Appendix E

ECOTOX Open Literature Bibliography

Explanation of OPP Acceptability Criteria and Rejection Codes for ECOTOX Data

Studies located and coded into ECOTOX must meet acceptability criteria, as established in the *Interim Guidance of the Evaluation Criteria for Ecological Toxicity Data in the Open Literature, Phase I and II*, Office of Pesticide Programs, U.S. Environmental Protection Agency, July 16, 2004. Studies that do not meet these criteria are designated in the bibliography as "Accepted for ECOTOX but not OPP." The intent of the acceptability criteria is to ensure data quality and verifiability. The criteria parallel criteria used in evaluating registrant-submitted studies. Specific criteria are listed below, along with the corresponding rejection code.

- The paper does not report toxicology information for a chemical of concern to OPP; (Rejection Code: NO COC)
- The article is not published in English language; (Rejection Code: NO FOREIGN)
- The study is not presented as a full article. Abstracts will not be considered; (Rejection Code: NO ABSTRACT)
- The paper is not publicly available document; (Rejection Code: NO NOT PUBLIC (typically not used, as any paper acquired from the ECOTOX holding or through the literature search is considered public)
- The paper is not the primary source of the data; (Rejection Code: NO REVIEW)
- The paper does not report that treatment(s) were compared to an acceptable control; (Rejection Code: NO CONTROL)
- The paper does not report an explicit duration of exposure; (Rejection Code: NO DURATION)
- The paper does not report a concurrent environmental chemical concentration/dose or application rate; (Rejection Code: NO CONC)
- The paper does not report the location of the study (e.g., laboratory vs. field); (Rejection Code: NO LOCATION)
- The paper does not report a biological effect on live, whole organisms; (Rejection Code: NO IN-VITRO)
- The paper does not report the species that was tested; and this species can be verified in a reliable source; (Rejection Code: NO SPECIES)
- The paper does not report effects associated with exposure to a single chemical. (Rejection Code: NO MIXTURE). It should be noted that all papers including data on pesticide mixtures are considered.

Additionally, efficacy studies on target species are excluded and coded as NO TARGET.

Data that originated from the OPP Pesticide Ecotoxicity Database is coded as NO EFED. These data are already available to the chemical team.

Papers Identified in the March 2011 ECOTOX Refresh

Acceptable for EcoTox and OPP

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).

Guidobono, J. S., Leon, V., Villafane, I. E. G., and Busch, M. (2010). Bromadiolone Susceptibility in Wild and Laboratory Mus musculus L. (House Mice) in Buenos Aires, Argentina. *Pest Manag. Sci.* 66: 162-167.

EcoReference No.: 151520
Chemical of Concern: BDL; Habitat: T; Effect Codes: BEH,GRO,MOR; Code: LITE EVAL CODED (BDL).

Jokic, G., Vuksa, P., and Vuksa, M. (2010). Comparative Efficacy of Conventional and New Rodenticides Against Microtus arvalis (Pallas, 1778) in Wheat and Alfalfa Crops. *Crop Prot.* 29: 487-491 (Auth. communication used).

EcoReference No.: 151522
Chemical of Concern: BDL; Habitat: T; Effect Codes: POP; Code: LITE EVAL CODED (BDL).

Kocher, D. K. and Kaur, R. (2008). Rodent Damage to Groundnut (Arachis hypogaea) Crop and Its Effective Control in Fields of Punjab. *Indian J. Agric. Sci.* 78: 723-725.

EcoReference No.: 151583
Chemical of Concern: BDL,ZnP; Habitat: T; Effect Codes: POP; Code: LITE EVAL CODED (BDL,ZnP).

Lee, C. H., Kamarudin, K. A., Tan, Y. P., and Rajapadman, C. V. (1990). A Case of Increased Tolerance of Rattus tiomanicus (Miller) to Brodifacoum and Bromadiolone. *Mardi Res. J.* 18: 197-203.

EcoReference No.: 79128
Chemical of Concern: BDF,BDL; Habitat: T; Effect Codes: BEH,GRO,MOR,POP; Code: LITE EVAL CODED (BDF,BDL).

Pervez, A., Ahmad, S. M., Waqar, S., and Rizvi, A. (1998). Comparative Efficacy of Bromadiolone, Cholecalciferol and Zinc Phosphide Against Short-Tailed Mole Rat Nesokia indica in Captivity. *Turk. J. Zool.* 22: 137-140.

EcoReference No.: 79137
Chemical of Concern: BDL,CFP,ZnP; Habitat: T; Effect Codes: BEH,MOR; Code: LITE EVAL CODED (BDL,CFP,ZnP), NO ENDPOINT (ZnP).

Saravanan, K. and Kanakasabai, R. (1998). Laboratory Studies on the Toxicity of Bromadiolone (0.005 %) Against Indian Mole Rat, Bandicota bengalensis (Gray). *J. Environ. Biol.* 19: 299-303.

EcoReference No.: 75942
Chemical of Concern: BDL; Habitat: T; Effect Codes: BEH,MOR; Code: LITE EVAL CODED (BDL).

Winters, A. M., Rumbeiha, W. K., Winterstein, S. R., Fine, A. E., Munkhtsog, B., and Hickling, G. J. (2010). Residues in Brandt's Voles (Microtus brandti) Exposed to Bromadiolone-Impregnated Baits in Mongolia. *Ecotoxicol. Environ. Saf.* 73: 1071-1077.

EcoReference No.: 151528
Chemical of Concern: BDL; Habitat: T; Effect Codes: ACC; Code: LITE EVAL CODED (BDL).

Accepted for EcoTox but not OPP

Balasubramanyam, M., Maddaiah, G. P., and Ramamurthi, R. (1991). Minimal Baiting and Control of Rats in Storages Using New Generation Anticoagulant Rodenticides. *In: Fleurat-Lessard and P. Ducom (Eds.) Proc. Fifth Int. Working Conf. on Stored-Product Protection, Vol III, Inst. Nat. Recherche Agronomy, INRA, Paris, France* 1481-1488.

EcoReference No.: 151587
Chemical of Concern: BDF,BDL; Habitat: T; Effect Codes: POP; Code: NO ENDPOINT (BDF,BDL).

Baskaran, J., Kanakasabai, R., and Neelanarayanan, P. (1995). Evaluation of Two Rodenticides in the Paddy Fields During Samba and Thaladi Seasons. *J. Exp. Biol.* 33: 113-121.

EcoReference No.: 40368
Chemical of Concern: BDL,ZnP; Habitat: T; Effect Codes: POP; Code: NO ENDPOINT (BDL,ZnP).

Berny, P. J., De Oliveira, L. A., Videmann, B., and Rossi, S. (2006). Assessment of Ruminal Degradation, Oral Bioavailability, and Toxic Effects of Anticoagulant Rodenticides in Sheep. *Am. J. Vet. Res.* 67: 363-371.

EcoReference No.: 120185
Chemical of Concern: BDL,CPC; Habitat: T; Effect Codes: ACC,BCM; Code: NO ENDPOINT (BDL,CPC).

Giorgi, M. and Mengozzi, G. (2010). An HPLC Method for the Determination of Bromadiolone Plasma Kinetics and Its Residues in Hen Eggs. *J. Chromatogr. Sci.* 48: 712-720.

EcoReference No.: 151582
Chemical of Concern: BDL; Habitat: T; Effect Codes: ACC,MOR; Code: NO ENDPOINT (BDL).

Grandemange, A., Kohn, M. H., Lasseur, R., Longin-Sauvageon, C., Berny, P., and Benoit, E. (2009). Consequences of the Y139F Vkorc1 Mutation on Resistance to AVKs: In-Vivo Investigation in a 7th Generation of Congenic Y139F Strain of Rats. *Pharmacogen. Genom.* 19: 742-750.

EcoReference No.: 151506
Chemical of Concern: BDL,CPC,DFM,DFT; Habitat: T; Effect Codes: PHY; Code: NO EXP TYPE (BDL,CPC,DFM,DFT).

Heiberg, A. C., Leirs, H., and Siegismund, H. R. (2006). Reproductive Success of Bromadiolone-Resistant Rats in Absence of Anticoagulant Pressure. *Pest Manag. Sci.* 62: 862-871.

EcoReference No.: 151521
Chemical of Concern: BDL; Habitat: T; Effect Codes: MOR,REP; Code: NO ENDPOINT (BDL).

Jeantet, A. Y., Truchet, M., Naulleau, G., and Martoja, R. (1991). Cytological Effects of Bromadiolone on Some Organs or Tissues (Liver, Kidney, Spleen, Blood) of Coypu (Myocastor coypus). *C. R. Acad. Sci. Paris Ser. III* 312: 149-156.

EcoReference No.: 78918
Chemical of Concern: BDL; Habitat: T; Code: NO ENDPOINT (BDL).

Kaukeinen, D. (1982). A Review of the Secondary Poisoning Hazard Potential to Wildlife from the use of Anticoagulant Rodenticides. *In: Marsh,R.E.(Ed.) Proceedings Tenth Vertebrate Pest Conference, Vertebrate Pest Council, Univ.of Ca, Davis CA* 151-158.

EcoReference No.: 37415
Chemical of Concern: BDL,DFM; Habitat: T; Effect Codes: ACC,MOR; Code: NO CONTROL (BDL,DFM).

Lund, M. (1981). Hens, Eggs and Anticoagulants. *Int. Pest Control* 23: 126-127.

EcoReference No.: 37764
Chemical of Concern: BDF,BDL,DFM,PPCP,WFN; Habitat: T; Effect Codes: BEH,MOR,PHY; Code: NO CONTROL (BDF,BDL,DFM,PPCP,WFN), NO ENDPOINT (BDF,BDL,DFM,PPCP,WFN).

Markussen, M. D., Heiberg, A. C., Alsbo, C., Nielsen, P. S., Kauppinen, S., and Kristensen, M. (2007). Involvement of Hepatic Xenobiotic Related Genes in Bromadiolone Resistance in Wild Norway Rats, Rattus norvegicus (Berk.). *Pestic. Biochem. Physiol.* 88: 284-295.

EcoReference No.: 151524
Chemical of Concern: BDL,PPCP; Habitat: T; Effect Codes: CEL; Code: NO EXP TYPE (BDL,PPCP).

Markussen, M. D., Heiberg, A. C., Fredholm, M., and Kristensen, M. (2007). Characterization of Bromadiolone Resistance in a Danish Strain of Norway Rats, Rattus norvegicus, by Hepatic Gene Expression Profiling of Genes Involved in Vitamin K-Dependent Gamma-Carboxylation. *J. Biochem. Mol. Toxicol.* 21: 373-381.

EcoReference No.: 151523
Chemical of Concern: BDL; Habitat: T; Effect Codes: CEL; Code: NO EXP TYPE (BDL).

Markussen, M. D. K., Heiberg, A. C., Fredholm, M., and Kristensen, M. (2008). Identification of Cytochrome P450 Differentiated Expression Related to Developmental Stages in Bromadiolone Resistance in Rats (Rattus norvegicus). *Pestic. Biochem. Physiol.* 91: 147-152.

EcoReference No.: 113640
Chemical of Concern: BDL; Habitat: T; Effect Codes: CEL; Code: NO EXP TYPE (BDL).

Mikhail, M. W., Kamilia, Allam, A. M., and Soliman, M. I. (2007). Efficiency of Three Anti-Coagulant Rodenticides on Commensal Rodents. *J. Egypt. Soc. Parasitol.* 37: 741-746.

EcoReference No.: 151585
Chemical of Concern: BDL,DFM; Habitat: T; Effect Codes: BEH,GRO,MOR; Code: NO CONTROL (BDL,DFM).

Parshad, V. R., Malhi, C. S., Ahmad, N., and Gupta, B. (1987). Rodent Damage and Control in Peanut Fields in India. *Peanut Sci.* 14: 4-6.

EcoReference No.: 79138
Chemical of Concern: BDF,BDL,ZnP; Habitat: T; Effect Codes: POP; Code: NO ENDPOINT (BDF,BDL,ZnP).

Revathi, K. and Yogananda, M. (2006). Effect of Bromadiolone on Haematology, Liver and Kidney in Mus musculus. *J. Environ. Biol.* 27: 135-140.

EcoReference No.: 151526
Chemical of Concern: BDL; Habitat: T; Effect Codes: BCM,BEH,CEL,GRO,MOR; Code: NO ENDPOINT (BDL).

Sage, M., Coeurdassier, M., Defaut, R., Gimbert, F., Berny, P., and Giraudoux, P. (2008). Kinetics of Bromadiolone in Rodent Populations and Implications for Predators After Field Control of the Water Vole, Arvicola terrestris. *Sci. Total Environ.* 407: 211-222.

EcoReference No.: 151527
Chemical of Concern: BDL; Habitat: T; Effect Codes: ACC; Code: NO ENDPOINT (BDL).

Vandenbroucke, V., Bousquet-Melou, A., De Backer, P., and Croubels, S. (2008). Pharmacokinetics of Eight Anticoagulant Rodenticides in Mice After Single Oral Administration. *J. Vet. Pharmacol. Ther.* 31: 437-445.

EcoReference No.: 151555
Chemical of Concern: BDL,CPC,PPCP,WFN; Habitat: T; Effect Codes: ACC,MOR; Code: NO CONTROL (BDL,CPC,PPCP,WFN).

Vandenbroucke, V., Desmet, N., De Backer, P., and Croubels, S. (2008). Multi-Residue Analysis of Eight Anticoagulant Rodenticides in Animal Plasma and Liver Using Liquid Chromatography Combined with Heated Electrospray Ionization Tandem Mass Spectrometry. *J. Chromatogr. B* 869: 101-110.

EcoReference No.: 151507
Chemical of Concern: BDF,BDL,CPC,DFM,DFT,PPCP,WFN; Habitat: T; Effect Codes: ACC; Code: NO CONTROL (BDF,BDL,CPC,DFM,DFT,PPCP,WFN), NO ENDPOINT (BDF,BDL,CPC,DFM,DFT,PPCP,WFN).

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: BDL 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: BDL 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

Bhat, S. K. (1992). Coconut. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 279-288.
Chem Codes: Chemical of Concern: BDL,FMN,WFN Code: REVIEW.

ISBN 81-7233-013-8//

Bhat, S. K. (1992). Plantation Crops. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 271-278.
Chem Codes: Chemical of Concern: BDF,BDL,FMN,WFN Code: REVIEW.

ISBN 81-7233-013-8//

Cai, Junmeng, Li, Tao, and Liu, Ronghou (A critical study of the Miura-Maki integral method for the estimation of the kinetic parameters of the distributed activation energy model. *Bioresource Technology* In Press, Corrected Proof.
Chem Codes: Chemical of Concern: BDL Code: METHODS.

Media Type: doi: DOI: 10.1016/j.biortech.2010.11.110
URL: http://www.sciencedirect.com/science/article/B6V24-51K993H-5/2/f8da9f0dac0d834050ac04ac70165bad
Keywords: Pyrolysis
Keywords: Nonisothermal kinetics
Keywords: Biomass
Keywords: Activation energy distribution
Keywords: Frequency factor

Chaliasos, N., Challa, A., Hatzimichael, E., Koutsouka, F., Bourantas, D. K., Vlahos, A. P., Siamopoulou, A., Bourantas, K. L., and Makis, A. (Serum Adipocytokine and Vascular Inflammation Marker Levels in Beta-Thalassaemia Major Patients. *Acta haematol. 2010; 124(4):191-6. [Acta haematologica]: Acta Haematol*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Background/Aim: The adipocytokines leptin and adiponectin represent a critical link between metabolism, immunity and chronic inflammation. A chronic vascular inflammatory state plays an important role in the pathophysiology of thalassaemia. We aimed to analyze the levels of these adipocytokines and determine any possible correlations with disease severity or vascular inflammation markers in beta-thalassaemia. Methods: Serum leptin, adiponectin, high-sensitivity C-reactive protein, endothelins, vascular adhesion molecule-1, intracellular adhesion molecule-1 and L- and E-selectin were measured in 28 beta-thalassaemia patients and compared with levels in healthy controls. Results: Leptin was significantly lower in patients compared to controls (2.23 ± 1.8 vs. 10.24 ± 5.78 μg/l; p = 0.0018), whereas adiponectin was elevated (11.75 ± 5.67 vs. 6.83 ± 2.75 μg/l; p = 0.009). For both adipocytokines, no correlations were found with characteristics such as age, gender, type of chelation, body mass index z score or haemoglobin. Leptin, but not adiponectin, was negatively correlated with ferritin (p = 0.032, r = -0.61). No correlations were found between leptin and the inflammation markers. However, adiponectin was positively correlated with endothelin-1 (p = 0.022, r = 0.63). Conclusions: Serum leptin is low in beta-thalassaemia, perhaps due to the toxic effect of iron overload on adipose tissue. Paradoxically, adiponectin levels are high and positively correlated with endothelin-1, raising questions about the pro- or anti-inflammatory role of this adipocytokine in beta-thalassaemia. eng

Chopra, G. (1992). Poultry Farms. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 309-330.
Chem Codes: Chemical of Concern: BDF,BDL,WFN,ZnP Code: REVIEW.

