Appendix D. Ecotox Bibliography

2010 Ecotox Search

Acceptable for EcoTox and OPP

Blus, L. J., Henny, C. J., and Grove, R. A. (1985). Effects of Pelletized Anticoagulant Rodenticides on California Quail. *J. Wildl. Dis.* 21: 391-395.

EcoReference No.: 47636
Chemical of Concern: CPC,DDE,DLD,DPC,EN,PCB; Habitat: T; Effect Codes: GRO,MOR,PHY; Code: LITE EVAL CODED (CPC,DPC), NO CONTROL (DDE,DLD,EN,PCB), NO EFED CHEM (PCB), NO ENDPOINT (DDE,DLD,EN,PCB), NO SURVEY (DDE,DLD,EN,PCB), TARGET (EN).

Byers, R. E. (1978). Performance of Rodenticides for the Control of Pine Voles in Orchards. *J. Am. Soc. Hortic. Sci.* 103: 65-69.

EcoReference No.: 69367
Chemical of Concern: BDF,BDL,CPC,DPC,EN,ZnP; Habitat: T; Effect Codes: BEH,MOR,POP; Code: LITE EVAL CODED (BDF,BDL,CPC,DPC,EN,ZnP), TARGET (BDF,BDL,CPC,DPC,ZnP).

Johnston, J. J., Pitt, W. C., Sugihara, R. T., Eisemann, J. D., Primus, T. M., Holmes, M. J., Crocker, J., and Hart, A. (2005). Probabilistic Risk Assessment for Snails, Slugs, and Endangered Honeycreepers in Diphacinone Rodenticide Baited Areas on Hawaii, USA. *Environ. Toxicol. Chem.* 24: 1557-1567.

EcoReference No.: 150801
Chemical of Concern: DPC; Habitat: T; Effect Codes: ACC,MOR; Code: LITE EVAL CODED (DPC).

Rattner, B. A., Horak, K. E., Warner, S. E., and Johnston, J. J. (2010). Acute Toxicity of Diphacinone in Northern Bobwhite: Effects on Survival and Blood Clotting. *Ecotoxicol. Environ. Saf.* 73: 1159-1164.

EcoReference No.: 150802
Chemical of Concern: DPC; Habitat: T; Effect Codes: MOR,PHY; Code: LITE EVAL CODED (DPC).

Savarie, P. J., Hayes, D. J., McBride, T., and Roberts, J. D. (1979). Efficacy and Safety of Diphacinone as a Predacide. *In: E.E.Kenaga (Ed.), Avian and Mammalian Wildlife Toxicology, ASTM STP 693, Philadelphia, PA* 69-79.

EcoReference No.: 35422
Chemical of Concern: DPC; Habitat: T; Effect Codes: ACC,PHY; Code: LITE EVAL CODED (DPC).

2005 Ecotox Search

ECOTOX and EFED

1. Byers, R. E. and Carbaugh, D. H. (1987). **Efficacy of Diphacinone for Control of Orchard Voles.** *Hortscience* 22: 46-48.

   EcoReference No.: 75342
   Chemical of Concern: DPC; Habitat: T; Effect Codes: MOR.

2. Byers, R. E. and Carbaugh, D. H. (1987). **Efficacy of Rodenticides for Control of Orchard Voles.** *J.Am.Soc.Hortic.Sci.* 112: 267-272.

   EcoReference No.: 75393
   Chemical of Concern: BDL,BDP,CPC,DPC,CLC,ZnP; Habitat: T; Effect Codes: POP,BEH.

3. Byers, R. E. and Carbaugh, D. H. (1991). **Rodenticides for the Control of Pine and Meadow Voles in Orchards.** *J.Environ.Hortic.* 9: 167-172.

   EcoReference No.: 75474
   Chemical of Concern: BDL,DFT,DPC,CPC,CLC,ZnP,OXT; Habitat: T; Effect Codes: BEH,MOR,POP.

4. Merson, M. H. and Byers, R. E. (1985). **Weathering and the Field Efficacy of Pelletized Rodenticide Baits in Orchards.** *Crop Prot.* 4: 511-519.

   EcoReference No.: 75532
   Chemical of Concern: PVL,BDF,BDL,DPC,CPC,ZnP; Habitat: T; Effect Codes: POP,MOR,BEH.

5. Mount, M. E. and Feldman, B. F. (1983). **Mechanism of Diphacinone Rodenticide Toxicosis in the Dog and Its Therapeutic Implications.** *Am.J.Vet.Res.* 44: 2009-2017.

   EcoReference No.: 38049
   Chemical of Concern: DPC,WFN; Habitat: T; Effect Codes: BCM,PHY.

6. Mount, M. E. and Kass, P. H. (1989). **Diagnostic Importance of Vitamin K-1 and Its Epoxide Measured in Serum of Dogs Exposed to an Anticoagulant Rodenticide.** *Am.J.Vet.Res.* 50: 1704-1709.

   EcoReference No.: 75504
   Chemical of Concern: DPC; Habitat: T; Effect Codes: BCM,PHY.

7. Savarie, P. J., Hayes, D. J., McBride, T., and Roberts, J. D. (1979). **Efficacy and Safety of Diphacinone as a Predacide.** *In: E.E.Kenaga (Ed.), Avian and Mammalian Wildlife Toxicology, ASTM STP 693, Philadelphia, PA* 69-79.

   EcoReference No.: 35422
   Chemical of Concern: DPC; Habitat: T; Effect Codes: ACE,PHY.

8. Shirazi, M. A., Bennett, R. S., and Ringer, R. K. (1994). **An Interpretation of Toxicity Response of Bobwhite Quail with Respect to Duration of Exposure.** *Arch.Environ.Contam.Toxicol.* 26: 417-424.

   EcoReference No.: 39583

Chemical of Concern: WFN,DPC,DLD,BDF,CBF,CPY; Habitat: T; Effect Codes: MOR.

9. Whisson, D. A. and Salmon, T. P. (2002). **Effect of Diphacinone on Blood Coagulation in Spermophilus beecheyi as a Basis for Determining Optimal Timing of Field Bait Applications.** *Pest Manag.Sci.* 58: 736-738.

   EcoReference No.: 68671
   Chemical of Concern: DPC; Habitat: T; Effect Codes: CEL.

ECOTOX only

1. Arjo, W. M. and Nolte, D. L. (2004). **Assessing the Efficacy of Registered Underground Baiting Products for Mountain Beaver (Aplodontia rufa) Control.** *Crop Prot.* 23: 425-430.

   EcoReference No.: 75340
   Chemical of Concern: CPC,ZnP,STCH,DPC; Habitat: T; Effect Codes: MOR.

2. Brooks, J. E., Htun, P. T., and Naing, H. (1980). **The Susceptibility of Bandicota bengalensis from Rangoon, Burma to Several Anticoagulant Rodenticides.** *J.Hyg.* 84: 127-135.

   EcoReference No.: 75713
   Chemical of Concern: DPC,WFN,BDF; Habitat: T; Effect Codes: MOR,BEH.

3. Loeb, H. A. and Kelly, W. H. (1963). **Acute Oral Toxicity of 1,496 Chemicals Force-Fed to Carp.** *U.S.Fish.Wildl.Serv., Sp.Sci.Rep.-Fish.No.471, Washington, D.C.* 124 p.

   EcoReference No.: 15898
   User Define 2: REPS,WASH,CALF,CORE,SENT
   Chemical of Concern: AZ,Captan,CBL,CMPH,HCCH,MLN,Naled,SZ,PNB,ACL,WFN,FUR,DPC,RTN,NaN3; Habitat: A; Effect Codes: MOR.

4. Marsh, R. E., Howard, W. E., , W. E., and Cole, R. E. (1977). **The Toxicity of Chlorophacinone and Diphacinone to Deer Mice.** *J.Wildl.Manag.* 41: 298-301.

   EcoReference No.: 35337
   Chemical of Concern: DPC,CPC; Habitat: T; Effect Codes: MOR.

5. Office of Pesticide Programs (2000). **Pesticide Ecotoxicity Database (Formerly: Environmental Effects Database (EEDB)).** *Environmental Fate and Effects Division, U.S.EPA, Washington, D.C.*

   EcoReference No.: 344
   User Define 2: REPS,WASH,CALF,CORE,SENT
   Chemical of Concern:
   24DXY,ACL,ACP,ACR,AQS,ATZ,AZ,BDF,BMC,BML,BMN,BS,BT,Captan,CBF,CBL,CFE,CFE,CLNB,CMPH,CPC,CPY,CTN,CTZ,Cu,CuO,CuS,CYD,CYF,CYP,CYT,DBN,DCNA,DFT,DFZ,DM,DMB,DMM,DMP,DMT,DOD,DPC,DPDP,DS,DU,DZ,DZM,EFL,EFS,EFV,EP,FHX,FMP,FO,Folpet,FPP,FVL,GYP,HCCH,HXZ,IPD,IZP,LNR,MAL,MB,MBZ,MDT,MFX,MFZ,MGK,MLN,MLT,MOM,MP,MTC,MTL,MTM,NAA,Naled,NFZ,NPP,NTP,OXF,OXT,OYZ,PDM,PEB,PHMD,PMR,PMT,PNB,PPB,PPG,PPMH,PQT,PRB,PRT,PSM,PYN,PYZ,RTN,SMM,SMT,SS,SXD,SZ,TBC,TDC,TDZ,TET,TFN,TFR,TMT,TPR,TRB,WFN,ZnP; Habitat: AT; Effect Codes: MOR,POP,PHY,GRO,REP.

6. Sterner, R. T. (1979). **Effects of Sodium Cyanide and Diphacinone in Coyotes (Canis latrans): Applications as Predacides in Livestock Toxic Collars.** *Bull.Environ.Contam.Toxicol.* 23: 211-217.

   EcoReference No.: 54523
   Chemical of Concern: DPC,CN; Habitat: T; Effect Codes: ACC,BCM,MOR.

Unaccepted Papers

2010 Ecotox Search

Acceptable for EcoTox but not OPP

Arjo, W. M. and Nolte, D. L. (2004). Assessing the Efficacy of Registered Underground Baiting Products for Mountain Beaver (Aplodontia rufa) Control. *Crop Prot.* 23: 425-430.

EcoReference No.: 75340
Chemical of Concern: CPC,DPC,STCH,ZnP; Habitat: T; Effect Codes: MOR; Code: LITE EVAL CODED (CPC,ZnP), NO ENDPOINT (DPC,STCH), TARGET (CPC,DPC,STCH,ZnP).

Brooks, J. E., Htun, P. T., and Naing, H. (1980). The Susceptibility of Bandicota bengalensis from Rangoon, Burma to Several Anticoagulant Rodenticides. *J. Hyg.* 84: 127-135.

EcoReference No.: 75713
Chemical of Concern: BDF,DPC,WFN; Habitat: T; Effect Codes: BEH,MOR; Code: NO CONTROL (BDF,DPC,WFN).

Gaines, T. B. (1960). The Acute Toxicity of Pesticides to Rats. *Toxicol. Appl. Pharmacol.* 2: 88-99.

EcoReference No.: 49403
Chemical of Concern: AND,AZ,As,CBL,CHD,DCF,DDT,DDVP,DEM,DLD,DPC,DZ,EN,EPRN,FNTH,HCCH,HPT,MLN,MP,PRN,PRT,PVL,TXP,WFN; Habitat: T; Effect Codes: MOR,PHY; Code: NO CONTROL (AND,AZ,As,CBL,CHD,DCF,DDT,DDVP,DEM,DLD,DPC,DZ,EN,EPRN,FNTH,HCCH,HPT,MLN,MP,PRN,PRT,PVL,TXP,WFN), TARGET (DPC,HCCH,PVL,WFN).

Gale, R. W., Tanner, M., and Orazio, C. E. (2009). Determination of Diphacinone in Seawater, Vertebrates, Invertebrates, and Bait Pellet Formulations Following Aerial Broadcast on Mokapu Island, Molokai, Hawaii. *Open-File Report 2008-1285, U.S. Geological Survey, Columbia, MO* 16 p.

EcoReference No.: 150798
Chemical of Concern: DPC; Habitat: A; Effect Codes: ACC; Code: NO ENDPOINT (DPC).

Hadler, M. R., Redfern, R., and Rowe, F. P. (1975). Laboratory Evaluation of Difenacoum as a Rodenticide. *J. Hyg. Camb.* 74: 441-448.

EcoReference No.: 86457
Chemical of Concern: CPC,DFM,DPC,WFN; Habitat: T; Effect Codes: BEH,MOR,PHY; Code: NO CONTROL (CPC,DFM,DPC,WFN).

Hayes, W. J. Jr. and Gaines, T. B. (1959). Laboratory Studies of Five Anticoagulant Rodenticides. *Public Health Rep* 74: 105-113.

EcoReference No.: 69370
Chemical of Concern: DPC,PSM,PVL,WFN; Habitat: T; Effect Codes: BEH,MOR; Code: NO CONTROL (DPC,PSM,PVL,WFN), TARGET (DPC,PVL,WFN).

Johns, B. E. and Thompson, R. D. (1979). Acute Toxicant Identification in Whole Bodies and Baits Without

Chemical Analysis. *In: E.E.Kenaga (Ed.), Avian and Mammalian Wildl.Toxicol., ASTM STP 693(Am.Soci.for Test.and Mater.)* 80-88.

EcoReference No.: 37330
Chemical of Concern: 4AP,DPC,NaFA,STAR,ZnP; Habitat: T; Effect Codes: MOR; Code: LITE EVAL CODED (4AP,DPC,NaFA,STAR,ZnP), NO CONTROL (4AP,DPC,STAR), NO ENDPOINT (STAR).

Loeb, H. A. and Kelly, W. H. (1963). Acute Oral Toxicity of 1,496 Chemicals Force-Fed to Carp. *U.S.Fish.Wildl.Serv., Sp.Sci.Rep.-Fish.No.471, Washington, D.C.* 124 p.

EcoReference No.: 15898
Chemical of Concern: 34XYL,35XYL,4CE,ACD,ACL,AN,AND,ATC,ATZ,AZ,AsAC,AsO3Na,AsTO,BPH,BUT,BZC,BZD,CBL,CHD,CHR,CIN,CMPH,CPP,CaOCl,Captan,CoCl,CuOX,DBE,DCA,DDT,DDVP,DEM,DIOSSNa,DLD,DPA,DPC,DSTCH,DZ,EDTA,EN,EPRN,EPV,ES,ETN,FUR,HCB,HCCH,HPT,LNR,MAT,MBTZ,MCRE,MLN,MOR,MXC,NATL,NPH,NaN3,NaPCP,Naled,OCRE,OPHP,PCP,PHTH,PNB,PPGL,PPHD,PRN,PVL,PYPG,RTN,SBDA,SFL,STCH,SZ,Se,TCF,TEAM,TEG,THM,TXP,WFN,Ziram,Zn,ZnO; Habitat: A; Effect Codes: BEH,MOR; Code: NO CONTROL (34XYL,35XYL,4CE,ACD,ACL,AN,AND,ATC,ATZ,AZ,AsAC,AsO3Na,AsTO,BPH,BUT,BZC,BZD,CBL,CHD,CHR,CIN,CMPH,CPP,CaOCl,Captan,CoCl,CuOX,DBE,DCA,DDT,DDVP,DEM,DIOSSNa,DLD,DPA,DPC,DSTCH,DZ,EDTA,EN,EPRN,EPV,ES,ETN,FUR,HCB,HCCH,HPT,LNR,MAT,MBTZ,MCRE,MLN,MOR,MXC,NATL,NPH,NaN3,NaPCP,Naled,OCRE,OPHP,PCP,PHTH,PNB,PPGL,PPHD,PRN,PVL,PYPG,RTN,SBDA,SFL,STCH,SZ,Se,TCF,TEAM,TEG,THM,TXP,WFN,Ziram,Zn,ZnO), NO ENDPOINT (34XYL,35XYL,4CE,ACD,ACL,AN,AND,ATC,ATZ,AZ,AsAC,AsO3Na,AsTO,BPH,BUT,BZC,BZD,CBL,CHD,CHR,CIN,CMPH,CPP,CaOCl,Captan,CoCl,CuOX,DBE,DCA,DDT,DDVP,DEM,DIOSSNa,DLD,DPA,DSTCH,DZ,EDTA,EN,EPRN,EPV,ES,ETN,FUR,HCB,HCCH,HPT,LNR,MAT,MBTZ,MCRE,MLN,MOR,MXC,NATL,NPH,NaN3,NaPCP,Naled,OCRE,OPHP,PCP,PHTH,PNB,PPGL,PPHD,PRN,PVL,PYPG,RTN,SBDA,SFL,SZ,TCF,TEAM,TEG,THM,TXP,WFN,Ziram,ZnO).

