Arch. Environm. Contam. Toxicol. 12, 355–382 (1983)

Archives of Environmental Contamination and Toxicology

The Acute Oral Toxicity, Repellency, and Hazard Potential of 998 Chemicals to One or More Species of Wild and Domestic Birds

E. W. Schafer, Jr., W. A. Bowles, Jr., and J. Hurlbut[1]

U.S. Fish and Wildlife Service, Wildlife Research Center, Bldg. 16, Denver Federal Center, Denver, Colorado 80225

Abstract. The acute oral toxicity, repellency, and hazard potential of 998 chemicals to one or more of 68 species of wild and domestic birds was determined by standardized testing procedures. Red-winged blackbirds were the most sensitive of the bird species tested on a large number of chemicals, and an index based on redwing toxicity and repellency may provide an appropriate indication of the probability of acute avian poisoning episodes. Avian repellency and toxicity were not positively correlated (*i.e.* toxicity varied independently with repellency).

In a program designed to evaluate chemicals as potential avian toxicants, stupefacients, or repellents, personnel of the Wildlife Research Center at Denver, Colorado have tested (since 1960) over 2000 chemicals for acute oral toxicity to one or more species of wild and domestic birds. The purpose of this paper is to summarize the data on 998 known chemicals, draw appropriate generalizations from the data, and make recommendations on how these data might be used to predict acute avian poisoning potential.

Methods

The chemicals included technical and analytical grade, pesticidal, pharmaceutical, and other commercial or experimental compounds that were either purchased or solicited from cooperating firms. For presentation purposes, they have been arranged according to Chemical Abstracts Registry Numbers (CAS), and are identified by an accepted trade, coined, product or other chemical name that is **not** included in the 9th Collective Index of Chemical Abstracts Service.[2]

Wild-trapped birds were preconditioned to captivity for 2 to 6 weeks and were usually dosed by gavage with solutions or suspensions of the test chemical in propylene glycol, according to methods described by DeCino *et al.* (1966), Schafer (1972), and Schafer *et al.* (1967). Other oral dosing methods were occasionally used (pellets, gelatin capsules) but are not noted in the tables (Schafer, 1972). LD_{50} values were calculated by the method of Thompson (1948), Thompson and Weil (1952), and Weil (1952). Repellency tests were conducted by the methods of Starr *et al.* (1964) and Schafer and Brunton (1971), and R_{50}'s (analogous to LD_{50}'s) were calculated either by the method of Litchfield and Wilcoxin (1949) or Thompson and Weil (1952).

A repellency-toxicity index (hazard factor) was calculated by assuming that at the R_{50} level, a sixty-five g male redwing would consume 50% of his approximate individual maximum food capacity of 1 g. By making this assumption, it was possible to estimate the mg/kg of a chemical that could conceivably be ingested by a redwing at a given R_{50} level. This value, when divided by the acute oral LD_{50}, provides an index for indicating how likely it would be for acute oral poisoning to occur in the wild. An index value >1.00 indicates well-accepted toxic agents that have definite potential for causing acute poisoning episodes, an index value $\geq 0.25 \leq 1.00$ indicates these compounds with a possible potential, and an index value <0.25 indicates those compounds with little or no potential to cause acute avian poisoning episodes, at least in redwings.

Because of the large amount of data accumulated, an attempt was made to determine the significance of and/or correlation between the two of the measured parameters. Statistical comparisons of species sensitivities and ranked data were made by Friedmans ranking procedure (Friedman 1937) and ANOVA followed by Duncans Multiple Range Test. Although the non-parametric Friedmans procedure is a more accurate and valid

[1] Present address: Department of Chemistry, Metropolitan State College, Auraria Campus, 1006 11th Street Denver, CO 80204

[2] Because of the length and complexity of chemical abstracts nomenclature, the names used to identify chemicals in Table 2 were extracted from several sources. Primary consideration was given to the common name, but shortened chemical names, code numbers, or registered trademarks were also used but may not be specifically identified

method for determining the significance of our data, ANOVA resulted in a similar evaluation and allowed us to separate the three most-tested species. In addition, Pearson and Spearman correlation coefficients (Snedecor & Cochran 1971) were calculated for redwing R_{50}'s and LD_{50}'s (when both values were known) to determine possible correlations.

Results

The 68 bird species tested, along with their currently accepted scientific names and a four letter species code that was used in the following tabular data, are detailed in Table 1. Table 2 presents a tabular listing of the acute oral toxicity (LD_{50}) of the 998 chemicals to one or more of three avian species (redwing, starling, coturnix) plus the avian repellency values (R_{50}) and the toxicity-repellency index for redwings. Redwing, starling, and coturnix data were analyzed for those cases where LD_{50}'s (other than $\leqslant$ or $\geqslant$ values) were available for all these species ($n = 73$) or for redwings and starlings along ($n = 130$). It was shown that redwings were significantly more sensitive than starlings ($p = 0.001$), and that starlings and coturnix were not different ($p = 0.05$). The difference in toxicological sensitivity between redwings and starlings was 2.1x and the difference between coturnix and redwings was 1.4x. This agrees with previously published observations of the relative sensitivity relationships of redwings compared to other wild and domestic avian species (Schafer 1972; Schafer *et al.* 1979).

Statistical comparisons of the correlation between redwing LD_{50}'s and R_{50}'s were made to determine the validity of observations made over the past 20 years indicating that avian repellent activity appears to increase with increasing acute oral toxicity. Of the 998 chemicals tested, redwing R_{50}'s and LD_{50}'s are presented for 836. Of the 836, R_{50} and LD_{50} values for 501 chemicals (60.0%) were both greater than selected minimum activity levels (1.00% for R_{50} and 100 mg/kg or (90 mg/kg) for LD_{50}), 84 (10.1%) were repellent at or below 1.00% but toxic above 100 mg/kg, 75 (8.9%) were toxic at or below 100 mg/kg but repellent above 1.00%, 41 (4.9%) were not usable and 135 (16.2%) possessed activity in the range ($R_{50} \leqslant 1.00\%$, $LD_{50} \leqslant 100$ mg/kg) that could be used to examine the relationship between these two factors. However, neither Pearson or Spearman correlation coefficients (0.33 and 0.43, respectively) showed any positive correlation between R_{50}'s and LD_{50}'s. Thus, the data indicate that gross acute toxicity, as defined by the LD_{50}, is not positively related to gross repellency, as defined by the R_{50}, at least over the small range examined.

The repellency/toxicity index or acute avian hazard index was calculated for 377 chemicals where one or both R_{50} and LD_{50} values were known. Those chemicals for which the LD_{50} and R_{50} were only known to exceed some value could not be used in subsequent calculations since no meaningful value or trend could be determined by the index. Of the 223 chemicals for which definite index values could be calculated, 124 fell into the >1.00 class, 47 into the $\geqslant 0.25 \leqslant 1.00$ class and 52 in the <0.25 class. Examples of some chemicals in the >1.00 class (hazardous) are: Mitomycin C, TEM, thiotepa, famphos, parathion, and dimethoate. Examples of chemicals in the possibly hazardous class ($\geqslant 0.25 \leqslant 1.00$) are: coumaphos, aprocarb, fensulfothion, fenitrothion, and malathion. Examples of chemicals that fall into the probably nonhazardous class (<0.25) are: lidane, sulphenone, chlorpropham, thiram, and chlorothion. This index appears to have great potential for predicting those chemicals that may cause acute avian poisoning episodes in the field. It is the first time, to our knowledge, that an attempt has been made to equate potential hazards to an index that combines the toxicity of a compound with a behavioral measure that predicts how much of the chemical could potentially be consumed in a field situation. Thus, field application of a highly toxic chemical that is aversive to birds could have the same or less likelihood of inducing acute avian poisoning as a less toxic chemical that was more readily accepted.

Table 3 presents acute oral toxicity data of 82 chemicals to one or more of seven additional avian species. Table 4 presents the acute oral toxicity and repellency data of 90 chemicals to one or more of 58 other species of birds.

Table 1. Species code, common, and scientific names of birds referred to in this paper

Species code	Common name	Scientific name
akes	American kestrel	(*Falco sparverius*)
bbgr	Blue-black grassquit	(*Volatia jacarina*)
bbmp	Black-billed magpie	(*Pica pica*)
bhcb	Brown-headed cowbird	(*Molothrus ater*)
bjay	Blue jay	(*Cyanocitta cristata*)
brcb	Bronzed cowbird	(*Tangavius aeneus*)
bowl	Barn owl	(*Tyto alba*)

Table 1. (cont'd)

Species code	Common name	Scientific name
brth	Brown thrasher	(*Toxostoma rufum*)
btgr	Boat-tailed grackle	(*Cassidix major*)
btpa	Brown-throated conure	(*Aratinga pertinax*)
budg	Budgerigar	(*Melopsittacus undulatus*)
bwqu	Common bobwhite	(*Colinus virginianus*)
bwte	Blue-winged teal	(*Anas discors*)
cbth	Curve-billed thrasher	(*Toxostoma curvirostre*)
ccro	American crow	(*Corvus brachyrhynchos*)
cfin	Cassins finch	(*Carpodacus cassinii*)
cgoo	Canada goose	(*Branta canadensis*)
cgra	Common grackle	(*Quiscalus quiscula*)
chac	Plain chachalaca	(*Ortalis vetula*)
chaw	Cooper's hawk	(*Accipiter cooperii*)
cotq	Coturnix	(*Coturnix coturnix*)
cpig	Rock dove or common pigeon	(*Columba livia*)
crav	Northern raven	(*Corvus corax*)
cwax	Cedar waxwing	(*Bombycilla cedrorum*)
dicl	Dickcissel	(*Spiza americana*)
edov	Eared dove	(*Zebauda auriculata*)
gcsp	Golden-crowned sparrow	(*Zonotrichia atricapilla*)
gdov	Common or ground dove	(*Columbina passerina*)
geag	Golden eagle	(*Aquila chrysaetos*)
gosp	Golden sparrow	(*Passer luteus*)
grja	Green jay	(*Cyanocorax yncas*)
hfin	House finch	(*Carpodacus mexicanus*)
hlar	Horned lark	(*Eremophila alpestris*)
hspa	House sparrow	(*Passer domesticus*)
idov	Inca dove	(*Scardafella inca*)
larb	Lark bunting	(*Calamospiza melanocory*)
mald	Mallard	(*Anas platyrhynchos*)
mdov	Mourning dove	(*Zenaida macroura*)
mhaw	Northern harrier (Marsh hawk)	(*Circus cyaneus*)
mpar	Monk parakeet	(*Myiopsitta monachus*)
mwea	Northern masked weaver	(*Ploceus taeniopterus*)
ofpa	Orange-fronted conure	(*Aratinga canicularis*)
pind	Common pintail	(*Anas acuta*)
rbis	Red bishop	(*Euplectes orix*)
rbgu	Ring-billed gull	(*Larus delawarensis*)
rbqu	Red-billed quelea	(*Quelea quelea*)
rbse	Ruddy-breasted seedeater	(*Sporophila minuta*)
recb	Red-eyed cowbird	(*Tangavius aeneus*)
rdgo	Ruddy ground dove	(*Columbina talpacoti*)
rnph	Ring-necked pheasant	(*Phasianus colchicus*)
robi	American robin	(*Turdus migratorius*)
rwbb	Red-winged blackbird	(*Agelaius phoeniceus*)
scrj	Scrub jay	(*Aphelocoma coerulescens*)
sdov	Scaly dove	(*Scardafella squammata*)
shcb	Shiny cowbird	(*Molothrus bonariensis*)
shcr	Sandhill crane	(*Grus canadensis*)
star	European starling	(*Sturnus vulgaris*)
swha	Swainson's hawk	(*Buteo swainsoni*)
tcbb	Tricolored blackbird	(*Agelaius tricolor*)
turk	Wild turkey	(*Meleagris gallopavo*)
valq	California quail	(*Loportyx californica*)
vwea	Village weaver	(*Ploceus cucullatus*)
wcsp	White-crowned sparrow	(*Zonotrichia leucophrys*)
wfdo	White-fronted dove	(*Leptotila verreauxi*)
wwdo	White-winged dove	(*Zenaida asiatica*)
yhbb	Yellow-headed blackbird	(*Xanthocephalus xanthocephalus*)
ybmp	Yellow-billed magpie	(*Pica nuttalli*)

Table 2. Acute oral toxicity and repellency of 998 chemicals to Redwinged blackbirds, Starlings, and Coturnix Quail

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Phenobarbital	50066	+ 100(a,e)	+1.00	—	—	—	—
Mitomycin C	50077	7.50	+1.00	+76.9	+10.3	+ 17.8	+ 10.0−+100(m)
Hexobarbital sodium	50099	+ 100(a,e)	+1.00	—	—	—	—
Metharbital	50113	+ 100(a,e)	+1.00	—	—	—	—
Lysergide	50373	1.78(a,e)	—	—	—	+ 31.6(a,e)	—
Chlorpromazine	50533	—	—	—	—	+ 74.0−+100(a,e)	—
Reserpine	50555	100(a,e)	—	—	—	—	—
Niclosamide	50657	+ (60.0)	0.850	65.4	−1.09	—	—
Alloxan	50715	—	1.70	—	—	—	—
Dactinomycin	50760	1.00−3.16	+0.100	+ 7.69	+ 7.69	+ 3.16	+ 3.16
Aspirin	50782	100−+100(a,e)	+1.00	+76.9	+ 0.769	—	—
Piperonyl butoxide	51036	+ 100(a)	+1.00	—	—	+ 100(a)	—
Procaine HCl	51058		—	—	—	+ 100−+953(a,e)	—
Triethylenemelamine	51183	2.87−5.62	+1.00	+76.9	+27.4	3.66−4.22	100−133(g)
2,4-Dinitrophenol	51285	13.3(a)	—	—	—	42.2−46.0(a)	—
d-Amphetamine SO_4	51638	56.2	0.121	9.30	0.165	—	—
Tremorine	51730	100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Urethane	51796	+ 100(a)	+0.100	—	—	+ 100(a)	—
Tetramethylmethylenediamine	51809	+ 100	+1.00	—	—	—	+ 316(m)
Thiotepa	52244	5.62	0.805	61.9	11.0	17.8	237(f,m)
Cyclobarbital	52313	+ 100(a,e)	+1.00	—	—	—	—
Allobarbital	52437	+ 100−133(e)	—	—	—	+ 100(a,e)	—
Cycloleucine	52528	+ 178	+1.00	—	—	—	+ 100−316(m)
Bay 37341	52608	4.22(a)	0.237	18.5	4.39	+ 100(a)	—
Trichlorfon	52686	37.0−75.0	0.110−0.562	43.2	1.17	43.0	—
Famophos	52857	1.78(e)	0.133	10.2	5.75	4.22(e)	—
Hydroxydione sodium	53101	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Nicotine	54115	17.8	0.650	50.0	2.81	42.2	42.2−316(m)
6-Azauridine	54251	+ 100	+1.00	—	—	—	+ 100−316(m)
Pentylenetetrazole	54955	+ 100	0.826	63.5	− 0.635	—	+ 316(f)
3,4-Diaminopyridine	54966	75.0	+1.00	+76.9	+ 1.03	—	—
gamma-Picolinic acid	55221	+1000	+1.00	—	—	+1000	+1000
Bay 37342	55378	7.50−10.0(a)	0.110	8.46	1.13	+ 500(a)	—
Fenthion	55389	1.69−3.50(a,b,c)	0.060	4.62	2.73	5.30−17.8(a,c)	17.8(c)
Busulfan	55981	56.2	+1.00	+76.9	+ 1.37	—	316−750(g)
Tetraethylammonium chloride	56348	—	+1.00	—	—	—	—
Tributyltin oxide	56359	+ (30.0)	0.316	24.3	− 0.810	—	—
Parathion	56382	2.37(a,b,c,e)	0.133	10.2	4.31	5.62(a,c,e)	4.22(c)
Coumaphos	56724	1.78−3.60(a,b,c)	0.002−0.020	1.53	0.864	75.0−316(a,c)	13.3(c)
Chlorobutanol	57158	+ 100(a,e)	+1.00	—	—	—	—
Strychnine	57249	—	0.030	—	—	—	—
Pentobarbital sodium	57330	75.0(a,e)	—	—	—	+ 100−+665(a,e)	237(f)
Meprobamate	57534	—	—	—	—	+ 127(e)	—
9,10-Dimethyl-1,2-benzanthracene	57976	+ 100	+1.00	—	—	—	+ 316(f)
Caffeine	58082	316	0.180	13.9	0.044	500−+500(e)	—
Menadione	58275	+ 316	+1.00	—	—	—	—
DID 47	58366	23.7(a)	0.089	6.85	0.289	—	—
Perphenazine	58399	31.6(a,e)	+1.00	+76.9	+ 2.43	100(a,e)	—
Promazine	58402	—	—	—	—	+ 325−+335(a,e)	—
Theophylline	58559	—	0.316	—	—	—	—
Lindane	58899	75.0(a)	0.121	9.31	0.124	100(a)	—
Bromodeoxyuridine	59143	+ 100	+1.00	—	—	—	+ 100
4-Chloro-*m*-cresol	59507	+ (113)	+1.00	—	—	—	—