ISBN 81-7233-013-8//

Danish Pest Infestation Laboratory (1998). Annual Report of Danish Pest Infestation Laboratory, 1997. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1997, Danish Pest Infest.Lab., Lyngby, Denmark* 112 p.
Chem Codes: EcoReference No.: 89164
Chemical of Concern:
AZM,BDL,BRSM,CPY,CYF,CYR,DDT,DDVP,DFM,DFZ,DMT,DZ,FNT,HCCH,MOM,PMR,PPB,PPCP,PYN Code: REVIEW.

Danish Pest Infestation Laboratory (1998). Annual Report of Danish Pest Infestation Laboratory, 1997. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1997, Danish Pest Infest.Lab., Lyngby, Denmark* 112 p.
Chem Codes: Chemical of Concern:
AZM,BDL,BRSM,CPY,CYF,CYR,DDT,DDVP,DFM,DFZ,DMT,DZ,FNT,HCCH,MOM,PMR,PPB,PYN
Code: REVIEW.

Danish Pest Infestation Laboratory (1999). Annual Report of Danish Pest Infestation Laboratory, 1998. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1998, Danish Pest Infest.Lab., Lyngby, Denmark* 110 p.
Chem Codes: EcoReference No.: 89161
Chemical of Concern:
AZM,BDL,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PPCP,PYN,TBF,TVP Code: REVIEW.

Danish Pest Infestation Laboratory (1999). Annual Report of Danish Pest Infestation Laboratory, 1998. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1998, Danish Pest Infest.Lab., Lyngby, Denmark* 110 p.
Chem Codes: Chemical of Concern:
AZM,BDL,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PYN,TBF,TVP Code: REVIEW.

Danish Pest Infestation Laboratory (2000). Annual Report of Danish Pest Infestation Laboratory, 1999. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1999, Danish Pest Infest.Lab., Lyngby, Denmark* 72 p.
Chem Codes: EcoReference No.: 89163
Chemical of Concern:
AZM,BDL,BRSM,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PMR,PPCP,PYN,TBF Code: REVIEW.

Danish Pest Infestation Laboratory (2000). Annual Report of Danish Pest Infestation Laboratory, 1999. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.1999, Danish Pest Infest.Lab., Lyngby, Denmark* 72 p.
Chem Codes: Chemical of Concern:
AZM,BDL,BRSM,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PMR,PYN,TBF Code: REVIEW.

Danish Pest Infestation Laboratory (2001). Annual Report of Danish Pest Infestation Laboratory, 2000. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.2000, Danish Pest Infest.Lab., Lyngby, Denmark* 59 p.
Chem Codes: EcoReference No.: 89162
Chemical of Concern:
AZM,BDL,CPY,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PMR,PPCP,PYN,SS,TMX,TVP
Code: REVIEW.

Danish Pest Infestation Laboratory (2001). Annual Report of Danish Pest Infestation Laboratory, 2000. *In: N.Bille,and M.Christensen (Eds.), Annu.Rep.2000, Danish Pest Infest.Lab., Lyngby, Denmark* 59 p.
Chem Codes: Chemical of Concern:
AZM,BDL,CPY,CYR,DDT,DFZ,DMT,DZ,FNT,FPN,HCCH,MOM,PMR,PYN,SS,TMX,TVP Code:
REVIEW.

Deepa, S. and Mishra, A. K. (Fluorescence Spectroscopic Study of Serum Albumin-Bromadiolone Interaction: Fluorimetric Determination of Bromadiolone. *J pharm biomed anal. 2005, jul 1; 38(3):556-63. [Journal of pharmaceutical and biomedical analysis]: J Pharm Biomed Anal*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Bromadiolone (BRD), a substituted 4-hydroxycoumarin derivative, is known to possess anti-coagulant activity with acute toxicity. In this paper, we report a study on the interaction of bromadiolone with the plasma proteins bovine serum albumin (BSA) and human serum albumin (HSA), using the intrinsic fluorescence emission properties of bromadiolone. Bromadiolone is weakly fluorescent in aqueous buffer medium, with an emission at 397 nm. Binding of bromadiolone with serum albumins (SA) leads to a marked enhancement in the fluorescence emission intensity and steady state fluorescence anisotropy (r(ss)), accompanied by a blueshift of 10 nm. In the serum albumin-bromadiolone complex, selective excitation of tryptophan (Trp) residue results in emission from bromadiolone, thereby indicating a Förster type energy transfer from Trp to BRD. This quenching of Trp fluorescence by BRD was used to estimate the binding constant of the SA-BRD complex. The binding constants for BRD with BSA and HSA were 7.5 x 10(4) and 3.7 x 10(5)L mol(-1), respectively. Based on this, a new method involving SA as fluorescence-enhancing reagent for estimation of BRD in aqueous samples has been suggested. The detection limits of bromadiolone under the optimum conditions were 0.77 and 0.19 microg mL(-1) in presence of BSA and HSA, respectively.
MESH HEADINGS: 4-Hydroxycoumarins/*analysis/chemistry
MESH HEADINGS: Algorithms
MESH HEADINGS: Animals
MESH HEADINGS: Cattle
MESH HEADINGS: Energy Transfer
MESH HEADINGS: Humans
MESH HEADINGS: Kinetics
MESH HEADINGS: Molecular Structure
MESH HEADINGS: Protein Binding
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Serum Albumin/*analysis/chemistry
MESH HEADINGS: Serum Albumin, Bovine/analysis/chemistry
MESH HEADINGS: Spectrometry, Fluorescence/*methods eng

Dowding, C. V., Shore, R. F., Worgan, A., Baker, P. J., and Harris, S. (Accumulation of Anticoagulant Rodenticides in a Non-Target Insectivore, the European Hedgehog (Erinaceus Europaeus). *Environ pollut. 2010, jan; 158(1):161-6. [Environmental pollution (barking, essex : 1987)]: Environ Pollut*.
Chem Codes: Chemical of Concern: BDL Code: SURVEY.

ABSTRACT: Studies on exposure of non-targets to anticoagulant rodenticides have largely focussed on predatory birds and mammals; insectivores have rarely been studied. We investigated the exposure of 120 European hedgehogs (Erinaceus europaeus) from throughout Britain to first- and second-generation anticoagulant rodenticides (FGARs and SGARs) using high performance liquid chromatography coupled with fluorescence detection (HPLC) and liquid-chromatography mass spectrometry (LCMS). The proportion of hedgehogs with liver SGAR concentrations detected by HPLC was 3-13% per compound, 23% overall. LCMS identified much higher prevalence for difenacoum and bromadiolone, mainly because of greater ability to detect low-level contamination. The overall proportion of hedgehogs with LCMS-detected residues was 57.5% (SGARs alone) and 66.7% (FGARs and SGARs combined); 27 (22.5%) hedgehogs contained > 1 rodenticide. Exposure of insectivores and predators to anticoagulant rodenticides appears to be similar. The greater sensitivity of LCMS suggests that hitherto exposure of non-targets is likely to have been under-estimated using HPLC techniques.
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*metabolism
MESH HEADINGS: Environmental Monitoring
MESH HEADINGS: Hedgehogs/*metabolism
MESH HEADINGS: Rodenticides/*metabolism eng

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 (Lond.)* 11: 35-48.
Chem Codes: Chemical of Concern: BDF,BDL,DPC,PVL,WFN Code: REVIEW.

Fourel, I., Hugnet, C., Goy-Thollot, I., and Berny, P. (2010). Validation of a New Liquid Chromatography- Tandem Mass Spectrometry Ion-Trap Technique for the Simultaneous Determination of Thirteen Anticoagulant Rodenticides, Drugs, or Natural Products. *J. Anal. Toxicol.* 34: 95-102.
Chem Codes: Chemical of Concern: BDF,BDL,CPC,DFM,DFT,PPCP,WFN Code: CHEM METHODS,NO CONC.

Fourel, I., Hugnet, C., Goy-Thollot, I., and Berny, P. (2010). Validation of a New Liquid Chromatography- Tandem Mass Spectrometry Ion-Trap Technique for the Simultaneous Determination of Thirteen Anticoagulant Rodenticides, Drugs, or Natural Products. *Journal of analytical toxicology* 34: 95-102.
Chem Codes: Chemical of Concern: BDL Code: METHODS.

ABSTRACT: The purpose of this study was to develop and validate a liquid chromatography-tandem mass spectrometry method for the identification and quantification of anticoagulant (anti-vitamin K or AVK) compounds, including rodenticides, drugs, and natural products because no published method could be found. The proposed method is based on ion-trap technology with electrospray ionization (ESI) and multiple reaction monitoring (MRM) technique. Each AVK is identified by means of its retention time, precursor ion, and two product ions. Plasma samples are extracted by liquid-liquid partition on Toxi-tube B((R)). The method was validated on dog plasma and gave good results in terms of specificity, linearity, and percent recovery for the 14 AVK tested (warfarin, acenocoumarol, bromadiolone, brodifacoum, chlorophacinone, coumatetralyl, dicoumarol, difenacoum, difethialone, flocoumafen, fluindione, phenindione, and tioclomarol). The limits of detection ranged from 5 to 25 ng/mL. Intraday repeatability was good, but interday repeatability was more variable though still sufficient for our diagnostic purposes. The technique was successfully applied in a series of clinical investigations to demonstrate its applicability in various animal species and gave very high sensitivity and specificity results.
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis/blood
MESH HEADINGS: Biological Products/*analysis/blood
MESH HEADINGS: Cats
MESH HEADINGS: Chromatography, Liquid/*methods
MESH HEADINGS: Dogs
MESH HEADINGS: Horses
MESH HEADINGS: Humans
MESH HEADINGS: Pharmaceutical Preparations/*analysis/blood
MESH HEADINGS: Poisoning/blood/diagnosis

MESH HEADINGS: Rats
MESH HEADINGS: Rodenticides/*analysis/blood
MESH HEADINGS: Sensitivity and Specificity
MESH HEADINGS: Sheep
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization
MESH HEADINGS: Tandem Mass Spectrometry/*methods eng

Fournier-Chambrillon Christine, Berny Philippe J, Coiffier Olivier, Barbedienne Philippe, Dasse Bernard, Delas Gerard, Galineau Hubert, Mazet Alexandra, Pouzenc Pascal, Rosoux Rene, and Fournier Pascal (2004). Evidence of Secondary Poisoning of Free-Ranging Riparian Mustelids by Anticoagulant Rodenticides in France: Implications for Conservation of European Mink (Mustela Lutreola). *Journal of Wildlife Diseases [J. Wildl. Dis.]*. 40, 40: 688-695. Oct 2004., 688-695.
Chem Codes: Chemical of Concern: BDL Code: SURVEY.

0090-3558 Descriptors: Article Subject Terms: Anticoagulants
Descriptors: Brominated hydrocarbons
Descriptors: Carcasses
Descriptors: Chlorinated hydrocarbons
Descriptors: Environmental monitoring
Descriptors: Lesions
Descriptors: Mortality causes
Descriptors: Pesticides
Descriptors: Rare species
Descriptors: Vulnerability
Descriptors: Article Taxonomic Terms: Lutra lutra
Descriptors: Mustela lutreola
Descriptors: Mustela putorius
Descriptors: Mustela vison
Descriptors: Article Geographic Terms: France
Abstract: Because of the rapid decline of the endangered European mink (Mustela lutreola) populations in France, a national conservation program has been put into action, including research to understand the causes of decline. As part of this research, concentrations of eight anticoagulant rodenticides were examined in livers from 122 carcasses of four species of free-ranging mustelids collected between 1990 and 2002 in southwestern France. Bromadiolone residue was found in all species and 9% of the sample (one of 31 European mink, three of 47 American mink [Mustela vison], five of 33 polecats [Mustela putorius], and two of 11 European otters [Lutra lutra]). Liver concentrations ranged from 0.6 mu g/g to 9.0 mu g/g. Chlorophacinone residue was found in two species and 4% of the sample (in four of the American mink and in one of the otters), with liver concentrations ranging from 3.4 mu g/g to 8.5 mu g/g. Two polecats and one American mink had lesions and liver residues indicating bromadiolone was directly responsible for their death. However, most of our study animals survived secondary poisoning until they were caught; this study certainly underestimates the extent of fatal exposure of mustelids to rodenticides. Moreover, anticoagulant poisoning could increase their vulnerability to other causes of death. The current status of the endangered European mink population is such that any additional risk factor for mortality is important, and it is thus urgent to monitor and reduce the extensive use of bromadiolone and chlorophacinone against field rodents in France.
Publisher: Allen Press, Inc., 810 East Tenth St. Lawrence KS 66044 USA,
[mailto:webmaster@allenpress.com], [URL:http://www.allenpress.com]
Language: English
English
Publication Type: Journal Article
Environmental Regime: Freshwater
Classification: Q5 01504 Effects on organisms
Subfile: ASFA 3: Aquatic Pollution & Environmental Quality

Giraudoux, P., Tremolli&Egrave, Res, C., Barbier, B., Defaut, R., Rieffel, D., Bernard, N., Lucot, E., and Berny, P. (Persistence of Bromadiolone Anticoagulant Rodenticide in Arvicola Terrestris Populations After Field

Control. *Environ res. 2006, nov; 102(3):291-8. [Environmental research]: Environ Res*.
Chem Codes: Chemical of Concern: BDL Code: SURVEY.

ABSTRACT: This paper documents the exposure pattern of a population of small mammals to bromadiolone over time in a field-scale follow up. This is the first assessment of the field-scale effect of such control operation on the availability of bromadiolone-exposed A. terrestris prey to nontarget predator species. It indicates that an important risk of poisoning of nontarget species does exist during large-scale field control operations with bromadiolone, which is contradictory to results obtained from laboratory experiments in the early 1980s and consistent with the secondary poisoning hazards due to repeated exposure regularly reported during the past 20 years.
MESH HEADINGS: 4-Hydroxycoumarins/administration &amp
MESH HEADINGS: dosage/*metabolism
MESH HEADINGS: Animals
MESH HEADINGS: Arvicolinae/*metabolism
MESH HEADINGS: Food Chain
MESH HEADINGS: Pesticide Residues/*metabolism
MESH HEADINGS: Predatory Behavior
MESH HEADINGS: Rodenticides/administration &amp
MESH HEADINGS: dosage/*metabolism eng

Grobosch, T., Angelow, B., Sch&Ouml, Nberg, L., and Lampe, D. (Acute Bromadiolone Intoxication. *J anal toxicol. 2006, may; 30(4):281-6. [Journal of analytical toxicology]: J Anal Toxicol*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: A 55-year-old man came to the hospital with a bleeding wound on his tongue. The coating of his tongue was green, and his sputum was red. Because an increased international normalized ratio-value was measured, a blood sample was sent to our laboratory with the suspicion of coumarin intoxication. Liquid chromatography-electrospray ionization-mass spectrometry (LC-ESI-MS) analysis confirmed the poisoning was by bromadiolone, with its maximum serum concentration at 440 microg/L. The analysis of further samples resulted in a calculated elimination half-life of 140 h. The analytical method described was developed for the determination and quantitation of bromadialone using LC-MS. This method is suitable for the simultaneous identification and quantitation of 10 indirect anticoagulants in human serum, which include five superwarfarins (brodifacoum, bromadiolone, difenacoum, difethialone, and flocoumafen) as rodenticides licenced in Germany and five other vitamin K antagonists (acenocoumarol, coumatetralyl, coumachlor, phenprocoumon, and warfarin). The method is based on an acidic (pH 4.2) liquid-liquid extraction followed by LC-ESI-MS analysis. Analytical separation was carried out using an Atlantis C18 column (2.1 x 20 mm, 3 microm). The mobile phase consisted of methanol/0.1% formic acid; the flow rate was 0.6 mL/min, and the time needed for analysis was 5 min. The lower limit of quantitation was 5 microg/L (signal-to-noise > 10).
MESH HEADINGS: 4-Hydroxycoumarins/*blood/*poisoning
MESH HEADINGS: Anticoagulants/blood/poisoning
MESH HEADINGS: Chromatography, High Pressure Liquid/methods
MESH HEADINGS: Humans
MESH HEADINGS: Male
MESH HEADINGS: Mass Spectrometry/methods
MESH HEADINGS: Middle Aged
MESH HEADINGS: Poisoning/drug therapy
MESH HEADINGS: Rodenticides/blood/poisoning
MESH HEADINGS: Vitamin K/therapeutic use eng

Hosokawa, Masakiyo and Satoh, Tetsuo (2006). Structure, Function, and Regulation of Carboxylesterases. 219-231.
Chem Codes: Chemical of Concern: BDL Code: REVIEW.