Orazio, C. E., Tanner, M. J., Swenson, C., Herod, J., and Dunlevy, P. (2009). Results of Laboratory Testing for Diphacinone in Seawater, Fish, Invertebrates, and Soil Following Aerial Application of Rodenticide on Lehua Island, Kauai County, Hawaii, January 2009. *Open-File Report 2009-1142, U.S. Geological Survey, Columbia, MO* 15 p. (with appendices).

EcoReference No.: 150799
Chemical of Concern: DPC; Habitat: A; Effect Codes: ACC; Code: NO ENDPOINT (DPC).

Palmateer, S. D. and McCann, J. A. (1976). Relationship of Acceptance and Mortality of Anticoagulant Baits to Rats. *Bull. Environ. Contam. Toxicol.* 15: 750-755.

EcoReference No.: 38233
Chemical of Concern: DPC,FMN,PVL,WFN; Habitat: T; Effect Codes: BEH,MOR; Code: NO CONTROL (DPC,FMN,PVL,WFN), NO ENDPOINT (DPC,FMN,PVL,WFN), TARGET (DPC,FMN,PVL,WFN).

Whisson, D. A. and Salmon, T. P. (2009). Assessing the Effectiveness of Bait Stations for Controlling California Ground Squirrels (Spermophilus beecheyi). *Crop Prot.* 28: 690-695.

EcoReference No.: 150803
Chemical of Concern: DPC; Habitat: T; Effect Codes: BEH,MOR; Code: NO ENDPOINT (DPC), TARGET (DPC).

Whisson, D. A. and Salmon, T. P. (2002). Effect of the Timing of Applications and Amount of 0.01% Diphacinone Consumed on Mortality of California Ground Squirrels (Spermophilus beecheyi). *Crop Prot.* 21: 885-889.

EcoReference No.: 75947
Chemical of Concern: DPC; Habitat: T; Effect Codes: BEH,MOR; Code: NO CONTROL (DPC).

Excluded

Albert, C. A., Wilson, L. K., Mineau, P., Trudeau, S., and Elliott, J. E. (Anticoagulant Rodenticides in Three Owl Species From Western Canada, 1988-2003. *Arch environ contam toxicol. 2010, feb; 58(2):451-9. [Archives of environmental contamination and toxicology]: Arch Environ Contam Toxicol.*
Chem Codes: Chemical of Concern: DPC Code: SURVEY.

ABSTRACT: Anticoagulant rodenticides are widely used to control rodent infestations. Previous studies have shown that nontarget organisms, such as birds, are at risk for both primary and secondary poisoning. This paper presents rodenticide residue information on the livers from 164 strigiformes which included barn owls (Tyto alba), barred owls (Strix varia), and great horned owls (Bubo virginianus), collected from 1988 to 2003 in the province of British Columbia and the Yukon Territory, Canada. Livers were analyzed for brodifacoum, bromadiolone, chlorophacinone, diphacinone, difethialone, and warfarin. Our results show that, of the 164 owl livers analyzed, 70% had residues of at least one rodenticide, and of these 41% had more than one rodenticide detected. Of the three species of owls examined, barred owls were most frequently exposed (92%, n = 23); brodifacoum and bromadiolone were most often detected, with liver concentrations ranging from 0.001 to 0.927 mg/kg brodifacoum, and 0.002 to 1.012 mg/kg bromadiolone. Six of the owls (three barred owls, two barn owls, and one great horned owl) were diagnosed as having died from anticoagulant poisoning; all six owls had brodifacoum residues in the liver.
MESH HEADINGS: 4-Hydroxycoumarins/analysis/metabolism
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/analysis/*metabolism/poisoning
MESH HEADINGS: Canada
MESH HEADINGS: Environmental Monitoring/*methods
MESH HEADINGS: Food Chain
MESH HEADINGS: Liver/chemistry/drug effects/metabolism
MESH HEADINGS: Mice
MESH HEADINGS: Pesticide Residues/*analysis
MESH HEADINGS: Rodenticides/analysis/*metabolism/poisoning
MESH HEADINGS: Species Specificity
MESH HEADINGS: Strigiformes/*metabolism eng

Andr&Eacute, C, Guyon, C., Thomassin, M., Barbier, A., Richert, L., and Guillaume, Y. C. (Association Mechanism Between a Series of Rodenticide and Humic Acid: a Frontal Analysis to Support the Biological Data. *J chromatogr b analyt technol biomed life sci. 2005, jun 5; 820(1):9-14. [Journal of chromatography. B, analytical technologies in the biomedical and life sciences]: J Chromatogr B Analyt Technol Biomed Life Sci.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS.

ABSTRACT: The binding constants (K) of a series of anticoagulant rodenticides with the main soil organic component, humic acid (HA), were determined using frontal analysis approach. The order of the binding constants was identical as the one obtained in a previous paper [J. Chromatogr. B 813 (2004) 295], i.e. bromadiolone>brodifacoum>difenacoum>chlorophacinone>diphacinone, confirming the power of this frontal analysis approach for the determination of binding constants. Moreover, and for the first time, the concentration of unbound rodenticide to HAs could be determined. Thanks this approach, we could clearly demonstrate that HA acid protected the human hepatoma cell line HepG2 against the cytotoxicity of all the rodenticides tested and that the toxicity of rodenticides was directly linked to the free rodenticide fraction in the medium (i.e. unbound rodenticide to HA).
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*chemistry
MESH HEADINGS: Carcinoma, Hepatocellular
MESH HEADINGS: Cell Survival/drug effects

MESH HEADINGS: Chromatography, High Pressure Liquid/methods
MESH HEADINGS: Humans
MESH HEADINGS: *Humic Substances
MESH HEADINGS: Rodenticides/*chemistry/toxicity
MESH HEADINGS: Tumor Cells, Cultured eng

Bennett, B. R. and Grimes, G. S. (1982). Reverse Phase Liquid Chromatographic Determination of Chlorophacinone and Diphacinone in Bait Formulations. *J. Assoc. Off. Anal. Chem.* 65: 927-929.
Chem Codes: Chemical of Concern: CPC Code : NO SPECIES.

Chan, J., Vogel, S. M., Wen, J., and Alany, R. G. (Potentiometric Determination of Ionisation Constants for Diphacinone and Chlorophacinone in a Dioxane-Water Cosolvent System. *J pharm biomed anal. 2009, aug 15; 50(1):86-9. [Journal of pharmaceutical and biomedical analysis]: J Pharm Biomed Anal.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS.

ABSTRACT: The purpose of this study was to determine the ionisation constants of two poorly soluble compounds, namely diphacinone and chlorophacinone, potentiometrically in 1,4-dioxane-water mixtures with ibuprofen used as a standard. In this study, Gran's method was employed for the calibration of glass electrode in cosolvent systems with pH measurements based on the concentration scale (p(c)H). Aqueous pK(a) values for the tested compounds were obtained by extrapolation on a Yasuda-Shedlovsky plot. It was demonstrated that the pK(a) for ibuprofen determined using this method was consistent with those reported in literature. The technique was applied successfully to the two indandione derivatives, diphacinone and chlorophacinone. The present study demonstrated that the use of an organic cosolvent is effective in improving the solubility of compounds allowing potentiometric determination of ionisation constants that are otherwise difficult in aqueous solutions.
MESH HEADINGS: Dioxanes/*chemistry
MESH HEADINGS: Hydrogen-Ion Concentration
MESH HEADINGS: Indans/*analysis
MESH HEADINGS: Osmolar Concentration
MESH HEADINGS: Phenindione/*analogs &amp
MESH HEADINGS: derivatives/analysis
MESH HEADINGS: Potentiometry/*methods
MESH HEADINGS: Water/*chemistry eng

Clarke, Zoe (2007). Diphenadione. 1-3.
Chem Codes: Chemical of Concern: DPC Code: REVIEW.

Keywords: Anticoagulant
Abstract: Diphenadione is an orally active anticoagulant. Oral anticoagulants were introduced in the late 1940s and are widely used today. They have been used for both treatment and prophylaxis of deep vein thrombosis and to aid in the decrease in the frequency and rate of second myocardial infarction. Diphenadione belongs to a class of anticoagulants, the indanedione derivatives (e.g., phenindione and anisindione) ..
ISSN/ISBN: 978-0-08-055232-3

Eason, C. T., Murphy, E. C., Wright, G. R. G., and Spurr, E. B. (2002). Assessment of Risks of Brodifacoum to Non-target Birds and Mammals in New Zealand. *Ecotoxicology* 11: 35-48.
Chem Codes: EcoReference No.: 75578
Chemical of Concern: BDF,BDL,DPC,PVL,WFN Code: REVIEW.

Eason, C. T., Murphy, E. C., Wright, G. R. G., and Spurr, E. B. (2002). Assessment of Risks of Brodifacoum to Non-Target Birds and Mammals in New Zealand. *Ecotoxicology* 11: 35-48.
Chem Codes: Chemical of Concern: BDF,BDL,DPC,PND,PVL,WFN Code: REVIEW.

Hohnloser, S. H., Crijns, H. J., Van Eickels, M. , Gaudin, C., Page, R. L., Torp-Pedersen, C., Connolly, S. J., and Athena Investigators (Effect of Dronedarone on Cardiovascular Events in Atrial Fibrillation. *N engl j*

med. 2009, feb 12; 360(7):668-78. [The new england journal of medicine]: N Engl J Med.
Chem Codes: Chemical of Concern: DPC Code: HUMAN HEALTH.

COMMENTS: Comment in: N Engl J Med. 2009 Jun 4;360(23):2479-80; author reply 2480-1 (medline /19504762)
COMMENTS: Comment in: N Engl J Med. 2009 Jun 4;360(23):2479; author reply 2480-1 (medline /19494229)
COMMENTS: Comment in: Kardiol Pol. 2009 Apr;67(4):455-6 (medline /19548374)
COMMENTS: Comment in: N Engl J Med. 2009 Jun 4;360(23):2480; author reply 2480-1 (medline /19504767)
COMMENTS: Comment in: N Engl J Med. 2009 Jun 4;360(23):2480; author reply 2480-1 (medline /19504766)
COMMENTS: Erratum in: N Engl J Med. 2009 Jun 4;360(23):2487
ABSTRACT: BACKGROUND: Dronedarone is a new antiarrhythmic drug that is being developed for the treatment of patients with atrial fibrillation. METHODS: We conducted a multicenter trial to evaluate the use of dronedarone in 4628 patients with atrial fibrillation who had additional risk factors for death. Patients were randomly assigned to receive dronedarone, 400 mg twice a day, or placebo. The primary outcome was the first hospitalization due to cardiovascular events or death. Secondary outcomes were death from any cause, death from cardiovascular causes, and hospitalization due to cardiovascular events. RESULTS: The mean follow-up period was 21+/-5 months, with the study drug discontinued prematurely in 696 of the 2301 patients (30.2%) receiving dronedarone and in 716 of the 2327 patients (30.8%) receiving placebo, mostly because of adverse events. The primary outcome occurred in 734 patients (31.9%) in the dronedarone group and in 917 patients (39.4%) in the placebo group, with a hazard ratio for dronedarone of 0.76 (95% confidence interval [CI], 0.69 to 0.84; P < 0.001). There were 116 deaths (5.0%) in the dronedarone group and 139 (6.0%) in the placebo group (hazard ratio, 0.84; 95% CI, 0.66 to 1.08; P=0.18). There were 63 deaths from cardiovascular causes (2.7%) in the dronedarone group and 90 (3.9%) in the placebo group (hazard ratio, 0.71; 95% CI, 0.51 to 0.98; P=0.03), largely due to a reduction in the rate of death from arrhythmia with dronedarone. The dronedarone group had higher rates of bradycardia, QT-interval prolongation, nausea, diarrhea, rash, and an increased serum creatinine level than the placebo group. Rates of thyroid- and pulmonary-related adverse events were not significantly different between the two groups. CONCLUSIONS: Dronedarone reduced the incidence of hospitalization due to cardiovascular events or death in patients with atrial fibrillation. (ClinicalTrials.gov number, NCT00174785.)
MESH HEADINGS: Aged
MESH HEADINGS: Amiodarone/adverse effects/*analogs &amp
MESH HEADINGS: derivatives/therapeutic use
MESH HEADINGS: Anti-Arrhythmia Agents/adverse effects/*therapeutic use
MESH HEADINGS: Atrial Fibrillation/*drug therapy/mortality
MESH HEADINGS: Bradycardia/chemically induced
MESH HEADINGS: Cardiovascular Diseases/mortality/prevention &amp
MESH HEADINGS: control
MESH HEADINGS: Creatinine/blood
MESH HEADINGS: Double-Blind Method
MESH HEADINGS: Female
MESH HEADINGS: Follow-Up Studies
MESH HEADINGS: Hospitalization/statistics &amp
MESH HEADINGS: numerical data
MESH HEADINGS: Humans
MESH HEADINGS: Kaplan-Meiers Estimate
MESH HEADINGS: Male
MESH HEADINGS: Middle Aged
MESH HEADINGS: Risk Factors
MESH HEADINGS: Secondary Prevention
MESH HEADINGS: Treatment Outcome eng

Jin, M. and Chen, X. ([Simultaneous Determination of Trace Diphacinone and Chlorophacinone in Biological

Samples by High Performance Liquid Chromatography Coupled With Ion Trap Mass Spectrometry]. *Se pu. 2010, feb; 28(2):197-203. [Se pu = chinese journal of chromatography / zhongguo hua xue hui]: Se Pu.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS,NON-ENGLISH.