Vitamin B	59676	+1000	+1.00	—	—	+1000	+1000
Dopa	59927	100	+0.316	+24.3	+ 0.234	—	—
Acetamide	60355	+ (101)	+1.00	—	—	—	—
Strychnine sulfate	60413	6.00(e)	—	—	—	− 5.00(a)	—
Dimethoate	60515	6.60−17.8(a)	0.160−0.562	43.2	6.55	31.6(a)	—
Dieldrin	60571	17.8(c)	—	—	—	237(c)	56.2(c)
Phlorizin	60811	+ 100	+1.00	—	—	—	—
Mepazine	60899	—	—	—	—	− 183−200(e)	—
Dibucaine HCl	61121	42.2(a,e)	+1.00	+76.9	+ 1.82	100(a)	—
Amitrole	61825	+ 100	+1.00	—	—	—	+ 316(m)
Aniline	62533	562	+1.00	+76.9	+ 0.137	+1000	750
Dichlorvos	62737	13.3−17.8(a,c)	0.488	37.5	2.82	11.0−42.2(a,c)	23.7(c)
Compound 1080	62748	4.22	—	—	—	2.37	—
Benzquinamide	63127	100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Carbaryl	63252	56.2−+150(a)	0.120−0.210	16.2	0.287	—	—
Hercules AC-5727	64006	3.16−10.0(a,d,e)	0.020	1.54	0.481	17.0(a,d,e)	—
Formic acid	64186	+ (111)	+1.00	—	—	—	—
Mebutamate	64551	100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Colchicine	64868	− 31.6	0.284	21.8	+ 0.690	—	42.2−64.7(f)
Nicotine sulfate	65305	75.0(a,e,h)	0.095−0.255(h)	19.6	0.261	+ 100(a,e)	316
Benzoic acid	65850	+ 100(a)	+1.00	—	—	+ 100(a)	—
Caproic aldehyde	66251	—	—	—	—	—	—
Methyl methanesulfonate	66273	56.2	+1.00	+76.9	+ 1.37	—	75.0(f)
Actidione	66819	—	0.316	—	—	—	—
Ethionine	67210	+ 100	+1.00	—	—	—	+1000(f)
3,5-Dimethylpyrazole	67516	+ (104)	+1.00	—	—	—	—
Dimethyl sulfoxide	67685	100−+100(a)	+1.00	+ 76.9	+ 0.769	100−+100(a)	—
Hydroxyzine	68882	—	—	—	—	+ 527(e)	—
Hypoxanthine	68940	—	+3.16	—	—	—	—
Fluphenazine	69238	+ 100−178(a,e)	0.486	37.4	0.210	+ 100−562(a,e)	—
Xanthine	69896	—	2.65	—	—	—	—
Mephenoxalone	70075	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
p-Toluenesulfonamide	70553	75.0(a)	0.680	52.3	0.697	75.0(a)	—
4′-Aminopropiophenone	70699	133	—	—	—	316	316−+316(m)
Succinylcholine chloride	71272	+ 100−+500(e)	—	—	—	460(e)	—
n-Butyl alcohol	71363	—	+1.00	—	—	−2500	—
Thiopental sodium	71738	133(e)	+1.00	+76.9	+ 0.578	+ 100(a,e)	—
Endrin	72208	2.37(a,c)	0.083	6.38	2.69	2.37−3.16(a,c,k)	4.22(c)
Mestranol	72333	+1000	+1.00	—	—	—	+1000(g)
Alizarin	72480	316	+1.00	+76.9	+ 0.243	—	—
Adenine	73245	—	2.55	—	—	—	—
Guanine	73405	—	+2.50	—	—	—	—
Ethylamine	75047	+ (101)	+1.00	—	—	—	—
Methanesulfonic acid	75752	+ 100	+1.00	—	—	—	1000(f)
Trichloroacetaldehyde	75876	+ 100(a,e)	+1.00	—	—	—	—
Triphenyltin hydroxide	76879	+ 100	+1.00	—	—	—	—
Glutethimide	77214	+ 100(a,e)	0.900	69.2	− 0.692	+ 100(a,e)	—
Butalbital	77269	100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Butethal	77281	133−178(e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Tomatidine	77598	+ 100	+1.00	—	—	—	—
Quinic acid	77952	+ 100	+1.00	—	—	—	—
Dioxathion	78342	+ 100	+1.00	—	—	—	—
DEF	78488	+ (101)	+1.00	—	—	—	—
Propionamide	79050	+ (98.0)	+1.00	—	—	—	—
Acrylic acid	79107	+ (98.0)	+1.00	—	—	—	—
Thiosemicarbazide	79196	—	—	—	—	9.10−11.0(a)	—
Isobutyric acid	79312	+ (101)	+1.00	—	—	—	—
Methacrylic acid	79414	+ (111)	+1.00	—	—	—	—
Camphene	79925	+ (96.0)	+1.00	—	—	—	—
Phenaglycodol	79936	31.6−316(a,e)	+1.00	+ 76.9	+ 2.43	+ 100−+577(e)	+ 100

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Sulphenone	80002	+ 100	0.080	6.15	− 0.062	—	—
Dapsone	80080	—	+1.00	—	—	—	—
Diazald	80115	+ 100	+1.00	—	—	—	—
CI 37151	80228	+ 100(a)	+1.00	—	—	+ 100(a)	—
Tiglic acid	80591	+ (111)	+1.00	—	—	—	—
Chlormezanone	80773	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
4-Amino-1-benzoylaminoanthraquinone	81469	+ (113)	+1.00	—	—	—	—
1-Amino-2,4-dibromoanthraquinone	81492	—	+3.16	—	—	—	—
Quinizarin	81641	+ 316	1.65	127	− 0.402	—	—
3,9-Dibromobenzanthrone	81981	—	+1.46	—	—	—	—
Benzanthrone	82053	—	0.290−+3.16	—	—	—	—
Anthrimide	82224	—	0.200−0.230	—	—	—	—
1-Amino-2-methylanthraquinone	82280	+ (40.0)	0.600	46.2	− 1.16	—	—
1,5-Dinitroanthraquinone	82359	—	+2.66	—	—	—	—
1-Methylaminoanthraquinone	82382	+ (113)	0.600	46.2	− 0.409	—	—
1,8-Dichloroanthraquinone	82439	+ 316	0.600	46.2	− 0.537	—	—
1-Chloroanthraquinone	82440	+1000	0.422	32.3	− 0.032	—	—
1-Aminoanthraquinone	82451	+ 316	+1.00	—	—	—	—
1,5-Dichloroanthraquinone	82462	+ 316	+1.00	—	—	—	—
1-Anthraquinonesulfonic acid	82495	+ (113)	+0.100	—	—	—	—
Acenaphthoquinone	82860	+ (103)	+1.00	—	—	—	—
Buclizine	82951	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Ampyrone	83078	+ 100(a)	+1.00	—	—	+ 100(a)	—
Acenaphthene	83329	+ (101)	+1.00	—	—	—	—
Skatole	83341	+ (98.0)	+1.00	—	—	—	—
1-Amino-2-anthraquinonesulfonic acid	83625	+ (90.0)	0.800	61.5	− 0.683	—	—
Theobromine	83670	—	1.27	—	—	—	—
Phenanthrenequinone	84117	+ (104)	0.800	61.5	− 0.591	—	—
9,10-Anthraquinone-2-sulfonic acid	84480	+ (113)	+1.00	—	—	—	—
Anthraquinone-2,6-disulfonic acid	84504	+ (113)	+1.00	—	—	—	—
2-Methylanthraquinone	84548	+ (113)	0.800	61.5	− 0.544	—	—
Anthraquinone	84651	+ 100−+300(a)	0.100−0.600	46.1	− 0.154	—	—
Methylmethanthranilate	85016	—	+1.90	—	—	—	—
Phenanthrene	85018	+ (113)	+1.00	—	—	—	—
2,2-Terephthaloyl dibenzoic acid	85596	+ (100)	+1.00	—	—	—	—
Methylmethanthranilate	85916	—	+1.00	—	—	—	—
Chromoflavine	86408	56.2	0.619	47.6	0.847	—	+ 100(m)
Azinphos-methyl	86500	8.00−8.50(a)	0.160	12.3	1.54	27.0(a)	—
Fluorene	86737	+ (101)	+1.00	—	—	—	—
3,4,5-Trimethoxybenzaldehyde	86817	422	+1.00	+76.9	+ 0.183	—	—
Ethylanthranilate	87252	—	+1.00	—	—	—	—
Violuric acid	87398	+ 100	+1.00	—	—	—	—
6-Chloropurine	87423	+ 100	+1.00	—	—	—	+ 100−316(m)
Pyrolan	87478	—	0.040	—	—	38.7(a)	—
3-Chloro-*o*-toluidine	87605	237	+1.00	+76.9	+ 0.325	562	—
Pyrogallol	87661	75.0	+1.00	+76.9	+ 1.03	—	—
Chloranilic acid	87887	+ (96.0−96.3)	0.580−+1.00	—	—	—	—
Vinylpyrrolidone	88120	+ (98.0)	+1.00	—	—	—	—
2-Carboxyfuran	88142	+ (98.0)	+1.00	—	—	—	—
Ex 5004	88368	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Anthranilamide	88686	1000	+1.00	+76.9	+ 0.077	+1000	+1000
2-Nitroaniline	88744	750	+1.00	+76.9	+ 0.103	+1000	750
TIBA	88824	+ 100	+1.00	—	—	—	—

Dinoseb	88857	7.50	0.648	49.8	6.64	7.10–8.30(a)	—
2,4-Dinitrobenzene sulfonic acid	89021	+ 100(a)	+1.00	—	—	+ 100(a)	—
Norphenazone	89258	+ (96.0)	+1.00	—	—	—	—
3,5-Dihydroxy-2-naphthoic acid	89350	+ 100	+1.00	—	—	+ 100	—
1,4-Dimethoxy-2-nitrobenzene	89394	+ 100(a)	0.680	57.3	− 0.523	+ 100(a)	—
1,2,4-Trichloro-5-nitrobenzene	89690	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
2-Hydroxybenzohydroxamic acid	89736	+ 100	0.562	43.2	− 0.432	+ 100	—
(+)-Pulegone	89827	+ 316	+1.00	—	—	—	—
Resacetophenone	89849	+ (101)	+1.00	—	—	—	—
Salicylaldehyde	90028	+ (111)	+1.00	—	—	—	—
2-Aminoanisole	90040	750	+1.00	+76.9	+ 0.103	+1000	422
1-Naphthol	90153	+ (100)	+1.00	—	—	—	—
Hymecromone	90335	+ 100	+1.00	—	—	—	—
Anthrone	90448	+ (113)	+1.00	—	—	—	—
3,4,5-Trimethoxycinnamic acid	90506	422	+1.00	+76.9	+ 0.183	—	—
Michlers ketone	90948	100	+1.00	+76.9	+ 0.769	—	+ 316(m)
Toluene-2,6-diisocyanate	91087	100	—	—	—	+ 100	—
Isatin	91565	+ (101)	+1.00	—	—	—	—
Diphenyl	92524	+ (96.0)	+1.00	—	—	—	—
Scopoletin	92615	+ 100	+1.00	—	—	—	—
3-Hydroxy-2-naphthoic acid	92706	+ (68.0)	0.422	32.3	− 0.475	—	—
Tritosol	92717	+ (96.2)	+1.00	—	—	—	—
Phenothiazine	92842	+ 100(e)	+1.00	—	—	+ 100(a)	—
Quinaldic acid	93107	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Methyleugenol	93152	+ 316	+1.00	—	—	+ 316	—
Isoeugenol methylether	93163	+ 316	+1.00	—	—	—	—
Umbelliferone	93356	+ 100	+1.00	—	—	—	—
Thioquinox	93754	+ (106)(a)	+1.00	—	—	—	—
Benzocaine	94097	56.0(a)	+1.00	+76.9	+ 1.37	+ 316(a)	—
Tetracaine	94246	+ 100(e)	—	—	—	+ 100–298(e)	—
Butamben	94257	100(e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Chalcone	94417	+ 100	+1.00	—	—	—	—
Safrole	94597	+ 316	0.237	18.2	− 0.058	+ 316	—
Ethohexadiol	94962	+ 100	+1.00	—	—	—	—
5-Chloro-*o*-anisidine	95034	+ 100(a)	0.316	24.6	− 0.246	+ 100(a)	—
Indene	95136	+ (101)	+1.00	—	—	—	—
Benzothiazole	95169	+ (96.0)	+1.00	—	—	—	—
o-Chloroaniline	95512	+ 100–562(a)	+1.00	+76.9	+ 0.137	+1000	+1000
o-Fluorotoluene	95523	+ 100	+1.00	—	—	100	—
o-Toluidine	95534	+ 100–316	+1.00	+76.9	+ 0.243	+ 100–422	+1000
o-Phenylenediamine	95545	133	+1.00	+76.9	+ 0.578	+1000	+1000
o-Aminophenol	95556	+1000	+1.00	—	—	+1000	316
o-Chlorophenol	95578	+ (113)	+1.00	—	—	—	—
3,4-Xylidine	95647	5.62(a)	+1.00	+76.9	+13.7	10.0(a)	—
4-Chloro-*o*-toluidine	95692	75.0	+1.00	+76.9	+ 1.03	+ 100	—
Methylhydroquinone	95716	+ (148)	+1.00	—	—	—	—
3-Chloro-*p*-toluidine	95749	1.00–2.37(a)	+1.00	+76.9	+76.9	3.16–4.22(a,k)	1.00
3,4-Dichloroaniline	95761	237	0.316	24.6	0.104	562	—
5-Chloro-*o*-toluidine	95764	+1000	+1.00	—	—	+1000	—
3-Chloro-1,2-propanediol	96242	23.7	+1.00	+76.9	+ 3.25	—	316–422(g)
Thioglycerol	96275	+ 100	+1.00	—	—	—	—
Butyrolactone	96480	+ 100	—	—	—	—	—
2-Aminothiazole	96504	+ (98.0)	+1.00	—	—	—	—
2-Nitro-*p*-anisidine	96968	+ 100(a)	0.316	24.6	− 0.246	+ 100(a)	—
4-Chloro-3-nitrobenzoic acid	96991	75.0–100(a)	+1.00	+76.9	+ 1.03	+ 100(a)	—
Dichlofenthion	97176	14.0–17.8(a,c)	0.170–0.826	63.5	3.57	80.0–2370(a,c)	316(c)
5-Chloro-2,4-dimethoxyaniline	97507	+ 100(a)	0.680	52.3	− 0.523	+ 100(a)	—
Eugenol	97530	+ 316	+1.00	—	—	+ 316	—
Isoeugenol	97541	+ 316	+1.00	—	—	—	+ 316
Disulfiram	97778	+ (111)	+1.00	—	—	—	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Furfural	98011	+ (98.0)	+1.00	—	—	—	—
Thiophene-2-aldehyde	98033	+ (101)	+1.00	—	—	—	—
Benzotrichloride	98077	+ 100	+1.00	—	—	—	—
Benzene sulfonic acid	98113	+ 100(a)	+1.00	—	—	75.0(a)	—
4-*test*-Butylcatechol	98293	+ (96.0)	+1.00	—	—	—	—
Cumene	98828	+ (98.0)	+1.00	—	—	—	—
alpha-Methylbenzylamine	98840	+ 100	+1.00	—	—	—	—
2-Pyridinecarboxylic acid	98986	178	+1.00	+76.9	+ 0.432	750	562
3-Carboxyaniline	99058	750	+1.00	+76.9	+ 0.103	+1000	+1000
3-Nitroaniline	99092	133(a)	0.316	24.6	0.185	+1000(a)	562
Citrazinic acid	99116	+ (104)	+1.00	—	—	—	—
Dichloran	99309	+ 100	0.562	43.2	− 0.432	—	—
5-Nitro-*o*-toluidine	99558	+ 100(a)	0.422	32.3	− 0.323	+ 100(a)	—
5-Nitro-*o*-anisidine	99592	+ 100(a)	0.680	52.3	− 0.523	+ 100(a)	—
m-Dinitrobenzene	99650	42.2(a)	0.316	24.6	0.585	+ 100(a)	—
Methylparaben	99763	—	+0.100−+1.00	—	—	—	—
Cymene	99876	+ 316	+1.00	—	—	—	—
4'-Aminoacetophenone	99923	+ 100−237(a)	0.540	41.5	0.175	+ 100−422	133−316
4-Nitroaniline	100016	75.0−100(a)	0.316	24.6	0.328	+1000(a)	1000
TMPD	100221	13.3	0.487	37.5	2.82	23.7	42.2(m)
4-Vinylpyridine	100436	100	+1.00	+76.9	+ 0.769	—	—
Phenyl cyanide	100470	+ 100(a)	+1.00	—	—	+ 100(a)	—
Benzyl alcohol	100516	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Nicotinyl alcohol	100550	+ 1000	+1.00	—	—	+1000	+1000
Triphenylguanidine	101019	+ 100(a)	0.562	43.2	− 0.432	—	—
Dyrene	101053	+ 100	0.237−0.520	40.0	− 0.400	—	—
Chlorpropham	101213	+ 500	0.120	9.23	− 0.018	+ 500	—
4,4'-Methylenedianiline	101779	+ (148)	+1.00	—	—	—	—
Phenylurethane	101995	+ 100	+0.100	—	—	+ 100	—
1,3-Diphenylguanidine	102067	+ 100(a)	0.564	43.4	− 0.434	—	—
1-Amino-2,5-dimethoxybenzene	102567	+ 100−+100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Tributylamine	102829	+ (101)	+1.00	—	—	—	—
beta-Nitrostyrene	102965	—	0.900	—	—	—	—
Azobenzene	103333	+ (98.0)	+1.00	—	—	—	—
Acetanilide	103844	+ 100(e)	+1.00	—	—	+ 100(e)	—
Chlorphenesin	104290	+ 100	+1.00	—	—	—	—
4-Propylanisole	104450	+ 316	+1.00	—	—	+ 316	—
Anethole	104461	316	+1.00	+76.9	+ 0.243	—	—
Cinnamaldehyde	104552	+ (96.0)	+1.00	—	—	—	—
p-Tolunitrile	104858	+ 100	+1.00	—	—	—	—
p-Anisidine	104949	316−+316(a)	+1.00	+76.9	+ 0.240	+ 316−+1000(a)	+1000
4-Methylthioaniline	104961	178−237(a)	+1.00	+76.9	+ 0.324	+1000(a)	562
Methylurethane	105408	+ 100(a)	+1.00	—	—	+ 100(a)	—
beta-Citronellol	106229	—	—	—	—	—	—
p-Cresol	106445	+ (96.0)	+1.00	—	—	—	—
4-Thiocresol	106456	+ (98.0)	+1.00	—	—	—	—
p-Chloroaniline	106478	—	—	—	—	1000(a)	237
p-Chlorophenol	106489	+ (113)	+1.00	—	—	—	—
p-Toluidine	106490	56.2(a)	+1.00	+76.9	+ 1.37	42.2(a)	237
p-Phenylenediamine	106503	100	+1.00	+76.9	+ 0.769	562	100
Quinone	106514	—	—	—	—	—	—
Acrolein	107028	+ 10.0−+100(a)	—	—	—	+ 10.0−+100(a)	—
Butyric acid	107926	—	+1.00	—	—	—	—

