloroethane after different dietary pretreatments of male Sprague-Dawley rats. Archives of Toxicology 59(3), 127-134.

1404 Stott WT and Kastl PE, 1986. Inhalation pharmacokinetics of technical grade 1,3-dichloropropene in rats. Toxicology and Applied Pharmacology 85(3), 332-341.

1407 Francis BM, 1986. Role of structure in diphenyl ether teratogenesis. Toxicology 40(3), 297-309.

1408 Quistad GB, Mulholland KM, et al. 1986. The fate of dienochlor administered orally and dermally to rats. Toxicology and Applied Pharmacology 85(2), 215-220.

1410 Gaines TB and Linder RE, 1986. Acute toxicity of pesticides in adult and weanling rats. Fundamental and Applied Toxicology 7(2), 299-308.

1411 Scott RC, Walker M, et al. 1986. A comparison of the invitro permeability properties of human and some laboratory-animal skins. International Journal of Cosmetic Science 8(4), 189-194.

1412 Tsuda S, Iwasaki M, et al. 1986. Effect of particle-size on inhalation toxicity of chlorfenvinphos. Japanese Journal of Veterinary Science 48(4), 729-737.

1414 Lu MH and Kennedy GL, 1986. Teratogenic evaluation of mancozeb in the rat following inhalation exposure. Toxicology and Applied Pharmacology 84(2), 355-368.

1417 Makary MH, Street JC, et al. 1986. Pharmacokinetics of dicamba isomers applied dermally to rats. Pesticide Biochemistry and Physiology 25(2), 258-263.

1419 Aboudonia MB, Abdo KM, et al. 1986. Brain acetylcholinesterase, acid-phosphatase, and 2',3'-cyclic nucleotide-3'-phosphohydrolase and plasma butyrylcholinesterase activities in hens treated with a single dermal neurotoxic dose of s,s,s-tri-normal-butyl phosphorotrithioate. Toxicology and Applied Pharmacology 82(3), 461-473.

1421 Breckenridge C, Lulham G, et al. 1986. A subchronic inhalation toxicity study of a matacil formulation in the albino-rat. Toxicology and Applied Pharmacology 82(2), 181-190.

1425 Clark DR, 1986. Toxicity of methyl parathion to bats - mortality and coordination loss. Environmental Toxicology and Chemistry 5(2), 191-195.

1431 Saleh MAA, Mohamed ZA, et al. 1986. comparative toxicity of flucythrinate and fenvalerate to albino rats. Egyptian Journal of Food Science 14(1), 31-38.

1433 Kennedy GL Jr., 1986. Acute toxicity studies with oxamyl. Fundamental and Applied Toxicology 86(6), 423-429.

1447 Sato M, Miyagawa M, et al. 1985. Subacute effects of methyl bromide dosed by inhalation exposure to rats. Industrial Health 23(3), 235-238.

1449 Francis BM, Metcalf RL, et al. 1985. Toxicity of organo-phosphorus esters to laying hens after oral and dermal administration. Journal of Environmental Science and Health Part B-Pesticides Food Contaminants and Agricultural Wastes 20(1), 73-95.

1452 Amer SM and Aboulela EI, 1985. Cytogenetic effects of pesticides .3. induction of micronuclei in mouse bone-marrow by the insecticides cypermethrin and rotenone. Mutation Research 155(3), 135-142.

1454 Grissom RE, Brownie C, et al. 1985. Dermal absorption of pesticides in mice. Pesticide

Biochemistry and Physiology 24(1), 119-123.

1461 Medinsky MA, Dutcher JS, et al. 1985. Uptake and excretion of c-14 methyl bromide as influenced by exposure concentration. Toxicology and Applied Pharmacology 78(2), 215-225.

1462 Bond JA, Dutcher JS, et al. 1985. Disposition of C-14 methyl bromide in rats after inhalation. Toxicology and Applied Pharmacology 78(2), 259-267.

1463 Smith GJ, Spann JW, et al. 1985. Cholinesterase activity in black-crowned night-herons Nycticorax-nycticorax exposed to fenthion-treated water. Archives of Environmental Contamination and Toxicology 15(1), 83-86.

1464 Lee WK and Hong SU, 1985. Toxicological study of carbaryl in rats. Archives of Pharmacal Research (Seoul) 8(3), 119-132.

1471 Reifenrath WG, Chellquist EM, et al. 1984. Percutaneous penetration in the hairless dog, weanling pig and grafted athymic nude-mouse - evaluation of models for predicting skin penetration in man. British Journal of Dermatology 111, 123-135.

1477 Shah PV, Monroe RJ, et al. 1983. Comparative penetration of insecticides in target and non-target species. Drug and Chemical Toxicology 6(2), 155-179.

1478 Iwata Y, Knaak JB, et al. 1983. Worker reentry research for carbosulfan applied to california citrus trees. Journal of Agricultural and Food Chemistry 31(6), 1131-1136.

1479 Shah PV and Guthrie FE, 1983. Percutaneous penetration of 3 insecticides in rats - a comparison of 2 methods for invivo determination. Journal of Investigative Dermatology 80(4), 291-293.

1485 Skinner CS and Kilgore WW, 1982. Acute dermal toxicities of various organo-phosphate insecticides in mice. Journal of Toxicology and Environmental Health 9(3), 491-497.

1486 Yamauchi T, Konno N, et al. 1982. Delayed neurotoxicity resulting from administration of leptophos to the comb of domestic-fowl. Tohoku Journal of Experimental Medicine 138(2), 199-208.

1492 Shah PV, Monroe RJ, et al. 1981. Comparative rates of dermal penetration of insecticides in mice. Toxicology and Applied Pharmacology 59(3), 414-423.

1494 Holden BV and Bevan D, 1981. Aerial application of insecticide against pine beauty moth. Forestry Commission, 112pp.

1505 Schwetz BA, Ioset HD, et al. 1979. Teratogenic potential of dichlorvos given by inhalation and gavage to mice and rabbits. Teratology 20(3), 383-387.

1509 Stevens JT, DiPasquale LC, et al. 1979. The acute inhalation toxicology of the technical grade organoarsenical herbicides, cacodylic acid and disodium methanearsonic acid; a route comparison. Bulletin of Environmental Contamination and Toxicology 21(3), 304-311.

1510 Kavlock R, Chernoff N, et al. 1979. Toxicity studies with decamethrin, a synthetic pyrethroid insecticide. Journal of environmental pathology and toxicology 2(3), 751-765.

1516 Lewis PJ, Klaff LJ, et al. 1979. Pulmonary effects of contact exposure to paraquat: a clinical and experimental study. Thorax 34(2), 150-160.

1517 Seidenfeld JJ, Wycoff D, et al. 1978. Paraquat lung injury in rabbits. British journal of industrial medicine 35(3), 245-257.

1532 Hoben HJ, Ching SA, et al. 1976. A study of inhalation of pentachlorophenol by rats III. Inhalation toxicity study. Bulletin of Environmental Contamination and Toxicology 15(4), 463-465.

1539 Hoben HJ, Ching SA, et al. 1976. A study of inhalation of pentachlorophenol by rats. Part 4. Distribution and excretion of inhaled pentachlorophenol. Bulletin of Environmental Contamination

and Toxicology 15(4), 466-474.

1541 Dean BJ and Blair D, 1976. Dominant lethal assay in female mice after oral dosing with dichlorvos or exposure to atmospheres containing dichlorvos. Mutation Research 40, 67-71.

1545 Bordas S, Molnar J, et al. 1976. Acute toxicological examination of Klorinol and Buvinol. The development of a pesticide as a complex scientific task; ed. by L. Banki., 147-157.

1554 Verschuuren HG, Kroes R, et al. 1975. Short-term oral and dermal toxicity of MCPA and MCPP (mecoprop). Toxicology 3, 349-359.

1572 Gaines TB, Kimbrough RD, et al. 1973. The toxicity of amitrole in the rat. Toxicology and Applied Pharmacology 26(1), 118-129.

1575 Loser E and Kimmerle G, 1973. Bidisin: toxicological studies with active ingredient and formulation. Pflanzenschutz-Nachrichten Bayer 26(3), 368-395.

1580 Clark DG and Hurst EW, 1970. The toxicity of diquat. British journal of industrial medicine 27(1), 51-55.

1582 Noakes DN and Sanderson DM, 1969. A method for determining the dermal toxicity of pesticides. British journal of industrial medicine 26(1), 59-64.

1585 Brown VK, Chambers PL, et al. 1967. Toxicological studies with the herbicide 2,6-dichloro-thiobenzamide (chlorthiamid, Prefix). Archiv fur Toxikologie 23(1), 42-51.

1590 Borkowska J, Kasperek W, et al. 1989. Action of low doses of organophosphoric pesticides in rat organism. II. Effect of dermal administration of Owadofos and Nogos. Bromatologia i Chemia Toksykologiczna 21(4), 288-292.

1654 Knaak JB, Yee K, et al. 1984. Percutaneous absorption and dermal dose-cholinesterase response studies with parathion and carbaryl in the rat. Toxicology and Applied Pharmacology 76(2), 252-263.

1686 Somers JD, Khan AA, et al. 1991. Effects of simulated field spraying of carbofuran, carbaryl and dimethoate on pheasant and partridge chicks. Bulletin of Environmental Contamination and Toxicology 46(1), 113-119.

1687 Qadri SSH, Usha G, et al. 1987. Effect of dermal application of phosphamidon-92 (technical) on different tissues and hematobiochemical parameters in albino rat. Journal of Toxicology and Environmental Health 20(3), 273-286.

1699 Abu-Qare A and Abou-Donia M, 2000. Increased 8-hydroxy-2'-deoxyguanosine, a biomarker of oxidative DNA damage in rat urine following a single dermal dose of DEET (N, N-diethyl-m-toluamide), and permethrin, alone and in combination. Toxicology Letters 117(3), 151-160.

1701 Mattsson JL, Johnson KA, et al. 1986. Lack of neuropathologic consequences of repeated dermal exposure to 2,4-dichlorophenoxyacetic acid in rats. Fundamental and applied toxicology (Print) 6(1), 175-181.

1703 Halkova Z, Zaykov C, et al. 1993. Experimental study of subacute oral, dermal and inhalation toxicity of Bulmoscide preparation. Polish Journal of Occupational Medicine and Environmental Health 6(1), 19-25.

1705 Knaak JB, Al-Bayati M, et al. 1987. Safety related to exposure: dermal dose-red cell cholinesterase response relationships for ethoprop and MOCAP 6EC. Bulletin of Environmental Contamination and Toxicology 38(5), 834-839.

1748 Kato N, Morinobu S, et al. 1986. Subacute inhalation experiment for methyl bromide in rats. Industrial Health 24(2), 87-103.

1754 Corley RA, Calhoun LL, et al. 1989. Chlorpyrifos: a 13-week nose-only vapor inhalation study in fischer 344 rats. Fundamental and applied toxicology (Print) 13(3), 616-618.

1773 Knaak JB, Yee K, et al. 1984. Percutaneous absorption of triadimefon in the adult and young male and female rat. Toxicology and Applied Pharmacology 72(3), 406-416.

1780 Grissom REJ, Brownie C, et al. 1987. In vivo and in vitro dermal penetration of lipophilic and hydrophilic pesticides in mice. Bulletin of Environmental Contamination and Toxicology 38(6), 917-924.

1782 Yamamoto O, Hori H, et al. 2000. Experimental exposure of rat skin to methyl bromide : a toxicokinetic and histopathological study. Archives of Toxicology 73(12), 641-648.

1786 Lomax LG, Stott WT, et al. 1989. The chronic toxicity and oncogenicity of inhaled technical-grade 1,3-dichloropropene in rats and mice. Fundamental and applied toxicology (Print) 12(3), 418-431.

1796 Rodgers K and Xiong S, 1997. Effect of acute administration of malathion by oral and dermal routes on serum histamine levels. International Journal of Immunopharmacology 19(8), 437-411.

1809 Inayat Q, Ilahi M, et al. 2007. A morphometric and histological study of the kidney of mice after dermal application of cypermethrin. Journal of the Pakistan Medical Association 57(12), 587-591.

1813 Reuzel PGJ, Dreef-Van Der Meulen HC, et al. 1991. Chronic inhalation toxicity and carcinogenicity study of methyl bromide in wistar rats. Food and Chemical Toxicology 29(1), 31-39.

1814 Punareewattana K, Smith BJ, et al. 2000. Topical permethrin exposure causes thymic atrophy and persistent inhibition of the contact hypersensitivity response in C57Bl/6 mice. Annual Meeting of the American College of Toxicology, Taylor & Francis, London.

1816 Moody RP, 1991. Erratum: Dermal absorption of the phenoxy herbicides 2,4-D, 2,4-D amine, 2,4-D isooctyl, and 2,4,5-T in rabbits, rats, rhesus monkeys, and humans, A cross-species comparison (Journal of Toxicology and Environmental Health 1990 29 (237-245)). Journal of Toxicology and Environmental Health 32(1), 107.

1820 Dutta KK, Mani U, et al. 2001. Subchronic inhalation exposure of rats to formulated fenvalerate (E.C.20%) using flow past nose only inhalation chamber: Some biochemical alterations in lungs. Biomedicine 21(1), 14-22.

1877 Russo JM, Anger WK, et al. 1984. Neurobehavioral assessment of chronic low-level methyl bromide exposure in the rabbit. Journal of Toxicology and Environmental Health 14(2-3), 247-255.

1893 Alexeeff GV, Kilgore WW, et al. 1985. Determination of acute toxic effects in mice following exposure to methyl bromide. Journal of Toxicology and Environmental Health 15(1), 109-123.

1906 Asakawa F, Jitsunari F, et al. 1996. Accumulation of chlordanes in adipose tissues of mice caused by long-term exposure of low level technical chlordane. Bulletin of Environmental Contamination and Toxicology 57(6), 909-916.

1915 Seidenfeld JJ, Sobonya RE, et al. 1985. Recovery from paraquat pneumonitis. British Journal of Industrial Medicine 42(3), 178-183.

1926 Fisher GD and Kilgore WW, 1989. Pharmacokinetics of S-[3-chloroprop-2-enyl] glutathione in rats following acute inhalation exposure to 1,3-dichloropropene. Xenobiotica (London. Print) 19(3), 269-278.

1938 Abu-Qare AW, Suliman HB, et al. 2001. Induction of urinary excretion of 3-nitrotyrosine, a marker of oxidative stress, following administration of pyridostigmine bromide, DEET (N, N-diethyl-m-toluamide) and permethrin, alone and in combination in rats. Toxicology Letters 121(2), 127-134.

1957 Chui YC, Poon G, et al. 1988. Toxicokinetics and bioavailability of paraquat in rats following

different routes of administration. Toxicology and Industrial Health 4(2), 203-219.

1973 Abou-Donia MB, Khan WA, et al. 2006. In utero exposure to nicotine and chlorpyrifos alone, and in combination produces persistent sensorimotor deficits and Purkinje neuron loss in the cerebellum of adult offspring rats. Archives of Toxicology 80(9), 620-631.

1983 Pool-Zobel BL, Guigas C, et al. 1993. Assessment of genotoxic effects by lindane. Food and Chemical Toxicology 31(4), 271-283.

1986 Seidenfeld JJ, 1985. Steroid pretreatment does not prevent paraquat pneumonitis in rabbits. The American journal of the medical sciences 289(2), 51-54.

2046 Moir D, Marwood TM, et al. 1994. In vitro cutaneous metabolism of DDT in human and animal skins. Bulletin of Environmental Contamination and Toxicology 52(3), 474-478.

2056 Chou,T-C, Tsai J-C, et al. 2005. Topical exposure to carbon disulfide induces epidermal permeability alterations in physiological and pathological changes. Toxicology Letters 158(3), 225-236.

2099 Kataranovski M, Vlalki M, et al. 2003. Immunotoxicity of epicutaneously applied anticoagulant rodenticide warfarin: evaluation by contact hypersensitivity to DNCB in rats. Toxicology (Amsterdam) 188(1), 83-100.

2108 Kataranovski M, Prokic V, et al. 2005. Dermatotoxicity of epicutaneously applied anticoagulant warfarin. Toxicology (Amsterdam) 212(2-3), 206-218.

2110 Uboh FE, Asuquo EN, et al. 2011. Endosulfan-induces renal toxicity independent of the route of exposure in rats. American Journal of Biochemistry and Molecular Biology 1(4), 359-367.

2111 Narayan S, Bajpai A, et al. 1985. Lipid peroxidation in lung and liver of rats given DDT and endosulfan intratracheally. Bulletin of Environmental Contamination and Toxicology 34(1), 63-67.

2120 Davenport CJ, Ali SF, et al. 1992. Effect of methyl bromide on regional brain glutathione, glutathione-S-transferases, monoamines, and amino acids in F344 rats. Toxicology and Applied Pharmacology 112(1), 120-127.

2138 Raszewski G and Latuszyńska J, 2006. Effect of dermally applied chlorpyrifos and cypermethrin on selected biochemical parameters in rats. Acta Toxicologica 14(1-2), 37-41.

2150 Francis BM, Hansen LG, et al. 1982. Comparison of the delayed neurotoxicity of O-methyl and O-ethyl analogs of EPN, leptophos, and cyanofenphos. Journal of Environmental Science and Health - Part B Pesticides, Food Contaminants, and Agricultural Wastes 17(6), 611-633.

2172 Narayan S, Bajpai A, et al. 1985. Effect of intratracheal administration of DDT and endosulfan on cytochrome P-450 and glutathione-s-transferase in lung and liver of rats. Bulletin of Environmental Contamination and Toxicology 34(1), 55-62.

APPENDICES

Appendix A. Results of EndNote screening

Table 4: Results of EndNote database screening

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Food safety
2	0	0	0	Not primary data. General information on operator exposure
3	1	1	1	
4	0	0	0	Not primary data. Overview, occupational exposure, not primary data
5	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Cotton dust
6	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Appears to be overview of studies required for registration
7	0	1	0	Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary case studies appear to be oral exposure
8	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary
9	0	0	0	Not pesticide. Not primary data. Mosquito repellents
10	0	0	0	Not primary data. Fatal poisoning by accidental inhalation of aluminium phosphide
11	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Residues
12	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Parasites
13	1	1	1	
14	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
15	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
16	1	1	1	
17	0	0	0	Not primary data. Veterinary treatment
18	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Insect pests
19	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Rats as pests
20	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
21	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Parasite treatment
22	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Rodenticides
23	0	0	0	Not pesticide. Not primary data. Not chemical pesticide
24	1	1	1	
25	0	0	0	Not birds or mammals. Not primary data. Synthesis of permethrin
26	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Disease
27	1	1	1	
28	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
29	1	1	1	
30	1	1	1	
31	1	1	1	
32	0	0	0	Not primary data. Unclear if primary data
33	0	0	0	Not pesticide. Not primary data. Parasites
34	0	0	0	Not primary data. Unclear if primary data
35	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Scabies treatment
36	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Exposure route not identified
37	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Sarin poisoning in humans
38	0	0	0	Not primary data. Occupational exposure, unclear if primary data
39	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Exposure routes unclear
40	1	1	1	
41	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Dioxins
42	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data.
43	0	0	0	Not birds or mammals. Not pesticide. Not primary data. Cannot identify compound as pesticide, unlikely to contain primary data
44	0	0	0	Not dermal or inhalation exposure/toxicity. Penetration of clothing

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
45	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Medicine, legal
46	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Exposure route unclear
47	0	0	0	Not birds or mammals. Not primary data. Occupational exposure, unlikely to be primary data
48	0	1	1	
49	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
50	1	1	1	
51	1	1	1	
52	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Occupational exposure
53	0	0	0	Not dermal or inhalation exposure/toxicity. Exposure route uncertain
54	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Aquatic risk, thiabendazole
55	1	1	1	
56	1	1	1	
57	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Mosquito densonucleosis virus (MDV)
58	0	0	0	Not dermal or inhalation exposure/toxicity. Intragastric administration
59	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary, disease
60	1	1	1	
61	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
62	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
63	0	0	0	Not pesticide.
64	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Exposure route unclear
65	0	0	0	Not pesticide. Cannot identify compound, not listed in Pesticide Manual
66	0	0	0	Not primary data. Poisoning therapies
67	0	0	0	Not pesticide. Pesticide synthesis product
68	1	1	1	
69	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Exposure route, compound type and species unclear

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
70	0	0	0	Not primary data. Unlikely to be contain primary data
71	0	0	0	Not primary data. Unlikely to be contain primary data
72	0	0	0	Not primary data. Unlikely to be contain primary data
73	0	0	0	Not primary data. Unlikely to be contain primary data
74	0	1	1	
75	0	1	1	
76	0	1	1	
77	1	1	1	
78	0	1	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
79	1	1	1	
80	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Compound, species and exposure route not identified
81	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
82	1	1	1	
83	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Species and exposure route not identified
84	0	0	0	Not birds or mammals. Not pesticide. Intermediate products of pesticide
85	0	0	0	Not birds or mammals. Not primary data. Occupational exposure, unlikely to contain primary data
86	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Parasites, dermatitis
87	1	1	1	
88	1	1	1	
89	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
90	1	1	1	
91	0	1	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Compound, species and exposure route not identified
92	1	1	1	
93	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
94	1	1	1	
95	1	1	1	
96	1	1	1	
97	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Foodstuffs
98	1	1	1	
99	0	0	0	Not dermal or inhalation exposure/toxicity. Exposure route unclear
100	0	0	0	Not pesticide. Not primary data. Cannot identify compound, not listed in Pesticide Manual
101	0	0	0	Not primary data. Skin sensitivity related to coformulants
102	0	0	0	Not birds or mammals. Not primary data. Species unclear (assume mammals), irritant/sensitizing effect rather than toxicity
103	0	1	0	Not primary data. Study of penetration through gloves
104	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Disease
105	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceuticals
106	0	0	0	Not primary data. Unlikely to contain primary data
107	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary pharmaceutical
108	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Species and exposure route not identified, unlikely to contain primary data
109	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Milk contamination
110	0	0	0	Not primary data. Unlikely to contain primary data
111	0	0	0	Not primary data. Unlikely to contain primary data
112	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Scabicide
113	1	1	1	
114	1	1	1	
115	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Unlikely to contain primary data, abstract
116	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Unlikely to contain primary data, abstract
117	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
118	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Species, exposure routes unclear. Unlikely to contain primary data
119	1	1	1	
120	1	1	1	
121	1	1	1	
122	1	1	1	
123	1	1	1	
124	1	1	1	
125	0	0	0	Not primary data.
126	1	1	1	
127	0	0	0	Not dermal or inhalation exposure/toxicity. Exposure route not clear
128	1	0	1	
129	1	1	1	
130	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
131	1	1	1	
132	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Diabetes
133	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Exposure routes unclear
134	0	0	0	Not pesticide. Veterinary treatment
135	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. SSDs including oral LD50 data
136	0	0	1	
137	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
138	1	1	1	
139	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
140	0	0	0	Not primary data. Veterinary treatment
141	1	1	1	
142	0	0	0	Not pesticide.
143	0	0	0	Not dermal or inhalation exposure/toxicity.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
144	0	0	0	Not dermal or inhalation exposure/toxicity.
145	0	0	0	Not dermal or inhalation exposure/toxicity. In vitro study
146	1	1	1	
147	0	0	0	Not pesticide. Veterinary treatment
148	1	1	1	
149	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Antioxidant enzyme treatments
150	0	0	0	Not pesticide. Metabolite effects
151	0	0	0	Not pesticide. Veterinary treatment
152	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
153	0	0	0	Not pesticide.
154	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
155	0	1	0	Not dermal or inhalation exposure/toxicity. Human operator exposure study
156	1	1	1	
157	1	1	1	
158	1	0	1	
159	0	0	0	Not dermal or inhalation exposure/toxicity. Appears to be oral exposure
160	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. UVR protection study
161	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
162	1	1	1	
163	1	1	1	
164	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Novel non-toxic mollusc control methods
165	0	0	0	Not dermal or inhalation exposure/toxicity. Inter-dermal exposure (needle)
166	0	0	0	Not pesticide. Trans-dermal delivery
167	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
168	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstracts
169	0	0	0	Not dermal or inhalation exposure/toxicity. Exposure of fertilised eggs

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
170	1	1	1	
171	1	1	1	
172	0	1	1	
173	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Encephalitis/autism
174	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Review of chlorinated hydrocarbons
175	0	0	0	Not pesticide. Veterinary treatment
176	1	1	1	
177	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Food safety
178	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
179	1	1	1	
180	0	0	0	Not pesticide.
181	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Food safety
182	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study lung tissue
183	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Skin cancer study
184	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
185	1	1	1	
186	1	1	1	
187	0	1	0	Not pesticide. In-vitro study of human exposure using pig skin
188	0	0	0	Not pesticide.
189	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Alcohol exposure
190	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Review. Occupational exposure
191	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Epidemiological study
192	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Lymph node assay methods
193	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
194	1	0	1	
195	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
196	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
197	0	0	0	Not dermal or inhalation exposure/toxicity. Human cancer risk
198	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Review of human poisoning cases
199	0	1	1	
200	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. HTV care
201	1	1	1	
202	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Hydrolysis of OP compounds
203	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Analytical methods
204	0	0	0	Not pesticide.
205	1	1	1	
206	1	1	1	
207	1	1	1	
208	1	1	1	
209	0	0	0	Not dermal or inhalation exposure/toxicity. Residues in tissues following acaricide treatment
210	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Chinese medicinal herb
211	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Grapes
212	1	0	0	Not dermal or inhalation exposure/toxicity.
213	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. In-vitro immunotoxicity screening
214	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
215	1	1	1	
216	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
217	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
218	1	1	1	
219	1	1	1	
220	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Not relevant, US statistics

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
221	1	1	1	
222	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
223	1	1	1	
224	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Leech repellent
225	1	1	1	
226	1	1	1	
227	0	1	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Air sampling study
228	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Wastewater treatment
229	1	1	1	
230	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
231	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Insect defences
232	1	1	1	
233	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
234	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Partition coefficients
236	0	1	1	
237	0	0	0	Not pesticide. Essential oils
238	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Review of EDCs
239	0	1	1	
240	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Degradation study
241	0	1	0	Not dermal or inhalation exposure/toxicity. Biomarkers, carcinogenicity
242	0	0	0	Not birds or mammals. Not primary data. Amphibians, review
243	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Air pollution, review
244	1	1	1	
245	1	1	1	
247	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Anticarcinogens, anthocyanins

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
248	0	0	0	Not pesticide.
249	0	0	0	Not pesticide. Veterinary treatment
250	1	1	1	
251	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Review of arsenic toxicology/carcinogenicity
252	1	1	1	
253	1	0	1	
254	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
255	1	1	1	
256	1	1	1	
257	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Fruit growing methods
258	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Biomonitoring, review
259	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
260	0	0	0	Not pesticide. Compound not listed in Pesticide Manual, mosquito control agent
261	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
262	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Herbal medicine
263	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure (drinking water)
264	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cosmetics
265	1	1	1	
266	0	1	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Risk assessment of mixtures, review
267	1	1	1	
268	1	1	1	
269	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Thyroid supplements
270	0	1	1	
271	0	0	0	Not pesticide. Chemical warfare agents
272	0	0	0	Not pesticide.
273	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
274	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
275	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Amphibians, review
276	1	1	1	
277	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
278	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstracts
279	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Lymph node assay methods
280	1	0	1	
281	1	1	1	
282	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poultry production
284	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
285	0	1	0	Not dermal or inhalation exposure/toxicity. Oral exposure
287	0	0	0	Not pesticide. Veterinary treatment
288	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Veterinary treatment
290	1	1	1	
291	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous or oral exposure
292	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
293	0	0	0	Not pesticide.
294	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Agricultural statistics
295	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Biopsy methods
296	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Scabies
297	1	1	1	
298	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Tumours
299	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Lymph node assay methods
300	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
301	1	1	1	
302	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parkinson's disease
303	1	1	1	
304	1	1	1	
305	0	0	0	Not dermal or inhalation exposure/toxicity. Likely oral exposure (dosed)
306	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Bioethanol project
307	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Book chapter, general review
308	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
309	1	1	1	
310	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
311	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
312	1	1	1	
313	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
314	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poultry production
315	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
316	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
317	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease
318	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
319	1	1	1	
320	1	1	1	
321	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Biomarker, avian age
322	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
323	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
324	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
325	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
326	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Scabies

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
327	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
328	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
329	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
330	1	1	1	
331	0	0	0	Not primary data. Not chemical pesticide, Meeting abstract
332	0	0	0	Not dermal or inhalation exposure/toxicity. Partition coefficients
333	1	1	1	May not be dosed with pesticide alone
334	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Herbal medicine
335	0	0	0	Not dermal or inhalation exposure/toxicity. Biomarkers
336	1	1	1	
337	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Food safety
338	1	1	1	
339	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human poisoning
340	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Canine lymphoma
341	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Crayfish
342	0	0	0	Not pesticide. Insect repellents
343	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
344	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
345	1	1	1	
346	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
347	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Synthetic membranes
348	0	1	1	
349	0	0	0	Not dermal or inhalation exposure/toxicity. oral exposure
350	1	1	1	
351	1	1	1	
352	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
353	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
354	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
355	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease
356	0	0	0	Not pesticide. Cancer treatment
357	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
358	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
359	0	0	0	Not dermal or inhalation exposure/toxicity. Biomonitoring, residues
360	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
361	0	0	0	Not pesticide.
362	1	1	1	
364	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Pollen growth tube test
365	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Fruit storage
366	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poultry production
367	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poultry production
368	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
369	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
371	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods
372	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
373	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
374	0	0	0	Not pesticide. Mosquito coil smoke
376	1	1	1	
377	0	0	0	Not pesticide. Veterinary treatment
379	0	0	0	Not pesticide. Carbon nanotubes
380	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
381	0	0	0	Not dermal or inhalation exposure/toxicity. In-utero exposure
382	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
383	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
384	0	0	0	Not dermal or inhalation exposure/toxicity. Intra-peritoneal exposure
385	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
387	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
388	1	1	1	
389	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
390	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
391	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Health and safety
392	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
393	0	1	0	Not dermal or inhalation exposure/toxicity. Veterinary treatment
394	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
395	1	1	1	
396	0	0	0	Not pesticide. Insect repellents
397	0	1	1	
399	1	1	1	
400	0	0	0	Not dermal or inhalation exposure/toxicity. Tissue distribution
401	1	0	0	Not dermal or inhalation exposure/toxicity. Not primary data.
402	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Allergies
403	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
404	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical
405	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Allergies
406	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous, subcutaneous or oral exposure
407	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
408	1	1	1	
409	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
410	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Medical

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
411	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Amphibians
412	0	0	0	Not pesticide.
413	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
414	1	1	1	
415	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
416	0	0	0	Not pesticide. Veterinary treatment
417	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
418	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
419	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
420	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Sub-cutaneous exposure
421	1	1	1	
422	0	0	0	Not pesticide. Ozone
423	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Amphibians
424	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Farming practices
426	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Mode of action
427	0	1	1	
428	1	1	1	
429	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Feed additive
430	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Organochlorine contamination
431	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
432	1	1	1	
433	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
434	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Asthma
435	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
436	0	0	0	Not dermal or inhalation exposure/toxicity. sub-cutaneous or oral exposure
437	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
438	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease
439	0	1	1	
440	0	0	0	Not pesticide. Veterinary treatment
441	1	1	1	
442	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Enzymes
443	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
444	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
445	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
446	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Solvent, oral exposure
447	0	0	0	Not pesticide. Sedative activity
448	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
449	0	0	0	Not primary data. Meeting abstract
450	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical
451	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
452	0	0	0	Not pesticide.
453	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
454	0	0	0	Not dermal or inhalation exposure/toxicity. Lymph node assay methods
455	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer
456	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
457	1	1	1	
458	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
459	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Metabolite effects
460	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
461	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
462	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
463	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
464	0	0	0	Not pesticide. Disinfectant
465	0	0	0	Not dermal or inhalation exposure/toxicity. Intratracheal or subcutaneous exposure
466	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical
467	1	1	1	
468	0	0	0	Not pesticide.
469	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
470	1	1	1	
471	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Food safety
472	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
473	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
474	1	0	1	
475	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
476	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case studies
477	1	1	1	
478	1	0	1	
479	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Health and safety
480	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
481	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
482	0	0	0	Not pesticide. Cosmetics
483	0	0	0	Not pesticide. Cosmetics
484	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
485	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Health and safety
486	0	0	0	Not pesticide. Pharmaceutical
487	1	0	0	Not dermal or inhalation exposure/toxicity. Exposure route unclear
488	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
489	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
490	1	1	1	
491	0	0	0	Not dermal or inhalation exposure/toxicity. Food safety
492	1	1	1	
493	1	1	1	
494	1	1	1	
495	0	0	0	Not dermal or inhalation exposure/toxicity. Disease
496	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In ovo exposure, organochlorine contaminants
497	1	1	1	
498	1	1	1	
499	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
500	1	1	1	
501	1	0	0	Not pesticide.
502	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Breakdown product, in-vitro study
503	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical
504	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure
505	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
506	1	1	1	
507	0	0	0	Not pesticide. Pharmaceutical
508	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
509	0	0	0	Not pesticide.
510	1	1	1	
511	0	0	0	Not pesticide. Insect repellents
512	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Residues
513	1	1	1	
514	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
515	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Environmental contamination

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
516	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure
517	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
518	0	0	0	Not pesticide.
519	0	0	0	Not pesticide.
520	1	1	1	
521	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Test methods - general
522	1	1	1	
523	1	1	1	
524	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
525	1	1	1	
526	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
527	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
528	1	1	1	
529	0	0	0	Not pesticide. Not primary data. Cosmetics
530	0	0	0	Not pesticide. Not primary data. Cosmetics
531	1	1	1	
532	1	1	1	
533	1	1	1	
534	1	1	1	
535	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Toxicity mechanisms insects
536	1	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Environmental contamination
537	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intubation
538	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cosmetics
539	1	1	1	
540	1	1	1	
541	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
542	0	0	0	Not dermal or inhalation exposure/toxicity. Birth defects (human)
543	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dioxins
544	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dioxins
545	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
546	0	0	0	Not dermal or inhalation exposure/toxicity.
547	1	1	1	
548	1	1	1	
549	1	0	1	
550	1	1	1	
551	1	1	1	
552	1	1	1	
553	1	1	1	
554	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Personal protective equipment
555	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. In-vitro study
556	1	1	1	
557	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
558	1	1	1	
559	1	1	1	
560	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Feeding study
561	0	0	0	Not dermal or inhalation exposure/toxicity. Human case studies
562	0	0	0	Not pesticide.
563	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
564	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Food safety
565	1	1	1	
566	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity.
567	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
568	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
569	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Residues
570	0	0	0	Not dermal or inhalation exposure/toxicity. Parasites
571	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
572	0	0	0	Not dermal or inhalation exposure/toxicity. Birth defects (human)
573	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case studies
574	1	1	1	
575	1	0	1	
576	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Anti-inflammatory formulation
577	1	1	1	
578	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
579	0	0	0	Not pesticide. Biocides, guinea pig maximization test, local lymph-node assay
580	1	0	0	Risk of human exposure to veterinary treatment
581	1	1	1	
582	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer
583	1	1	1	
584	1	1	1	
585	1	1	1	
586	0	0	0	Not dermal or inhalation exposure/toxicity. Carcinogenesis assay
587	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Alzheimer's, copper
588	1	1	1	
589	1	1	1	
590	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Organochlorine contamination
591	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Bird behaviour
592	0	0	0	Not pesticide. Essential oils
593	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
594	0	0	0	Not pesticide. Insect repellents
595	0	1	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
596	1	1	1	
597	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
598	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
599	1	1	1	
600	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning case studies
601	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
602	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
603	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Review of urea
604	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Review of mink oil
605	1	1	1	
606	1	1	1	
608	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Herbal medicine
609	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Overview of effects
610	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
611	1	1	1	
612	1	1	1	
613	0	0	0	Not dermal or inhalation exposure/toxicity. Mink oil
614	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
615	0	0	0	Not dermal or inhalation exposure/toxicity. Asthma
616	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
617	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Allergies
618	0	1	0	Not pesticide. Not listed as pesticide in Pesticide Manual
619	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
620	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Pharmacokinetic/pharmacodynamic model