ABSTRACT: A rapid qualitative and quantitative method for the simultaneous determination of trace diphacinone and chlorophacinone in biological samples has been established. The method mainly serves for the emergent poisoning detection. The whole blood was treated with methanol-acetonitrile (50/50, v/v) and the urine was cleaned-up by Waters Oasis HLB SPE cartridges. The samples were separated on an Extend C18 column (150 mm x 4.6 mm, 5 microm) by using the mobile phase consisted of ammonium acetate-acetic acid (0.02 mol/L, pH 5.5) - methanol (15/85, v/v). The determination was performed by high performance liquid chromatography coupled with ion trap mass spectrometry (HPLC-IT-MS) using a negative electrospray ionization interface in the multiple reaction monitoring (MRM) mode. The transitions of m/z 339 -- > 167 for diphacinone and m/z 373 -- > 201 for chlorophacinone were selected for the quantificantions. For the whole blood samples, the calibration curves were linear within the ranges of 1.0 - 200.0 microg/L and 0.5 - 100.0 microg/L; the limits of quantification were 1.0 microg/L and 0.5 microg/L; the spike recoveries were 90.1% - 92.2% and 87.6% - 93.4%, the intra-day relative standard deviations (RSDs) were less than 6.8% and 7.4%, and the inter-day RSDs were less than 9.9% and 10.9% for diphacinone and chlorophacinone, respectively. For the urine samples, the calibration curves were linear within the ranges of 0.2 - 40.0 microg/L and 0.1 - 20.0 microg/L; the limits of quantification were 0.2 microg/L and 0.1 microg/L; the spike recoveries were 90.1% -94.5% and 90.0% -98.0%, the intra-day RSDs were less than 6.1% and 7.3%, and the inter-day RSDs were less than 8.9% and 11.2% for diphacinone and chlorophacinone, respectively. This method is simple and sensitive for the satisfactory determination of trace diphacinone and chlorophacinone residues in poisoned patients for the clinical diagnosis. chi

Jin, M. C., Cai, M. Q., and Chen, X. H. (Simultaneous Measurement of Indandione-Type Rodenticides in Human Serum by Liquid Chromatography-Electrospray Ionization- Tandem Mass Spectrometry. *J anal toxicol. 2009 jul-aug; 33(6):294-300. [Journal of analytical toxicology]: J Anal Toxicol.*
Chem Codes: Chemical of Concern: DPC Code: HUMAN HEALTH.

ABSTRACT: Measurement of indandione rodenticides is important in the diagnosis and treatment of accidental rodenticide ingestion. Current assays lack effective measurements for simultaneous analysis of the indandiones, especially the isomers. The intent of this study was to establish a novel and selective method for the simultaneous determination of indandione-type rodenticides (diphacinone, chlorophacinone, valone, and pindone) in human serum by liquid chromatography-electrospray ionization-tandem mass spectrometry. After addition of internal standard, the sample was extracted with 10% methanol in acetonitrile and cleaned by solid-phase extraction (SPE). The analytes were separated on a C(18) rapid column and infused into an ion trap mass spectrometer in the negative electrospray ionization mode. The multiple-reaction monitoring ion pairs were m/z 339 --> 167, m/z 373 --> 201, m/z 229 --> 145, m/z 229 --> 172, and m/z 307 --> 161 for diphacinone, chlorophacinone, valone, pindone, and IS, respectively. Recoveries were between 81.5 and 94.6%, and the limits of quantification were 0.2 to 0.5 ng/mL. Intra- and interday RSDs were less than 7.9 and 11.5%, respectively. The assay was linear in the range of 0.5-100.0 ng/mL with coefficients of determination (r(2) > 0.99) for all analytes. The proposed method enables the unambiguous confirmation and quantification of the indandiones in both clinical and forensic specimens.
MESH HEADINGS: Calibration
MESH HEADINGS: Chromatography, High Pressure Liquid
MESH HEADINGS: Humans
MESH HEADINGS: Indans/*blood/isolation &amp
MESH HEADINGS: purification
MESH HEADINGS: Quality Control
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Rodenticides/*blood/isolation &amp
MESH HEADINGS: purification
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization eng

Jin, M. C., Chen, X. H., Ye, M. L., and Zhu, Y. (Analysis of Indandione Anticoagulant Rodenticides in Animal

Liver by Eluent Generator Reagent Free Ion Chromatography Coupled With Electrospray Mass Spectrometry. *J chromatogr a. 2008, dec 5; 1213(1):77-82. [Journal of chromatography. A]: J Chromatogr A.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS.

ABSTRACT: A novel analytical method has been developed for simultaneous determination of four indandione anticoagulant rodenticides (diphacinone, chlorophacinone, pindone and valone) in animal liver tissues by eluent generator reagent free ion chromatography coupled with electrospray ionization mass spectrometry (RFIC-ESI-MS). After the rodenticides were extracted from homogenized animal liver tissues with methanol-acetonitrile (10/90, v/v), the extracts were subjected to a solid-phase extraction (SPE) process using Oasis HLB cartridges. The IC separation was carried out on an IonPac AS11 analytical column (250 mm x 4.0 mm) using 10% methanol in a gradient of KOH solution at a constant flow rate of 1.0 mL/min. The objective compounds were ionized by negative ion pneumatically assisted electrospray and detected in the selected ion monitoring (SIM) mode. Warfarin was applied as an internal standard (IS) for the compensation of the losses in the course of sample processing and the sensitivity drift of the detector, linear calibration functions were calculated for all analytes. The relative average recoveries of the objective compounds spiked in animal liver tissues were between 83.4 and 104.9%. The limits of quantification (LOQs) were 0.2-1.0 ng/g for them. Within-day and day-to-day relative standard deviations (RSDs) were less than 10.4 and 13.3%, respectively. It was confirmed that this method could be used in a toxicological analysis. The coupling of IC to MS provided a new analytical tool to the analysts faced with the requirement of separating and analyzing indandione rodenticides in animal livers.
MESH HEADINGS: Animals
MESH HEADINGS: Chromatography, Ion Exchange/*methods
MESH HEADINGS: Dogs
MESH HEADINGS: Ducks
MESH HEADINGS: Indans/analysis
MESH HEADINGS: Liver/*chemistry
MESH HEADINGS: Phenindione/analogs &amp
MESH HEADINGS: derivatives/analysis
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Rodenticides/*analysis
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization/*methods
MESH HEADINGS: Swine eng

Marek, L. J. and Koskinen, W. C. (Multiresidue Analysis of Seven Anticoagulant Rodenticides by High-Performance Liquid Chromatography/Electrospray/Mass Spectrometry. *J agric food chem. 2007, feb 7; 55(3):571-6. [Journal of agricultural and food chemistry]: J Agric Food Chem.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS.

ABSTRACT: Mice and rat populations are commonly controlled by two classes of rodenticide anticoagulants, coumarins and indandiones. However, poisoning of nontarget animals also often occurs. For cases such as these, a rapid, multiresidue method, which provides positive confirmation for both classes of anticoagulant rodenticides, is needed by diagnostic laboratories. A method was developed for the determination of seven anticoagulant rodenticides, coumafuryl, pindone, warfarin, diphacinone, chlorophacinone, bromadiolone, and brodifacoum, in diverse matrices, animal feed, cooked beef, and fruit-flavored beverages using high-performance liquid chromatography/electrospray/mass spectrometry. Detection was by MS/MS with electrospray ionization in negative mode. Confirmation was by retention time, m/z of molecular ion, and two parent-daughter transitions. Recoveries from selected the matrices ranged from 61 to 117%. Limits of quantitation were as low as 1.5-4.5 ng g-1. The developed method was rapid and provided the simultaneous confirmation and quantification of the seven anticoagulant rodenticides.
MESH HEADINGS: Animal Feed/analysis
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis
MESH HEADINGS: Beverages/analysis
MESH HEADINGS: Cattle

MESH HEADINGS: Chromatography, High Pressure Liquid/*methods
MESH HEADINGS: Coumarins/analysis
MESH HEADINGS: Food Contamination/analysis
MESH HEADINGS: Indans/analysis
MESH HEADINGS: Meat/analysis
MESH HEADINGS: Pesticide Residues/*analysis
MESH HEADINGS: Rodenticides/*analysis
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization/*methods eng

Mendenhall, V. M. and Pank, L. F. (1980). Secondary Poisoning of Owls by Anticoagulant Rodenticides. *Wildl. Soc. Bull.* 8: 311-315.
Chem Codes: Chemical of Concern: BDF,CPC,DPC Code: NO CONC .

WAS ECOREF#35347//

Nelson, A. T., Hartzell, J. D., More, K., and Durning, S. J. (Ingestion of Superwarfarin Leading to Coagulopathy: a Case Report and Review of the Literature. *Medgenmed. 2006; 8(4):41. [Medgenmed : medscape general medicine]: MedGenMed*.
Chem Codes: Chemical of Concern: DPC Code: REVIEW.

COMMENTS: Cites: Ann Emerg Med. 2000 Sep;36(3):262-7 (medline /10969235)
COMMENTS: Cites: South Med J. 2000 Jan;93(1):74-5 (medline /10653073)
COMMENTS: Cites: Am J Emerg Med. 2001 Sep;19(5):337-95 (medline /11555795)
COMMENTS: Cites: Am J Emerg Med. 2002 Sep;20(5):391-452 (medline /12216043)
COMMENTS: Cites: Ann Allergy Asthma Immunol. 2002 Oct;89(4):400-6 (medline /12392385)
COMMENTS: Cites: S Afr Med J. 2002 Nov;92(11):874-6 (medline /12506584)
COMMENTS: Cites: Ann Emerg Med. 1992 Mar;21(3):331-6 (medline /1346954)
COMMENTS: Cites: Chest. 1992 Oct;102(4):1301-2 (medline /1395796)
COMMENTS: Cites: Am J Emerg Med. 2003 Sep;21(5):353-421 (medline /14523881)
COMMENTS: Cites: Blood Coagul Fibrinolysis. 2005 Jun;16(4):239-44 (medline /15870542)
COMMENTS: Cites: Lancet. 2005 Feb 12-18;365(9459):628 (medline /15708110)
COMMENTS: Cites: Pharmacotherapy. 2003 Sep;23(9):1186-9 (medline /14524650)
COMMENTS: Cites: Am J Emerg Med. 2005 Sep;23(5):589-666 (medline /16140178)
COMMENTS: Cites: Am J Hematol. 1991 Jan;36(1):50-4 (medline /1984683)
COMMENTS: Cites: Blood. 1990 Dec 15;76(12):2555-9 (medline /2265249)
COMMENTS: Cites: Br J Clin Pharmacol. 1986 Mar;21(3):289-93 (medline /3964529)
COMMENTS: Cites: N C Med J. 1994 Nov;55(11):554-6 (medline /7808522)
COMMENTS: Cites: J Community Health. 1994 Feb;19(1):55-65 (medline /8169251)
COMMENTS: Cites: Arch Intern Med. 1993 Aug 23;153(16):1925-8 (medline /8250654)
COMMENTS: Cites: J Toxicol Clin Toxicol. 1994;32(1):69-73 (medline /8308951)
COMMENTS: Cites: Forensic Sci Int. 1996 Mar 5;78(1):13-8 (medline /8855043)
COMMENTS: Cites: Am J Emerg Med. 1996 Nov;14(7):656-9 (medline /8906764)
COMMENTS: Cites: Anaesth Intensive Care. 1997 Dec;25(6):707-9 (medline /9452861)
COMMENTS: Cites: Arch Intern Med. 1998 Sep 28;158(17):1929-32 (medline /9759690)
COMMENTS: Cites: Nature. 1975 Jan 24;253(5489):275-7 (medline /1113846)
ABSTRACT: Superwarfarins are found in many pesticides, including D-con, Prufe I and II, Ramik, Talon-G, Ratak, and Contrac. Ingestion of can lead to significant morbidity and even mortality. Physicians need to consider this diagnosis in any patient presenting with coagulopathy of unclear etiology. We present a patient with superwarfarin-induced coagulopathy and review previous cases in adults in the literature. The patient is a 60-year-old man who presented to our medical center with painless hematuria. Laboratory studies revealed an elevated prothrombin time (PT) (42.5 seconds), partial thromboplastin time (PTT) (64.6 seconds), and international normalized ratio (INR) of 7. Liver-associated enzymes were normal, and complete blood cell count (CBC) showed no evidence of disseminated intravascular coagulation. Subsequent work-up included the absence of an inhibitor by mixing study and deficiencies of vitamin K-dependent coagulation factors. The patient's warfarin level was negative. A brodifacoum level was positive, confirming superwarfarin-induced coagulopathy. The patient is currently doing well with normal

coagulation studies after receiving high doses of vitamin K for several weeks. The cause of his exposure to superwarfarin remains uncertain. Physicians need to be cognizant of this unusual cause of coagulopathy in adults. The appropriate diagnostic work-up and unique features of therapy are discussed.
MESH HEADINGS: 4-Hydroxycoumarins/*adverse effects
MESH HEADINGS: Blood Coagulation Disorders/*chemically induced/*diagnosis
MESH HEADINGS: Humans
MESH HEADINGS: Male
MESH HEADINGS: Middle Aged eng

Primus, T., Primus, T. M., Kohler, D. J., Johnston, J. J., Sugihara, R. T., and Pitt, W. C. (Determination of Diphacinone Residues in Hawaiian Invertebrates. *J chromatogr sci. 2006, jan; 44(1):1-5. [Journal of chromatographic science]: J Chromatogr Sci.*
Chem Codes: Chemical of Concern: DPC Code: SURVEY,CHEM METHODS.

COMMENTS: Erratum in: J Chromatogr Sci. 2006 Sep;44(8):3A: Primus, Thomas M [corrected to Primus, Thomas]; Sugihara, Robert T [added]; Pitt, William C [added]
ABSTRACT: A reversed-phase ion-pair liquid chromatographic analysis combined with a solid-phase extraction clean-up method is used to assess the quantity of diphacinone residue found in invertebrates. Three invertebrate species are exposed to commercially available diphacinone-fortified bait used for rat control. The invertebrate samples are collected, frozen, and shipped to the laboratory. The samples are homogenized after cryogenic freezing. A portion of the homogenized samples are extracted with acidified chloroform-acetone, followed by cleanup with a silica solid-phase extraction column. Diphacinone is detected by UV absorption at 325 nm after separation by the chromatographic system. The method limit of detection (MLOD) for snail and slug samples averaged 0.055 and 0.066 mg/kg, respectively. Diphacinone residues in snail tissue ranges from 0.83 to 2.5 mg/kg for Oxychilus spp. The mean recoveries from snails at 0.20 and 2.0 are 97 +/- 21% and 84 +/- 6%. Diphacinone residues in slug tissue ranges from 1.3 to 4.0 mg/kg for Deroceras laeve and < MLOD to 1.8 mg/kg for Limax maximus, respectively. The mean recoveries from slugs at 0.20 and 2.0 mg/kg are 91% +/- 15% and 86% +/- 5%.
MESH HEADINGS: Animals
MESH HEADINGS: Chromatography, High Pressure Liquid
MESH HEADINGS: Drug Residues/*analysis
MESH HEADINGS: Hawaii
MESH HEADINGS: Phenindione/*analogs &amp
MESH HEADINGS: derivatives/analysis
MESH HEADINGS: Rodenticides/*analysis
MESH HEADINGS: Sensitivity and Specificity
MESH HEADINGS: Snails/*chemistry
MESH HEADINGS: Spectrophotometry, Ultraviolet eng

Schulman, A., Lusk, R., Lippincott, C. L., and Ettinger, S. J. (1986). Diphacinone-Induced Coagulopathy in the Dog. *J. Am. Vet. Med. Assoc.* 188: 402-405.
Chem Codes: Chemical of Concern: DPC Code: INCIDENT.

Schulman, A., Lusk, R., Lippincott, C. L., and Ettinger, S. J. (1986). Diphacinone-Induced Coagulopathy in the Dog. *J. Am. Vet. Med. Assoc.* 188: 402-405.
Chem Codes: Chemical of Concern: DPC Code: INCIDENT.

Schwartz, G. G., Olsson, A. G., Ballantyne, C. M., Barter, P. J., Holme, I. M., Kallend, D., Leiter, L. A., Leitersdorf, E., Mcmurray, J. J., Shah, P. K., Tardif, J. C., Chaitman, B. R., Duttlinger-Maddux, R., Mathieson, J., and Dal-Outcomes Committees and Investigators (Rationale and Design of the Dal-Outcomes Trial: Efficacy and Safety of Dalcetrapib in Patients With Recent Acute Coronary Syndrome. *Am heart j. 2009, dec; 158(6):896-901.e3. [American heart journal]: Am Heart J.*
Chem Codes: Chemical of Concern: DPC Code: HUMAN HEALTH.