Isopropylacetone	108101	+ 100	—	—	—	—	—
Succinic anhydride	108305	+ (96.0)	+1.00	—	—	—	—
2-Amino-5-methylthiadiazole	108338	+ 100	+1.00	—	—	—	+ 316(m)
Pyrazoxon	108349	—	—	—	—	40.0	—
m-Cresol	108394	+ (113)	+1.00	—	—	—	—
m-Chloroaniline	108429	133(a)	+1.00	+76.9	+ 0.578	+1000	422
m-Toluidine	108441	242	+1.00	+76.9	+ 0.318	+1000	562
m-Phenylenediamine	108452	+1000	0.800	61.5	− 0.062	+1000	562
3,5-Dimethylphenol	108689	+ (113)	+1.00	—	—	—	—
gamma-Picoline	108894	+ 100−+1000	+1.00	—	—	+1000	422
Phenol	108952	+ (113)	+1.00	—	—	—	—
Thiophenol	108985	23.7(a)	+1.00	+76.9	+ 3.25	31.6−75.0(a)	—
B-Picoline	108996	1000	+1.00	+76.9	+ 0.077	+1000	1000
3-Hydroxypyridine	109002	750	+1.00	+76.9	+ 0.103	+1000	+1000
2-Methylpyridine	109068	+1000	+1.00	—	—	+1000	+1000
2-Chloropyridine	109091	1000	+1.00	+76.9	+ 0.077	+1000	+1000
n-Butylamine	109739	—	+1.00	—	—	—	—
Butyronitrile	109740	—	+1.00	—	—	—	—
Pyrrole	109977	+ (100)	+1.00	—	—	—	—
Tetrahydrofuran	109999	+ (98.0)	+1.00	—	—	—	—
Furan	110009	+ (101)	+1.00	—	—	—	—
Thiophene	110021	+ (101)	+1.00	—	—	—	—
Maleic acid	110167	+ (98.0)	+1.00	—	—	—	—
Tetraethylenediamine	110189	+ (96.0)−+(100)	+1.00	—	—	—	+ 316(m)
2-Butynediol	110656	75.0	+1.00	+76.9	+ 1.03	—	+ 75.0(m)
Pyridine	110861	+1000	+1.00	—	—	+1000	+1000
6-Methyl-5-heptene-2-one	110930	+ (111)	+1.00	—	—	—	—
Tetramethylpropanediamine	110952	+ 100	+1.00	—	—	—	+ 316(m)
Hexylmethyl ketone	111137	—	+1.00	—	—	—	—
Hexylamine	111262	+ (98.0)	+1.00	—	—	—	—
Tetramethylputrescine	111513	+ 100	+1.00	—	—	—	+ 316(m)
1,4-Bis(dimethylamino)-2-butyne	111535	+ 100	+1.00	—	—	—	+ 316(m)
Octyl chloride	111853	—	+1.00	—	—	—	—
Octylamine	111864	—	+1.00	—	—	—	—
Octyl alcohol	111875	—	+1.00	—	—	—	—
2-Undecanone	112129	+ 100	+1.00	—	—	—	—
Dimethyldodecylamine	112185	+ (101)	+1.00	—	—	—	—
Nonylamine	112209	+ (96.0)	+1.00	—	—	—	—
Triethylenetetramine	112243	+ (101)	+1.00	—	—	—	—
Decanal	112312	+ (111)	+1.00	—	—	—	—
Undecanoic acid	112378	+ 100	—	—	—	+ 100	—
Dodecyl chloride	112527	—	+0.316	—	—	—	—
Dodecyl alcohol	112538	—	+1.00	—	—	—	—
Lethane 384	112561	—	—	—	—	− 100(a)	—
Dodecyl acetate	112663	+ 100	+1.00	—	—	—	—
Ethclorvynol	113188	42.2(a,e)	+1.00	+76.0	+ 1.83	—	—
Chlorprothixene	113597	+ 100(a,e)	—	—	—	+ 100(a,e)	—
Chlorpheniramine maleate	113928	75.0(a,e)	0.316	24.3	0.324	100(a,e)	—
5-Hydroxytryptophan	114034	+ 100	+0.316	—	—	—	—
Aprocarb	114261	3.83(a,c,d,e)	0.036	2.77	0.723	13.3−17.0(a,c,d,e)	42.2(c)
Endosulfan	115297	—	0.237	—	—	35.0(a)	—
Thanite	115311	+ 100	+1.00	—	—	—	—
Mephobarbital	115388	+ 178−+316(e)	+1.00	—	—	+ 100(a,e)	—
Talbutal	115446	75.0(a,e)	+1.00	+76.9	+ 1.03	+ 100(a,e)	—
2-Amino-2-methyl-1-propanol	115695	+ (102)	+1.00	—	—	—	—
Chlorphonium	115786	+ 100	0.562	43.2	− 0.432	—	—
Ambenonium chloride	115797	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Fensulfothion	115902	0.237−0.316(a,b,c)	0.0009	0.069	0.292	0.562(a,c)	1.78(c)
Aldicarb	116063	1.78(c)	—	—	—	4.22(c)	4.22(c)
1-Amino-4-hydroxyanthraquinone	116858	+ (77.0)	0.600	46.2	− 0.600	—	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Dianthron	117102	+ 316	+1.00	—	—	—	—
Anthrarufin	117124	+ (113)	+1.00	—	—	—	—
1,5-Disulfoanthraquinone	117146	+ (113)	+1.00	—	—	—	—
Quercitin	117395	+ 100	+1.00	—	—	—	—
Anthraquinone-2-carboxylic acid	117782	+ (113)	+1.00	—	—	—	—
2-Aminoanthraquinone	117793	+ 316	0.340	26.1	− 0.083	—	—
Dichlone	117806	+ 316	+5.60	—	—	—	—
Chloranil	118752	+ (100)	11.00	846	− 8.46	—	—
Uramil	118785	+ 100	+1.00	—	—	—	—
2-Aminobenzoic acid	118923	750	+1.00	+76.9	+ 0.103	+1000	+1000
3-Nitro-*p*-toluidine	119324	3.16(a)	0.316	24.6	18.5	31.6(a)	—
Isolan	119380	—	—	—	—	7.94−860(a)	—
Benzoin	119539	+ (98.0)	+1.00	—	—	—	—
Anthrazene	120127	+ (111)	+1.00	—	—	—	—
3-Amino-4-methoxybenzanilide	120354	+ 100(a)	+1.00	—	—	+ 100(a)	—
Isosafrole	120581	+ 1000	0.750	57.7	− 0.058	—	—
Indole	120729	+ (100)	+1.00	—	—	—	—
N,N'-Dimethyldithiooxamide	120796	7.50−10.0	0.237	18.2	2.43	42.2	17.8(m)
Catechin	120809	+ 100	+1.00	—	—	—	—
N,N'-Didodecyldithiooxamide	120887	+ (102)	+1.00	—	—	—	—
2-Imidazolidinone	120934	+ 100	+1.00	—	—	—	+1000(f)
Vanillic acid	121346	+ 100	+1.00	—	—	—	—
Triethylamine	121448	+ 100	1.00	76.9	− 0.769	—	—
3-Amino-4-chlorobenzo trifluoride	121506	+ 100(a)	+1.00	—	—	+ 100(a)	—
Acetylsulfanilyl chloride	121608	+ (104)	+1.00	—	—	—	—
2-Amino-5-nitrothiazole	121664	+ (98.0)	+1.00	—	—	—	—
Malathion	121755	400	1.55	119	0.298	—	—
Bomyl	122101	0.950−1.00(a)	—	—	—	9.50−10.0(a)	—
Fenitrothion	122145	17.8−25.0(a)	0.100	7.69	0.432	11.0	56.2
Diphenylamine	122394	+ (101)	+1.00	—	—	—	—
p-Chlorophenoxy acetic acid	122883	+ (104)	+1.00	—	—	—	—
p-Aminophenol	123308	56.2	+1.00	+76.9	+ 1.37	+1000	+1000
Succinimide	123568	+ (96.0)	+1.00	—	—	—	—
Paraldehyde	123637	+ 100(a,e)	+1.00	—	—	—	—
Pyrrolidine	123751	+ (101)	+1.00	—	—	—	—
Baytan	123886	+ 316	+1.00	—	—	—	—
Caprylic acid	124072	—	+1.00	—	—	—	—
1,6-Hexanediamine	124094	+ (101)	+1.00	—	—	—	—
Caprylic aldehyde	124130	+ (111)	+1.00	—	—	—	—
Dodecylamine	124221	+ (98.0)	+1.00	—	—	—	—
Carbonic anhydride	124389	3.94×10^5(6)	—	—	—	4.69×10^5(6)	3.92×10^5(6)
Unsic acid	125462	+ 100	+1.00	—	—	—	—
ENT 17596	126158	+ 100	+1.00	—	—	—	—
Butonate	126227	158(a)	+1.00	+76.9	+ 0.487	280(a)	—
Oxethazaine	126272	+ 100(a,e)	+1.00	—	—	—	—
1-Bromo-2,2-dimethoxypropanone	126385	+ 100	+1.00	—	—	—	—
Ethinamate	126523	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
2,4-Dimethylthiazole	126818	+ (102)	+1.00	—	—	—	—
Demeclocycline	127333	—	+1.00	—	—	—	—
1,8-Diamino-4,5-dihydroxyanthraquinone	128949	+ (67.0)	0.800	61.5	− 0.918	—	—
1,4-Diaminoanthraquinone	128950	+ (87.0)	0.800	61.5	− 0.707	—	—
2-Methyl-1-nitroanthraquinone	129157	+ (113)	+1.00	—	—	—	—
1,5-Diaminoanthraquinone	129442	+ (113)	+1.00	—	—	—	—