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
621	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Parasites
622	1	1	1	
623	0	1	0	Not dermal or inhalation exposure/toxicity. Oral exposure
624	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
625	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
626	1	1	1	
627	0	1	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
628	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Copper as biocide in products
629	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
630	1	1	1	
631	0	0	0	Not dermal or inhalation exposure/toxicity. Tumours
632	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
633	0	1	0	Not pesticide.
634	0	0	0	Not dermal or inhalation exposure/toxicity. Meeting abstract
635	0	0	0	Not dermal or inhalation exposure/toxicity. Meeting abstract
636	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
637	1	1	1	
638	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
639	0	0	0	Not dermal or inhalation exposure/toxicity. Embryo exposure
640	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Asthma
641	1	1	1	
642	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
643	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning incidents
644	1	1	1	
645	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
646	0	1	0	Not pesticide. Not listed as pesticide in Pesticide Manual
647	1	1	1	
648	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
649	1	1	1	
650	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Patent
651	0	0	0	Not birds or mammals. Amphibians
652	1	1	1	
653	0	0	0	Not pesticide. In-vitro study
654	1	1	1	
655	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
656	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Human diet
657	0	0	0	Not pesticide. Cosmetics
658	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Salmonella
659	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
660	1	1	1	
661	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
662	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
663	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Mosquito repellents
664	1	1	1	
665	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
666	0	0	0	Not pesticide. Herbal medicine
667	1	1	1	
668	0	0	0	Not pesticide.
669	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer
670	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Environmental contamination
671	1	0	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
672	1	1	1	
673	1	1	1	
674	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
675	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Amphibians
676	1	1	1	
677	1	1	1	
678	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure, Meeting abstract
679	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure
680	1	1	1	
681	1	1	1	
682	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
683	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
684	1	1	1	
685	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
686	1	1	1	
687	1	1	1	
688	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Amphibians
689	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
690	0	0	0	Not pesticide. Meeting abstract
691	1	1	1	
692	1	1	1	
693	0	0	0	Not dermal or inhalation exposure/toxicity.
694	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
695	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
696	1	1	1	
697	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
698	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
699	1	1	1	
700	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
701	1	1	1	
702	1	1	1	
703	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
704	1	1	1	
705	1	1	1	
706	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Medical
707	1	1	1	
708	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
709	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Nematodes
710	1	1	1	
711	1	1	1	
712	1	1	1	
713	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous exposure
714	1	1	1	
715	1	1	1	
716	1	1	1	
717	0	0	0	Not pesticide. Veterinary treatment
718	1	1	1	
719	1	1	1	
720	1	1	1	
721	0	0	0	Not pesticide. Not primary data. Meeting abstract
722	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
723	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Insect repellents

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
724	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Fruit production
725	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
726	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
727	0	0	0	Not dermal or inhalation exposure/toxicity.
728	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Residues
729	0	1	0	Not pesticide.
730	0	1	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Carcinogenicity
731	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Insect repellents
732	1	1	1	
733	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
734	1	1	1	
735	1	1	1	
736	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Methods
737	1	1	1	
738	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Asthma
740	1	1	1	
741	1	1	1	
742	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
743	1	1	1	
744	1	1	1	
745	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Parkinson's disease
746	1	1	1	
747	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Pest control
748	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
749	0	0	0	Not pesticide. Insect repellents
750	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
751	1	1	1	
752	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
753	1	1	1	
754	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Tank mixes
755	1	1	1	
756	1	1	1	
757	1	1	1	
758	1	1	1	
759	1	1	1	
760	1	1	1	
761	0	0	0	Not pesticide. Poisoning incidents
762	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods
763	0	0	0	Not pesticide. Particulates
764	1	1	1	
765	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
766	1	1	1	
767	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
768	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Biomonitoring
769	1	1	1	
770	0	1	1	
771	1	1	1	
772	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data.
773	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Pest control
774	0	0	0	Not dermal or inhalation exposure/toxicity. In blood
775	1	1	1	
776	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
777	1	1	1	
778	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods
779	0	1	1	
780	1	1	1	
781	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods
782	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Analytical methods
783	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Mutagenicity review
784	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Parasites
785	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Analytical methods
786	1	1	1	
787	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
788	0	0	0	Not primary data. Human exposure assessment
789	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
790	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning incidents
791	1	1	1	
792	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
793	1	1	1	Meeting abstract
794	1	1	1	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
795	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
796	1	1	1	Wood preservatives
797	0	0	0	Not pesticide.
798	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Patent
799	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Insect repellents
800	1	1	1	
801	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
802	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
803	1	1	1	
804	1	1	1	
805	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
806	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Veterinary treatment
807	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
808	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
809	0	0	0	Not pesticide. Insect repellents
810	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Lymphocytes
811	1	1	1	
812	0	0	0	Not dermal or inhalation exposure/toxicity. IP and oral exposure
813	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
814	0	0	0	Not pesticide. Veterinary treatment
815	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
817	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
818	0	0	0	Not pesticide. Pharmaceutical
819	1	1	1	
820	0	0	0	Not pesticide. Veterinary treatment
821	0	0	0	Not dermal or inhalation exposure/toxicity. Intramuscular injection
822	1	1	1	
823	0	0	0	Not pesticide. Chemical intermediate in pesticide manufacture
824	1	1	1	
825	0	0	0	Not pesticide. Veterinary treatment
826	1	1	1	
827	1	1	1	
828	1	1	1	
829	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
830	1	1	1	
831	1	1	1	
832	1	1	1	
833	1	1	1	
834	1	1	1	
835	1	1	1	
836	0	0	0	Not dermal or inhalation exposure/toxicity. Exposure via food
837	0	0	0	Not dermal or inhalation exposure/toxicity. Veterinary treatment
838	1	1	1	
839	0	0	0	Not pesticide. Intermediate compound
840	1	1	1	
841	1	1	1	
842	0	1	0	Not pesticide. Not listed as pesticide in Pesticide Manual
843	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
844	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
845	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
846	1	1	1	
847	1	1	1	
848	0	0	0	Not pesticide.
849	1	1	1	
850	1	1	1	
851	1	1	1	
852	0	0	0	Not dermal or inhalation exposure/toxicity. Food safety
853	1	1	1	
854	0	1	1	
855	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
856	1	1	1	
857	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning incidents
858	1	1	1	
859	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
860	0	0	0	Not dermal or inhalation exposure/toxicity. Injected into scrotal pouch
861	0	0	0	Not birds or mammals. Reptiles
862	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
863	1	1	1	
864	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
865	1	1	1	
866	0	0	0	Not pesticide. Veterinary treatment
867	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease
868	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning incidents
869	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
870	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
871	0	0	0	Not pesticide. Veterinary treatment
872	0	0	0	Not pesticide. Veterinary treatment
873	0	0	0	Not dermal or inhalation exposure/toxicity. Dolphins
874	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
875	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Biomarkers
876	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
877	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
878	1	1	1	
879	0	0	0	Not pesticide. Veterinary treatment
880	0	1	0	Not pesticide. Veterinary treatment
881	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
882	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
883	0	0	0	Not dermal or inhalation exposure/toxicity. Veterinary treatment
884	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Human exposure assessment
885	1	1	1	
886	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
887	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
888	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Tea extracts
889	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
890	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
891	0	0	0	Not dermal or inhalation exposure/toxicity. Metabolism study
892	0	0	0	Not dermal or inhalation exposure/toxicity. Biomarkers
893	1	1	1	
894	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
895	0	0	0	Not pesticide. Drug delivery
896	1	1	1	
897	0	0	0	Not pesticide. Insect repellents
898	1	1	1	
899	1	1	1	
900	1	1	1	
901	1	0	0	
902	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
903	1	1	1	
904	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Reproductive risk estimation
905	0	0	0	Not pesticide. Insect repellents
906	1	1	1	
907	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
908	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
909	0	0	0	Not pesticide. Synergist
910	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
911	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical treatment
912	0	0	0	Not dermal or inhalation exposure/toxicity. Excretion, bioindicators
913	0	0	0	Not pesticide. Not primary data. Veterinary treatment
914	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
915	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
916	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
917	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceutical
918	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
919	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
920	1	1	1	
921	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
922	1	1	1	
923	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
924	1	1	1	
925	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
926	1	1	1	
927	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
928	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
929	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
930	0	1	1	
931	1	0	1	
932	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dermatitis
933	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dioxins

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
934	1	1	1	
935	1	1	1	
936	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
937	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Ticks
938	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceutical
939	0	0	0	Not pesticide. Insect repellents
940	1	1	1	
941	1	1	1	
942	1	1	1	
943	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
944	1	1	1	
945	1	1	1	
946	1	1	1	
947	0	0	0	Not pesticide. Wood preservatives
948	0	0	0	Not pesticide. Solvent
949	1	1	1	
950	1	1	1	
951	0	0	0	Not primary data. Potato desiccant
952	1	1	1	
953	0	0	0	Not pesticide. Veterinary treatment
954	0	0	0	Not pesticide. Veterinary treatment
955	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Plant leaf as molluscicide
956	1	1	1	
957	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Human exposure assessment
958	1	1	1	
959	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
960	1	1	1	
961	0	0	0	Not pesticide. Insect repellents
962	1	1	1	
963	1	1	1	
964	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
965	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
966	1	1	1	
967	0	0	0	Not pesticide. Pharmaceutical
968	0	0	0	Not pesticide. Veterinary treatment
969	1	1	1	
970	1	1	1	
971	1	1	1	
972	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
973	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
974	1	1	1	
975	0	0	0	Not pesticide.
976	0	0	0	Not pesticide.
977	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Smoking
978	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
979	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
980	1	1	1	
981	1	1	1	
982	1	1	1	
983	1	1	1	
984	0	0	0	Not dermal or inhalation exposure/toxicity.
985	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
986	0	1	1	
987	1	1	1	
988	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
989	1	1	1	
990	0	0	0	Not pesticide. Veterinary treatment
991	1	1	1	
992	0	0	0	Not dermal or inhalation exposure/toxicity. Injected exposure
993	0	0	0	Not pesticide. Wood preservatives
994	1	0	1	
995	1	1	1	
996	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning incidents
997	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
998	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
999	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1000	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
1001	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Cancer treatment
1002	1	1	1	
1003	0	0	0	Not pesticide. Veterinary treatment
1004	0	0	0	Not dermal or inhalation exposure/toxicity. Metabolism study
1005	1	1	1	
1006	0	0	0	Not pesticide. Veterinary treatment
1007	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1008	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1009	1	1	1	
1010	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceutical
1011	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1012	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1013	1	1	1	
1014	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1015	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
1016	0	0	0	Not dermal or inhalation exposure/toxicity. Human risk assessment
1017	0	0	0	Not pesticide. Surfactant
1019	0	0	0	Not birds or mammals. Fish
1020	0	0	0	Not pesticide. Veterinary treatment
1021	1	1	1	
1022	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Antibiotics
1023	1	1	1	
1024	1	1	1	
1025	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1026	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
1027	1	0	1	
1028	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
1029	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Medical treatment
1030	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1031	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
1032	0	0	0	Not pesticide. Insect repellents
1033	0	0	0	Not dermal or inhalation exposure/toxicity. General account
1034	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1035	0	1	1	
1036	1	1	1	
1037	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Hides and skins
1038	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1039	1	1	1	
1040	1	1	1	
1041	1	1	1	
1042	1	1	1	
1043	0	0	0	Not pesticide.
1044	0	0	0	Not dermal or inhalation exposure/toxicity.
1045	0	0	0	Not pesticide. Pharmaceutical
1046	1	1	1	
1047	1	1	1	
1048	1	1	1	
1049	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1050	1	1	1	
1051	1	1	1	
1052	1	1	1	
1053	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1054	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1055	1	1	1	
1056	1	1	1	
1057	1	1	1	
1058	1	1	1	
1059	1	1	1	
1060	1	0	0	In-vitro study
1061	0	0	0	Not pesticide. Mosquito coil smoke
1062	1	1	1	
1063	1	0	1	
1064	1	0	0	Not primary data.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1065	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1066	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1067	1	1	1	
1068	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1069	1	0	1	
1070	0	0	0	Not dermal or inhalation exposure/toxicity. Biomarkers
1071	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
1072	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1073	1	0	1	
1074	0	0	0	Not primary data. Poisoning incidents
1075	0	0	0	Not primary data. Poisoning incidents
1076	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
1078	0	0	0	Not pesticide. Mosquito coil smoke
1079	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1080	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1081	0	1	1	
1082	0	0	0	Not pesticide. Poisoning incidents
1083	1	1	1	
1084	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1085	0	0	0	Not pesticide.
1086	0	1	1	
1087	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1088	0	0	0	Not pesticide. Cigarette smoke
1089	0	0	0	Not pesticide.
1090	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1091	0	0	0	Not pesticide. Not primary data.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1092	0	0	0	Not pesticide. Not primary data.
1093	1	1	1	
1094	0	0	0	Not pesticide.
1095	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1096	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Pharmaceutical
1097	1	1	1	
1098	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer treatment
1099	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1100	1	0	0	
1101	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1102	1	1	1	
1103	1	1	1	
1104	0	0	0	Not pesticide.
1105	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1106	0	0	0	Not pesticide.
1107	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1108	0	0	0	Not pesticide. Insect repellents
1109	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Occupational exposure
1110	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1111	1	1	1	
1112	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1113	0	1	1	
1114	1	1	1	
1115	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
1116	1	1	1	
1117	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1118	1	1	1	
1119	1	1	1	
1120	1	1	1	
1121	1	1	1	
1122	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1123	0	0	0	Not dermal or inhalation exposure/toxicity. Subcutaneous exposure
1124	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1125	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1126	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1127	1	1	1	
1128	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1129	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1130	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1131	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Pests
1132	1	1	1	
1133	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Pests
1134	0	0	0	Not dermal or inhalation exposure/toxicity. Personal protective equipment
1135	0	0	0	Not pesticide.
1136	0	0	0	Not dermal or inhalation exposure/toxicity. Biomarkers
1137	1	1	1	
1138	1	1	1	
1139	1	1	1	
1140	1	1	1	
1141	0	0	0	Not pesticide.
1142	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1143	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1144	1	1	1	Mosquito coil smoke
1145	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Metabolism study
1146	1	1	1	
1147	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1148	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dioxins
1149	1	1	1	
1150	1	1	1	
1151	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1152	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Human exposure assessment
1153	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Mites
1154	0	0	0	Not dermal or inhalation exposure/toxicity. Metabolism study
1155	1	1	1	
1156	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1157	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1158	1	1	1	
1159	1	1	1	
1160	1	1	1	
1161	1	1	1	
1162	1	1	1	
1163	1	1	1	
1164	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1165	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Leaves
1166	1	1	1	
1167	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1168	1	1	1	
1169	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1170	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1171	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1172	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Residues
1173	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1174	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1175	1	1	1	
1176	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1177	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1178	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1179	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1180	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1181	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1182	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1183	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. In-vitro study
1184	1	1	1	
1185	1	1	1	
1186	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1187	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1188	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1189	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1190	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1191	1	1	1	
1192	1	1	1	
1193	1	1	1	
1194	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1195	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1196	1	1	1	
1197	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1198	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1199	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1200	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceutical
1201	0	0	0	Not dermal or inhalation exposure/toxicity. Veterinary treatment
1202	1	1	1	
1203	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1204	1	1	1	
1205	1	1	1	
1206	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1207	1	1	1	
1208	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1209	1	1	1	
1210	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1211	0	0	0	Not dermal or inhalation exposure/toxicity.
1212	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1213	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous exposure
1214	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1215	1	1	1	
1216	1	1	1	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
1217	0	0	0	Not dermal or inhalation exposure/toxicity.
1218	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Insect repellents
1219	0	0	0	Not pesticide. Insect repellents
1220	0	0	0	Not pesticide.
1221	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1222	1	1	1	
1223	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1224	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1225	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1226	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poultry production
1227	1	1	1	
1228	1	1	1	
1229	1	1	1	
1230	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1231	1	1	1	
1232	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1233	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1234	0	0	0	Not pesticide.
1235	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1236	1	1	1	
1237	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1238	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1239	0	0	0	Not dermal or inhalation exposure/toxicity.
1240	0	0	0	Not dermal or inhalation exposure/toxicity.
1241	0	1	1	
1242	1	1	1	
1243	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1244	1	1	1	
1245	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1246	1	1	1	
1247	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1248	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intravenous exposure
1249	1	1	1	
1250	0	1	1	
1251	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity.
1252	1	1	1	
1253	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Meeting abstract
1254	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1255	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1256	1	1	1	
1257	1	1	1	
1258	1	1	1	
1259	0	0	0	Not pesticide. Insect repellents
1260	1	1	1	
1261	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1262	1	1	1	
1263	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1264	0	0	0	Not pesticide.
1265	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1266	1	1	1	
1267	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
1268	0	0	0	Not dermal or inhalation exposure/toxicity.
1269	1	1	1	
1270	1	1	1	
1271	1	1	1	
1272	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1273	0	0	0	Not pesticide. Mosquito coil smoke

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1274	1	1	1	
1275	1	1	1	
1276	0	1	0	Not pesticide. Intermediate compound
1277	0	0	0	Not pesticide. Metabolite?
1278	1	1	1	
1279	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1280	1	1	1	
1281	1	1	1	
1282	1	1	1	
1283	1	1	1	
1284	0	0	0	Not pesticide. Insect repellents
1285	1	1	1	
1286	0	0	0	Not pesticide. Veterinary treatment
1287	1	1	1	
1288	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1289	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Tumours
1290	0	0	0	Not pesticide. Insect repellents
1291	1	1	1	
1292	0	0	0	Not primary data. Meeting abstract
1293	1	1	1	
1294	1	1	1	
1295	1	1	1	
1296	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Veterinary treatment
1297	1	1	1	
1298	0	0	0	Not dermal or inhalation exposure/toxicity. Metabolism study
1299	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Tumours

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1300	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Cancer
1301	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1302	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Efficacy
1303	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Human exposure assessment
1304	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1305	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous exposure
1306	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1307	1	1	1	
1308	0	0	0	Not dermal or inhalation exposure/toxicity. Injected
1309	1	1	1	Tumours
1310	1	1	1	
1311	1	1	1	
1312	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Insect repellents
1313	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1314	1	1	1	
1315	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1316	1	1	1	
1317	0	0	0	Not dermal or inhalation exposure/toxicity. Injected
1318	0	0	0	Not pesticide. Agent orange
1319	0	0	0	Not pesticide. Agent orange
1320	1	1	1	
1321	1	0	0	Veterinary treatment
1322	1	1	1	
1323	1	1	1	
1324	1	1	1	
1325	1	0	0	Not pesticide.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1326	0	0	0	Not pesticide. Insect repellents
1327	1	1	1	
1328	1	1	1	
1329	1	1	1	
1330	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity.
1331	1	1	1	
1332	1	1	1	
1333	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1334	1	1	1	Not primary data.
1335	1	1	1	
1336	1	1	1	
1337	1	1	1	
1338	1	1	1	
1339	1	1	1	
1340	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Pest control
1341	0	0	0	Not dermal or inhalation exposure/toxicity. Museum collections
1342	1	1	1	
1343	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1344	1	1	1	
1345	0	0	0	Not pesticide. Anaesthesia
1346	0	0	0	Not pesticide.
1347	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
1348	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1349	1	1	1	
1350	1	1	1	
1351	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1352	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1353	1	1	1	
1354	1	1	1	
1355	1	1	1	
1356	1	1	1	
1357	1	1	1	
1358	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1359	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
1360	1	1	1	
1361	0	0	0	Not pesticide. Intermediate compound
1362	0	0	0	Not pesticide. Intermediate compound
1363	0	0	0	Not pesticide. Intermediate compound
1364	0	0	0	Not pesticide. Intermediate compound
1365	0	0	0	Not pesticide. Intermediate compound
1366	0	0	0	Not pesticide. Intermediate compound
1367	1	1	1	
1368	1	1	1	
1369	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
1370	1	1	1	
1371	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1372	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Solvent
1373	0	0	0	Not pesticide. Intermediate compound
1374	0	0	0	Not pesticide. Intermediate compound
1375	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1376	0	0	0	Not pesticide. Insect repellents
1377	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1378	1	1	1	
1379	1	1	1	
1380	1	1	1	
1381	1	1	1	
1382	1	1	1	
1383	0	0	0	Not pesticide. Rosemary oil
1384	1	1	1	
1385	1	1	1	
1386	1	1	1	
1388	1	0	0	Meeting abstract, full paper is item 1295
1390	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
1391	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Veterinary treatment
1392	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Pest control
1393	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1394	1	1	1	
1395	1	1	1	
1396	1	1	1	
1397	0	0	0	Not pesticide. Pharmaceutical
1398	1	1	1	
1399	1	1	1	
1400	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1401	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1402	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1403	1	1	1	
1404	1	1	1	
1405	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1406	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1407	1	1	1	
1408	1	1	1	
1409	1	1	1	
1410	1	1	1	
1411	1	1	1	
1412	1	1	1	
1413	0	0	0	Not pesticide.
1414	1	1	1	
1415	0	0	0	Not pesticide. In-vitro study
1416	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
1417	1	1	1	
1418	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1419	1	1	1	
1420	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1421	1	1	1	
1422	1	1	1	
1423	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Museum collections
1424	1	1	1	
1425	1	0	1	
1426	0	0	0	Not pesticide. Biocide
1427	1	1	1	
1428	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
1429	0	0	0	Not pesticide. Veterinary treatment
1430	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1431	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1432	1	1	1	
1433	1	1	1	
1434	0	0	0	Not dermal or inhalation exposure/toxicity.
1435	0	0	0	Not pesticide. Meeting abstract
1436	1	1	1	
1437	1	1	1	
1438	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1439	0	0	0	Not dermal or inhalation exposure/toxicity. Infused lungs
1440	0	0	0	Not dermal or inhalation exposure/toxicity. Meeting abstract
1441	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous exposure
1442	1	1	1	
1443	0	0	0	Not dermal or inhalation exposure/toxicity. Meeting abstract
1444	0	0	0	Not dermal or inhalation exposure/toxicity.
1445	0	0	0	Not pesticide.
1446	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
1447	1	1	1	
1448	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1449	1	1	1	
1450	0	0	0	Not pesticide.
1451	1	1	1	Meeting abstract
1452	1	1	1	
1453	0	0	0	Not dermal or inhalation exposure/toxicity. Effects due to vegetation change
1454	1	1	1	
1455	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1456	0	0	0	Not pesticide.
1457	0	0	0	Not pesticide.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1458	0	0	0	Not pesticide.
1459	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
1460	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
1461	1	1	1	
1462	1	1	1	
1463	1	1	1	
1464	1	1	1	
1465	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1466	0	0	0	Not pesticide. Meeting abstract
1467	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Dioxins
1469	1	1	1	
1470	0	0	0	Not pesticide. Parasites
1471	1	1	1	
1472	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1473	1	1	1	
1474	1	1	1	
1475	1	1	1	
1476	1	1	1	
1477	1	1	1	
1478	1	1	1	
1479	1	1	1	
1480	1	1	1	
1481	0	0	0	Not dermal or inhalation exposure/toxicity. Effects in humans
1482	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1483	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Toxicity classification system
1484	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1485	1	1	1	
1486	1	1	1	
1487	1	1	1	
1488	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Parasites
1489	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1490	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Review of carcinogenicity studies
1491	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Parasites
1492	1	1	1	
1493	0	0	0	Not dermal or inhalation exposure/toxicity.
1494	1	1	1	
1495	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1496	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Residues
1497	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Dioxins
1498	1	1	1	
1499	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1500	0	0	0	Not pesticide. Antisera
1501	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Personal protective equipment
1502	0	1	1	
1503	0	1	0	Not primary data. Meeting abstract
1504	0	1	0	Not primary data. Meeting abstract
1505	1	1	1	
1506	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case study
1507	0	0	0	Not dermal or inhalation exposure/toxicity. Injected
1508	0	0	0	Not pesticide. Intermediate compound
1509	1	1	1	
1510	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1511	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Pest control
1512	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1513	1	1	1	
1514	0	1	1	
1515	0	0	0	Not primary data. Meeting abstract
1516	1	1	1	
1517	1	1	1	
1518	1	1	1	
1519	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity.
1520	1	1	1	
1521	0	1	1	
1522	0	1	1	
1523	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Fruit production
1524	0	0	0	Not pesticide. Tumours
1525	0	0	0	Not pesticide. Intermediate compound
1526	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1527	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1528	1	1	1	
1529	0	0	0	Not dermal or inhalation exposure/toxicity.
1530	1	1	1	
1531	1	1	1	
1532	1	1	1	
1533	0	0	0	Not pesticide.
1534	0	0	0	Not pesticide.
1535	1	1	1	
1536	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1537	0	0	0	Not dermal or inhalation exposure/toxicity. Residues
1539	1	1	1	
1540	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease
1541	1	0	1	
1542	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1543	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Meeting abstract
1544	1	1	1	
1545	1	1	1	
1546	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Fruit production
1547	1	1	1	
1548	0	0	0	Not dermal or inhalation exposure/toxicity. Food safety
1549	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
1550	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Pharmaceutical
1551	1	1	1	
1552	0	0	0	Not dermal or inhalation exposure/toxicity.
1553	0	0	0	Not pesticide. Veterinary treatment
1554	1	1	1	
1555	1	1	1	
1556	1	1	1	
1557	0	0	0	Not dermal or inhalation exposure/toxicity. Injected
1558	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1559	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. May not include primary data on toxicity
1560	0	0	0	Not pesticide. Virus
1561	0	1	1	
1562	1	1	1	Not primary data.
1563	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Fruit production

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1564	1	1	1	
1565	1	1	1	
1566	1	0	1	
1567	0	1	1	
1568	1	1	1	
1569	0	0	0	Not pesticide. Not primary data. Meeting abstract
1570	1	1	1	
1571	0	0	0	Not dermal or inhalation exposure/toxicity. Food safety
1572	1	1	1	
1573	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Fruit production
1574	0	0	0	Not primary data. Meeting abstract
1575	1	1	1	
1576	1	1	1	
1577	1	1	1	
1578	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity.
1579	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Food safety
1580	1	1	1	
1581	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1582	1	1	1	
1583	0	0	0	Not dermal or inhalation exposure/toxicity. Food safety
1584	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1585	1	1	1	
1586	1	1	1	
1587	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1588	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Unlikely to contain primary data
1589	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1590	1	1	1	
1591	1	1	1	
1592	1	1	1	
1593	1	1	1	
1594	1	1	1	
1595	1	1	1	
1596	1	1	1	
1597	0	0	0	Not dermal or inhalation exposure/toxicity. Human allergy testing
1598	0	0	0	Not dermal or inhalation exposure/toxicity. Appears to be oral exposure
1599	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Legal medicine
1637	1	0	1	
1643	0	0	0	Not pesticide. Intermediate compound
1654	1	1	1	
1658	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1662	1	1	1	
1665	1	1	1	
1672	0	0	0	Not pesticide. Insect repellents
1680	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case study
1681	1	1	1	
1684	0	0	0	Not pesticide. Insect repellents
1686	1	1	1	
1687	1	1	1	
1690	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Not chemical pesticide
1694	0	0	0	Not pesticide. Intermediate compound
1699	1	1	1	
1700	0	0	0	Not pesticide.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1701	1	1	1	
1703	1	0	1	
1712	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1715	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
1717	1	0	0	Not primary data.
1722	1	1	1	
1723	1	1	1	
1737	1	1	1	
1741	1	1	1	
1744	1	1	1	
1748	1	1	1	
1754	1	1	1	
1755	1	1	1	
1760	1	1	1	
1771	1	0	0	Insect repellents
1773	1	1	1	
1776	1	0	0	
1777	1	1	1	
1778	1	1	1	
1779	1	1	1	
1780	1	1	1	
1782	1	1	1	
1784	1	1	1	
1786	1	1	1	
1790	1	1	1	
1791	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1793	1	0	1	
1796	1	1	1	
1800	1	0	1	
1806	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
1807	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Human exposure assessment
1809	1	1	1	
1812	1	1	1	
1813	1	1	1	
1814	1	1	1	
1816	1	1	1	
1820	1	1	1	
1831	1	1	1	
1833	0	0	0	Not pesticide. In-vitro study
1838	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1842	1	1	1	
1845	1	1	1	
1849	0	0	0	Not dermal or inhalation exposure/toxicity. Implanted pellet exposure
1852	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1854	0	0	0	Not dermal or inhalation exposure/toxicity. Paper retracted
1855	0	0	0	Not pesticide. Herbal medicine
1856	1	1	1	
1857	0	0	0	Not pesticide. In-vitro study
1860	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
1861	0	0	0	Not dermal or inhalation exposure/toxicity. Metabolism study
1865	0	0	0	Not pesticide. Not primary data. Cosmetics
1869	1	1	1	

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1870	1	0	1	
1871	0	0	0	Not pesticide. Not listed as pesticide in Pesticide Manual
1876	0	1	1	
1877	1	1	1	
1890	1	1	1	
1893	1	1	1	
1897	0	0	0	Not pesticide. Insect repellents
1899	0	0	0	Not dermal or inhalation exposure/toxicity.
1900	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1901	0	0	0	Not pesticide. Mosquito coil smoke
1905	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
1906	1	1	1	
1911	1	1	1	
1913	0	0	0	Not pesticide. Plant extract
1915	1	1	1	
1926	1	1	1	
1929	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Pharmaceutical
1931	1	1	1	
1932	1	1	1	
1938	1	1	1	
1940	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1941	1	1	1	
1943	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intermediate compound
1950	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Cosmetics
1957	1	1	1	
1958	0	0	0	Not dermal or inhalation exposure/toxicity.

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
1962	1	1	1	
1964	1	1	1	
1966	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data. Biosensor
1969	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
1970	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
1973	1	0	1	
1977	0	1	1	
1983	1	1	1	
1984	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
1986	1	1	1	
1989	0	0	0	Not pesticide. Insect repellents
1994	0	0	0	Not pesticide. Insect repellents
1995	0	0	0	Not pesticide. Intermediate compound
1996	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2006	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2007	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2008	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2009	0	0	0	Not pesticide. Metabolite
2010	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2011	0	0	0	Not pesticide. Insect repellents
2014	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
2015	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2021	1	1	1	Mosquito coil smoke
2022	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2026	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
2027	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Intermediate compound

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
2028	0	0	0	Not pesticide. Not primary data. Cosmetics
2029	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Solvent
2030	0	0	0	Not pesticide. Not primary data. Cosmetics
2034	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case study
2035	1	1	1	
2036	0	1	1	
2037	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Test guideline oral toxicity
2038	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
2039	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2044	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2045	0	0	0	Not pesticide. Not primary data. Cosmetics
2046	0	1	1	
2047	0	0	0	Not dermal or inhalation exposure/toxicity.
2048	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data.
2049	0	0	0	Not pesticide. Not primary data.
2050	1	0	0	Not dermal or inhalation exposure/toxicity. Not primary data.
2054	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Not listed as pesticide in Pesticide Manual
2055	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning case study
2056	1	1	1	
2057	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Poisoning case study
2058	0	0	0	Not pesticide. Mosquito coil smoke
2062	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Drinking water
2064	0	0	0	Not pesticide. Mosquito coil smoke
2066	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
2067	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
2073	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Inhalation exposure method

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
2074	0	0	0	Not dermal or inhalation exposure/toxicity. Subcutaneous exposure
2075	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2076	1	1	1	
2077	1	1	1	
2078	0	0	0	Not dermal or inhalation exposure/toxicity.
2080	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data.
2081	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2082	0	0	0	Not pesticide.
2086	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2087	0	0	0	Not pesticide. Emulsifiers
2088	0	0	0	Not pesticide.
2091	0	0	0	Not birds or mammals. Not dermal or inhalation exposure/toxicity. Not primary data.
2092	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2096	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Dietary exposure
2097	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
2098	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
2099	1	1	1	
2100	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
2101	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Insect repellents
2103	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2108	1	1	1	
2109	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2110	1	1	1	
2111	1	1	1	
2112	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity.
2113	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Disease

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
2115	0	0	0	Not dermal or inhalation exposure/toxicity. Oral exposure
2116	0	0	0	Not dermal or inhalation exposure/toxicity.
2117	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. In-vitro study
2118	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2120	1	1	1	
2122	0	0	0	Not dermal or inhalation exposure/toxicity. Dietary exposure
2124	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case study
2125	1	1	1	
2126	0	0	0	Not pesticide. Metabolite
2129	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2130	1	1	1	
2132	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Antidotes
2133	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
2134	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Biomonitoring
2135	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2136	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2137	1	1	1	
2138	1	1	1	
2139	0	0	0	Not dermal or inhalation exposure/toxicity.
2140	0	0	0	Not dermal or inhalation exposure/toxicity. Human exposure assessment
2141	0	0	0	Not dermal or inhalation exposure/toxicity.
2142	0	0	0	Not pesticide.
2143	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Bioassays review
2144	0	0	0	Not pesticide. Poisoning case study
2145	0	0	0	Not dermal or inhalation exposure/toxicity. Intraperitoneal exposure
2146	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Intravenous exposure

Reference ID	Reviewer 1	Reviewer 2	Agreed decision	Reason for exclusion
2148	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Human exposure assessment
2150	1	1	1	
2151	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data.
2152	0	0	0	Not dermal or inhalation exposure/toxicity. Poisoning case study
2153	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Lymph node assay
2154	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
2155	0	0	0	Not dermal or inhalation exposure/toxicity. Intravenous exposure
2157	1	1	1	
2159	0	0	0	Not primary data. Human exposure assessment
2161	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning case study
2162	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Human exposure assessment
2164	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2165	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
2167	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Oral exposure
2169	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Poisoning cases
2170	0	0	0	Not dermal or inhalation exposure/toxicity. In-vitro study
2171	0	0	0	Not pesticide. Asbestos
2172	1	1	1	
2174	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data.
2175	0	0	0	Not birds or mammals. Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2177	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data.
2178	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment
2180	0	0	0	Not dermal or inhalation exposure/toxicity. Not primary data. Poisoning cases
2182	0	0	0	Not pesticide. Not dermal or inhalation exposure/toxicity. Not primary data. Human exposure assessment