ABSTRACT: BACKGROUND: Despite contemporary therapies for acute coronary syndrome (ACS), morbidity and mortality remain high. Low levels of high-density lipoprotein (HDL) cholesterol are

common among patients with ACS and may contribute to ongoing risk. Strategies that raise levels of HDL cholesterol, such as inhibition of cholesterol ester transfer protein (CETP), might reduce risk after ACS. Dal-OUTCOMES is a multicenter, randomized, double-blind, placebo-controlled trial designed to test the hypothesis that CETP inhibition with dalcetrapib reduces cardiovascular morbidity and mortality in patients with recent ACS. DESIGN: The study will randomize approximately 15,600 patients to receive daily doses of dalcetrapib 600 mg or matching placebo, beginning 4 to 12 weeks after an index ACS event. There are no prespecified boundaries for HDL cholesterol levels at entry. Other elements of care, including management of low-density lipoprotein cholesterol, are to follow best evidence-based practice. The primary efficacy measure is time to first occurrence of coronary heart disease death, nonfatal acute myocardial infarction, unstable angina requiring hospital admission, resuscitated cardiac arrest, or atherothrombotic stroke. The trial will continue until 1,600 primary end point events have occurred, all evaluable subjects have been followed for at least 2 years, and 80% of evaluable subjects have been followed for at least 2.5 years. SUMMARY: Dal-OUTCOMES will determine whether CETP inhibition with dalcetrapib, added to current evidence-based care, reduces cardiovascular morbidity and mortality after ACS.
MESH HEADINGS: Acute Coronary Syndrome/*drug therapy
MESH HEADINGS: Anticholesteremic Agents/adverse effects/*therapeutic use
MESH HEADINGS: Humans
MESH HEADINGS: *Research Design
MESH HEADINGS: Sulfhydryl Compounds/adverse effects/*therapeutic use eng

Vudathala, D., Cummings, M., and Murphy, L. (Analysis of Multiple Anticoagulant Rodenticides in Animal Blood and Liver Tissue Using Principles of Quechers Method. *J anal toxicol. 2010; 34(5):273-9. [Journal of analytical toxicology]: J Anal Toxicol.*
Chem Codes: Chemical of Concern: DPC Code: CHEM METHODS.

ABSTRACT: A quick and easy method for the analysis of anticoagulant rodenticides in blood or tissue using principles of dispersive solid-phase extraction (dSPE), commonly known as QuEChERS (short for quick, easy, cheap, effective, rugged, and safe), was developed. Briefly, a combination of magnesium sulfate, PSA, florisil, and basic alumina was used to cleanup blood samples. Further, to cleanup liver tissue samples, C(18) sorbent was included along with the previously mentioned. The samples were analyzed using high-performance liquid chromatography equipped with a reversed-phase C(18) column (150 x 4.6 mm, 5-microm particle size) and a UV and fluorescence detector. The mobile phase consisted of 0.03 M tetrabutylammonium hydroxide (TBA) adjusted to pH 7/methanol (1:1, v/v) as solvent A and methanol as solvent B in a gradient run. The method detection limit was as low as 10 ng/mL for brodifacoum and difenacoum in blood and 10 ng/g in liver; 50 ng/mL for bromadiolone, difethialone, and chlorphacinone in blood and similarly 50 ng/g in liver; and 100 ng/mL for coumafuryl, pindone, warfarin, and diphacinone in blood and 100 ng/g in liver samples. A number of clinical samples of both blood and liver were analyzed; the comparison of this modified QuEChERS and traditional solid-phase extraction data was found to be in close agreement. This method resulted in drastic reduction in processing time and solvent cost both in terms of consumption and disposal, thus making it an attractive alternative to the traditional solid-phase extraction.
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis/blood/isolation &amp
MESH HEADINGS: purification
MESH HEADINGS: Chromatography, High Pressure Liquid/*methods
MESH HEADINGS: Liver/*chemistry
MESH HEADINGS: Rodenticides/*analysis/blood/isolation &amp
MESH HEADINGS: purification
MESH HEADINGS: Solid Phase Extraction/*methods eng

Watt, B. E., Proudfoot, A. T., Bradberry, S. M., and Vale, J. A. (Anticoagulant Rodenticides. *Toxicol rev. 2005; 24(4):259-69. [Toxicological reviews]: Toxicol Rev.*
Chem Codes: Chemical of Concern: DPC Code: REVIEW, HUMAN HEALTH.

ABSTRACT: Anticoagulant pesticides are used widely in agricultural and urban rodent control. The

emergence of warfarin-resistant strains of rats led to the introduction of a new group of anticoagulant rodenticides variously referred to as 'superwarfarins', 'single dose' or 'long-acting'. This group includes the second generation 4-hydroxycoumarins brodifacoum, bromadiolone, difenacoum, flocoumafen and the indanedione derivatives chlorophacinone and diphacinone. Most cases of anticoagulant rodenticide exposure involve young children and, as a consequence, the amounts ingested are almost invariably small. In contrast, intentional ingestion of large quantities of long-acting anticoagulant rodenticides may cause anticoagulation for several weeks or months. Occupational exposure has also been reported. Anticoagulant rodenticides inhibit vitamin K(1)-2,3 epoxide reductase and thus the synthesis of vitamin K and subsequently clotting factors II, VII, IX and X. The greater potency and duration of action of long-acting anticoagulant rodenticides is attributed to their: (i) greater affinity for vitamin K(1)-2,3-epoxide reductase; (ii) ability to disrupt the vitamin K(1)-epoxide cycle at more than one point; (iii) hepatic accumulation; and (iv) unusually long biological half-lives due to high lipid solubility and enterohepatic circulation. Substantial ingestion produces epistaxis, gingival bleeding, widespread bruising, haematomas, haematuria with flank pain, menorrhagia, gastrointestinal bleeding, rectal bleeding and haemorrhage into any internal organ; anaemia may result. Spontaneous haemoperitoneum has been described. Severe blood loss may result in hypovolaemic shock, coma and death. The first clinical signs of bleeding may be delayed and patients may remain anticoagulated for several days (warfarin) or days, weeks or months (long-acting anticoagulants) after ingestion of large amounts. There are now sufficient data in young children exposed to anticoagulant rodenticides to conclude that routine measurement of the international normalised ratio (INR) is unnecessary. In all other cases, the INR should be measured 36-48 hours post exposure. If the INR is normal at this time, even in the case of long-acting formulations, no further action is required. If active bleeding occurs, prothrombin complex concentrate (which contains factors II, VII, IX and X) 50 units/kg, or recombinant activated factor VII 1.2-4.8 mg or fresh frozen plasma 15 mL/kg (if no concentrate is available) and phytomenadione 10mg intravenously (100 microg/kg bodyweight for a child) should be given. If there is no active bleeding and the INR is < or =4.0, no treatment is required; if the INR is > or =4.0 phytomenadione 10mg should be administered intravenously.
MESH HEADINGS: Animals
MESH HEADINGS: Antifibrinolytic Agents/therapeutic use
MESH HEADINGS: *Blood Coagulation Disorders/chemically induced/epidemiology/therapy
MESH HEADINGS: Charcoal/therapeutic use
MESH HEADINGS: Humans
MESH HEADINGS: Poison Control Centers
MESH HEADINGS: Rodenticides/blood/pharmacokinetics/*poisoning
MESH HEADINGS: United States eng

2005 Ecotox Search

DIPHACINONE
Papers that Were Excluded from ECOTOX

1. Arends, J. J. and Robertson, S. H. (1986). **Integrated Pest Management for Poultry Production: Implementation Through Integrated Poultry Companies.** *Poult.Sci.* 65: 675-682.

   Chem Codes: Chemical of Concern: BDF,DPC,CPC,WFN,BDL,CLC,BML; Rejection Code: NO CONC/NO DURATION.

2. Arjo, Wendy M. and Nolte, D. L. Dale L. (2004). **Assessing the efficacy of registered underground baiting products for mountain beaver (Aplodontia rufa) control.** *Crop Protection* 23: 425-430.

   Chem Codes: Chemical of Concern: ZnP; Rejection Code: INCIDENT.
   The mountain beaver (Aplodontia rufa) is a fossorial rodent species endemic to the Pacific Northwest and portions of California. This herbivore inflicts millions of dollars of damage annually to forest seedling plantations. Currently, extensive trapping prior to planting is the most reliable method for reducing damage. With increasing restrictions placed on trapping, forest resource managers need alternative tools to minimize forest damage. This study assessed the potential of four toxicants registered for underground use to control mountain beaver; zinc phosphide, diphacinone, chlorophacinone, and strychnine. Zinc phosphide and strychnine are acute toxicants, whereas diphacinone and chlorophacinone are anticoagulants. Anticoagulants prevent the recycling of vitamin K in the body, which inhibits the production of clotting factors. Efficacy varied among treatments. Zinc phosphide and strychnine were avoided by mountain beaver. Pre-baiting marginally increased acceptance of strychnine, but did not alter mountain beaver acceptance of zinc phosphide. Diphacinone and chlorophacinone were both readily consumed, but only chlorophacinone was 100% effective after a 14-day baiting regime. Subsequently, we tested the effects of diet on the efficacy of diphacinone by varying the availability of food containing vitamin K, the anticoagulant antidote. Restricting access to potential sources of vitamin K appeared to increase efficacy. We conclude that anticoagulants hold some promise as additional tools for managers to reduce mountain beaver populations with chlorophacinone showing the most promise. However, limitations to anticoagulant baits include the necessity of long-term baiting (greater than 10 days), a possible decrease in toxicity if baits contact moisture, and potential primary hazards.

3. Arjo, Wendy M. and Nolte, D. L. Dale L. (2004). **Assessing the efficacy of registered underground baiting products for mountain beaver (Aplodontia rufa) control.** *Crop Protection* 23: 425-430.

   Chem Codes: Chemical of Concern: CPC; Rejection Code: INCIDENT.
   The mountain beaver (Aplodontia rufa) is a fossorial rodent species endemic to the Pacific Northwest and portions of California. This herbivore inflicts millions of dollars of damage annually to forest seedling plantations. Currently, extensive trapping prior to planting is the most reliable method for reducing damage. With increasing restrictions placed on trapping, forest resource managers need alternative tools to minimize forest damage. This study assessed the potential of four toxicants registered for underground use to control mountain beaver; zinc phosphide, diphacinone, chlorophacinone, and strychnine. Zinc phosphide and strychnine are acute toxicants, whereas diphacinone and chlorophacinone are anticoagulants. Anticoagulants prevent the recycling of vitamin K in the body, which inhibits the production of clotting factors. Efficacy varied among treatments. Zinc phosphide and strychnine were avoided by mountain beaver. Pre-baiting marginally increased acceptance of strychnine, but did not alter mountain beaver acceptance of zinc phosphide. Diphacinone and chlorophacinone were both readily consumed, but only chlorophacinone was 100% effective after a 14-day baiting regime. Subsequently, we tested the effects of diet on the efficacy of

diphacinone by varying the availability of food containing vitamin K, the anticoagulant antidote. Restricting access to potential sources of vitamin K appeared to increase efficacy. We conclude that anticoagulants hold some promise as additional tools for managers to reduce mountain beaver populations with chlorophacinone showing the most promise. However, limitations to anticoagulant baits include the necessity of long-term baiting (greater than 10 days), a possible decrease in toxicity if baits contact moisture, and potential primary hazards.

4. Arjo, Wendy M. and Nolte, D. L. Dale L. (2004). **Assessing the efficacy of registered underground baiting products for mountain beaver (Aplodontia rufa) control.** *Crop Protection* 23: 425-430.

   Chem Codes: Chemical of Concern: CPC; Rejection Code: INCIDENT.
   The mountain beaver (Aplodontia rufa) is a fossorial rodent species endemic to the Pacific Northwest and portions of California. This herbivore inflicts millions of dollars of damage annually to forest seedling plantations. Currently, extensive trapping prior to planting is the most reliable method for reducing damage. With increasing restrictions placed on trapping, forest resource managers need alternative tools to minimize forest damage. This study assessed the potential of four toxicants registered for underground use to control mountain beaver; zinc phosphide, diphacinone, chlorophacinone, and strychnine. Zinc phosphide and strychnine are acute toxicants, whereas diphacinone and chlorophacinone are anticoagulants. Anticoagulants prevent the recycling of vitamin K in the body, which inhibits the production of clotting factors. Efficacy varied among treatments. Zinc phosphide and strychnine were avoided by mountain beaver. Pre-baiting marginally increased acceptance of strychnine, but did not alter mountain beaver acceptance of zinc phosphide. Diphacinone and chlorophacinone were both readily consumed, but only chlorophacinone was 100% effective after a 14-day baiting regime. Subsequently, we tested the effects of diet on the efficacy of diphacinone by varying the availability of food containing vitamin K, the anticoagulant antidote. Restricting access to potential sources of vitamin K appeared to increase efficacy. We conclude that anticoagulants hold some promise as additional tools for managers to reduce mountain beaver populations with chlorophacinone showing the most promise. However, limitations to anticoagulant baits include the necessity of long-term baiting (greater than 10 days), a possible decrease in toxicity if baits contact moisture, and potential primary hazards.

5. Arjo, Wendy M. and Nolte, D. L. Dale L. (2004). **Assessing the efficacy of registered underground baiting products for mountain beaver (Aplodontia rufa) control.** *Crop Protection* 23: 425-430.

   Chem Codes: Chemical of Concern: DPC; Rejection Code: INCIDENT.
   The mountain beaver (Aplodontia rufa) is a fossorial rodent species endemic to the Pacific Northwest and portions of California. This herbivore inflicts millions of dollars of damage annually to forest seedling plantations. Currently, extensive trapping prior to planting is the most reliable method for reducing damage. With increasing restrictions placed on trapping, forest resource managers need alternative tools to minimize forest damage. This study assessed the potential of four toxicants registered for underground use to control mountain beaver; zinc phosphide, diphacinone, chlorophacinone, and strychnine. Zinc phosphide and strychnine are acute toxicants, whereas diphacinone and chlorophacinone are anticoagulants. Anticoagulants prevent the recycling of vitamin K in the body, which inhibits the production of clotting factors. Efficacy varied among treatments. Zinc phosphide and strychnine were avoided by mountain beaver. Pre-baiting marginally increased acceptance of strychnine, but did not alter mountain beaver acceptance of zinc phosphide. Diphacinone and chlorophacinone were both readily consumed, but only chlorophacinone was 100% effective after a 14-day baiting regime. Subsequently, we tested the effects of diet on the efficacy of diphacinone by varying the availability of food containing vitamin K, the anticoagulant antidote. Restricting access to potential sources of vitamin K appeared to increase efficacy. We conclude that anticoagulants hold some promise as additional tools for managers to reduce mountain beaver populations with chlorophacinone showing the most promise. However, limitations to anticoagulant baits include the necessity of long-term baiting (greater than 10 days), a possible decrease in toxicity if baits contact moisture, and potential primary hazards.

6. ASKHAM LR (1985). **MECHANICAL EVALUATION OF THE WEATHERABILITY OF PELLETIZED RODENTICIDES.** *INT PEST CONTROL; 27 (6). 1985 (RECD. 1986). 138-140.*

Chem Codes: Chemical of Concern: BDF,BDC,DPC,CPC,ZNP; Rejection Code: NO TOX DATA.
BIOSIS COPYRIGHT: BIOL ABS. RRM BAIT FORMULATION Climate/ Ecology/ Meteorological Factors/ Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Poisoning/ Animals, Laboratory/ Disinfection/ Pest Control/ Disease Vectors/ Pesticides/ Disease Vectors/ Herbicides/ Pest Control/ Pesticides

7. Bennett, B. R. and Grimes, G. S. (1982). **Reverse Phase Liquid Chromatographic Determination of Chlorophacinone and Diphacinone in Bait Formulations.** *J.Assoc.Off.Anal.Chem.* 65: 927-929.

