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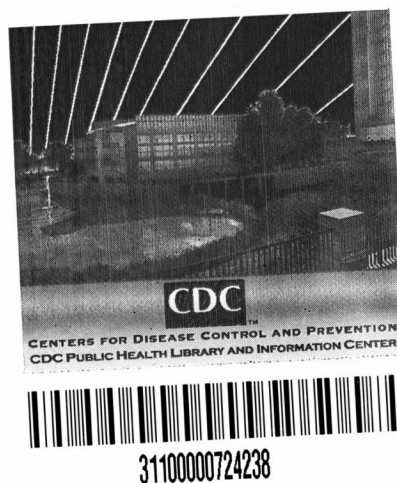
ENVIRONMENTAL
HEALTH
ABSTRACTS

November 1976

focus:

URBAN
RAT
CONTROL

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE - PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL, ATLANTA, GEORGIA 30333



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FOREWORD

Environmental Health Abstracts presents a survey of recently published literature in the field. Effort is made to keep the abstracts as current as possible and sufficiently informative to enable the reader to decide whether the original article would be of interest to him or her. For the benefit of the reader, where possible the address of the first author is included with each abstract. Some future issues will be devoted to protoporphyrins, youth camp safety, and other environmental health topics.

In compiling these abstracts we utilize the BIOLOGICAL ABSTRACTS and the BIBLIO OF AGRICULTURE. Under these systems, both foreign and domestic biomedical periodicals are searched for material dealing with or related to environmental health. We also utilize the libraries of Emory University, the Center for Disease Control and other federal agencies.

Individuals desiring to be placed on the mailing key to receive Environmental Health Abstracts as published should write to the Center for Disease Control, Attention: Environmental Health Services Division, Bureau of State Services, Atlanta, Georgia 30333.

Vernon N. Houk, M.D.
Director
Environmental Health Services Division
Bureau of State Services
Center for Disease Control
Atlanta, Georgia 30333

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AN INNOVATION IN ROOF RAT CONTROL. Donald R. Brothers -- Technical Assistant, Santa Clara County Health Department, San Jose, CA. PROC VERTEBR PEST CONF 5:161-167, 1972.

Author's abstract: Within the past ten years, the roof rat (Rattus rattus) problem in residential Santa Clara County has developed from an insignificant nuisance to one of major concern. When a considerable number of complaints to the Santa Clara County Health Department reported roof rats on telephone cables, a study was made of 29 city blocks to determine the feasibility of utility pole baiting as a means of roof rat control. In the baiting process, rat signs were commonly observed on telephone equipment attached to the utility poles. A correlation was observed between bait consumption and the close proximity of vegetation to the telephone cable clamp. Bait consumption profiles on most blocks demonstrated patterns which resembled activity ranges. During the study approximately 190 two ounce bait blocks were consumed and many dead roof rats were found by the Health Department and residents living in the baited areas. The procedure appears to be an effective means of population reduction and has the potential of long range effectiveness.

CHEMICALS IN RODENT CONTROL. N.J.A. Gutteridge -- Lilly Research Centre Ltd., Erl Wood Manor, Windlesham, Surrey. CHEM SOC REV 1(3):381-409, 1972.

Presents thorough technical descriptions of most chemicals in use or with potential usefulness in the field of rodent control: rodenticides (bait poisons, poison dusts, and fumigants), baits and additives (attractants, potentiating agents, and formulation additives), chemosterilants, and repellants. Particular reference is made to commensal rodents of the United Kingdom, but procedures used to combat other rodent pests are described.

COMMENSAL RODENT CONTROL. D.R. Maddock and H.F. Schoof -- Center for Disease Control, Technical Development Laboratories, Department of Health, Education, and Welfare, Public Health Service, Savannah, GA. VERTEBR PEST CONF PROC 5th:189-191, 1972.