Appendix B. Results of full text screening

Table 5: Results of full text screening

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
3	0	0	0	Decision not to translate	
13	0	0	0	Short paper without detailed information	
16	0	0	0	Review, not primary data	
20	0	0	0	Unable to obtain material	
24	0	0	0	Decision not to translate	
27	1	1	1	Decision not to translate	
29	1	0	0	Decision not to translate	Yes
30	0	0	0	Decision not to translate	
31	0	0	0	Data presented appears to be for oral toxicity	
40	0	0	0	Unable to obtain material	
48	0	1	0	Short paper without detailed information	
50	0	0	0	Short paper without detailed information	
51	0	0	0	Short paper without detailed information	
55	0	0	0	Short paper without detailed information	
56	0	0	0	Short paper without detailed information	
60	0	0	0	Unable to obtain material	
68	0	0	0	Short paper without detailed information	
74	0	0	0	Outline of toxicity tests only	Yes
75	0	0	0	Outline of toxicity tests only	Yes
76	0	0	0	Outline of toxicity tests only	Yes
77	0	1	0	Insufficient control animals relative to treatment group	
79	0	0	0	Decision not to translate	
82	0	0	0	Decision not to translate	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
87	0	0	0	Decision not to translate	
88	0	0	0	Unable to obtain material	
90	0	0	0	Unable to obtain material	
92	0	0	0	Decision not to translate	
93	1	1	1		
94	1	1	1		
95	0	0	0	Unable to obtain material	
96	1	0	0	Decision not to translate	
98	0	0	0	Short paper without detailed information	
113	1	1	1		
114	0	0	0	Meeting abstract, not full study	
119	0	0	0	Unable to obtain material	
120	0	0	0	Decision not to translate	
121	0	0	0	Review, not primary data	
122	0	0	0	Efficacy data, no primary toxicity data	
123	0	0	0	Short paper without detailed information	
124	0	0	0	Short paper without detailed information	
126	0	0	0	Short paper without detailed information	
128	0	0	0	Decision not to translate	
129	1	0	0	Short paper without detailed information	
131	1	1	1		
136	0	0	0	Unable to obtain material	
138	0	0	0	Exposure level not defined, mosquito coil smoke	Yes
141	1	1	1		Yes
146	1	1	1		
148	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
156	1	0	0	Mosquito repellent	
157	0	0	0	Review, not primary data	
158	0	1	0	Review, not primary data. Skin irritation study	Yes
162	0	1	0	Dose level of pesticide mixture used cannot be determined for either dermal or inhalation exposure	Yes
163	0	0	0	Human risk assessment	Yes
170	1	1	1		Yes
171	0	0	0	Review, not primary data	
172	0	0	0	Chickens exposed by dipping but no detailed data on any effects, emphasis of study is on the effects on the parasites	
176	0	0	0	Review, not primary data. Skin irritation study	Yes
179	0	1	0	Experimental data are for oral exposure in rats.	Yes
185	1	1	1		Yes
186	1	1	1		Yes
194	0	0	0	Meeting abstract, not full study	Yes
195	0	0	0	Meeting abstract, not full study	Yes
199	0	0	0	Partridges exposed to diquat via drinking water	
201	1	1	1		Yes
205	0	0	0	Unable to obtain material	
206	1	1	1		
207	1	1	1		Yes
208	0	0	0	Human exposure study	Yes
215	0	0	0	Dose not determined (mosquito coil smoke)	
218	1	1	1		Yes
219	1	1	0	Model, not primary data	Yes
221	1	0	0	Exposure concentration does not appear to have been determined	Yes
223	1	1	1		
225	0	0	0	Decision not to translate	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
226	1	1	1		
229	0	0	0	Discussion of other potential routes of exposure but no data relating to dermal/inhalation	
232	1	0	1		Yes
236	0	0	0	Peer review of active substance, not primary data	Yes
239	0	0	0	Mosquito mat, exposure level not determined	
244	1	0	0	Effects on skin only	
245	0	0	0	Meeting abstract, not full study	Yes
250	0	0	0	Relates to reptiles not birds or mammals	Yes
252	0	0	0	Human exposure study	
253	0	0	0	Meeting abstract, not full study, oral exposure	Yes
255	1	1	1		Yes
256	1	1	1		
265	1	0	0	Subcutaneous exposure (not dermal as suggested)	Yes
267	1	1	1		Yes
268	1	0	1	Review, no primary data	Yes
270	0	0	0	Unable to obtain material	
273	1	1	1		Yes
276	0	0	0	Exposure method not detailed ('topical')	
280	1	1	1		Yes
281	0	0	0	Decision not to translate	Yes
290	0	0	0	Unable to obtain material	
297	0	1	0	Exposure method not detailed ('topical')	
301	1	1	1		Yes
303	1	1	1		
304	0	1	0	Estimation of human exposure based on data from other studies, original data is in reference 303 (Reifenrath et al 2011)	
309	0	0	0	Review, not primary data	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
312	1	1	1		Yes
319	1	1	1		Yes
320	1	1	1		Yes
330	0	0	0	Tumour promotion study	Yes
333	0	1	0	Diflubenzuron not tested alone, only in combination with insect pheromone C21.	Yes
336	1	1	1		Yes
338	1	1	1		Yes
345	0	0	0	Review, not primary data	Yes
348	0	1	0	Layout confused, indicates tests with rats in methods but gives results for mice	Yes
350	1	1	1		Yes
351	0	0	0	Tumour promotion study	Yes
352	1	1	1		
362	0	0	0	Risk assessment, not primary data	Yes
376	1	1	1		
388	1	1	1		Yes
395	1	1	1		Yes
397	0	0	0	Meeting abstract, not full study	
399	0	0	0	Sensitisation/allergy testing study	Yes
408	1	1	1		
414	0	0	0	Human poisoning case study	Yes
421	0	0	0	Review, not primary data	Yes
427	0	0	0	Meeting abstract, not full study	Yes
428	0	0	0	Risk assessment, not primary data	Yes
432	1	1	1		Yes
439	0	0	0	Veterinary treatment for mites not effects on rabbits	
441	1	1	1		Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
457	1	1	1		Yes
467	0	0	0	Human biomonitoring study	Yes
470	0	0	0	Information is for oral exposure only	
474	0	0	0	Short paper without detailed information	
477	1	1	1		
478	0	0	0	Dermal sensitivity/irritation study	Yes
489	0	0	0	Overview of studies, not primary data, not referenced	
490	0	0	0	Meeting abstract, not full study	Yes
492	0	0	0	Not primary data, toxicity data referenced is from industry studies	
493	1	1	1		
494	0	0	0	Overview of studies, not primary data, not referenced	Yes
497	1	1	1		Yes
498	1	1	1		
500	0	0	0	Review, not primary data	Yes
506	1	1	1		Yes
510	1	1	1		Yes
513	0	0	0	Review, not primary data	Yes
520	0	0	0	Short paper without detailed information	Yes
522	1	1	1		
523	1	1	1		
525	1	1	1		Yes
528	1	1	1		
531	0	0	0	Mosquito coil smoke, dose not determined only duration of exposure	Yes
532	0	0	0	Review, not primary data	Yes
533	1	0	1		
534	0	0	0	Exposure method not well described	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
539	0	0	0	Review, not primary data	Yes
540	0	0	0	Review, not primary data	Yes
547	1	1	1		Yes
548	0	0	0	Not dermal or inhalation exposure (simulates uptake by lung in vitro following simulated oral exposure).	
549	1	0	1		Yes
550	0	0	0	Mosquito repellent, dose not defined only duration of exposure and concentration in product	
551	0	0	0	Main data is for transferrable residues to humans following pet treatment for parasites	
552	1	0	0	Mosquito coil smoke (mixture)	
553	0	0	0	Human operator exposure study	Yes
556	0	0	0	Only considers effectiveness of fipronil in reducing dermatitis due to parasites	
558	1	1	1		Yes
559	1	1	1		Yes
565	0	0	0	Overview of chemical, no primary data	
574	1	1	1		Yes
575	0	1	0	Data concerning residues of PCBs from contaminated soil, not pesticides	Yes
577	0	0	0	Overview of test methods, no pesticide data	Yes
581	0	1	0	Human skin data only	
583	1	1	1		Yes
584	0	1	0	Not pesticide for agricultural use	Yes
585	1	1	1		
588	1	1	1		Yes
589	0	0	0	Meeting abstract, not full study	
593	0	0	0	Reference values for human exposure only	
596	0	0	0	Review, not primary data	Yes
599	0	0	0	Contact hypersensitivity study	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
605	0	0	0	Dust solutions injected intratracheally to detect inflammatory or fibrotic response, test substance not inhaled.	
606	0	0	0	Review of cancer risk, no primary data	
611	0	0	0	Overview relating to human poisoning cases	
612	0	0	0	Development of reference values for humans	
622	0	0	0	Review, not primary data	
626	0	0	0	Replication not clear, initially stating 10 rats used when there were 4 treatments but also stating 6 control and 6 treated animals in statistical analysis.	
630	1	1	1		
637	0	0	0	Not pesticide, inhalation study methods paper	
641	1	1	1		Yes
644	1	1	1		Yes
647	0	0	0	Review of data for development of QSAR/PBFK/PD models for human risk	
649	1	1	1		
652	0	0	0	Mosquito repellent, no dose determination merely timed exposure to vapour	Yes
654	1	1	1		
660	0	0	0	Meeting abstract, not full study	
664	0	0	0	Dose cannot be determined as only concentration of test material given not quantity or area treated	
667	1	1	1		
671	0	0	0	Sensitisation study	Yes
672	0	0	0	Meeting abstract, not full study	Yes
673	0	0	0	Replication not clearly described making it difficult to determine the numbers used	
676	0	0	0	Not pesticide	Yes
677	1	1	1		Yes
680	1	1	1		
681	0	0	0	Overview of test methods, no pesticide data	Yes
684	0	0	0	Summary of data from industry studies, not primary data	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
686	0	0	0	Meeting abstract, not full study	
687	0	0	0	Meeting abstract, not full study	
691	0	0	0	Pesticide (permethrin) not applied alone but only in combination with the insect repellent DEET	
692	1	1	1		Yes
696	1	1	1		
699	1	1	1		
701	1	1	1		
702	1	1	1		
704	0	0	0	Unable to obtain material	
705	0	0	0	Dose not determined just concentration of spray	Yes
707	1	1	1		Yes
710	1	1	1		
711	1	1	1		
712	1	1	1		
714	0	0	0	Tumour promotion study	Yes
715	0	0	0	Tumour promotion study	Yes
716	0	0	0	Model with no primary data	
718	1	0	1	Model with no primary data	Yes
719	1	1	1		
720	1	1	1		Yes
732	1	1	1		Yes
734	1	1	1		
735	1	1	1		
737	0	0	0	Pharmacokinetic/pharmacodynamic model based on oral exposure data	Yes
740	1	1	1		Yes
741	0	0	0	Review, not primary data	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
743	1	1	1		
744	1	1	1		
746	1	1	1		Yes
750	0	0	0	Short paper, lacking in methodological detail	
751	1	1	1		
753	0	0	0	Data summary with oral exposure and only dermal sensitization/irritation studies	Yes
755	1	1	1		
756	1	1	1		Yes
757	1	1	1		
758	1	1	1		Yes
759	1	1	1		
760	0	1	0	Exposure concentration not measured, merely amount of formulation in test chamber	Yes
764	0	0	0	Meeting abstract, not full study	Yes
766	0	0	0	Dose level not well defined.	
769	1	1	1		Yes
770	0	0	0	Allergy testing - not relevant	
771	1	1	1		
775	0	0	0	Pesticide not tested alone only in combination with DEET	
777	1	1	1		
779	0	0	0	Development of analytical methods, little detail about animal study (e.g. exposure method)	Yes
780	0	0	0	Tumour promotion study	Yes
786	1	1	1		
791	1	1	1		Yes
793	0	0	0	Meeting abstract, not full study	
794	0	0	0	Review of toxicity data, no primary data	Yes
796	0	0	0	Carcinogenicity test with wood preservative formulation	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
800	1	1	1		Yes
802	1	1	1		
803	1	1	1		Yes
804	1	1	1		Yes
811	0	0	0	Review of toxicity data, no primary data	
819	1	1	1		Yes
822	1	1	1		Yes
824	0	0	0	Sensitization study for contact allergic contact dermatitis	
826	0	0	0	Review, no primary data	Yes
827	1	1	1		Yes
828	0	0	0	Meeting abstract, not full study	
830	0	1	0	Human skin data only	Yes
831	0	0	0	Review of toxicity data for development of occupational exposure limits	Yes
832	1	1	1		Yes
833	1	1	1		
834	0	1	1	Numbers per test group not provided in methods	
835	0	0	0	Review of inhalation toxicity test methods, no data	Yes
838	0	0	0	Review of data from industry studies, not primary data	
840	1	1	1		Yes
841	0	1	0	Metabolism study (skin homogenate)	Yes
846	0	1	0	Sensitisation study involving response to antigen rather than formulation	Yes
847	0	0	0	Unable to obtain material	
849	0	0	0	Human exposure assessment	
850	0	0	0	Commercial formulation containing a mixture, dose level not determined other than time of exposure	
851	0	0	0	Review, no primary data	Yes
853	0	0	0	Tumour promotion study	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
854	0	0	0	Information pertaining to food safety	
855	1	1	1		
856	0	0	0	Review of toxicity data, no primary data	Yes
858	1	1	1		
863	0	0	0	Review of toxicity data, no primary data	Yes
865	1	1	1		Yes
878	1	1	1		
881	0	0	0	Review of chemical mainly in relation to human exposure/risk	
885	0	1	0	Human data only	Yes
893	0	0	0	Review of toxicity data for OPs and carbamates, compounds not identified.	
896	0	0	0	Meeting abstract, not full study	
898	1	1	1		
899	0	0	0	Skin sensitisation study	Yes
900	0	0	1	Model, no primary data	Yes
903	1	1	1		Yes
906	0	0	0	Dosage not adequately described, only describes concentration of allethrin in the product	
920	0	0	0	Field study of immunotoxic effects in chicks from sprayed orchards. No assessment of dermal or inhalation exposure.	
922	0	0	0	Carcinogenicity, tumour promotion study	Yes
924	1	1	1		Yes
926	1	1	1		Yes
930	0	0	0	Unable to obtain material	
931	0	0	0	Human data only	Yes
934	1	1	1		Yes
935	0	0	0	Development of biomarker using birds living in a treated area, exposure route therefore unclear	
940	0	0	0	Meeting abstract, not full study	
941	0	0	0	Compared toxicity, no toxicity data presented	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
942	0	0	0	Workshop summary for inhalation toxicity assessment, no primary data	Yes
944	1	1	1		
945	1	1	1		
946	0	1	0	Exposure concentration not measured, merely amount of formulation in test chamber	Yes
949	0	0	0	Overview of toxicology, not primary data	Yes
950	0	0	0	Overview of toxicology, not primary data	Yes
952	0	0	0	Overview of toxicology, not primary data	
956	0	0	0	Review of field studies, no data relating to dermal or inhalation toxicity/exposure	Yes
958	1	1	1		
960	1	1	1		
962	1	0	1		Yes
963	1	0	1		Yes
966	0	0	0	Unable to obtain material	
969	1	1	1		Yes
970	1	1	1		Yes
971	1	1	1		
974	0	0	0	Dose not well defined, e.g. 2 or 4 diazinon treated ear tags	
980	1	1	1		
981	0	1	0	Exposure concentration not measured, merely amount of formulation in test chamber	Yes
982	1	1	1		
983	0	0	0	Summary of toxicity data, not primary data	Yes
985	0	0	0	Meeting abstract, not full study	
986	0	0	0	Decision not to translate	
987	1	0	0	Results related to human asthma risk	Yes
989	1	1	1		Yes
991	0	1	1	Too little detail of methods used, doses etc.	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
994	0	0	0	Mainly concerned with dietary/grit intake exposure, merely suggests possibility of some dermal exposure during trials but this not measured	
995	0	0	0	Overview of toxicity values, no primary data	
1002	1	1	1		
1005	0	0	0	Carcinogenicity/tumour promotion study	Yes
1009	1	1	1		Yes
1011	1	1	1		
1013	0	0	0	Meeting abstract, not full study	
1021	1	1	1		
1023	1	1	1		
1024	0	1	1	Too little detail of methods used, group sizes, doses etc.	Yes
1027	1	0	1	No data specific to dermal exposure	Yes
1035	1	0	1		Yes
1036	0	1	0	Review, not primary data	
1038	0	0	0	Workshop article overview, general account, no information on pesticides	
1039	1	1	1		
1040	1	1	1		
1041	1	1	1		
1042	0	0	0	Tumour promotion study	
1046	1	1	1		
1047	0	0	0	Dose used cannot be determined	
1048	1	1	1		
1050	0	0	0	Contains no data, method description	
1051	1	1	1		
1052	1	1	1		
1055	1	1	1		
1056	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1057	1	0	1		
1058	1	1	1		
1059	1	1	1		
1062	0	0	0	Tumour promotion study	
1063	1	0	1		
1067	1	1	1		
1069	0	0	0		
1073	0	0	0		
1081	0	0	0	Tumour promotion study	Yes
1083	1	1	1		
1086	0	0	0		
1093	0	0	0	Methods paper for dermal penetration studies, no data	
1097	0	0	0	Tumour promotion study	
1102	1	1	1		
1103	0	0	0	Model of dermal pharmokinetics in the human (reference 1102 is model for rat)	
1111	1	1	1		
1113	0	0	0	Human biomarker study with main data presented relating to oral exposure	
1114	0	0	0	Review, not primary data	
1116	1	1	1		
1118	1	1	1		
1119	0	0	0	Human volunteer study, main data published elsewhere.	
1120	1	1	1		
1121	1	1	1		
1127	0	0	0	Review of dermal absorption values, not primary data	Yes
1132	0	0	0	Meeting abstract, not full study	Yes
1137	0	0	0	Description of in vitro dermal absorption methods, no pesticide related data	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1138	0	0	0	Human data only	
1139	1	0	0	Not study data	
1140	1	1	1		
1144	0	0	0	Mosquito coil smoke study, level of exposure to pesticide not ascertained	
1146	1	1	1		
1149	0	0	0	Human data only	
1150	1	1	1		
1155	1	1	1		
1158	0	0	0	Carcinogenicity/tumour promotion study	Yes
1159	1	1	1		
1160	0	0	0	Tumour promotion study	Yes
1161	1	1	1		
1162	1	1	1		
1163	1	1	1		
1166	0	0	0	Review of chemical propertied/efficacy, not primary data	
1168	1	1	1		
1175	0	0	0	Summary of toxicity data, not primary data	Yes
1184	1	1	1		
1185	1	1	1		
1191	0	1	0	Carcinogenicity/tumour promotion study	
1192	1	1	1		
1193	1	1	1		
1196	1	1	1		Yes
1202	1	1	1		
1204	1	1	1		
1205	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1207	1	1	1		
1209	1	1	1		Yes
1215	1	1	1		
1216	0	0	0	Discussion of methodological aspects of inhalation exposure methods	
1222	1	1	1		
1227	1	1	1		
1228	0	0	0	Tumour promotion study	
1229	0	0	0	Meeting abstract, not full study	
1231	0	0	0	Review of toxicity data, no primary data	
1236	0	1	0	Metabolite exposure (paraoxon, chlorpyrifos oxon)	
1241	0	0	0	Human operator exposure study, no primary data	
1242	0	0	0	Tumour promotion study	
1244	1	1	1		
1246	1	1	1		
1247	1	1	1		
1249	1	1	1		
1250	0	0	0	Decision not to translate	
1252	1	1	1		
1256	0	0	0	Tumour promotion study	
1257	0	0	0	Very little detail of methods used, exposure levels, replication.	
1258	1	1	1		
1260	1	1	1		
1262	1	1	1		
1266	1	1	1		
1269	1	1	1		
1270	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1271	1	1	1		
1274	1	1	1		
1275	0	0	0	Short paper with little detail on actual results (no tables/figures)	Yes
1278	1	1	1		
1280	1	1	1		
1281	1	1	1		
1282	1	1	1		
1283	1	1	1		
1285	1	1	1		
1287	1	1	1		
1291	1	1	1		
1293	0	0	0	Review, no primary data	
1294	0	0	0	Review of in-vivo and in-vitro data, not primary data	
1295	1	1	1		
1297	0	0	0	Review, not primary data	
1307	0	1	0	Sensitisation mouse study and 'drench' application to small numbers of goats	
1309	0	0	0	Tumour promotion study	
1310	1	1	1		
1311	1	1	1		
1314	1	1	1		
1316	1	1	1		
1320	1	1	1		
1322	1	1	1		
1323	1	1	1		
1324	1	1	1		
1327	1	1	1		Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1328	1	1	1		Yes
1329	0	0	0	Skin irritation study, not well described	
1331	1	1	1		
1332	0	0	0	Summary of toxicity data, not primary data	Yes
1334	0	0	0	Review, not primary data	
1335	1	1	1		
1336	1	1	1		
1337	0	0	0	Contains LD50 data but paper is laid out in a confusing manner making it difficult to determine numbers used	
1338	0	0	0	Teratogenic scoring system for human risk assessment	
1339	0	0	0	Meeting abstract, not full study	
1342	0	0	0	Meeting abstract, not full study	
1344	0	0	0	Meeting abstract, not full study	
1349	1	1	1		
1350	1	1	1		
1351	1	1	1		
1353	0	0	0	Tumour promotion study	
1354	1	1	1		
1355	0	0	0	Meeting abstract, not full study	
1356	1	1	1		
1357	1	1	1		Yes
1360	1	1	1		
1367	1	1	1		
1368	1	1	1		
1370	1	1	1		
1377	0	0	0	Methods not adequately described	Yes
1378	1	1	1		Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1379	1	1	1		
1380	1	1	1		
1381	1	1	1		
1382	1	1	1		
1384	0	0	0	Unable to obtain material	
1385	1	1	1		
1386	0	0	0	Meeting abstract, not full study	
1394	1	1	1		Yes
1395	0	0	0	Meeting abstract, not full study	Yes
1396	1	1	1		
1398	1	0	0	Short paper, skin metabolism study	
1399	1	1	1		
1403	0	0	0	Review of human exposure assessment, no primary data	
1404	1	1	1		
1407	1	1	1		
1408	1	1	1		
1409	0	1	0	Uses animal data from another study, not primary source.	
1410	1	1	1		
1411	1	1	1		
1412	1	1	1		Yes
1414	1	1	1		
1417	1	1	1		
1419	1	1	1		
1421	1	1	1		
1422	0	0	0	Meeting abstract, not full study	
1424	0	0	0	Meeting abstract, not full study	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1425	1	1	1		
1427	0	0	0	Human poisoning case study, not relevant	
1431	1	1	1		
1432	0	0	0	Methods not adequately described. Dose level not defined	
1433	1	1	1		
1436	0	0	0	Meeting abstract, not full study	
1437	0	0	0	Human poisoning case study, not relevant	
1442	0	0	0	Contact dermatitis study - not relevant	
1447	1	1	1		Yes
1449	1	1	1		
1451	0	0	0	Meeting abstract, not full study	Yes
1452	1	1	1		
1454	1	1	1		
1461	1	1	1		
1462	1	1	1		
1463	1	1	1		
1464	1	1	1		
1469	0	0	0	Not primary toxicity data, efficacy study	
1471	1	1	1		
1473	0	0	0	Review paper, not primary data	
1474	0	0	0	Review paper, not primary data	
1475	0	1	0	No data for pesticides	
1476	0	0	0	Meeting abstract, not full study	
1477	1	1	1		
1478	1	1	1		
1479	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1480	0	0	0	Review, not primary toxicity data	
1485	1	1	1		
1486	1	1	1		Yes
1487	0	0	0	No details of methods used for rat studies	
1492	1	1	1		
1494	1	1	1		
1498	0	0	0	Human poisoning case study, not relevant	Yes
1502	0	0	0	Not primary data, efficacy study	
1505	1	1	1		
1509	1	1	1		
1510	1	1	1		
1513	0	0	0	Irritation/sensitization study - In Hungarian	
1514	0	0	0	Not primary data, efficacy study	
1516	1	0	1		Yes
1517	1	1	1		Yes
1518	0	0	0	Short paper with little detail of exposure level and very limited replication	
1520	0	0	0	Only one animal appears to have been used for the dermal absorption part of the study	
1521	0	0	0	Efficacy trial, no primary toxicity data	
1522	0	0	0	Not primary data, efficacy study	
1528	0	0	0	Meeting abstract, not full study	
1530	0	0	0	Decision not to translate	
1531	0	0	0	Tumour promotion study	
1532	1	1	1		
1535	0	0	0	Analytical method to be used in subsequent inhalation studies	
1536	1	0	0	Methods paper, no data	
1539	1	1	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1541	1	1	1		
1544	0	0	0	Not primary toxicity data, efficacy study	
1545	1	1	1		
1547	0	0	0	Pesticides administered in cigarette smoke, unrealistic exposure	Yes
1551	0	0	0	Unable to obtain material	
1554	1	1	1		
1555	0	0	0	Short paper without detailed information	
1556	0	0	0	Not primary data, efficacy study	
1561	0	0	0	Not primary data, efficacy study	
1562	0	0	0	Review, not primary data	
1564	0	0	0	Not primary toxicity data, general account of chemical	
1565	0	0	0	Not primary toxicity data, efficacy study	
1566	0	0	0	Not primary toxicity data, efficacy study	
1567	0	0	0	Not primary data, efficacy study	
1568	0	0	0	Not primary data, efficacy study	
1570	0	0	0	Unable to obtain material	
1572	1	1	1		
1575	1	1	1		
1576	0	0	0	Unable to obtain material	
1577	0	0	0	Unable to obtain material	
1580	1	1	1		Yes
1582	1	1	1		Yes
1585	1	1	1		
1586	0	0	0	Exposure to dimethoate in tobacco smoke, no study of dimethoate alone.	
1589	1	1	0	Decision not to translate	
1590	1	0	1		

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1591	1	0	0	Decision not to translate	
1592	0	0	0	Suggests main route of exposure via food with only possible absorption through the skin	
1593	1	0	0	Decision not to translate	
1594	0	0	0	Short paper without detailed information	
1595	0	1	0	Decision not to translate	
1596	0	0	0	Decision not to translate	
1637	0	0	0	Summary of toxicity/exposure data, not primary data	Yes
1654	1	1	1		
1665	0	0	0	Human exposure assessment only	Yes
1681	0	0	0	Human dermal exposure study, no rat dermal exposure data (oral only)	
1686	1	1	1		
1687	1	1	1		
1699	1	1	1		Yes
1701	1	1	1		
1703	1	1	1		
1722	0	0	0	Review of skin irritation studies	
1723	1	0	0		
1737	0	0	0	Review, not primary data	
1741	0	0	0	Human poisoning case study	
1744	0	0	0	Skin irritation study, insecticides used not identified	Yes
1748	1	1	1		Yes
1754	1	1	1		
1755	0	0	0	Sensitization/allergy study	
1760	0	0	0	Human exposure assessment study	
1773	1	1	1		
1777	0	0	0	Summary of toxicity/exposure data, not primary data	Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1778	0	0	0	Short paper/abstract only	
1779	0	0	0	Review of toxicity data, not primary data	Yes
1780	1	1	1		
1782	1	1	1		
1784	0	0	0	Mosquito coil smoke study, level of exposure to pesticide not ascertained	Yes
1786	1	0	1		
1790	0	0	0	Human allergic contact dermatitis case study	
1791	0	0	0	Summary of toxicity data, not primary data	Yes
1793	0	0	0	Unable to obtain material	
1796	1	1	1		Yes
1800	0	0	0	Dosing methods not detailed, no evidence of control group found	
1809	1	1	1		Yes
1812	0	0	0	Review, not primary data	
1813	1	1	1		
1814	1	1	1		
1816	1	0	1		Yes
1820	1	1	1		
1831	0	0	0	Review, not primary data	
1842	0	0	0	Unable to determine level of replication for the dermal exposure study	
1845	0	0	0	Method paper, no data	
1856	0	0	0	Meeting abstract, not full study	
1869	0	0	0	Skin and eye irritation data only	
1870	0	0	0	Summary of toxicity data, not primary data	Yes
1876	0	1	0	Skin and eye irritation data only	Yes
1877	1	1	1		
1890	0	0	0	Human exposure model parameters	

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
1893	1	1	1		
1906	1	1	1		
1911	0	0	0	Summary of toxicity data, not primary data	Yes
1915	1	1	1		Yes
1926	1	1	1		
1931	0	0	0	Human exposure assessment	Yes
1932	0	0	0	Tumour promotion study	
1938	1	1	1		Yes
1941	0	0	0	Meeting abstract, not full study	
1957	1	1	1		
1962	1	0	0	Not dermal or inhalation study	
1964	0	0	0	Level of exposure not defined, 2% or 5% allethrin mosquito mats	
1973	1	1	1		
1977	0	0	0	Review of carcinogenicity only - not relevant	
1983	1	1	1		
1986	1	1	1		
2021	0	0	0	Mosquito coil smoke study, level of exposure to pesticide not ascertained	
2035	0	0	0	Review of pharmacokinetics/pharmacodynamics, no primary data	Yes
2036	0	0	0	Review of human poisoning case studies, not primary data	
2046	1	1	1		
2056	1	1	1		Yes
2076	0	0	0	QSAR model, no dermal or inhalation toxicity data	Yes
2077	0	0	0	Study of constituents of mosquito coils only, no animal exposure data	
2099	1	1	1		Yes
2108	1	1	1		Yes
2110	1	1	1		Yes

Reference	Reviewer 1	Reviewer 2	Agreed include	Reason for exclusion	Available online?*
2111	1	0	1		
2120	1	1	1		
2125	0	0	0	Summary of toxicity/uptake data, not primary data	Yes
2130	0	0	0	Review of toxicity for veterinary uses, not primary data	
2137	0	0	0	Summary of toxicity/uptake data, not primary data	Yes
2138	1	1	1		
2150	1	1	1		
2157	0	0	0	Review of human poisoning cases	
2172	1	0	1		

Appendix C. References rejected at data extraction

It was necessary to reject the following papers at the data extraction phase.

Table 6: References rejected at the data extraction stage

Ref.	Reason
2111	Found to contain only intratracheal exposure data.
2172	Found to contain only intratracheal exposure data.
1585	Found to contain only irritation/sensitivity information.
27	Not translated.
319	Dose could not be determined- flumetralin applied as treated tobacco leaves.
493	All dose levels applied to same animal at different sites.
1705	Found to be a duplicate of 1367.
113	Data not entered, found to contain too little detail
528	Unable to determine exposure level – sprayed volume not defined.
769	Unable to determine exposure level – sprayed volume not defined.
769	Found to contain only intratracheal exposure data.
1349	Unable to determine dose levels used.
1986	Exposure concentration not defined.

Appendix D. Dermal toxicity – LD50

Table 7: Studies reporting dermal LD50 values

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
2,4,5-T	T	NR	Rat	M	NR	NR	NR	4 (min)	1974		1410	Gaines and Linder (1986)
2,4,5-T	T	NR	Rat	F	NR	NR	NR	4 (min)	1535		1410	Gaines and Linder (1986)
2,4_D dimethylamine salt	NR	67.9%	Rabbit	NR	NR	Abdominal skin	24h	NR	2244	Decontaminated after 24h. Mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4_D isobutyl ester	NR	96.1%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4-D	NR	95%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4-D butoxyethanol ester	NR	97.1%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4-D butyl ester	NR	98.6%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4-D isocytol ester	NR	94%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)
2,4-D sodium salt	NR	90.8%	Rabbit	NR	NR	Abdominal skin	24h	NR	>2000	Decontaminated after 24h. No mortalities at 2000mg/kg	1350	Gorzinski et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Acephate	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Acephate	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Ametryn	T	NR	Rat	M	NR	NR	NR	4 (min)	>3000		1410	Gaines and Linder (1986)
Ametryn	T	NR	Rat	F	NR	NR	NR	4 (min)	>3000		1410	Gaines and Linder (1986)
Amitrole	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Amitrole	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Amitrole	P'	99%	Rat	M	451-605	NR	14d	1	>2500	No mortalities. No signs of toxicity.	1572	Gaines et al (1973)
Amitrole	P	99%	Rat	F	451-605	NR	14d	1	>2500	No mortalities. No signs of toxicity.	1572	Gaines et al (1973)
Atrazine	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Atrazine	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Azinphos-methyl	A	99%	Mouse	M	40	Hind feet	24h	5	6000		1485	Skinner and Kilgore (1982)
Bromacil	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Bromacil	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Bufencarb	T	NR	Rat	M	NR	NR	NR	4 (min)	237		1410	Gaines and Linder (1986)
Bufencarb	T	NR	Rat	F	NR	NR	NR	4 (min)	163		1410	Gaines and Linder (1986)
Carbanolate	T	NR	Rat	M	NR	NR	NR	4 (min)	>1200		1410	Gaines and Linder (1986)
Carbanolate	T	NR	Rat	F	NR	NR	NR	4 (min)	>1200		1410	Gaines and Linder (1986)
Carbofuran	T	NR	Rat	M	NR	NR	NR	4 (min)	>1000		1410	Gaines and Linder (1986)
Carbofuran	T	NR	Rat	F	NR	NR	NR	4 (min)	>1000		1410	Gaines and Linder (1986)
Chlordimef-orm	T	NR	Rat	M	NR	NR	NR	4 (min)	337		1410	Gaines and Linder (1986)
Chlordimef-orm	T	NR	Rat	F	NR	NR	NR	4 (min)	263		1410	Gaines and Linder (1986)
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Abdominal skin	4h	1	>1000		1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Dorsal skin	7d	1	>750		1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	F	50% EC	Rat	M	160-220	Dorsal skin	7d	1	>1000 formulation	Value presented is for formulation (50% a.i.)	1575	Loser and Kimmerle (1973)
Chlorothalonil	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Chlorothalonil	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Cycloate	T	NR	Rat	M	NR	NR	NR	4 (min)	2467		1410	Gaines and Linder (1986)
Cycloate	T	NR	Rat	F	NR	NR	NR	4 (min)	2502		1410	Gaines and Linder (1986)
Cyhexatin	T	NR	Rat	M	NR	NR	NR	4 (min)	767		1410	Gaines and Linder (1986)
Cyhexatin	T	NR	Rat	F	NR	NR	NR	4 (min)	446		1410	Gaines and Linder (1986)
Cypermethrin/ Chlorpyrifos	F	5%/24 %	Rat	M	120	NR	NR	5	2125.64		170	Noaishi et al (2013)
Dalapon	T	NR	Rat	M	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Dalapon	T	NR	Rat	F	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Decamethrin	T	NR	Rat	F	NR	Back	5d	NR	>800	No mortalities. No signs of toxicity.	1510	Kavlock et al (1979)
Dialifos	T	NR	Rat	M	NR	NR	NR	4 (min)	45		1410	Gaines and Linder (1986)
Dialifos	T	NR	Rat	F	NR	NR	NR	4 (min)	28		1410	Gaines and Linder (1986)
Di-allate	T	NR	Rat	M	NR	NR	NR	4 (min)	2175		1410	Gaines and Linder (1986)
Di-allate	T	NR	Rat	F	NR	NR	NR	4 (min)	2124		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Diazinon	A	99%	Mouse	M	40	Hind feet	24h	5	2750		1485	Skinner and Kilgore (1982)
Diazinon	F	20%	Rat	M	150-200	Trunk	24h	3-4	>1000	Plaster alone group.	1582	Noakes et al (1969)
Diazinon	F	20%	Rat	M	150-200	Trunk	24h	3-4	500	Aluminium foil lined group.	1582	Noakes et al (1969)
Diazinon	F	20%	Rat	M	150-200	Trunk	4h	3-4	>1000	Plaster alone group.	1582	Noakes et al (1969)
Diazinon	F	20%	Rat	M	150-200	Trunk	4h	3-4	c.1000-1200	Aluminium foil lined group.	1582	Noakes et al (1969)
Dichlofenthion	T	NR	Rat	M	NR	NR	NR	4 (min)	576		1410	Gaines and Linder (1986)
Dichlofenthion	T	NR	Rat	F	NR	NR	NR	4 (min)	355		1410	Gaines and Linder (1986)
Dichlorvos	NR	95%	Rat	F	200-230	Back skin	24h	NR	41.4	Not decontaminated after exposure	802	Knezic et al (2001)
Dichlorvos	NR	95%	Rat	F	200-230	Back skin	24h	NR	386.5	Decontaminated after 5 minutes	802	Knezic et al (2001)
Dimethoate	F	32%	Rat	M	150-200	Trunk	24h	3-4	770	Plaster alone group. Minimum value of 4 estimates. Others were 840, 840 and 1090 mg/kg.	1582	Noakes et al (1969)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Dimethoate	F	32%	Rat	M	150-200	Trunk	24h	3-4	353	Aluminium foil lined group. 0% mortality at 250mg/kg, 100% mortality at 500 mg/kg. Minimum value of 3 estimates. Others were 460 and 700mg/kg.	1582	Noakes et al (1969)
Dimethoate	F	32%	Rat	M	150-200	Trunk	4h	3-4	>1100	Plaster alone group.	1582	Noakes et al (1969)
Dimethoate	F	32%	Rat	M	150-200	Trunk	4h	3-4	1000	Aluminium foil lined group.	1582	Noakes et al (1969)
Dinoseb amine	F	18.5%	Rat	M	150-200	Trunk	24h	3-4	113	Plaster alone group. 0% mortality at 80mg/kg, 100% mortality at 160 mg/kg. Minimum of 2 estimates, other was 135 (95-190) mg/kg	1582	Noakes et al (1969)
Dinoseb amine	F	18.5%	Rat	M	150-200	Trunk	24h	3-4	67	Aluminium foil lined group. Minimum of 2 values, other was 80 (54-449) mg/kg	1582	Noakes et al (1969)
Diquat	NR	99%	Rabbit	M/F	1500-2500	Dorsal skin	24h	NR	>400	No abnormalities in major organs.	1580	Clark and Hurst (1970)
Diquat	T	NR	Rat	M	NR	NR	NR	4 (min)	433		1410	Gaines and Linder (1986)
Diuron	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Diuron	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Dodine	T	95%	Rat	M	120-150	Back	14d	NR	894.32		1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	14d	NR	1122.01		1215	Masood et al (1991)
Endothall	T	NR	Rat	M	NR	NR	NR	4 (min)	>1000		1410	Gaines and Linder (1986)
Endothall	T	NR	Rat	F	NR	NR	NR	4 (min)	>1000		1410	Gaines and Linder (1986)
Famphur	T	NR	Rat	M	NR	NR	NR	4 (min)	400		1410	Gaines and Linder (1986)
Famphur	T	NR	Rat	F	NR	NR	NR	4 (min)	533		1410	Gaines and Linder (1986)
Fenthion	A	>96%	Rat	F	185-200	NR	4h	5	271	Decontaminated after 4h	1252	Chenglong et al (1990)
Fluorodifen	T	NR	Rat	M	NR	NR	NR	4 (min)	>2800		1410	Gaines and Linder (1986)
Fluorodifen	T	NR	Rat	F	NR	NR	NR	4 (min)	>2800		1410	Gaines and Linder (1986)
Formothion	F	25%	Rat	M	150-200	Trunk	24h	3-4	600	Plaster alone group.	1582	Noakes et al (1969)
Formothion	F	25%	Rat	M	150-200	Trunk	24h	3-4	353	Aluminium foil lined group. 0% mortality at 250mg/kg, 100% mortality at 500mg/kg	1582	Noakes et al (1969)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	5	2400		533/743/819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)
Leptophos	T	NR	Rat	M	NR	NR	NR	4 (min)	103		1410	Gaines and Linder (1986)
Leptophos	T	NR	Rat	F	NR	NR	NR	4 (min)	44		1410	Gaines and Linder (1986)
Linuron	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Linuron	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Methamid-ophos	T	NR	Rat	M	NR	NR	NR	4 (min)	179		1410	Gaines and Linder (1986)
Methamid-ophos	T	NR	Rat	F	NR	NR	NR	4 (min)	151		1410	Gaines and Linder (1986)
Methazole	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Methazole	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Methidathion	T	NR	Rat	M	NR	NR	NR	4 (min)	94		1410	Gaines and Linder (1986)
Methidathion	T	NR	Rat	F	NR	NR	NR	4 (min)	85		1410	Gaines and Linder (1986)
Methomyl	T	NR	Rat	M	NR	NR	NR	4 (min)	>2400		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Methomyl	T	NR	Rat	F	NR	NR	NR	4 (min)	>2400		1410	Gaines and Linder (1986)
Methyl parathion	A	99%	Mouse	M	40	Hind feet	24h	5	1200		1485	Skinner and Kilgore (1982)
Mevinphos	A	99%	Mouse	M	40	Hind feet	24h	5	12		1485	Skinner and Kilgore (1982)
Monuron	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Monuron	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Nitrofen	T	NR	Rat	M	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Nitrofen	T	NR	Rat	F	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Oxamyl	F	0.25	Rabbit	M	NR	NR	24h	4	740	All mortalities occurred within 4.5h of exposure. No mortality at 250mg/kg, mortalities at 500mg/kg and above.	1433	Kennedy (1986)
Oxamyl	F	25%	Rat	NR	NR	NR	24h	5	>1200	No mortalities at any dose	1433	Kennedy (1986)
Oxamyl	F	25%	Rat	NR	NR	NR	24h	5	>1200	No mortalities at 150mg/kg or below. One mortality at 300mg/kg, two at 1200mg/kg.	1433	Kennedy (1986)
Parathion	A	98%	Mouse	M	40	Hind feet	24h	5	400		1485	Skinner and Kilgore (1982)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Parathion	F	20%	Rat	M	200± 20	Back	NR	4	310	Values appear to be for formulation	991	Puga and Rodriguez (1996)
Parathion	F	20%	Rat	M	200± 20	Back	NR	4	242	Values appear to be for formulation	991	Puga and Rodriguez (1996)
Parathion	T	NR	Rat	F	150-200	Trunk	24h	3-4	18	Plaster with aperture group (uncovered). 0% mortality at 12.5mg/kg, 100% mortality at 25mg/kg.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	4h	3-4	c.25-30	Plaster with aperture group (uncovered). 0% mortality at 12.5mg/kg, 100% mortality at 25mg/kg.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	24h	3-4	39	Unlined (plaster only) group. Minimum value of 4 estimates. Others were 54 (47-56), 50 (33-76) and 54 (46-65) mg/kg	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	4h	3-4	60	Unlined (plaster only) group. Minimum value of 2 estimates. Others estimate was 70mg/kg.	1582	Noakes et al (1969)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Parathion	T	NR	Rat	F	150-200	Trunk	24h	3-4	4.4	Aluminium foil lined group. 0% mortality at 3.1mg/kg, 100% mortality at 6.2mg/kg. Minimum value of 4 estimates. Others were 5.2 (95% CL 3.7-7.4), 9.5 (6.7-13.0) and 8.0 (6.6-12.0) mg/kg	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	4h	3-4	8.8	Aluminium foil lined group.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	24h	3-4	41	Rubber sheet lined group.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	4h	3-4	41	Rubber sheet lined group.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	24h	3-4	18	Polythene sheet lined group. 0% mortality at 12.5mg/kg, 100% mortality at 25mg/kg.	1582	Noakes et al (1969)
Parathion	T	NR	Rat	F	150-200	Trunk	4h	3-4	18	Polythene sheet lined group. 0% mortality at 12.5mg/kg, 100% mortality at 25mg/kg.	1582	Noakes et al (1969)
Parathion	F	35%	Rat	F	150-200	Trunk	24h	3-4	16	Plaster alone group.	1582	Noakes et al (1969)
Parathion	F	35%	Rat	F	150-200	Trunk	24h	3-4	76	Plaster alone group.	1582	Noakes et al (1969)
Parathion	F	35%	Rat	F	150-200	Trunk	24h	3-4	8	Aluminium foil lined group. Minimum value of 3 estimates. Others were 13 and 11 mg/kg.	1582	Noakes et al (1969)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Parathion	F	25%	Rat	F	150-200	Trunk	24h	3-4	46	Plaster alone group. Minimum value of 4 estimates. Others were 54, 54 and 65mg/kg.	1582	Noakes et al (1969)
Parathion	F	25%	Rat	F	150-200	Trunk	24h	3-4	21	Aluminium foil lined group. Minimum value of 2 estimates. Other was 35 mg/kg.	1582	Noakes et al (1969)
Pentachlor-ophenol	T	NR	Rat	F	150-200	Trunk	24h	3-4	149	Plaster alone group.	1582	Noakes et al (1969)
Pentachlor-ophenol	T	NR	Rat	F	150-200	Trunk	24h	3-4	105	Aluminium foil lined group.	1582	Noakes et al (1969)
Phoxim	T	NR	Rat	M	NR	NR	NR	4 (min)	1276		1410	Gaines and Linder (1986)
Phoxim	T	NR	Rat	F	NR	NR	NR	4 (min)	1224		1410	Gaines and Linder (1986)
Piprotal	T	NR	Rat	M	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Piprotal	T	NR	Rat	F	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Prometon	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Prometon	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Prometryne	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Prometryne	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Propazin	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Propazin	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Propham	T	NR	Rat	M	NR	NR	NR	4 (min)	>4000		1410	Gaines and Linder (1986)
Propham	T	NR	Rat	F	NR	NR	NR	4 (min)	>4000		1410	Gaines and Linder (1986)
Pyrazon	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Pyrazon	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Quintozene	T	NR	Rat	M	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Quintozene	T	NR	Rat	F	NR	NR	NR	4 (min)	>5000		1410	Gaines and Linder (1986)
Resmethrin	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Resmethrin	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Simazine	T	NR	Rat	M	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)
Simazine	T	NR	Rat	F	NR	NR	NR	4 (min)	>2500		1410	Gaines and Linder (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
TCPE (fenteracol)	'Pure'	94.3%	Rat	NR	NR	NR	4h	NR	>7100		1545	Bordas et al (1976) (original in Bulgarian)
TCPE (fenteracol)/ Aktinit PK (atrazine)	F	25%/25 %	Rat	NR	NR	NR	4h	NR	>2100	Value would appear to be for formulation.	1545	Bordas et al (1976) (original in Bulgarian)