Media Type: doi: DOI: 10.1016/B978-012088523-7/50017-X
URL: http://www.sciencedirect.com/science/article/B8476-4MWS131-Y/2/e36b16281f45f81bf023b6868a414be8

Abstract: Summary

Hou, Wen-Shang, Chang, Yuan-Hsiou, Chuang, Tsai-Fu, and Chen, Chun-Hsiang (2010). Effect of ecological engineering design on biological motility and habitat environment of Hynobius arisanensis at high altitude areas in Taiwan. *Ecological Engineering* 36: 791-798.
Chem Codes: Chemical of Concern: BDL Code: NO TOXICANT.

Media Type: doi: DOI: 10.1016/j.ecoleng.2010.02.004
URL: http://www.sciencedirect.com/science/article/B6VFB-4YR8B0M-2/2/02140ef5ef1147cfacc138be7be73755
Keywords: Hynobius arisanensis
Keywords: Water bank
Keywords: Substrate
Keywords: Climbing ability

Huang, B., Lu(dieresis), C., Wu, B., and Fan, L. (2007). A Rhizobia Strain Isolated From Root Nodule of Gymnosperm Podocarpus Macrophyllus. *Science in China, Series C: Life Sciences, 50 (2) pp. 228-233, 2007*.
Chem Codes: Chemical of Concern: BDL Code: BACTERIA.

1006-9305 Descriptors: Podocarpus macrophyllus
Descriptors: P. macrophyllus var. maki
Descriptors: Rhizobia
Descriptors: Physiological and biochemical characteristics
Descriptors: 16S rDNA sequence
Abstract: Symbiotic nitrogen fixation of rhizobia and leguminous plants is considered as the most important biologic nitrogen fixation system on earth. Symbiotic nodulation of gymnosperm Podocarpus macrophyllus and rhizobia has never been reported. In this study, 11 endophytic bacteria strains were isolated from root nodules of P. macrophyllus and its variation P. macrophyllus var. maki. The plant infection tests on these strains indicated that the isolated strains could be nodulated on P. macrophyllus plants, and weak nitrogenase activity of nodules was found in acetylene reduction method. According to the physiological and biochemical characteristics of the 11 strains, GXLO 02 was selected as the representative strain. 16S rDNA full-length sequence analysis of GXLO 02 confirmed that the representative strain GXLO 02 belongs to Rhizobium sp. (copyright) 2007 Science in China Press.
18 refs.
Language: English
English
Publication Type: Journal
Publication Type: Article
Country of Publication: Germany
Classification: 92.11.2.3 PLANT PATHOLOGY AND SYMBIOSES: Symbioses: Rhizobia and related symbionts
Subfile: Plant Science

Jaeger, K., Zenz, S., J&Uuml, Ttner, B., Ruschulte, H., Kuse, E., Heine, J., Piepenbrock, S., Ganser, A., and Karthaus, M. (Reduction of Catheter-Related Infections in Neutropenic Patients: a Prospective Controlled Randomized Trial Using a Chlorhexidine and Silver Sulfadiazine-Impregnated Central Venous Catheter. *Ann hematol. 2005, apr; 84(4):258-62. [Annals of hematology]: Ann Hematol*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Antiseptic coating of intravascular catheters may be an effective means of decreasing catheter-related colonization and subsequent infection. The purpose of this study was to assess the efficacy of chlorhexidine and silver sulfadiazine (CH-SS)-impregnated central venous catheters (CVCs) to prevent catheter-related colonization and infection in patients with hematological malignancies who were subjected to intensive chemotherapy and suffered from severe and sustained neutropenia. Proven CVC-related bloodstream infection (BSI) was defined as the isolation of the same species from peripheral blood culture

and CVC tip (Maki technique). This randomized, prospective clinical trial was carried out in 106 patients and compared catheter-related colonization and BSI using a CH-SS-impregnated CVC (n=51) to a control arm using a standard uncoated triple-lumen CVC (n=55). Patients were treated for acute leukemia (n=89), non-Hodgkin's lymphoma (n=10), and multiple myeloma (n=7). Study groups were balanced regarding to age, sex, underlying diseases, insertion site, and duration of neutropenia. The CVCs were in situ a mean of 14.3+/-8.2 days (mean+/-SD) in the study group versus 16.6+/-9.7 days in the control arm. Catheter-related colonization was observed less frequently in the study group (five vs nine patients; p=0.035). CVC-related BSI were significantly less frequent in the study group (one vs eight patients; p=0.02). In summary, in patients with severe neutropenia, CH-SS-impregnated CVCs yield a significant antibacterial effect resulting in a significantly lower rate of catheter-related colonization as well as CVC-related BSI.
MESH HEADINGS: Bacteremia/etiology/microbiology
MESH HEADINGS: Bacteria/isolation &amp
MESH HEADINGS: purification
MESH HEADINGS: Catheterization, Central Venous/*adverse effects
MESH HEADINGS: Catheters, Indwelling/adverse effects
MESH HEADINGS: Chlorhexidine/*therapeutic use
MESH HEADINGS: Equipment Contamination/prevention &amp
MESH HEADINGS: control
MESH HEADINGS: Hematologic Neoplasms/complications/drug therapy
MESH HEADINGS: Humans
MESH HEADINGS: Immunocompromised Host
MESH HEADINGS: Infection Control/*methods
MESH HEADINGS: Neutropenia/chemically induced/*complications
MESH HEADINGS: Opportunistic Infections/etiology/microbiology/transmission
MESH HEADINGS: Serotyping
MESH HEADINGS: Silver Sulfadiazine/*therapeutic use eng

Jansen, Andrea, Tnrck, Michael, Szekat, Christiane, Nagel, Michael, Clever, Indra, and Bierbaum, Gabriele (2007-). Role of insertion elements and yycFG in the development of decreased susceptibility to vancomycin in Staphylococcus aureus. *International Journal of Medical Microbiology* 297: 205-215.
Chem Codes: Chemical of Concern: BDL Code: BACTERIA.

Media Type: doi: DOI: 10.1016/j.ijmm.2007.02.002
URL: http://www.sciencedirect.com/science/article/B7GW0-4NDVHK9-1/2/235edeca163e5b8bad2c472c56f439e0
Keywords: VISA
Keywords: Microarray
Keywords: Staphylococcus aureus
Keywords: IS256
Keywords: yycFG
Keywords: vicRK

Jarosz-Chobot, P., Nowakowska, M., and Polanska, J. (Seeking the Factors Predisposing to Local Skin Inflammatory State Development in Children With Type 1 Diabetes (T1dm) Treated With Continuous Subcutaneous Insulin Infusion (Csii). *Exp clin endocrinol diabetes. 2007, mar; 115(3):179-81. [Experimental and clinical endocrinology & diabetes : official journal, german society of endocrinology [and] german diabetes association]: Exp Clin Endocrinol Diabetes*.
Chem Codes: Chemical of Concern: BDL Code : HUMAN HEALTH.

ABSTRACT: The often CSII treatment complication is local skin infection. The aim of the study was to analyze chosen factors predisposing to this complication. MATERIAL AND METHODS: We observed 40 children aged 1.9-15.6, suffering from diabetes for 0.1-12 and treated by CSII for 0.01-4.4 years in whom HbA1c, BMI, injection site and catheter insertion duration, catheter colonization, skin flora and Staphylococcus aureus carrier state were analyzed. The catheter cultures were prepared with Maki method. The skin and nasal vestibule swab were taken to detect local flora. RESULTS: In the culture of 43 catheters (Maki method) a positive growth (>10 cfu) was detected in 9 (21%), homogeny culture of coagulase-

negative staphylococci in 7 and mixed culture (both S.epidermidis and S.aureus) in two cases. Skin inflammation of the injection site was observed in a total of 10 children (25%), in two of whom catheter culture was positive. A statistically significant relation between the presence of bacteria in the catheter and on the skin around the injection site was found. Among the examined parameters, the relation between the catheter colonization and HbA1c, female sex and BMI were observed. CONCLUSIONS: Metabolic control, female sex and BMI influence the development of a skin inflammatory state in patients treated with CSII. S.aureus carrier state has no impact either on catheter colonization or the development of an infection. However, bacteria skin occurrences can predispose to catheter colonization by the strain as well as to developing an inflammation.
MESH HEADINGS: Adolescent
MESH HEADINGS: Bacterial Infections/*classification/*etiology
MESH HEADINGS: Child
MESH HEADINGS: Child, Preschool
MESH HEADINGS: Diabetes Mellitus, Type 1/*drug therapy
MESH HEADINGS: Female
MESH HEADINGS: Humans
MESH HEADINGS: Infant
MESH HEADINGS: Inflammation/epidemiology/*etiology
MESH HEADINGS: Insulin Infusion Systems/*adverse effects
MESH HEADINGS: Male
MESH HEADINGS: Poland
MESH HEADINGS: Skin Diseases/etiology/*microbiology eng

Jensen, I. H. and Bile, N. (1993). Scientific and Technical Work. 6. Flies. *In: I.H.Jensen and N.Bile (Eds.) Dan.Pest Infest.Lab.Annu.Rep.for 1992, Lyngby, Denmark* 36-85.
Chem Codes: EcoReference No.: 70762
Chemical of Concern:
ATN,BDF,BDL,BRSM,CYP,DDT,DFT,DMT,DZ,HCCH,MOM,MTPN,PPB,PPC,PPCP,TVP Code:
REVIEW.

Jensen, I. H. and Bile, N. (1993). Scientific and Technical Work. 6. Flies. *In: I.H.Jensen and N.Bile (Eds.) Dan.Pest Infest.Lab.Annu.Rep.for 1992, Lyngby, Denmark* 36-85.
Chem Codes: Chemical of Concern:
ATN,BDF,BDL,BRSM,CYP,DDT,DFT,DMT,DZ,HCCH,MOM,MTPN,PPB,PPC,TVP Code: REVIEW.

Some data that is not published elsewhere//

Jensen, I. H. and Bile, N. (1994). Scientific and Technical Work. 6. Flies. *In: I.H.Jensen and N.Bile (Eds), Dan.Pest Infest.Lab.Annu.Rep.for 1993, Lyngby, Denmark* 35-74.
Chem Codes: EcoReference No.: 70763
Chemical of Concern:
ATN,BDF,BDL,BRSM,CLC,CYP,DDT,DMT,DZ,HCCH,MOM,MTPN,PPB,PPCP,TVP Code:
REVIEW.

Jensen, I. H. and Bile, N. (1995). Scientific and Technical Work. 6. Flies. *In: I.H.Jensen and N.Bile (Eds.) Dan.Pest Infest.Lab.Annu.Rep.for 1994, Lyngby, Denmark* 35-80.
Chem Codes: EcoReference No.: 70764
Chemical of Concern: ATN,BDF,BDL,BRSM,CLC,DDT,DZ,HCCH,MOM,MTPN,PPB,PPCP,TVP Code:
REVIEW.

Jin, M., Chen, X., and Li, X. ([Determination of Five 4-Hydroxycoumarin Rodenticides in Whole Blood by High Performance Liquid Chromatography With Fluorescence Detection]. *Se pu. 2007, mar; 25(2):214-6. [Se pu = chinese journal of chromatography / zhongguo hua xue hui]: Se Pu*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: A simple, accurate and sensitive method has been developed for the simultaneous

determination of warfarin, coumatetralyl, bromadiolone, flocoumafen and brodifacoum in whole blood by high performance liquid chromatography (HPLC) with fluorescence detection. The five 4-hydroxycoumarin rodenticides in whole blood were extracted by ethyl acetate, separated on XDB C,, column(150 mm x 2. 1 mm, 5 [microm) by using the mobile phase consisting of methanol-0. 2% acetic acid aqueous solution (88: 12, v/v) at a flow rate of 0. 5 mL/min and detected with a variational time program for fluorescence wavelength. Each analyte was qualitatively determined with its fluorescence excitation spectrum, fluorescence emission spectrum and retention time being compared with those of the reference standard, and quantified with external calibration method. The linear range was 0. 01 - 10. 00 mg/L and the limit of quantification was 0. 01 mg/L except warfarin of which the corresponding results were 0. 05 - 10. 00 mg/L and 0. 05 mg/L. The recoveries were between 81% and 98% and the relative standard deviations (RSDs) were between 3. 8% and 8. 5%. This method can be used in the diagnosis of the clinical poisoned patients.
MESH HEADINGS: 4-Hydroxycoumarins/*blood
MESH HEADINGS: Chromatography, High Pressure Liquid/*methods
MESH HEADINGS: Humans
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Rodenticides/*blood
MESH HEADINGS: Warfarin/blood chi

Jin, M. C. and Chen, X. H. (Rapid Determination of Three Anticoagulant Rodenticides in Whole Blood by Liquid Chromatography Coupled With Electrospray Ionization Mass Spectrometry. *Rapid commun mass spectrom. 2006; 20(18):2741-6. [Rapid communications in mass spectrometry : rcm]: Rapid Commun Mass Spectrom*.
Chem Codes: Chemical of Concern: BDL Code: CHEM METHODS.

ABSTRACT: A rapid, sensitive and selective method for the simultaneous determination of bromadiolone, flocoumafen and brodifacoum in whole blood using warfarin as internal standard (IS) by high-performance liquid chromatography coupled with electrospray ionization mass spectrometry (HPLC/ESI-MS) has been developed and validated. The target compounds were extracted from the whole blood with ethyl acetate and separated on an XDB C18 column (150 mm x 2.1 mm i.d. x 5 microm) by using a mobile phase consisting of 0.2% acetic acid/methanol (12/88, v/v) at a constant flow rate of 0.50 mL/min. The analytes were detected using negative ESI-MS in the selected ion monitoring (SIM) mode. The molecular ions [M-H]- of m/z 527, 541,523 and 307 were selected for the quantification for bromadiolone, flocoumafen, brodifacoum and the IS, respectively. The calibration curves were linear (r2 > 0.995) in the concentration range of 0.50-100.00 ng/mL. The method showed a satisfactory sensitivity (0.05-0.5 ng/mL using 200 microL blood), precision (RSD < 11.9%), accuracy (recovery: 82.0-96.1%) and selectivity. This method was successfully applied to the determination of the analytes for the diagnoses of poisoned human beings and animals.
MESH HEADINGS: 4-Hydroxycoumarins/*blood
MESH HEADINGS: Anticoagulants/*blood
MESH HEADINGS: *Chromatography, High Pressure Liquid
MESH HEADINGS: Humans
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Rodenticides/*blood
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization/*methods eng

Jin, M. C., Ren, Y. P., Xu, X. M., and Chen, X. H. (Determination of Bromadiolone in Whole Blood by High-Performance Liquid Chromatography Coupled With Electrospray Ionization Tandem Mass Spectrometry. *Forensic sci int. 2007, aug 24; 171(1):52-6. [Forensic science international]: Forensic Sci Int*.
Chem Codes: Chemical of Concern: BDL Code: CHEM METHODS.

ABSTRACT: A rapid, sensitive and selective high-performance liquid chromatography tandem mass spectrometric method (HPLC/MS-MS) has been developed and validated for the determination of bromadiolone in whole blood using warfarin as an internal standard (IS). Bromadiolone was extracted from the whole blood samples by liquid-liquid extraction with ethyl acetate. Multiple-reaction monitoring (MRM) was used to detect bromadiolone and IS, using precursor --> product ion combinations at m/z 527 --> 465 and 307 --> 161, respectively. The calibration curve was linear (r2=0.998) in the concentration

range of 0.5-100.0 ng/mL with a lower limit of quantification of 0.5 ng/mL in whole blood. Intra- and inter-day relative standard deviations (R.S.D.s) were less than 7.5 and 11.9%, respectively. Recoveries of bromadiolone ranged from 82.1 to 85.2%. This method is found to be determined trace bromadiolone in whole blood and can be used in the diagnosis of the poisoned human beings.
MESH HEADINGS: 4-Hydroxycoumarins/*blood/chemistry
MESH HEADINGS: Female
MESH HEADINGS: Forensic Toxicology/*methods
MESH HEADINGS: *Gas Chromatography-Mass Spectrometry
MESH HEADINGS: Humans
MESH HEADINGS: Middle Aged
MESH HEADINGS: Molecular Structure
MESH HEADINGS: Poisoning/diagnosis
MESH HEADINGS: Rodenticides/*blood/chemistry
MESH HEADINGS: *Spectrometry, Mass, Electrospray Ionization eng

Jobsen, J. A. (1988). Integrated Control of the Fossorial Form of Arvicola Terrestris in Orchards. *Bull. OEPP* 18: 441-444.
Chem Codes: Chemical of Concern: BDL Code: REFS CHECKED,REVIEW.