Carbic anhydride	129646	+ 100	+1.00	—	—	—	—
1,4-Naphthoquinone	130154	133	0.316–0.562	43.1	0.324	—	—
Quinine HCl	130892	+ 100	+1.00	—	—	—	—
2-Chloroanthraquinone	131099	+ 316	+1.00	—	—	+ 316	—
Dimethylphthalate	131113	+ 100	+1.00	—	—	—	—
2,6-Diaminoanthraquinone	131146	+ (113)	+1.00	—	—	—	—
Dibenzofuran	132649	+ (102)	+1.00	—	—	—	—
Captan	133062	+ 100–+(104)	0.650–1.67	128	– 1.28	—	—
Phenylethylanthranilate	133186	—	+1.00	—	—	—	—
Indolebutyric acid	133324	+ (101)	+1.00	—	—	—	—
Dichloroxylenol	133539	+ (113)	+1.00	—	—	—	—
Methylanthranilate	134203	—	+1.00	—	—	—	—
Diethyltoluamide	134623	+ 500	0.820–3.90	300	– 0.600	—	—
2-Naphthol	135193	+ (100)	+1.00	—	—	—	—
Cupferron	135206	+ (96.0)	+1.00	—	—	—	—
1,2,4-Trimethoxybenzene	135773	+ 316	+1.00	—	—	—	—
Mecrylate	137053	—	—	—	—	+ 100	—
Thiram	137268	300	0.623	47.9	0.160	—	—
Ziram	137304	100(a)	0.650	50.0	0.500	—	—
Shikimic acid	138590	+100	+1.00	—	—	—	—
trans-Cinnamic acid	140103	100	+1.00	+76.9	+ 0.769	—	—
Meralluride	140205	+ (98.0)	+1.00	—	—	—	—
Aminoethylpiperazine	140318	+ (98.0)	+1.00	—	—	—	—
Fenaminosulf	140567	17.8(a)	0.750	57.7	3.24	17.8(a)	—
Aramite	140578	+ 100	—	—	—	—	—
Pramocaine	140658	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Estragole	140670	+ 316	+1.00	—	—	+ 316	—
n-Butyl acrylate	141322	+ (103)	+1.00	—	—	—	—
Dicrotophos	141662	1.00–1.60(a,b,c)	—	—	—	2.70–10.0(a,c)	7.50(c)
2-Thiouracil	141902	+ (101)	+1.00	—	—	—	—
2-Hydroxypyridine	142085	+ 1000	+1.00	—	—	+1000	+1000
Lauric acid	143077	—	+1.00	—	—	—	—
Hexadecylamine	143271	+ (98.0)	+1.00	—	—	—	—
Chlordecone	143500	—	+1.00	—	—	—	237–316(f)
Probarbital sodium	143828	42.2(a,e)	+1.00	+76.9	+ 1.83	+ 100(a,e)	—
Barbital sodium	144025	+ 100(a,e)	+1.00	—	—	—	—
Triflupromazine	146543	+ 100(a,e)	0.178	13.7	– 0.137	+ 100(a,e)	—
Dinitolmide	148016	—	0.562	—	—	—	—
8-Quinolinol	148243	+ (104)	+1.00	—	—	—	—
Butacaine sulfate	149155	100(a,e)	0.422	32.4	0.324	+ 100(a,e)	—
Gallic acid	149917	+ 100	+1.00	—	—	—	—
4-Carboxyaniline	150130	+ 1000	+1.00	—	—	+1000	+1000
p-Methoxyphenol	150765	+ (113)	+1.00	—	—	—	—
1,4-Dimethoxybenzene	150787	—	+1.00	—	—	—	—
Dimethylbenzylcarbinol acetate	151053	—	+1.00	—	—	—	—
Schradan	152169	—	—	—	—	11.0–12.0(a)	—
Rutin	153184	+ 100	+1.00	—	—	—	—
U 5036	155419	+ (90.0)	+1.00	—	—	—	—
Acridine	260946	+ (101)	+1.00	—	—	—	—
Pyrazole	288131	+ (98.0)	+1.00	—	—	—	—
Imidazole	288324	+ (100)	+1.00	—	—	—	—
1*H*-1,2,4-Triazole	288880	+ 100	+1.00	—	—	—	+ 316(m)
s-Triazine	290879	100	+1.00	+76.9	– 0.769	—	237(m)
Thioform	291214	+ 100	+1.00	—	—	—	—
Isobenzan	297789	3.16(c)	—	—	—	2.37(c)	4.22(c)
Thionazin	297972	2.37(c)	0.237	18.6	7.85	7.50(c)	3.16(c)
Phosphamidon	297994	1.78–3.16(a,c,e)	0.030	2.31	1.30	5.62(a,c,e)	7.50(c)
Methyl parathion	298000	10.0(a,e)	0.318	24.5	2.45	7.50	—
Phorate	298022	1.00(a)	0.047	3.62	3.62	7.50(a)	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Disulfoton	298044	3.16(a)	0.091	7.00	2.19	+ 31.6(a)	—
Ephedrin	299423	562	—	—	—	—	—
Ronnel	299843	75.0–80.0(a)	0.080–0.422	32.4	0.432	353–375(a)	—
DMPA	299854	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Cruformate	299865	100(a,e)	0.562–+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Amphetamine	300629	+ (84.0)	—	—	—	—	—
Chloral hydrate	302170	+ 100(e)	+1.00	—	—	+ 100–+422(e)	—
2-Iodosobenzoic acid	304916	+ 316	+1.00	—	—	+ 316	+ 316
Aldrin	309002	23.7(c)	—	—	—	5.00–23.7(a,c)	42.2(c)
Secobarbital sodium	309433	75.0(a,e)	+1.00	+76.9	+ 1.03	+ 100(a,e)	—
Azacosterol	313053	422	+1.00	+76.9	+ 0.183	—	422–562(g)
Mexacarbate	315184	10.0–13.3(a,c,d,e)	0.040	3.08	0.308	23.7–31.6(a,c,d,e)	2.37(c)
Emetine HCl	316427	56.2	—	—	—	+ 100	—
5-Azacytidine	320672	100	+1.00	+76.9	+ 0.769	—	+ 100(m)
5-Chloro salicyclic acid	321142	75.0–+100(a)	0.680	52.3	0.697	75.0–+100(a)	—
Chlorogenic acid	327979	+ 100	+1.00	—	—	—	—
Trichloronate	327980	1.60–4.22(a,c)	0.160	12.3	6.48	110–1000(a,c)	23.7(c)
HRS 1422	330643	10.0(a,d,e,h)	0.076(h)	5.85	0.585	+ 100(a,d,e)	—
Caffeic acid	331395	+ 100	+1.00	—	—	—	—
Methyl trifluoromethanesulfonate	333277	+ 100	+1.00	—	—	—	+1000
Diazinon	333415	2.00–3.16(a,c)	0.020	1.54	0.769	110–316(a,c)	4.22(c)
Bay 38156	333437	1.60–1.78(a)	0.110	8.46	4.75	5.00(a)	—
Thiamylal sodium	337473	+ 100(a,e)	+1.00	—	—	—	—
Mecloqualone	340578	+ 100–178(a,e)	0.650	50.0	0.281	+ 100(e)	—
3-Acetylpyridine	350038	178	+1.00	+76.9	+ 0.437	1000	422
Pentazocine	359831	+ 100–562(a,e)	1.00	76.9	0.137	+ 100(a,e)	—
N,N,N',N'-Tetramethylbenzidine	366290	+ 100	+1.00	—	—	—	+ 316(m)
3-Chloro-4-fluoroaniline	367215	+ 100	0.316	24.6	– 0.246	+ 100	—
4-Fluoroaniline	371404	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
3-Fluoroaniline	372190	56.2(a)	+1.00	+76.9	+ 1.37	+ 100(a)	—
Chlordiazepoxide HCl	438415	316–360(e)	+1.00	+76.9	+ 0.124	+ 100(a,e)	1000
Diazepam	439145	+ 316(e)	0.667	51.3	– 0.162	+ 100(a,e)	—
Trifluoperazine HCl	440175	+ 100(a,e)	0.438	33.7	– 0.337	+ 100(a,e)	—
3-Fluoro-*p*-toluidine	452777	1.78(a)	0.316	24.6	13.8	1.33(a)	—
6-Azauracil	461892	+ 100	+1.00	—	—	—	+ 100(m)
3-Aminopyridine	462088	13.3	0.562	43.2	3.25	133	178
1,5-Pentanediamine	462942	+ (101)	0.800	61.5	– 0.609	—	—
Cineole	470826	—	1.57	—	—	—	—
Chlorfenvinphos	470906	10.0–13.3(a,c)	0.422	32.4	2.43	3.16–23.7(a,c)	17.8–178(c)
Ellagic acid	476664	+ 100	+1.00	—	—	—	—
Taxifolin	480182	+ 100	+1.00	—	—	—	—
Dithranol	480228	+ (100)(a)	1.23	94.6	– 0.946	—	—
Naringenin	480411	+ 100	+1.00	—	—	—	—
5-Nitrobarbituric acid	480682	+ (104)	+1.00	—	—	—	—
Cinchonidine	485712	+ 100	0.524	40.3	– 0.403	—	+ 100
Fluorenone	486259	+ (96.0)	+1.00	—	—	—	—
Flavanone	487263	75.0	+1.00	+76.9	+ 1.03	—	—
1-Epicatechin	490460	+ 100	+1.00	—	—	—	—
2,4,5-Trimethoxybenzoic acid	490642	+1000	+1.00	—	—	—	—
Biochanin A	491805	+ 100	+1.00	—	—	—	—
CI Solvent yellow 34	492808	—	0.562	—	—	—	—
Euchrysine	494382	+ 100	0.282	21.7	– 0.217	—	—
Hippuric acid	495692	+ (101)	+1.00	—	—	—	—

Indan	496117	+ (101)	+1.00	—	—	—	—
Aconitic acid	499127	+ (100)	+1.00	—	—	—	—
3-Pyridinecarboxaldehyde	500221	+ 1000	+1.00	—	—	+1000	+1000
Chlorothion	500287	+ 280(a)	0.391–0.562	43.2	– 0.154	+ 500(a)	—
Phenylcarbamic acid	501826	+ 100(a)	+1.00	—	—	+ 100(a)	—
Trimethylene oxide	503300	+ 100	+1.00	—	—	—	—
4-Aminopyridine	504245	1.78–8.50(a,b,c,*)	0.040–0.053	4.07	2.29	4.90(a,c,e,l)	7.65–8.05(c,l)
2-Aminopyridine	504290	31.6	+1.00	+76.9	+ 2.43	75.0–100	133
Chlorobenzilate	510156	+ 100	+1.00	—	—	—	—
Methyl phosphate	512561	+ 100	+1.00	—	—	—	860(f)
sec-Butylamine	513495	+ (96.0)	+1.00	—	—	—	—
Emodin	518821	+ 100	+1.00	—	—	+ 100	—
Hesperidin	520263	+ 100	+1.00	—	—	—	—
Apigenin	520365	+ 100	+1.00	—	—	—	—
Apiol	523808	+ 100–+316	+1.00	—	—	—	+ 316
Dimenhydrate	523875	—	—	—	—	+ 50–+625(e)	—
Ricinine	524403	+ 42.2	+1.00	—	—	—	—
1,2-Naphthoquinone	524425	75.0	0.355	27.3	0.364	—	—
MA 1337	525268	+ 100(a)	+1.00	—	—	+ 100(a)	—
Flavone	525826	+ 100	0.908	69.8	– 0.698	—	—
Thiophene 2-carboxylic acid	527720	+ (96.0)	+1.00	—	—	—	—
Fisetin	528483	+ 100	+1.00	—	—	—	—
alpha-Tetralone	529340	+ (113)	+1.00	—	—	—	—
Methocarbamol	532036	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
2-Methylfuran	534225	+ (98.0)	+1.00	—	—	—	—
3,5-Diamino benzoic acid	535875	+ 100(a)	+1.00	—	—	+ 100(a)	—
p-Dimethylaminobeyal rhodanine	536174	+ 100(a)	0.316	24.6	– 0.246	+ 100(a)	—
4-Ethylpyridine	536754	+ 100	+1.00	—	—	—	—
3-Aminoanisole	536903	562	0.562	43.2	0.077	+1000	562
Diperodon	537122	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
4-Iodoaniline	540374	100(a)	0.422	32.3	+ 0.323	+ 100(a)	—
n-Butyramide	541355	+ (96.0)	+1.00	—	—	—	—
Trichloroacetonitrile	545062	+ 100	+1.00	—	—	—	—
Droperidol	548732	+ 100(a,e)	1.00	76.9	– 0.769	+ 100(a,e)	—
Zolamine	553139	+ 100(a,e)	0.422	32.5	– 0.325	+ 100(a,e)	—
Glyceryl iodide	554109	+ 100	+1.00	—	—	—	—
2,2′,2″-Trichlorotriethylamine	555771	31.6	–0.178	–13.7	– 0.434	—	117–133(f)
Ethion	563122	45.0–58.0(a)	0.316	24.3	0.540	+ 304(a)	—
2-Ethylaniline	578541	750	+1.00	+76.9	+ 0.103	+1000	+1000
Potassium carbonate	584087	100	+1.00	+76.9	+ 0.769	—	—
4-Amino-1,2,4-triazole	584134	+ 100	+1.00	—	—	—	+ 316(m)
Toluene-2,4-diisocyanate	584849	100	—	—	—	+ 100	—
n-Butyloxamate	585284	—	+1.00	—	—	—	—
4-Pyridylcarbinol	586958	422	+1.00	+76.9	+ 0.182	+1000	+1000
2-Pyridylcarbinol	586981	750	+1.00	+76.9	+ 0.103	+1000	1000
3-Ethylaniline	587020	316	+1.00	+76.9	+ 0.243	+1000	750
4-Ethylaniline	589162	75.0	+1.00	+76.9	+ 1.03	750	422
Hydroxyurethane	589413	+ (98.0)	+1.00	—	—	—	—
Acetylthiourea	591082	+ (96.0)	+1.00	—	—	—	—
3-Aminophenol	591275	237	0.261	20.1	0.085	+1000	750
Butyl carbamate	592358	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Dibutyl sulfone	598049	—	+1.00	—	—	—	—
alpha-Methyl-*n*-butyric acid	600077	+ (111)	+1.00	—	—	—	—
Triphenylarsine	603327	+ (98.0)	+1.00	—	—	—	—
Triphenylbismuth	603338	+ (98.0)	+1.00	—	—	—	—
Diphenylurethane	603521	+ 100(a)	+1.00	—	—	+ 100(a)	—
Oxazepam	604751	+ 100–178(a,e)	+1.00	+ 76.9	+ 0.432	+ 100(a,e)	—
2,4-Dinitrophenetole	610548	+ 31.6	+1.00	—	—	—	—
2-Chloro-p-toluidine	615656	—	+1.00	—	—	—	—
6-Chloro-*m*-cresol	615747	562	+1.00	+76.9	+ 0.137	750	562

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
3-Amino-1,2-propanediol	616308	+ 100	+1.00	—	—	—	—
2-Pyrrolidone	616455	+ (98.0)	+1.00	—	—	—	—
2-Furfurylamine	617890	+ (96.0)	+1.00	—	—	—	—
N-Acetylpiperidine	618428	+ (96.0)	+1.00	—	—	—	—
p-Nitrodiphenyl ether	620882	+ (100)	+1.00	—	—	—	—
1,3,5-Trimethoxybenzene	621238	+ 1000	+1.00	—	—	—	—
4-Chlorobenzonitrile	623030	—	+1.00	—	—	—	—
3-Dimethylamino-1,2-propanediol	623574	+ 100	+1.00	—	—	—	—
N-Ethylurethane	623789	+ 100(a)	+0.100	—	—	+ 100(a)	—
3-Iodoaniline	626017	+ 100(a)	+1.00	—	—	+ 100(a)	—
3-Chloropyridine	626608	1000	+1.00	+76.9	+ 0.077	1000	750
4-Chloropyridine	626619	+ 100	+1.00	—	—	—	+ 100(m)
4-Hydroxypyridine	626642	+ 100−+1000	+1.00	—	—	+1000	+1000
Propyl carbamate	627123	+ 100	+1.00	—	—	+ 100	—
Hexyl cyanide	629083	—	+1.00	—	—	—	—
Naphthocaine	629505	—	—	—	—	—	—
Hexadecyl acetate	629709	+ 100	+1.00	—	—	—	—
Carbon monoxide	630080	1334(6)	—	—	—	2213(6)	2103(6)
Methylsyringol	634366	+ 1000	+1.00	—	—	—	—
4-Chloro-3-nitroaniline	635223	100(a)	0.316	24.6	0.246	+ 100(a)	—
Trimetozine	635416	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Distamycin A	636475	− (72.0)	0.422	32.3	+ 0.449	—	—
3-Pyridylsulfonic acid	636737	+ 100	+1.00	—	—	—	+ 316(m)
Coniine HBr	637490	56.2	+1.00	+76.9	+ 0.137	—	+ 56.2(m)
Trichlorocyanuric acid	638164	+ 100	+1.00	—	—	—	—
Triphenyl tin chloride	639587	—	0.422	—	—	—	—
Fluoroacetamide	640197	5.62	+1.00	+76.9	+13.7	—	13.3(f)
1,3,5-Trimethoxyphenol	642717	+ 1000	+1.00	—	—	—	—
Dimetilan	644644	—	0.800	—	—	250(a)	—
Hexamethylmelamine	645056	—	—	—	—	—	316(f)
Aminooxy acetic acid	645885	—	+1.00	—	—	—	—
Carbanolate	671045	2.37−6.00(a,c,*)	—	—	—	11.5(a,c,d,e)	7.50(c)
U 17556	672060	13.3(d,e,h)	0.091	70.0	5.26	+ 100(d,e)	—
RE 5305	673198	4.00−5.00(a,d,e)	0.030	2.31	0.502	5.00−6.00(a,d)	—
Hempa	680319	+ 100	+1.00	—	—	—	1000(f)
Pyridine 1-oxide	694597	1000	+1.00	+76.9	+ 0.077	+1000	+1000
N-Methyl-2-pyridone	694859	+ 100	+1.00	—	—	—	422(f)
4-Pyridinealdoxime	696548	+ 100	+1.00	—	—	—	—
2-(2-Nitrovinyl)furan	699183	—	+1.00	—	—	—	—
Tetramethyl-1,2-benzenediamine	704018	—	—	—	—	—	+ 316(m)
Prilocaine	721506	+ 100(a,e)	—	—	—	+ 100(a,e)	—
Phosmet	732116	17.8(a)	0.244	18.8	1.05	+ 100(a)	—
EPTC	759944	100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Dodecyl thiocyanate	765151	+ 100(a)	—	—	—	+ 100(a)	—
Adamantamine	768945	+ 178	+1.00	—	—	—	+ 100−+316(m)
Carbophenothion	786196	7.50(a)	0.282	21.7	2.89	5.62(a)	—
Calcium citrate	813945	+ (100)	+1.00	—	—	—	—
Cupric oxalate	814915	+ (111)	1.00−1.10	84.6	− 0.762	—	—
Dimethoxane	828002	+ (98.0)	+1.00	—	—	—	—
Mescaline HCl	832928	+ 100	+0.316	—	—	—	—
Sudan I	842079	+ 500	+1.00	—	—	—	—
Naphthol Yellow S	846708	—	+1.00	—	—	—	—
Levopromazine	851683	100(a,e)	0.650	50.0	0.500	+ 100(a,e)	—