Appendix E. Dermal toxicity – ED50

Table 8: Studies reporting dermal ED50 values for cholinesterase activity

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Azinphos-methyl	A	99%	Mouse	M	40	Hind feet	24h	5	1500	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Azinphos-methyl	A	99%	Mouse	M	40	Hind feet	24h	5	600	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Carbofuran	A	NR	Rat	M	220-240	Back	24h	5	85.8 (µg/cm^2)	ED50 - Calculated from data presented and checked against graph. Assuming a 230g rat and 25cm^2 treated area this is equivalent to 9.33 mg/kg.	1478	Iwata et al (1983)
Carbosulfan	A	NR	Rat	M	220-240	Back	24h	4	101.4 (µg/cm^2)	ED50 - Calculated from data presented and checked against graph. Assuming a 230g rat and 25cm^2 treated area this is equivalent to 11.02 mg/kg.	1478	Iwata et al (1983)
Diazinon	A	99%	Mouse	M	40	Hind feet	24h	5	20	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Diazinon	A	99%	Mouse	M	40	Hind feet	24h	5	40	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Ethoprop	T	95%	Rat	M	310	Back	72h	7	13	ED50 9.5µg/cm^2; ED10 3.3µg/cm^2; ED10 4.5mg/kg	1367	Knaak et al (1987)
Ethoprop	F	[69]%	Rat	M	280	Back	72h	4	13.1	ED50 9.3µg/cm^2; ED10 3.8µg/cm^2; ED105.3mg/kg	1367	Knaak et al (1987)
Methyl parathion	A	99%	Mouse	M	40	Hind feet	24h	5	950	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Methyl parathion	A	99%	Mouse	M	40	Hind feet	24h	5	550	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Mevinphos	A	99%	Mouse	M	40	Hind feet	24h	5	39	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Mevinphos	A	99%	Mouse	M	40	Hind feet	24h	5	3	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Parathion	A	98%	Mouse	M	40	Hind feet	24h	5	290	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)
Parathion	A	98%	Mouse	M	40	Hind feet	24h	5	260	Dose causing 50% inhibition in blood samples from exposed mice.	1485	Skinner and Kilgore (1982)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Effect dose (mg/kg)	Comments	Ref.	Source
Parathion	T	95%	Rat	M	266	Back	72h	4	5.6	ED50 3.9µg/cm^2; ED10 1.0µg/cm^2; ED10 1.5mg/kg	1367	Knaak et al (1987)
Parathion	A	98%	Rat	M	296	Back	72h	4	24.3 (µg/cm^2)	ED50 - also expressed as 1.7µg/cm^2 of total body surface, equivalent to 2.4mg/kg	1654	Knaak et al (1984)
Parathion	A	98%	Rat	M	145	Back	72h	4	22.7 (µg/cm^2)	ED50 - also expressed as 1.6µg/cm^2 of total body surface, equivalent to 2.9mg/kg	1654	Knaak et al (1984)
Parathion	A	98%	Rat	F	279	Back	72h	4	14 (µg/cm^2)	ED50 - also expressed as 1.0µg/cm2 of total body surface, equivalent to 1.4mg/kg	1654	Knaak et al (1984)
Parathion	A	98%	Rat	F	147	Back	72h	4	19 (µg/cm^2)	ED50 - also expressed as 13µg/cm2 of total body surface, equivalent to 1.8mg/kg	1654	Knaak et al (1984)

Appendix F. Dermal toxicity to birds – other effects

Table 9: Studies reporting the effects of dermal exposure on birds

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Carbaryl	F	NR	Chukar partridge (*Alectoris graeca*)	F	NR	Over-sprayed	3d	1	-	1	Mortality, bodyweight and brain AChE activity.	1200 g AI/ha	No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)
Carbaryl	F	NR	Pheasant (*Phasianus colchicus*)	F	NR	Over-sprayed	10d	2	7d	1	Mortality, bodyweight and brain AChE activity.	1200 g AI/ha	No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)
Carbofuran	F	NR	Chukar partridge (*Alectoris graeca*)	F	NR	Over-sprayed	3d	1	-	1	Mortality, bodyweight and brain AChE activity.	132 g AI/ha	One mortality in control group. No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)
Carbofuran	F	NR	Pheasant (*Phasianus colchicus*)	F	NR	Over-sprayed	10d	2	7d	1	Mortality, bodyweight and brain AChE activity.	132 g AI/ha	One mortality in each of control and test group. No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)
Chlorpyrifos	NR	99%	Hen	F	NR	Ventral wing surface	30-61d	0	Daily	1	Symptoms and mortality	20 mg/kg/d	Effects on individual birds. No ataxic symptoms after 61 doses (total 1220 mg/kg). Mortality at day 38 (total 760 mg/kg) or day 35 (total 600 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Diazinon	T	85%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	16 mg/kg	No mortality. Significant reduction in ChE activity compared to initial values from 8h to day 5.	1058	Henderson et al (1994)
Diazinon	T	85%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	53 mg/kg	No mortality. Significant reduction in ChE activity compared to initial values from 8h to day 7.	1058	Henderson et al (1994)
Diazinon	T	85%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	110 mg/kg	No mortality. Significant reduction in ChE activity compared to initial values from 8h to day 9.	1058	Henderson et al (1994)
Dichlorvos	NR	99.9%	Hen	F	NR	Ventral wing surface	2-3d	2-3	Daily	3	Symptoms and mortality	12.5-15.7 mg/kg/d	Effects on individual birds. No ataxic symptoms (total 37.5 mg/kg). Mortality on day 2 (total 28.8 mg/kg) or day 3 (total 47.1 mg/kg).	1449	Francis et al (1985)
Dichlorvos	NR	99.9%	Hen	F	NR	Ventral wing surface	28-44d	28-44	Daily	3	Symptoms and mortality	2.8-3.8 mg/kg/d	Effects on individual birds. Mortality at day 30 (total 78.4 mg/kg), day 36 (total 112.2 mg/kg) or day 45 (total 167.2 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dichlorvos	NR	99.9%	Hen	F	NR	Ventral wing surface	36-39d	36-39	Daily	2	Symptoms and mortality	1.7-1.8 mg/kg/d	Effects on individual birds. Severely ataxic at day 37 (total 70.9 mg/kg). Mortality on day 36 (total 61.2 mg/kg) or day 37 (total 62.9 mg/kg).	1449	Francis et al (1985)
Dichlorvos	NR	99.9%	Hen	F	NR	Ventral wing surface	90d	90	Daily	3	Symptoms and mortality	0.54-0.71 mg/kg/d	Effects on individual birds. No ataxic symptoms after 90 doses (total 48.6-63.9 mg/kg).	1449	Francis et al (1985)
Dieldrin	T	92%	Mallard (*Anas platyrhynchos*)	NR	NR	Whole body (swimming)	34d	1	-	3	Behaviour, growth, tissue uptake and bioconcentration.	0.014-0.118 mg/L	No mortality, no effects on growth. Concentration related uptake of dieldrin into lipid, skin and liver. Given that the ducklings were maintained in the contaminated water there is the potential that some of the exposure could be due to drinking.	1163	Nebeker et al (1992)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dieldrin	T	92%	Mallard (*Anas platyrhyn-chos*)	NR	NR	Whole body (swim-ming)	12d	1	-	3	Behaviour, growth, tissue uptake and bioconcentration.	0.019-0.193 mg/L	No mortality, no effects on growth. Concentration related uptake of dieldrin into lipid, skin and liver. Given that the ducklings were maintained in the contaminated water there is the potential that some of the exposure could be due to drinking.	1163	Nebeker et al (1992)
Dieldrin	T	92%	Mallard (*Anas platyrhyn-chos*)	NR	NR	Whole body (swim-ming)	34d	1	-	1	Behaviour, growth, tissue uptake and bioconcentration.	0.117 mg/L	No mortality, no effects on growth. Concentration uptake of dieldrin into lipid, skin, brain, blood and liver reported. Given that the ducklings were maintained in the contaminated water there is the potential that some of the exposure could be due to drinking.	1163	Nebeker et al (1992)
Dimethoate	F	NR	Chukar partridge (*Alectoris graeca*)	F	NR	Over-sprayed	3d	1	-	1	Mortality, bodyweight and brain AChE activity.	432 g AI/ha	No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dimethoate	F	23.4%	Hen	F	NR	Ventral wing surface	88d	88	Daily	2	Symptoms and mortality	7.2-7.5 mg/kg/d	Effects on individual birds. No ataxic symptoms after 88 doses (total 633.6-660.0 mg/kg).	1449	Francis et al (1985)
Dimethoate	F	NR	Pheasant (*Phasianus colchicus*)	F	NR	Over-sprayed	10d	2	7d	1	Mortality, bodyweight and brain AChE activity.	432g AI/ha	No significant effect on bodyweight or brain AChE activity.	1686	Somers et al (1991)
EPN	NR	99%	Hen	F	NR	Ventral wing surface	44-65d	44-65	Daily	3	Symptoms and mortality	10 mg/kg/d	Effects on individual birds. Paraplegic at 48d (total 440 mg/kg), 55d (total 500 mg/kg). Mortality at 76d (total 650 mg/kg).	1449	Francis et al (1985)
EPN	NR	99%	Hen	F	NR	Ventral wing surface	34-90d	34-90	Daily	3	Symptoms and mortality	3.6-4.4 mg/kg/d	Effects on individual birds. Ataxic at 70d (total 396 mg/kg. Severely ataxic at 78d (total 285 mg/kg). Mortality at 49d (total 122 mg/kg).	1449	Francis et al (1985)
EPN	NR	99%	Hen	F	NR	Ventral wing surface	90d	90	Daily	3	Symptoms and mortality	1.3-1.5 mg/kg/d	Effects on individual birds. Ataxic at 79d (total 135 mg/kg), 76d (total 135 mg/kg), 52d (total 117 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
EPN-ethyl	T	NR	Hen	F	1350	Under wing	44-65d	44-65	Daily	1	Clinical signs of neurotoxicity	10 mg/kg/d	Individual bird results. Paralysis at 48 and 55 days (44 and50 doses respectively). Paralysis at 70 days (65 doses) followed by death.	2150	Francis et al (1982)
EPN-ethyl	T	NR	Hen	F	1350	Under wing	34-90d	34-90	Daily	3	Clinical signs of neurotoxicity	3.6-4.4 mg/kg/d	Individual bird results. Ataxic at 70d (90 doses). Severely ataxic at 78d (77 doses). Paralysis at 36d (34 doses).	2150	Francis et al (1982)
EPN-ethyl	T	NR	Hen	F	1350	Under wing	90d	90	Daily	2	Clinical signs of neurotoxicity	1.3 mg/kg/d	Ataxic at 52, 76 or 79d (all after 90 doses).	2150	Francis et al (1982)
Ethoprop	NR	98-99%	Hen	F	NR	Ventral wing surface	1d	1	Daily	3	Symptoms and mortality	5.9-6.8 mg/kg/d	Effects on individual birds. Mortality on day 1 all birds (total 5.9, 6.8 or 6.7 mg/kg)	1449	Francis et al (1985)
Ethoprop	NR	98-99%	Hen	F	NR	Ventral wing surface	1-3d	1-3	Daily	3	Symptoms and mortality	3.2-3.5 mg/kg/d	Effects on individual birds. Mortality on day 1 two birds (total 3.5 or 3.2 mg/kg). Mortality on day 3 (10.5 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Ethoprop	NR	98-99%	Hen	F	NR	Ventral wing surface	2-3d	2-3	Daily	2	Symptoms and mortality	1.6-1.7 mg/kg/d	Effects on individual birds. Mortality on day 2 (total 3.4 mg/kg) or day 3 (total 4.8 mg/kg).	1449	Francis et al (1985)
Fenchlorphos	NR	99%	Hen	F	NR	Ventral wing surface	90d	90	Daily	3	Symptoms and mortality	24.3-29.3 mg/kg/d	Effects on individual birds. No ataxic symptoms after 90 doses (total 2187-2637 mg/kg).	1449	Francis et al (1985)
Fenchlorphos	NR	99%	Hen	F	NR	Ventral wing surface	90d	90	Daily	3	Symptoms and mortality	54.1-56.7 mg/kg/d	Effects on individual birds. No ataxic symptoms after 90 doses (total 5067 mg/kg). Ataxic at day 50 (total 5103 mg/kg) or day 67 (total 4869 mg/kg)	1449	Francis et al (1985)
Fenthion	F	NR	Black-crowned night-heron (*Nycticorax nycticorax*)	M	NR	Feet/ legs (wading)	24h	1	-	2	Brain and plasma ChE activity.	112 g AI/ha	No effect on brain AChE activity. Non-significant decrease in plasma BChE activity.	1463	Smith et al (1985)
Fenthion	F	NR	Black-crowned night-heron (*Nycticorax nycticorax*)	F	NR	Feet/ legs (wading)	24h	1	-	2	Brain and plasma ChE activity.	112 g AI/ha	No effect on brain AChE activity. Non-significant decrease in plasma BChE activity.	1463	Smith et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenthion	F	NR	Black-crowned night-heron (*Nycticorax nycticorax*)	M	NR	Feet/ legs (wading)	24h	1	-	2	Brain and plasma ChE activity.	1120 g AI/ha	No effect on brain AChE activity. Non-significant decrease in plasma BChE activity.	1463	Smith et al (1985)
Fenthion	F	NR	Black-crowned night-heron (*Nycticorax nycticorax*)	F	NR	Feet/ legs (wading)	24h	1	-	2	Brain and plasma ChE activity.	1120 g AI/ha	No effect on brain AChE activity. Non-significant decrease in plasma BChE activity.	1463	Smith et al (1985)
Fenthion	F	0.2	Hen	F	1000-1700	Under-side of wing	24 weeks	24	Weekly	2	Electromyographical, histopathological, biochemical assays. Clinical signs.	1 mg/kg	Significant increase in swollen or atrophic muscle fibres from week 12. Significant decrease in serum ChE at week 24 and brain AChE at week 4. Significant increase in egg production at week 4 and 8.	878	Tuler and Bowen (1999)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenthion	F	0.2	Hen	F	1000-1700	Under-side of wing	24 weeks	24	Weekly	2	Electromyographical, histopathological, biochemical assays. Clinical signs.	4 mg/kg	Significant increase in swollen or atrophic muscle fibres from week 4. Significant decrease in serum ChE from week 12 and brain AChE at all time periods. Significant decrease in egg production at weeks 12, 16 and 24. Significant decrease in bodyweight at weeks 12, 16 and 20. Behavioural impairment from week 16.	878	Tuler and Bowen (1999)
Fenthion	F	20%	Hen	F	NR	Ventral wing surface	17-21d	17-21	Daily	3	Symptoms and mortality	4.2-5.1 mg/kg/d	Effects on individual birds. Severely ataxic at 6d (total 81.6 mg/kg. Paraplegic at 27d (total 86.7 mg/kg). Mortality at 23d (total 88.2 mg/kg),	1449	Francis et al (1985)
Fenvalerate	T	90.5%	Chicken	0	1200	lateral side of chest wall	31d	31	Daily	2	Clinical signs, bodyweight, tissue biochemistry, histopathology, tissue residues.	0.1-1.0% solution	No clinical signs of toxicity. No effect on bodyweight at any dose. Tissue biochemistry and histopathology results also reported.	982	Majumder et al (1997)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Isofenphos	NR	NR	Hen	F	NR	Ventral wing surface	18-52d	18-52	Daily	3	Symptoms and mortality	4.7-5.2 mg/kg/d	Effects on individual birds. Mortality at 44d (total 150 mg/kg), 61d (total 265 mg/kg), 21d (total 88.2 mg/kg).	1449	Francis et al (1985)
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	2d	4	0.5d	1	Mortality, symptoms	340 mg/d	No mortalities or symptoms.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	5d	4	0.5d	1	Mortality, symptoms	340 mg/d	No mortality. 40% showed ataxia.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	10d	4	0.5d	1	Mortality, symptoms	340 mg/d	No mortality. 80% showed ataxia. 20% showed paralysis.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	15d	4	0.5d	1	Mortality, symptoms	340 mg/d	20% mortality. 100% showed ataxia. 40% showed paralysis.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	20d	4	0.5d	1	Mortality, symptoms	340 mg/d	40% mortality. 100% showed ataxia (80% before the end of the dosing period). 60% showed paralysis.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	M	1450 ±190	Comb	5d	4	0.5d	1	Mortality, symptoms	340 mg/d	No mortalities or symptoms.	1486	Yamauchi et al (1982)
Leptophos	F	34%	Chicken	M	1450 ±190	Comb	10d	4	0.5d	1	Mortality, symptoms	340 mg/d	40% mortality. 100% showed ataxia . 80% showed paralysis.	1486	Yamauchi et al (1982)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Leptophos	F	34%	Chicken	F	1720 ±220	Comb	10d	4	0.5d	1	Mortality, symptoms	340 mg/d	20% mortality. 80% showed ataxia. 40% showed paralysis.	1486	Yamauchi et al (1982)
Leptophos	NR	99.5%	Hen	F	NR	Ventral wing surface	90d	90	Daily	3	Symptoms and mortality	6.5-7.1 mg/kg/d	Effects on individual birds. Birds developed ataxia at 73-90d. Total dose 585-639 mg/kg	1449	Francis et al (1985)
Leptophos-methyl	T	NR	Hen	F	1350	Under wing	90d	90	Daily	3	Clinical signs of neurotoxicity	6.4-7.2 mg/kg/d	Ataxic at 81-90d (81-90 doses).	2150	Francis et al (1982)
Methidathion	T	99%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	2	Mortality, clinical signs, plasma ChE activity.	21 mg/kg	No mortality. No significant effects on ChE activity.	1058	Henderson et al (1994)
Methidathion	T	99%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	2	Mortality, clinical signs, plasma ChE activity.	37 mg/kg	No mortality. No significant effects on ChE activity.	1058	Henderson et al (1994)
Methiocarb	Reagent grade	NR	Starling (*Sturnus vulgaris*)	NR	NR	Foot (via perch)	2h/d	5	Daily	1	Activity (perch transitions), food and water consumption	1%	Significant increase in perch transitions relative to controls. No significant effect on food or water intake.	963	Clark (1997)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Parathion	T	99%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	10 mg/kg	No clinical signs or histopathologic changes. Plasma butylcholinesterase activity not depressed (graphical results). Significant decrease in brain AChE activity. Significant increase in acid phosphase (APase) and CNP in brain at end of study. Significant increase in acid phosphase (APase) and CNP in brain at end of study.	1419	Aboudonia et al (1986)
Parathion	T	93%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	17 mg/kg	No mortality. Significant reduction in ChE activity compared to initial values from day 1 to day 11.	1058	Henderson et al (1994)
Parathion	T	93%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	59 mg/kg	67% mortality on day 4. Significant reduction in ChE activity compared to initial values from 5h to day 3 (Recovery delayed to end of study but too few birds for analysis).	1058	Henderson et al (1994)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Parathion	T	93%	Pigeon (*Columba livia*)	NR	NR	Top of foot	42d	1	-	3	Mortality, clinical signs, plasma ChE activity.	113 mg/kg	33% mortality on day 4. Significant reduction in ChE activity compared to initial values from 8h to day 2 (Recovery delayed to end of study but too few birds for analysis).	1058	Henderson et al (1994)
Terbufos	NR	92%	Hen	F	NR	Ventral wing surface	19-45d	13-19	Daily	3	Symptoms and mortality	4.9-6.7 mg/kg/d	Effects on individual birds. Mortality at day 19 (total 99.2 mg/kg) or day 45 (total 73.7 mg/kg - 13 doses). Severely ataxic on day 31 (total 147.0 mg/kg).	1449	Francis et al (1985)
Tetrachlor-vinphos	NR	97.3%	Hen	F	NR	Ventral wing surface	86d	86	Daily	2	Symptoms and mortality	25.6-26.9 mg/kg/d	Effects on individual birds. No ataxic symptoms (total 2313 and 2202 mg/kg). Ataxic at 69d (total 2201 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Tribufos	T	95%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	100 mg/kg	No clinical signs or histopathologic changes. Plasma butylcholinesterase activity depressed (graphical results). Significant increase in acid phosphase (APase) and CNP in brain at end of study.	1419	Aboudonia et al (1986)
Tribufos	T	95%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	250 mg/kg	Clinical signs including paralysis in one bird on day 28. Histopathological changes. Plasma butylcholinesterase activity depressed (graphical results). Significant decrease in brain AChE activity. Significant increase in acid phosphase (APase) and CNP in brain at end of study. Significant increase in acid phosphase (APase) and CNP in brain at end of study.	1419	Aboudonia et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Tribufos	T	95%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	500 mg/kg	Clinical signs including paralysis in one bird on day 28. One bird died on day 3. Histopathological changes. Plasma butylcholinesterase activity depressed (graphical results).	1419	Aboudonia et al (1986)
Tribufos	T	95%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	750 mg/kg	Clinical signs including paralysis in one bird on day 19. One bird died on day 25. Histopathological changes. Plasma butylcholinesterase activity depressed (graphical results). Significant decrease in brain AChE activity. Significant increase in acid phosphase (APase) and CNP in brain at end of study. Significant increase in acid phosphase (APase) and CNP in brain at end of study.	1419	Aboudonia et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Tribufos	T	95%	Hen	F	1800 (1500 - 2300)	Back of neck	28d	1	-	5	Clinical signs, enzyme analysis, protein determination, histopathologic examination.	1000 mg/kg	Clinical signs including paralysis in all birds. Two birds died on days 25 and 28. Histopathological changes. Plasma butylcholinesterase activity depressed (graphical results). Significant decrease in brain AChE activity. Significant increase in acid phosphase (APase) and CNP in brain at end of study. Significant increase in acid phosphase (APase) and CNP in brain at end of study.	1419	Aboudonia et al (1986)
Tribufos	NR	93%	Hen	F	NR	Ventral wing surface	54-90d	54-90	Daily	3	Symptoms and mortality	24.4-27.4 mg/kg/d	Effects on individual birds. Severely ataxic at 56d (total 1480 mg/kg), 101d (total 2196 mg/kg) and 55d (total 2056 mg/kg).	1449	Francis et al (1985)
Tribufos	NR	93%	Hen	F	NR	Ventral wing surface	91d	91	Daily	3	Symptoms and mortality	11.7-15.6 mg/kg/d	Effects on individual birds. Ataxic at 86d (total 1228 mg/kg) and 76d (1420 mg/kg).	1449	Francis et al (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Tribufos	NR	93%	Hen	F	NR	Ventral wing surface	101d	101	Daily	3	Symptoms and mortality	5.6-7.8 mg/kg/d	Effects on individual birds. Ataxic at 98d (total 188 mg/kg, 98d (total 596 mg/kg), 109d (total 677 mg/kg).	1449	Francis et al (1985)
Trichlorfon	NR	97%	Hen	F	NR	Ventral wing surface	3d	3	Daily	1	Symptoms and mortality	100 mg/kg/d	Effects on individual birds. No ataxic symptoms in two birds (total 300 mg/kg). Mortality on day 4 (total 300 mg/kg).	1449	Francis et al (1985)
Trichlorfon	NR	97%	Hen	F	NR	Ventral wing surface	13-33d	0	Daily	3	Symptoms and mortality	50-56 mg/kg/d	Effects on individual birds. No ataxic symptoms (total 918 mg/kg). Mortality at day 16 (total 896 mg/kg), day 17 (total 850 mg/kg), day 39 (total 650 mg/kg - 13 doses) or day 58 (total 1650 mg/kg - 33 doses).	1449	Francis et al (1985)