BULL OEPP(ORGAN EUR MEDITERR PROT PLANT)//FY05 ALP -COMPLETED 10/07//

Knopper, L. D., Mineau, P., Walker, L. A., and Shore, R. F. (2007). Bone Density and Breaking Strength in UK Raptors Exposed to Second Generation Anticoagulant Rodenticides. *Bull. Environ. Contam. Toxicol.* 78: 249-251.
Chem Codes: Chemical of Concern: BDF,BDL,DFM Code: SURVEY.

Knopper, L. D., Mineau, P., Walker, L. A., and Shore, R. F. (2007). Bone Density and Breaking Strength in Uk Raptors Exposed to Second Generation Anticoagulant Rodenticides. *Bull. Environ. Contam. Toxicol.* 78: 249-251.
Chem Codes: Chemical of Concern: BDF,BDL,DFM Code: SURVEY.

Bulletin of Environmental Contamination and Toxicology//

Kupper, J., Grobosch, T., Kistler, R., Sydler, T., and Naegeli, H. ([Bromadiolone Poisoning in Foxes]. *Schweiz arch tierheilkd. 2006, aug; 148(8):405-8. [Schweizer archiv fur tierheilkunde]: Schweiz Arch Tierheilkd*.
Chem Codes: Chemical of Concern: BDL Code: SURVEY.

ABSTRACT: Bromadiolone is an anticoagulant rodenticide that inhibits the reactivation of vitamin K1 by the enzyme vitamin K1-epoxide reductase. The present case report originated from the application of bromadiolone against water voles (Arvicola terrestris) in northeastern Switzerland. At least 40 foxes (Vulpes vulpes) were found dead after the inappropriate use of a bait that contained 0.02 % bromadiolone. Anticoagulant rodenticide poisoning was suspected on the basis of the postmortem examination and subsequently confirmed by the detection ofbromadiolone both in the blood and in samples from thoracic and abdominal fluids.
MESH HEADINGS: 4-Hydroxycoumarins/*poisoning
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/metabolism/*poisoning
MESH HEADINGS: *Foxes
MESH HEADINGS: Rodenticides/*poisoning
MESH HEADINGS: Species Specificity
MESH HEADINGS: Switzerland ger. Bromadiolon-Vergiftung bei Füchsen.

Lambert, O., Pouliquen, H., Larhantec, M., Thorin, C., and L'Hostis, M. (2007). Exposure of Raptors and Waterbirds to Anticoagulant Rodenticides (Difenacoum, Bromadiolone, Coumatetralyl, Coumafen, Brodifacoum): Epidemiological Survey in Loire Atlantique (France). *Bulletin of Environmental Contamination and Toxicology [Bull. Environ. Contam. Toxicol.]*. 79, 79: 91-94. Jul 2007., 91-94.

Chem Codes: Chemical of Concern: BDL Code: SURVEY.

0007-4861 Descriptors: Article Subject Terms: Anticoagulants
Descriptors: Aquatic birds
Descriptors: Birds
Descriptors: Contamination
Descriptors: Exposure
Descriptors: Rivers
Descriptors: Rodenticides
Descriptors: Surveys
Descriptors: Toxicity
Descriptors: Toxicology
Descriptors: anticoagulants
Descriptors: Article Geographic Terms: France, Auvergne, Loire R.
Publisher: Springer-Verlag, 175 Fifth Ave. New York NY 10010 USA, [mailto:orders@springer-ny.com], [URL:http://www.springer-ny.com/]
DOI: 10.1007/s00128-007-9134-6
Language: English
English
Publication Type: Journal Article
Classification: X 24330 Agrochemicals
Classification: Q5 01504 Effects on organisms
Classification: AQ 00008 Effects of Pollution
Classification: SW 3030 Effects of pollution
Classification: P 6000 TOXICOLOGY AND HEALTH
Classification: EN 10 General Environmental Engineering
Subfile: Pollution Abstracts; Aqualine Abstracts; Water Resources Abstracts; ASFA 3: Aquatic Pollution & Environmental Quality; Toxicology Abstracts

Lo, V. M., Ching, C. K., Chan, A. Y., and Mak, T. W. (Bromadiolone Toxicokinetics: Diagnosis and Treatment Implications. *Clin toxicol (phila). 2008, sep; 46(8):703-10. [Clinical toxicology (philadelphia, pa.)]: Clin Toxicol (Phila).*
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: INTRODUCTION: Ingestion of bromadiolone can lead to prolonged and life-threatening coagulopathy. Traditional treatment of bromadiolone intoxication relies on the coagulation profile. Currently, there is scanty information on bromadiolone elimination kinetics and half-life. CASE REPORT: We report a case of bromadiolone poisoning in a 40-year old female who, by history, ingested four 42.5-gram bags of rat poison (0.005% bromadiolone), equivalent to 8.5 mg bromadiolone (0.17 mg/kg body weight), four days prior to admission. On admission, her prothrombin time was 92.0 seconds, international normalized ratio was 5.7, and activated partial thromboplastin time was 50.2 seconds with no bleeding on clinical examination. The first plasma bromadiolone level (5 days post-ingestion) was 92 ng/mL. Serial measurement of plasma bromadiolone levels confirmed the diagnosis and demonstrated that bromadiolone obeys the elimination kinetic of a two-compartment model with a rapid, fairly steep decline phase (half-life 3.5 days) followed by a slower termination phase (half-life 24 days). Plasma bromadiolone level of less than 10 ng/mL in our patient was associated with a consistently normal coagulation profile without vitamin K1 therapy. CONCLUSIONS: There is a lack of information on the toxicodynamics and toxicokinetics of bromadiolone in humans; further studies are needed before the plasma bromadiolone level can serve as one of the logical and safe therapeutic endpoints for vitamin K1 therapy.
MESH HEADINGS: 4-Hydroxycoumarins/blood/*pharmacokinetics/*poisoning
MESH HEADINGS: Adult
MESH HEADINGS: Anticoagulants/blood/*pharmacokinetics/*poisoning
MESH HEADINGS: Antifibrinolytic Agents/administration &amp
MESH HEADINGS: dosage
MESH HEADINGS: Blood Coagulation/drug effects
MESH HEADINGS: Blood Coagulation Tests

MESH HEADINGS: Chromatography, Liquid
MESH HEADINGS: Drug Administration Schedule
MESH HEADINGS: Drug Monitoring
MESH HEADINGS: Female
MESH HEADINGS: Half-Life
MESH HEADINGS: Humans
MESH HEADINGS: Models, Biological
MESH HEADINGS: Overdose/blood/diagnosis
MESH HEADINGS: Rodenticides/blood/*pharmacokinetics/*poisoning
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization
MESH HEADINGS: Suicide, Attempted
MESH HEADINGS: Tandem Mass Spectrometry
MESH HEADINGS: Vitamin K 1/administration &amp
MESH HEADINGS: dosage eng

Makis, A., Polychronopoulou, S., and Haidas, S. (Osteosarcoma as a Second Tumor After Treatment for Primary Non-Hodgkin's Lymphoma in a Child With Ataxia-Telangiectasia: Presentation of a Case and Review of Possible Pathogenetic Mechanisms. *J pediatr hematol oncol. 2004, jul; 26(7):444-6. [Journal of pediatric hematology/oncology : official journal of the american society of pediatric hematology/oncology]: J Pediatr Hematol Oncol*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Patients with ataxia-telangiectasia (A-T) and cancer are exposed to additional toxicity due to their underlying inability to repair chemotherapy-induced DNA damage. The authors report the development of osteosarcoma as a second neoplasia in a child with A-T who was treated, without being irradiated, for non-Hodgkin's lymphoma as a primary malignancy. This is the first report of osteosarcoma associated with A-T. The authors postulate that the mechanisms of carcinogenesis are common and independent of the different histopathology categories of these two neoplasias, and the underlying "canvas" of the A-T mutated gene was further triggered by chemotherapy, leading to the development of a second malignancy.
MESH HEADINGS: Ataxia Telangiectasia/*complications
MESH HEADINGS: Bone Neoplasms/complications/*pathology
MESH HEADINGS: Child
MESH HEADINGS: Humans
MESH HEADINGS: Lymphoma, Non-Hodgkin/complications/*pathology
MESH HEADINGS: Male
MESH HEADINGS: Neoplasms, Second Primary/complications/*pathology
MESH HEADINGS: Osteosarcoma/complications/*pathology eng

Makis, A. C., Tzoufi, M., Kateri, M. D., Bourantas, K. L., and Papadopoulou, Z. L. (Valproate-Induced Eosinophilia in Children With Epilepsy: Role of Interleukin-5. *J child neurol. 2005, feb; 20(2):150-2. [Journal of child neurology]: J Child Neurol*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Interleukin-5 contributes both in eosinophilopoiesis and neural development. Serum interleukin-5 levels were measured with enzyme-linked immunosorbent assay technique in 68 children with epilepsy receiving sodium valproate monotherapy and compared with the levels of 60 healthy controls and 14 children with epilepsy receiving carbamazepine. Eosinophilia was observed in 35.3% of children receiving valproate. Interleukin-5 in valproate users was significantly higher compared with children receiving carbamazepine and controls. Valproate users who exhibited eosinophilia had higher interleukin-5 levels compared with those without eosinophilia. However, the interleukin-5 level was also elevated, although to a lesser degree, in children without eosinophilia. The majority of valproate responders had high interleukin-5 levels. A positive correlation between interleukin-5 levels and the eosinophil count was also noted. We postulate that valproate contributes to the pathogenesis of eosinophilia, probably inducing interleukin-5 production. The finding that serum interleukin-5 was significantly elevated in valproate responders and even in valproate users without eosinophilia suggests that the increase in interleukin-5

might represent one of valproate's antiepileptic mechanisms.
MESH HEADINGS: Adolescent
MESH HEADINGS: Anticonvulsants/*adverse effects
MESH HEADINGS: Carbamazepine/therapeutic use
MESH HEADINGS: Case-Control Studies
MESH HEADINGS: Child
MESH HEADINGS: Child, Preschool
MESH HEADINGS: Eosinophilia/*blood/*chemically induced
MESH HEADINGS: Epilepsy/*blood/drug therapy
MESH HEADINGS: Female
MESH HEADINGS: Humans
MESH HEADINGS: Interleukin-5/*blood
MESH HEADINGS: Male
MESH HEADINGS: Valproic Acid/*adverse effects 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: BDL 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

Mittal, V. P. and Vyas, H. J. (1992). Groundnut. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 249-264.
Chem Codes: Chemical of Concern: BDL,CLC,ZnP Code: REVIEW.

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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: BDL Code: HUMAN HEALTH.

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COMMENTS: Cites: Anaesth Intensive Care. 1997 Dec;25(6):707-9 (medline /9452861)
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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

Owens, J. and Koester, C. (Analysis of Carbamate Pesticides: Validation of Semi-Volatile Analysis by Hplc-Ms/Ms by Epa Method Ms666. *Govt reports announcements & index (gra&i), issue 12, 2009*.
Chem Codes: Chemical of Concern: BDL Code: CHEM METHODS.

ABSTRACT: Sponsored by Department of Energy, Washington, DC.
ABSTRACT: The Environmental Protection Agencys (EPA) Region 5 Chicago Regional Laboratory (CRL) developed a method for analysis of aldicarb, bromadiolone, carbofuran, oxamyl, and methomyl in water by high performance liquid chromatography tandem mass spectrometry (HPLC-MS/MS), titled Method EPA MS666. This draft standard operating procedure (SOP) was distributed to multiple EPA laboratories and to Lawrence Livermore National Laboratory, which was tasked to serve as a reference

laboratory for EPAs Environmental Reference Laboratory Network (ERLN) and to develop and validate analytical procedures. The primary objective of this study was to validate and verify the analytical procedures described in MS666 for analysis of carbamate pesticides in aqueous samples. The gathered data from this validation study will be used to: (1) demonstrate analytical method performance; (2) generate quality control acceptance criteria; and (3) revise the SOP to provide a validated method that would be available for use during a homeland security event. The data contained in this report will be compiled, by EPA CRL, with data generated by other EPA Regional laboratories so that performance metrics of Method EPA MS666 can be determined.
KEYWORDS: Carbamates
KEYWORDS: *Pesticides
KEYWORDS: *Semivolatile organic compounds
KEYWORDS: Mass spectrometry
KEYWORDS: Liquid chromatography
KEYWORDS: Validation
KEYWORDS: Test methods
KEYWORDS: Aldicarb
KEYWORDS: Carbofuran
KEYWORDS: Bromadiolone
KEYWORDS: Oxamyl
KEYWORDS: Methomyl
KEYWORDS: Aqueous solutions
KEYWORDS: Method EPA MS666

Quintana, R., Prieto, M. F., Bagilet, D. H., Dalman, M. C., and Gregorini, E. ([Acridine Orange Staining Method in the Diagnosis of Catheter-Related Bloodstream Infections]. *Med intensiva. 2008, may; 32(4):168-71. [Medicina intensiva / sociedad espanola de medicina intensiva y unidades coronarias]: Med Intensiva*. Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: OBJECTIVE: To study if the utility of acridine orange (AO) staining method on blood extracted through intravenous device (ID) is a reliable method to diagnose catheter-related bloodstream infection (CRB). DESIGN: Prospective and observational study. PATIENTS: Patients with central ID and clinical data consistent with CRB who gave their consent to participate. Patients having another infection site were excluded. INTERVENTION: At the moment of the clinical suspicion of CRB and before removing the ID, blood samples were extracted from peripheral veins and through the ID to be analyzed by AO staining. After extracting the samples, the catheter was removed and sent for microbiological analysis with Liñares et al and Maki et al techniques. CRS was defined as development of the same microorganism in the tip of the catheter (endoluminal surface with > or = 10 (3) UFC/ml and/or extraluminal surface > or = 15 UFC/ml) and in the peripheral blood. VARIABLES OF INTEREST: Sensitivity, specificity, negative and positive and negative predictive values and positive likelihood ratios (LR) were calculated for the diagnosis of CRB. RESULTS: A total of 121 patients were studied and 4 were diagnosed with CRB: 2 infected with Staphylococcus aureus, 1 with Pseudomonas aeruginosa and 1 with Candida albicans. AO sensitivity was 87.5%, specificity 92.7% and the negative predictive value was 99.5%. Positive likelihood ratio was 12.04 and negative LR 0.13. CONCLUSIONS: Although the number of events does not allow for the estimation of the efficacy of AO to diagnose CRB, its high negative predictive value would make it possible to rule out this infectious complication with some degree of safety.
MESH HEADINGS: *Acridine Orange
MESH HEADINGS: Bacteremia/*diagnosis/etiology
MESH HEADINGS: Bacteriological Techniques
MESH HEADINGS: Candidiasis/*blood/*microbiology
MESH HEADINGS: Catheters, Indwelling/*adverse effects/microbiology
MESH HEADINGS: Diagnosis, Differential
MESH HEADINGS: Female
MESH HEADINGS: Humans
MESH HEADINGS: Male
MESH HEADINGS: Middle Aged
MESH HEADINGS: Pseudomonas Infections/*blood/*microbiology

MESH HEADINGS: Staphylococcal Infections/*blood/*microbiology spa. Naranja de acridina para el diagnósticode bacteriemias relacionadas con catéteres.

Rao, A. M. K. M. (1992). Integrated Rodent Management. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 651-667.
Chem Codes: Chemical of Concern: BDL,ZnP Code: REVIEW.

ISBN 81-7233-013-8//

Rao, K. S. (2005). Bromadiolone. 338-340.
Chem Codes: Chemical of Concern: BDL Code: REVIEW.

Media Type: doi: 10.1016/B0-12-369400-0/00150-2
URL: http://www.sciencedirect.com/science/article/B7T72-4H7THN8-P3/2/8694fad805a1d43d00def75136238823

Robben, J. H., Mout, H. C. A., and Kuijpers, E. A. P. (1997). Anticoagulant Rodenticide Poisoning in Dogs in the Netherlands (Rodenticide Anticoagulans-Intoxicatie Bij Honden in Nederland). *Tijdschr. Diergeneeskd.* 122: 466-471(DUT) (ENG ABS).
Chem Codes: Chemical of Concern: BDF,BDL,CPC,DFT Code: NON-ENGLISH.