   Chem Codes: EcoReference No.: 35801
   Chemical of Concern: DPC,CPC; Rejection Code: NO SPECIES.

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   Chem Codes: Chemical of Concern: BDF,BDL,DPC,CPC,WFN,ZNP,DFT ; Rejection Code: METHODS.
   BIOSIS COPYRIGHT: BIOL ABS. RRM BOOK CHAPTER RODENTICIDE POISON BAIT ANTICOAGULANT FUMIGANT Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Mammals/ Rodentia

9. BUCKLE AP (1994). **RODENT CONTROL METHODS CHEMICAL.** *BUCKLE, A. P. AND R. H. SMITH (ED.). RODENT PESTS AND THEIR CONTROL. X+405P. CAB INTERNATIONAL: WALLINGFORD, ENGLAND, UK. ISBN 0-85198-820-2.; 0* 127-160.

   Chem Codes: Chemical of Concern: BDF,BDL,DPC,CPC,WFN,ZNP,DFT ; Rejection Code: METHODS.
   BIOSIS COPYRIGHT: BIOL ABS. RRM BOOK CHAPTER RODENTICIDE POISON BAIT ANTICOAGULANT FUMIGANT Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Mammals/ Rodentia

10. CORRIGAN, B. (1990). **A GUIDE TO BLOCK BAIT RODENTICIDES.** *PEST CONTROL;* 58: 18-20, 36.

    Chem Codes: Chemical of Concern: DPC; Rejection Code: NO TOX DATA.
    BIOSIS COPYRIGHT: BIOL ABS. RRM PESTS PEST CONTROL BAITING LOCATIONS Biology/ Animals/ Ecology/ Biochemistry/ Herbicides/ Pest Control/ Pesticides

11. Donlan, C. Josh, Howald, Gregg R., Tershy, Bernie R., and Croll, Donald A. (2003). **Evaluating alternative rodenticides for island conservation: roof rat eradication from the San Jorge Islands, Mexico.** *Biological Conservation* 114: 29-34.

    Chem Codes: Chemical of Concern: BDF,CLC,DPC; Rejection Code: RISK ASSESSMENT.
    Introduced commensal rats (Rattus spp.) are a major contributor to the extinction and endangerment of island plants and animals. The use of the toxin brodifacoum to completely eradicate rats from islands is a powerful conservation tool. However, brodifacoum is toxic to animals other than rats and on some islands its use may not be feasible without prohibitively expensive mitigation. As part of a regional conservation program, we experimentally tested brodifacoum and two less toxic rodenticides, diphacinone and cholecalciferol, in eradicating Rattus rattus from three small islands in the northern Gulf of California, Mexico. All three rodenticides were successful in eradicating rats, suggesting that the less toxic diphacinone and cholecalciferol may be useful alternatives to brodifacoum for some island eradication programs. However, the choice of rodenticide must be balanced between efficacy and the risks to non-target species. Applied field research is needed on less toxic rodenticides, as well as improving palatability of baits. This may prove invaluable in preventing extinctions and in restoring larger and more diverse island ecosystems.

12. Donlan, C. Josh, Howald, Gregg R., Tershy, Bernie R., and Croll, Donald A. (2003). **Evaluating alternative rodenticides for island conservation: roof rat eradication from the San Jorge Islands, Mexico.** *Biological Conservation* 114: 29-34.

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13. Eason, C. T., Murphy, E. C., Wright, G. R. G., and Spurr, E. B. (2002). **Assessment of Risks of Brodifacoum to Non-target Birds and Mammals in New Zealand.** *Ecotoxicology* 11: 35-48.

    Chem Codes: EcoReference No.: 75578
    Chemical of Concern: BDF,WFN,BDL,PND,DPC; Rejection Code: REVIEW.

14. Eason, C. T., Murphy, E. C., Wright, G. R. G., and Spurr, E. B. (2002). **Assessment of Risks of Brodifacoum to Non-target Birds and Mammals in New Zealand.** *Ecotoxicology* 11: 35-48.

    Chem Codes: EcoReference No.: 75578
    Chemical of Concern: BDF,WFN,BDL,PND,DPC; Rejection Code: REVIEW.

15. ELLIOTT AC (1995). **RODENTICIDES.** *GODFREY, C. R. A. (ED.). AGROCHEMICALS FROM NATURAL PRODUCTS. X+418P. MARCEL DEKKER, INC.: NEW YORK, NEW YORK, USA; BASEL, SWITZERLAND. ISBN* 0-8247-9553-9.; 0: 341-368.

    Chem Codes: Chemical of Concern: BDF,BDL,DPC,CPC,WRN,ZPN,CLC ; Rejection Code: REVIEW.
    BIOSIS COPYRIGHT: BIOL ABS. RRM BOOK CHAPTER LITERATURE REVIEW NATURAL PRODUCT Biochemistry/ Biophysics/ Macromolecular Systems/ Molecular Biology/ Biophysics/ Plants/Chemistry/ Herbicides/ Pest Control/ Pesticides/ Rodentia

16. ELLIOTT AC (1995). **RODENTICIDES.** *GODFREY, C. R. A. (ED.). AGROCHEMICALS FROM NATURAL PRODUCTS. X+418P. MARCEL DEKKER, INC.: NEW YORK, NEW YORK, USA; BASEL, SWITZERLAND. ISBN* 0-8247-9553-9.; 0: 341-368.

    Chem Codes: Chemical of Concern: BDF,BDL,DPC,CPC,WRN,ZPN,CLC ; Rejection Code: REVIEW.
    BIOSIS COPYRIGHT: BIOL ABS. RRM BOOK CHAPTER LITERATURE REVIEW NATURAL PRODUCT Biochemistry/ Biophysics/ Macromolecular Systems/ Molecular Biology/ Biophysics/ Plants/Chemistry/ Herbicides/ Pest Control/ Pesticides/ Rodentia

17. Hoffmann, Michael P., Gardner, Jeffrey, and Curtis, Paul D (20031023). **Fiber-supported pesticidal compositions.** 41 pp.

    Chem Codes: Chemical of Concern: SPM,BDL; Rejection Code: NO TOX DATA.
    The invention provides fibrous pest deterrents that combine the useful properties of a phys. barrier in the form of a nonwoven fibrous matrix with a chem. deterrent such as a pesticide, behavior-modifying compd. or a pest repellent. The use of such fibrous pest deterrents protects plants, animals and structures in both agricultural and nonagricultural settings from damage inflicted by pests. Unlike traditional pesticides, the behavior-modifying compd., pesticide or chem. deterrent of the invention is adsorbed or attached to a fibrous

matrix, and so it is not so readily dispersed into the environment. Hence, use of the fibrous pest deterrents can reduce the levels of pesticides that inadvertently contaminate nontarget areas and pollute water supplies. [on SciFinder (R)] fiber/ supported/ pesticide/ compn Copyright: Copyright 2004 ACS on SciFinder (R))
Database: CAPLUS
Accession Number: AN 2003:836400
Chemical Abstracts Number: CAN 139:318718
Section Code: 5-4
Section Title: Agrochemical Bioregulators
Coden: USXXCO
Index Terms: Glycols Role: MOA (Modifier or additive use), USES (Uses) (alyplastic, fiber; support for pest-behavior-modifying compn.); Polyester fibers Role: MOA (Modifier or additive use), USES (Uses) (arom.; support for pest-behavior-modifying compn.); Naphthenic acids Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (copper salts, mammal repellent; fiber-supported pest-behavior-modifying compn.); Anethum graveolens; Insect attractants; Insect feeding inhibitors; Insect repellents; Nepeta cataria; Piper; Repellents; Zingiber officinale (fiber-supported pest-behavior-modifying compn.); Allomones; Kairomones; Monoterpenes; Phenols; Pheromones Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pest-behavior-modifying compn.); Bacillus thuringiensis; Pesticides; Quassia; Schoenocaulon (fiber-supported pesticidal compn.); Pyrethrins Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pesticidal compn.); Fibers Role: MOA (Modifier or additive use), USES (Uses) (fiber-supported pesticidal compn.); Albumins; Collagens; Gelatins; Neoprene rubber; Ovalbumin; Polyamides; Polyanhydrides; Polycarbonates; Polyoxyalkylenes; Polysiloxanes; Polyurethane fibers; Rayon Role: MOA (Modifier or additive use), USES (Uses) (fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (glycolide-based, fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (hydroxycarboxylic acid-based, fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (lactide, fiber; support for pest-behavior-modifying compn.); Capsicum annuum annuum (longum group, paprika; fiber-supported pest-behavior-modifying compn.); Capsicum annuum annuum (longum group; fiber-supported pest-behavior-modifying compn.); Polyethers Role: MOA (Modifier or additive use), USES (Uses) (polyamide-, fiber; support for pest-behavior-modifying compn.); Synthetic polymeric fibers Role: MOA (Modifier or additive use), USES (Uses) (polyamide-polyethers; support for pest-behavior-modifying compn.); Synthetic polymeric fibers Role: MOA (Modifier or additive use), USES (Uses) (polycarbonates; support for pest-behavior-modifying compn.); Polyamide fibers Role: MOA (Modifier or additive use), USES (Uses) (polyether-; support for pest-behavior-modifying compn.); Aves (repellents; fiber-supported pest-behavior-modifying compn.); Insecticides (sterilants; fiber-supported pest-behavior-modifying compn.); Polyester fibers; Polyolefin fibers Role: MOA (Modifier or additive use), USES (Uses) (support for pest-behavior-modifying compn.); Naphthenic acids Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (zinc salts, mammal repellent; fiber-supported pest-behavior-modifying compn.)
CAS Registry Numbers: 84-65-1 (Anthraquinone); 137-30-4 (Ziram.); 333-41-5 (Diazinon); 1332-40-7 (Copper oxychloride); 2032-65-7 (Methiocarb); 12407-86-2 (Trimethacarb); 15879-93-3 (Chloralose); 108173-90-6 (Guazatine) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (bird repellent; fiber-supported pest-behavior-modifying compn.); 57-50-1D (Sugar); 58-08-2 (, Caffein); 404-86-4 (Capsaicin) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pest-behavior-modifying compn.); 50-14-6 (> Ergocalciferol); 50-29-3 (DDT); 52-68-6 (Trichlorfon); 52-85-7 (Famphur); 54-11-5 (Nicotine); 55-38-9 (Fenthion); 55-98-1 (Busulfan); 56-23-5 (Carbon tetrachloride); 56-38-2 (Parathion); 56-72-4 (Coumaphos); 56-75-7 (Chloramphenicol); 57-24-9 (Strychnine); 58-89-9 (Lindane); 60-51-5 (Dimethoate); 60-57-1 (Dieldrin); 62-73-7 (Dichlorvos); 62-74-8 (Sodium fluoroacetate); 63-25-2 (Carbaryl); 67-66-3 (Chloroform); 70-38-2 (Dimethrin); 70-43-9 (Barthrin); 71-55-6 (Methylchloroform); 72-43-5 (Methoxychlor); 74-83-9 (Methyl bromide); 74-90-8 (Hydrogen cyanide); 75-09-2 (Methylene chloride); 75-21-8 (Ethylene oxide); 76-06-2 (,Chloropicrin); 76-44-8 (Heptachlor); 78-34-2 (Dioxathion); 78-53-5 (Amiton); 78-57-9 (Menazon); 78-87-5 (1,2-Dichloropropane); 79-34-5 (Tetrachloroethane); 80-05-7 (Bisphenol A); 81-81-2 (Warfarin); 81-82-3 (Coumachlor); 82-66-6 (Diphacinone); 83-26-1 (Pindone); 83-79-4 (Rotenone); 85-34-7 (Chlorfenac); 86-50-0 (Azinphosmethyl); 86-88-4 (Antu); 87-86-5 (Pentachlorophenol); 91-20-3 (Naphthalene); 96-24-2 (a-Chlorohydrin); 97-11-0 (Cyclethrin); 97-17-6 (Dichlofenthion); 97-27-8 (Chlorbetamide); 104-29-0 (Chlorphenesin); 106-46-7