Appendix G. Dermal toxicity to mammals – other effects

Table 10: Studies reporting the effects of dermal exposure on mammals

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
2, 4-D	NR	48%	Rat	M	NR	Lower limbs	2h/d	10	Daily (5d a week for 2 weeks)	1	Bodyweight, grip strength, kidney weight.	150 mg/rat	Significant reduction in bodyweight in week 2.	1701	Mattsson et al (1986)
2, 4-D	NR	48%	Rat	M	NR	Lower limbs	2h/d	15	Daily (5d a week for 3 weeks)	1	Bodyweight, grip strength, kidney weight.	111 mg/rat	Significant reduction in bodyweight in weeks 2 and 3. Significant increase in grip strength and kidney weight relative to controls.	1701	Mattsson et al (1986)
2,4-D	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	500-2000 µmol/kg	Significant increase in nuclear aberrations at highest dose (2000µmol/kg).	1222	Schop et al (1990)
Acephate	NR	0.98	Rat	M	190-210	Back of neck	4 weeks	12	3 times a week for 4 weeks	1	Bodyweight, food consumption. Superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX) activities in rat tissues.	12.6 mg/200 g rat	No effects on bodyweight or food consumption. Significant decrease in SOD activity in exposure phase only.	855	Panemangalore and Bebe (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	20 mg/kg	Intake of saccharin solution not significantly different to control. No mortality up to 96h.	1287	Mitchell et al (1989)
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	200 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	2000 mg/kg	Significantly lower saccharin solution relative to controls. 16.75% mortality between 24 and 48h observations.	1287	Mitchell et al (1989)
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	20 mg/kg	No significant increase in activity of group housed mice relative to controls. Significant increase in ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	200 mg/kg	Significant increase in activity of group housed mice relative to controls. Significant increase in non-ambulatory and ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)
Alachlor	F	43%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	2000 mg/kg	Significant increase in activity of group housed mice relative to controls. Significant increase in non-ambulatory and ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)
Alphacyper-methrin/ Piperonyl butoxide	T	95%/95%	Rat	M/F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000 mg/kg	50% mortality. Significant reduction in feed consumption in M (days 7 and 14). Significant reduction in feed consumption in M and F. Significant effects on some biochemical parameters in F.	352	Yavuz et al (2010)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Alphacyper-methrin Piperonyl butoxide/ Tetramethrin	T	95%/95%/95%	Rat	M/F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000/ 2000 mg/kg	50% mortality. Significant reduction in bodyweight in M (days 7 and 14). Significant reduction in feed consumption in M and F. Significant increase in blood urea nitrogen (BUN) in M.	352	Yavuz et al (2010)
Aminocarb	NR	98.9%	Mouse	F	NR	Ears	20d	1	-	3	Plaque forming cell (PFC), mixed lymphocyte reaction (MLR) and Interleukin-2 (IL-2) assays.	0.12-7.75 mg/kg	Significant increase in plaque forming cells reported at 0.48 mg/kg 10d after exposure	1024	Bernier et al (1995)
Aminocarb	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	88-352 µmol/kg	Significant increase in nuclear aberrations at all doses.	1222	Schop et al (1990)
Aminocarb	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Serum ChE activity.	354 µmol/kg	Significant reduction in serum ChE activity relative to controls.	1222	Schop et al (1990)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Bacillus thuringiensis israelensis	F	NR	Rat	M/F	160-180	NR	3 weeks	15	Daily (5d a week for 3 weeks)	2	Symptoms and mortality. Organ weights, haematological and biochemical assays.	1.2 x 10^{10} sp./kg	No symptoms. No effects on organ weight or haematology. Significant increase in liver LDH in female rats.	1703	Halkova et al (1993)
Bacillus thuringiensis israelensis	F	NR	Rat	M/F	160-180	NR	3 weeks	15	Daily (5d a week for 3 weeks)	2	Symptoms and mortality. Organ weights, haematological and biochemical assays.	3.6 x 10^{10} sp./kg	No symptoms. No effects on organ weight or haematology. Significant increase in liver SucDH in male rats, LDH and G6PDH in females..	1703	Halkova et al (1993)
Bacillus thuringiensis var. kenyae	NR	NR	Rabbit	M/F	NR	Trunk (abraded)	24h	1	-	1	Clinical signs, bodyweight, food consumption, biochemical and haematological parameters, necropsy.	2.5 x 10^{7} spores	No deleterious effects during observations or subsequent necropsy.	734	Meher et al (2002)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Bromophos	T	93%	Rat	F	180-200	Dorsal skin	24h	1	-	7	Cholinesterase assays in plasma, brain and erythrocytes.	50-4000 mg/kg	No mortalities. Mild symptoms started at 2000 mg/kg. Dose related decrease in activity of plasma, brain and erythrocyte ChE activity but no statistical analysis presented. ID50s for ChE inhibition were; plasma 10.1 mg/kg, brain 567.1 and erythrocytes 1938 mg/kg.	1328	Shivananda ppa et al (1988)
Bromophos	T	93%	Rat	F	180-200	Dorsal skin	4-24h	1	-	7	Cholinesterase assays in serum and brain.	1000 mg/kg	Time course presented graphically with peak inhibition around 16h and recovery thereafter. No statistical analysis.	1328	Shivananda ppa et al (1988)
Bromophos	T	93%	Rat	F	180-200	Dorsal skin	5-10d	5-10	-	1	Cholinesterase assays in serum and brain.	50 mg/kg/d	Inhibition of ChE reported. No statistical analysis.	1328	Shivananda ppa et al (1988)
Bromophos	T	93%	Rat	F	180-200	Dorsal skin	17d	1	-	3	Cholinesterase assays in serum and brain.	10-50 mg/kg/d	Dose related Inhibition of ChE reported. No statistical analysis.	1328	Shivananda ppa et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Carbaryl	S	99%	Rat	M	220± 20	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Bodyweight, histologic and histopathologic assays.	11 mg/cm^2	Bodyweight similar in treated and control groups. No numerical data presented. Slight histological and ultrastructural changes in organs reported.	803	Tos-Luty et al (2001)
Carbaryl	S	99%	Rat	M	220± 20	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Bodyweight, histologic and histopathologic assays.	22 mg/cm^2	Bodyweight similar in treated and control groups. No numerical data presented. Slight histological and ultrastructural changes in organs reported.	803	Tos-Luty et al (2001)
Carbaryl	NR	98-99%	Rat	M	189-242	Dorsal skin	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	100 mg/kg	No significant effects.	1055	Ladics et al (1994)
Carbaryl	NR	98-99%	Rat	M	189-242	Dorsal skin	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	500 mg/kg	No significant effects.	1055	Ladics et al (1994)
Carbaryl	NR	98-99%	Rat	M	189-242	Dorsal skin	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	1000 mg/kg	No significant effects.	1055	Ladics et al (1994)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Carbofuran	T	NR	Rat	M/F	219-310/164-230	Back	6h	1	-	4	Brain and red blood cell (RBC) AChE activity.	25/75/150/250 mg/kg	Significant decrease in both brain and RBC AChE activity at all doses	207	Gammon et al (2012)
Carbofuran	T	NR	Rat	M/F	219-310/164-230	Back	0.5/1.5/3.0/6.0h	1	-	1	Brain and red blood cell (RBC) AChE activity.	75 mg/kg	Significant decrease in both brain and RBC AChE activity at all exposure times tested (0.5-6h)	207	Gammon et al (2012)
Carbofuran	T	NR	Rat	M/F	219-310/164-230	Back	21d	1	-	3	Brain and red blood cell (RBC) AChE activity.	75 mg/kg	Significant dose-dependent decrease in both brain and RBC AChE activity at all doses tested.	207	Gammon et al (2012)
Carbon disulfide	NR	NR	Mouse	F	NR	Lateral abdo-men	10min	1	-	3	Trans epidermal water loss (TEWL)	10-20% solution	Significant dose related increase in TEWL.	2056	Chou et al (2005)
Chlordane	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	125-500 µmol/kg	Significant increase in the percentage MN in micronucleus test. At highest dose (500µL/kg).	1222	Schop et al (1990)
Chlorpyrifos	F	38.7% w/w	Mouse	M	25-30	Tail	4h/d	14	Daily for 2 weeks	1	Serum AChE activity. Glial fibrillary acidic protein (GFAP) expression in the cerebellum.	101 mg/kg	Significant decrease in serum AChE activity and GFAP expression in the cerebellum relative to controls.	206	Krishnan et al (2012)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	F	38.7% w/w	Mouse	M	11-15	Tail	4h/d	14	Daily for 2 weeks	1	Serum AChE activity. Glial fibrillary acidic protein (GFAP) expression in the cerebellum.	101 mg/kg	Significant decrease in serum AChE activity relative to controls. No significant increase in GFAP expression in the cerebellum relative to controls.	206	Krishnan et al (2012)
Chlorpyrifos	F	38.7%	Mouse	M	30-32	Tail	6h/d	7	24h	2	Serum cholinesterase and corticosterone assays, histomorphometric study, estimation of GFAP expression.	20.1 mg/kg	No significant effect on cholinesterase activity or corticosterone. Significant decrease in neuronal density in hippocampal area CA3. Significant increase in astrocytic density in hippocampus (both areas).	301	Lim et al (2011)
Chlorpyrifos	F	38.7%	Mouse	M	30-32	Tail	6h/d	7	24h	2	Serum cholinesterase and corticosterone assays, histomorphometric study, estimation of GFAP expression.	40.4 mg/kg	No significant effect on corticosterone, significant decrease in cholinesterase activity. Significant decrease in neuronal density in hippocampal areas CA1, CA2 and CA3. Significant increase in astrocytic density in hippocampus (one area).	301	Lim et al (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	F	38.7%	Mouse	M	30-32	Tail	6h/d	7	24h	2	Serum cholinesterase and corticosterone assays, histomorphometric study, estimation of GFAP expression.	20.1 mg/kg (swim stress-ed)	No significant effect on corticosterone, significant decrease in cholinesterase activity. Significant decrease in neuronal density in hippocampal areas CA1 and CA3. Significant increase in astrocytic density in hippocampus (both areas).	301	Lim et al (2011)
Chlorpyrifos	F	38.7%	Mouse	M	30-32	Tail	6h/d	7	24h	2	Serum cholinesterase and corticosterone assays, histomorphometric study, estimation of GFAP expression.	40.4 mg/kg (swim stress-ed)	No significant effect on corticosterone, significant decrease in cholinesterase activity. Significant decrease in neuronal density in hippocampal areas CA1, CA2 and CA3. Significant increase in astrocytic density in hippocampus (both areas).	301	Lim et al (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	F	38.7%	Mouse	M	25-32	Tail	4h/d	14	24h	1	Bodyweight, serum AChE and PON levels, neuron changes in hippocampus and iso-cortex, changes in hippocampal neuronal density.	101 mg/kg	Non-significant decrease in bodyweight. Significant decrease in serum AChE. Significant decrease in neuronal density in CA1 and CA3 areas of hippocampus. Significant reduction in neuronal density in iso-cortex.	350	Mitra et al (2010)
Chlorpyrifos	F	38.7%	Mouse	M	11-14	Tail	4h/d	14	24h	1	Bodyweight, serum AChE and PON levels, neuron changes in hippocampus and iso-cortex, changes in hippocampal neuronal density.	101 mg/kg	Non-significant decrease in bodyweight. Significant decrease in serum AChE and PON. Significant decrease in neuronal density in CA3 areas of hippocampus. Significant reduction in neuronal density in iso-cortex.	350	Mitra et al (2010)
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	40.4 mg/kg	Significance of bodyweight changes not reported. Significant reduction in serum AChE activity.	423	Mitra et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	101 mg/kg	Significance of bodyweight changes not reported. Significant reduction in serum AChE activity.	423	Mitra et al (2009)
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	40.4 mg/kg (swim stressed)	Significance of bodyweight changes not reported. Significant reduction in serum AChE activity. Significantly lower neuronal count in all 3 regions of the hippocampus (CA1, CA2, CA3).	423	Mitra et al (2009)
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	101 mg/kg (swim stressed)	Significance of bodyweight changes not reported. Significant reduction in serum AChE activity. Significantly lower neuronal count in all 3 regions of the hippocampus (CA1, CA2, CA3).	423	Mitra et al (2008)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	40.4 mg/kg	Significance of bodyweight and AChE changes not reported.	441	Mitra et al (2009)
Chlorpyrifos	F	38.7%	Mouse	M	20-25	Tail	6h/d	18	Daily, 6d/week	2	Bodyweight, serum and brain AChE, histological and histomorpho-metric measurements.	101 mg/kg	Significance of bodyweight and AChE changes not reported. Significantly lower neuronal count in one regions of the hippocampus (CA3).	441	Mitra et al (2009)
Chlorpyrifos	NR	NR	Rabbit	M	NR	Ears	4 weeks	28	Daily for 4 weeks	4	Biochemical evaluations of blood. Histopathology of the liver and brain.	50-400 mg/kg	Significant increase in blood aspartate aminotransferase, alanine amino-transferase, alkaline phosphatase and total cholesterol. Significant decrease in blood albumin and total protein. Pathologic effects on liver and brain recorded.	226	Solati et al (2012)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	NR	99%	Rat	F	300-350	Back of neck	17d	17	24h	1	Biochemical assays including ChE levels, histopathological analysis of pups	0.1 mg/kg	Significant increase in plasma bChE in female pups. Significantly elevated levels of brain AChE in brainstem in male off spring and midbrain in female offspring.	630	Abdel-Rahman et al (2004)
Chlorpyrifos	NR	99%	Rat	F	300-350	Back of neck	17d	17	24h	1	Biochemical assays including ChE levels, histopathological analysis of pups	0.1 mg/kg	No mortalities or overt signs in mothers or offspring. Significant increase in plasma BChE activity in pups on PND7. Significant increase in brain AChE in brainstem and cerebellum for male pups on PND30. Significant increase in brain AChE in brainstem for female pups on PND30.	667	Abdel-Rahman et al (2003)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and brain. ChE levels in maternal liver and placenta.	30 mg/kg	Significant reduction in AChE activity in relation to controls in maternal brain (4-48h), foetal brain (24-48h). Significant reduction in BuChE in maternal plasma (24-96h)	777	Abu-Qare et al (2001)
Chlorpyrifos	NR	99%	Rat	F	300-350	Back of neck	17d	17	Daily	1	Clinical signs, neurobehavioral performance in offspring, ChE activity in offspring, histopathological assays.	0.1 mg/kg/d	No overt symptoms in mothers or offspring. Significant decrease in grip time in both male and female offspring relative to controls at PND 90. Significantly poorer performance in the inclined plane test in female offspring. Significant increase in brain AChE activity (brainstem and cerebellum) in females only at PND 90. Significant histopathological changes.	1973	Abou-Donia et al (2006)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	1	-	2	Behavioural effects. Blood and brain cholinesterase activity.	5.6/0.5 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE activity.	804	Latuszynska et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	5	Daily (5 days a week for 1 week)	2	Behavioural effects. Blood and brain cholinesterase activity.	5.6/0.5 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE and brain ChE activity.	804	Latuszynska et al (2001)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Behavioural effects. Blood and brain cholinesterase activity.	5.6/0.5 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE and brain ChE activity.	804	Latuszynska et al (2001)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	1	-	2	Behavioural effects. Blood and brain cholinesterase activity.	27.8/2.7 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE and brain ChE activity.	804	Latuszynska et al (2001)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	5	Daily (5 days a week for 1 week)	2	Behavioural effects. Blood and brain cholinesterase activity.	27.8/2.7 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE and brain ChE activity.	804	Latuszynska et al (2001)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	170-200	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Behavioural effects. Blood and brain cholinesterase activity.	27.8/2.7 mg/cm^2	No significant behavioural effects. Significant reduction in plasma ChE and brain ChE activity.	804	Latuszynska et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	NR	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Histologic, ultrastructural and immunologic assays.	200/20 mg/kg	Non-significant increase in bactericidal activity of neutrophils relative to the control group. No other numerical data presented.	903	Latuszynska et al (1999)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	NR	Tail	4h/d	20	Daily (5 days a week for 4 weeks)	2	Histologic, ultrastructural and immunologic assays.	1000/ 100 mg/kg	Non-significant increase in bactericidal activity of neutrophils relative to the control group. No other numerical data presented.	903	Latuszynska et al (1999)
Chlorpyrifos/ Cypermethrin	F	500g/ 50g	Rat	F	NR	Tail	4h/d	20	Daily (5d a week for 4 weeks)	1	Biochemical assays, histological studies.	27.8/2.7 mg/cm^2	Significant increase in serum alanine aminotransferase (ALT) activity from 1d to 2 weeks. Significant decrease in serum alkaline phosphatase (ALP) at all time points (1d-3 weeks). Significant decrease in serum total proteins (TP) at 1d and 1 week.	2138	Raszewski and Latuszyńska (2006)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cyhalothrin	NR	NR	Rat	F	NR	NR	Through-out pregnancy	NR	Daily	1	Effects on pups. Developmental parameters, locomotor activity, inhibitory avoidance behaviour.	1ml of 0.018% solution /d	Significant increase in median effective time (ET50) for fur development, ear and eye opening and testes descent. Significant increase in bodyweight relative to controls at 2, 7 and 14d of age. No significant effects on locomotor activity at weaning or 90d of age.	1193	Gomes et al (1991)
Cypermethrin	NR	93%	Mouse	NR	NR	Back	1-14d	4	Twice weekly	2	Percentage polychromatic erythrocytes (PE) and PE with micronuclei in bone marrow.	120 mg/kg/ 0.5 week	No mortality. No significant effect on PEs.	1452	Amer and Aboulela (1985)
Cypermethrin	NR	93%	Mouse	NR	NR	Back	1-14d	4	Twice weekly	2	Percentage polychromatic erythrocytes (PE) and PE with micronuclei in bone marrow.	360 mg/kg/ 0.5 week	20% mortality. Significant increase in PEs with micronuclei at 7 and 14d (2 and 4 doses respectively).	1452	Amer and Aboulela (1985)
Cypermethrin	NR	NR	Mouse	NR	27.8-33.5	Tail	6 weeks	-	Daily	2	Histology of kidney.	15 mg/kg	Irritation caused by treatment. No significant effect on kidneys.	1809	Inayat et al (2007)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cypermethrin	NR	NR	Mouse	NR	27.8-33.5	Tail	6 weeks	-	Daily	2	Histology of kidney.	30 mg/kg	Irritation caused by treatment.. Symptoms (e.g. lethargy). Significant increase in kidney weight.	1809	Inayat et al (2007)
Cypermethrin	F	10%	Rat	M/F	130-170	Inter-scapular	10d	10	24h	1	Blood biochemical parameters.	50 mg/kg	Significant increase in lipid peroxidation, total protein and catalase relative to controls. Significant decrease in glutathione peroxidase, superoxide dismutase and blood glutathione.	376	Raina et al (2010)
Cypermethrin	NR	NR	Rat	M/F	150-200	Inter-scapular	30d	30	24h	1	Blood enzymes, blood glutathione and lipid peroxidation.	50 mg/kg	Significantly elevated catalase, superoxide dismutase and lipid peroxidation relative to controls. Significantly decreased glutathione peroxidase and reduced glutathione.	395	Raina et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cypermethrin	NR	NR	Rat	M/F	150-200	Inter-scapular	60d	60	24h	1	Blood enzymes, blood glutathione and lipid peroxidation.	50 mg/kg	Significantly elevated catalase, glutathione S-transferase and lipid peroxidation relative to controls. Significantly decreased superoxide dismutase, glutathione peroxidase and reduced glutathione.	395	Raina et al (2009)
Cypermethrin	NR	NR	Rat	M/F	150-200	Inter-scapular	90d	90	24h	1	Blood enzymes, blood glutathione and lipid peroxidation.	50 mg/kg	Significantly elevated catalase, glutathione S-transferase and lipid peroxidation relative to controls. Significantly decreased superoxide dismutase, glutathione peroxidase and reduced glutathione.	395	Raina et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cypermethrin	NR	NR	Rat	M/F	150-200	Inter-scapular	120d	120	24h	1	Blood enzymes, blood glutathione and lipid peroxidation.	50 mg/kg	Significantly elevated catalase, glutathione S-transferase and lipid peroxidation relative to controls. Significantly decreased superoxide dismutase, glutathione peroxidase and reduced glutathione.	395	Raina et al (2009)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Chromosomal aberrations in bone marrow	42.51 mg/kg	No significant increase relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Chromosomal aberrations in bone marrow	70.85 mg/kg	Significant increase relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Blood glutathione (GSH) levels	42.51 mg/kg	No significant difference relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Blood glutathione (GSH) levels	70.85 mg/kg	Significant decrease relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Blood catalase (CAT) activity	42.51 mg/kg	Significant decrease relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Blood catalase (CAT) activity	70.85 mg/kg	Significant decrease relative to controls	170	Noaishi et al (2013)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	120	NR	NR	1	NR	2	Liver thiobarbituric acid reactive substances (TBARS) level	42.51 mg/kg	Significant increase relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	121	NR	NR	2	NR	3	Liver thiobarbituric acid reactive substances (TBARS) level	70.85 mg/kg	Significant increase relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	122	NR	NR	3	NR	4	Blood butylcholinesterase (BuChE) activity	42.51 mg/kg	Significant decrease relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Chlorpyrifos	F	5%/ 24%	Rat	NR	123	NR	NR	4	NR	5	Blood butylcholinesterase (BuChE) activity	70.85 mg/kg	Significant decrease relative to controls	170	Noaishi et al (2013)
Cypermethrin/ Piperonyl butoxide	T	92%/ 95%	Rat	M/ F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000 mg/kg	20% mortality. Significant reduction in feed consumption in M. Significant increase in WBC in M. Significant effects on some biochemical parameters in F.	352	Yavuz et al (2010)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cypermethrin/ Piperonyl butoxide/ Tetramethrin	T	92%/ 95%/ 95%	Rat	M/ F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000/ 2000 mg/kg	40% mortality. No significant effects on bodyweight or feed consumption. Significant increase in WBC in M.	352	Yavuz et al (2010)
DDT	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	340-1360 µmol/kg	Significant increase in nuclear aberrations at highest dose (1360µmol/kg).	1222	Schop et al (1990)
Deltamethrin	F	2.8% EC	Mouse	M	12-15	Dorsal skin	24h	1	-	1	Early protein expression changes in skin.	4 mg/kg	Significant effects on protein expression, some of which are involved in cancer-related key processes	141	George and Shukla (2013)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Deltamethrin	NR	98%	Rat	M	200-250	Back of neck	4 weeks	28	24h	1	Neurotoxicity, neurochemical assays.	750 mg/kg	Significantly reduced number of nerve cells in frontal cortex and hippocampus relative to controls. Significantly elevated glial fibrillary acidic protein (GFAP) in frontal cortex and hippocampus. Significantly reduced dopamine concentration in hippocampus and striatum. Significant increase in choline acetyltransferase in striatum.	388	Tayebati et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Deltamethrin	NR	NR	Rat	M	120-125	Back	2 weeks	10	Daily (5d a week for 2 weeks)	1	Haematological assays, RBC AChE activity, blood urea and glucose levels, serum bilirubin levels, organ weights.	5 µL/kg	Significant decrease in haemoglobin, RBC and leukocytes, and increase in WBC and neutrophils at end of exposure period. Significant decrease in haemoglobin and increase in WBC at end of observation period. Significant increase in blood urea and serum bilirubin at end of exposure period and blood glucose, blood urea and serum bilirubin at end of observation period. No statistics presented for AChE activity or organ weights.	1331	Mohamed (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Deltamethrin/ Piperonyl butoxide	T	98%/ 95%	Rat	M/ F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000 mg/kg	70% mortality. Significant reduction in bodyweight of M and F on day 7, M on day 14. Significant reduction in feed consumption in M and F. Significant effects on some hematologic and biochemical parameters in M and F.	352	Yavuz et al (2010)
Deltamethrin/ Piperonyl butoxide/ Tetramethrin	T	98%/ 95%/ 95%	Rat	M/ F	197-328	Dorsal skin	14d	14	24h	1	Mortality and clinical observations, bodyweight and feed consumption, haematology/ biochemistry, gross necropsy/ histopathology.	400/ 2000/ 2000 mg/kg	Significant decrease in feed consumption in Significant increase in blood urea nitrogen (BUN) in F.	352	Yavuz et al (2010)
Diazinon	NR	98%	Mouse	M/ F	NR	Back	4h	1	-	3	Brain and diaphragm Chee activity	4-16 mg/kg	Graphs of ChE activity vs. dose presented but no analysis of effects as wild type mice were used as a control group. Analysis restricted to comparison with PON-1 knockout mice.	822	Li et al (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Diazinon	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and liver. ChE levels in placenta.	65 mg/kg	Depression of ChE activity presented in graphs with no statistical analysis.	771	Abu-Qare and Abou-Donia (2001)
Dichlobenil	NR	NR	Mouse	M	20-21	NR	24h	1	-	6	Olfactory bulb GFAP levels.	10-200 mg/kg	Significant increase in GFAP levels at 150 1md 200 mg/kg only.	1056	Deamer et al (1994)
Dichlobenil	NR	NR	Mouse	M	20-21	NR	24h	1	-	6	Histopathology	10-200 mg/kg	Olfactory epithelial damage at 50 mg/kg and above. No statistical analysis.	1056	Deamer et al (1994)
Dichlobenil	NR	NR	Mouse	M	20-21	NR	5d	5	Daily	6	Histopathology	10-200 mg/kg	Olfactory epithelial damage at 50 mg/kg and above. No statistical analysis.	1056	Deamer et al (1994)
Dichlorfos	F	50%	Rat	M	220-260	Tail	1h	1	-	4	Brain and whole blood ChE activity.	0.1-0.5% solution	Dose related decrease in both brain AChE and blood ChE activity, significantly different from controls at all doses in brain and from 0.2% in blood.	1590	Borkowska et al (1989)
Dichlorvos	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	22-88µmol/kg	Significant increase in nuclear aberrations at highest dose (88µmol/kg).	1222	Schop et al (1990)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dichlorvos	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Serum ChE activity.	88.4 µmol/kg	Significant reduction in serum ChE activity relative to controls.	1222	Schop et al (1990)
Dimethyl-arsinic acid	NR	NR	Mouse	F	18	Back	4 + 3 weeks	4 + 3	Weekly	2	Skin thickness. Expression of apoptosis-related proteins in skin.	1 mg/kg	Significant increase in skin thickness. Significant increase in expression of Bcl-2, Bad and Caspase-12 relative to controls. No significant increase in offspring.	201	Kim et al (2012)
Dimethyl-arsinic acid	NR	NR	Mouse	F	18	Back	4 + 3 weeks	4 + 3	Weekly	2	Skin thickness. Expression of apoptosis-related proteins in skin.	10 mg/kg	Significant increase in skin thickness. Significant increase in expression of Bcl-2, Bad and Caspase-12 relative to controls. Significant increase in expression of Bcl-2 and Bad relative to 1mg/kg group. No significant increase in offspring.	201	Kim et al (2012)
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	20 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	200 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	2000 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	20 mg/kg	No significant increase in activity of group housed or individually housed mice relative to controls.	1287	Mitchell et al (1989)
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	200 mg/kg	No significant increase in activity of group housed or individually housed mice relative to controls.	1287	Mitchell et al (1989)
Dinoseb	F	51%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	2000 mg/kg	Significant increase in activity of group housed mice relative to controls. Significant increase in non-ambulatory and ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Blood haematocrit (%)	37.5 mg/kg	Significant reduction compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Red Blood Cell count	37.5 mg/kg	Significant reduction compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	White Blood Cell count	37.5 mg/kg	Significant increase compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Haemoglobin (%), reticulocytes (%), thrombocyte count, clotting time (s).	37.5 mg/kg	No significant effect relative to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Serum sodium levels	37.5 mg/kg	Significant increase compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Serum aspartate aminotransferase levels (SAST) levels.	37.5 mg/kg	Significant increase compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Serum acid phosphatase (SAP) levels	37.5 mg/kg	Significant increase compared to controls	1215	Masood et al (1991)
Dodine	T	95%	Rat	F	120-151	Back	3 weeks	15	Daily	1	Serum potassium, chloride, glucose, protein, serum alanine transferase (SALT), RBC Cholinesterase activity.	37.5 mg/kg	No significant effect relative to controls	1215	Masood et al (1991)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Endosulfan	NR	NR	Rat	M	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	18.8 mg/kg/d	No mortality, some clinical signs. Significant increase in epididymis weight. Significant effects on GOT and GPT in liver and serum, alkaline phosphatase in serum. Significant effect on haemoglobin levels.	1316	Dikshith et al (1988)
Endosulfan	NR	NR	Rat	M	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	37.5 mg/kg/d	No mortality, some clinical signs. Significant effect on GOT, GPT and protein in liver and serum, alkaline phosphatases in serum only. Significant effect on WBC, haemoglobin, lymphocytes and neutrophils in blood.	1316	Dikshith et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Endosulfan	NR	NR	Rat	M	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	62.5 mg/kg/d	No mortality, some clinical signs. Significant decrease in liver weight and increase in testis weight. Significant change in GOT, GPT and protein in liver, alkaline phosphatase in serum only. Significant effect on WBC and haemoglobin in blood.	1316	Dikshith et al (1988)
Endosulfan	NR	NR	Rat	F	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	9.8 mg/kg/d	No mortality, some clinical signs. No significant changes in organ weight. Significant effect on GPT in liver and serum, GOT alkaline phosphatase and LDH in liver only, protein in serum only.	1316	Dikshith et al (1988)
Endosulfan	NR	NR	Rat	F	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	19.7 mg/kg/d	No mortality, some clinical signs. Significant decrease in liver weight and increase in adrenal weight. Significant effect on GPT, LDH, protein in liver and serum.	1316	Dikshith et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Endosulfan	NR	NR	Rat	F	NR	Lateral abdo-men	30d	30	Daily	3	Clinical signs, organ weight, histopathology, biochemical and haematological assays.	32 mg/kg/d	No mortality, some clinical signs. Significant decrease in spleen weight. Significant effect on GOT, GPT, protein in lever and serum, alkaline phosphatase and LDH in liver only.	1316	Dikshith et al (1988)
Fenitrothion	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Genotoxicity - bone marrow micronucleus test, hair follicle nuclear aberration assay.	82.5-330 µmol/kg	No significant effects.	1222	Schop et al (1990)
Fenitrothion	NR	NR	Mouse	M	NR	Inter-scapular	24h	1	-	3	Serum ChE activity.	331 µmol/kg	Significant reduction in serum ChE activity relative to controls.	1222	Schop et al (1990)
Fenitrothion	F	50%	Rat	M	220-260	Tail	1-2h	1	-	4	Brain and whole blood ChE activity.	0.5-1.5% solution	Dose related decrease in both brain AChE and blood ChE activity, significantly different from controls at all doses except 0.5% (1h) in brain and blood.	1590	Borkowska et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	5	Conditioned taste aversion	0.6 mg/kg	Consumption of saccharin solution not significantly different to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	5	Conditioned taste aversion	6 mg/kg	Consumption of saccharin solution not significantly different to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	5	Conditioned taste aversion	60 mg/kg	Consumption of saccharin solution significantly decreased relative to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	5	Conditioned taste aversion	600 mg/kg	Consumption of saccharin solution significantly decreased relative to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	5	Conditioned taste aversion	1800 mg/kg	Consumption of saccharin solution significantly decreased relative to controls. Two mortalities, one found at 24h and one at 48h..	1322	Mitchell et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	60 mg/kg	No significant effect on activity in individually housed or group housed mice.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	600 mg/kg	Significant increase in non-ambulatory activity of individual mice and total activity of groups of five.	1322	Mitchell et al (1988)
Fenvalerate	F	30%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	1800 mg/kg	Significant increase in non-ambulatory activity of individual mice and total activity of groups of five.	1322	Mitchell et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	NR	NR	Rat	M	120-125	Back	2 weeks	10	Daily (5d a week for 2 weeks)	1	Haematological assays, RBC AChE activity, blood urea and glucose levels, serum bilirubin levels, organ weights.	40 µL/kg	Significant decrease in haemoglobin and RBC and increase in WBC and neutrophils at end of exposure period. Significant decrease in haemoglobin and increase in WBC at end of observation period. Significant increase in blood urea and serum bilirubin at end of exposure period and blood glucose, blood urea and serum bilirubin at end of observation period. No statistics presented for AChE activity or organ weights.	1331	Mohamed (1988)
Fenvalerate	T	NR	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily, 5d a week for 2 weeks)	1	Liver function, blood glucose, blood urea, cholinesterase activity	31 mg/kg	Significant increase in blood glucose, blood urea, GOT and bilirubin at the end of the exposure period. Significant decrease in serum AChE and proteins at the end of the exposure period.	1431	Saleh et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	F	20%	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	155 mg/kg	Significant increase in blood glucose, blood urea, GPT, GOT, and bilirubin at the end of the exposure period. Significant decrease in serum proteins at the end of the exposure period.	1431	Saleh et al (1986)
Fenvalerate	F	20%	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	310 mg/kg	Significant increase in blood glucose, blood urea, GOT and bilirubin at the end of the exposure period. Significant decrease in serum proteins at the end of the exposure period.	1431	Saleh et al (1986)
Fipronil	F	10%	Rat	M	NR	Neck	3h	1	-	3	Behavioural tests 3h after exposure (open field test, holeboard test, elevated plus-maze test).	70 mg/kg	No significant effect on open field behaviour, holeboard test or elevated plus-maze performance compared to controls.	273	Galbiati Tercariol and Godinho (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fipronil	F	10%	Rat	M	NR	Neck	3h	1	-	3	Behavioural tests 3h after exposure (open field test, holeboard test, elevated plus-maze test).	140 mg/kg	Open field: significant increase in rearing. Holeboard; significant increase in head dip numbers and duration. Plus-maze; no significant effects.	273	Galbiati Tercariol and Godinho (2011)
Fipronil	F	10%	Rat	M	NR	Neck	3h	1	-	3	Behavioural tests 3h after exposure (open field test, holeboard test, elevated plus-maze test).	280 mg/kg	Open field: significant increase in rearing, freezing and grooming. Holeboard; significant increase in head dip numbers and duration. Plus-maze; significant increase in number of open and closed arm entries.	273	Galbiati Tercariol and Godinho (2011)
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	20 mg/kg	Intake of saccharin solution not significantly different to control. No mortality up to 96h.	1287	Mitchell et al (1989)
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	200 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	2000 mg/kg	Significantly lower saccharin solution relative to controls. No mortality up to 96h.	1287	Mitchell et al (1989)
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	20 mg/kg	No significant increase in activity of group housed mice relative to controls. Significant increase in ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	200 mg/kg	Significant increase in activity of group housed mice relative to controls. Significant increase in non-ambulatory and ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)
Fluchloralin	F	45%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	2000 mg/kg	Significant increase in activity of group housed mice relative to controls. Significant increase in non-ambulatory and ambulatory behaviour in individually housed mice.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Flucythrinate	T	NR	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	50 mg/kg	Significant increase in blood glucose, blood urea, GOT and bilirubin at the end of the exposure period. Significant decrease in serum proteins at the end of the exposure period.	1431	Saleh et al (1986)
Flucythrinate	T	NR	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	100 mg/kg	100% mortality within 5d of treatment.	1431	Saleh et al (1986)
Flucythrinate	F	30%	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	166.5 mg/kg	Significant increase in blood glucose, blood urea, GOT and bilirubin at the end of the exposure period. Significant decrease in serum proteins at the end of the exposure period.	1431	Saleh et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Flucythrinate	F	30%	Rat	N	120-130	Dorsal flank	2 weeks	10	Daily (5d a week for 2 weeks)	2	Liver function, blood glucose, blood urea, cholinesterase activity	333.3 mg/kg	60% mortality within 9d of treatment. Significant increase in blood glucose, blood urea, GOT, and bilirubin at the end of the exposure period. Significant decrease in serum proteins at the end of the exposure period.	1431	Saleh et al (1986)
Flumethrin	T	0.6	Mouse	M	NR	Back	24-72h	1	-	1	Mitotic index, chromosomal aberrations, micronucleus test in bone marrow.	5325 mg/kg	Significant decrease in mitotic index relative to controls. Significantly higher number of cells with 'gaps' at 24h.	1011	Nakano et al (1996)
HCH	T	NR	Rabbit	M	1500	Dorsal skin	30d	30	Daily	1	Clinical signs, organ weight, histopathology, enzyme assays.	25 mg/kg/d	Mild symptoms. Significant increase in liver weight. Severe morphological changes. Significant increase in liver and serum GPT. Significant increase in alkaline phosphatases and decrease in LDH in serum.	1269	Dikshith et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH	T	NR	Rabbit	M	1500	Ventral skin	30d	30	Daily	1	Clinical signs, organ weight, histopathology, enzyme assays.	25 mg/kg/d	Severe symptoms, 25% mortality at day 20. Morphological changes. Significant increase in liver weight. Significant increase in GPT and alkaline phosphatases in liver and serum. Significant decrease in liver LDH.	1269	Dikshith et al (1989)
HCH	T	NR	Rabbit	M	1500	Thigh (inner)	30d	30	Daily	1	Clinical signs, organ weight, histopathology, enzyme assays.	25 mg/kg/d	Severe symptoms, 50% mortality at day 35. Severe morphological changes. Significant increase in liver weight. Significant increase in GOT, GPT and alkaline phosphatase in liver and serum. Significant decrease in liver and serum LDH.	1269	Dikshith et al (1989)
HCH	T	98.01 %	Rat	M	NR	Nape	120d	0	Daily (5 days per week)	2	Spermatozoa count, sperm motility assay, sperm abnormalities, testicular enzymes, serum testosterone.	50 mg/kg/d	Significant effects on testicular enzymes. Significant decrease in sperm count and motility. Significant increase in abnormal sperm.	1023	Prasad et al (1995)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH	T	98.01 %	Rat	M	NR	Nape	120d	-	Daily (5 days per week)	2	Spermatozoa count, sperm motility assay, sperm abnormalities, testicular enzymes, serum testosterone.	100 mg/kg/d	Significant effects on testicular enzymes. Significant reduction in serum testosterone. Significant decrease in sperm count and motility. Significant increase in abnormal sperm.	1023	Prasad et al (1995)
HCH	T	97.7%	Rat	M	NR	Nape	60d	-	Daily	2	Activity of testicular plasma membrane marker enzymes.	50 mg/kg	Significant decrease in activity of Ca2+-ATPase, Na+ + K+-ATPase and Mg2+-ATPase	1035	Srivastava et al (1995)
HCH	T	97.7%	Rat	M	NR	Nape	60d	-	Daily	2	Activity of testicular plasma membrane marker enzymes.	100 mg/kg	Significant decrease in activity of 5'-Nucleotidae, Ca2+-ATPase, Na+ + K+-ATPase and Mg2+-ATPase	1035	Srivastava et al (1995)
HCH	T	97.5%	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Clinical signs. Organ weight. Skin, liver and brain histopathology. Liver and serum enzymatic changes.	100 mg/kg	Signs of poisoning in 15 and 30d groups. No significant effects on liver enzymes. Significant effects on some serum enzymes at all time points. Significant reduction in AChE activity in RBC at 30d.	1059	Raizada et al (1994)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH	T	97.5%	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Mortality, clinical signs, organ weight, ChE activity, Enzyme activity in organs, pathological signs.	100 mg/kg/d	A few mortalities reported. 30d exposure produced severe signs of poisoning (tremor, dyspnoea, salivation, convulsion, diarrhoea). Significant increase in liver weight relative to controls at 15 and 30d.Pathological changes reported in skin, liver and cerebellum. Effects on enzymes GOT, GPT, alkaline phosphatase and LDH also reported. Significant increase in AChE activity of brain at 7d while at 30d RBC AChE was significantly inhibited.	1116	Raizada et al (1993)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH	T	NR	Rat	F	150	Lateral abdo-men	7-15d	7-15	Daily	1	Mortality and symptoms, organ weight, morphological changes, enzyme activity.	100 mg/kg/d	20% mortality in both 15d and 30d groups. Significant increase in liver weight in 15d and 30d groups. Significant effects on some liver and serum enzymes/proteins in all groups. Significant increase in Ache in brain in 7d group. Significant decrease in AChE in RBC in 30d group.	1202	Dikshith et al (1991)
HCH/ Methyl parathion	T/NR	NR/50 %	Rat	F	150	Lateral abdo-men	7-15d	7-15	Daily	1	Mortality and symptoms, organ weight, morphological changes, enzyme activity.	100/2 mg/kg/d	20% mortality in both 15d and 30d groups. Significant increase in liver weight in 15d group. Significant effects on some liver and serum enzymes/proteins in all groups. Significant decrease in AChE in brain and RBC in all groups.	1202	Dikshith et al (1991)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH/ Oxydemeton methyl	T/F	97.5% /NR	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Mortality, clinical signs, organ weight, ChE activity, Enzyme activity in organs, pathological signs.	100/125 mg/kg/d	A few mortalities reported. 15 and 30d exposure produced severe signs of poisoning (tremor, dyspnoea, salivation, convulsion, diarrhoea). Significant increase in liver weight relative to controls at 7, 15, and 30d. Pathological changes reported in skin, liver and cerebellum. Significantly inhibited brain AChE at 7, 15 and 30d and RBC at 7 and 30d.	1116	Raizada et al (1993)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
HCH/ Pirimophos-methyl	T/F	97.5% /50% EC	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Clinical signs. Organ weight. Skin, liver and brain histopathology. Liver and serum enzymatic changes.	100/250 mg/kg	Signs of poisoning in 15 and 30d groups. Significant effects on some liver enzymes at all time points. Significant effects on some serum enzymes at all time points. Significant reduction in AChE activity in brain at 7 and 30d and in RBC at all time points	1059	Raizada et al (1994)
Isoproturon	T	NR	Rat	M/ F	150	Lateral abdo-men	21d	21	Daily	3	Mortality and clinical signs, organ weight, histopathological studies, biochemical studies, haematological assays.	250 mg/kg/d	No mortality or clinical signs. Significant effects on serum GPT and liver GOT reported. Significant effects on RBC, haemoglobin, neutrophils and leukocytes reported.	1227	Dikshith et al (1990)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Isoproturon	T	NR	Rat	M/F	150	Lateral abdo-men	21d	21	Daily	3	Mortality and clinical signs, organ weight, histopathological studies, biochemical studies, haematological assays.	500 mg/kg/d	No clinical signs, 1 male died on day 7. Significant effects on liver and serum GPT, serum alkaline phosphatases and liver and serum proteins reported. Significant effects on RBC, haemoglobin, neutrophils and leukocytes reported.	1227	Dikshith et al (1990)
Isoproturon	T	NR	Rat	M/F	150	Lateral abdo-men	21d	21	Daily	3	Mortality and clinical signs, organ weight, histopathological studies, biochemical studies, haematological assays.	1000 mg/kg/d	No clinical signs, 1 male died on day 14. Significant changes in liver GOT, liver and serum GPT and serum proteins reported. Significant effects on RBC, haemoglobin, neutrophils and leukocytes reported.	1227	Dikshith et al (1990)
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	1	-	5	Toxicity symptoms/Mortality	8000 mg/kg	Salivation, defecation, muscle tremor, respiratory distress (135-220 mins), 100% mortality (6-10h).	533/743/819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	1	-	5	Toxicity symptoms/ Mortality	4000 mg/kg	Salivation, defecation, muscle tremor (160-280 mins), 70% mortality (8-12h).	533/ 743/ 819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	1	-	5	Toxicity symptoms/ Mortality	2000 mg/kg	Salivation, defecation (240-310 mins), 60% mortality (12-18h).	533/ 743/ 819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	1	-	5	Toxicity symptoms/ Mortality	1000 mg/kg	Salivation (onset 280-340 mins), 10% mortality (18-20h).	533/ 743/ 819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)
Kitazin	T	94%	Rat	NR	NR	Back skin	20h	1	-	5	Toxicity symptoms/ Mortality	500 mg/kg	No symptoms or mortalities	533/ 743/ 819	Ranvir et al (2007)/Ranvir et al (2002)/Ranvir et al (2001)
Malathion	Purified	99.9%	Mouse	F	NR	NR	4-24h	1	-	4	Blood histamine levels	2-2000 mg/kg	At 4h there was a dose dependent increase in serum histamine not present at later time points. States statistical analysis method but no results presented.	1796	Rodgers and Xiong (1997)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Malathion	NR	99%	Rat	M	225-250	Back of neck	30d	30	Daily	1	Clinical signs, bodyweight, brain AChE activity, plasma BChE activity, effects on m_2-muscarinic acetylcholine receptors in cortex and brain stem, histopathological changes.	44.4 mg/kg/d	No clinical signs or effects on bodyweight. All behavioural measurements (beam walk score and time, inclined plane and grip time) significantly affected. Significant decrease in surviving neurons in dentate gyrus.	649	Abdel-Rahman et al (2004)
Malathion	S	99%	Rat	NR	200-230	Tail	4h/d	28	24h	2	Histologic and ultrastructural effects on liver, kidneys, heart and lungs.	8 mg	No numerical results. Histopathologic effects noted in liver, ultrastructural changes in liver , lungs and kidneys.	692	Tos-Luty et al (2003)
Malathion	S	99%	Rat	NR	200-230	Tail	4h/d	28	24h	2	Histologic and ultrastructural effects on liver, kidneys, heart and lungs.	16 mg	No numerical results. Histopathologic effects noted in liver and lungs, ultrastructural changes in liver , lungs and kidneys.	692	Tos-Luty et al (2003)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Malathion	Purified	99.9%	Rat	F	NR	NR	4-24h	1	-	4	Blood histamine levels	2-2000 mg/kg	At 4h there was a dose dependent increase in serum histamine not present at later time points. States statistical analysis method but no results presented.	1796	Rodgers and Xiong (1997)
Malthion/ Permethrin	NR/T	99%/93.6%	Rat	M	225-250	Back of neck	30d	30	Daily	1	Clinical signs, bodyweight, brain AChE activity, plasma BChE activity, effects on m2-muscarinic acetylcholine receptors in cortex and brain stem, histopathological changes.	44.4/ 0.13 mg/kg/d	No clinical signs or effects on bodyweight. All behavioural measurements (beam walk score and time, inclined plane and grip time) significantly affected. Significant increase in AChE in midbrain. Significant decrease in surviving neurons in CA1 and CA3 subfields of the hippocampus, brainstem and Purkinje cell layer in the cerebellum.	649	Abdel-Rahman et al (2004)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Mancozeb	T	95%	Mouse	F	20	NR	5-197h	1-5	0, 24 or 48h	4	Ornithine decarboxylase (ODC) activity in skin. Rate of DNA synthesis	1-10 mg	Time course of increases in ODC activity and DNA synthesis at 2mg/mouse reported. Dose response of ODC activity reported. No statistical analysis.	1162	Gupta and Mehrotra (1992)
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	0	3	Conditioned taste aversion	20 mg/kg	Intake of saccharin solution not significantly different to control. No mortality up to 96h.	1287	Mitchell et al (1989)
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	200 mg/kg	Intake of saccharin solution not significantly different to control. No mortality up to 96h.	1287	Mitchell et al (1989)
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	-	3	Conditioned taste aversion	2000 mg/kg	Intake of saccharin solution not significantly different to control. No mortality up to 96h.	1287	Mitchell et al (1989)
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	20 mg/kg	No significant increase in activity of group housed or individually housed mice relative to controls.	1287	Mitchell et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	200 mg/kg	No significant increase in activity of group housed or individually housed mice relative to controls.	1287	Mitchell et al (1989)
Maneb	F	80%	Mouse	M	25-30	Back	24h	1	-	3	Total activity 4h after exposure.	2000 mg/kg	No significant increase in activity of group housed or individually housed mice relative to controls.	1287	Mitchell et al (1989)
MCPA	NR	80.6%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, histopathological examination of liver, kidneys, heart, spleen and thymus.	500 mg/kg/d	Significant growth retardation. Decrease in n umber of lymphocytes.	1554	Verschuuren et al (1975)
MCPA	NR	80.6%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, histopathological examination of liver, kidneys, heart, spleen and thymus.	1000 mg/kg/d	75% mortality. Too few survivors for haematology.	1554	Verschuuren et al (1975)
MCPA	NR	80.6%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, histopathological examination of liver, kidneys, heart, spleen and thymus.	2000 mg/kg/d	100% mortality. Too few survivors for haematology.	1554	Verschuuren et al (1975)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Mecoprop	NR	92-93%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, weight and histopathological examination of liver, kidneys, heart, spleen and thymus.	500 mg/kg/d	No mortalities. No effect on organ weights or haematological changes.	1554	Verschuuren et al (1975)
Mecoprop	NR	92-93%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, weight and histopathological examination of liver, kidneys, heart, spleen and thymus.	1000 mg/kg/d	25% mortality. No effect on organ weights or haematological changes.	1554	Verschuuren et al (1975)
Mecoprop	NR	92-93%	Rabbit	M	NR	Back and flanks	3 weeks	15	Daily (5d a week for 2 weeks)	3	Haematology, weight and histopathological examination of liver, kidneys, heart, spleen and thymus.	2000 mg/kg/d	25% mortality. No effect on organ weights or haematological changes.	1554	Verschuuren et al (1975)
Methamidophos	P	NR	Mouse	M/F	NR	Back	2 weeks	4	Twice weekly	2	Micronucleus test	12 mg/kg	Significant increase in percentage of polychromatic erythrocytes (PE) relative to controls at 7 and 14 days of treatment.	1385	Amer and Sayed (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methamid-ophos	P	NR	Mouse	M/F	NR	Back	2 weeks	4	Twice weekly	2	Micronucleus test	24 mg/kg	Significant increase in percentage of polychromatic erythrocytes (PE) relative to controls at 7 and 14 days of treatment. Significant increase in micronucleated PEs.	1385	Amer and Sayed (1987)
Methamid-ophos	NR	99%	Rat	M	190-210	Back of neck	4 weeks	12	3 times a week for 4 weeks	1	Bodyweight, food consumption. Superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX) activities in rat tissues.	1.3 mg/ 200g rat	No effects on bodyweight or food consumption. Significant decrease in SOD activity in exposure phase only.	855	Panemangalore and Bebe (2000)
Methyl bromide	NR	NR	Rat	M	280-320	Back	0.5-5mins	1	-	1	Mortality, effects on skin, bromide ion concentration, histological changes.	NR	30% mortality in the 5 minute exposure group. Dose time related effects on skin, bromide concentration and histological changes described.	1782	Yamamoto et al (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl parathion	F	61%	Little brown bat (*Myotis lucifugus*)	F	NR	Dorsal surface of right wing	24h	1	-	5	Mortality, brain ChE activity,	170-1220 mg/kg	One bat died at 360 mg/kg. Brain ChE activity was reduced in a dose related fashion ranging from 22.2 to 16.0% of control values.	1425	Clark (1986)
Methyl parathion	NR	≥99%	Rat	F	167± 2	Back of neck	95d	95	Daily	2	Inhibition of brain AChE activity, effects on [3H]QNB binding in brain.	0.1 mg/kg/d	Significant inhibition of brain AChE activity in two out of seven regions examined. No significant effect on [3H]QNB binding in brain.	699	Ma et al (2003)
Methyl parathion	NR	≥99%	Rat	F	167± 2	Back of neck	95d	95	Daily	2	Inhibition of brain AChE activity, effects on [3H]QNB binding in brain.	1 mg/kg/d	Significant inhibition of brain AChE activity in all seven regions examined. No significant effect on [3H]QNB binding in brain.	699	Ma et al (2003)
Methyl parathion	NR	NR	Rat	F	190-210	Nape	122h	1	-	3	Blood cholinesterase activity.	6.25 mg/kg	Significance of ChE inhibition in whole blood not presented for this dose, only time course graph although activity appears to be >50% lower than control values at 26h. Peak inhibition after 12-26h.	735	Kramer et al (2002)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl parathion	NR	NR	Rat	F	190-210	Nape	122h	1	-	3	Blood cholinesterase activity.	12.5 mg/kg	Significant inhibition of ChE activity in blood and brain after 48h relative to controls. Peak inhibition after 12-26h.	735	Kramer et al (2002)
Methyl parathion	NR	NR	Rat	F	190-210	Nape	122h	1	-	3	Blood cholinesterase activity.	25 mg/kg	Significant inhibition of ChE activity in blood and brain after 48h relative to controls. Peak inhibition after 12-26h.	735	Kramer et al (2002)
Methyl parathion	NR	NR	Rat	F	175-200	Inter-scapular	28d	1	-	3	Behavioural tests, blood ChE assays.	6.25 mg/kg	Significant decrease in blood ChE activity at days 2 and 7 compared to day 0.	759	Zhu et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl parathion	NR	NR	Rat	F	175-200	Inter-scapular	28d	1	-	3	Behavioural tests, blood ChE assays.	12.5 mg/kg	Significant decrease in blood ChE activity at days 2 and 7 compared to day 0. Significant decrease in bodyweight at day 2 (compared to day 0), recovered by day 7. Significant reduction in spontaneous motor activity (open field test) and neuromuscular coordination (rota rod test) at day 2 compared to day 0.	759	Zhu et al (2001)
Methyl parathion	NR	NR	Rat	F	175-200	Inter-scapular	28d	1	-	3	Behavioural tests, blood ChE assays.	50 mg/kg	100% mortality by 72h post-treatment. Significant decrease in blood ChE activity (only determined on day 2 due to mortality. Total loss of spontaneous motor activity (open field test) at day 2 compared to day 0.	759	Zhu et al (2001)
Methyl parathion	NR	NR	Rat	F	175-200	Inter-scapular	28d	28	Daily	2	Behavioural tests, blood ChE assays.	0.1 mg/kg/d	No significant effects.	759	Zhu et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl parathion	NR	NR	Rat	F	175-200	Inter-scapular	28d	28	Daily	2	Behavioural tests, blood ChE assays.	1 mg/kg/d	Significant decrease in blood ChE activity at days 7, 14, 21 and 28 compared to day 0. Significant decrease in blood ChE activity at days 7, 21 and 28 compared to day 0.	759	Zhu et al (2001)
Methyl parathion	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and liver. ChE levels in placenta.	10 mg/kg	Depression of ChE activity presented in graphs with no statistical analysis.	771	Abu-Qare and Abou-Donia (2001)
Methyl parathion	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and brain. ChE levels in maternal liver and placenta.	10 mg/kg	Significant reduction in AChE in relation to controls in maternal brain (all times , 1-96h), foetal brain (4-96h), placenta (at 12h only). Significant reduction in BuChE activity in maternal plasma (2-96h), foetal plasma (2-12h), maternal liver (1-24h and 72h), placenta (1-12h).	777	Abu-Qare et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl parathion	NR	0.5	Rat	F	150	Lateral abdo-men	7-15d	7-15	Daily	1	Mortality and symptoms, organ weight, morphological changes, enzyme activity.	2 mg/kg/d	40% mortality in 30d group. Significant reduction in liver weight in 7d group. Significant effects on some liver and serum enzymes/proteins in all groups. Significant decrease in AChE in brain and RBC in all groups.	1202	Dikshith et al (1991)
Methyl parathion/ Chlorpyrifos	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and brain. ChE levels in maternal liver and placenta.	10/30 mg/kg	Significant reduction in AChE activity in relation to controls in maternal brain (1-72h), foetal brain (96h only). Significant reduction in BuChE in maternal plasma (24-96h), placenta (12-48h).	777	Abu-Qare et al (2001)
Methyl parathion/ Diazinon	NR	NR	Rat	F	NR	Back of neck	1-96h	1	-	1	Maternal and foetal ChE levels in blood and liver. ChE levels in placenta.	10/65 mg/kg	Depression of ChE activity presented in graphs with no statistical analysis.	771	Abu-Qare and Abou-Donia (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Nicotine	NR	99.8%	Rat	M	190-210	Back of neck	4 weeks	12	3 times a week for 4 weeks	1	Bodyweight, food consumption. Superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX) activities in rat tissues.	9.6 mg/ 200g rat	No effects on bodyweight or food consumption. Significant decrease in SOD activity in both exposure phase and post-exposure phases.	855	Panemangalore and Bebe (2000)
Nitrofen	NR	>95%	Mouse	F	NR	Back	Gestation day 8 onwards	1-10	Single dose or daily for 10d	4	Survival and weight gain of pups.	75-750 mg/kg	Significant decrease in number of pups surviving to weaning at higher doses. effect on	1407	Francis (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Oxydemeton methyl	F	NR	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Mortality, clinical signs, organ weight, ChE activity, Enzyme activity in organs, pathological signs.	125 mg/kg/d	A few mortalities reported. 30d exposure produced severe signs of poisoning (tremor, dyspnoea, salivation, convulsion, diarrhoea). No significant increase in liver weight relative to controls. Pathological changes reported in skin, liver and cerebellum. Effects on enzymes GOT, GPT, alkaline phosphatase and LDH also reported. Significant inhibition in brain at 30d and in RBC at 7, 15 and 30d.	1116	Raizada et al (1993)
Paraquat	NR	NR	Rat	M	200-220	Back	4h/d	5	24h	3	Sperm count, sperm morphology/ motility/mortality.	6 mg/kg	Significantly lower sperm count on day 7, significantly elevated by day 14 relative to controls. Significant increase in sperm abnormalities at all times.	559	D'Souza et al (2006)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Paraquat	NR	NR	Rat	M	200-220	Back	4h/d	5	24h	3	Sperm count, sperm morphology/ motility/mortality.	15 mg/kg	Significantly lower sperm count on days 7 and 14 relative to controls. Significant increase in sperm mortality at days 7 and 14, and sperm abnormalities at all times.	559	D'Souza et al (2006)
Paraquat	NR	NR	Rat	M	200-220	Back	4h/d	5	24h	3	Sperm count, sperm morphology/ motility/mortality.	30 mg/kg	Significantly lower sperm count on days 7 and 14 relative to controls. Significant increase in sperm mortality at days 7, 14 and 28, and sperm abnormalities at all times.	559	D'Souza et al (2006)
Paraquat	NR	NR	Rat	M	NR	Dorsal skin	4h	1	-	3	Bone marrow micronucleus assay	6 mg/kg	Genotoxic effect with significantly elevated micronucleated polychromatic (MNPCE) and normochromatic (MNNCE) erythrocytes along with significantly reduced polychromatic erythrocytes.	588	D'Souza et al (2005)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Paraquat	NR	NR	Rat	M	NR	Dorsal skin	4h	1	-	3	Bone marrow micronucleus assay	15 mg/kg	Genotoxic effect with significantly elevated micronucleated polychromatic (MNPCE) and normochromatic (MNNCE) erythrocytes along with significantly reduced polychromatic erythrocytes.	588	D'Souza et al (2005)
Paraquat	NR	NR	Rat	M	NR	Dorsal skin	4h	1	-	3	Bone marrow micronucleus assay	30 mg/kg	Genotoxic effect with significantly elevated micronucleated polychromatic (MNPCE) and normochromatic (MNNCE) erythrocytes along with significantly reduced polychromatic erythrocytes.	588	D'Souza et al (2005)
Paraquat	NR	NR	Rat	M	250	Back of neck	9 weeks	-	Weekly	2	Morphometry of lung tissue	32-133 mg	Two mortalities after four exposures to 28.5mg/week. Thickening of walls of pulmonary arteries, no statistical analysis.	1516	Lewis et al (1979)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	P	91.6%	Mouse	F	NR	Inter-scapular	48h	1	-	1	Thymic and splenic weight and cellularity, splenocyte and thymocyte proliferation, splenocyte functional assays, B-lymphocyte antibody production.	25 µl	Significant decrease in thymic weight (not cellularity) relative to controls. Significant decrease in splenocyte proliferation. Significant decrease in splenic macrophage chemiluminescence. Significant decrease in splenocyte antibody production. Also reports 10% mortality in experiments at this dose level.	696	Prater et al (2003)
Permethrin	P	91.6%	Mouse	F	16.32±0.21	Inter-scapular	48h	1	-	4	Organ weights and cellularity, surface antigen expression, thymocyte aptosis, functional assays (macrophages, B cells, leukocytes and T cells).	5 µl	No significant effects recorded.	707	Prater et al (2002)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	P	91.6%	Mouse	F	16.32±0.21	Inter-scapular	48h	1	-	4	Organ weights and cellularity, surface antigen expression, thymocyte aptosis, functional assays (macrophages, B cells, leukocytes and T cells).	10 µl	Significant reduction in spleen weight relative to controls.	707	Prater et al (2002)
Permethrin	P	91.6%	Mouse	F	16.32±0.21	Inter-scapular	48h	1	-	4	Organ weights and cellularity, surface antigen expression, thymocyte aptosis, functional assays (macrophages, B cells, leukocytes and T cells).	15 µl	Significant decreases in thymus weight and cellularity, spleen weight and cellularity, thymocytes and splenocyte proliferation response.	707	Prater et al (2002)
Permethrin	P	91.6%	Mouse	F	16.32±0.21	Inter-scapular	48h	1	-	4	Organ weights and cellularity, surface antigen expression, thymocyte aptosis, functional assays (macrophages, B cells, leukocytes and T cells).	25 µl	Significant decreases in thymus weight and cellularity, spleen weight and cellularity, thymocytes and splenocyte proliferation response. Significant impact on thymocyte viability and apoptosis.	707	Prater et al (2002)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, chemiluminescent response, macrophage phagocytosis, plaque forming cell (PFC) response.	0.5 µl	EXPOSURE 1 (10/10) - no significant effects, EXPOSURE 2 (7/14) - no significant effects, EXPOSURE 3 (14/28) - no significant effect, EXPOSURE 4 (30/30) - significant decrease in H2O2 production in splenic macrophages at day 2.	800	Punareewattana et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, chemiluminescent response, macrophage phagocytosis, plaque forming cell (PFC) response.	1.5 µl	EXPOSURE 1 (10/10) - significant reduction in bodyweight at day 10, significant decrease in H2O2 production in splenic macrophages at day 2 and 10, significant reduction in plaque numbers at day 10, EXPOSURE 2 (7/14) - significant decrease in H2O2 production in splenic macrophages at day 2 and increase at day 10, EXPOSURE 3 (14/28) - no significant effect, EXPOSURE 4 (30/30) - significant decrease in H2O2 production in splenic macrophages at day 2.	800	Punareewattana et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, chemiluminescent response, macrophage phagocytosis, plaque forming cell (PFC) response.	5 µl	EXPOSURE 1 (10/10) - significant decrease in H2O2 production in splenic macrophages at day 2 and 10, significant reduction in plaque numbers at day 10, EXPOSURE 2 (7/14) - significant decrease in H2O2 production in splenic macrophages at day 2 and increase at day 30, significant increase in macrophage phagocytic activity at day 10, EXPOSURE 3 (14/28) - significant decrease in H2O2 production in splenic macrophages at day 2, EXPOSURE 4 (30/30) - significant decrease in H2O2 production in splenic macrophages at day 2 and 10.	800	Punareewattana et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	F	26%	Mouse	M	20-25	Back	24h	1	-	4	Conditioned taste aversion	0.3 mg/kg	Consumption of saccharin solution not significantly different to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Permethrin	F	26%	Mouse	M	20-25	Back	24h	1	-	4	Conditioned taste aversion	3 mg/kg	Consumption of saccharin solution not significantly different to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Permethrin	F	26%	Mouse	M	20-25	Back	24h	1	-	4	Conditioned taste aversion	30 mg/kg	Consumption of saccharin solution significantly decreased relative to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Permethrin	F	26%	Mouse	M	20-25	Back	24h	1	-	4	Conditioned taste aversion	300 mg/kg	Consumption of saccharin solution significantly decreased relative to controls. No mortality by 96h.	1322	Mitchell et al (1988)
Permethrin	F	25.6%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	3 mg/kg	No significant effect on activity in individually housed or group housed mice.	1322	Mitchell et al (1988)
Permethrin	F	25.6%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	30 mg/kg	No significant effect on activity in individually housed or group housed mice.	1322	Mitchell et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	F	25.6%	Mouse	M	20-25	Back	24h	1	-	3	Total activity 4h after exposure.	300 mg/kg	Significant increase in non-ambulatory activity of individual mice and total activity of groups of five.	1322	Mitchell et al (1988)
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, organ weight, histopathology, cell-surface antigen expression, contact hypersenstivity.	0.5 µl	EXPOSURE 1 (10/10) - Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 2 (7/14) - Significant reduction in ear thickness at 2d, EXPOSURE 3 (14/28) - Significant reduction in ear thickness at 2d, EXPOSURE 4 (30/30) - Significant reduction in ear thickness at 2d.	1814	Punareewattana et al (2000)
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, organ weight, histopathology, cell-surface antigen expression, contact hypersenstivity.	1.5 µl	EXPOSURE 1 (10/10) - significant decrease in bodyweight at 10 days. Significant decrease in thymus/bodyweight ratio at 2 and 10 days, Significant decrease in thymic	1814	Punareewattana et al (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
													cellularity at 2 days. Significant increase in spleen/bodyweight ratio at 2 days, EXPOSURE 2 (7/14) - Significant increase in spleen/bodyweight ratio at 2 days. Significant reduction in ear thickness at 2, 10 and 30d. Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 3 (14/28) - Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 4 (30/30) - Significant reduction in ear thickness at 2, 10 and 30d.		