Authors' summary: Federal Urban Rat Control Program grants were awarded to cities in different areas of the United States. Severe problems of rat infestations have been detected in many of the cities by the Environmental Health Service. Approximately 20% of 3.8 million people in the project areas were occupying homes infested with rats. Control operations are now in effect in all cities, and the living conditions of the people have been substantially improved. An increase in interest in rodent control also is evident in countries outside of the United States. The Technical Development Laboratories of the Center for Disease Control are participating in the World Health Organization program of research on new rodenticides. The evaluation program involves five steps which carry a candidate toxicant from laboratory phase through field testing. Acceptability and suitable

concentrations of both acute and accumulative rodenticides are determined. Observations are made on the hazard of the compound to pets and to other nontarget vertebrates. Laboratory and field studies have been completed on a new, promising stabilized scilliroside glycoside which has given excellent control of the Norway rat in 16 out of 19 premises. Another new coded compound has shown a unique specificity for roof rats as compared to Norway rats. Although anticoagulant resistant rat populations have occurred in several countries in Europe, as yet no evidence has been noted of such resistance in rats in the United States.

DRY BAIT RAT CONTROL IN A FEED WAREHOUSE. T.D. Pierce -- Palmetto Exterminators, Inc., Walterboro, SC. PEST CONTR 38(8):11-12, 14, 16, August 1970.

A commercial exterminator reports results using a new formula dry rat bait mixture in a large feed warehouse and an egg farm. The formula is called "Wunda-Bait" and was developed by Captain Douglas A Cole, chief rodent control officer of Auckland, New Zealand.

Placing the new bait in special galvanized tin boxes in a hammer mill below the first floor level of a large warehouse (capacity: about 2 carloads of feed and seed), author observed no bait acceptance for five nights. He then placed the formula in open trays in the bottom of the hammer mill. By the ninth day using this technique, author counted about 40 dead rats in the bottom of the hammer mill, with no estimate of those dead in the warrens. New bait also was set out in the hen house of a large egg producing farm, where the author reports 77 dead rats by the sixth day.

EVALUATION OF U-5897 AS A MALE CHEMOSTERILANT FOR RAT CONTROL. Alan M. Bowerman and Joe E. Brooks, Bureau of Rodent Control, New York State Department of Health, Troy, NY. J WILDL MANAGE 35(4):618-624, 1971.

Authors' abstract: Laboratory studies conducted with U-5897 (3-chloro-1,2-propanediol) in individually caged and penned colonies of wild Norway rats (Rattus norvegicus) demonstrated that an effective sterilizing dose of 175 mg/kg of body weight was voluntarily consumed by 70 to 80 percent of the test males. Two similar rat-infested dumps, one serving as a control and the other as the treated site, were utilized for a field trial of U-5897 during the late summer-early fall breeding peak. After several nights of pre-baiting the test site with plain bait, rats consumed 3,255 grams of the one percent U-5897 bait on the 1 night of exposure. A second application of U-5897 bait was made 11 weeks after the first, and 2,630 grams of bait was consumed in 1 night. Two weeks after the first treatment, 18 of 23 mature males exhibited effects of U-5897. A maximum of 36 percent of the mature males trapped from the test site 4, 8, and 15-17 weeks after the first treatment were sterile. During the test period, 46 of 84 mature females captured from the treated dump were either pregnant or lactating, and 34 of 73 from the control dump were pregnant or lactating. These data indicate that pregnancies and lactation were not inhibited by the level of male sterility achieved during the field trial.

NEW YORK CITY'S RAT CONTROL PROGRAM. Murry H. Raphael, Bureau of Pest Control, Department of Health, 93 Worth Street, New York, NY 10013. J MILK FOOD TECHNOL 33(2):52-58, February 1970.

From author's abstract: Article reviews the legal basis for extermination activities in buildings and vacant lots. Describes eradication measures used by Bureau of Pest Control exterminators. Explains the community education techniques employed to secure the cooperation of tenants, property owners, and others living within urban areas.