(Paradichlorobenzene); 106-93-4 (Ethylene Dibromide); 107-06-2 (Ethylene dichloride); 107-13-1 (Acrylonitrile); 109-94-4 (Ethyl formate); 114-26-1 (Propoxur); 115-90-2 (Fensulfothion); 115-93-5 (Cythioate); 116-01-8 (Ethoatemethyl); 116-06-3 (Aldicarb); 118-75-2 (Chloranil); 119-12-0 (Pyridaphenthion); 121-20-0 (Cinerin II); 121-21-1 (Pyrethrin I); 121-29-9 (Pyrethrin II); 121-75-5 (Malathion); 122-14-5 (Fenitrothion); 122-15-6 (Dimetan); 126-22-7 (Butonate); 126-75-0 (Demeton-S); 131-89-5 (Dinex); 133-06-2 (Captan); 133-90-4 (,Chloramben); 141-66-2 (Dicrotophos); 143-50-0 (Chlordecone); 144-41-2 (Morphothion); 152-16-9 (Schradan); 288-14-2 (Isoxazole); 298-00-0 (Parathionmethyl); 298-02-2 (Phorate); 298-03-3 (Demeton-O); 298-04-4 (Disulfoton); 299-84-3 (Fenchlorphos); 299-86-5 (Crufomate); 300-76-5 (Naled); 301-12-2 (Oxydemetonmethyl); 302-04-5 (Thiocyanate); 309-00-2 (Aldrin); 314-40-9 (Bromacil); 315-18-4 (Mexacarbate); 327-98-0 (Trichloronat); 333-20-0 (Potassium thiocyanate); 370-50-3 (Flucofuron); 371-86-8 (Mipafox); 470-90-6 (Chlorfenvinphos); 483-63-6 (Crotamiton); 485-31-4 (Binapacryl); 494-52-0 (Anabasine); 500-28-7 (Chlorothion.); 507-60-8 (Scilliroside); 535-89-7 (Crimidine); 555-89-5 (Bis(p-chlorophenoxy)methane); 563-12-2 (Ethion); 572-48-5 (Coumithoate); 584-79-2 (Bioallethrin); 640-15-3 (Thiometon); 640-19-7 (Fluoroacetamide); 644-06-4 (Precocene II); 644-64-4 (Dimetilan); 671-04-5 (Carbanolate); 682-80-4 (Demephion-O); 732-11-6 (Phosmet); 786-19-6 (Carbophenothion); 867-27-6 (Demeton-O-methyl); 919-54-0 (Acethion); 919-76-6 (Amidithion); 919-86-8 (Demeton-S-methyl); 944-22-9 (FOnofos); 947-02-4 (Phosfolan); 950-10-7 (Mephosfolan); 950-37-8 (Methidathion); 991-42-4 (Norbormide); 1113-02-6 (Omethoate); 1129-41-5 (Metolcarb); 1172-63-0 (Jasmolin II); 1303-96-4 (Borax); 1314-84-7 (Zinc phosphide); 1327-53-3 (Arsenous oxide); 1344-81-6 (Calcium Polysulfide); 1403-17-4 (Candicidin); 1491-41-4 (Naftalofos); 1563-66-2 (Carbofuran); 1563-67-3 (Decarbofuran); 1646-88-4 (Aldoxycarb); 1716-09-2 (Fenthionethyl); 2032-59-9 (Aminocarb); 2104-96-3 (Bromophos); 2274-67-1 (Dimethylvinphos); 2275-14-1 (Phenkapton); 2275-18-5 (Prothoate); 2275-23-2 (Vamidothion); 2310-17-0 (Phosalone); 2385-85-5 (Mirex); 2425-10-7 (Xylylcarb); 2463-84-5 (Dicapthon); 2540-82-1 (Formothion); 2550-75-6 (Chlorbicyclen); 2587-90-8 (Demephion-S); 2595-54-2 (Mecarbam); 2597-03-7 (Phenthoate); 2631-37-0 (Promecarb); 2631-40-5 (Isoprocarb); 2633-54-7 (Trichlormetaphos-3); 2636-26-2 (Cyanophos); 2642-71-9 (Azinphosethyl); 2655-19-8 (Butacarb); 2669-32-1 (Lythidathion); 2674-91-1 (Oxydeprofos); 2699-79-8 (Sulfuryl fluoride); 2778-04-3 (Endothion); 2921-88-2 (Chlorpyrifos); 3383-96-8 (,Temephos); 3604-87-3 (.a.-Ecdysone); 3689-24-5 (Sulfotep); 3691-35-8 (Chlorophacinone); 3734-95-0 (Cyanthoate); 3761-41-9 (,Mesulfenfos); 3766-81-2 (Fenobucarb); 3811-49-2 (Dioxabenzofos); 4097-36-3 (Dinosam); 4104-14-7 (Phosacetim); 4151-50-2 (Sulfluramid); 4466-14-2 (Jasmolin I); 4824-78-6 (Bromophosethyl); 5221-49-8 (Pyrimitate); 5598-13-0 (Chlorpyrifosmethyl); 5598-52-7 (Fospirate); 5826-76-6 (Phosnichlor); 5834-96-8 (Azothoate); 5836-29-3 (Coumatetralyl); 5989-27-5; 6164-98-3 (Chlordimeform); 6392-46-7 (Allyxycarb); 6923-22-4 (Monocrotophos); 6988-21-2 (Dioxacarb); 7219-78-5 (Mazidox); 7257-41-2 (Dinoprop); 7292-16-2 (Propaphos); 7446-18-6 (Thallium sulfate); 7645-25-2 (Lead arsenate); 7696-12-0 (Tetramethrin); 7700-17-6 (Crotoxyphos); 7723-14-0 (Phosphorus); 7778-44-1 (Calcium arsenate); 7786-34-7 (Mevinphos); 7803-51-2 (Phosphine); 8001-35-2 (Camphechlor); 8022-00-2 (Demetonmethyl); 8065-36-9 (Bufencarb); 8065-48-3 (Demeton); 8065-62-1 (Demephion); 10112-91-1 (Mercurous chloride); 10124-50-2 (Potassium Arsenite); 10265-92-6 (Methamidophos); 10311-84-9 (Dialifos); 10453-86-8 (Resmethrin); 10537-47-0 (Malonoben); 10605-21-7 (Carbendazim); 11141-17-6 (Azadirachtin); 12002-03-8 (C.I. Pigment Green 21); 12789-03-6 (Chlordane); 13067-93-1 (Cyanofenphos); 13071-79-9 (Terbufos); 13171-21-6 (Phosphamidon); 13194-48-4 (Ethoprophos); 13457-18-6 (Pyrazophos); 13464-37-4 (Sodium arsenite;); 13593-03-8 (Quinalphos); 13593-08-3 (Quinalphosmethyl); 13804-51-8 (Juvenile hormone I); 14168-01-5 (Dilor); 14255-88-0 (Fenazaflor); 14816-16-1 (Phoximmethyl); 14816-18-3 (Phoxim); 14816-20-7 (Chlorphoxim); 15096-52-3 (Cryolite); 15263-53-3 (Cartap); 15589-31-8 (Terallethrin); 15662-33-6 (Ryania); 16752-77-5 (Methomyl); 16893-85-9 (Sodium hexafluorosilicate); 16984-48-8 (Fluoride); 17080-02-3 (Furethrin); 17125-80-3 (Barium hexafluorosilicate); 17598-02-6 (Precocene I); 17606-31-4 (Bensultap); 17702-57-7 (Formparanate); 18181-70-9 (Jodfenphos); 18181-80-1 (Bromopropylate); 18854-01-8 (Isoxathion); 19691-80-6 (Athidathion); 20276-83-9 (Prothidathion); 20425-39-2 (Pyresmethrin); 21548-32-3 (Fosthietan); 21609-90-5 (Leptophos); 22248-79-9 (>Tetrachlorvinphos); 22259-30-9 (Formetanate); 22431-62-5 (Bioethanomethrin); 22439-40-3 (Quinothion); 22569-71-7 (Phosphide); 22662-39-1 (Rafoxanide); 22781-23-3 (Bendiocarb); 22868-13-9 (Sodium Disulfide,<); 22963-93-5 (Juvenile hormone III); 23031-36-9 (Prallethrin); 23103-98-2 (Pirimicarb); 23135-22-0 (Oxamyl); 23505-41-1 (Pirimiphosethyl); 23526-02-5 (Thuringiensin,<); 23560-59-0 (Heptenophos); 24017-47-8 (Triazophos); 24019-05-4 (Sulcofuron); 24934-91-6 (Chlormephos); 25171-63-5 (Thiocarboxime); 25311-71-1 (Isofenphos); 25402-06-6 (Cinerin); 25601-84-7 (Methocrotophos); 26002-80-2 (Phenothrin); 26097-80-3 (Cambendazole); 28434-01-7 (Bioresmethrin);

28772-56-7 (Bromadiolone); 29173-31-7 (Mecarphon); 29232-93-7 (Pirimiphosmethyl); 29672-19-3 (Nitrilacarb); 29871-13-4 (Copper arsenate); 30087-47-9 (Fenethacarb); 30560-19-1 (Acephate); 30864-28-9 (Methacrifos); 31218-83-4 (Propetamphos); 31377-69-2 (Pirimetaphos); 31895-21-3 (Thiocyclam); 33089-61-1 (Amitraz); 33399-00-7 (Bromfenvinfos); 33629-47-9 (Butralin); 34218-61-6 (Juvenile hormone II); 34264-24-9 (Promacyl); 34643-46-4 (Prothiofos); 34681-10-2 (Butocarboxim); 34681-23-7 (Butoxycarboxim); 35367-31-8 (Penfluron); 35367-38-5 (Diflubenzuron); 35400-43-2 (Sulprofos); 35575-96-3 (Azamethiphos); 35764-59-1 (Cismethrin); 36145-08-1 (Chlorprazophos); 37032-15-8 (Sophamide); 38260-63-8 (Lirimfos); 38524-82-2 (Trifenofos); 38527-91-2 (Etaphos); 39196-18-4 (Thiofanox); 39247-96-6 (Primidophos); 39515-40-7 (Cyphenothrin); 39515-41-8 (Fenpropathrin); 40085-57-2 (Tazimcarb); 40596-69-8 (Methoprene); 40596-80-3 (Triprene); 40626-35-5 (Heterophos); 41096-46-2 (Hydroprene); 41198-08-7 (Profenofos); 41219-31-2 (Dithicrofos); 41483-43-6 (Bupirimate); 42509-80-8 (Isazofos); 42588-37-4 (Kinoprene); 50512-35-1; 51487-69-5 (Cloethocarb); 51596-10-2 (Milbemectin); 51630-58-1 (Fenvalerate); 51877-74-8 (Biopermethrin); 52315-07-8 (,Zetacypermethrin); 52645-53-1 (Permethrin); 52918-63-5 (Deltamethrin); 53558-25-1 (Pyrinuron); 54406-48-3 (Empenthrin); 54593-83-8 (Chlorethoxyfos); 55179-31-2 (Bitertanol); 55285-14-8 (Carbosulfan); 56073-07-5 (Difenacoum); 56073-10-0 (Brodifacoum); 56716-21-3 (Hyquincarb); 57808-65-8 (Closantel); 58481-70-2 (Dicresyl); 58842-20-9 (Nithiazine); 59669-26-0 (Thiodicarb); 60238-56-4 (Chlorthiophos); 60589-06-2 (Metoxadiazone); 60628-96-8 (Bifonazole); 61444-62-0 (Nifluridide); 61949-77-7 (Trans-Permethrin); 63333-35-7 (Bromethalin); 63771-69-7 (Zolaprofos); 63837-33-2 (Diofenolan); 63935-38-6 (Cycloprothrin); 64628-44-0 (Triflumuron); 64902-72-3 (Chlorsulfuron); 65383-73-5 (Precocene III); 65400-98-8 (Fenoxacrim); 65691-00-1 (Triarathene); 65907-30-4 (,Furathiocarb); 66215-27-8 (Cyromazine); 66230-04-4 (Esfenvalerate); 66841-25-6 (Tralomethrin); 67485-29-4 (Hydramethylnon); 68359-37-5 (Betacyfluthrin); 68523-18-2 (Fenpirithrin); 69327-76-0 (Buprofezin); 69409-94-5 (Fluvalinate); 70124-77-5 (Flucythrinate); 70288-86-7 (Ivermectin); 71422-67-8 (Chlorfluazuron); 71697-59-1 (Thetacypermethrin); 71751-41-2 (Abamectin); 72490-01-8 (Fenoxycarb); 72963-72-5 (Imiprothrin); 75867-00-4 (Fenfluthrin); 79538-32-2 (Tefluthrin); 80060-09-9 (Diafenthiuron); 80844-07-1 (Etofenprox); 81613-59-4 (Flupropadine); 82560-54-1 (Benfuracarb); 82657-04-3 (Bifenthrin); 83121-18-0 (Teflubenzuron); 83130-01-2 (Alanycarb); 83733-82-8 (Fosmethilan); 86479-06-3 (Hexaflumuron); 89784-60-1 (Pyraclofos); 90035-08-8 (Flocoumafen); 90338-20-8 (Butathiofos); 95465-99-9 (Cadusafos); 95737-68-1 (Pyriproxyfen); 96182-53-5 (Tebupirimfos); 96489-71-3 (Pyridaben); 101007-06-1 (Acrinathrin); 101463-69-8 (,Flufenoxuron); 102851-06-9 (Taufluvalinate); 103055-07-8 (Lufenuron); 103782-08-7 (Allosamidin); 104653-34-1 (Difethialone); 105024-66-6 (Silafluofen); 105779-78-0 (Pyrimidifen); 107713-58-6 (Flufenprox); 111872-58-3 (Halfenprox); 112143-82-5 (Triazamate.); 112226-61-6 (Halofenozide); 112410-23-8 (Tebufenozide); 112636-83-6 (Dicyclanil); 113036-88-7 (Flucycloxuron); 116714-46-6 (NOvaluron); 117704-25-3 (Doramectin); 118712-89-3 (Transfluthrin); 119168-77-3 (Tebufenpyrad); 119791-41-2 (Emamectin); 120068-37-3 (Fipronil); 121451-02-3 (Noviflumuron); 122453-73-0 (Chlorfenapyr); 123997-26-2 (Eprinomectin); 129558-76-5 (TOlfenpyrad); 143807-66-3 (Chromafenozide); 150824-47-8 (Nitenpyram); 153719-23-4 (Thiamethoxam); 158062-67-0 (Flonicamid); 161050-58-4 (Methoxyfenozide); 165252-70-0 (Dinotefuran); 168316-95-8 (Spinosad); 170015-32-4 (Flufenerim); 173584-44-6 (Indoxacarb); 179101-81-6 (Pyridalyl); 181587-01-9 (Ethiprole); 201593-84-2 (Bistrifluron); 209861-58-5 (Acetoprole); 210880-92-5 (Clothianidin); 220119-17-5 (Selamectin); 223419-20-3 (Profluthrin); 240494-70-6 (Metofluthrin); 283594-90-1 (Spiromesifen) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pesticidal compn.); 51-79-6 (Urethane); 78-79-5 (Isoprene); 108-05-4 (Vinyl acetate); 7782-42-5 (Graphite); 9002-88-4 (Polyethylene); 9002-89-5 (Poly(vinyl alcohol); 9003-05-8; 9003-39-8 (Poly(vinylpyrrolidone); 9003-53-6 (,Polystyrene); 9004-32-4 (Carboxymethyl cellulose sodium salt); 9004-34-6D (Cellulose); 9004-65-3 (Hydroxypropyl methylcellulose); 9005-25-8 (Starch); 9005-32-7 (Alginic acid); 9005-49-6 (Heparin sulfate); 9007-28-7 (Chondroitin sulfate); 24980-41-4 (Polycaprolactone); 25085-53-4 (Isotactic polypropylene); 25248-42-4 (Polycaprolactone); 25322-68-3 (Poly(ethylene oxide); 25702-74-3 (Polysucrose); 25805-17-8 (Poly(ethyloxazoline); 26023-30-3 (Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)]); 26100-51-6 (Polylactic acid); 26780-50-7 (Poly(Lactide-co-glycolide); 31621-87-1 (Polydioxanone) Role: MOA (Modifier or additive use), USES (Uses) (fiber; support for pest-behavior-modifying compn.); 84-74-2 (Dibutyl phthalate); 94-96-2 (Ethohexadiol); 131-11-3 (Dimethyl phthalate); 134-62-3 (DEET); 532-34-3 (Butopyronoxyl); 3653-39-2 (,Hexamide); 19764-43-3 (Methoquin-butyl); 39589-98-5 (Dimethyl carbate); 66257-53-2 (Oxamate); 105726-67-8 (Methylneodecanamide); 119515-38-7 (Picaridin) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (insect repellent; fiber-supported pest-behavior-modifying

compn.); 7783-06-4 (Hydrogen sulfide) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (mammal repellent; fiber-supported pest-behavior-modifying compn.); 9010-98-4 Role: MOA (Modifier or additive use), USES (Uses) (neoprene rubber, fiber; support for pest-behavior-modifying compn.)
Patent Application Country: Application: US
Priority Application Country: US
Priority Application Number: 2001-345349
Priority Application Date: 20011025

18. Hoffmann, Michael P., Gardner, Jeffrey, and Curtis, Paul D (20031023). **Fiber-supported pesticidal compositions.** 41 pp.