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	NR	91.6%	Mouse	F	21.5 ±1.0	Inter-scapular	10-30d	7-30	24-48h	3	Bodyweight, organ weight, histopathology, cell-surface antigen expression, contact hypersenstivity.	5 µl	EXPOSURE 1 (10/10) - Significant decrease in thymus/bodyweight ratio at 2 days. Significant increase in spleen/bodyweight ratio at 2 days. Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 2 (7/14) - Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 3 (14/28) - Significant reduction in ear thickness at 2, 10 and 30d, EXPOSURE 4 (30/30) - Significant reduction in ear thickness at 2, 10 and 30d.	1814	Punareewattana et al (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	T	93.6%	Rat	M	225-250	Back of neck	30d	30	Daily	1	Clinical signs, bodyweight, brain AChE activity, plasma BChE activity, effects on m2-muscarinic acetylcholine receptors in cortex and brain stem, histopathological changes.	0.13 mg/kg/d	No clinical signs or effects on bodyweight. All behavioural measurements (beam walk score and time, inclined plane and grip time) significantly affected. Significant increase in AChE activity in cortex. Significant increase in m2-muscarinic acetylcholine receptor ligand binding in cortex. Significant decrease in surviving neurons in dentate gyrus, CA1 and CA3 subfields of the hippocampus.	649	Abdel-Rahman et al (2004)
Permethrin	NR	99%	Rat	M	250-300	Back	2-72h	1	-	1	Levels of 6β-Hydrocortisol and cortisol in urine.	1.3 mg/kg	No significant effect on Levels of 6β-Hydrocortisol and cortisol in urine.	757	Abu-Qare and Abou-Donia (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	T	93.6%	Rat	M	200-250	Back of neck	60d	60	24h	1	Morphological and histopathological changes in motor cortex, hippocampus and cerebellum.	0.13 mg/kg	No significant effects on clinical condition or bodyweight compared to controls. Significant decrease in surviving neurons in motor cortex, hippocampus and cerebellum. Significant decrease in MAP-2 immunoreactivity in motor cortex and hippocampus. Significant increase in GFAP immunoreactivity in motor cortex, hippocampus and cerebellum.	758	Abdel-Rahman et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	T	93.6%	Rat	M	200-250	Back of neck	60d	60	Daily	3	Behavioural assessments, blood-brain barrier and blood-testis barrier permeability.	0.013 mg/kg	No analysis of behaviour for individual dose levels. Significant effect of dose and interaction between dose and time for beam walk time, inclined plane performance, (ANOVA). Significant effect of dose on forepaw grip test. No significant effect on blood-brain or blood-testis permeability.	786	Abou-Donia et al (2001)
Permethrin	T	93.6%	Rat	M	200-250	Back of neck	60d	60	Daily	3	Behavioural assessments, blood-brain barrier and blood-testis barrier permeability.	0.13 mg/kg	No analysis of behaviour for individual dose levels. Significant effect of dose and interaction between dose and time for beam walk time, inclined plane performance, (ANOVA). Significant effect of dose on forepaw grip test. No significant effect on blood-brain or blood-testis permeability.	786	Abou-Donia et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	T	93.6%	Rat	M	200-250	Back of neck	60d	60	Daily	3	Behavioural assessments, blood-brain barrier and blood-testis barrier permeability.	1.3 mg/kg	No analysis of behaviour for individual dose levels. Significant effect of dose and interaction between dose and time for beam walk time, inclined plane performance, (ANOVA). Significant effect of dose on forepaw grip test. No significant effect on blood-brain or blood-testis permeability.	786	Abou-Donia et al (2001)
Permethrin	T	93.6%	Rat	M	225-250	Back of neck	45d	45	24h	1	Behavioural and biochemical assays.	0.13 mg/kg	No significant effects on clinical condition or bodyweight compared to controls. Significant reduction in grip strength. Significant increase in AChE activity in cortex and cerebellum. Significant increase in m2 muscarinic acetaldehyde receptor ligand binding in cortex.	791	Abou-Donia et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Permethrin	NR	99.00 %	Rat	NR	200-240	Back	2-72h	1	-	1	Levels of 2-deoxyguanosine and 8-hyrdoxy-2-deoxyguanosine in urine.	1.3 mg/kg	No significant effect on level of 8-hyrdoxy-2-deoxyguanosine in urine.	1699	Abu-Qare and Abou-Donia (2000)
Permethrin	NR	99%	Rat	NR	200-240	Back	4-72h	1	-	1	Levels of L-tyrosine and 3-nitrotyrosine in urine.	1.3 mg/kg	No significant effect on level of 3-nitrotyrosine in urine.	1938	Abu-Qare et al (2001)
Phospham-idon	T	92%	Rat	M/F	100-110	Dorsal	3 weeks	15	Daily (5 days a week for 3 weeks)	3	Clinical symptoms, bodyweight, food intake, organ weight, blood chemistry.	0.48 mg/kg/d	Significant decrease in blood glucose, ChE and packed cell volume. Significant increase in blood SGOT and SGPT.	1687	Qadri et al (1987)
Phospham-idon	T	92%	Rat	M/F	100-110	Dorsal	3 weeks	15	Daily (5 days a week for 3 weeks)	3	Clinical symptoms, bodyweight, food intake, organ weight, blood chemistry.	2.2 mg/kg/d	Significant decrease in blood haemoglobin, packed cell volume, glucose, protein and ChE. Significant increase in white cell count, SGOT, SGPT.	1687	Qadri et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Phospham-idon	T	92%	Rat	M/F	100-110	Dorsal	3 weeks	15	Daily (5 days a week for 3 weeks)	3	Clinical symptoms, bodyweight, food intake, organ weight, blood chemistry.	3.98 mg/kg/d	Symptoms of hypersalivation/frothing. Significant decrease in blood haemoglobin, packed cell volume, glucose, protein and ChE. Significant increase in white cell count, SGOT, SGPT.	1687	Qadri et al (1987)
Pirimophos-methyl	F	50% EC	Rat	F	150	Lateral abdo-men	7-30d	7-30	Daily	1	Clinical signs. Organ weight. Skin, liver and brain histopathology. Liver and serum enzymatic changes.	250 mg/kg	Signs of poisoning in 15 and 30d groups. Significant effects on some liver enzymes at all time points. Significant effects on some serum enzymes at 15 and 30d. Significant reduction in AChE activity in brain at 15 and 30d and in RBC at all time points	1059	Raizada et al (1994)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Profenofos	T	95%	Rat	M	120	Dorsal skin	3mo	-	48h	1	Biochemical measurements in liver, brain and kidneys.	330 mg/kg	Significant decrease in total lipid in brain and kidney; total cholesterol in liver and brain; total triglycerides in brain and kidney; total phospholipid in brain and kidney; G6PD in liver, brain and kidney; 6PGD in brain.	255	Abdel-Rahim and Mahmoud (2011)
Profenofos	T	95%	Rat	M	120	Dorsal skin	3mo	-	48h	1	Biochemical measurements in liver, brain and kidneys.	330 mg/kg	No significant effect on biochemical measurements.	255	Abdel-Rahim and Mahmoud (2011)
Profenofos	F	72% EC	Rat	M	120	Dorsal skin	3mo	-	48h	1	Biochemical measurements in liver, brain and kidneys.	330 mg/kg	Significant decrease in total lipid in liver, brain and kidney; total cholesterol in liver, brain and kidney; total triglycerides in liver, brain and kidney; total phospholipid in liver, brain and kidney; G6PD in liver, brain and kidney; 6PGD in liver and brain.	255	Abdel-Rahim and Mahmoud (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Profenofos	F	72% EC	Rat	M	120	Dorsal skin	3mo	-	48h	1	Biochemical measurements in liver, brain and kidneys.	330 mg/kg	Significant decrease in total lipid in liver, brain and kidney; total phospholipid in brain; G6PD in kidney.	255	Abdel-Rahim and Mahmoud (2011)
Rotenone	T	NR	Mouse	NR	NR	Back	1-14d	4	Twice weekly	2	Percentage polychromatic erythrocytes (PE) and PE with micronuclei in bone marrow.	135 mg/kg/ 0.5 week	Significant increase in percentage PEs one day after treatment. No effect on PEs with micronuclei after 4 dose (14d).	1452	Amer and Aboulela (1985)
Vinclozolin	NR	NR	Rabbit	M	0	NR	8 weeks	40	Daily (5d a week)	1	Bodyweight, accessory sex gland weight, sperm count.	100 mg/kg	Non-significant decrease in bodyweight relative to controls. Significantly lower accessory sex glands than controls. Significant increase in sperm count.	833	Moorman et al (2000)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Warfarin	NR	NR	Rat	M	200	Back	3d	3	24h	1	Skin tissue injury by lipid peroxidation, histomorphological changes and reparative activity. Also indicators of immune/ inflammatory response.	0.8-1 µg/cm^2	Metabolic viability of skin affected with significant increase in MTT at 72h post exposure. Lipid peroxidation affected with significant increase in MDA formation at 24h. Significant increase in CD3+ cells at 24h. Immune/inflammatory effects with significantly increased 3H-TDR and TNF-α at 72h.	267	Popov et al (2011)
Warfarin	NR	NR	Rat	M	190-210	Back	3d	3	24h	1	Prothrombin time, peripheral blood cell counts, granulocyte activity.	0.05 mg/kg	Significant increase in prothrombin time. Significant increase in granulocyte activity.	477	Kataranovski et al (2008)
Warfarin	NR	NR	Rat	M	190-210	Back	3d	3	24h	1	Prothrombin time, peripheral blood cell counts, granulocyte activity.	0.5 mg/kg	Significant increase in prothrombin time. Significant increase in granulocytes and leukocytes (%), granulocyte activity and priming.	477	Kataranovski et al (2008)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Warfarin	NR	NR	Rat	M	200	Back	3d	3	24h	1	Histology, immunohistochemistry, full thickness skin organ culture, T cell activation costimulatory assay.	1 µg/rat	Non-numerical histological effects reported. Significant increase in costimulatory activity in ConA stimulated thymocyte cultures.	522	Kataranovski et al (2007)
Warfarin	NR	NR	Rat	M	200	Back	3d	3	24h	1	Histology, immunohistochemistry, full thickness skin organ culture, T cell activation costimulatory assay.	10 µg/rat	Non-numerical histological effects reported. Significant increase in costimulatory activity in ConA stimulated thymocyte cultures.	522	Kataranovski et al (2007)
Warfarin	NR	NR	Rat	M	200	Back	3d	3	24h	1	Histology, immunohistochemistry, full thickness skin organ culture, T cell activation costimulatory assay.	100 µg/rat	Non-numerical histological effects reported. Significant increase in costimulatory activity in ConA stimulated thymocyte cultures.	522	Kataranovski et al (2007)
Warfarin	NR	NR	Rat	M	180-200	Dorsal skin	24h	1	-	2	Granulocyte activity.	0.05 mg/kg	Significant increase in granulocyte activity (MTT reduction and adhesion to plastic) relative to controls	2099	Kataranovski et al (2003)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Warfarin	NR	NR	Rat	M	180-200	Dorsal skin	24h	1	-	2	Granulocyte activity.	0.5 mg/kg	Significant increase in granulocyte activity (MTT reduction and adhesion to plastic) relative to controls	2099	Kataranovski et al (2003)
Warfarin	NR	NR	Rat	M	200	Dorsal skin	24h	1	-	2	Metabolic viability of skin explants, oxidative activity in skin tissue homogenates and inflammatory/ immune response of warfarin treated skin.	1 µg	Significant increase in malondialdehyde (MDA) and decreased levels of glutathione and protein sulphydryls indicating oxidative stress in treated skin. Significant increase in T-cell activation capacity of treated epidermal cells.	2108	Kataranovski et al (2005)
Warfarin	NR	NR	Rat	M	200	Dorsal skin	24h	1	-	2	Metabolic viability of skin explants, oxidative activity in skin tissue homogenates and inflammatory/ immune response of warfarin treated skin.	10 µg	Significant increase in malondialdehyde (MDA) and decreased levels of glutathione and protein sulphydryls indicating oxidative stress in treated skin. Significant increase in T-cell activation capacity of treated epidermal cells.	2108	Kataranovski et al (2005)