Ethyleneglycol methacrylate	868779	+ (98.0)	+1.00	—	—	—	—
Diethylaminoethyl chloride HCl	869249	42.2(a)	0.562	43.1	1.02	100(a)	—
4-Pyridinecarboxaldehyde	872855	+ 1000	+1.00	—	—	+1000	+1000
4-Cyanoaniline	873745	23.7	0.316	24.3	1.03	316	23.7
Chlorphenesin carbamate	886748	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Tricaine	886862	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Fentin acetate	900958	100	+1.00	+76.9	+ 0.769	—	100–117(f)
Isopropylmethanesulfonate	926067	562	+1.00	+76.9	+ 0.137	287	562–+1000(g)
2-Methylpyridine-*N*-oxide	931191	+ 100–+1000	+1.00	—	—	+1000	+1000(f)
Azacytosine	931862	+ 100	+1.00	—	—	—	+ 100
Fonofos	944229	10.0(a,c)	0.238	18.3	1.83	42.2(a,c)	31.6(c)
Phenylsulfoxide	945517	+ 100(a)	0.422–0.750	57.7	– 0.577	+ 100	—
Phospholan	947024	2.37(b,c)	0.128	9.84	4.15	5.62(c)	23.7(c)
Methyltrithion	953173	17.8(a)	0.130	10.0	0.562	+ 78.0–+178(a)	—
Phencyclidine HCl	956901	42.2(a,e)	0.395	30.4	0.722	237(a,e)	—
Tetrachlorvinphos	961115	100	+1.00	+76.9	+ 0.769	+ 100	—
Dinobuton	973217	—	0.650	—	—	—	—
Norbormide	991424	+ 100(a)	+1.00	—	—	+ 100(a)	—
VC 3-676	996043	—	0.050	—	—	—	—
Tributylphosphine	998403	+ (98.0)	+1.00	—	—	—	—
4-Methylpyridine 1-oxide	1003674	1000	+1.00	+76.9	+ 0.077	1000	750
3-Methylpyridine 1-oxide	1003732	+ 1000	+1.00	—	—	+1000	+1000
2,4,6-Triaminopyrimidine	1004382	+ 100	+1.00	—	—	—	—
3-(2-Pyridyl)-5,6-diphenyltriazine	1046566	+ 178	0.826	63.5	– 0.357	—	+ 316(m)
Trimethyltin chloride	1066451	+ (98.0)	+1.00	—	—	—	—
Tripropyltin oxide	1067294	+ (40.0)	0.316	24.6	– 0.615	—	—
Acethydrazide	1068571	42.2	+1.00	+76.9	+ 1.83	—	—
1-(2-Cyanoethyl)aziridine	1072668	—	—	—	—	—	5.62(m)
Dimercaptothiadiazole	1072715	+ 178	+1.00	—	—	—	+ 316(m)
4-Hydroxycoumarin	1076386	+ 100	+1.00	—	—	—	—
Mobam	1079330	17.8(c)	0.112	8.61	0.484	750(c)	42.2(c)
Dichlofluanid	1085989	+ 100(a)	+1.00	—	—	+ 100(a)	—
Pebulate	1114712	+ 100(a)	+1.00	—	—	+ 100(a)	—
Lauryl amide	1120167	+ (96.0)	+1.00	—	—	—	—
3-Amino-1,2,4-triazine	1120996	+ 100	+1.00	—	—	—	+ 100–+316(m)
3-Nitroisoxazoline	1121148	+ (96.0)	0.422	32.3	– 0.337	—	—
Pyrithione	1121308	100	+1.00	+76.9	+ 0.769	—	133–178(f)
Picolinal	1121604	+ 100	+1.00	—	—	—	—
4-Acetylpyridine	1122549	+ 100–750	+1.00	+76.9	+ 0.103	+1000	+1000
4-Dimethylaminopyridine	1122583	+ 100	+1.00	—	—	—	—
2-Acetylpyridine	1122629	1000	+1.00	+76.9	+ 0.077	+1000	+1000
Phenyltin trichloride	1124192	+ (98.0)	+1.00	—	—	—	—
MOPS	1132612	+ 100	+1.00	—	—	—	+ 316(m)
Ro-neet	1134232	+ 100(a)	+1.00	—	—	+ 100(a)	—
Ferulic acid	1135246	+ 100	+1.00	—	—	—	—
CAPS	1135406	+ 100	+1.00	—	—	—	+ 316(m)
4-Aminobenzophenone	1137413	562	—	—	—	+ 562	+ 316
SU 8746	1142843	+ 100	+1.00	—	—	+ 100	—
Metoserpate HCl	1178296	100	0.153	11.8	0.118	100	—
4-Aminothiophenol	1193028	42.2	+1.00	+76.9	+ 1.83	56.2	42.2
Fenchone	1195795	+ 316	+1.00	—	—	—	—
4-Aminophenyl acetic acid	1197553	+ 316	+1.00	—	—	+ 316	—
Bis(*p*-nitrophenyl)sulfide	1223310	+ (102)	+1.00	—	—	—	—
Euprocin	1301424	+ 100(a,e)	0.562	43.2	– 0.432	+ 100(a,e)	—
Calcium hydroxide	1305620	+ (111)	+1.00	—	—	—	—
Antimony trioxide	1309644	—	+1.00	—	—	—	—
Lead tetroxide	1314416	+ (111)	+1.00	—	—	—	—
Zinc phosphide	1314847	23.7–237	—	—	—	—	—
Monasteral Green	1328536	+ (111)	+1.00	—	—	—	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Tribromoethanol	1329868	316	—	—	—	+ 316−445(e)	422
Cuprous oxide	1371391	+ (50.0)	0.660	50.8	− 1.02	—	—
Tannin	1401554	+ 100	+1.00	—	—	—	—
Bacitracin	1405874	+ 100	+1.00	—	—	—	+ 100−+316(m)
Humic acid	1415936	+ (101)	+1.00	—	—	—	—
Niclosamide	1420048	+ (96.0)	+1.00	—	—	—	—
Amidephrine mesylate	1421687	+ 100	+1.00	—	—	—	—
Guanazole	1455772	+ 100	+1.00	—	—	—	+ 316(m)
Tributyl tin chloride	1461229	75.0−+100(a)	0.520	40.0	0.533	—	—
Naftalofos	1491414	1.78−2.37(a)	0.020	1.54	0.864	+ 100(a)	—
Trifluoro methanesulfonic acid	1493136	+ 100	+1.00	—	—	—	+1000(f)
Ethylcyclohexane carbamate	1541191	+ 100	+1.00	—	—	+ 100	—
Gallocyanine	1562852	+ 100	+1.00	—	—	—	—
Carbofuran	1563662	0.422(b,c)	0.028	2.15	5.11	5.62(c)	—
Daminazide	1596845	+ 100	+1.00	—	—	—	—
Metaxalone	1665481	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
1-(4-Ethoxyphenyl)ethanone	1676637	+ (96.0)	+1.00	—	—	—	—
4-Aminobutyrophenone	1688717	42.2	—	—	—	178	178
Nellite	1754581	13.3(a,e)	+1.00	+76.9	+ 5.78	75.0(a,e)	—
Akton	1757182	75.0	0.750	57.7	0.769	—	—
1,2-Diaminoanthraquinone	1758685	+ (113)	+1.00	—	—	—	—
3-(Methylthio)aniline	1783819	750	0.650	50.0	0.067	+1000	750
2-Cyanoaniline	1885296	+ 1000	+1.00	—	—	+1000	+1000
2,4,6-Triphenoxy-*s*-triazine	1919488	+ 178	+1.00	—	—		+ 316(m)
Vernolate	1929777	+ 100(a)	+1.00	—	—	+ 100(a)	—
N-Serve	1929824	—	+1.00	—	—	—	—
AC 24055	1933502	56.2(a,e)	+1.00	+76.9	+ 1.37	75.0(a,e)	—
Phenyl *N*-methylcarbamate	1943799	+ 100(a,d,e)	+1.00	—	—	+ 100(a,d,e)	—
4-Amino-3-picoline	1990905	2.37(a)	0.486	37.4	15.8	3.16(a)	—
Butylate	2008415	+ 100(a)	+1.00	—	—	+ 100(a)	—
Aminocarb	2032599	50.0(a,d,e)	0.150	11.5	0.231	+ 100−212(a,d,e)	—
Methiocarb	2032657	4.67−12.6(a,b,*)	0.050−0.089(h)	6.85	1.47	11.3−+50.0(c,d)	8.84−10.4(c)
2-Amino-4-morpholino-*s*-triazine	2045252	+ 100	+1.00	—	—	—	+ 316
Bis(4-chloro-2-nitrophenyl)disulfide	2050660	+ (96.0)	+1.00	—	—	—	—
Trifluperidol HCl	2062773	133(e)	0.178	13.7	0.137	+ 100(a,e)	—
Benperidol	2062842	+ 100(a,e)	0.562	43.2	− 0.432	+ 100(a,e)	—
1-Chloro-2,5-dimethoxybenzene	2100427	+ 100(a)	+1.00	—	—	+ 100(a)	—
EPN	2104645	3.16(a,c,e)	0.464	35.7	11.3	7.50(a,c,e)	10.0(c)
4-Benzylpyridine	2116656	+ 17.8(a)	0.800	61.5	3.46	+ 100(a)	—
Pemoline	2152343	100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Methiocarb sulfone	2179251	42.2−147(a)	0.562	43.2	1.03	—	—
1-Phenylcyclohexylamine	2201243	+ (98.0)	+1.00	—	—	—	—
Dowco 159	2213845	+ 56.2(a,e)	0.800	61.5	1.10	+ 100(a,e)	—
Ethyl *N,N*-dibutylcarbamic acid	2217881	+ 100(a)	+0.100	—	—	+ 100(a)	—
3-Cyanoaniline	2237301	562	0.355	27.3	0.049	1000	562
Fencamfamin	2240144	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
d-Phellandrene	2243336	—	1.78	—	—	—	—
Phenethyl isothiocyanate	2257092	+ 100	0.750	57.7	− 0.577	—	—
Olin 53139	2271934	—	+1.00	—	—		316−+316(f)
Dowco 177	2274911	100(a)	0.422	32.3	0.323	+ 100(a)	—
Phencapton	2275141	+ 178(a)	0.316	24.3	− 0.135	+ 178(a)	—
Tripropyltin chloride	2279767	+ (79.0)	0.800	61.5	− 0.779	—	—
Omite	2312358	+ 100	+1.00	—	—	—	—

2-Methoxy-1,4-naphthoquinone	2348825		316	+1.00	+76.9	+ 0.243	—	—
Mirex	2385855	+	100(a)	+1.00	—	—	+ 562	—
Butane sulfonic acid	2386472	—		+1.00	—	—	—	—
Hercules 3944	2425050	+	100−+500(a)	0.740	56.9	− 0.114	—	—
Quinomethionate	2439012	+	100−+500	+0.316−+1.00	—	—	+ 500	—
Dodine	2439103	—		0.400−0.620	—	—	—	—
4-Amino-2-chlorobenzoic acid	2457763	+	316	+1.00	—	—	+ 316	+ 316
Mercaptobenzothiazole sodium	2492264	—		+1.00	—	—	—	—
Picryl sulfonic acid	2508192	+	100	+1.00	—	—	—	+ 316(m)
Encyprate	2521019	+	100(a,e)	+1.00	—	—	+ 100(a,e)	—
Pyramat	2532492	—		0.260	—	—	+ 500(a)	—
2-Bromoethylamine HBr	2576478	+	(104)	+1.00	—	—	—	—
Dow ET-15	2591664	+	400	0.150	11.5	− 0.029	—	—
Bay 38920	2592623	+	28.0(a)	0.050	3.85	− 0.138	50.0(a)	—
p-Chlorophenyl *N*-methylcarbamate	2620533	+	100(a,d,e)	+1.00	—	—	+ 100(a,d,e)	—
Ethyl-4-chlorophenyl carbamate	2621809	+	100(a)	0.422	32.3	− 0.323	+ 100(a)	—
Pericyazine	2622266		100(a)	0.650	50.0	0.500	1000(a)	—
ENT 25670	2631405		56.2	0.487	37.5	0.666	—	—
Methiocarb sulfoxide	2635101		1.78−3.16(a)	0.121	9.31	5.23	—	—
3,5-Xylyl *N*-methylcarbamate	2655143		75.0−80.0(a,d,e)	+1.00	+76.9	+ 1.03	+ 100(a,d,e)	—
Bay 22408	2668920		17.8−31.6	0.020−0.050	3.85	0.216	500(a)	—
Chloroneb	2675776	+	100(a)	+1.00	—	—	+ 100(a)	—
SD 8530	2686999		10.0−31.6(a,e)	+1.00	+76.9	+ 7.69	+ 100(a,e)	—
Enticide	2728021	+	100(a)	+1.00	—	—	+ 100(a)	—
Diallylitaconate	2767999	—		+1.00	—	—	—	—
4-Aminobenzamide	2835689	+	1000	+1.00	—	—	+1000	+1000
5-Amino-*o*-cresol	2835952	+	1000	+1.00	—	—	+1000	750
Dowco 210	2864611		23.7(a,e)	—	—	—	+ 100(a,e)	—
DID 95	2865705		100(a)	0.056	4.31	0.043	—	—
beta-Dimethylaminoethyl methacrylate	2867472	+	(98.0)	+1.00	—	—	—	—
1-Amino-4-chloroanthraquinone	2872471	+	(27.0)	0.600	46.2	− 1.71	—	—
trans-Asarone	2883989		750	0.237	18.2	0.024	+ 100	+ 100
Sulazepam	2898137	+	100(a,e)	+1.00	—	—	+ 100(a,e)	—
RE 5655	2917193		2.37−3.00(a,d,e)	0.050	3.85	1.62	5.62(a,d,e)	—
Chlorpyrifos	2921882		13.3(a,c,e,h)	0.083(h)	6.38	0.480	75.0(c,e)	13.3(c)
Bay 42903	2984658		5.62(a)	—	—	—	31.6(a)	—
2-(Methylthio)aniline	2987533	+	1000	+1.00	—	—	+1000	+1000
ENT 62488	3054215		10.0	+1.00	+76.9	+ 7.69	—	+ 316(f)
Hexamethyltriethylenetetramine	3083101	+	100	+1.00	—	—	—	+ 316(m)
Acrizane chloride	3131086	—		0.210−0.237	—	—	—	—
d-Camphorsulfonic acid	3144169	+	178	+1.00	—	—		+ 100−+316
Acid fuchsine	3244880	+	100	+1.00	—	—	—	—
Aspon	3244904	+	100(a)	0.150	11.5	− 0.115	+ 100(a)	—
GC 6506	3254635		0.562(a)	0.035	2.69	4.79	0.562(a)	—
Hercules 9699	3279467		45.0(a,d,e)	0.800	61.5	1.37	45.0(a,d,e)	—
N-Cyclohexyl-1,3-propanediamine	3312605	+	(40.0)	0.316	24.6	− 0.615	—	—
Cyclohexylpiperidine	3319015	+	(98.0)	+1.00	—	—	—	—
O,S,S-Tridehylphosphorotrithioic acid	3347306	—		+0.100	—	—	—	—
Temephos	3383968		42.2(a)	+1.00	+76.9	+ 1.82	+ 100(a)	75.0
3-Aminobenzamide	3544249		1000	+1.00	+76.9	+ 0.077	+1000	+1000
R-874	3547339	+	100	+1.00	—	—	—	—
Pimetine	3565035	+	100(a)	+1.00	—	—	+ 100(a)	—
Bay 32651	3566005		67.0−70.0(a,d)	0.002−0.020	1.54	0.023	57.0−65.0(a,d)	—
Bay 34042	3568567	−	0.316(a)	—	—	—	1.78(a)	—
Repellent 1207	3569571	+	100	+1.00	—	—	—	—
Ethoxomane	3570465		100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
2-Chloroethyl methanesulfonate	3570589	+	100	+1.00	—	—		178−237(f)
TPTZ	3682357		5.62	0.168	12.9	2.30	+ 100	75.0−+316(m)
SD 7727	3687136	—		0.562	—	—	—	—
Sulfotepp	3689245	−	100(a)	0.060	4.62	+ 0.046	100(a)	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
Chlorophacinone	3691358	+ 100(a)	—	—	—	—	—
Hercules 8717	3692908	15.0(a,d,e)	0.316	24.3	1.62	+ 29.0−150(a,d,e)	—
1,5-Dichloro-2,4-dinitrobenzene	3698837	+ 100	0.824	63.4	− 0.634	—	—
2-Picolylamine	3731519	562	+1.00	+7.69	+ 0.137	+1000	750
3-Picolylamine	3731520	+ 1000	+1.00	—	—	+1000	+1000
4-Aminomethylpyridine	3731531	+ 100−+ 1000	0.856	65.8	− 0.066	+1000	+1000
Denatonium benzoate	3734336	+ 100	+1.00	—	—	—	—
Diloxanide furoate	3736810	+ (98.0)	+1.00	—	—	—	—
ENT 17591	3737222	+ 100	+1.00	—	—	—	—
ENT 6249a	3750434	13.3	—	—	—	23.7	75.0−+100(f)
2-Chloro-4,6-diamino-1,3,5-triazine	3797624	+ 100	+1.00	—	—	—	+ 316
Chloroprocaine HCl	3858897	+ 100(a,e)	+1.00	—	—	—	—
SD 8786	3971899	42.2(a,e)	0.562	43.2	1.03	+ 100(a,e)	—
Ronnoxon	3983457	17.8(a,e)	0.400	30.8	1.73	+ 100(a,e)	—
Dowicide Q	4080313	+ 100(a)	+1.00	—	—	+ 100(a)	—
VC 3-668	4104034	—	+1.00	—	—	—	—
Gophacide	4104147	4.22−4.46	—	—	—	17.8(a,e)	—
Ethyl carbazate	4114312	23.7−+100	0.540	41.5	1.75	100	100(m)
7-Hydroxy-4,8-dimethylcoumarin	4115768	+ 100	+1.00	—	—	—	—
Valnoctamide	4171135	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Sudan black B	4197255	+ 100−+500	+1.00	—	—	—	—
2-Phenoxytetrahydropyran	4203503	+ 1000	+1.00	—	—	—	—
Kelevan	4234791	+ (104)	+1.00	—	—	—	—
Trichloroacetophenone	4252782	+ 100	+1.00	—	—	—	—
2-Bromoethane sulfonic acid Na salt	4263529	+ 100	+1.00	—	—	—	+ 1000(f)
Tybamate	4268364	+ 100(a)	+1.00	—	—	+ 100(a)	—
Rauwolfine	4360127	178	+1.00	+76.9	+ 0.432	—	+ 100(m)
Sudan green	4392681	+ 500	+1.00	—	—	—	—
MES	4432319	+ 100	+1.00	—	—	—	+ 316(m)
Clothizamide dimaleate	4434202	+ 100(a,e)	0.650	50.0	− 0.500	+ 100(a,e)	—
2,4,5-Trimethoxybenzaldehyde	4460860	422	+1.00	+76.9	+ 0.182	—	—
4-Mercaptopyridine	4556234	+ 100	+1.00	—	—	—	750
Thionicotinamide	4621663	+ 100	+1.00	—	—	—	—
(+)-Fenchone	4695629	+ 316	+1.00	—	—	—	—
Trioctylphosphine	4731537	+ (98.0)	+1.00	—	—	—	—
5-Chloroisatoic anhydride	4743173	+ 100	+1.00	—	—	—	—
Lilly 21784	4806875	75.0(a,e)	+1.00	+76.9	+ 1.03	+ 100(a,e)	—
3-Piperidino-1,2-propanediol	4847932	+ 100	+1.00	—	—	—	—
Pentyl-2-furoic acid	4996489	+ (98.0)	+1.00	—	—	—	—
4-Acetamidopyridine	5221421	42.2(a)	—	—	—	13.3(a)	—
Carboxin	5234684	42.2	+1.00	+76.9	+ 1.83	—	—
Metomidate	5377208	56.2−100(a,e)	+1.00	+76.9	+ 1.37	178−+178(e)	—
Citral	5392405	—	—	—	—	—	—
3,3'-Thiobispropionamide	5459109	—	+1.00	—	—	—	—
1,2,5-Triacetoxy pentane	5470860	+ (98.0)	+1.00	—	—	—	—
Capuride	5579135	+ 100(a,e)	+1.00	—	—	100(e)	—
Bromchlorenone	5579851	+ (42.1)	0.316	24.3	− 0.577	—	—
Dimefadane	5581408	75.0(a,e)	0.930	71.5	0.954	+ 100(a,e)	—
Mesoridazine	5588330	+ 100(a)	0.562	43.2	− 0.432	+ 100(a)	—
Thiothixene	5591457	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
Chlorpyrifos-methyl	5598130	100	+1.00	+76.9	+ 0.769	+ 100	—
Dowco 217	5598527	13.3(a,e)	0.154	11.8	0.890	56.2(a,e)	—