Chem Codes: Chemical of Concern: AZD,SPM; Rejection Code: NO TOX DATA.
The invention provides fibrous pest deterrents that combine the useful properties of a phys. barrier in the form of a nonwoven fibrous matrix with a chem. deterrent such as a pesticide, behavior-modifying compd. or a pest repellent. The use of such fibrous pest deterrents protects plants, animals and structures in both agricultural and nonagricultural settings from damage inflicted by pests. Unlike traditional pesticides, the behavior-modifying compd., pesticide or chem. deterrent of the invention is adsorbed or attached to a fibrous matrix, and so it is not so readily dispersed into the environment. Hence, use of the fibrous pest deterrents can reduce the levels of pesticides that inadvertently contaminate nontarget areas and pollute water supplies. [on SciFinder (R)] fiber/ supported/ pesticide/ compn Copyright: Copyright 2004 ACS on SciFinder (R))
Database: CAPLUS
Accession Number: AN 2003:836400
Chemical Abstracts Number: CAN 139:318718
Section Code: 5-4
Section Title: Agrochemical Bioregulators
Coden: USXXCO
Index Terms: Glycols Role: MOA (Modifier or additive use), USES (Uses) (alyplastic, fiber; support for pest-behavior-modifying compn.); Polyester fibers Role: MOA (Modifier or additive use), USES (Uses) (arom.; support for pest-behavior-modifying compn.); Naphthenic acids Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (copper salts, mammal repellent; fiber-supported pest-behavior-modifying compn.); Anethum graveolens; Insect attractants; Insect feeding inhibitors; Insect repellents; Nepeta cataria; Piper; Repellents; Zingiber officinale (fiber-supported pest-behavior-modifying compn.); Allomones; Kairomones; Monoterpenes; Phenols; Pheromones Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pest-behavior-modifying compn.); Bacillus thuringiensis; Pesticides; Quassia; Schoenocaulon (fiber-supported pesticidal compn.); Pyrethrins Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pesticidal compn.); Fibers Role: MOA (Modifier or additive use), USES (Uses) (fiber-supported pesticidal compn.); Albumins; Collagens; Gelatins; Neoprene rubber; Ovalbumin; Polyamides; Polyanhydrides; Polycarbonates; Polyoxyalkylenes; Polysiloxanes; Polyurethane fibers; Rayon Role: MOA (Modifier or additive use), USES (Uses) (fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (glycolide-based, fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (hydroxycarboxylic acid-based, fiber; support for pest-behavior-modifying compn.); Polyesters Role: MOA (Modifier or additive use), USES (Uses) (lactide, fiber; support for pest-behavior-modifying compn.); Capsicum annuum annuum (longum group, paprika; fiber-supported pest-behavior-modifying compn.); Capsicum annuum annuum (longum group; fiber-supported pest-behavior-modifying compn.); Polyethers Role: MOA (Modifier or additive use), USES (Uses) (polyamide-, fiber; support for pest-behavior-modifying compn.); Synthetic polymeric fibers Role: MOA (Modifier or additive use), USES (Uses) (polyamide-polyethers; support for pest-behavior-modifying compn.); Synthetic polymeric fibers Role: MOA (Modifier or additive use), USES (Uses) (polycarbonates; support for pest-behavior-modifying compn.); Polyamide fibers Role: MOA (Modifier or additive use), USES (Uses) (polyether-; support for pest-behavior-modifying compn.); Aves (repellents; fiber-supported pest-behavior-modifying compn.); Insecticides (sterilants; fiber-supported pest-behavior-modifying compn.); Polyester fibers; Polyolefin fibers Role: MOA (Modifier or additive use), USES (Uses) (support for pest-behavior-modifying compn.); Naphthenic acids Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (zinc salts, mammal repellent; fiber-supported

pest-behavior-modifying compn.)
CAS Registry Numbers: 84-65-1 (Anthraquinone); 137-30-4 (Ziram.); 333-41-5 (Diazinon); 1332-40-7 (Copper oxychloride); 2032-65-7 (Methiocarb); 12407-86-2 (Trimethacarb); 15879-93-3 (Chloralose); 108173-90-6 (Guazatine) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (bird repellent; fiber-supported pest-behavior-modifying compn.); 57-50-1D (Sugar); 58-08-2 (, Caffein); 404-86-4 (Capsaicin) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pest-behavior-modifying compn.); 50-14-6 (> Ergocalciferol); 50-29-3 (DDT); 52-68-6 (Trichlorfon); 52-85-7 (Famphur); 54-11-5 (Nicotine); 55-38-9 (Fenthion); 55-98-1 (Busulfan); 56-23-5 (Carbon tetrachloride); 56-38-2 (Parathion); 56-72-4 (Coumaphos); 56-75-7 (Chloramphenicol); 57-24-9 (Strychnine); 58-89-9 (Lindane); 60-51-5 (Dimethoate); 60-57-1 (Dieldrin); 62-73-7 (Dichlorvos); 62-74-8 (Sodium fluoroacetate); 63-25-2 (Carbaryl); 67-66-3 (Chloroform); 70-38-2 (Dimethrin); 70-43-9 (Barthrin); 71-55-6 (Methylchloroform); 72-43-5 (Methoxychlor); 74-83-9 (Methyl bromide); 74-90-8 (Hydrogen cyanide); 75-09-2 (Methylene chloride); 75-21-8 (Ethylene oxide); 76-06-2 (,Chloropicrin); 76-44-8 (Heptachlor); 78-34-2 (Dioxathion); 78-53-5 (Amiton); 78-57-9 (Menazon); 78-87-5 (1,2-Dichloropropane); 79-34-5 (Tetrachloroethane); 80-05-7 (Bisphenol A); 81-81-2 (Warfarin); 81-82-3 (Coumachlor); 82-66-6 (Diphacinone); 83-26-1 (Pindone); 83-79-4 (Rotenone); 85-34-7 (Chlorfenac); 86-50-0 (Azinphosmethyl); 86-88-4 (Antu); 87-86-5 (Pentachlorophenol); 91-20-3 (Naphthalene); 96-24-2 (a-Chlorohydrin); 97-11-0 (Cyclethrin); 97-17-6 (Dichlofenthion); 97-27-8 (Chlorbetamide); 104-29-0 (Chlorphenesin); 106-46-7 (Paradichlorobenzene); 106-93-4 (Ethylene Dibromide); 107-06-2 (Ethylene dichloride); 107-13-1 (Acrylonitrile); 109-94-4 (Ethyl formate); 114-26-1 (Propoxur); 115-90-2 (Fensulfothion); 115-93-5 (Cythioate); 116-01-8 (Ethoatemethyl); 116-06-3 (Aldicarb); 118-75-2 (Chloranil); 119-12-0 (Pyridaphenthion); 121-20-0 (Cinerin II); 121-21-1 (Pyrethrin I); 121-29-9 (Pyrethrin II); 121-75-5 (Malathion); 122-14-5 (Fenitrothion); 122-15-6 (Dimetan); 126-22-7 (Butonate); 126-75-0 (Demeton-S); 131-89-5 (Dinex); 133-06-2 (Captan); 133-90-4 (,Chloramben); 141-66-2 (Dicrotophos); 143-50-0 (Chlordecone); 144-41-2 (Morphothion); 152-16-9 (Schradan); 288-14-2 (Isoxazole); 298-00-0 (Parathionmethyl); 298-02-2 (Phorate); 298-03-3 (Demeton-O); 298-04-4 (Disulfoton); 299-84-3 (Fenchlorphos); 299-86-5 (Crufomate); 300-76-5 (Naled); 301-12-2 (Oxydemetonmethyl); 302-04-5 (Thiocyanate); 309-00-2 (Aldrin); 314-40-9 (Bromacil); 315-18-4 (Mexacarbate); 327-98-0 (Trichloronat); 333-20-0 (Potassium thiocyanate); 370-50-3 (Flucofuron); 371-86-8 (Mipafox); 470-90-6 (Chlorfenvinphos); 483-63-6 (Crotamiton); 485-31-4 (Binapacryl); 494-52-0 (Anabasine); 500-28-7 (Chlorothion.); 507-60-8 (Scilliroside); 535-89-7 (Crimidine); 555-89-5 (Bis(p-chlorophenoxy)methane); 563-12-2 (Ethion); 572-48-5 (Coumithoate); 584-79-2 (Bioallethrin); 640-15-3 (Thiometon); 640-19-7 (Fluoroacetamide); 644-06-4 (Precocene II); 644-64-4 (Dimetilan); 671-04-5 (Carbanolate); 682-80-4 (Demephion-O); 732-11-6 (Phosmet); 786-19-6 (Carbophenothion); 867-27-6 (Demeton-O-methyl); 919-54-0 (Acethion); 919-76-6 (Amidithion); 919-86-8 (Demeton-S-methyl); 944-22-9 (FOnofos); 947-02-4 (Phosfolan); 950-10-7 (Mephosfolan); 950-37-8 (Methidathion); 991-42-4 (Norbormide); 1113-02-6 (Omethoate); 1129-41-5 (Metolcarb); 1172-63-0 (Jasmolin II); 1303-96-4 (Borax); 1314-84-7 (Zinc phosphide); 1327-53-3 (Arsenous oxide); 1344-81-6 (Calcium Polysulfide); 1403-17-4 (Candicidin); 1491-41-4 (Naftalofos); 1563-66-2 (Carbofuran); 1563-67-3 (Decarbofuran); 1646-88-4 (Aldoxycarb); 1716-09-2 (Fenthionethyl); 2032-59-9 (Aminocarb); 2104-96-3 (Bromophos); 2274-67-1 (Dimethylvinphos); 2275-14-1 (Phenkapton); 2275-18-5 (Prothoate); 2275-23-2 (Vamidothion); 2310-17-0 (Phosalone); 2385-85-5 (Mirex); 2425-10-7 (Xylylcarb); 2463-84-5 (Dicapthon); 2540-82-1 (Formothion); 2550-75-6 (Chlorbicyclen); 2587-90-8 (Demephion-S); 2595-54-2 (Mecarbam); 2597-03-7 (Phenthoate); 2631-37-0 (Promecarb); 2631-40-5 (Isoprocarb); 2633-54-7 (Trichlormetaphos-3); 2636-26-2 (Cyanophos); 2642-71-9 (Azinphosethyl); 2655-19-8 (Butacarb); 2669-32-1 (Lythidathion); 2674-91-1 (Oxydeprofos); 2699-79-8 (Sulfuryl fluoride); 2778-04-3 (Endothion); 2921-88-2 (Chlorpyrifos); 3383-96-8 (,Temephos); 3604-87-3 (.a.-Ecdysone); 3689-24-5 (Sulfotep); 3691-35-8 (Chlorophacinone); 3734-95-0 (Cyanthoate); 3761-41-9 (,Mesulfenfos); 3766-81-2 (Fenobucarb); 3811-49-2 (Dioxabenzofos); 4097-36-3 (Dinosam); 4104-14-7 (Phosacetim); 4151-50-2 (Sulfluramid); 4466-14-2 (Jasmolin I); 4824-78-6 (Bromophosethyl); 5221-49-8 (Pyrimitate); 5598-13-0 (Chlorpyrifosmethyl); 5598-52-7 (Fospirate); 5826-76-6 (Phosnichlor); 5834-96-8 (Azothoate); 5836-29-3 (Coumatetralyl); 5989-27-5; 6164-98-3 (Chlordimeform); 6392-46-7 (Allyxycarb); 6923-22-4 (Monocrotophos); 6988-21-2 (Dioxacarb); 7219-78-5 (Mazidox); 7257-41-2 (Dinoprop); 7292-16-2 (Propaphos); 7446-18-6 (Thallium sulfate); 7645-25-2 (Lead arsenate); 7696-12-0 (Tetramethrin); 7700-17-6 (Crotoxyphos); 7723-14-0 (Phosphorus); 7778-44-1 (Calcium arsenate); 7786-34-7 (Mevinphos); 7803-51-2 (Phosphine); 8001-35-2 (Camphechlor); 8022-00-2 (Demetonmethyl); 8065-36-9 (Bufencarb); 8065-48-3 (Demeton); 8065-62-1 (Demephion); 10112-91-1 (Mercurous chloride); 10124-50-2 (Potassium Arsenite); 10265-92-6

(Methamidophos); 10311-84-9 (Dialifos); 10453-86-8 (Resmethrin); 10537-47-0 (Malonoben); 10605-21-7 (Carbendazim); 11141-17-6 (Azadirachtin); 12002-03-8 (C.I. Pigment Green 21); 12789-03-6 (Chlordane); 13067-93-1 (Cyanofenphos); 13071-79-9 (Terbufos); 13171-21-6 (Phosphamidon); 13194-48-4 (Ethoprophos); 13457-18-6 (Pyrazophos); 13464-37-4 (Sodium arsenite;); 13593-03-8 (Quinalphos); 13593-08-3 (Quinalphosmethyl); 13804-51-8 (Juvenile hormone I); 14168-01-5 (Dilor); 14255-88-0 (Fenazaflor); 14816-16-1 (Phoximmethyl); 14816-18-3 (Phoxim); 14816-20-7 (Chlorphoxim); 15096-52-3 (Cryolite); 15263-53-3 (Cartap); 15589-31-8 (Terallethrin); 15662-33-6 (Ryania); 16752-77-5 (Methomyl); 16893-85-9 (Sodium hexafluorosilicate); 16984-48-8 (Fluoride); 17080-02-3 (Furethrin); 17125-80-3 (Barium hexafluorosilicate); 17598-02-6 (Precocene I); 17606-31-4 (Bensultap); 17702-57-7 (Formparanate); 18181-70-9 (Jodfenphos); 18181-80-1 (Bromopropylate); 18854-01-8 (Isoxathion); 19691-80-6 (Athidathion); 20276-83-9 (Prothidathion); 20425-39-2 (Pyresmethrin); 21548-32-3 (Fosthietan); 21609-90-5 (Leptophos); 22248-79-9 (>Tetrachlorvinphos); 22259-30-9 (Formetanate); 22431-62-5 (Bioethanomethrin); 22439-40-3 (Quinothion); 22569-71-7 (Phosphide); 22662-39-1 (Rafoxanide); 22781-23-3 (Bendiocarb); 22868-13-9 (Sodium Disulfide,<); 22963-93-5 (Juvenile hormone III); 23031-36-9 (Prallethrin); 23103-98-2 (Pirimicarb); 23135-22-0 (Oxamyl); 23505-41-1 (Pirimiphosethyl); 23526-02-5 (Thuringiensin,<); 23560-59-0 (Heptenophos); 24017-47-8 (Triazophos); 24019-05-4 (Sulcofuron); 24934-91-6 (Chlormephos); 25171-63-5 (Thiocarboxime); 25311-71-1 (Isofenphos); 25402-06-6 (Cinerin); 25601-84-7 (Methocrotophos); 26002-80-2 (Phenothrin); 26097-80-3 (Cambendazole); 28434-01-7 (Bioresmethrin); 28772-56-7 (Bromadiolone); 29173-31-7 (Mecarphon); 29232-93-7 (Pirimiphosmethyl); 29672-19-3 (Nitrilacarb); 29871-13-4 (Copper arsenate); 30087-47-9 (Fenethacarb); 30560-19-1 (Acephate); 30864-28-9 (Methacrifos); 31218-83-4 (Propetamphos); 31377-69-2 (Pirimetaphos); 31895-21-3 (Thiocyclam); 33089-61-1 (Amitraz); 33399-00-7 (Bromfenvinfos); 33629-47-9 (Butralin); 34218-61-6 (Juvenile hormone II); 34264-24-9 (Promacyl); 34643-46-4 (Prothiofos); 34681-10-2 (Butocarboxim); 34681-23-7 (Butoxycarboxim); 35367-31-8 (Penfluron); 35367-38-5 (Diflubenzuron); 35400-43-2 (Sulprofos); 35575-96-3 (Azamethiphos); 35764-59-1 (Cismethrin); 36145-08-1 (Chlorprazophos); 37032-15-8 (Sophamide); 38260-63-8 (Lirimfos); 38524-82-2 (Trifenofos); 38527-91-2 (Etaphos); 39196-18-4 (Thiofanox); 39247-96-6 (Primidophos); 39515-40-7 (Cyphenothrin); 39515-41-8 (Fenpropathrin); 40085-57-2 (Tazimcarb); 40596-69-8 (Methoprene); 40596-80-3 (Triprene); 40626-35-5 (Heterophos); 41096-46-2 (Hydroprene); 41198-08-7 (Profenofos); 41219-31-2 (Dithicrofos); 41483-43-6 (Bupirimate); 42509-80-8 (Isazofos); 42588-37-4 (Kinoprene); 50512-35-1; 51487-69-5 (Cloethocarb); 51596-10-2 (Milbemectin); 51630-58-1 (Fenvalerate); 51877-74-8 (Biopermethrin); 52315-07-8 (,Zetacypermethrin); 52645-53-1 (Permethrin); 52918-63-5 (Deltamethrin); 53558-25-1 (Pyrinuron); 54406-48-3 (Empenthrin); 54593-83-8 (Chlorethoxyfos); 55179-31-2 (Bitertanol); 55285-14-8 (Carbosulfan); 56073-07-5 (Difenacoum); 56073-10-0 (Brodifacoum); 56716-21-3 (Hyquincarb); 57808-65-8 (Closantel); 58481-70-2 (Dicresyl); 58842-20-9 (Nithiazine); 59669-26-0 (Thiodicarb); 60238-56-4 (Chlorthiophos); 60589-06-2 (Metoxadiazone); 60628-96-8 (Bifonazole); 61444-62-0 (Nifluridide); 61949-77-7 (Trans-Permethrin); 63333-35-7 (Bromethalin); 63771-69-7 (Zolaprofos); 63837-33-2 (Diofenolan); 63935-38-6 (Cycloprothrin); 64628-44-0 (Triflumuron); 64902-72-3 (Chlorsulfuron); 65383-73-5 (Precocene III); 65400-98-8 (Fenoxacrim); 65691-00-1 (Triarathene); 65907-30-4 (,Furathiocarb); 66215-27-8 (Cyromazine); 66230-04-4 (Esfenvalerate); 66841-25-6 (Tralomethrin); 67485-29-4 (Hydramethylnon); 68359-37-5 (Betacyfluthrin); 68523-18-2 (Fenpirithrin); 69327-76-0 (Buprofezin); 69409-94-5 (Fluvalinate); 70124-77-5 (Flucythrinate); 70288-86-7 (Ivermectin); 71422-67-8 (Chlorfluazuron); 71697-59-1 (Thetacypermethrin); 71751-41-2 (Abamectin); 72490-01-8 (Fenoxycarb); 72963-72-5 (Imiprothrin); 75867-00-4 (Fenfluthrin); 79538-32-2 (Tefluthrin); 80060-09-9 (Diafenthiuron); 80844-07-1 (Etofenprox); 81613-59-4 (Flupropadine); 82560-54-1 (Benfuracarb); 82657-04-3 (Bifenthrin); 83121-18-0 (Teflubenzuron); 83130-01-2 (Alanycarb); 83733-82-8 (Fosmethilan); 86479-06-3 (Hexaflumuron); 89784-60-1 (Pyraclofos); 90035-08-8 (Flocoumafen); 90338-20-8 (Butathiofos); 95465-99-9 (Cadusafos); 95737-68-1 (Pyriproxyfen); 96182-53-5 (Tebupirimfos); 96489-71-3 (Pyridaben); 101007-06-1 (Acrinathrin); 101463-69-8 (,Flufenoxuron); 102851-06-9 (Taufluvalinate); 103055-07-8 (Lufenuron); 103782-08-7 (Allosamidin); 104653-34-1 (Difethialone); 105024-66-6 (Silafluofen); 105779-78-0 (Pyrimidifen); 107713-58-6 (Flufenprox); 111872-58-3 (Halfenprox); 112143-82-5 (Triazamate.); 112226-61-6 (Halofenozide); 112410-23-8 (Tebufenozide); 112636-83-6 (Dicyclanil); 113036-88-7 (Flucycloxuron); 116714-46-6 (NOvaluron); 117704-25-3 (Doramectin); 118712-89-3 (Transfluthrin); 119168-77-3 (Tebufenpyrad); 119791-41-2 (Emamectin); 120068-37-3 (Fipronil); 121451-02-3 (Noviflumuron); 122453-73-0 (Chlorfenapyr); 123997-26-2 (Eprinomectin); 129558-76-5 (TOlfenpyrad); 143807-66-3 (Chromafenozide); 150824-47-8 (Nitenpyram); 153719-23-4 (Thiamethoxam); 158062-67-0 (Flonicamid); 161050-58-4 (Methoxyfenozide); 165252-70-0