Appendix H. Inhalation toxicity– LD50/LC50

Table 11: Studies reporting inhalation LD50 or LC50 values

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Cacodylic acid	F	65.6 %	Mouse	M	25-30	Whole body	2h	1	LC50	>6.4 mg/L	One mortality during the observation period.	1509	Stevens et al (1976)
Cacodylic acid	F	65.6 %	Mouse	F	25-30	Whole body	2h	1	LC50	>6.4 mg/L	No mortalities	1509	Stevens et al (1976)
Cacodylic acid	F	65.6 %	Rat	F	100-200	Whole body	2h	4	LC50	3.9 mg/L		1509	Stevens et al (1976)
Cacodylic acid	F	65.6 %	Rat	M	100-200	Whole body	2h	3	LC50	>6.9 mg/L	Two mortalities at 4.1mg/L, no mortalities at 6.9 mg/L. LC50 could not be calculated	1509	Stevens et al (1976)
Chlorfenprop-methyl	T	NR	Guinea pig	M	400-750	Whole body	4h	3	LD50	>929 mg/m^3	No mortality at any dose.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Mouse	M	18-22	Whole body	4h	1	LD50	>1425 mg/m^3	No mortalities or symptoms.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Mouse	M	18-22	Whole body	4h	3	LD50	>929 mg/m^3	No mortality at lower doses, 20% mortality at highest dose	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Rabbit	M	2000-3000	Whole body	4h	3	LD50	>929 mg/m^3	No mortality at any dose.	1575	Loser and Kimmerle (1973)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Whole body	1h	1	LD50	>1425 mg/m^3	No mortalities or symptoms.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Whole body	4h	3	LD50	>1383 mg/m^3	Mortality (20%) at highest dose tested (1383mg/m^3) only.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Whole body	4h/d (5 days)	2	LD50	>1150 mg/m^3	Mortality (10%) at highest dose tested (1150mg/m^3) only.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	F	50% (EC)	Rat	M	160-220	Whole body	4h	2	LD50	>1070 mg/m^3	No mortality at either dose.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	F	50% (EC)	Rat	M	160-220	Whole body	4h/d (5 days)	2	LD50	>1520 mg/m^3	No mortality at either dose.	1575	Loser and Kimmerle (1973)
Chlorfenprop-methyl	T	NR	Rat	M	160-220	Whole body	4h	3	LD50	>929 mg/m^3	No mortality at lower doses, 70% mortality at highest dose	1575	Loser and Kimmerle (1973)
Chlorfenvinphos	T	91.5 %	Rat	M	194-233 (mean 205)	Snout only	4h	9	LC50	0.34 mg/L	Small mist size.	1412	Tsuda et al (1986)
Chlorfenvinphos	T	91.5 %	Rat0	M	194-233 (mean 205)	Snout only	4h	8	LC50	0.072 mg/L	Large mist size.	1412	Tsuda et al (1986)
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	5	LC50	0.094 mg/L	Temperature at exposure was 18C. Large mist size.	1351	Ikeda et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	5	LC50	0.128 mg/L	Temperature at exposure was 24C. Large mist size.	1351	Ikeda et al (1987)
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	5	LC50	0.093 mg/L	Temperature at exposure was 29C. Large mist size.	1351	Ikeda et al (1987)
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	2	LC50	0.34 mg/L	Temperature at exposure was 18C. Small mist size.	1351	Ikeda et al (1987)
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	2	LC50	0.52 mg/L	Temperature at exposure was 24C. Small mist size.	1351	Ikeda et al (1987)
Chlorfenvinphos	T	92.7 %	Rat	M	183-236	Snout only	4h	2	LC50	0.51 mg/L	Temperature at exposure was 29C. Small mist size.	1351	Ikeda et al (1987)
Chlorfenvinphos	NR	NR	Rat	M	185-215	Nose only	4h	3	LC50	0.133 mg/L	No mortality at the lowest dose, 60% mortality at 0.144mg/L, 100% at 0.236mg/L.	1051	Takahashi et al (1994)
Chlorfenvinphos	NR	NR	Rat	M	185-215	Nose only	4h	3	LC50	0.509 mg/L	20% mortality at 0.254mg/L, 40% mortality at 0.471mg/L and 100% mortality at 1.019mg/L.	1051	Takahashi et al (1994)
Chloropicrin	NR	99.6 %	Rat	M	NR	Whole body	4h	6	LC50	11.9 ppm	No mortality at lowest dose tested, 100% mortality at the highest dose. Symptoms recorded at all doses.	1378	Yoshida et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Chloropicrin	NR	99.7 %	Rat	M	NR	Nose only	4h	4	LC50	6.6 ppm	No mortalities at lowest dose, one mortality at 5.9ppm, six mortalities at 6.6ppm and six mortalities at the highest dose. All mortalities within 24h of exposure.	1209	Yoshida et al (1991)
Chloropicrin	NR	99.7 %	Rat	M	NR	Whole body	4h	3	LC50	14.4 ppm	One mortality at 12.3ppm, 2 mortalities at 13.9ppm within 24h of exposure. Seven mortalities at highest dose, 5 on day of exposure, 2 on day 9 post-exposure.	1209	Yoshida et al (1991)
Decamethrin	T	NR	Rat	M	175-200	NR	120-150min	NR	LC50	940 mg/m^3	Assuming a 200g rat has a minute volume of 80ml/min, that 100% is absorbed in the lungs, and 60% of inspired material is decamethrin, the LD50 was calculated as 36mg/kg. LCT50 (LC50 x exposure time) =1.12 x 10(power)5 mg min/m^3	1510	Kavlock et al (1979)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Decamethrin	T	NR	Rat	F	175-200	NR	120-150min	NR	LC50	785 mg/m^3	Assuming a 200g rat has a minute volume of 80ml/min, that 100% is absorbed in the lungs, and 60% of inspired material is decamethrin, the LD50 was calculated as 28mg/kg. LCT50 (LC50 x exposure time) =1.00 x 10(power)5 mg min/m^3	1510	Kavlock et al (1979)
Diazinon	NR	NR	Rat	M	250	Whole body	4h	NR	LD50	3.5 mg/L	Calculated dose 672 mg/kg,	898	Sabaitis et al (1999)
DSMA	F	80.1 %	Mouse	M	25-30	Whole body	2h	3	LC50	>6.9 mg/L	No mortalities	1509	Stevens et al (1976)
DSMA	F	80.1 %	Mouse	F	25-30	Whole body	2h	3	LC50	>6.9 mg/L	No mortalities	1509	Stevens et al (1976)
DSMA	F	80.1 %	Rat	M	100-200	Whole body	2h	1	LC50	>6.1 mg/L	No mortalities	1509	Stevens et al (1976)
DSMA	F	80.1 %	Rat	F	100-200	Whole body	2h	1	LC50	>6.1 mg/L	No mortalities	1509	Stevens et al (1976)
Fenthion	T	95.3 %	Rat	M	183-236	Snout only	4h	4	LC50	1.39 mg/L	Temperature at exposure was 18C. Large mist size.	1351	Ikeda et al (1987)
Fenthion	T	95.3 %	Rat	M	183-236	Snout only	4h	5	LC50	1.72 mg/L	Temperature at exposure was 24C. Large mist size.	1351	Ikeda et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Fenthion	T	95.3 %	Rat	M	183-236	Snout only	4h	5	LC50	1.35 mg/L	Temperature at exposure was 29C. Large mist size.	1351	Ikeda et al (1987)
Fenthion	T	95.3 %	Rat	M	200	Whole body	4h	7	LC50	0.22 mg/L	No mortalities at the two lowest doses (0.16 and 0.18 mg/L). 100% mortality at the two highest doses (0.25 and 0.28 mg/L). All mortalities occurred from post-exposure days 3 to 9.	1327	Iwasaki et al (1988)
Fenthion	T	95.3 %	Rat	M	200	Snout only	4h	6	LC50	1.84 mg/L	No mortalities at the lowest dose (1.54 mg/L). 100% mortality at the two highest doses (2.01 and 2.03 mg/L). All mortalities occurred from post-exposure days 1 to 9.	1327	Iwasaki et al (1988)
Fenvalerate	F	20%	Rat	M	150	Nose only	4h	NR	LC50	32376 mg/m^3		1820	Dutta et al (2001)
Methyl bromide	NR	NR	Rat	M	NR	Whole body	4h	10	LC50	780 ppm	Onset of mortality at about 830ppm, 100% mortality at about 830ppm.Estimated 100% survival concentration was 650ppm, 100% mortality concentration 900ppm.	1748	Kato et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Monocrotophos	NR	NR	Rat	M	250	Whole body	4h	NR	LD50	0.08 mg/L	Calculated dose 15 mg/kg.	898	Sabaitis et al (1999)
Oxamyl	T	95%	Rat	M	NR	NR	4h	5	LC50	0.064 mg/L	No mortalities at 0.020mg/L, mortalities at 0.053mg/L and higher doses.	1433	Kennedy (1986)
Oxamyl	T	95%	Rat	F	NR	NR	1h	3	LC50	0.12 mg/L	Mortalities at all doses.	1433	Kennedy (1986)
Oxamyl	T	95%	Rat	M	NR	NR	1h	4	LC50	0.17 mg/L	No mortalities at 0.14mg/L, mortalities at 0.16mg/L and higher doses.	1433	Kennedy (1986)
Parathion	NR	NR	Rat	M	250	Whole body	4h	NR	LD50	0.01 mg/L	Calculated dose 2 mg/kg	898	Sabaitis et al (1999)
Pentachlorophenol	NR	NR	Rat	M	220	Nose only	28-44mins	7	LD50	11.7 mg/kg	Mortality ranged from 33.3% at the lowest dose to 85.3% at the highest dose.	1532	Hoben et al (1976)
Phosphamidon	NR	NR	Rat	M	250	Whole body	4h	NR	LD50	0.18 mg/L	Calculated dose 35 mg/kg	898	Sabaitis et al (1999)
Phosphine	P	99.995%	Mouse	M	NR	Whole body	1h	5	LC50	>59.2 ppm	No mortalities at any dose.	1009	Omae et al (1996)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Dose levels	Endpoint	Effect dose	Effect comments	Ref.	Source
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	4h	5	LC50	26.5-33.4 ppm	0% mortality at 26.5ppm and below, 100% mortality at 33.4ppm and above. Time to death within 3d at 33.4 ppm, within 2d at 45.5 ppm and within 12h at 66.9ppm.	1009	Omae et al (1996)
TCPE (fenteracol)/ Aktinit PK (atrazine)	F	25%/ 25%	Rat	NR	NR	NR	4h	NR	LD50	>1070 mg/kg	Value would appear to be for formulation.	1545	Bordas et al (1976) (original in Bulgarian)

Appendix I. Inhalation toxicity– other effects

Table 12: Studies of the effects of inhalation exposure on mammals

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,2-Dichloro-propane	NR	99%	Rat	M	230	Whole body	4h	1	-	8	Blood concentration, biochemical assays.	15-4900 mg/m^3	Hepatic GSH significantly reduced at 100-4900mg/m^3 immediately after exposure and from 1800-490mg/m^3 after 20h.	1244	Di Nucci et al (1990)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	T	90.9%	Mouse	M/F	NR	Whole body	6h/d	-	Daily (5d a week for 13 weeks)	4	Clinical signs, bodyweight, organ weight, clinical chemistry, haematology, urinalysis, necropsy and histopathology.	10-150 ppm	One F died in each of the 90 and 150ppm groups that were not attributed to treatment. Significant decrease in relative heart and liver weight in M at 90ppm. Significant increase in relative kidney weight and decrease in relative thymus weight in F at 90ppm. Significant decrease in relative brain and liver weight in both sexes at 150ppm. Significant decrease in relative heart and kidney weight in M, and relative thymus weight in F at 90 and 150ppm. Significant increase in relative kidney weight in F at 150ppm. Other findings at the higher doses also presented without statistics.	1310	Stott et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	NR	92.1%	Mouse	M/F	NR	Whole body	6h/d	-	Daily (5d a week for 24 months)	3	Clinical signs, bodyweight, clinical pathology, organ weight, pathology.	5-60 ppm	No clinical signs. Survival c. 90% in males, 80-90% in females. Significant decrease in bodyweight of males during study but only significant for females during the first 5 weeks. Significant decrease in relative liver weight and increase in relative kidney weight in the male 20ppm group at 12 months. Significant decrease in relative kidney weight in male mice in the 60ppm group at 6, 12 and 24 months. Significant decrease in relative liver weight in 60ppm males at 6 and 12 months. Some significant histopathological changes in both sexes at 60ppm and females only at 20ppm.	1786	Lomax et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloropropene	NR	90.1%	Rabbit	F	NR	Whole body	6h/d	13	Daily	3	Maternal measurements, reproductive parameters and foetal alterations.	20-120 ppm	No clinical signs reported. One mortality in each of control, 60 and 120ppm groups were not attributed to treatment. Significant decrease in maternal bodyweight gain during the exposure period. No effects on reproductive parameters.	1368	Hanley et al (1987)
1,3-Dichloro-propene	NR	49.3-49.6% cis,46.7% trans isomer	Rat	M	363-366	Whole body	6h/d	70	Daily for 10 weeks.	3	Clinical signs, bodyweight and necropsy results for unexposed females mated with exposed males..	10-150 ppm	No obvious treatment related symptoms. One male died at 2weeks in the 60ppm group but this was not thought to be treatment related.. Significant depression in bodyweight of males in the 150ppm group during exposure. No significant effects on fertility found apart from reduced post implantation loss in week 2 and decreased corpora lutea in week 1 both at 150ppm	945	Gollapudi et al (1998)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	T	92%	Rat	M/F	NR	Whole body	6h/d	-	Daily (5d a week) prior to breeding , daily 7d a week) during breeding , gestat-ion and lactation	3	Bodyweight, fertility indices, postnatal survival, pup weights, histopathology.	10-90 ppm	Significant decrease in bodyweight of F0 and F1 males exposed to 90ppm throughout most of the treatment periods. No adverse effects on reproductive parameters observed at any dose or in any generation. Mortality of some pups in the 10ppm F1b group died 24h post-partem but this was not considered treatment related. No significant adverse histopathologic effects apart from the nasal mucosa which were affected at 90ppm..	1278	Breslin et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	T	90.9%	Rat	M/F	NR	Whole body	6h/d	-	Daily (5d a week for 13 weeks)	4	Clinical signs, bodyweight, organ weight, clinical chemistry, haematology, urinalysis, necropsy and histopathology.	10-150 ppm	No mortalities. Significant decrease in bodyweight at 90 and 150ppm. Significant increase in relative brain, heart, liver and testes weight in M at 90ppm. Significant decrease in bodyweight at 150ppm. Significant increase in relative brain heart and kidney weight in both sexes, liver and thymus weight in M. Other findings at the higher doses also presented without statistics.	1310	Stott et al (1988)
1,3-Dichloro-propene	F	94%	Rat	M	150-175	Nose only	1h	1	-	5	Urine volume, excretion of mercapturic acid of cis-1,3-dichloropropene (3C-NAC).	40.3-788.5 ppm	Significant increase in urine volume at 283.9ppm only. Significant increase in 3C-NAC excretion at all doses relative to controls.	1311	Fisher and Kilgore (1988)
1,3-Dichloro-propene	F	94%	Rat	M	200-250	Nose only	1h	1	-	7	Glutathione (GSH) levels in heart, kidney, liver, lung and testes.	1.8-1716.0 ppm	Significant decrease in GSH in heart, liver, lung and testes at 1716.0ppm.	1335	Fisher and Kilgore (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	F	94%	Rat	M	200-250	Nose only	1h	1	-	4	Glutathione (GSH) levels in nasal tissues.	5.2-222.9 ppm	GSH levels reduced at all doses. No statistics presented.	1335	Fisher and Kilgore (1988)
1,3-Dichloro-propene	F	94%	Rat	M	200-250	Nose only	1h	1	-	3	Lung weight and serum lactate dehydrogenase (LDH).	24.9-2276.7 ppm	No significant effects on lung weight. Significant decrease in serum LDH activity at 2276.7ppm.	1335	Fisher and Kilgore (1988)
1,3-Dichloro-propene	NR	90.1%	Rat	F	NR	Whole body	6h/d	10	Daily	3	Maternal measurements, reproductive parameters and foetal alterations.	20-120 ppm	No mortalities or clinical signs. Maternal bodyweight and food consumption significantly depressed at all dose levels relative to controls. Significant effects on water consumption at 20 and 120ppm. Significant decrease in absolute liver weight at all dose levels and increase in relative kidney weight at 120ppm. Significant effects on reproductive parameters were decreases in % pregnant at 70ppm and foetal bodyweight at 20ppm.	1368	Hanley et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene	NR	92.1%	Rat	M/F	NR	Whole body	6h/d	-	Daily (5d a week for 24 months)	3	Clinical signs, bodyweight, clinical pathology, organ weight, pathology.	5-60 ppm	No clinical signs. Survival >50% in all groups except male controls (46%). Significant reduction in bodyweight at 60ppm in both sexes. Some significant histopathological changes in both sexes at 60ppm and females only at 20ppm.	1786	Lomax et al (1989)
1,3-Dichloropropene	F	94%	Rat	M	200-250	Nose only	1h	1	-	3	Levels of the glutathione conjugate (GSCP) in the blood at different time points up to 1d post-exposure (decay).	78-404 ppm	No significant dose related effects.	1926	Fisher and Kilgore (1989)
1,3-Dichloro-propene/ 1,2-Dichloro-propane	T	NR	Rat	M	NR	Whole body	6h/d	-	Daily (5d a week for 10 weeks)	3	Clinical signs. Male fertility.	10-90 ppm	No treatment related mortality or signs. Significant reduction in bodyweight in the 90ppm group. No significant effect on male reproductive performance.	1324	Linnett et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
1,3-Dichloro-propene/ 1,2-Dichloro-propane	T	NR	Rat	F	NR	Whole body	6h/d	-	Daily (5d a week for 10 weeks)	3	Clinical signs. Female fertility.	10-90 ppm	No treatment related mortality or signs. Significant reduction in bodyweight in the 90ppm group. No significant effect on female reproductive performance. Significant increase in kidney weight when measured 7 weeks post-exposure.	1324	Linnett et al (1988)
1,3-Dichloro-propene/ 1,2-Dichloro-propane	T	NR	Rat	M/ F	NR	Whole body	6h/d	-	Daily (5d a week for 10 weeks)	3	Clinical signs, organ weights, necropsy and histopathology	10-90 ppm	No treatment related mortality or signs. Significant reduction in bodyweight in the 90ppm group. Significant increase in kidney and liver weight in both sexes at the end of the exposure period.	1324	Linnett et al (1988)
Alachlor	NR	NR	Rat	M/ F	160-180	Whole body	6h/d	-	Daily (5d a week for 30d)	2	Symptoms, bodyweight, histological and biochemical assays.	11.0-49.0 mg/m^3	No symptoms or change in bodyweight. Significant histological/biochemical changes indicated but no statistics presented.	93	Antov et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Alachlor	NR	NR	Rat	M/F	160-180	Whole body	6h/d	-	Daily (5d a week for 120d)	2	Symptoms, bodyweight, histological and biochemical assays.	1.5-8.5 mg/m^3	No symptoms or change in bodyweight. Significant histological/biochemical changes indicated but no statistics presented.	93	Antov et al (1986)
Aminocarb	NR	98.9%	Mouse	F	NR	Nose only	NR	1	-	3	Plaque forming cell (PFC), mixed lymphocyte reaction (MLR) and Interleukin-2 (IL-2) assays.	0.9 mg/m^3/h	No significant effects reported.	1024	Bernier et al (1995)
Aminocarb	F	4.4%	Rat	M	NR	Nose only	1h	1	-	3	Lung weight, lung biochemistry and histology.	11-134 mg/m^3	Significant increase in lung weight in rats exposed to the highest dose (134mg/m^3) 1d and 14d post-exposure. Significant effects on enzymatic activities and protein/ phospholipid content reported across doses and time points.	1118	Chevalier et al (1993)
Aminocarb	F	19.7%	Rat	M/F	193/211	Nose only	2h/d	30	Daily for 30d	3	Clinical signs, bodyweight, ChE activity, serum biochemical, haematological and urinary parameters.	22.5-90 µg/L	No treatment related mortalities. Mild symptoms seen in the 45 and 90µg/L groups. Significant decrease in serum	1421	Brecken-ridge et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
													triglyceride concentration in both sexes at 45 and 90µg/L at the end of treatment and the recovery period. Significant reduction in erythrocyte AChE activity in females at 22.5 and 90µg/L at the end of the exposure period. Significant reduction in plasma pseudocholinesterase activity at 90µg/L measured on days 8, 15 and 30 of the exposure period. Significant increase in lung weight at all dose levels in both sexes at the end of both the exposure and post-exposure periods. Some significant effects in the vehicle control group when compared with the air control group also reported.		

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Bacillus thuringiensis israelensis	F	NR	Mouse	F	18-22	Head only	60min/d	10	Daily (5 days a week for 2 weeks)	1	Airway irritation, CFU, inflammatory cells in BALF, Histology.	1.9 x 10^4 CFU/d	No evidence of irritation. Some histological changes in 3 mice indicating inflammation.	320	Barfod et al (2010)
Bacillus thuringiensis israelensis	F	NR	Rat	M/F	160-180	NR	6h/d	15	Daily (5d a week for 30d)	1	Symptoms and mortality. Organ weights, haematological and biochemical assays.	1.2 x 10^{10} sp./kg	No symptoms. No effects on organ weight, biochemistry or haematology.	1703	Halkova et al (1993)
Bacillus thuringiensis kurtaki	F	NR	Mouse	F	18-23	Head only	60min/d	10	Daily (5 days a week for 2 weeks)	0	Airway irritation, CFU, inflammatory cells in BALF, Histology.	2.3 x 10^3 CFU/d	No evidence of irritation. One mouse with residual CFU in BAL fluid after 70d.	320	Barfod et al (2010)
Bacillus thuringiensis var. israelensis	F	NR	Rat	M/F	275.3/ 220.1	Intra nasal	21d	1	-	1	Clinical signs, bodyweight and clearance rate.	3.6 x 10^8 CFU	No significant effects reported during observation period.	280	Mancebo et al (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Benomyl	T	NR	Rat	M/F	89-175	Nose only	6h/d	63/64	Daily (5d a week for 14 weeks).	3	Clinical observations, bodyweight, clinical pathology, pathology, organ weights.	10-200 mg/m^3	Significant depression in bodyweight in males considered to reflect reduced food consumption. Significant decrease in F between days 64-92 of test also recorded at all doses. Significantly higher levels of degeneration of olfactory epithelium in both sexes at 200mg/m^3 after both 45 and 90 days of test.	1271	Warheit et al (1989)
Carbaryl	NR	98-99%	Rat	M	189-242	Nose only	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	36 mg/kg	No significant effects.	1055	Laics et al (1994)
Carbaryl	NR	98-99%	Rat	M	189-242	Nose only	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	137 mg/kg	No significant effects. Some signs of neurotoxicity.	1055	Laics et al (1994)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Carbaryl	NR	98-99%	Rat	M	189-242	Nose only	6h/d	10	Daily (5 days per week for 2 weeks)	3	Lymphoid organ and liver weights, spleen cell number and blood cell counts	335 mg/kg	Significant decrease in spleen cell number and thymus weight relative to controls. Significant reduction in primary antibody response to SRBC. Some signs of neurotoxicity.	1055	Laics et al (1994)
Carbaryl	T	99%	Rat	M	200	Whole body	1h/d	1-3	Daily	3	Barbiturate sleeping time, ChE activity, liver cytochrome P450 and protein, histopathology.	112-224 mg/m^3	Significant increase in pentabarbitol sleeping time after one exposure, significant decrease after 3 exposures relative to controls. Significant reduction in hepatic microsomal cytochrome P-450 at 168 and 224mg/m^3. Significant reduction in protein concentration in liver microsomal fractions	1464	Lee and Hong (1985)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Carbon disulfide	P	≥99%	Rat	M	285-335	NR	6h/d	-	Daily for 14 weeks	1	Food consumption, hemodynamic effects, histological assay.	700 ppm	No significant effects on food consumption. Significant decrease in body mass and cardiac output relative to controls. Significant increase in relative mass of heart, liver and kidney. Significant increase in blood pressure and cardiac index (ml/min/100g). Significant negative effects on kidney, lung and brain circulation.	585	Morvai et al (2005)
Carbon disulfide	NR	NR	Rat	M/F	NR	Nose only	6h/d	65	Daily (5d a week for 13 weeks).	3	Bodyweight, blood carbon disulfide levels.	50-800 ppm	Significantly reduced bodyweight during the exposure period at 500 and 800ppm, more pronounced in males.	944	Moorman et al (1998)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlordane	T	100%	Cynomo-lgus monkey (Macaca fascicul-aris)	NR	NR	Whole body	8h/d	-	Daily (5d a week for 90d)	3	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	0.1-10 µg/L	No mortalities or clinical signs. No effects on bodyweight, food consumption Significant increase in rectal temperature at 1.0 and 10µg/L. Blood MCV levels significantly higher in M at all dose levels.. Significant decrease in platelets in F in the 10µg/L group at 13 weeks. No effects on organ weights.	1283	Khasawinah et al (1989)
Chlordane	T	100%	Rat	M/ F	NR	Whole body	8h/d	-	Daily (5d a week for 28d)	4	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	5.8 µg/L	No clinical signs observed. Significant increase in blood globulin in M. Increase in liver weight in F and thyroid weight in M (no statistics presented).	1283	Khasawinah et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlordane	T	100%	Rat	M/ F	NR	Whole body	8h/d	-	Daily (5d a week for 28d)	4	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	28.2 µg/L	Some F rats showed signs of sensitivity to touch from day 16. Significant decrease in blood glucose and increase in blood globulin in both sexes. Significant increase in blood total protein, cholesterol and albumin in F. Significant increase in water consumption in M. Significantly lower urine pH in both sexes. Increased liver weight in both sexes,, kidney and thyroid weight in M, lower thymus weight in F (no statistics presented.	1283	Khasawinah et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlordane	T	100%	Rat	M/F	NR	Whole body	8h/d	-	Daily (5d a week for 28d)	4	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	154 µg/L	Early mortality led to sacrificing remaining rats after exposure 11. Severe symptoms from exposure 2. Significant weight loss and reduced food consumption in both sexes. Early mortality limited comparisons with controls for many parameters.	1283	Khasawinah et al (1989)
Chlordane	T	100%	Rat	M/F	NR	Whole body	8h/d	-	Daily (5d a week for 28d)	4	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	413 µg/L	Early mortality lead to sacrificing remaining rats after exposure 3.Severe symptoms from exposure 2-3. Early mortality limited comparisons with controls for many parameters.	1283	Khasawinah et al (1989)
Chlordane	T	100%	Rat	M/F	NR	Whole body	8h/d	-	Daily (5d a week for 90d)	3	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	0.1 µg/L	No mortalities or clinical signs. Significant increase in blood albumin and Ca in M.	1283	Khasawinah et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlordane	T	100%	Rat	M/ F	NR	Whole body	8h/d	-	Daily (5d a week for 90d)	3	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	1 µg/L	No mortalities or clinical signs. Significant increase in WBC and decrease in Hb in F. Significant increase in kidney weight of M at week 9 only	1283	Khasawinah et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlordane	T	100%	Rat	M/ F	NR	Whole body	8h/d	-	Daily (5d a week for 90d)	3	Bodyweight, food and water consumption, haematology blood chemistry, urinalysis, organ weight and histopathology.	10 µg/L	No mortalities or clinical signs apart from some F exhibited sensitivity to touch from exposure 18 and some M after exposure 63. Significant increase in water consumption by M during week 4-6 along with higher rectal temperature at exposure 18. Significant effects on several haematology and blood chemistry parameters. Significant increase liver weight in both sexes at weeks 9 and 14 only.. Significant increase in kidney weight in M at week 9, and both sexes at week 14.	1283	Khasawinah et al (1989)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	8.8 ppm	No mortalities. Significant reduction in bodyweight 1 week after exposure.	1378	Yoshida et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	11 ppm	25% mortality. Significant reduction in bodyweight 1 week and 2 weeks after exposure.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	11.4 ppm	37.5% mortality. Significant reduction in bodyweight 1 week and 2 weeks after exposure.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	12.1 ppm	62.5% mortality. Significant reduction in bodyweight 1 week and 2 weeks after exposure. Significant increase in absolute lung weight.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	13.6 ppm	87.5% mortality. Significant reduction in bodyweight 1 week after exposure, not determined thereafter due to mortality.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	4h	1	-	6	Mortality, bodyweight, organ weight.	16 ppm	100% mortality. Effect on bodyweight not determined due to mortality.	1378	Yoshida et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	0.5h	1	-	6	Mortality, bodyweight.	21.7 ppm	No mortalities. Significant reduction in bodyweight 1 week after exposure.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.6%	Rat	M	NR	Whole body	0.5h	1	-	6	Mortality, bodyweight.	45.5 ppm	100% mortality. Effect on bodyweight not determined due to mortality.	1378	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	2 weeks	10	Daily (5d a week for 2 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	0.73 ppm	No mortalities. N significant effects.	1394	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	2 weeks	10	Daily (5d a week for 2 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	1.28 ppm	No mortalities. Significantly reduced bodyweight by end of study.	1394	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	2 weeks	10	Daily (5d a week for 2 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	2.5 ppm	No mortalities. Significantly reduced bodyweight from day 3 to end of study. Significant reduction in absolute lung weight.	1394	Yoshida et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	2 weeks	10	Daily (5d a week for 2 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	4.98 ppm	100% mortality with all animals dying between days 9 and 13. Significantly reduced bodyweight from day 3 to day 10 (no survivors at end of study).	1394	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	13 weeks	65	Daily (5d a week for 13 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	0.37 ppm	No mortalities.	1394	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	13 weeks	65	Daily (5d a week for 13 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	0.67 ppm	No mortalities. Significant increase in Haemoglobin concentration.	1394	Yoshida et al (1987)
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	13 weeks	65	Daily (5d a week for 13 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	1.58 ppm	No mortalities. Significant reduction in bodyweight. Significant increase in red blood cell count.	1394	Yoshida et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chloropicrin	NR	99.7%	Rat	M	NR	Whole body	13 weeks	65	Daily (5d a week for 13 weeks)	4	Mortality, bodyweight, organ weight, urinalysis, hematologic, serum biochemical and gross pathology.	2.93 ppm	No mortalities. Significant reduction in bodyweight. Significant reduction in absolute lung weight. Significant increase in haematocrit, haemoglobin concentration, red blood cell count,, blood urea nitrogen and alkaline phosphatase. Significant decrease in total cholesterol.	1394	Yoshida et al (1987)
Chlorothalonil	NR	NR	Mouse	NR	NR	Whole body	1h	1	-	1	DNA damage.	1.2 kg/ha	No significant effects reported on DNA tail length or percent DNA in tail..	218	Garron et al (2012)
Chlorpyrifos	NR	100%	Rat	M/ F	NR	Nose only	6h/d	-	Daily (5d a week for 13 weeks)	3	Clinical signs, bodyweight, organ weight, clinical chemistry, ChE activity, pathology.	5-20 ppm	No clinical signs or significant effects on any of the parameters.	1754	Corley et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Chlorpyrifos/ prophenophos +cypermethrin /alpha-methrin/ hexaconazole mixture	F	20%/ 40% + 4%/ 10%/ (used at 5.43 %)	Mouse	M/ F	20-24	Whole body	6h/d	-	Daily (5 days a week for 90d)	1	Effects on blood parameters and bone marrow.	10 ml of 5% aqueous mixture/ d	Significant effect on blood parameters (reduced haemoglobin, red blood cells, white blood cells). Significantly reduced bone marrow cellularity and cell release. Further effects on bone marrow.	186	Chaklader et al (2012)
Cyfluthrin	NR	93%	Mouse	M/ F	NR	Nose only	1h	1	-	1	Breathing patterns.	90 mg/m^3	Increase in expiratory and apnea times, decrease in respiratory rate. No statistics presented.	989	Pauluhn (1996)
Cyfluthrin	NR	NR	Rat	M	NR	Nose only	6h/d	20-65	Daily (5 days a week) for 4 or 13 weeks	1	NOAEL based on upper respiratory tract (URT) sensory irritation.	approx. 0.1 mg/m^3	NOAEL based on upper respiratory tract (URT) sensory irritation.	934	Pauluhn and Machemer (1998)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Cyfluthrin	NR	93%	Rat	M/F	NR	Nose only	6h/d	20	Daily (5 days a week) for 4 weeks	3	Clinical signs, breathing patterns.	0.44 - 47 mg/m^3	No clinical signs at two lowest dose levels. Exposure to highest concentration caused piloerection, hyperactivity and bradypnea. Decrease in breathing rate at the two higher doses. No statistics presented.	989	Pauluhn (1996)
Cyfluthrin	NR	93%	Rat	M/F	NR	Nose only	1h	1	-	1	Breathing patterns.	90 mg/m^3	Increase in expiratory and apnea times, decrease in respiratory rate. No statistics presented.	989	Pauluhn (1996)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
d-allethrin	NR	97.3%	Mouse	M/F	NR	Whole body	6h/d	7	Daily	4	Effects on pups including clinical signs, bodyweight, motor activity, muscarinic receptor density and water maze.	0.43-74.2 mg/m^3	Some mortalities but these were not considered to be treatment related. No effect on bodyweight. Transitory effects motor activity in females at 17d and 4 months old reported. No significant effects on muscarinic receptor density at 7d or 4 months, or water maze performance in males at 11 months old.	712	Tsuji et al (2002)
Deltamethrin	F	0.05g/m2	Rat	M	115.6 ±14.4	Whole body	30mins/d	45	Daily for 45 days	2	Clinical signs, histopathological assessment of lung tissue.	6 mg/m^3	No clinical signs exhibited. Significant negative effects on lungs reported.	558	Erdogan et al (2006)
Deltamethrin	F	0.05g/m2	Rat	M	115.6 ±14.4	Whole body	30mins/d	45	Daily for 45 days	2	Clinical signs, histopathological assessment of lung tissue.	12 mg/m^3	No clinical signs exhibited. Significant negative effects on lungs reported.	558	Erdogan et al (2006)
Dichlorvos	NR	96%	Mouse	F	NR	Whole body	7h/d	10	Daily (GD 6 to GD 15)	1	Clinical signs, bodyweight, reproductive parameters and effects on foetuses.	4 µg/L	No clinical signs observed. No significant effect on any of the reproductive or foetal parameters.	1505	Schwetz et al (1979)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dichlorvos	NR	NR	Mouse	F	NR	Whole body	8 weeks	1	-	2	Clinical effects, percentage pregnancies, implantation rate, early foetal death.	2.3-7.7 µg/L	No clinical signs observed, no significant effects on reproduction observed.	1541	Dean and Blair (1976)
Dichlorvos	NR	96%	Rabbit	F	NR	Whole body	7h/d	13	Daily (GD 6 to GD 18)	1	Clinical signs, bodyweight, reproductive parameters and effects on foetuses.	4 µg/L	No clinical signs observed. No significant effect on any of the reproductive or foetal parameters.	1505	Schwetz et al (1979)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Dichlorvos	P	98%	Rat	M	180-200	Whole body	45mins	1	-	5	Electrophysiological investigations, microbiological assay, histopathology.	1-15 µg/L	Dyspnoea, increased salivation, and excessive urination and defecation in animals at 10 and 15µg/L. No significant electromyographic changes at 1µg/L. Significant increase in amplitude of motor unit action potential (MUAP) at 2µg/L and above from 60 mins onwards. Significant decrease in MUAP frequency and increase in duration for all doses 5µg/L and above from 60 mins onwards. Significant decrease in phrenic nerve compound muscle action potential (CMAP) amplitude and area at all dose 5µg/L and above from 60 mins onwards. Histopathological effects described.	751	Atiy et al (2002)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Endosulfan	F	35%	Mouse	M	NR	Whole body	10 min/week	2-4	Weekly	1	Serum protein, albumin, globulin, gamma and A-gamma globulin assayed.	375 ppm	Significant decrease in serum protein at 15d, serum albumin at 30d, serum globulin at 15 and 30d, gamma globulin at 30d, A-gamma globulin at 15d.	338	Nawaz et al (2010)
Endosulfan	F	35%	Mouse	M	NR	Whole body	2min/h	3-6	Hourly	1	Serum protein, albumin, globulin, gamma and A-gamma globulin assayed.	375 ppm	Significant decrease in serum protein at 15d, serum albumin at 30d, serum globulin at 15 and 30d, gamma globulin at 30d, A-gamma globulin at 15d.	338	Nawaz et al (2010)
Endosulfan	F	NR	Rat	NR	180-200	Whole body	6h/d		Daily (5d a week for 30d)	1	Serum liver enzyme levels, liver histology.	100 ml/d (formulation sprayed)	Significant increase in aspartate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphatase (ALP) and creatine kinase (CK) in serum.	256	Uboh et al (2011)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Endosulfan	F	35%	Rat	NR	180-200	Whole body	4h/d	26	Daily (6d a week for 30d)	1	Renal function test serum indices, histopathological examination.	100 ml (formulation sprayed)	Significant decrease in serum total protein, albumin, sodium, chlorine relative to controls. Significant increase in serum creatinine, urea, BUN, Uric acid and potassium. Histopathology results described.	2110	Uboh et al (2011)
Fenvalerate	F	20%	Rat	M	150±20	Nose only	4h/d	-	Daily (5 days a week for 90d)	1	Clinical signs, kidney weight, serum urea and creatinine levels	2200 ppm	No significant effects reported.	506	Mani et al (2007)
Fenvalerate	F	20%	Rat	M	150±20	Nose only	4h/d	-	Daily (5 days a week for 90d)	1	Clinical signs, kidney weight, serum urea and creatinine levels	3500 ppm	No significant effects reported.	506	Mani et al (2007)
Fenvalerate	F	20%	Rat	M	150±20	Nose only	4h/d	-	Daily (5 days a week for 90d)	1	Clinical signs, kidney weight, serum urea and creatinine levels	6500 ppm	Five of six animals exhibited acute signs of pyrethroid poisoning. Significant increase in kidney weight. Significant increase in serum urea and creatinine	506	Mani et al (2007)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	F	20%	Rat	M	150	Nose only	4h/d	-	Daily (5d a week for 3 months)	3	Sperm motility, sperm count, biochemical assay of testes.	2200-6500 mg/m^3	Clinical signs observed at 6500mg/m3. Significant decrease in bodyweight, testes weight, sperm count, sperm motility, serum testosterone concentration and activity of testicular G6PDH and 17-β-HSD observed at the highest dose (6500mg/m^3) only.	711	Mani et al (2002)
Fenvalerate	F	20%	Rat	M	150	Nose only	4h/d	-	Daily (5d a week for 90d)	3	Clinical signs, lung weight, histopathology and biochemistry.	2200-6500 mg/m^3	Symptoms including ataxia, convulsions and tremors at the highest dose (6500mg/m^3. Non-acute symptoms at 3500mg/m3. Significant increase in lung weight and lung LDH, ACP, ALP and γ-GT at the highest dose (6500mg/m^3).	755	Mani et al (2001)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Fenvalerate	F	20%	Rat	M	150	Nose only	4h/d	-	Daily (5 days a week for 90d)	1	Biochemical and histopathological measurements, lung weight.	32376 mg/m^3	No mortalities. Symptoms (convulsions, lethargy and tremors) following exposure which normalised overnight. Significant increase in oxidatively damaged end products of lipid peroxidation in lungs. Significant elevation of levels of end products of protein oxidation in lungs. Significant increase in lung weight expressed as a proportion of bodyweight.	1820	Dutta et al (2001)
gamma-HCH	NR	99.5%	Rat	NR	NR	Nose only	1h	1	0	2	DNA damage of nasal mucosal cells.	0.3-3 mg/m^3	Clear genotoxic effects in the nose' at 100µg/kg (3mg/m^3). Data presented graphically (no statistics).	1983	Pool-Zobel et al (1993)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Mancozeb	F	80%	Rat	F	214	Whole body	6h/d	-	Daily	3	Clinical signs, bodyweight, maternal organ changes, effects on reproduction and foetal alterations	110-1890/500 mg/m^3	Three mortalities at 110mg/m3, 30 mortalities at 890mg/m^3 (including 3 killed in extremis), 24 mortalities at the highest dose (including 11 rats killed in extremis). Symptom recorded in all treated groups with severity increasing with dose. Significant decrease in body weight change at110 and 1890/500mg/m^3 (not determined at 890mg/m^3). Incidence of pregnancy in surviving dams at 890 and 1890/500mg/m^3 significantly reduced. Significant increase in the incidence of haemorrhage and waxy rib in foetuses in the 110/mg/m^3 group.	1414	Lu and Kennedy (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Mancozeb	F	80%	Rat	F	213	Whole body	6h/d	-	Daily	3	Clinical signs, bodyweight, maternal organ changes, effects on reproduction and foetal alterations	1-55 mg/m^3	No clinical signs observed except for mild symptoms in 6 rats at the highest dose. Significant decrease in body weight change at $55mg/m^3$. Significant increase in the incidence of waxy rib in foetuses in the $55mg/m^3$ group	1414	Lu and Kennedy (1986)
Methomyl	F	45%	Rat	M	NR	Whole body	4h	1	-	1	ChE activity in plasma and RBC.	9.9 mg/m^3	Plasma ChE activity depressed, no statistics presented.	1370	Tanaka et al (1987)
Methomyl	F	45%	Rat	M	NR	Whole body	4h/d	-	Daily (5d a week for 3 months)	1	Body weight, organ weight, ChE activity in plasma and RBC, lipid concentration in lungs,, fatty acid composition of phosphatidylcholine, histopathology.	14.4 mg/m^3	Significant decrease in Plasma ChE activity. No other significant effects reported.	1370	Tanaka et al (1987)
Methyl bromide	NR	99%	Rabbit	M	2300-2700	Whole body	7.5h/d	120	Daily (4d a week, to total 900h expos-ure)	1	Neurobehavioral tests (latency rates of sciatic and ulnar nerves and eye blink reflex of the orbicularis oculi muscle).	26.6 ppm	No treatment effects detected.	1877	Russo et al (1984)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	96%	Rat	M	185-290	Whole body	6h	1	-	1	Uptake into organs (liver, lung, stomach and fore stomach.	55.5 µmol/kg	Radioactivity highest in stomach and forestomach.	1192	Gansewendt et al (1991)
Methyl bromide	NR	96%	Rat	F	185-290	Whole body	6h	1	-	1	Uptake into organs (liver, lung, stomach and fore stomach.	113 µmol/kg	Radioactivity highest in stomach and forestomach.	1192	Gansewendt et al (1991)
Methyl bromide	NR	99.9%	Rat	M	265	Whole body	6h/d	1-5	Daily for 1, 3 or 5d	1	Clinical observations, morphology.	200 ppm	No clinical signs. Significant decrease in bodyweight relative to controls by day 5 of exposure which continued until day 47 post-exposure. Histopathological effects following exposure described. Significant increase in olfactory epithelial cell proliferation response from day 1 of exposure which peaked at day 2 and was still significantly elevated at post-exposure week 10.	1314	Hurtt et al (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	99.9%	Rat	M	265	Whole body	6h	1	-	2	Olfactory function, morphology.	90-200 ppm	Animals exposed to 200ppm rendered temporarily incapable of locating the hidden pellets until 4-6d post-exposure. The 90ppm group were unaffected. Histopathological effects at 200ppm described.	1314	Hurtt et al (1988)
Methyl bromide	NR	99.9%	Rat	M	NR	Whole body	6h/d	1-5	Daily for 1, 3 or 5d	1	Clinical signs, bodyweight, testicular indices, epididymal sperm parameters, non-protein sulfhydryl, plasma testosterone.	200 ppm	No clinical signs. Significant decrease in bodyweight relative to controls until day 52. Significant reduction in non-protein sulfhydryl in testis and liver on exposure days 1 and 3. Significant decrease in plasma testosterone throughout exposure period and one day post-exposure (day 6).	1320	Hurtt and Working (1988)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	NR	Rat	M	250-300	Whole body	8h	1	-	1	Concentration of dopamine (DA), homovanillic acid (HVA), norepinephrine (NE),3-methoxy-4-hydroxyphenyl-glycol (MHPG), serotonin (5HT0 and 5-hydroxyindoleacetic acid (5HIAA) in the brain.	100 ppm	Significant effects on levels of DA relative to controls immediately after exposure and HVA up to 8h after exposure. Significant effect on levels of NE and MHPG from 0 to 2h after exposure.	1354	Honma et al (1987)
Methyl bromide	NR	NR	Rat	M	250-300	Whole body	8h	1	-	4	Concentration of dopamine (DA), homovanillic acid (HVA), norepinephrine (NE),3-methoxy-4-hydroxyphenyl-glycol (MHPG), serotonin (5HT0 and 5-hydroxyindoleacetic acid (5HIAA) in the brain.	31-250 ppm	Significant effects on HVA at 63ppm and DA and HVA at 125 and 250ppm relative to controls . Significant effects on MHPG at 63ppm and NE and MHPG at 125 and 250ppm.	1354	Honma et al (1987)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	99.9%	Rat	M	NR	Whole body	6h/d	5	Daily for 5d	4	Clinical signs, pathology.	90-325 ppm	30% mortality at 325ppm after the fourth exposure. Diarrhoea and ataxia observed at 250 and 325ppm with tremors and convulsions at the higher dose. Pathological findings at the highest dose described.	1356	Hurtt et al (1987)
Methyl bromide	NR	99.5%	Rat	M	NR	Whole body	3 weeks	1	-	3	Organ weights, biochemical evaluation of blood and organs	1-10 ppm	40% mortality in highest dose. Indicates no difference between control, 1ppm group and controls, some effects in the 5ppm group and many changes in the 10ppm group. Detailed data provided but no statistical analysis.	1447	Sato et al (1985)
Methyl bromide	NR	NR	Rat	M	177.1 (mean)	Whole body	4h/d	55	Daily (5 days a week for 11 weeks)	4	Mortality, clinical signs, bodyweight, haematology, organ weight, bromide residues, histopathology.	150 ppm	Subacute exposure. No mortalities, no clinical signs. Significant decrease in blood alkaline phosphokinase, aldolase, total lipids and non-esterified fatty acids.	1748	Kato et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	NR	Rat	M	177.1 (mean)	Whole body	4h/d	30	Daily (5 days a week for 6 weeks)	4	Mortality, clinical signs, bodyweight, haematology, organ weight, bromide residues, histopathology.	200 ppm	Subacute exposure. No mortalities, no clinical signs. Significant decrease in blood LAP, total lipids, triglycerides and non-esterified fatty acids.	1748	Kato et al (1986)
Methyl bromide	NR	NR	Rat	M	177.1 (mean)	Whole body	4h/d	30	Daily (5 days a week for 6 weeks)	4	Mortality, clinical signs, bodyweight, haematology, organ weight, bromide residues, histopathology.	300 ppm	Subacute exposure. Three treated rats with hindlimb paralysis sacrificed at 5 weeks. Significant increase in blood aspartic transaminase, LAP, hydroxybutyrate dehydrogenase and decrease in total lipids. Significant decrease in brain weight.	1748	Kato et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	NR	Rat	M	177.1 (mean)	Whole body	4h/d	30	Daily (5 days a week for 6 weeks)	4	Mortality, clinical signs, bodyweight, haematology, organ weight, bromide residues, histopathology.	400 ppm	Subacute exposure. Ataxia after 2 weeks, and paralysis after 5 weeks in five rats. Four treated rats died, a further two were sacrificed due to weakness. Significant decrease in blood alkaline phosphokinase and increase in total cholesterol. Significant decrease in thymus and heart weight.	1748	Kato et al (1986)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	NR	98.8%	Rat	M/F	91-99	Whole body	6h/d	-	Daily (5d a week for 128 weeks [M], 129 weeks [F])	3	Mortality, clinical signs, bodyweight, organ weight, pathology.	3-90 ppm	In the 90ppm group mortality significantly exceeded control mortality at week 114 in males and week 121 in females. Significant lower bodyweight in 90ppm animals of both sexes at several time points through the study. Significant decrease in kidney weight in both sexes at 53 weeks in both sexes. Significant decrease in brain weight of females at 90ppm at weeks 53 and 105. Significant increase in nasal cavity hyperplastic changes at all doses after 29 months. Significant increase in heart thrombi in both sexes at 90ppm at 29 months.	1813	Reuzel et al (1991)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl bromide	P	99.9%	Rat	M/F	NR	Whole body	6h/d	5	Daily for 5d	1	Brain glutathione-S-transferase (GST) activity, concentrations of glutathione (GSH), monoamines and amino acids.	150 ppm	Significant decrease in GST activity and GSH concentration in both sexes in all brain regions examined. In males there was a significant increase in aspartate (ASP) levels in the frontal cortex and cerebellum and glycine (GLY) in the frontal cortex only.	2120	Davenport et al (1992)
Methyl iodide	NR	99.7%	Rabbit	F	3000-4500	Whole body	6h/d	23	Daily	3	Maternal and foetal effects.	10-75/50 ppm	Significant increase in maternal food consumption at 10ppm, decrease at 20ppm. Significantly higher % early resorptions per litter at 75/50ppm and % late resorptions at 25ppm and 75/50ppm. Significant increase in total postimplantaion loss (%) at 25ppm and decrease in foetal bodyweight at 75/50ppm.	408	Nemec et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Methyl iodide	NR	99.7%	Rabbit	F	3000-4500	Whole body	6h/d	23	Daily	3	Maternal and foetal effects.	2-20 ppm	Significant decrease in weight of gravid uterus, % live foetuses per litter at 20ppm. Significant increase in % early and late resorptions and total postimplantaion loss. Significant reduction in foetal bodyweight loss in mal offspring at 10ppm and in both sexes at 20ppm.	408	Nemec et al (2009)
Methyl iodide	NR	99.7%	Rabbit	F	3000-4500	Whole body	6h/d	2-23	Daily	1	Maternal and foetal effects.	20 ppm	Some effects on maternal bodyweight change during parts of the gestation period but no net effect. Significant increase in % late resorptions per litter.	408	Nemec et al (2009)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Paraquat	NR	NR	Mouse	M	NR	Intra nasal	30d	30	Daily	3	Motor performance, striatal dopamine (DA) and dihydroxyphenylacetic acid (DOPAC) levels, loss of dopaminergic neurons.	10-30 mg/kg	Decline in motor performance over time at 20mg/kg and above. At 30mg/kg about one third died in the first week and another third showed severe symptoms. No evidence of dopaminergic degeneration. No apparent effect on DA or DOPAC levels. No statistics presented.	497	Rojo et al (2007)
Paraquat	NR	NR	Rabbit	M	2500	Whole body	2h	1	-	1	Clinical signs, physiological studies, pathological examination, tissue levels	10000 Total mg in 134L chamber over 2h	Dose estimated as 5.4mg. Severe symptoms with 3 animals dead within 12h and the remaining three within 38h. Pathological signs described.	1517	Seidenfeld et al (1978)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Paraquat	NR	NR	Rabbit	M	2500	Whole body	2h/week	5	Weekly	1	Clinical signs, physiological studies, pathological examination, tissue levels	200 Total mg in 134L chamber over 2h	Dose estimated as 0.3mg. Symptoms commenced from the second exposure onwards, less active than controls. Significantly reduced PaO2 relative to controls. Pathological signs described.	1517	Seidenfeld et al (1978)
Paraquat	NR	NR	Rabbit	M	2500	Whole body	2h/week	13	Weekly	1	Clinical signs, physiological studies, pathological examination, tissue levels	10 Total mg in 134L chamber over 2h	Dose estimated as 270mg. Not different from controls.	1517	Seidenfeld et al (1978)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Paraquat	NR	NR	Rabbit	M	2000	Whole body	1h/d	2	5d	1	Clinical signs, physiological studies, pathological examination.	250 Total mg in 140L chamber over 2h	Symptoms observed 2d after initial exposure. Significantly lower PaO2 , bodyweight, breathing frequency, A-aO2, % macrophages, % polymorphonuclear leukocytes (PMNs) and significantly higher lung weight relative to controls at 3d post-exposure. Significantly higher bodyweight and lung volume relative to controls at 42d post-exposure. pathological signs described.	1915	Seidenfeld et al (1985)
Parathion	NR	NR	Rat	M	140-180	Whole body	2h	1	-	1	Plasma and RBC ChE activity.	29 mg/m^3	Significant decrease in plasma and RBC ChE activity relative to controls.	641	Mehrani (2004)
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	1h	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	>24.5 ppm	Acute exposure, no mortalities. Significant reduction in kidney weight. Significant increase in monocytes, significant reduction in alkali phosphatases.	1009	Omae et al (1996)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	2h	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	23.9 ppm	Acute exposure, no mortalities. Significant reduction in bodyweight. Significant reduction in heart weight. Significant increase in monocytes.	1009	Omae et al (1996)
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	4h	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	>24.5 ppm	Acute exposure, no mortalities. Significant decrease in bodyweight. Significant reduction in kidney, testes and heart weight. Significant reduction in red blood cells and segmented leukocytes. Significant increase in eosinophilic leukocytes and monocytes. Significant reduction in alkali phosphatases.	1009	Omae et al (1996)
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	8h	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	24.9 ppm	Acute exposure, 100% mortality.	1009	Omae et al (1996)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	2 weeks	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	>4.9 ppm	Sub-acute exposure, no mortalities. Significant reduction in spleen and thymus weight.	1009	Omae et al (1996)
Phosphine	P	99.99 5%	Mouse	M	NR	Whole body	4weeks	1	-	1	Mortality, bodyweight, organ weight, haematological and serum biochemical measures.	4.9 ppm	Sub-acute exposure, 10% mortality (one mouse died on day 12). Significant reduction in bodyweight. Significant decrease in kidney weight. Significant increase in eosinophilic leukocytes and alanine aminotransferase.	1009	Omae et al (1996)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Propineb	NR	83%	Rat	M/F	230/160	Nose only	6h/d	5	Daily	4	Clinical observations, haematology, clinical pathology.	10.1-78.7 mg/m^3	%0% mortality in F rats exposed to 78.7mg/m^3. Significant decrease in grip strength in F rats at 38.1 and 78.7mg/m^3. Significant decrease in bodyweight at 78.7mg/m^3. Significant increase in lung weights of males at 38.1 and 78.7mg/m^3. Significant dose related increase in TTCA measurements in urine. NOAEL based on muscular weakness and grip strength was 19.9mg/m^3.	680	Pauluhn and Rosenbruch (2003)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Propineb	NR	83%	Rat	M/F	230/160	Nose only	6h/d	20	Daily (5d a week for 4 weeks).	4	Clinical observations, haematology, clinical pathology.	3.97-21.95 mg/m^3	Significant decrease in bodyweight of F rats at 21.95mg/m^3. One F at 11.2mg/m^3 and one at 21.95mg/m^3 euthanized due to severe weight loss. Significant increase in lung weight at 21.95mg/m^3. Lung lesions observed at all doses and muscle lesions in females at 11.1 and 21.95mg/m^3.	680	Pauluhn and Rosenbruch (2003)
Propoxur	F	1%	Rat	M/F	125	Whole body	5min	1	-	1	Tests of learning and memory.	5ml 1% spray	Significantly delayed learning process on first 2 days of the 5 day trial period. Significant negative effect on memory retention. Significant decline in brain AChE activity after 30mins, recovered by 24h.	1270	Mathew et al (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Propoxur	F	1%	Rat	M/F	125	Whole body	5min/d	21	Daily for 3 weeks	1	Tests of learning and memory.	5ml 1% spray/d	Significantly delayed learning process on all 5 days of the trial period. Significant negative effect on the learning process and memory retention. Significant decline in brain AChE activity after 30mins, recovered by 24h.	1270	Mathew et al (1989)
Rotenone	NR	NR	Mouse	M	NR	Intra nasal	30d	30	Daily	1	Motor performance, striatal dopamine (DA) and dihydroxyphenyl-acetic acid (DOPAC) levels, loss of dopaminergic neurons.	2.5 mg/kg	No apparent effect on motor performance or DA, DOPAC levels. No evidence of dopaminergic degeneration. No statistics presented.	497	Rojo et al (2007)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Sulfuryl fluoride	NR	99.8%	Rabbit	F	3500-4500	Whole body	6h/d	13	Daily	3	Maternal measurements, reproductive parameters and foetal alterations.	25-225 ppm	No overt signs of toxicity. Significant decrease in maternal bodyweight gain GD 12-15 and GD19-29 at 225ppm. Significant decrease in foetal bodyweight at 225ppm. Significant decrease in satellite vessels off major arteries in foetuses from the 25ppm and 225ppm groups.	1260	Hanley et al (1989)
Sulfuryl fluoride	NR	99.8%	Rabbit	M/F	NR	Whole body	6h/d	9	Daily (5d a week)	3	Clinical signs, clinical pathology, anatomic pathology.	10-600 ppm	One female rabbit at 600ppm had a convulsion which led to a fractured tibia. This and another with a fractured vertebra were euthanized. Nervous system and respiratory system effects at 300 and 600ppm described.	1266	Eisenbrandt and Nitschke (1989)
Sulfuryl fluoride	NR	99.8%	Rabbit	M/F	NR	Whole body	6h/d	65	Daily (5d a week for 13 weeks)	3	Clinical signs, clinical pathology, anatomic pathology.	30-600/300 ppm	Convulsions were observed at 600ppm in one male and one female and one male. A further female was euthanized after the eighth exposure due	1266	Eisenbrandt and Nitschke (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
													to posterior paralysis attributed to a fractured vertebra. The maximum dosed was reduced to 300ppm after the ninth exposure (overall 337ppm over the exposure period) and no further clinical signs were observed. Treatment related effects on bodyweight, nervous system and respiratory system described but no statistical differences presented. Significant decrease in liver weight at the highest dose. Significant increase in serum fluoride levels at 30, 100 and 337ppm. Significant increase in WBC counts in males at 337ppm.		