Chlorethate	5634377	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
l-Bornylacetate	5655518	316	+1.00	+76.9	+ 0.243	—	—
Acetophenzaine maleate	5714001	75.0(a,e)	+1.00	+76.9	+ 1.03	100(a,e)	—
Ethyl-4-nitrophenyl carbamate	5819216	75.0(a)	0.316	24.6	0.328	+ 100(a)	—
Chloropropylate	5836102	+ 100	+1.00	—	—	—	—
Benaphyllin	5878615	+ 100	0.422	32.5	− 0.325	—	+ 100(m)
4-Propylveratrole	5888528	+ 316	+1.00	—	—	+ 316	—
Narlene	5902523	75.0(a)	0.030	2.31	0.031	—	—
1,3-Bis(dimethylamino)isopropanol	5966518	+ 100	+1.00	—	—	—	+ 316(m)
Benoxinate HCl	5987826	133	+1.00	+76.9	− 0.578	—	100(m)
d-Limonene	5989275	+ (111)	+1.00	—	—	—	—
N 244	6012926	+ 100(a)	0.020−0.110	8.46	− 0.085	—	—
p-Aminopropiophenone HCl	6170258	237	—	—	—	422	133
p-Aminopropiophenone SO_4	6170269	133	—	—	—	+ 178	+ 178
p-Toluenesulfonic acid, monohydrate	6192525	+ 100	+1.00	—	—	—	+ 316
Morin HCl	6202273	+ 100	+1.00	—	—	—	—
Triallyl citrate	6299736	—	+1.00	—	—	—	—
4-Chloro-2,5-dimethoxyaniline	6358641	+ 100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Bithionolate sodium	6385586	+ (75.0)	0.750	57.7	− 0.769	—	—
Allyxycarb	6392467	13.3(a,d,e)	0.100	7.69	0.578	10.0−13.3(a,d,e)	—
3-Chlorobenzanthrone	6409445	—	0.340	—	—	—	—
Tridodecylphosphine	6411241	+ (98.0)	+1.00	—	—	—	—
HRS 1635	6436051	75.0(a)	0.422	32.3	0.431	+ 100(a)	—
Sodium silicate	6834920	+ (100)	+1.00	—	—	—	—
Monocrotophos	6923224	1.00(a,b,c,e)	0.056	4.31	4.31	3.16−5.62(a,c,e)	4.22(c)
2-Benzylamino pyridine	6935279	+ 100	—	—	—	—	—
4-Chloro-2,5-dimethoxynitrobenzene	6940530	+ 100	0.680	52.3	− 0.523	+ 100	—
2-Chloro-4-acetotoluidide	7149793	1.78(a)	0.282−+1.00	+76.9	+43.2	1.33(a)	1.33
HEPES	7365459	+ 100	+1.00	—	—	—	+ 316(m)
Dimethyloctylamine	7378996	+ (101)	+1.00	—	—	—	—
4-Chloropyridine HCl	7379353	+ 100−+1000	+1.00	—	—	+1000	+1000
Aluminum	7429905	+ (111)	+1.00	—	—	—	—
Carbon	7440440	+ (100)	+1.00	—	—	—	—
Thallium sulfate	7446186	—	+1.00	—	—	34.6−56.6(a)	—
Lithium chloride	7447418	422	+1.00	+76.9	+ 0.183	+1000	422
Trichloromelamine	7673098	+ 100	+1.00	—	—	—	—
Sodium fluoride	7681494	—	+1.00	—	—	+ 200	—
Bay 75546	7682908	2.37(a,b)	0.056	4.31	1.82	+ 100(a)	—
Crotoxyphos	7700176	56.2	0.649	49.9	0.888	—	—
Sulfur	7704349	—	+0.316−+1.00	—	—	—	—
Starlicide	7745893	2.41(a,j)	0.800	61.5	25.5	3.16−4.11(a,j,k)	2.24−10.0(j)
3-Bromo-*p*-toluidine	7745917	1.90(a)	0.760	58.5	30.8	6.60−7.50(a)	—
Dowco 105	7780338	600	0.090	6.92	0.012	—	—
Potassium alum dodecahydrate	7784249	+ (100)	+1.00	—	—	—	—
Ammonium alum	7784250	+ (100)	+1.00	—	—	—	—
Phosdrin	7786347	1.78(c)	—	—	—	3.90−7.50(a,c)	23.7(c)
Bone oil	8001852	—	+1.00	—	—	—	—
Neem oil	8002651	1000−+1000	+1.00	+76.9	+ 0.077	—	—
Chemagro 2635	8003461	+ 100(a)	−0.100	− 7.69	− 0.077	+ 100(a)	—
Cinnamon oil	8007805	+ 1000	+1.00	—	—	—	—
Ditran	8015541	+ 100(a,e)	—	—	—	+ 100(a,e)	—
Veratrine	8051023	17.8	0.178	13.7	0.770	—	—
Lignosulfonic acid sodium	8061516	+ 100	+1.00	—	—	—	—
Bufencarb	8065369	4.22(c)	+1.00	+76.9	+18.3	75.0(c)	42.2−56.2(c)
Demeton	8065483	2.37−22.0(a,b,c)	—	—	—	13.3−+39.0(a,c)	13.3(c)
Calcium nitrate	10124375	+ (99.0)	+1.00	—	—	—	—
BES	10191181	+ 100	+1.00	—	—	—	+ 316(m)
Naringin	10236472	+ 100	+1.00	—	—	—	—
Resmethrin	10453868	75.0	+1.00	+76.9	+ 1.03	—	—
Propineb	12071839	+ 100	—	—	—	—	—
Zineb	12122677	+ 100(a)	+1.00−2.55	196	− 1.96	+ 100	—
Maneb	12427382	+ 100	+100	—	—	—	—

Table 2. (cont'd)

Name	Registry number (CAS)	LD_{50} (mg/kg) (1,2,5)	Redwinged blackbird R_{50} (%)(5)	R_{50} (mg/kg) (3)	Hazard factor (4)	Starling LD_{50} (mg/kg)	Coturnix LD_{50} (mg/kg)
GC 5942	12707607	+ 100(a)	0.200	15.4	− 0.154	100(a)	—
Phillips 2605	12712286	2.37(a)	0.178	13.7	5.78	17.8(a)	—
Micoluteina destacina	12764475	2.37(a)	0.150	11.5	4.77	2.37−3.16(a)	—
(1-Adamantyl)urea	13072690	+ 100	+1.00	—	—	—	+ 100
5-Anilino-1,2,3,4-thiatriazole	13078303	+ 100	0.453	34.8	− 0.348	—	+ 316(m)
ENT 27318	13194484	4.22(c)	—	—	—	7.50(c)	7.50(c)
SD 14114	13356086	+ 100	+1.00	—	—	+ 100	
Titanium dioxide	13463677	100	+1.00	+76.0	+ 0.769	—	—
Wy 5244	13822054	100−+100(a,e)	+1.00	+76.9	+ 0.769	+ 100(a,e)	—
Fenchyl acetate	13851111	+ 316	+1.00	—	—	—	—
Aminomethanesulfonic acid	13881919	+ 100	+1.00	—	—	—	+1000(f)
Fenpipramide HCl	14007535	—	0.282	—	—	—	—
Trimethidinium methosulfate	14149430	+ 100(a,e)	+1.00	—	—	+ 100(a,e)	—
ACD 7029	14285439	31.6(a,e)	0.400	30.8	0.974	+ 100(a)	—
SD 3450	14458958	− (25.0)(a)	−1.00	—	—	—	—
Ba 33215	14548460	+ 100	+1.00	—	—	—	—
Bis(1,2,2-trichloroethyl)sulfoxide	14788977	+ 100	+0.100	—	—	—	—
Phoxim	14816183	10.0(c)	+1.00	+76.9	+ 7.69	23.7(c)	23.7(c)
Bay 78172	14816207	+ 100	—	—	—	—	—
beta-Ionone	14901076	+ 562	+1.00	—	—	—	—
Cryolite	15096523	+ 100(a)	+1.00	—	—	+ 100(a)	—
2-Chloroethane sulfonic acid Na salt	15484443	+ 100	+1.00	—	—	—	+1000(f)
Triphenyllead phenyl sulfide	15590779	+ (100)	+1.00	—	—	—	—
Ryania	15662336	1.78(c)	0.133	10.2	5.75	3.16(c)	13.3(c)
Cyprazepam	15687077	+ 100(a,e)	0.900	69.2	− 0.692	+ 100(a,e)	—
alpha-Chloralose	15879933	31.6(a,e)	+1.00	+76.9	2.43	75.0(a,e)	31.6
RE 5454	15942480	9.00(a,d,e)	0.316	24.3	2.70	16.0(a,d,e)	—
2,3,4-Trichlorophenol	15950660	+ 100	+1.00	—	—	—	—
EPPS	16052065	+ 100	+1.00	—	—	—	+ 316(m)
3-Amino-5-mercapto-1,2,4-triazole	16691433	+ 100	+1.00	—	—	—	+ 316(m)
Methomyl	16752775	10.0(a,c,e)	0.224	17.2	1.72	13.3−42.2(a,c,e)	23.7(c)
4'-Acetamidopropiophenone	16960499	+ 316	—	—	—	+ 316	+ 316
Edinfenphos	17109498	+ 100	+1.00	—	—	—	—
Xanthiol HCl	17162322	+ 100(a,e)	0.650	50.0	− 0.500	+ 100(a,e)	—
2,2,2-Trichloroethylchloroformate	17341934	+ 100	+1.00	—	—	—	—
Tomatine	17406450	+ 100	+1.00	—	—	—	—
5-Amino-3-phenyl-1,2,4,-thiadiazole	17467151	56.2−+100	0.422	32.5	0.577	—	75.0(m)
3-Amino-5,6-dimethyl-1,2,4-triazine 1,2,4-triazine	17584122	+ 100	+1.00	—	—	—	+ 316(m)
Dodecylamine picrate	17623415	+ (104)	+1.00	—	—	—	—
Benomyl	17804352	100−+100(a)	+1.00	+76.9	+ 0.769	+ 100(a)	—
Bromopropylate	18181801	+ 100	+1.00	—	—	—	—
Bay 69047	19645422	+ (113)	+1.00	—	—	—	—
Thioglucose	20408973	+ 100	+1.00	—	—	—	+ 316(m)
Calcium sulfide	20548543	—	+1.00	—	—	—	—
Potassium azide	20762601	17.8	+1.00	+76.9	+ 4.32	—	—
Chloraniformethan	20856579	+ 100	+1.00	—	—	—	—
Metribuzin	21087649	+ 100	+1.00	—	—	—	—
4-Cyclohexylthiosemicarbazide	21198185	+ 100	0.299	23.0	− 0.230	—	+ 316

Tin oxide	21651194	+ (103)	+1.00	—	—	—	—
Cyanazine	21725462	—	0.133	—	—	—	—
Bay 9015	21832257	13.3(a)	+0.100	+ 7.69	+ 0.587	13.3(a)	—
Pirimiphos-ethyl	23505411	7.50	0.604	46.4	6.19	+ 100	—
Bay 93820	24353615	0.562(b)	0.024	1.85	3.52	—	—
Rescinnamine	24815245	+ 100(a,e)	—	—	—	—	—
Bay 91273	25205087	—	0.042	—	—	—	—
Propiopromazine	25333839	+ 316	0.465	35.8	− 0.113	316	+ 316
Sodium azide	26628228	23.7	+1.00	+76.9	+ 3.24	—	—
Pyridyl disulfonic acid-1,2,4-triazine	28048331	+ 100	+1.00	—	—	—	+ 316(m)
Tartar emetic	28300745	+ 100	0.133	10.2	− 0.102	—	—
Thiocarboxime	29118874	4.22	0.147	11.3	2.69	—	—
Cyanopyridine	29386661	+ 100	+1.00	—	—	—	—
Bay 79845	32575807	3.16(g)	0.056	4.31	1.35	7.50(a)	—
Bay 88991	32575818	—	+1.00	—	—	—	—
Tributyltin chloroacetate	33550220	+ (39.0)	0.316	24.3	− 0.623	—	—
Chemagro 5461	34491128	+ 10.0(a)	0.562	43.2	− 4.32	+ 10.0(a)	
Dimethyldinitro carbanilide	34594473	+ 100	0.824	63.4	− 0.634	—	629−750(f)
Bay HOL 0574	35335605	2.37(b)	0.480	36.9	15.6	13.3	—
3-Iodo-*p*-toluidine	35944640	1.78−2.37(a)	0.150	11.5	6.48	23.7	—
Phillips 2133	35944731	1.78−2.10(a)	0.080	6.15	3.46	1.33(a)	—
Metomidate HCl	35944742	56.2(a,e)	0.667	53.1	0.913	+ 100(a,e)	56.2
Dowco 211	35944797	75.0(a,e)	+1.00	+76.9	+ 1.03	+ 100(a,e)	—
Dowco 160	35944822	10.0(a,e)	0.500	38.5	3.85	17.8(a,e)	—
Dowco 133	35944833	7.50(a)	0.500	38.5	5.13	+ 100(a)	—
GC 4276	35944866	10.0(a)	—	—	—	178(a)	—
Dowco 161	36031660	23.7(a,e)	0.500	38.5	1.62	13.3(a,e)	—
Ziram cyclohexylamine complex	36530231	31.6(a)	0.621	47.8	1.51	—	—
Propoquad HT/12	37234621	—	+1.00	—	—	—	—
Phostex	37333407	+ 500	+1.00	—	—	+ 500	—
SKF 10812A	37841331	+ 178(e)	+1.00	+76.9	+ 0.432	316−+316(e)	—
2-Methyl-*p*-aminobenzoic acid	38667559	+ 316	+1.00	—	—	+ 316	+1000
Guazatine	39202396	+ 100	+1.00	—	—	—	—
Bay COE 3664	39457244	2.37(b)	0.562	43.2	18.2	13.3	—
Bay COE 3675	39457255	1.33(b)	0.562	43.2	32.5	4.22	—
U 5092	42062395	+ (113)	+1.00	—	—	—	—
Ethyl-1-(hydroxymethyl)propylcarbamate	51170480	+ 100(a)	+1.00	—	—	+ 100(a)	—
Crotulin	52964428	+ (104)	+1.00	—	—	—	—
4-Pyridineethanesulfonic acid	53054765	+ 100	+1.00	—	—	—	—
2,5-Bis(4-pyridyl)-1,3,4-thiadiazole	54010218	+ 100	0.422	32.5	− 0.325	—	+ 100(m)
U 12171	61164098	75.0(c,h)	0.091−0.178(*)	13.7	0.183	100(c)	178−316(f)
Alcian yellow	61968761	+ 178	+1.00	—	—	—	—
Sirmate	62046371	—	+1.00	—	—	—	—
1-(2-Naphthalenylcarbonyl)aziridine	63021454	+ 100	+1.00	—	—	—	+ 316(m)
Mercaptoacetanilide carbamate	64046588	+ 100(a)	0.680	52.3	− 0.523	+ 100(a)	—
VC 3-759	66869330	—	+0.100	—	—	—	—
Tergitol 15-S-9	68131408	+ 1000	—	—	—	—	—

(1) Letters in ( ) indicate previously published sources for data presented as follows: (a) Schafer 1972; (b) Schafer *et al.* 1973b; (c) Schafer *et al.* 1979; (d) Schafer *et al.* 1967; (e) Schafer *et al.* 1972; (f) Schafer *et al.* 1976; (g) Schafer *et al.* 1977; (h) Schafer *et al.* 1971; (i) Frank *et al.* 1970; (j) DeCino *et al.* 1966; (k) Schafer *et al.* 1969; (l) Schafer *et al.* 1973a; (m) Schafer *et al.* 1982; (n) Shefte *et al.* 1982.