WAS ECOREF 75550//Tijdschrift voor Diergeneeskunde (Netherlands Journal of Veterinary Science)//ISSN: 0040-7453// (Was ECOREF# 75550)

Sage, M., Coeurdassier, M., Defaut, R., Lucot, E., Barbier, B., Rieffel, D., Berny, P., and Giraudoux, P. (2007). How Environment and Vole Behaviour may Impact Rodenticide Bromadiolone Persistence in Wheat Baits After Field Controls of Arvicola terrestris? *Environ. Pollut.* 148: 372-379.
Chem Codes: Chemical of Concern: BDL Code : FATE.

Sage, M., Coeurdassier, M., Defaut, R., Lucot, E., Barbier, B., Rieffel, D., Berny, P., and Giraudoux, P. (2007). How Environment and Vole Behaviour May Impact Rodenticide Bromadiolone Persistence in Wheat Baits After Field Controls of Arvicola Terrestris? *Environ. Pollut.* 148: 372-379.
Chem Codes: Chemical of Concern: BDL Code : FATE.

Environmental Pollution//

Sage, M., Fourel, I., C&Oelig, Urdassier, M., Barrat, J., Berny, P., and Giraudoux, P. (Determination of Bromadiolone Residues in Fox Faeces by Lc/Esi-Ms in Relationship With Toxicological Data and Clinical Signs After Repeated Exposure. *Environ res. 2010, oct; 110(7):664-74. [Environmental research]: Environ Res*.
Chem Codes: Chemical of Concern: BDL Code: NO EFFECT.

ABSTRACT: In many countries, the fox (Vulpes vulpes), predator of small mammals, is particularly affected by anticoagulant rodenticides such as bromadiolone due to secondary poisoning. Nevertheless, to date, no method of exposure monitoring is applicable in the field over large areas, and no toxicological data are available concerning sensitivity of foxes to bromadiolone. The aim of this work was to compare excretion kinetics of bromadiolone in fox faeces with clinical and haemostatic effects after repeated exposure to intoxicated voles. A sensitive method for the quantification of bromadiolone excretion in fox faeces and plasma was developed, using liquid chromatography combined with electrospray ionisation mass spectrometry (LC/ESI-MS). The LoD was 0.9microg/kg and 0.15microg/L, and the LoQ was 3.0microg/kg and 0.5microg/L, in faeces and in plasma, respectively. Four captive foxes were fed for 2 or 5 days with water voles (Arvicola terrestris Sherman) spiked with bromadiolone at concentrations close to those measured in the field. Faeces and blood were collected for bromadiolone titration, and blood-clotting tests were performed to monitor fox health daily during 10 days and then every 3-4 days until the end of the experiment (D28). Then, after euthanasia, a complete necropsy was performed, and levels of bromadiolone residues in the liver were determined. **Bromadiolone residues were detected in faeces 15h after the first**

exposure. They increased dramatically during the exposure period and then gradually decreased, but they remained detectable at the end of the experiment, i.e., 26 days after the last exposure. Bromadiolone residues in plasma showed a similar pattern but were no longer detectable 7-24 days after the last exposure. Two foxes presented very severe external haemorrhages, requiring the administration of the antidote vitamin-K1. Bromadiolone residues in faeces and their relationships with exposure and other direct-markers that were measured are discussed. Liver residues and the toxicity data of our study will help to interpret data from fox carcasses collected by wildlife disease surveillance networks. These findings provide a basis for programs aiming to monitor the exposure of wild fox populations to bromadiolone using non-invasive methods based on standard sampling and analysis of residues in faeces.
MESH HEADINGS: 4-Hydroxycoumarins/*analysis/blood
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis/blood
MESH HEADINGS: Chromatography, High Pressure Liquid/*methods
MESH HEADINGS: *Environmental Exposure
MESH HEADINGS: Feces/*chemistry
MESH HEADINGS: Foxes
MESH HEADINGS: Limit of Detection
MESH HEADINGS: Rodenticides/*analysis/blood
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization/*methods eng

Sasaki, M., Akahira, A., Oshiman, K., Tsuchido, T., and Matsumura, Y. (Purification of Cytochrome P450 and Ferredoxin, Involved in Bisphenol a Degradation, From Sphingomonas Sp. Strain Ao1. *Appl environ microbiol. 2005, dec; 71(12):8024-30. [Applied and environmental microbiology]: Appl Environ Microbiol*.
Chem Codes: Chemical of Concern: BDL Code: BACTERIA.

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ABSTRACT: In a previous study (M. Sasaki, J. Maki, K. Oshiman, Y. Matsumura, and T. Tsuchido, Biodegradation 16:449-459, 2005), the cytochrome P450 monooxygenase system was shown to be involved in bisphenol A (BPA) degradation by Sphingomonas sp. strain AO1. In the present investigation, we purified the components of this monooxygenase, cytochrome P450 (P450bisd), ferredoxin (Fd(bisd)), and ferredoxin reductase (Red(bisd)). We demonstrated that P450bisd and Fd(bisd) are homodimeric proteins with molecular masses of 102.3 and 19.1 kDa, respectively, by gel filtration chromatography analysis. Spectroscopic analysis of Fd(bisd) revealed the presence of a putidaredoxin-type [2Fe-2S] cluster. P450(bisd), in the presence of Fd(bisd), Red(bisd), and NADH, was able to convert BPA. The K(m) and kcat values for BPA degradation were 85 +/- 4.7 microM and 3.9 +/- 0.04 min(-1), respectively. NADPH, spinach ferredoxin, and spinach ferredoxin reductase resulted in weak monooxygenase activity. These results indicated that the electron transport system of P450bisd might exhibit strict specificity. Two BPA degradation products of the P450(bisd) system were detected by high-performance liquid chromatography analysis and were thought to be 1,2-bis(4-hydroxyphenyl)-2-propanol and 2,2-bis(4-hydroxyphenyl)-1-propanol based on mass spectrometry-mass spectrometry analysis. This is the first report demonstrating that the cytochrome P450 monooxygenase system in bacteria is involved in BPA degradation.
MESH HEADINGS: Air Pollutants, Occupational
MESH HEADINGS: Amino Acid Sequence
MESH HEADINGS: Biodegradation, Environmental
MESH HEADINGS: Cytochrome P-450 Enzyme System/chemistry/*isolation &amp
MESH HEADINGS: purification/metabolism
MESH HEADINGS: Ferredoxins/*isolation &amp
MESH HEADINGS: purification/metabolism
MESH HEADINGS: Kinetics
MESH HEADINGS: Molecular Sequence Data
MESH HEADINGS: Peptide Fragments/chemistry
MESH HEADINGS: Phenols/*pharmacokinetics
MESH HEADINGS: Sphingomonas/enzymology/*metabolism eng

Saud, Zahangir A., Minobe, Etsuko, Wang, Wu-yang , Han, Dong-yun, Horiuchi, Masahisa, Hao, Li-ying, and Kameyama, Masaki (2007-). Calpastatin binds to a calmodulin-binding site of cardiac Cav1.2 Ca2+ channels. *Biochemical and Biophysical Research Communications* 364: 372-377.
Chem Codes: Chemical of Concern: BDL Code: NO TOXCICANT.

Media Type: doi: DOI: 10.1016/j.bbrc.2007.10.017
URL: http://www.sciencedirect.com/science/article/B6WBK-4PX127K-5/2/4dceb2d3fe0d45749ffae074fce214a6
Keywords: Ca2+ channels
Keywords: Calpastatin
Keywords: IQ domain
Keywords: Calmodulin
Keywords: Channel regulation
Keywords: Pull-down assay

Sheikher, C. and Jain, S. D. (1991). Rodent Damage and Control in Pecan Orchards. *Proc. Indian Natl. Sci. Acad. Part B* 57: 391-396.

Chem Codes: Chemical of Concern: AlP,BDL,ZnP Code: MIXTURE .

Shi, H. P., Liu, Y., and Ma, D. Y. ([One Case of Acute Severe Bromadiolone Poisoning]. *Zhonghua lao dong wei sheng zhi ye bing za zhi. 2005, dec; 23(6):469-70. [Zhonghua lao dong wei sheng zhi ye bing za zhi = zhonghua laodong weisheng zhiyebing zazhi = chinese journal of industrial hygiene and occupational diseases]: Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

MESH HEADINGS: 4-Hydroxycoumarins/*poisoning
MESH HEADINGS: Acute Disease
MESH HEADINGS: Adult
MESH HEADINGS: Humans
MESH HEADINGS: Male
MESH HEADINGS: Poisoning/diagnosis
MESH HEADINGS: Prothrombin Time chi

Shore, R. F., Malcolm, H. M., McLennan, D., Turk, A., Walker, L. A., Wienburg, C. L., and Burn, A. J. (2006). Did Foot-and-Mouth Disease-Control Operations Affect Rodenticide Exposure in Raptors? *J. Wildl. Manag.* 70: 588-593 .
Chem Codes: Chemical of Concern: BDF,BDL,DFM Code: NO CONC,NO DURATION,SURVEY.

Srivastava, D. C. (1992). Sugarcane. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 231-248.
Chem Codes: Chemical of Concern: BDF,BDL,WFN,ZnP Code: REVIEW.

ISBN 81-7233-013-8//

Subbiah, D., Kala, S., and Mishra, A. K. (Study on the Fluorescence Characteristics of Bromadiolone in Aqueous and Organized Media and Application in Analysis. *Chemosphere. 2005, dec; 61(11):1580-6. [Chemosphere]: Chemosphere*.
Chem Codes: Chemical of Concern: BDL Code : CHEM METHODS.

ABSTRACT: The fluorescence spectroscopic behavior of bromadiolone (anticoagulant rodenticide), a substituted 4-hydroxycoumarin derivative, was investigated in water and in organized media like micelles and cyclodextrins. A detailed study on various photophysical parameters like fluorescence intensity (I(F)), quantum yield (phi), lifetime (tau) and steady state fluorescence anisotropy (r) of bromadiolone in aqueous and in organized media was carried out. Bromadiolone in aqueous solution was observed to be in an aggregated state, thereby showing weak emission due to self-quenching. Marked enhancement of fluorescence intensity was observed in organized media like micelles and beta-cyclodextrin. A preliminary investigation has been done to find out whether this enhancement of fluorescence can be used to develop a sensitive analytical method for determination of bromadialone in aqueous media. A linear relationship between the fluorescence intensity and concentration of bromadiolone was observed in the range of 0.15-7.9 microg ml(-1) in cetyltrimethylammonium bromide (CTAB) and 0.5-26.4 microg ml(-1) in beta-cyclodextrin medium. The lower detection limit was found to be 37 ng ml(-1) in presence of CTAB and 23 ng ml(-1) in beta-cyclodextrin. Comparison with 4-hydroxycoumarin, an unsubstituted analogue, was made.
MESH HEADINGS: 4-Hydroxycoumarins/analysis/*chemistry
MESH HEADINGS: Anticoagulants/analysis/*chemistry
MESH HEADINGS: Cetrimonium Compounds/analysis
MESH HEADINGS: Cyclodextrins/chemistry
MESH HEADINGS: Fluorescence
MESH HEADINGS: Fluorescence Polarization/*methods
MESH HEADINGS: Micelles
MESH HEADINGS: Spectrometry, Fluorescence/*methods
MESH HEADINGS: Surface-Active Agents/chemistry
MESH HEADINGS: Water/chemistry

MESH HEADINGS: beta-Cyclodextrins/chemistry eng

Subiah, K. S. and Mathur, R. P. (1992). Andamans With Special Reference to Oil Palm Plantations. *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 343-356.
Chem Codes: Chemical of Concern: BDL,WFN,ZnP Code: REFS CHECKED,REVIEW.

ISBN 81-7233-013-8//FY05, ALP//

Vandenbroucke, V., Desmet, N., De Backer, P., and Croubels, S. (Multi-Residue Analysis of Eight Anticoagulant Rodenticides in Animal Plasma and Liver Using Liquid Chromatography Combined With Heated Electrospray Ionization Tandem Mass Spectrometry. *J chromatogr b analyt technol biomed life sci. 2008, jun 15; 869(1-2):101-10. [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: BDL Code : CHEM METHODS.

ABSTRACT: A sensitive method for the simultaneous quantification of eight anticoagulant rodenticides (brodifacoum, bromadiolone, chlorophacinone, coumatetralyl, difenacoum, difethialone, flocoumafen and warfarin) in animal plasma and liver using liquid chromatography combined with heated electrospray ionization tandem mass spectrometry (LC-HESI-MS/MS) is described. The sample preparation includes a liquid-liquid extraction with acetone. The compound 7-acetoxy-6-(2,3-dibromopropyl)-4,8-dimethylcoumarin is used as an internal standard. Chromatographic separation was achieved using a Nucleodur C18 gravity column. Good linearity was observed up to 750 ng mL(-1) for chlorophacinone and up to 500 ng mL(-1) for the other compounds in plasma. In liver, good linearity was seen up to 500 ng g(-1) for brodifacoum, chlorophacinone, difenacoum and difethialone and up to 750 ng g(-1) for the other compounds. Depending on the compound, a level of 1 or 5 ng mL(-1) could be quantified fulfilling the criteria for accuracy and precision and was therefore set as limit of quantification of the method in plasma. In liver, the limit of quantification was set at 250 ng g(-1) for coumatetralyl and warfarin and at 100 ng g(-1) for the other compounds. In plasma, the limit of detection varied from 0.07 ng mL(-1) for flocoumafen to 3.21 ng mL(-1) for brodifacoum. In liver, the limit of detection varied from 0.37 ng g(-1) for warfarin to 4.64 ng g(-1) for chlorophacinone. The method was shown to be of use in a pharmacokinetic study after single oral administration to mice and in the confirmation of suspected poisoning cases in domestic animals.
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis/blood/poisoning
MESH HEADINGS: Chromatography, Liquid/*methods
MESH HEADINGS: Dog Diseases/chemically induced
MESH HEADINGS: Dogs
MESH HEADINGS: Female
MESH HEADINGS: Liver/*chemistry
MESH HEADINGS: Male
MESH HEADINGS: Mice
MESH HEADINGS: Poisoning/veterinary
MESH HEADINGS: Reproducibility of Results
MESH HEADINGS: Rodenticides/*analysis/blood/poisoning
MESH HEADINGS: Spectrometry, Mass, Electrospray Ionization
MESH HEADINGS: Tandem Mass Spectrometry/*methods eng

Vindenes, V., Karinen, R., Hasvold, I., Bernard, J. P., M&Oslash, Rland, J. G., and Christophersen, A. S. (Bromadiolone Poisoning: Lc-Ms Method and Pharmacokinetic Data. *J forensic sci. 2008, jul; 53(4):993-6. [Journal of forensic sciences]: J Forensic Sci*.
Chem Codes: Chemical of Concern: BDL Code: HUMAN HEALTH.

ABSTRACT: Poisoning with superwarfarins, like bromadiolone, is a growing public health problem, and the mortality is high. Pharmacokinetic data on bromadiolone in humans are however scarce, and there are no reports following repeated exposures to bromadiolone. We have developed a method for quantification

of bromadiolone in whole blood, using liquid chromatography-mass spectrometry (LC-MS). The analytical method is reported. Limit of detection was 0.005 mg/L and limit of quantification was 0.01 mg/L. The concentrations of bromadiolone in whole blood and plasma in serial samples from a 62-year-old woman were measured. The half-life of bromadiolone in blood was estimated to be about 6 days in the initial phase of elimination and about 10-13 days in the terminal phase. The mean plasma/blood ratio of bromadiolone was 1.7 +/- 0.6. Stability testing of bromadiolone in whole blood samples after two cycles of freeze and thaw revealed that bromadiolone concentrations decreased.
MESH HEADINGS: 4-Hydroxycoumarins/blood/*pharmacokinetics/*poisoning
MESH HEADINGS: Anticoagulants/blood/*pharmacokinetics/*poisoning
MESH HEADINGS: Chromatography, Liquid
MESH HEADINGS: Drug Stability
MESH HEADINGS: Female
MESH HEADINGS: Forensic Toxicology
MESH HEADINGS: Half-Life
MESH HEADINGS: Humans
MESH HEADINGS: Mass Spectrometry
MESH HEADINGS: Middle Aged
MESH HEADINGS: Molecular Structure 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: BDL 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

Walker, L. A., Turk, A., Long, S. M., Wienburg, C. L., Best, J., and Shore, R. F. (Second Generation Anticoagulant Rodenticides in Tawny Owls (Strix Aluco) From Great Britain. *Sci total environ. 2008, mar 15; 392(1):93-8. [The science of the total environment]: Sci Total Environ*.
Chem Codes: Chemical of Concern: BDL Code: SURVEY.