(Dinotefuran); 168316-95-8 (Spinosad); 170015-32-4 (Flufenerim); 173584-44-6 (Indoxacarb); 179101-81-6 (Pyridalyl); 181587-01-9 (Ethiprole); 201593-84-2 (Bistrifluron); 209861-58-5 (Acetoprole); 210880-92-5 (Clothianidin); 220119-17-5 (Selamectin); 223419-20-3 (Profluthrin); 240494-70-6 (Metofluthrin); 283594-90-1 (Spiromesifen) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (fiber-supported pesticidal compn.); 51-79-6 (Urethane); 78-79-5 (Isoprene); 108-05-4 (Vinyl acetate); 7782-42-5 (Graphite); 9002-88-4 (Polyethylene); 9002-89-5 (Poly(vinyl alcohol); 9003-05-8; 9003-39-8 (Poly(vinylpyrrolidone); 9003-53-6 (,Polystyrene); 9004-32-4 (Carboxymethyl cellulose sodium salt); 9004-34-6D (Cellulose); 9004-65-3 (Hydroxypropyl methylcellulose); 9005-25-8 (Starch); 9005-32-7 (Alginic acid); 9005-49-6 (Heparin sulfate); 9007-28-7 (Chondroitin sulfate); 24980-41-4 (Polycaprolactone); 25085-53-4 (Isotactic polypropylene); 25248-42-4 (Polycaprolactone); 25322-68-3 (Poly(ethylene oxide); 25702-74-3 (Polysucrose); 25805-17-8 (Poly(ethyloxazoline); 26023-30-3 (Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)]); 26100-51-6 (Polylactic acid); 26780-50-7 (Poly(Lactide-co-glycolide); 31621-87-1 (Polydioxanone) Role: MOA (Modifier or additive use), USES (Uses) (fiber; support for pest-behavior-modifying compn.); 84-74-2 (Dibutyl phthalate); 94-96-2 (Ethohexadiol); 131-11-3 (Dimethyl phthalate); 134-62-3 (DEET); 532-34-3 (Butopyronoxyl); 3653-39-2 (,Hexamide); 19764-43-3 (Methoquin-butyl); 39589-98-5 (Dimethyl carbate); 66257-53-2 (Oxamate); 105726-67-8 (Methylneodecanamide); 119515-38-7 (Picaridin) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (insect repellent; fiber-supported pest-behavior-modifying compn.); 7783-06-4 (Hydrogen sulfide) Role: BUU (Biological use, unclassified), BIOL (Biological study), USES (Uses) (mammal repellent; fiber-supported pest-behavior-modifying compn.); 9010-98-4 Role: MOA (Modifier or additive use), USES (Uses) (neoprene rubber, fiber; support for pest-behavior-modifying compn.)
Patent Application Country: Application: US
Priority Application Country: US
Priority Application Number: 2001-345349
Priority Application Date: 20011025

19. LAZAR, R. and LIRA EP (1986). **RODENTICIDE COMPOSITIONS COMPRISING AN ARTIFICIAL SWEETENER AND A RODENTICIDE US PATENT-4581378. APRIL 8 1986.** *OFF GAZ U S PAT TRADEMARK OFF PAT;* 1065: 879.

Chem Codes: Chemical of Concern: DPC; Rejection Code: NO TOX DATA.
BIOSIS COPYRIGHT: BIOL ABS. RRM USCL-514-681 DIPHACINONE SODIUM SACCHARIN

20. LEVY, S. (2003). **Getting the Drop on Hawaiian Invasives.** *BioScience* 53: 694-699.

Chem Codes: Chemical of Concern: BDF,DPC; Rejection Code: REVIEW.
The Hawaiian Islands were once home to some 68 native bird species. Today, 29 native birds are extinct and 17 species are endangered. Hawaii's native birds evolved without any natural mammalian predators; however, populations were decimated when new settlers brought with them dogs, pigs, cats, mongoose, and rats. In addition, goats, cattle, logging, and the accidental introduction of mosquitoes have harmed native plants and animals, including birds. The native birds surviving today inhabit a small number of high-elevation habitats. These areas are subject to massive conservation efforts, including plans to control the rat populations that harm native birds. Many biologists support aerial drops of rat poison into remote Hawaiian forests. New Zealand rat poison campaigns have had dramatic results in protecting native seabirds and lizards. Diphacinone, a drug originally used by cardiac patients, is particularly lethal to rats, targeting vitamin K-dependent production of clotting factors. New Zealand aerial drops of brodifacoum, a more lethal form of the drug, require that some mice and birds of prey are trapped and returned in order to target only rats. Helicopter drops of rat poison in remote Hawaiian locations is a cost-effective program without the logistical problems associated with bait stations put out by people. Yet, concerns over harming sensitive species and secondary poisoning of predators have alarmed some. Furthermore, even though many habitats are in high elevation and remote areas, rats will eventually repopulate the area. Small-scale trials of aerial diphacinone drops are underway in Hawaii Volcanoes National Park. Other smaller trials have shown that few birds take up the bait, and the poison effectively kills rats. Whether decreasing the rat population on a large scale will help native birds in the long term remains to be seen. HAWAIIAN ISLANDS/ NATIVE BIRD SPECIES/ BIRD CONSERVATION/ RAT PREDATORS/ PREDATION CONTROL/ DIPHACINONE RAT POISON/

AERIAL POISON DROPS/ FOREST CONSERVATION/ NEW ZEALAND RAT CONTROL/ INVASIVE SPECIES

21. LEVY, S. (2003). **Getting the Drop on Hawaiian Invasives.** *BioScience* 53: 694-699.

    Chem Codes: Chemical of Concern: BDF; Rejection Code: REVIEW.
    The Hawaiian Islands were once home to some 68 native bird species. Today, 29 native birds are extinct and 17 species are endangered. Hawaii's native birds evolved without any natural mammalian predators; however, populations were decimated when new settlers brought with them dogs, pigs, cats, mongoose, and rats. In addition, goats, cattle, logging, and the accidental introduction of mosquitoes have harmed native plants and animals, including birds. The native birds surviving today inhabit a small number of high-elevation habitats. These areas are subject to massive conservation efforts, including plans to control the rat populations that harm native birds. Many biologists support aerial drops of rat poison into remote Hawaiian forests. New Zealand rat poison campaigns have had dramatic results in protecting native seabirds and lizards. Diphacinone, a drug originally used by cardiac patients, is particularly lethal to rats, targeting vitamin K-dependent production of clotting factors. New Zealand aerial drops of brodifacoum, a more lethal form of the drug, require that some mice and birds of prey are trapped and returned in order to target only rats. Helicopter drops of rat poison in remote Hawaiian locations is a cost-effective program without the logistical problems associated with bait stations put out by people. Yet, concerns over harming sensitive species and secondary poisoning of predators have alarmed some. Furthermore, even though many habitats are in high elevation and remote areas, rats will eventually repopulate the area. Small-scale trials of aerial diphacinone drops are underway in Hawaii Volcanoes National Park. Other smaller trials have shown that few birds take up the bait, and the poison effectively kills rats. Whether decreasing the rat population on a large scale will help native birds in the long term remains to be seen. HAWAIIAN ISLANDS/ NATIVE BIRD SPECIES/ BIRD CONSERVATION/ RAT PREDATORS/ PREDATION CONTROL/ DIPHACINONE RAT POISON/ AERIAL POISON DROPS/ FOREST CONSERVATION/ NEW ZEALAND RAT CONTROL/ INVASIVE SPECIES

22. MEDVEDOVICI, A., DAVID, F., and SANDRA, P. (1997). **Determination of the rodenticides warfarin, diphenadione and chlorophacinone in soil samples by HPLC-DAD.** *TALANTA;* 44: 1633-1640.

    Chem Codes: Chemical of Concern: DPC,CPC,WFN; Rejection Code: NO TOX DATA.
    BIOSIS COPYRIGHT: BIOL ABS. A HPLC-DAD method is described for the analysis of the rodenticides warfarin, diphenadione and chlorophacinone, together with the phenylurea herbicides isoproturon and diuron, in soil samples. The HPLC parameters have been optimised to provide baseline separation with symmetrical peakshapes in short analysis times. The sample preparation consists of Soxhlet extraction followed by SPE clean-up on cyanopropyl silica. Biochemistry/Methods/ Biophysics/Methods/ Methods/ Plants/ Soil/ Herbicides/ Pest Control/ Pesticides

23. Mendenhall, V. M. and Pank, L. F. (1980). **Secondary Poisoning of Owls by Anticoagulant Rodenticides.** *Wildlife Society Bulletin* 8: 311-315.

    Chem Codes: Chemical of Concern: BDF,DPC,CPC; Rejection Code: NO CONC.

24. Mendenhall, V. M. and Pank, L. F. (1980). **Secondary Poisoning of Owls by Anticoagulant Rodenticides.** *Wildlife Society Bulletin* 8: 311-315.

    Chem Codes: Chemical of Concern: BDF,DPC,CPC; Rejection Code: NO CONC.

25. Schulman, A., Lusk, R., Lippincott, C. L., and Ettinger, S. J. (1986). **Diphacinone-Induced Coagulopathy in the Dog.** *J.Am.Vet.Med.Assoc.* 188: 402-405.

    Chem Codes: Chemical of Concern: DPC; Rejection Code: INCIDENT.

26. Stone, W B, Okoniewski, J C, and Stedelin, J R (1999). **Poisoning of wildlife with anticoagulant rodenticides in New York.** *Journal Of Wildlife Diseases* 35: 187-193.

Chem Codes: Chemical of Concern: BDF,BDL,DPC,CPC,WFN; Rejection Code: INCIDENT/SURVEY. From 1971 through 1997, we documented 51 cases (55 individual animals) of poisoning of non-target wildlife in New York (plus two cases in adjoining states) (USA) with anticoagulant rodenticides--all but two of these cases occurred in the last 8 yrs. Brodifacoum was implicated in 80% of the incidents. Diphacinone was identified in four cases, bromadiolone in three cases (once in combination with brodifacoum), and chlorophacinone and coumatetralyl were detected once each in the company of brodifacoum. Warfarin accounted for the three cases documented prior to 1989, and one case involving a bald eagle (Haliaeetus leucocephalus) in 1995. Secondary intoxication of raptors, principally great horned owls (Bubo virginianus) and red-tailed hawks (Buteo jamaicensis), comprised one-half of the cases. Gray squirrels (Sciurus carolinensis), raccoons (Procyon lotor) and white-tailed deer (Odocoileus virginianus) were the most frequently poisoned mammals. All of the deer originated from a rather unique situation on a barrier island off southern Long Island (New York). Restrictions on the use of brodifacoum appear warranted. [Journal Article; In English; United States]

27. TROY GC (1988). **DIPHACINONE TOXICITY VON WILLEBRAND'S DISEASE AND EHRLICHIA-CANIS IN A DOG .** *VET CLIN NORTH AM SMALL ANIM PRACT;* 18: 255-257.

Chem Codes: Chemical of Concern: DPC; Rejection Code: INCIDENT.
BIOSIS COPYRIGHT: BIOL ABS. RRM THROMBOCYTOPENIA VITAMIN K HEMATOLOGIC-DRUG TETRACYCLINE ANTIBACTERIAL-DRUG Animals/Genetics/ Biochemistry/ Vitamins/ Lipids/ Therapeutics/ Hematologic Diseases/Pathology/ Hematologic Diseases/Physiopathology/ Hematopoietic System/Pathology/ Hematopoietic System/Physiopathology/ Lymphatic Diseases/Pathology/ Lymphatic Diseases/Physiopathology/ Reticuloendothelial System/Pathology/ Reticuloendothelial System/Physiopathology/ Blood/Drug Effects/ Hematinics/Pharmacology/ Hematopoiesis/Drug Effects/ Animal/ Toxicology/ Veterinary Medicine/ Bacteria/ Animal Diseases/Pathology/ Animal Diseases/Physiopathology/ Animal Diseases/Microbiology/ Antibiotics/ Bacterial Infections/Drug Therapy/ Herbicides/ Pest Control/ Pesticides/ Rickettsiaceae/ Carnivora/ Carnivora