(2) Numbers in ( ) indicate an estimated LD_{50} based on food consumption data over a 18 hour period. In Tables 2, 3, and 4, the + signs = >, and the − signs = <.

(3) Calculated assuming 50% consumption of an average food intake during one feeding session (1.00g) and an average body weight of 65 g.

(4) Calculated by the following formula: R_{50} (mg/kg) (maximum value)/LD_{50} (mg/kg) (minimum value) = *Hazard Factor*

(5) Additional references deleted from table because of space limitations are denoted by an (*), as follows: 504245-Redwinged blackbird-LD50-(e,l); 671045-Redwinged blackbird-LD50(d,e); 2032657-Redwinged blackbird-LD50-(c,d,e,h); 61164098-Redwinged blackbird-R50-(c,h).

(6) LC_{50} (inhalation) in ppm.

Table 3. Acute oral toxicity of 186 chemicals to 7 other bird species

Registry Number (CAS)	LD_{50}(mg/kg)(1,2,3) HSPA	CGRA	CPIG	HFIN	MALD	RNPH	YHBB
51285	+ 9.00	—	—	—	—	—	—
52437	178(e)	—	100−133(e)	42.2(e)	75.0(e)	+ 100(e)	133−+133(e)
55221	+1000	—	—	—	—	—	—
55389	2.37−5.62(a,b,c)	4.22−7.50(c)	1.78(a,c)	13.3	—	—	2.37
56382	1.33(b,c)	5.62(c)	1.33(c)	2.37	—	—	—
56724	10.0(b,c)	3.16−4.22(c)	5.62(c)	2.37	—	—	—
57330	75.0(a,e)	178(a,e)	133(a,e)	100−133(a,e)	75.0(a,e)	+ 100(a,e)	100(a,e)
58366	100(a)	—	—	—	—	—	—
58899	56.2(a)	+ 100(a)	—	—	—	—	—
59676	+1000	—	—	—	—	—	—
60413	—	—	—	5.62(a)	—	—	—
60571	13.3(c)	42.2(c)	23.7(c)	—	—	—	—
62533	562	—	—	—	—	—	—
62737	17.8(c)	13.3(c)	23.7(c)	—	—	—	—
62748	1.00	7.50	—	—	—	—	—
63252	+ 100	—	—	—	—	—	—
65305	+ 100(a,e,h)	+ 31.6−+100(a,e,h)	75.0(a,e)	100−+100(a,e)	75.0(a,e)	+ 100(a,e,h)	42.2(a,e)
66251	+ (240)	—	—	—	—	—	—
71272	+ 100	+ 100	75.0	+ 100	+ 100	75.0	+ 100
71738	100(e)	—	+ 100(e)	178(e)	+ 316(e)	+ 100(e)	+ 100(e)
72208	1.78(a,c,k)	0.316−5.62(a,c)	5.62(a,c,k)	—	—	—	—
77269	100(a,e)	—	75.0(a,e)	133(a,e)	56.2(a,e)	+ 100(a,e)	56.2(a,e)
77281	+ 100(e)	—	242(e)	133(e)	+ 100(e)	+ 100(e)	+ 100(e)
79936	+ 100(e)	+ 100(e)	+ 100(e)	+ 100−+316(e)	+ 100(e)	+ 100(e)	+ 100(e)
80002	+ 100	—	—	—	—	—	—
84651	+ 100	—	—	—	—	—	—
88686	+1000	—	—	—	—	—	—
88744	750	—	—	—	—	—	—
90040	421	—	—	—	—	—	—
94246	+ 100	+ 100	+ 100	133	+ 100	+ 100	+ 100
95534	750	—	—	—	—	—	—
95545	100	—	—	—	—	—	—
95556	316	—	—	—	—	—	—
95749	316(a,k)	—	13.3(a,k)	—	42.2	—	—
97176	56.2(c)	75.0(c)	75.0(c)	—	—	—	—
97778	+ (244)	—	—	—	—	—	—
98986	178	—	—	—	—	—	—
99058	+1000	—	—	—	—	—	—
99092	+1000	—	—	—	—	—	—
100550	+1000	—	—	—	—	—	—
101019	+ 100	—	—	—	—	—	—
102067	+ 100	—	—	—	—	—	—
104961	316−562	—	—	—	—	—	—
106229	+ (240)	—	—	—	—	—	—
106478	100	—	—	—	—	—	—
106490	237	—	—	—	—	—	—
106503	422	—	—	—	—	—	—
106514	+ (240)	—	—	—	—	—	—
108429	178	—	—	—	—	—	—
108452	+1000	—	—	—	—	—	—
108894	1000	—	—	—	—	—	—
108996	1000	—	—	—	—	—	—
109002	1000	—	—	—	—	—	—
109068	+1000	—	—	—	—	—	—

109091	+1000	—	—	—	—	—	—
110861	+1000	—	—	—	—	—	—
114261	13.3–15.0(a,c,d)	13.3(a,c,e)	7.50(a,c,d)	4.22–10.0(a,d,e)	17.8(a,e)	13.3–15.0(a,d)	7.50(a)
115388	+ 100(e)	—	+ 100(e)	+ 100–133(e)	+ 100(e)	+ 100(e)	+ 100(e)
115446	133(a,e)	—	56.2(a,e)	100–133(a,e)	100(a,e)	+ 100(a,e)	100–+100(a,e)
115902	0.316(b,c)	0.422(c)	0.562(c)	—	—	—	—
116063	0.750(c)	0.750(c)	3.16(c)	—	—	—	—
118923	+1000	—	—	—	—	—	—
120127	+ (244)	—	—	—	—	—	—
122145	316	—	—	316	—	—	—
123308	178	—	—	—	—	—	—
126523	+ 100(e)	+ 100(e)	+ 100(e)	237(e)	+ 100(e)	+ 100(e)	+ 100(e)
133062	+ 100	+ 100	—	—	—	—	—
137268	+ 100	+ 100	—	—	—	—	—
137304	+ 100	—	—	—	—	—	—
141662	4.22(b,c)	1.78(c)	4.22(c)	—	—	—	—
142085	1000	—	—	—	—	—	—
143828	42.2(a)	—	+ 100(a)	23.7(a)	+ 100(a)	+ 100(a)	178(a,e)
149155	+ 100–316(e)	+ 100(e)	+ 100(e)	237(e)	+ 100(e)	+ 100(e)	+ 100(e)
150130	+1000	—	—	—	—	—	—
297789	1.00(c)	1.33(c)	10.0(c)	—	—	—	—
297972	4.22(c)	3.16(c)	2.37(c)	—	—	—	—
297994	3.16(c)	5.62(c)	4.22(c)	—	—	—	—
298022	—	1.33(a)	—	—	—	—	—
298044	—	2.37(a)	—	—	—	—	—
302170	+ 100	+ 100	+ 100	+ 100	+ 100	+ 100	+ 100
309002	13.3(c)	7.50(c)	56.2(c)	—	—	—	—
309433	56.2(a,e)	—	133(a,e)	56.2(a,e)	75.0(a,e)	+ 100(a,e)	100(a,e)
315184	7.50(c)	7.50(c)	5.62(c)	—	—	—	—
327980	5.62(c)	5.62(c)	13.3(c)	—	—	—	—
333415	7.50(c)	7.50(c)	3.16(c)	—	—	—	—
340578	+ 100(e)	+ 100(e)	+ 316(e)	+ 316–+316(e)	+ 100–+316(e)	+ 100(e)	+ 100(e)
350038	+1000	—	—	—	—	—	—
359831	+ 100(e)	+ 100(e)	+ 100(e)	+ 100–178(e)	+ 100(e)	+ 100(e)	+ 100(e)
438415	+ 316(e)	+ 100(e)	+ 100(e)	316(e)	+ 100(e)	+ 100(e)	+ 100(e)
439145	+ 316–+562(e)	+ 100–+316(e)	+ 316(e)	+ 316(e)	+ 316(e)	+ 316–+562(e)	+ 316(e)
440175	75.0	—	—	—	—	—	—
462088	133	—	—	—	—	—	—
470906	13.3(c)	17.8(c)	13.3(c)	23.7	—	—	—
480228	+ 100	—	—	—	—	—	—
500221	+1000	—	—	—	—	—	—
500287	+ 100	—	—	—	—	—	—
504245	3.80–7.50(a,b,c,1)	2.37(c,1)	7.50(c,1)	5.62(1)	4.22(a,1)	5.62–7.50(a,1)	—
504290	75.0	—	—	—	—	—	—
536903	750	—	—	—	—	—	—
578541	750	—	—	—	—	—	—
586958	+1000	—	—	—	—	—	—
586981	100	—	—	—	—	—	—
587020	1000	—	—	—	—	—	—
589162	178	—	—	—	—	—	—
591275	+1000	—	—	—	—	—	—
615747	562	—	—	—	—	—	—
626608	562	—	—	—	—	—	—
626642	+1000	—	—	—	—	—	—
629505	+ (240)	—	—	—	—	—	—
671045	4.22(a,c,d,e)	1.78(a,c,e)	4.22(a,c,d,e)	1.78–3.00(a,d,e)	2.37(a,e)	10.0–11.0(a,d,e)	1.33(a,e)
694597	+1000	—	—	—	—	—	—
814915	+(250)	—	—	—	—	—	—
872855	+1000	—	—	—	—	—	—

Table 3. (cont'd)

Registry Number (CAS)	LD_{50}(mg/kg)(1,2,3) HSPA	CGRA	CPIG	HFIN	MALD	RNPH	YHBB
873745	56.2	—	—	—	—	—	—
931191	+1000	—	—	—	—	—	—
944229	13.3(c)	17.8(c)	13.3(c)	—	—	—	—
947024	2.37(b,c)	2.37(c)	2.37(c)	—	—	—	—
956901	133(a,e)	133(a,e)	133–237(a,e)	75.0(a,e)	75.0(a,e)	133(a,e)	23.7(a,e)
1003674	+1000	—	—	—	—	—	—
1003732	+1000	—	—	—	—	—	—
1079330	23.7(c)	17.8(c)	56.2(c)	—	—	—	—
1121604	1000	—	—	—	—	—	—
1122549	1000	—	—	—	—	—	—
1122629	+1000	—	—	—	—	—	—
1193028	56.2	—	—	—	—	—	—
1305620	+ 56.2	—	—	—	—	—	—
1314416	+ (195)	—	—	—	—	—	—
1328536	+ (278)		—	—	—	—	—
1329868	+ 316	+ 100	+ 100	+ 100	+ 100	+ 100	+ 100
1371391	+ (100)	—	—	—	—	—	—
1461229	+ 100	—	—	—	—	—	—
1563662	1.33(b,c)	1.33—3.16(c)	1.33(c)	0.750	—	—	—
1783819	562	—	—	—	—	—	—
1885296	+1000	—	—	—	—	—	—
2032657	17.8(a,b,c,d,e,h)	10.0(a,c,e,h)	13.3(27.3(a,*)	2.37–3.00(a,d,e)	13.3(a,e)	13.3–+1000(a,*)	3.16(a,e)
2104645	2.37(c)	4.22(c)	4.22(c)	—	—	—	—
2237301	562	—	—	—	—	—	—
2835689	1000	—	—	—	—	—	—
2835952	562	—	—	—	—	—	—
2864611	56.2(a)	56.2(a,e)	+ 316	75.0(a)	75.0–100(a,e)	+ 100(a)	+ 100(a)
2865705	100(a)	—	—	—	—	—	—
2921882	10.0(a,c,h)	5.62–13.3(a,h)	10.0(c)	—	—	8.40(h)	—
2987533	1000	—	—	—	—	—	—
3383968	31.6	—	—	56.2	—	—	—
3544249	+1000	—	—	—	—	—	—
3731519	+1000	—	—	—	—	—	—
3731520	+1000	—	—	—	—	—	—
3731531	1000	—	—	—	—	—	—
4104147	—	—	15.9	—	—	—	—
5377208	31.6(a,e)	56.2(a,e)	42.2(a,e)	56.2(a,e)	133(a,e)	+ 100(a,e)	75.0(a)
5392405	+(240)	—	—	—	—	—	—
5902523	+ 100	—	—	—	—	—	—
6012926	+ 100	—	—	—	—	—	—
6923224	1.33(b,c)	4.22(c)	4.22(c)	—	—	—	—
7149793	—	—	—	—	42.2	—	—
7379353	+1000	—	—	—	—	—	—
7429905	+ (250)	—	—	—	—	—	—
7682908	3.16(b)	10.0	4.22	5.62	—	17.8	2.37
7745893	316–448(a,j,k)	1.00	17.8(a,j,k)	+ 225(a)	17.8(a,j)	10.0(a,j)	—
7780338	+ 100	—	—	—	—	—	—
7786347	1.78(c)	4.22(c)	4.22(c)	—	—	—	—
8065369	23.7(c)	42.2(c)	23.7(c)	+ 3.16(c)	—	—	—
8065483	5.62(b,c)	1.78(c)	13.3(c)	—	—	—	—
10453868	+ 100	—	—	—	—	—	—
12712286	—	—	—	—	—	15.3	—
13194484	4.21(c)	10.0(c)	13.3(c)	—	—	—	—
14285439	31.6(a,e)	100(a,e)	13.3(a,e)	1.78(a,e)	7.50(a,e)	+ 100(a,e)	13.3(a,e)
14816183	5.62(c)	75.0(c)	23.7(c)	—	—	—	—

14816207	+ 100	+ 100	—	—	—	+ 100	—
15590779	+ 100	—	—	—	—	—	—
15662336	2.37(c)	1.78(c)	2.37(c)	—	—	—	—
15879933	42.2(a,e)	75.0(a,e)	178(a,e)	56.2(a,e)	42.2(a,e)	+ 100(a,e)	133(a,e)
16752775	13.3–31.6(c)	13.3–23.7(c)	10.0(c)	—	—	—	—
20856579	+ 100	+ 100	—	—	—	—	—
21087649	+ 100	+ 100	—	—	—	—	—
24353615	1.00(b)	—	—	—	—	—	—
32575807	1.78	—	2.37	2.37	—	—	—
35335605	3.16(b)	7.50	7.50	—	—	1.00	—
35944731	—	—	—	—	—	4.22	—
35944742	31.6(e)	—	56.2(e)	42.2(e)	56.2(e)	100(e)	56.2(e)
35944822	5.62(a)	—	—	—	—	—	—
36031660	7.50(a,e)	7.50–23.7(a,e)	75.0(a,e)	42.2(a,e)	13.3(a,e)	13.3(a,e)	10.0(a,e)
37841331	+ 100(e)	+ 100(e)	+ 100(e)	316(e)	100(e)	+ 100(e)	+ 100(e)
39457244	5.62(b)	5.62	10.0	—	—	10.0	—
39457255	1.78(b)	2.37	7.50	—	—	13.3	—
61164098	+ 100(h,i)	+ 100(h,i)	—	—	—	+ 100(h)	—