ABSTRACT: Secondary exposure of vertebrate predators to second generation anticoagulant rodenticides (SGARs) is widespread in Britain. Tawny owl (Strix aluco) populations in the UK are thought to have

declined since the 1970s, when SGARs were first introduced, and these compounds may have contributed to any decline in owl numbers. Our aims were to conduct the first systematic survey of SGAR exposure in tawny owls and ascertain whether there had been a change in the proportion of exposed birds that was concurrent with the decline in the population. Liver difenacoum, bromadiolone, flocoumafen and brodifacoum concentrations in British tawny owls from two periods (1990-1993 and 2003-2005) were quantified. In total, some 20% of birds contained detectable residues of one or more SGAR. The extent of exposure (% of birds exposed, magnitude of residues) to different SGARs did not change consistently between time periods. Of the raptors analysed to date in Britain, tawny owls had the lowest proportion of individuals that contained detectable liver residues and so appear to be the least vulnerable to exposure and/or assimilation of SGARs. We found no clear evidence to implicate SGARs as a major factor affecting tawny owl numbers in Britain between 1990 and 2005.
MESH HEADINGS: Animals
MESH HEADINGS: Anticoagulants/*analysis
MESH HEADINGS: Female
MESH HEADINGS: Great Britain
MESH HEADINGS: Male
MESH HEADINGS: Rodenticides/*analysis
MESH HEADINGS: Strigiformes 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: BDL Code: 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

Winters, Ann M. (2006). Rodenticide use and secondary poisoning risks to non-target wildlife in central Mongolia. Chem Codes: Chemical of Concern: BDL Code: SURVEY.

Media Type: 1438178
End Page: 84
URL:
https://login.libpdb.d.umn.edu:2443/login?url=http://proquest.umi.com/pqdweb?did=1203561951&Fmt=7&clientId=3285&RQT=309&VName=PQD
Abstract: In 2001, hundreds of non-target wildlife deaths occurred in the steppe region of Mongolia after aerial applications of bromadiolone, a second generation anticoagulant, were carried out to control eruptive Brandt's vole (Microtus brandti) populations in areas used for livestock grazing. A two-year field study was initiated in 2004 to investigate bromadiolone application policies and practices and quantify the secondary poisoning risk that bromadiolone use may pose to non-target wildlife in Mongolia. The study found that carcasses of voles killed by bromadiolone control are commonly available to scavengers; a mean of 2.64 carcasses/100 m 2 (_0.47 SE) were found on bromadiolone-treated field plots. Digital trip-cameras were used to investigate which wildlife species are likely to scavenge non-toxic vole carcasses; five birds and five mammals were recorded doing so. High-performance liquid chromatography assays of tissues from live and dead voles exposed to either 0.05% or 0.005% bromadiolone-treated wheat grain revealed that these voles contain relatively small amounts (means 11.8 +g _ 3.8 SE and 2.3 +g _ 0.5 SE, respectively) of bromadiolone. It is unlikely that non-target animals could consume enough of these toxic voles to kill 50% of the population (i.e. to reach an LD 50 dose). However, in situations where excessive bromadiolone concentrations are used, or where the toxicant is reapplied frequently, there may be a significant risk to some of the valued wild animals present on Mongolia's rangelands.
Keywords: Forestry
Keywords: Toxicology

Wu, J. and Shan, X. O. ([Bromadiolone Poisoning Complicated With Thrombosis in the Lower Extremities in a Case]. *Zhonghua er ke za zhi. 2010, jul; 48(7):550-1. [Zhonghua er ke za zhi. Chinese journal of pediatrics]: Zhonghua Er Ke Za Zhi*.
Chem Codes: Chemical of Concern: BDL Code : HUMAN HEALTH.

chi

Target: Toxicity of Chemical to Intended Pest

Markussen, M. D. K., Heiberg, A. C., Fredholm, M., and Kristensen, M. (2008). Differential Expression of Cytochrome P450 Genes Between Bromadiolone-Resistant and Anticoagulant-Susceptible Norway Rats: a Possible Role for Pharmacokinetics in Bromadiolone Resistance. *Pest Manag. Sci.* 64: 239-248.

EcoReference No.: 151525
Chemical of Concern: BDL; Habitat: T; Effect Codes: CEL; Code: TARGET (BDL).

Mikhail, M. W. and Abdel-Hamid, Y. M. (2010). Susceptibility of Bromadiolone Anticoagulant Rodenticide in Two Rodent Species and Its Haematologic Effect. *J. Egypt. Soc. Parasitol.* 40: 35-44.

EcoReference No.: 151578
Chemical of Concern: BDL; Habitat: T; Effect Codes: BEH,CEL,GRO,MOR,PHY; Code: TARGET (BDL).

Papers Identified in the January 2005 ECOTOX Run

ECOTOX and EFED

1. Ahmad, M. S. and Munir, S. (1990). **Comparative Evaluation of Three Anticoagulants Brodifacoum, Bromadialone and Flucoumafen Against Indian Gerbil, Tatera indica.** *Pak.J.Zool.* 22: 421-426.

   EcoReference No.: 75417
   Chemical of Concern: BDF,BDL; Habitat: T; Effect Codes: MOR,BEH.

2. Ahmad, N. and Parshad, V. R. (1991). **Evaluation of Rodenticidal Baits in Fields of Sugarcane (Saccharum officinarum).** *Indian J.Agric.Sci.* 61: 281-284.

   EcoReference No.: 75653
   Chemical of Concern: ZnP,BDF,BDL; Habitat: T; Effect Codes: POP.

3. Ahmad, N., SHEIKHER, C., and Guraya, S. S. (1989). **Rodenticidal Baitings in Wheat Fields of the Garhwal Himalayas.** *Trop.Pest Manag.* 35: 282-285.

   EcoReference No.: 75606
   Chemical of Concern: ZnP,BDF,BDL; Habitat: T; Effect Codes: POP.

4. Balasubramanyam, M. and Purushotham, K. R. (1987). **Comparative Effect of Three Rodenticides Warfarin, Bromadiolone and Brodifacoum on the Indian Field Mouse, Mus booduga Gray.** *Int.Biodeterior.* 23: 307-314.

   EcoReference No.: 75517
   Chemical of Concern: BDF,WFN,BDL; Habitat: T; Effect Codes: MOR,BEH.

5. 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.

6. 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.

7. Byers, R. E. and Carbaugh, D. H. (1989). **Vole Population Shifts Related to Rodenticide Usage.** *Hortscience* 24: 783-785.

   EcoReference No.: 75463
   Chemical of Concern: CPC,ZnP,CLC,BDL; Habitat: T; Effect Codes: POP.

8. Chawla, R. (1996). **Determination of Bromadiolone Toxicity Against Three Rodent Species.** *J.Anim.Morphol.Physiol.* 43: 125-127.

   EcoReference No.: 75394
   Chemical of Concern: BDL; Habitat: T; Effect Codes: BEH,MOR.

9. Dubey, O. P., Awasthi, A. K., and Patel, R. K. (1993). **Damage of Wheat (Triticum aestivum) Tillers by Field Rats (Bandicota bengalensis, Rattus rattus, Millardia meltada) and Their Control with Rodenticide**

Baits. *Indian J.Agric.Sci.* 63: 127-129.

EcoReference No.: 75466
Chemical of Concern: BDL,ZnP; Habitat: T; Effect Codes: POP.

10. Gill, J. E. and Redfern, R. (1983). **Laboratory Tests of Seven Rodenticides for the Control of Meriones shawi.** *J.Hyg.,Camb.* 91: 351-357.

EcoReference No.: 75651
Chemical of Concern: BDF,CLC,BDL,WFN,ZnP; Habitat: T; Effect Codes: MOR.

11. Gill, J. E. and Redfern, R. (1980). **Laboratory Trials of Seven Rodenticides for Use Against the Cotton Rat (Sigmodon hispidus).** *J.Hyg.* 85: 443-450.

EcoReference No.: 75709
Chemical of Concern: WFN,BDF,BDL,ZnP; Habitat: T; Effect Codes: BEH,MOR.

12. Kanakasabai, R. and Saravanan, K. (1999). **Field Evaluation of Anticoagulant Rodenticides, Bromadiolone and Difethialone in Sugarcane Fields of Cauvery Delta.** *Indian J.Exp.Biol.* 37: 56-60.

EcoReference No.: 75135
Chemical of Concern: BDL,DFT; Habitat: T; Effect Codes: POP.

13. Malhi, C. S. and SHEIKHER, C. (1985). **Efficacy of Bromodiolone Against Rattus rattus gangutrianus (Hinton) and Bandicota bengalensis (Wardi).** *Indian J.Plant Prot.* 13: 115-116.

EcoReference No.: 75458
Chemical of Concern: BDL; Habitat: T; Effect Codes: MOR.

14. 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.

15. Parshad, V. R. (1986). **Comparative Evaluation of Three Second Generation Single-Dose Anticoagulant Rodenticides in Short Feeding Trials Against Three Rodent Species.** *Proc.Indian Natl.Sci.Acad.Part B* 52: 481-484.

EcoReference No.: 75395
Chemical of Concern: BDF,BDL; Habitat: T; Effect Codes: MOR,BEH.

16. Parshad, V. R. and Kochar, J. K. (1995). **Potential of Three Rodenticides to Induce Conditioned Aversion to Their Baits in the Indian Mole Rat, Bandicota bengalensis.** *Appl.Anim.Behav.Sci.* 45: 267-276.

EcoReference No.: 75654
Chemical of Concern: ZnP,BDF,BDL; Habitat: T; Effect Codes: BEH.

17. SHEIKHER, C. and Ahmad, N. (1986). **Control of Murids Using Water as Carrier of Anticoagulant Rodenticides.** *Proc.Indian Natl.Sci.Acad.Part B* 52: 341-345.

EcoReference No.: 75154
Chemical of Concern: BDF,BDL; Habitat: T; Effect Codes: BEH,MOR.

18. Twigg, L. E. and Kay, B. J. (1995). **The Effect of Sub-lethal Doses of Bromadiolone on the Breeding Performance of House Mice (Mus domesticus).** *Comp.Biochem.Physiol.C* 110: 77-82.

    EcoReference No.: 55004
    Chemical of Concern: BDL; Habitat: T; Effect Codes: BEH,REP,GRO.

ECOTOX only

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    EcoReference No.: 75476
    Chemical of Concern: BDL,ZnP; Habitat: T; Effect Codes: MOR.

2. Askham, L. R. (1985). **Effectiveness of Two Anticoagulant Rodenticides (Chlorophacinone and Bromadiolone) for Columbian Ground Squirrel (Spermophilus columbianus) Control in Eastern Washington.** *Crop Prot.* 4: 365-371.

    EcoReference No.: 75482
    Chemical of Concern: BDL,CPC; Habitat: T; Effect Codes: MOR.

3. Balasubramanyam, M., Christopher, M. J., and Purushotham, K. R. (1984). **Laboratory Trials of Three Anticoagulant Rodenticides for Use Against the Indian Field Mouse, Mus booduga Gray.** *J.Hyg.,Camb.* 93: 575-578.

    EcoReference No.: 75671
    Chemical of Concern: BDF,WFN,BDL; Habitat: T; Effect Codes: MOR.

4. Balasubramanyam, M., Maddaiah, G. P., and Purushotham, K. R. (1988). **Laboratory Evalution of Anticoagulant Wax Blocks to Control Indian Field-Mouse (Mus booduga).** *Indian J.Agric.Sci.* 58: 330-332.

    EcoReference No.: 75634
    Chemical of Concern: WFN,BDL,BDF; Habitat: T; Effect Codes: BEH,MOR.

5. Balasubramanyam, M. and Purushotham, K. R. (1988). **The Susceptibility of the Indian Field Mouse Mus booduga Gray to Anticoagulant Rodenticidal Baits.** *Pestic.Sci.* 23: 208-214.

    EcoReference No.: 75714
    Chemical of Concern: BDL,WFN,BDF; Habitat: T; Effect Codes: MOR.

6. Baskaran, J., Kanakasabai, R., and Neelanarayanan, P. (1995). **Evaluation of Two Rodenticides in the Paddy Fields During Samba and Thaladi Seasons.** *J.Exp.Biol.* 33: 113-121.

    EcoReference No.: 40368
    Chemical of Concern: BDL,ZnP; Habitat: T; Effect Codes: POP.

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    EcoReference No.: 75443
    Chemical of Concern: BDL,WFN; Habitat: T; Effect Codes: POP.

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   Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: METHODS.
   BIOSIS COPYRIGHT: BIOL ABS. RRM ABSTRACT RAT LIVER BRODIFACOUM BROMADIOLONE FLOCOUMAFEN COUMATETRALYL DIFENACOUM Congresses/ Biology/ Animals/ Cytology/ Histocytochemistry/ Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Biophysics/ Membranes/Physiology/ Metabolism/ Digestive System Diseases/Pathology/ Digestive System/Pathology/ Pharmaceutical Preparations/Metabolism/ Poisoning/ Animals, Laboratory/ Muridae

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Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: METHODS.
BIOSIS COPYRIGHT: BIOL ABS. RRM ABSTRACT RAT LIVER BRODIFACOUM BROMADIOLONE FLOCOUMAFEN COUMATETRALYL DIFENACOUM Congresses/ Biology/ Animals/ Cytology/ Histocytochemistry/ Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Biophysics/ Membranes/Physiology/ Metabolism/ Digestive System Diseases/Pathology/ Digestive System/Pathology/ Pharmaceutical Preparations/Metabolism/ Poisoning/ Animals, Laboratory/ Muridae

4. Berny, P. J., Buronfosse, T., Buronfosse, F., Lamarque, F., and Lorgue, G. (**Field evidence of secondary poisoning of foxes (Vulpes vulpes) and buzzards (Buteo buteo) by bromadiolone, a 4-year survey.** *Chemosphere [CHEMOSPHERE]. Vol. 35, no. 8, pp. 1817-1829. Oct 1997.*

   Chem Codes: Chemical of Concern: BDL; Rejection Code: INCIDENT/SURVEY.
   This paper presents the result of a 4 year survey in France (1991-1994) based on the activity of a wildlife disease surveillance network (SAGIR). The purpose of this study was to evaluate the detrimental effects of anticoagulant (Ac) rodenticides in non-target wild animals. Ac poisoning accounted for a very limited number of the identified causes of death (1-3%) in most species. Predators (mainly foxes and buzzards) were potentially exposed to anticoagulant compounds (especially bromadiolone) via contaminated prey in some instances. The liver concentrations of bromadiolone residues were elevated and species-specific diagnostic values were determined. These values were quite similar to those reported in the literature when secondary anticoagulant poisoning was experimentally assessed. Classification: H 14000 Toxicology; P 6000 TOXICOLOGY AND HEALTH; X 24136 Environmental impact Poisoning/ Vulpes vulpes/ Buteo buteo/ France/ Wildlife/ Rodenticides/ bromadiolone/ anticoagulants/ nontarget organisms/ Vulpes vulpes/ Buteo buteo/ Red fox

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8. 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

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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

10. Chopra, G. (1992). **Poultry Farms.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 309-330.

    Chem Codes: EcoReference No.: 75529
    Chemical of Concern: BDF,BDL,WFN,ZnP; Rejection Code: REVIEW.

11. Chopra, G. (1992). **Poultry Farms.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 309-330.

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    Chem Codes: Chemical of Concern: BDL; Rejection Code: INCIDENT/SURVEY.

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    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. GREAVES JH (1995). **Managing resistance to anticoagulant rodenticides: An appraisal.** *PESTICIDE SCIENCE;* 43: 79-82.

    Chem Codes: Chemical of Concern: BDF,BDL,DFT,WRN; Rejection Code: METHODS.

BIOSIS COPYRIGHT: BIOL ABS. The action necessary for resistance management is specified and compared with what has actually been done, with reference to executive, extension and research activities and to the role of rodenticides and rodenticide development. Some obstacles to resistance management are discussed. To account for the fact that no plausible programme to manage resistance has been developed over the last 36 years, the hypothesis is examined that resistance management is injurious to the parties concerned and, hence, that resistance is perceived not as a problem but as an exploitable asset. If correct, this hypothesis yields the prediction that the action necessary for resistance management will be taken when such action is judged to be economically efficient. The establishment of the Rodenticide Resistance Action Committee indicates that this time may be approaching. Biochemistry/ Hematologic Diseases/Pathology/ Hematologic Diseases/Physiopathology/ Hematopoietic System/Pathology/ Hematopoietic System/Physiopathology/ Lymphatic Diseases/Pathology/ Lymphatic Diseases/Physiopathology/ Reticuloendothelial System/Pathology/ Reticuloendothelial System/Physiopathology/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Muridae

18. GREAVES JH (1995). **Managing resistance to anticoagulant rodenticides: An appraisal.** *PESTICIDE SCIENCE;* 43: 79-82.