Article summarizes the progress during the past 5 years of prevention and control activities. Evaluation of the program is afforded by citation of the incidence of reported rat bites prior to and since the inception of these abatement activities.

ON ACHIEVING RAT CONTROL. John Uhlarik, Neochem Products Co. PEST CONTR 38(8):24, August 1970.

Points out that to have an effective rodent control program, one must: (1) know the ecology of the target species and the particular weaknesses of the rodent; (2) use a bait that will be best suited for the particular problem (i.e., "loaded" water, dry bait, wax bait, or a semi-moist bait); and (3) have an on-going maintenance program to insure continued effectiveness.

RODENT CONTROL MANUAL. Walter E. Howard and Rex E. Marsh -- Professor of Wildlife Biology, University of California, Division of Wildlife and Fisheries Biology, Davis, CA. PEST CONTROL 48(2, suppl.):D-U Ref., August 1974.

Information was collected from many previously published sources and assembled into one manual that avoids technical jargon. A principal theme is that "any realistic attempt at rat control must take place in an ecological context. To do this one must understand the rat's habitat requirements, reproductive capabilities, food habits, life history, behavior, senses, movements, and the dynamics of its population structure. Control would be less difficult if we knew a good deal more about the biology and ecology of the niches." Rodenticides, baits, fumigants, and traps are discussed, in addition to rodent biology and ecology.

RODENT CONTROL PILOT STUDIES IN BOMBAY. P.B. Deobhankar -- Insecticide Branch, Public Health Department, Bombay Municipal Corporation. PESTICIDES 3(6):46-48, June 1969.

An ongoing study in the southernmost end of Bombay is making appreciable results in controlling rodents.

In the City of Bombay, high rat infestations have produced enormous damage to food and property. Railway traffic at Wadi Bunder and Carnac Bunder has actually been endangered because of rat burrows underneath the tracks. This study is aimed at devising better rodent control techniques for use throughout the city. The plan of operation included: (1) selection of area; (2) initial trapping to assess the degree of infestation; (3) environmental sanitation and rat prevention; (4) rat destruction; (5) final trapping to assess the results; and (6) maintenance through the social organizations and the residents of the locality. Each of these steps are discussed in detail with charts and statistics showing degree of success so far.

RODENT CONTROL STRATEGY. David E. Davis -- PEST CONTROL STRATEGIES FOR THE FUTURE 157-171, 1972.

From author's introduction: The control of rodents has been a major problem for centuries and despite decades of research remains an insurmountable task. This discussion summarizes briefly the results of research for the past three decades and suggests a strategy for the control of urban rats and other rodents. The major concepts include population dynamics (the study of birth rates, mortality rates, and movement rates) and the concept of diversity (which suggests that populations are more stable if there is greater diversity in the numbers of species and in the types of environment). Political mechanisms must be able to administer the control procedures that are dictated by the principles. A corollary of the strategy of working with principles is that research should not continue in clear violation of population principles in expectation that a politically acceptable solution will be found.

THE INFLUENCE OF ATTRACTANTS AND REPELLENTS ON THE FEEDING BEHAVIOUR OF RATTUS NORVEGICUS. J.O. Bull -- Chief Biologist, Rentokil Limited, Felcourt, East Grinstead, Sussex, England. PROC VERTEBR PEST CONF 5:154-160, 1972.

Author's abstract: Poison baits are extensively used for commensal rodent control; considerable folk lore exists regarding the use of additives to induce rodents to come to and eat poison baits. This paper describes a rational evaluation of attractants and the influence of different odours in inducing Rattus norvegicus to feed at given locations. The influence of certain repellents was also examined. Tests consisted of attempts to induce rats to feed at non-preferred sites or to repel them from preferred sites. Place preference was the dominant factor in feeding by rats, and odours failed to influence feeding activity significantly.