(1). Species codes are identified in Table 1.
(2). Letters in ( ) indicate previously published sources for data presented as follows: (a) Schafer 1972; (b) Schafer *et al.* 1973b; (c) Schafer *et al.* 1979; (d) Schafer *et al.* 1967; (e) Schafer *et al.* 1972; (f) Schafer *et al.* 1976; (g) Schafer et al. 1977; (h) Schafer et al. 1971; (i) Frank, et al. 1970; (j) DeCino *et al.* 1966; (k) Schafer *et al.* 1969; (l) Schafer *et al.* 1973a; (m) Schafer *et al.* 1982; (n) Shefte *et al.* 1982.
(3). Additional references deleted from table because of space limitations are denoted by an (*), as follows: 2032657-Common pigeon-(c,d,e); 2032657-Ring-necked pheasant-(d,e,h)

Table 4. Acute oral toxicity and repellency of 91 chemicals to 58 other bird species

Registry Number (CAS)	LD_{50}(mg/kg)(1,2) Other species		Other species		Other species		HSPA	R_{50}(%) Other species		Other species	
51285	—		—		—		0.600	—		—	
55389	akes	1.00–1.33(a)	bbmp	4.22–5.62(a)	bhcb	7.50	—	—		—	
	mdov	2.37	rbqu	1.33(b)	robi	5.62	—	—		—	
56382	bhcb	1.33	rbqu	1.78(b)	vwea	+ 1.78	—	—		—	
56724	bhcb	1.00	rbqu	3.16(b)		—	—	—		—	
58082		—		—		—	—	yhbb	0.430	—	
58366		—		—		—	+1.00	—		—	
58899	ccro	+ 100(a)		—		—	0.220	cgra	0.121	rnph	+1.00
60413	robi	+ 10.0(a)		—		—	—	—		—	
63252		—		—		—	0.316	rnph	+1.00	—	
65305	bhcb	31.6(a,e)	ccro	42.2(a,e)	wcsp	56.2(a)	0.562(h)	cgra	0.176(h)	rnph	0.422(h)
66251		—		—		—	+1.00	—		—	
70699	bbmp	178	ccro	178		—	—	—		—	
72208	akes	1.50(k)	mpar	– 2.10		—	—	—		—	
80002		—		—		—	0.316–0.562	—		—	
84651		—		—		—	0.650	yhbb	0.150	—	
95749	akes	422(a,k)	budg	31.6	rbqu	31.6–42.2	—	—		—	
	robi	–3.16(a)	tcbb	2.37		—	—	—		—	
97778		—		—		—	+1.00	—		—	
99923	bbmp	178	ccro	178		—	—	—		—	
101019		—		—		—	0.650	—		—	
102067		—		—		—	0.824	—		—	
106229		—		—		—	+1.00	—		—	
106514		—		—		—	+1.00	—		—	

Table 4. (cont'd)

Registry Number (CAS)	LD_{50}(mg/kg)(1,2) Other species			Other species			HSPA	R_{50}(%) Other species			Other species
114261	bhcb	10.0(a)	btgr	5.62(a)	budg	4.22	—	—			—
	ccro	13.3(a,d,e)	mdov	17.8(a)		—	—	—			—
115902	rbqu	0.237(b)		—		—	—	—			—
118752		—		—		—	+1.00	—			—
120127		—		—		—	+1.00	—			—
130154		—		—		—	0.824	—			—
133062	ccro	+ 100		—		—	0.824	—			—
137268		—		—		—	0.562	cgra	0.562	cotq	+1.00
		—		—		—	—	cwax	0.365	rnph	0.083
		—		—		—	—	star	0.085		—
137304		—		—		—	0.650		—		—
141662	rbqu	1.33(b)		—		—	—		—		—
149155		—		—		—	0.650		—		—
298022		—		—		—	—	cgra	1.00		—
298044		—		—		—	—	cgra	+1.00		—
330643		—		—		—	0.487(h)		—		—
438415	bhcb	+ 56.2		—		—	—		—		—
439145	ccro	+ 100	mdov	+ 100	wcsp	+ 100(e)	—		—		—
440175		—		—		—	0.382	cgra	0.562		—
470906	bhcb	13.3	gcsp	178		—	—		—		—
480224		—		—		—	0.708		—		—
500287		—		—		—	0.294		—		—
504245	akes	5.62(1)	bbgr	10.0(1)	bbmp	2.37(1)	—		—		—
	bhcb	4.22(a,1)	brcb	3.16(a,1)	btgr	2.37–3.16(a,1)	—		—		—
	btpa	10.0(1)	budg	5.62(1)	ccro	2.37(a,1)	—		—		—
	dicl	10.0(1)	gcsp	5.62(1)	gosp	2.37–2.74(n)	—		—		—
	grja	−10.0(1)	mdov	8.10–8.50(a,1)	mpar	12.0(1)	—		—		—
	mwea	4.22–4.87(n)	ofpa	12.0(1)	rbis	1.78–2.37(n)	—		—		—
	rbqu	5.62(b,1)	rbse	− 7.20(1)	rdgo	− 25.0(1)	—		—		—
	robi	4.22(1)	sdov	+ 4.00(1)	shcb	− 1.00(1)	—		—		—
	tcbb	4.22(1)	vwea	1.78–4.22(n)	wcsp	5.62(a,1)	—		—		—
	wwdo	13.3(a,1)	ybmp	2.37(1)		—	—		—		—
629505		—		—		—	+1.00		—		—
671045	ccro	7.50(a)	mdov	− 32.0		—	—		—		—
672060		—		—		—	0.650(h)		—		—
814915		—		—		—	+1.00		—		—
947024	rbqu	1.78(b)		—		—	—		—		—
956901	btgr	5.62(a)	ccro	237(e)	cgoo	+ 56.2(a,e)	0.200		—		—
	mdov	56.2–75.0(a,e)	wwdo	31.6–133(a)		—	—		—		—
1305620		—		—		—	0.200		—		—
1314416		—		—		—	+1.00		—		—
1314847	tcbb	75.0–237		—		—	—		—		—
1328536		—		—		—	+1.00		—		—
1329868	ccro	+ 100	wcsp	+ 100		—	—		—		—
1371391		—		—		—	0.681		—		—
1461229		—		—		—	0.180		—		—
1563662	bhcb	1.33		—		—	—	rbqu	0.422–0.562		—
2032657	bhcb	7.50(a,d,h)	btgr	4.22(a)	budg	1.33	0.042(h)	bhcb	0.316(h)	bwqu	+1.00
	bwqu	19.6–24.0(a)	ccro	7.50(a,d)	cwax	5.62	—	cgra	0.056(h)	cwax	0.012
	edov	3.16	gcsp	3.16	gosp	5.62(n)	—	gosp	0.178(n)	mdov	−0.500
	hlar	4.22	idov	4.22(a)	mdov	10.0(a)	—	mwea	0.076(n)	rbis	0.133(n)
	mwea	4.87–7.50(n)	wwdo	10.0(a)	rbis	5.62–7.50(n)	—	rbqu	0.015	rnph	0.422(h)
	rbqu	4.22–7.50(a,b,d)	shcr	23.7	tcbb	5.62(h)	—	star	0.288	tcbb	0.022

	valq	24.0(h)	vwea	7.50(n)	wcsp	4.22	—	valq	0.562(h)	vwea	0.063(n)
2104645	bhcb	5.62		—		—	—		—		—
2240144	btgr	4.22	mdov	5.62	wwdo	10.0	—		—		—
2921882	ccro	+ 31.6(a)		—		—	0.056(h)	cgra	−1.00(h)	rnph	+1.00(h)
5221421	btgr	17.8(a)	mdov	23.7(a)		—	—		—		—
5377208	budg	178	ccro	+ 100(a)	mdov	133	—		—		—
	wcsp	56.2(a,e)		—		—	—		—		—
5392405		—		—		—	+1.00		—		—
5902523		—		—		—	0.810		—		—
6012926		—		—		—	0.650		—		—
6923224	rbqu	1.33(b)		—		—	—		—		—
7149793	bwqu	1.78		—		—	—		—		—
7429905		—		—		—	+1.00		—		—
7682908	rbqu	+ 2.37(b)		—		—	—		—		—
7704349		—		—		—	+1.00		—		—
7745893	akes	+ 316(j,k)	bbmp	10.0	bjay	− 10.0(j)	—		—		—
	bowl	4.22	budg	237	brth	− 3.16	—		—		—
	btgr	1.00	bwqu	4.22	bwte	31.6	—		—		—
	cbth	3.16	ccro	1.33−1.78(j)	cfin	+ 100	—		—		—
	chac	42.2	chaw	562(j)	crav	5.62	—		—		—
	gdov	4.22	geag	+ 100	gosp	287−316(n)	—		—		—
	grja	5.62	mdov	3.16−7.50(j)	mwea	+ 316(n)	—		—		—
	pind	+ 31.6(j)	rbis	215−237(n)	rbqu	31.6	—		—		—
	recb	5.62	robi	3.16	scrj	1.78	—		—		—
	tcbb	2.74	turk	5.62	valq	− 10.0	—		—		—
	vwea	+ 316(n)	wcsp	+ 320	wfdo	+ 5.62	—		—		—
	wwdo	4.22		—		—	—		—		—
7780338		—		—		—	0.680		—		—
8001852		—		—		—	+1.00		—		—
8065483	rbqu	1.33(b)		—		—	—		—		—
10124375		—		—		—	+1.00		—		—
12712286	btgr	10.0(a)	mdov	7.50(a)	wfdo	4.21(a)	—		—		—
	wwdo	4.21(a)		—		—	—		—		—
14007535		—		—		—	+0.316		—		—
14285439	robi	+ 17.8(a)		—		—	—		—		—
14816207	bhcb	+ 100	bwqu	100	robi	100	0.821	bhcb	0.178	bwqu	+1.00
		—		—		—	—	cgra	+1.00	rnph	0.316
15590779		—		—		—	+1.00		—		—
15879933	ccro	42.2(a,e)	mdov	42.2(a,e)	rbqu	42.2	—		—		—
	wcsp	56.2(a,e)		—		—	—		—		—
20856579	bhcb	+ 100		—		—	—		—		—
21087649	bhcb	+ 100		—		—	—		—		—
24353615	rbqu	0.750		—		—	—		—		—
32575807	ccro	− 10.0	budg	23.7	robi	1.55	—		—		—
	scrj	− 10.0		—		—	—		—		—
35335605	bhcb	10.0	bwqu	1.33	rbqu	5.62(b)	—		—		—
35944731	bwqu	3.16	ccro	4.22	mdov	1.78	—		—		—
	mpar	6.35		—		—	—		—		—
36530231		—		—		—	0.422		—		—
37841331	mdov	+ 100		—		—	—		—		—
39457244	bhcb	2.37	bwqu	5.62	rbqu	2.37(b)	—		—		—
39457255	bhcb	2.37	bwqu	13.3	rbqu	0.750(b)	—		—		—
61164098	bhcb	+ 100(h)	ccro	+ 100(i)	tcbb	+ 100(h)	0.237(h,i)	bhcb	0.350(h)	cgra	0.056(h,i)
	valq	+ 100(h)		—		—	—	rnph	0.178(h,i)	tcbb	0.032(h,i)
		—		—		—	—	valq	0.178(h,i)		—

(1). Species codes are identified in Table 1.
(2). Letters in ( ) indicate previously published sources for data presented as follows: (a) Schafer 1972; (b) Schafer *et al.* 1973b; (c) Schafer *et al.* 1979; (d) Schafer *et al.* 1967; (e) Schafer *et al.* 1972; (f) Schafer *et al.* 1976; (g) Schafer *et al.* 1977; (h) Schafer *et al.* 1971; (i) Frank *et al.* 1970; (j) DeCino *et al.* 1966; (k) Schafer *et al.* 1969; (l) Schafer *et al.* 1973a; (m) Schafer *et al.* 1982; (n) Shefte *et al.* 1982.

Acknowledgments. The authors wish to thank the following individuals for assistance in collecting, typing, and editing the data contained in this publication; Trudie Abendroth, Lore Burbach, Donald Cunningham, Patrick Funderburg, Janet Garcia, Thomas Hall, David Hayes, Glenn Hood, Cecelia Nelson, and Barbara Recktenwald. The preparation and compilation of this data was supported, in part, through Interagency Agreement #14-16-0009-81-957 which was funded by the U.S. Environmental Protection Agency.

References

DeCino, T. J., D. J. Cunningham, and E. W. Schafer: Toxicity of DRC-1339 to starlings. J. Wildl. Manage. **30,** 249 (1966).

Frank, F. R., E. W. Schafer, Jr., and J. L. Guarino: Laboratory and field studies with an avian repellent for sprouting seeds. Proc. Bird Control Seminar **5,** 86 (1970).

Friedman, M.: The use of ranks to avoid the assumption of normality implicit in the analysis of variance. J. Amer. Stat. Assoc. **32,** 675 (1937).

Litchfield, J. T., and E. W. Wilcoxon: A simplified method of evaluating dose-effect experiments. J. Pharmacol. Exptl. Therap. **96,** 99 1949.

Schafer, E. W., Jr.: The acute oral toxicity of 369 pesticidal, pharmaceutical and other chemicals to wild birds. Toxicol. Appl. Pharmacol. **21,** 315 (1972).

Schafer, E. W., Jr., and R. B. Brunton: Chemicals as bird repellents—two promising agents. J. Wildl. Manage. **35,** 569 (1971).

Schafer, E. W., Jr., and D. J. Cunningham: An evaluation of 146 compounds as avian immobilizing agents. USDI Spec. Sci. Rept. Wildl. 150, Washington, DC (1972).

Schafer, E. W., Jr., R. B. Brunton, and D. J. Cunningham: A summary of the acute toxicity of 4-aminopyridine to birds and mammals. Toxicol Appl. Pharmacol. **26,** 532 (1973a).

Schafer, E. W., Jr., R. B. Brunton, and N. F. Lockyer: Evaluation of 45 chemicals as chemosterilants in adult male coturnix. J. Reprod. Fert. **48,** 371 (1976).

Schafer, E. W., Jr., R. B. Brunton, and N. F. Lockyer: Indicator bird species for toxicity determinations: Is the technique useful in test method development? Vertebrate Pest Control and Management Materials. ASTM STP 680 J. R. Beck (ed.). American Society for Testing and Materials, 157. Philadelphia, PA (1979).

Schafer, E. W. Jr., J. L. Guarino, and R. B. Brunton: Use of male coturnix quail in the laboratory development of avian chemosterilants. Vertebrate Pest Control and Management Materials. ASTM STP 625 W. B. Jackson and R. E. Marsh (eds.). American Society for Testing and Materials, 225. Philadelphia, PA (1977).

Schafer, E. W., Jr., R. R., West, and D. J. Cunningham: DRC-1347-A new starling contact toxicant. Pest Control **37,** 22 (1969).

Schafer, E. W., Jr., R. B. Brunton, N. F. Lockyer, and J. W. DeGrazio: Comparative toxicity of 17 pesticides to the quelea, house sparrow and red-winged blackbird. Toxicol. Appl. Pharmacol. **21,** 154 (1973b).

Schafer, E. W. Jr., R. B. Brunton, E. C. Schafer, and J. Chevez: Effects of 77 chemicals on reproduction in male and female coturnix quail. Ecotoxicol. Environm. Safety **6,** 149 (1982).

Schafer, E. W., Jr., R. I. Starr, D. J. Cunningham, and T. J. DeCino: Substituted phenyl *N*-methylcarbamates as temporary immobilizing agents for birds. J. Agric. Food Chem. **15,** 287 (1967).

Shefte, N., R. L. Bruggers, and E. W. Schafer, Jr.: Repellency and toxicity of three bird control chemicals to four species of African grain-eating birds. J. Wildl. Manage. **41,** 453 (1982).

Snedecor, G. W., and W. G. Cochran: Statistical methods. 6 ed. Iowa State Univ. Press Ames, Iowa: (1971).

Starr, R. I., J. F. Besser, and R. B. Brunton: A laboratory method for evaluating chemicals as bird repellents. J. Agric. Food Chem. **12,** 342 (1964).

Thompson, W. R.: Use of moving averages and interpolation to estimate median effective dose. Bacteriol. Rev. **11,** 115 (1948).

Thompson, W. R., and C. S. Weil: On the construction of tables for moving average interpolation. Biometrics **8,** 51 (1952).

Weil, C. S.: Tables for convenient calculation of median effective dose (LD_{50} or ED_{50}) and instructions in their use. Biometrics **8,** 249 (1952).

Manuscript received for publication July 10, 1982 and in revised form November 1, 1982.