Chem Codes: Chemical of Concern: BDF,BDL,DFT,WRN; Rejection Code: METHODS.
BIOSIS COPYRIGHT: BIOL ABS. The action necessary for resistance management is specified and compared with what has actually been done, with reference to executive, extension and research activities and to the role of rodenticides and rodenticide development. Some obstacles to resistance management are discussed. To account for the fact that no plausible programme to manage resistance has been developed over the last 36 years, the hypothesis is examined that resistance management is injurious to the parties concerned and, hence, that resistance is perceived not as a problem but as an exploitable asset. If correct, this hypothesis yields the prediction that the action necessary for resistance management will be taken when such action is judged to be economically efficient. The establishment of the Rodenticide Resistance Action Committee indicates that this time may be approaching. Biochemistry/ Hematologic Diseases/Pathology/ Hematologic Diseases/Physiopathology/ Hematopoietic System/Pathology/ Hematopoietic System/Physiopathology/ Lymphatic Diseases/Pathology/ Lymphatic Diseases/Physiopathology/ Reticuloendothelial System/Pathology/ Reticuloendothelial System/Physiopathology/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Muridae

19. HANSEN, H. and BRIMER, L. (1999). **Veterinary intoxications in Denmark 1975-1997. A limited retrospective survey.** *DANSK VETERINAERTIDSSKRIFT;* 82: 227-234.

Chem Codes: Chemical of Concern: BDL,WFN; Rejection Code: INCIDENT,SURVEY.
BIOSIS COPYRIGHT: BIOL ABS. A retrospective survey of veterinary intoxications registrered at The Royal Veterinary and Agricultural University from 1975-97 was conducted with the aim of exposing the occurence and types of toxicoses during the period. A total of 407 cases were analysed concerning year, animal species and age, data on collected sample(s), geographical distribution, enquirer, circumstances of exposure, and laboratory results. In 195 cases intoxication was confirmed, and dogs made the major contribution (35%) rmed by similar registrations by The Danish Veterinary Laboratory. The share of pesticides in particular was decreasing, whereas heavy metals made a relatively constant share. The present investigation disclosed an uneven and random registration of veterinary poisoning incidents in Denmark in the period 1975 to 1997. Today nearly all laboratory investigations of reported veterinary intoxications are handled by the Danish Veterinary Laboratory. However, it still needs to be discussed, whether the Animal/ Toxicology/ Veterinary Medicine/ Zoonoses/ Animal Diseases/Pathology/ Animal Diseases/Physiopathology/ Animals/ Artiodactyla/ Carnivora

20. 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

21. 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

22. ISAJI, M., MOMOSE, Y., and NAITO, J. (1989). **Enhancement of inflammatory reactions in a non-immunological air pouch model in rats.** *BR J EXP PATHOL;* 70: 705-716.

Chem Codes: Chemical of Concern: BDL; Rejection Code: NO TOX DATA.
BIOSIS COPYRIGHT: BIOL ABS. In a carboxymethyl cellulose (CMC) air pouch inflammation model, accumulation of exudate decreased at a relatively rapid rate and almost disappeared 3 days after a 2% CMC injection into the preformed air pouch. After a second injection of 2% CMC solution into the I-day-old CMC pouch on the day following the first CMC injection, the decrease in rate of exudate was similar to the change seen after the first CMC injection. In another group of rats, 3 days after the first CMC injection when inflammatory had subsided, a second injection of 2% CMC solution into the 3-day-old CMC pouch resulted n a marked increase of exudate accumulation, inflammatory cell infiltration and vascular permeability. Histologically, large numbers of macrophages accumulated in the 3-day-old CMC pouch and fibroblast profileration and newly formed blood vessels were also visible. The enhanced exudative reaction was significantly inhibited by dexamethasone but not by indomethacin. These results indicat Animals/ Cytology/ Histocytochemistry/ Lipids/ Steroids/ Sterols/ Carbohydrates/ Enzymes/Physiology/ Inflammation/Pathology/ Lipids/Metabolism/ Cardiovascular System/Physiology/ Cardiovascular System/Metabolism/ Hematopoietic System/Physiology/ Lymph/Chemistry/ Lymph/Physiology/ Lymphatic System/Physiology/ Reticuloendothelial System/Physiology/ Body Fluids/Chemistry/ Adrenal Glands/ Adipose Tissue/Physiology/ Adipose Tissue/Metabolism/ Bone and Bones/Physiology/ Bone and Bones/Metabolism/ Connective Tissue/Anatomy & Histology/ Connective Tissue/Metabolism/ Fascia/Physiology/ Fascia/Metabolism/ Joints/Physiology/ Joints/Metabolism/ Pharmacology/ Endocrine Glands/Drug Effects/ Muridae

23. Jeantet, A. Y., Truchet, M., Naulleau, G., and Martoja, R. (**Cytological effects of bromadiolone on some organs or tissues (liver, kidney, spleen, blood) of coypu (Myocastor coypus).** *C. R. ACAD. SCI. (PARIS), SER. III., vol. 312, no. 4, pp. 149-156, 1991*.

Chem Codes: Chemical of Concern: BDL; Rejection Code: INCIDENT/SURVEY.
Bromadiolone damaged the erythrocytes in Myocastor coypus , resulting in a probable saturation of transferrin, a deposit of iron in the connective tissue and in a few cells of the proximal tubules of the kidneys and an increased storage of ferritin in the spleen. In the hepatocytes, mitochondria were distorted, their lipid

inclusions being granular; a large depletion of glycogen may be considered a reflection of an elevated phosphorylase a ascribable to the proliferation of the smooth endoplasmic reticulum. In the kidneys, pyelonephritis may be irrelevant to the poisoning of the animals. Bromine could not be detected using microanalytical methods. Classification: Q1 01485 Species interactions: pests and control; X 24164 Pathology lethal effects/ pesticides/ rodenticides/ bromadiolone/ Myocastor coypus/ histochemistry/ cytology/ body organs/ France/ pest control/ histopathology/ hydroxycoumarin bromadiolone

24. Jobsen, J. A. (1988). **Integrated Control of the Fossorial Form of Arvicola terrestris in Orchards.** *Bull.OEPP* 18: 441-444.

Chem Codes: Chemical of Concern: BDL; Rejection Code: REFS CHECKED/REVIEW.

25. Kang, J. J. and Cheng, Y. W. (1998). **Effects of boldine on mouse diaphragm and sarcoplasmic reticulum vesicles isolated from skeletal muscle.** *Planta Med* 64: 18-21.

Chem Codes: Chemical of Concern: BDL; Rejection Code: DRUG .
CAS Registry Number 0 (Aporphines); 0 (Neuromuscular Depolarizing Agents); 15662-33-6 (Ryanodine); 476-70-0 (boldine); 7440-70-2 (Calcium). The effects of boldine [(S)-2,9-dihydroxy-1,10-dimethoxyaporphine], a major alkaloid in the leaves and bark of boldo (Peumus boldus Mol.), on skeletal muscle were studied using mouse diaphragm and isolated sarcoplasmic reticulum membrane vesicles. Boldine, at 10-200 microM, has little effect on the muscle-evoked twitches; however, the ryanodine-induced contracture was potentiated dose-dependently. At higher concentrations of 300 microM, boldine by itself induced muscle contracture of two phases, which were caused by the influx of extracellular Ca2+ and induction of Ca2+ release from the internal Ca2+ storage site, the sarcoplasmic reticulum, respectively. When tested with isolated sarcoplasmic reticulum membrane vesicles, boldine dose-dependently induced Ca2+ release from actively loaded sarcoplasmic reticulum vesicles isolated from skeletal muscle of rabbit or rat which was inhibited by ruthenium red, suggesting that the release was through the Ca2+ release channel, also known as the ryanodine receptor. Boldine also dose-dependently increased apparent [3H]-ryanodine binding with the EC50 value of 50 microM. In conclusion, we have shown that boldine could sensitize the ryanodine receptor and induce Ca2+ release from the internal Ca2+ storage site of skeletal muscle

26. Kang, J. J., Cheng, Y. W., and Fu, W. M. (1998). **Studies on neuromuscular blockade by boldine in the mouse phrenic nerve-diaphragm.** *Jpn J Pharmacol* 76: 207-212.

Chem Codes: Chemical of Concern:BDL; Rejection Code: DRUG .
CAS Registry Number 0 (Aporphines); 0 (Cholinergic Antagonists); 0 (Neuromuscular Depolarizing Agents); 476-70-0 (boldine); 51-84-3 (Acetylcholine). The effects of boldine [(S)-2,9-dihydroxyl-1,10-dimethoxy-aporphine], a major alkaloid in the leaves and bark of Boldo (Peumus boldus Mol.), on neuromuscular transmission were studied using a muscle phrenic-nerve diaphragm preparation. Boldine at concentrations lower than 200 microM preferentially inhibited, after an initial period of twitch augmentation, the nerve-evoked twitches of the mouse diaphragm and left the muscle-evoked twitches unaffected. The twitch inhibition could be restored by neostigmine or washout with Krebs solution. The twitches evoked indirectly and directly were both augmented initially, suggesting that the twitch augmentation induced by boldine was myogenic. Boldine inhibited the acetylcholine-induced contraction of denervated diaphragm dose-dependently with an IC50 value of 13.5 microM. At 50 microM, boldine specifically inhibited the amplitude of the miniature end plate potential. In addition, boldine was similar to d-tubocurarine in its action to reverse the neuromuscular blocking action of alpha-bungarotoxin. These results showed that the neuromuscular blockade by boldine on isolated mouse phrenic-nerve diaphragm might be due to its direct interaction with the postsynaptic nicotinic acetylcholine receptor

27. KITAMURA, T., NISHIMURA, S., SASAHARA, K., YOSHIDA, M., ANDO, J., TAKAHASHI, M., SHIRAI, T., and MAEKAWA, A. (1999). **Transplacental administration of diethylstilbestrol (DES) causes lesions in female reproductive organs of Donryu rats, including endometrial neoplasia.** *CANCER LETTERS;* 141: 219-228.

Chem Codes: Chemical of Concern: BDL; Rejection Code: HUMAN HEALTH.

BIOSIS COPYRIGHT: BIOL ABS. The effects of transplacental administration of diethylstilbestrol (DES) on female reproductive organs were investigated using Donryu rats. The animals were given subcutaneous injections of DES dissolved in olive oil at doses of 0.01 or 0.1 mg/kg on days 17 and 19 of gestation. In female offspring, clinical signs, body weights and estrous cycles were continuously assessed until all survivors were killed at month 18. A low mean litter size and shortening of period of pregnancy were recognized in e of atrophy were increased in both 0.01 and 0.1 mg/kg groups. In the uterus, total incidences of endometrial hyperplasias were about the same in all groups. However, endometrial adenocarcinomas were dose-dependently increased in the treated groups, the incidence in the 0.1 mg/kg group being significant, compared to that in the control. In the vagina, mucification was more prominent in the treated animals, especially at the higher dose, but no tumors were observed. The present re Diagnosis/ Genitalia/ Reproduction/ Endocrine Glands/ Poisoning/ Animals, Laboratory/ Neoplasms/ Muridae

28. LAKE JL, RUBINSTEIN, N., and PAVIGNANO, S. (1987). **PREDICTING BIOACCUMULATION DEVELOPMENT OF A SIMPLE PARTITIONING MODEL FOR USE AS A SCREENING TOOL FOR REGULATING OCEAN DISPOSAL OF WASTES.** *DICKSON, K. L., A. W. MAKI AND W. A. BRUNGS (ED.). SETAC (SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY) SPECIAL PUBLICATIONS SERIES: FATE AND EFFECTS OF SEDIMENT-BOUND CHEMICALS IN AQUATIC SYSTEMS; SIXTH PELLSTON WORKSHOP, FLORISSANT, COLORADO, USA, AUGUST 12-17, 1984. XXVIII+449P. PERGAMON PRESS: ELMSFORD, NEW YORK USA; OXFORD, ENGLAND, UK. ILLUS. MAPS. ISBN 0-08-034866-1.; 0 (0). 1987. 151-166.*

   Chem Codes: Chemical of Concern: BDL; Rejection Code: NO TOX DATA.
   BIOSIS COPYRIGHT: BIOL ABS. RRM WASTE MANAGEMENT THEORY MATHEMATICAL ANALYSIS Philosophy/ Conservation of Natural Resources/ Congresses/ Biology/ Mathematics/ Statistics/ Biology/ Ecology/ Oceanography/ Air Pollution/ Soil Pollutants/ Water Pollution

29. Markussen, Mette D K, Heiberg, Ann-Charlotte, Nielsen, Robert, and Leirs, Herwig (2003). **Vitamin K requirement in Danish anticoagulant-resistant Norway rats (Rattus norvegicus).** *Pest Management Science* 59: 913-920.

   Chem Codes: Chemical of Concern: BDL,WFN; Rejection Code: SURVEY.
   Resistance to warfarin has been connected to an increase in dietary requirement for vitamin K in British strains of the Norway rat, Rattus norvegicus (Berk). This study examines vitamin K requirement of Danish anticoagulant-resistant Norway rats using a vitamin K deficient feeding test. Wild bromadiolone-resistant rats sampled from different localities in Denmark and rats from bromadiolone-resistant and susceptible laboratory strains were fed on a vitamin K deficient diet over a maximum period of 15 days. Development of vitamin K deficiency, measured as reduced blood-clotting capacity, took place in 43% of the Danish resistant rats and was independent of sex, treatment with supplementary vitamin K3 and sampling locality. Development of deficiency was slower for resistant rats that were supplemented with vitamin K3 prior to the feeding test, suggesting storage of the vitamin K in a vitamin body pool. Intraperitoneal administration of vitamin K1 revealed that 80 microg vitamin K1 kg(-1) bodyweight was sufficient to restore normal blood clotting activity in deficient rats, while 60 microg vitamin K1 kg(-1) bodyweight was insufficient. We conclude that vitamin K requirement is moderately increased in Danish homozygous resistant rats whereas heterozygous resistant rats only have a minor increase in vitamin K requirement compared with susceptible rats. We found no indication of different resistance types being present in our test material since vitamin K requirement was not different between rats from separate sampling localities. [Journal Article; In English; United States]

30. McDonald, R. A., Harris, S., Turnbull, G., Brown, P., and Fletcher, M. (1998). **Anticoagulant rodenticides in stoats (Mustela erminea) and weasels (Mustela nivalis) in England.** *Environmental Pollution* 103: 17-23.

   Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: SURVEY.
   Concentrations of six anticoagulant rodenticides were examined in the livers of stoats Mustela erminea L. and weasels Mustela nivalis L. trapped or shot by gamekeepers between August 1996 and March 1997. Residues of rodenticides were detected in nine out of 40 stoats (23%) and three out of ten weasels (30%) from five out of eight estates in central and eastern England. Bromadiolone (0.04-0.38 mg kg-1 wet wt) was detected in

three stoats and one weasel, coumatetralyl (0.0085-0.06 mg kg-1) in six stoats and three weasels and brodifacoum (0.12 mg kg-1) in one stoat. One stoat and one weasel contained combinations of two rodenticides. Exposure to rodenticides was more prevalent in female stoats than in males. Rodenticides were widely used away from buildings on the sampled estates and so mustelids need not forage around buildings to be exposed. We conclude that stoats and weasels are secondarily exposed to rodenticides mainly by eating non-target species.

31. McDonald, R. A., Harris, S., Turnbull, G., Brown, P., and Fletcher, M. (1998). **Anticoagulant rodenticides in stoats (Mustela erminea) and weasels (Mustela nivalis) in England.** *Environmental Pollution* 103: 17-23.

    Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: SURVEY.
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32. Mittal, V. P. and Vyas, H. J. (1992). **Groundnut.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 249-264.

    Chem Codes: EcoReference No.: 75524
    Chemical of Concern: ZnP,BDL,CLC; Rejection Code: REVIEW.

33. PARK SW, SEO, B., KIM, E., KIM, D., and PAENG K-J (1996). **Purification and determination procedure of coumarin derivatives.** *JOURNAL OF FORENSIC SCIENCES;* 41: 685-688.