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Sulfuryl fluoride	NR	99.8%	Rat	F	175-220	Whole body	6h/d	10	Daily	3	Maternal measurements, reproductive parameters and foetal alterations.	25-225 ppm	No overt signs of toxicity. Significant increase in maternal water consumption GD6 to GD 18 in 225ppm group. Significant increase in foetal bodyweight at 225ppm.Significant increase in bilobed vertebral centra in foetuses from the 25 and 225ppm groups and unfused vertebral centra at 75ppm.	1260	Hanley et al (1989)
Sulfuryl fluoride	NR	99.8%	Rat	M/F	NR	Whole body	6h/d	9	Daily (5d a week)	3	Clinical signs, clinical pathology, anatomic pathology.	10-600 ppm	Significant weight loss and 90% mortality at 600ppm between the second and sixth exposures. Significant increase in heart weight in males 100ppm and females at 300 and 600ppm. Significant increase in kidney weight and decrease in thymus weight in females at 300 and 600ppm. Significant increase in white blood cells at 300ppm in both sexes.	1266	Eisenbrandt and Nitschke (1989)

Pesticide name	Grade	Purity	Species	Sex	Bwt (g)	Site	Duration	Doses	Dose interval	Dose levels	Measurements	Effect dose	Main findings	Ref.	Source
Sulfuryl fluoride	NR	99.8%	Rat	M/F	NR	Whole body	6h/d	65	Daily (5d a week for 13 weeks)	3	Clinical signs, clinical pathology, anatomic pathology.	30-300 ppm	Treatment related effects on bodyweight, nervous system and kidneys described but no statistical differences presented. Urinary specific gravity significantly decreased at 300ppm. Significant decrease in liver weight at 100ppm,	1266	Eisenbrandt and Nitschke (1989)
Sulfuryl fluoride	NR	99.8%	Rat	M/F	NR	Whole body	6h/d	-	Daily (5d a week for 13 weeks)	3	Observational battery, hindlimb grip strength, electrophysiology.	30-300 ppm	Significant reduction in bodyweight in the 300ppm group. All central nervous system evoked response significantly affected at 300ppm with some of these affected in females at 100ppm. Neuropathological changes at 300ppm described.	1323	Mattsson et al (1988)

Appendix J. Sources of dermal uptake information

Table 13: Information available from studies related to dermal uptake in mammals

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
2,4,5-T	X		X		X	Rhesus monkey (Macaca mulatta)		X				X			X		1247	Moody et al (1990)
2,4,5-T	X		X		X	Rhesus monkey (Macaca mulatta)		X				X		[Erratum Moody et al (1990) - (1247)]	X		1816	Moody (1991)
2,4-D	X						X									X	525	Brand et al (2007)
2,4-D		X					X									X	702	Brand et al (2003)
2,4-D	X					Guinea pig		X		X		X	X		X		1040	Moody et al (1994)
2,4-D	X				X	Guinea pig; Pig	X									X	1040	Moody et al (1994)
2,4-D	X		X		X	Rhesus monkey (Macaca mulatta)		X				X			X		1247	Moody et al (1990)
2,4-D		X						X							X		1360	Grissom et al (1987)
2,4-D		X					X									X	1360	Grissom et al (1987)
2,4-D		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985)
2,4-D		X						X							X		1780	Grissom et al (1987)
2,4-D	X		X		X	Rhesus monkey (Macaca mulatta)		X				X		[Erratum Moody et al (1990) - (1247)]	X		1816	Moody (1991)
2,4-D		X					X									X	523	Brand et al (2007)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
2,4-D		X					X									X	644	Pont et al (2004)
2,4-D	X						X									X	654	Brand et al (2004)
2,4-D		X					X									X	701	Pont et al (2003)
2,4-D		X					X									X	744	Brand et al (2002).
2,4-D						Pig	X									X	1121	Moody (1993)
2,4-D isoctyl	X		X		X	Rhesus monkey (Macaca mulatta)		X				X			X		1247	Moody et al (1990)
2,4-D isoctyl	X		X		X	Rhesus monkey (Macaca mulatta)		X				X		[Erratum Moody et al (1990) - (1247)]	X		1816	Moody (1991)
2,4-D-dimethylammonium	X							X				X			X		1159	Knopp and Schiller (1992)
2,4-D-dimethylammonium	X							X	X			X			X		1246	Pelletier et al (1990)
2,4-D-dimethylammonium	X		X		X	Rhesus monkey (Macaca mulatta)		X				X			X		1247	Moody et al (1990)
2,4-D-dimethylammonium	X							X	X	X	X	X	X		X		1281	Pelletier et al (1989)
2,4-D-dimethylammonium	X		X		X	Rhesus monkey (Macaca mulatta)		X				X		[Erratum Moody et al (1990) - (1247)]	X		1816	Moody (1991)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
2,4-D-dimethylammonium	X				X	Guinea pig	X									X	970	Moody and Nadeau (1997)
2,4-D-sodium	X							X				X			X		1159	Knopp and Schiller (1992)
2-phenylphenol	X				X			X	X			X	X		X		732	Cnubben et al (2002)
2-phenylphenol	X				X	Perfused pig ear	X									X	732	Cnubben et al (2002)
Alachlor		X					X									X	720	Brand and Mueller (2002)
Aldrin	X							X	X						X		1184	Graham et al (1991)
Aldrin	X						X									X	1205	Macpherson et al.
Aminocarb	X					Rhesus monkey (Macaca mulatta)		x							x		1382	Moody and Franklin (1987)
Atrazine	X							X							X		1381	Shah et al (1987)
Atrazine		X					X									X	720	Brand and Mueller (2002)
Bifenthrin	X				X		X									X	336	Hughes and Edwards (2010)
Captan	X							X			X	X	X	Carcass residue	X		1150	Fisher et al. (1992)
Captan	X						X									X	1150	Fisher et al. (1992)
Captan	X							X							X		1381	Shah et al (1987)
Captan		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985)
Carbaryl	X							X							X		1274	Shah et al (1989)
Carbaryl	X						X									X	1274	Shah et al (1989)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Carbaryl	X							X							X		1381	Shah et al (1987)
Carbaryl		X		X		[= Japanese quail]		X	X	X	X		X	Carcass residue	X		1477	Shah et al (1983)
Carbaryl	X							X	X		X		X		X		1479	Shah and Guthrie (1983)
Carbaryl		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Carbaryl						Pig	X									X	969	Baynes et al (1997)
Carbaryl	X						X									X	1204	Macpherson et al (1991)
Carbaryl	X							X		X	X	X		Carcass	X		1654	Knaak et al (1984)
Carbofuran	X							X							X		1274	Shah et al (1989)
Carbofuran	X						X									X	1274	Shah et al (1989)
Carbofuran	X							X	X	X	X	X	X		X		1379	Shah et al (1987)
Carbofuran	X						X									X	1379	Shah et al (1987)
Carbofuran	X							X							X		1381	Shah et al (1987)
Carbofuran		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Carbofuran	X						X									X	677	Liu and Kim (2003)
Carbofuran	X				X				X							X	207	Gammon et al (2012)
Carbosulfan	X						X									X	677	Liu and Kim (2003)
Chlordane						Rhesus monkey (Macaca mulatta)		X				X		[Uptake from soil]	X		1155	Wester et al (1992)
Chlordane					X		X							[Uptake from soil]		X	1155	Wester et al (1992)
Chlordecone	X							X	X	X		X	X	Carcass	X		926	Heatherington et al (1998)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Chlordecone	X						X									X	926	Heatherington et al (1998)
Chlordecone	X							X							X		1274	Shah et al (1989)
Chlordecone	X						X									X	1274	Shah et al (1989)
Chlordecone	X							X							X		1381	Shah et al (1987)
Chlordecone		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Chlorpyrifos	X							X							X		1381	Shah et al (1987)
Chlorpyrifos		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Chlorpyrifos-methyl		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
cis-Permethrin	X					Rhesus monkey (Macaca mulatta)		X				X			X		1336	Sidon et al (1988)
Cyhexatin		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985)
Cypermethrin	X				X	(human skin grafted onto mouse)	X	X							X		510	Capt et al (2007)
Cypermethrin	X				X		X	X								X	510	Capt et al (2007)
Cypermethrin	X							X				X			X		1357	Scott and Ramsey (1987)
Cypermethrin	X				X		X									X	1357	Scott and Ramsey (1987)
DDT	X							X			X				X		740	Tos-Luty et al (2002)
DDT	X					Guinea pig		X		X	X	X	X	Carcass residue	X		1041	Moody et al. (1994).
DDT	X				X	Guinea pig; Pig	X									X	1041	Moody et al. (1994). -
DDT		X						X							X		1360	Grissom et al (1987)
DDT		X					X									X	1360	Grissom et al (1987)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
DDT		X		X		[= Japanese quail]		X	X	X	X		X	Carcass residue	X		1477	Shah et al (1983)
DDT	X							X	X		X		X		X		1479	Shah and Guthrie (1983)
DDT		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
DDT		X						X							X		1780	Grissom et al (1987)
DDT						Pig	X									X	1121	Moody (1993)
DDT	X						X									X	1262	Bronaugh et al (1989)
DDT	X				X	Guinea pig; Pig	X									X	2046	Moir et al. (1994)
Deltamethrin	X				X		X									X	336	Hughes and Edwards (2010)
Diazinon	X					Guinea pig		X		X		X	X		X		1039	Moody and Nadeau (1994)
Diazinon	X				X	Guinea pig; Pig	X									X	1039	Moody and Nadeau (1994)
Diazinon						Pig	X									X	1121	Moody (1993)
Dicamba	X							X	X			X			X		1417	Makary et al (1986)
Dieldrin		X		X		[= Japanese quail]		X	X	X	X		X	Carcass residue	X		1477	Shah et al (1983)
Dieldrin		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Dienochlor	X							X				X	X	Carcass	X		1408	Quistad et al (1986)
Dimethylarsinic acid		X					X									X	1021	Hughes et al (1995)
Diniconazole	X							X							X		710	Navidi and Bunge (2002)
Dinoseb	X							X	X						X		131	Henneberg (1966)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Dinoseb	X							X		X	X	X	X		X		1146	Hall et al (1992)
Dinoseb	X						X									X	1146	Hall et al (1992)
Dinoseb	X							X							X		1274	Shah et al (1989)
Dinoseb	X						X									X	1274	Shah et al (1989)
Dinoseb	X							X							X		1381	Shah et al (1987)
Diquat dibromide	X	X	X		X	Guinea pig	X									X	1249	Scott and Corrigan (1990)
DSMA	X							X							X		1381	Shah et al (1987)
Emamectin benzoate						Rhesus monkey (Macaca mulatta)		X				X	X		X		962	Wrzesinski et al (1997)
Endosulfan	X								X	X	X				X		1316	Dikshith et al (1988)
EPTC	X							X	X	X	X	X	X		X		1295	Knaak et al. (1989)
Fenitrothion	X					Rhesus monkey (Macaca mulatta)		X				X			X		1380	Moody et al (1987)
Fenitrothion	X					Rhesus monkey (Macaca mulatta)		x							x		1382	Moody and Franklin (1987)
Fenoxaprop-ethyl	X							X				X			X		1168	Moody and Ritter (1992)
Fenoxaprop-ethyl	X						X									X	1168	Moody and Ritter (1992)
Fenvalerate		X						X							X		1360	Grissom et al (1987)
Fenvalerate		X					X									X	1360	Grissom et al (1987)
Fenvalerate		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985)
Fenvalerate		X						X							X		1780	Grissom et al (1987)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Fenvalerate				X		[= Broiler chicken]				X	X				X		982	Majumder et al (1997)
Flocoumafen	X							X		X	X	X	X		X		1291	Huckle et al (1989)
Fluazipop-butyl	X				X			X				X	X		X		1048	Ramsey et al (1994)
Fluazipop-butyl	X				X		X									X	1048	Ramsey et al (1994)
Fluazipop-butyl	X							X	X			X			X		1052	Rawlings et al (1994)
Fluazipop-butyl	X				X		X									X	1046	Hilton et al (1994)
Fluazipop-butyl	X						X									X	1102	Auton et al (1993)
Fluazipop-butyl	X				X		X									X	1111	Clark et al. (1993)
Fluroxypyr		X					X									X	840	Hewitt et al (2000)
Fluroxypyr-meptyl		X					X									X	840	Hewitt et al (2000)
Folpet	X							X							X		1381	Shah et al (1987)
Fomesan	X							X	X			X			X		1052	Rawlings et al (1994)
Fomesan-sodium	X				X		X									X	1046	Hilton et al (1994)
Furathiocarb	X								X			X		(metabolites)	X		746	Liu et al (2002)
Furathiocarb	X						X									X	677	Liu and Kim (2003)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
gamma-HCH	X				X	(human skin grafted onto mouse)	X	X							X		510	Capt et al (2007)
gamma-HCH	X				X		X	X								X	510	Capt et al (2007)
gamma-HCH	X								X						X		834	Suwalsky et al (2000)
gamma-HCH	X					Rhesus monkey (Macaca mulatta)		X				X			X		1280	Moody and Ritter (1989)
gamma-HCH	X							X				X			X		1282	Moody et al (1989)
gamma-HCH		X				Human or pig skin grafted onto mouse; Pig		X				X	X	Carcass residue	X		1471	Reifenrath et al (1984)
gamma-HCH					X		X									X	958	Dick et al (1997)
HCH	X													Brain	X		924	Kumar et al. (1998).
HCH			X						X	X	X	X	X		X		1269	Dikshith et al (1989)
Hexaconazole	X							X							X		710	Navidi and Bunge (2002)
Iprobenfos	X											X		(metabolites)	X		583	Min et al (2005)
Malathion	X				X	(human skin grafted onto mouse)	X	X							X		510	Capt et al (2007)
Malathion	X				X		X	X								X	510	Capt et al (2007)
Malathion	X							X							X		756	Dary et al (2001)
Malathion	X							X		X	X			Carcass	X		858	Saleh et al (2000)
Malathion	X							X	X		X	X			X		960	Saleh et al (1997)
Malathion	X				X			X	X	X	X	X	X		X		1067	Dary et al (1994)
Malathion	X							X	X		X	X	X		X		1120	Zeid et al (1993)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Malathion		X				Human or pig skin grafted onto mouse; Pig		X				X	X	Carcass residue	X		1471	Reifenrath et al (1984)
Malathion		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Maleic hydrazide		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985).
Methidathion	X											X		(metabolites)	X		583	Min et al (2005)
Methomyl		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Methyl parathion	X								X						X		719	Kramer et al (2002)
Methyl parathion	X											X			X		832	Abu-Qare and Abou-Donia (2000)
Methyl parathion	X							X		X	X	X	X	Foetus	X		865	Abu-Qare et al (2000)
MSMA	X							X							X		1381	Shah et al (1987)
Nicotine	X							X							X		1381	Shah et al (1987)
Nicotine		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Oxadiazon	X							X				X	X	Carcass	X		1396	Knaak et al (1987)
Paraquat	X							X	X						X		1285	Hoffer et al (1989)
Paraquat		X							X	X	X	X	X	Carcass residue	X		1454	Grissom et al (1985)
Paraquat	X						X									X	547	Brand et al (2006)
Paraquat	X						X									X	654	Brand et al (2004)
Paraquat	X				X	Marmoset	X									X	1196	Scott et al (1991)
Paraquat dichloride	X	X	X		X	Guinea pig	X									X	1411	Scott et al (1986)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Parathion					X	(grafted onto mouse)		X							X		457	Boudry et al (2008)
Parathion					X	Pig		X								X	457	Boudry et al (2008)
Parathion	X							X							X		1381	Shah et al (1987)
Parathion		X				Human or pig skin grafted onto mouse; Pig		X				X	X	Carcass residue	X		1471	Reifenrath et al (1984)
Parathion		X		X		[= Japanese quail]		X	X	X	X		X	Carcass residue	X		1477	Shah et al (1983)
Parathion	X							X	X		X		X		X		1479	Shah and Guthrie (1983)
Parathion		X						X	X	X	X	X	X		X		1492	Shah et al (1981)
Parathion						Pig	X									X	1185	Chang and Riviere (1991)
Parathion	X							X		X	X	X		Carcass	X		1654	Knaak et al (1984)
Permethrin	X							X				X	X	Carcass	X		303	Reifenrath et al (2011)
Permethrin	X				X			X								X	303	Reifenrath et al (2011)
Permethrin			X					X				X	X		X		1161	Snodgrass (1992)
Permethrin		X						X							X		1360	Grissom et al (1987)
Permethrin		X					X									X	1360	Grissom et al (1987)
Permethrin	X							X							X		1381	Shah et al (1987)
Permethrin		X		X		[= Japanese quail]		X	X	X	X		X	Carcass residue	X		1477	Shah et al (1983)
Permethrin		X						X	X	X	X	X	X		X		1492	Shah et al (1981)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
Permethrin		X						X							X		1780	Grissom et al (1987)
Permethrin	X				X		X									X	336	Hughes and Edwards (2010)
Permethrin	X	X				Pig	X									X	969	Baynes et al (1997)
Permethrin			X			[= perfused ear]	X									X	980	Bast et al (1997)
Phosalone	X											X		(metabolites)	X		583	Min et al (2005)
Propiconazole	X							X							X		710	Navidi and Bunge (2002)
Propoxur	X				X			X				X	X		X		827	van de Sandt et al (2000)
Propoxur	X				X		X									X	827	van de Sandt et al (2000)
Propoxur			X		X	Pig	X									X	1083	Vandesandt et al (1993)
trans-Permethrin	X					Rhesus monkey (Macaca mulatta)		X				X			X		1336	Sidon et al (1988)
Triadimefon		X						X	X			X	X	Carcass residue	X		1773	Knaak et al (1984).
Triclopyr-butotyl	X				X		X									X	1140	Hotchkiss et al (1992)
Trifluralin		X					X									X	720	Brand and Mueller (2002)
Uniconazole	X							X							X		710	Navidi and Bunge (2002)
Vamidothion		X						X							X		1360	Grissom et al (1987)
Vamidothion		X					X									X	1360	Grissom et al (1987)
Vamidothion		X						X							X		1780	Grissom et al (1987)

Pesticide name	Species						Data								Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Dermal penetration	Dermal absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
α-HCH			X						X	X	X				X		312	Xue et al (2010)

Appendix K. Sources of inhalation uptake information

Table 14: Information available from studies related to inhalation uptake in mammals

Pesticide name	Species						Data							Study type		Ref. ID	Source
	Rat	Mouse	Rabbit	Bird	Human	Other	Inhalation absorption	Blood	Tissues	Organs	Urine	Faeces	Other	In-vivo	In-vitro		
1,2-Dichloroethane	X						X							X		1399	Igwe et al (1986)
1,3-Dichloropropene	X						X							X		1404	Stott and Kastl (1986)
Methyl bromide	X						X				X	X	Body	X		1461	Medinsky et al (1985)
Methyl bromide	X						X	X	X	X	X	X	Body	X		1462	Bond et al (1985)
Pentachlorophenol	X						X	X	X	X	X			X		1539	Hoben et al (1976)
Chlordane		X							X					X		1906	Asakawa et al (1996)
Sulfuryl fluoride	X							X	X		X	X		X		574	Mendrala et al (2005)
Carbon disulfide	X							X			X			X		944	Moorman et al (1998)
1,2-Dichloropropane	X							X						X		1244	Di Nucci et al (1990)
Carbaryl	X							X	X	X				X		1464	Lee and Hong (1985)
Paraquat dichloride	X						X	X	X	X	X	X		X		1957	Chui et al (1988)
Chlordane	X					Cynomolgus monkey		X	X	X				X		1258	Khasawinah (1989)