THE PROBLEM OF RODENTS IN OUR MODERN ENVIRONMENT. L.A. Penn -- Milwaukee Health Department, 841 North Broadway, Milwaukee, WI 53202. J MILK FOOD TECHNOL 34(10):471-474, 1971.

From author's abstract: A brief history of commensal rats and their relationship to man is presented. Some early urban control programs are summarized. Recent social developments in cities have focused attention on rat control programs and have intensified efforts to free urban areas of rats, particularly in poverty-stricken neighborhoods. An effective community rat control program depends upon motivation and education of citizens as well as enforcement of wisely written rat control ordinances and related solid waste disposal rules. A good rat control ordinance should require rat-proofing of buildings, elimination of rat harborages and sources of food for rats, as well as rat extermination on all premises. For the future, not only will more sophisticated means of citizen motivation be needed, but further studies of the role of sewers and other heretofore neglected areas of rat control in the urban environment.

THE ROLE OF W.H.O. IN THE STUDY AND CONTROL OF RODENT-BORNE DISEASE. N.G. Gratz -- Scientist-Entomologist, Vector Biology and Control Unit, World Health Organization, Geneva, Switzerland. PROC VERTEBR PEST CONF 6:73-77, 1974.

Author's abstract: While little information is available on the distribution and incidence of most of the diseases with rodent reservoirs, many of them are known to be widespread and may have considerable public health importance in some of the foci in which they are found. The World Health Organization is carrying out investigations on the epidemiology of several diseases with rodent reservoirs and on the biology and ecology of the rodent reservoir species themselves. These investigations are being carried out both at WHO research units and with collaborating laboratories. Based on the ecological information the organization is attempting to develop effective and economically acceptable methods and materials to control rodent populations to a point where transmission of disease no longer occurs.

WEATHERABILITY OF ZINC PHOSPHIDE TREATED RICE BAITS. Richard R. West, William H. Robison, and Agapito M. Dela Paz -- USAID/Philippines, APO San Francisco 96528. PHILIPP AGRI 56(7-8):258-262, 1972-1973.

Four rice baits containing 2% zinc phosphide--polished rice or binlid (broken rice), with or without 1% coconut oil--were exposed outdoors 24, 48, or 72 hours with about 1 inch of simulated rain per day, or for 72 hours without rain. Gas chromatographic analysis showed that all exposed baits lost considerable amounts of zinc phosphide in comparison with unexposed baits. After exposure without rain, baits without oil lost more (56-68%) than those with oil (15-38%). Polished rice without oil lost about 65% regardless of exposure. After 1 and 2 days of rain, rice with oil and binlid with or without oil lost 43-54%. However, limited bioassays suggested that, even after losses of 50-60%, 2% baits should retain enough zinc phosphide to kill most ricefield rats (Rattus rattus mindanensis).

WHAT MAKES A PALATABLE WARFARIN? Alan M. Bowerman and Joe E. Brooks -- New York State Department of Health, Bureau of Rodent Control, Rodent Control Evaluation Laboratory, Troy, NY. PEST CONTR 40(2):22, 28-29, February 1972.

Since regulations governing the manufacture of anticoagulants have expired, inferior warfarins have appeared on the market. These inferior warfarins, while inexpensive, contain contaminants which rodents have an aversion to and will not eat.

Authors obtained highly pure technical warfarin from the Wisconsin Alumni Research Foundation and found it to be well accepted as a bait. In studying the difference between palatability of several warfarins and their levels of contaminants, authors found "WARF warfarin in millet was highly preferred over cornmeal. The other commercial warfarins were less preferred, one seriously enough so as not to pass federal Environmental Protection Agency standards of 33% acceptance."

Since warfarin has been a primary weapon in the control of rats for the past 20 years, it is essential that the warfarin being sold on the commercial market be a pure chemical, void of contaminants. Otherwise, this very effective control measure would lose its effectiveness.

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