    Chem Codes: Chemical of Concern: BDF,BDL,WFN; Rejection Code: CHEM METHODS.
    BIOSIS COPYRIGHT: BIOL ABS. Anticoagulant coumarin derivatives, bromadiolone, brodifacoum, warfarin, and coumatetralyl were analyzed simultaneously with a modified analytical method. The method includes purification by Sep-Pak cartridge and HPLC analysis using isocratic elution with methanol: 0.8% Acetic acid (8:2). The recoveries of coumarin derivatives from biological samples ranged from 96 to 99%. The concentrations of coumarin derivatives in intoxicated rats' organ were also determined with this analytical procedure. Forensic Medicine/ Biology/ Biochemistry/Methods/ Biochemistry/ Biophysics/Methods/ Blood Chemical Analysis/ Body Fluids/Chemistry/ Lymph/Chemistry/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides

34. PARK SW, SEO, B., KIM, E., KIM, D., and PAENG K-J (1996). **Purification and determination procedure of coumarin derivatives.** *JOURNAL OF FORENSIC SCIENCES;* 41: 685-688.

    Chem Codes: Chemical of Concern: BDF,BDL,WFN; Rejection Code: CHEM METHODS.
    BIOSIS COPYRIGHT: BIOL ABS. Anticoagulant coumarin derivatives, bromadiolone, brodifacoum, warfarin, and coumatetralyl were analyzed simultaneously with a modified analytical method. The method includes purification by Sep-Pak cartridge and HPLC analysis using isocratic elution with methanol: 0.8% Acetic acid (8:2). The recoveries of coumarin derivatives from biological samples ranged from 96 to 99%. The concentrations of coumarin derivatives in intoxicated rats' organ were also determined with this analytical procedure. Forensic Medicine/ Biology/ Biochemistry/Methods/ Biochemistry/ Biophysics/Methods/ Blood Chemical Analysis/ Body Fluids/Chemistry/ Lymph/Chemistry/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides

35. PARMAR, G., BRATT, H., MOORE, R., and BATTEN PL (1987). **EVIDENCE FOR A COMMON**

BINDING SITE IN-VIVO FOR THE RETENTION OF ANTICOAGULANTS IN RAT LIVER. *BRITISH TOXICOLOGY SOCIETY MEETING, OXFORD, ENGLAND, UK, MARCH* 26-27, 1987. HUM TOXICOL; 6: 431-432.

Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: ABSTRACT.
BIOSIS COPYRIGHT: BIOL ABS. RRM ABSTRACT BRODIFACOUM BROMADIOLONE DIFENACOUM COUMATERALYL RODENTICIDE TOXICOKINETICS Congresses/ Biology/ Biochemistry/ Metabolism/ Digestive System/Physiology/ Digestive System/Metabolism/ Digestive System Diseases/Pathology/ Digestive System/Pathology/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Muridae

36. PARMAR, G., BRATT, H., MOORE, R., and BATTEN PL (1987). **EVIDENCE FOR A COMMON BINDING SITE IN-VIVO FOR THE RETENTION OF ANTICOAGULANTS IN RAT LIVER.** *BRITISH TOXICOLOGY SOCIETY MEETING, OXFORD, ENGLAND, UK, MARCH* 26-27, 1987. HUM TOXICOL; 6: 431-432.

    Chem Codes: Chemical of Concern: ,BDF,BDL; Rejection Code: ABSTRACT.
    BIOSIS COPYRIGHT: BIOL ABS. RRM ABSTRACT BRODIFACOUM BROMADIOLONE DIFENACOUM COUMATERALYL RODENTICIDE TOXICOKINETICS Congresses/ Biology/ Biochemistry/ Metabolism/ Digestive System/Physiology/ Digestive System/Metabolism/ Digestive System Diseases/Pathology/ Digestive System/Pathology/ Poisoning/ Animals, Laboratory/ Herbicides/ Pest Control/ Pesticides/ Muridae

37. Pascal, M., Pradier, B., and Habert, M. (1988). **Methodologie Appliquee a l'Evaluation en Nature de l'Efficacite de Rodenticides a Effet Differe. Application de cette Methodologie a l'Evaluation de l'Efficacite de deux Molecules Rodenticides, Bromadiolone et Difethialone sur la Forme Fouisseuse du Campagnol Terrestre Arvicola terrestris scherman (Shaw).** *Acta Oecol.(Oecol.Appl.)* 9: 371-384.

    Chem Codes: EcoReference No.: 75572
    Chemical of Concern: DFT,BDF; Rejection Code: NON-ENGLISH.

38. Pascal, M., Pradier, B., and Habert, M. (1988). **Methodologie Appliquee a l'Evaluation en Nature de l'Efficacite de Rodenticides a Effet Differe. Application de cette Methodologie a l'Evaluation de l'Efficacite de deux Molecules Rodenticides, Bromadiolone et Difethialone sur la Forme Fouisseuse du Campagnol Terrestre Arvicola terrestris scherman (Shaw).** *Acta Oecol.(Oecol.Appl.)* 9: 371-384.

    Chem Codes: EcoReference No.: 75572
    Chemical of Concern: DFT,BDF; Rejection Code: NON-ENGLISH.

39. Pikula, J., Beklova, M., and Vitula, F. (2003). **Effect of bromadiolone on biochemical parameters of blood plasma of the common pheasant (Phasianus colchicus).** *Toxicology Letters* 144: s173.

    Chem Codes: Chemical of Concern: BDL; Rejection Code: ABSTRACT.

40. Rao, A. M. K. M. (1992). **Integrated Rodent Management.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 651-667.

    Chem Codes: EcoReference No.: 75527
    Chemical of Concern: BDL,ZnP; Rejection Code: REVIEW.

41. Raoul, F, Michelat, D, Ordinaire, M, Decote, Y, Aubert, M, Delattre, P, Deplazes, P, and Giraudoux, P (2003). **Echinococcus multilocularis: secondary poisoning of fox population during a vole outbreak reduces environmental contamination in a high endemicity area.** *International Journal For Parasitology* 33: 945-954.

    Chem Codes: Chemical of Concern: BDL; Rejection Code: SURVEY.

This paper describes the role of fox population level on Echinococcus multilocularis infection in foxes in a highly endemic area in eastern France. Fox population level was monitored by spotlight survey at Le Souillot from 1989 to 2000, and from 1992 to 2000 at Chemin, a control site located in a low endemic area. The infection level of the fox population was estimated at Le Souillot from winter 1995 to winter 1999 using a coproantigen ELISA performed on faeces collected in the field. Population biomass of intermediate hosts (Microtus arvalis and Arvicola terrestris) was monitored using index methods from 1995 to 1999. At Le Souillot, a significant decline in the fox population level was recorded after spring 1997 (Pbromadiolone, an anticoagulant used at a large scale for the control of A. terrestris population outbreaks. No decline of population was recorded at Chemin, where bromadiolone was not used for rodent control. Significant differences among ELISA OD distributions in fox faeces were recorded for the five winters under study at Le Souillot (P=0.0004). The median of ELISA OD distribution was 0.209 and 0.207 before the population decline (winter 1995 and 1996, respectively), significantly increased to 0.306 just after the decline (winter 1997), and then significantly decreased to 0.099 and 0.104 afterwards (winter 1998 and 1999, respectively). Therefore, the decrease in infection level occurred during winter 1998, 1 year after the population decline, when the intermediate host biomass in the field was at its highest. These results suggest a complex dependence between the fox population level and E. multilocularis infection in a high endemicity area. Alternative ways to control fox population as a way to reduce E. multilocularis transmission in a given area are discussed. [Journal Article; In English; England]

42. Ray, A. C., Murphy, M. J., DuVall, M. D., and Reagor, J. C. (1989). **Determination of brodifacoum and bromadiolone residues in rodent and canine liver.** *American Journal of Veterinary Research [AM. J. VET. RES.]* 50: 546-550.

    Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: INCIDENT/SURVEY.
    Classification: X 24222 Analytical procedures A method to determine residue concentrations of anticoagulant rodenticides, brodifacoum (BF) and bromadiolone (BD) in liver was developed, using gas chromatography/mass spectrometry. This protocol, which does not differentiate between BF and BD because of the formation of a common product after chromic acid oxidation, was used to diagnose anticoagulant toxicosis in 3 dogs, 1 human being and 1 llama naturally poisoned. bromadiolone/ liver/ animals/ brodifacoum/ residues/ determination/ methodology

43. Reece, R. L. , Scott, P. C., Forsyth, W. M., Gould, J. A., and Barr, D. A. (1985). **Toxicity episodes involving agricultural chemicals and other substances in birds in Victoria, Australia.** *Veterinary Record [VET. REC.]* 117: 525-527.

    Chem Codes: Chemical of Concern: BDL; Rejection Code: SURVEY/INCIDENT.
    A series of case reports detailing observations on toxicity episodes in birds caused by a variety of agricultural chemicals and other substances is presented. These problems arose as a result of ignorance, accident and malicious intent. The episodes involved maldison, monocrotophos, fenitrothion, trichlorofon, dieldrin, chlordance, endrin, metaldehyde, bromadiolone, arsenic, lead and zinc. An unresolved episode where toxicity was implicated is also included. Classification: X 24136 Environmental impact; X 24166 Environmental impact pesticides/ agrochemicals/ Aves/ metals/ toxicity

44. Robben, J. H., Mout, H. C. A., and Kuijpers, E. A. P. (1997). **Anticoagulant Rodenticide Poisoning in Dogs in The Netherlands (Rodenticide Anticoagulans-Intoxicatie Bij Honden in Nederland).** *Tijdschr.Diergeneeskd.* 122: 466-471 (DUT) (ENG ABS).

    Chem Codes: EcoReference No.: 75550
    Chemical of Concern: BDF,BDL,DFT,CPC; Rejection Code: NON-ENGLISH.

45. Shore, R. F. , Birks, J. D. S., Afsar, A., Wienburg, C. L., and Kitchener, A. C. (2003). **Spatial and temporal analysis of second-generation anticoagulant rodenticide residues in polecats (Mustela putorius) from throughout their range in Britain, 1992-1999.** *Environmental Pollution* 122: 183-193.

    Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: SURVEY.
    Polecats (Mustela putorius) in Britain are currently expanding their range eastwards from Wales to reoccupy

central and eastern areas of England. Second-generation anticoagulant rodenticides (SGARs), to which polecats are exposed by eating contaminated prey, are used more extensively in these central and eastern regions, leading to fears of increased exposure, and possible resultant mortality. We measured bromadiolone, difenacoum, flocoumafen and brodifacoum concentrations in the livers of 50 polecats from areas that included newly recolonised habitats and found that at least one SGAR was detected in the livers of 13 out of 37 (35.1%) male and 5 out of 13 (38.5%) female polecats. Difenacoum and bromadiolone were detected most frequently. We then combined these data with measurements on another 50 individuals from earlier studies to create a dataset for 100 polecats collected throughout the 1990s from across the whole of their current range. Using this dataset, we determined if there was any evidence that contamination in polecats had increased during the 1990s and whether animals from England were more contaminated than those from Wales, as might be expected given regional differences in the patterns of SGAR use. Overall, 31 of the 100 polecats analysed to date contained SGAR residues. The incidence was a little higher (40%) in animals that died between January and June and this probably better reflects the overall proportion of animals that are sub-lethally exposed. There was no statistically significant change during the 1990s in the proportion of polecats exposed to SGARs nor any evidence that greater use of SGARs in England resulted in more contamination of polecats. Contrary to expectation, the proportion of animals that contained difenacoum was marginally higher in Wales than elsewhere.

46. Shore, R. F. , Birks, J. D. S., and Freestone, P. (**Exposure of non-target vertebrates to second-generation rodenticides in Britain, with particular reference to the polecat Mustela putorius .** *New Zealand Journal of Ecology [N. Z. J. Ecol.]. Vol. 23, no. 2, pp. 199-206. 1999.*

Chem Codes: Chemical of Concern: BDL; Rejection Code: SURVEY.
In Britain, the use of "second-generation" rodenticides has become widespread on agricultural premises. The high toxicity and relatively long half-lives of these compounds has raised concerns over potential secondary exposure and poisoning of non-target predators. Over the last 15 years, exposure has been extensively documented in the barn owl Tyto alba but relatively little is known about mammalian terrestrial predators. This paper reviews recent studies and demonstrates that there is evidence of both secondary exposure and secondary poisoning in a variety of non-target, terrestrial mammals in Britain. It also presents new data on rodenticide levels in the polecat Mustela putorius which preys on farmyard rats in winter in Britain and is, therefore, considered to be highly vulnerable to exposure to rodenticides. The new data demonstrated that 26% of polecats in the sample contained difenacoum or bromadiolone and that exposure was geographically widespread and occurred in several years. The possible effects of secondary exposure on populations of polecats and other predators are discussed. Classification: D 04710 Control; D 04672 Mammals Control programs/ Poisoning/ Nontarget organisms/ Pollution levels/ British Isles/ Mammalia/ Mustela putorius/ Mammals/ Polecat

47. Shore, R. F. , Birks, J. D. S., Freestone, P., and Kitchener, A. C. (1996). **Second-generation rodenticides and polecats (Mustela putorius) in Britain.** *Environmental Pollution* 91: 279-282.

Chem Codes: Chemical of Concern: BDF,BDL; Rejection Code: INCIDENT/SURVEY.
In Britain, polecats Mustela putorius hunt around farm buildings, especially in winter, and, as a result, may be secondarily exposed to rodenticides by eating contaminated prey. This paper reports the first survey of second-generation rodenticides in polecats. Twenty-nine adult polecats which had been killed either accidentally on roads (24) and in traps (4), or had died of an unknown cause (1) were collected during 1992-1994. The livers of 24 animals and the stomach walls of the remaining five, for which the livers were not available, were analysed for difenacoum, bromadiolone, brodifacoum and flocoumafen. In total, rodenticide residues were detected in 31% of the polecats analysed. Residues were found in seven of the 24 livers (29%) and in two of the five stomachs analysed (40%). Difenacoum was detected most frequently (28% of animals), and was the only rodenticide in the stomach, while bromadiolone and brodifacoum were detected in only 10% and 3% of polecats, respectively. Flocoumafen was not detected in any animals. More than one rodenticide occurred in the livers of two animals; one contained difenacoum and bromadiolone, the other also contained brodifacoum. There was no sex bias in the proportion of animals containing rodenticides. Animals with detectable residues came from more than one county and were collected only during January-April in each year.

48. Srivastava, D. C. (1992). **Sugarcane.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 231-248.

Chem Codes: EcoReference No.: 75523
Chemical of Concern: BDF,BDL,ZnP,WFN; Rejection Code: REVIEW.

49. STANKOVIC, I. (1992). **Experiences with ozone treatment of drinking water in Yugoslavia.** *OZONE SCI ENG;* 14: 101-121.

Chem Codes: Chemical of Concern: BDL; Rejection Code: NO TOX DATA.
BIOSIS COPYRIGHT: BIOL ABS. Ozone currently is being used in several drinking water treatment plants in Yugoslavia. The new Belgarde water treatment plant "Makis" is the largest one with 42 kg/h of installed ozone generating capacity and has been in operation since 1987. This paper describes the main features of ozone application in drinking water treatment. The experimental results of "Makis" pilot-plant investigations and a few examples of ozone application in Yugoslavia are presented. Conservation of Natural Resources/ Gases/ Biochemistry/ Biomedical Engineering/ Biophysics/ Engineering/ Sanitation/ Sewage

50. 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]

51. Subiah, K. S. and Mathur, R. P. (1992). **Andamans with Special Reference to Oil Palm Plantations.** *In: I.Prakash and P.K.Ghosh (Eds.), Rodents in Indian Agriculture, Volume 1, State of the Art, Sci.Publ., Jodhpur, India* 343-356.

Chem Codes: Chemical of Concern: BDL,WFN,ZNP; Rejection Code: REFS CHECKED/REVIEW.

52. SUBIAH KS and SHAMSUDDIN VM (1992). **LAKSHADWEEP ISLANDS.** *PRAKASH, I. AND P. K. GHOSH (ED.). RODENTS IN INDIAN AGRICULTURE, VOL.1. STATE OF THE ART. XVII+707P. SCIENTIFIC PUBLISHERS: JODHPUR, INDIA. ISBN 81-7233-013-8.; 0* 331-341.

Chem Codes: Chemical of Concern: BDF,BDL,WFN; Rejection Code: REVIEW.
BIOSIS COPYRIGHT: BIOL ABS. RRM RATTUS-RATTUS MUS-MUSCULUS COCONUT RODENTICIDES WARFARIN BROMADIOLONE BRODIFACOUM ARABIAN SEA Animals, Wild/ Conservation of Natural Resources/ Ecology/ Biochemistry/ Poisoning/ Animals, Laboratory/ Fruit/ Nuts/ Tropical Climate/ Herbicides/ Pest Control/ Pesticides/ Plants/ Muridae