

ZOOLOGY

Chairman: JACKSON L. MARR
Indiana State University-Evansville
Evansville, Indiana 47712

Chairman-Elect: RICHARD C. MCCRAKEN
Indiana University-Purdue University at Indianapolis
Indianapolis, Indiana 46205

Abstracts

Rabies in Bats From Indiana: 1973-1977. JOHN O. WHITAKER, JR., Department of Life Sciences, Indiana State University, Terre Haute, Indiana 47809, and LOUIS R. DOUGLAS, Indiana State Board of Health, 1330 West Michigan Street, Indianapolis, Indiana 46206. _____ A total of 642 bats from Indiana taken from 1973 through 1977 was examined for rabies, bringing to 1,957 the number examined for this virus since 1965. During this most recent five-year period, 15, or 2.3 percent, were rabid, as compared to 5.1 percent for the period 1968-1972. Of the 1,957, 82 were rabid (4.2 percent). The greatest number of cases was in red bats, *Lasiurus borealis*, and big brown bats, *Eptesicus fuscus*, but these were submitted in the greatest numbers. The greatest percentage infection occurred in the hoary bat, *Lasiurus cinereus*. Of 70 examined 13 were rabid (18.6 percent). Bats of the genera *Myotis*, *Lasionycteris* and *Nycticeius* were seldom rabid. Rabid bats were taken for the first time in DeKalb, Floyd, Fulton, Lake and Martin Counties during the 1973-77 period, bringing to 28 the number of counties from which bat rabies has been detected.

Serological Evidence of Arboviral Infections in East Central Indiana Wildlife, 1977-78. ROBERT R. PINGER, Public Health Entomology Laboratory, RALPH D. KIRKPATRICK and GLEN A. NELSON, Department of Biology, Ball State University, Muncie, Indiana 47306, MICHAEL J. SINSKO, Indiana State Board of Health, Indianapolis, Indiana 46206, PAUL R. GRIMSTAD, Laboratory for Arbovirus Research and Surveillance, Notre Dame University, South Bend, Indiana 46556, and DONALD C. DORSEY, Iowa State Hygienic Laboratory, University of Iowa, Iowa City, Iowa 52242. _____ Sera from 34 squirrels and rabbits collected in Delaware County were screened in microneutralization tests for antibodies against St. Louis encephalitis (SLE), western equine encephalomyelitis (WEE) and three viruses of the California encephalitis (CE) virus group, La Crosse (LAC), Trivittatus (TVT) and Jamestown Canyon (JC). Neutralizing antibodies to TVT virus were demonstrated in 8/13 red squirrels, 2/8 fox squirrels and 4/13 eastern cottontail rabbits. Antibodies to SLE virus were found in 4/14 mammalian sera from one collection site located within the city limits of Muncie, while none of the sera collected from a second site a mile outside the city were positive for SLE antibodies. However, serum from a single cottontail rabbit captured at the latter site neutralized WEE virus at a 1:8 dilution.

A total of 338 avian sera was collected from birds trapped and netted in Delaware and Grant Counties between June and September, 1978. These sera were tested for the presence of antibodies to SLE, WEE, and eastern equine encephalomyelitis (EEE) virus by the hemagglutination inhibition (HI) test. Two House Sparrows, one from Delaware County and one from Grant County, had low HI antibody titers (1:10) against SLE virus. None of the birds showed evidence of infection with WEE or EEE viruses.

Mebendazole Treatment of the Invasive Phase of Experimental Trichinosis in Mice. RICHARD O. MCCracken, Department of Biology, Indiana University-Purdue University at Indianapolis, Indianapolis, Indiana 46205.——Recent reports have demonstrated the chemotherapeutic effectiveness of a benzimidazole anthelmintic, mebendazole, in the treatment of *Trichinella spiralis* infections in rats and mice. Because mebendazole (methyl 5-benzoyl-benzimidazole-2-carbamate) is used for the treatment of other helminthoses in man, and because it is highly active against enteral and parenteral *Trichinella* in laboratory animals, this compound is one of great potential utility in the treatment of trichinosis in man. However, comparatively few studies have been reported with mebendazole on the relative susceptibility of the parasite during the invasive phase of infection (days 14 to 21) of the efficacy of dosage regimens similar to those used in man. I report here observations on the efficacy of mebendazole against the invasive phase of trichinosis because of its special clinical importance. Mebendazole proved to be effective against the invasive phase of trichinosis in mice in a 3-day regimen at dosages close to, or within the range of those recommended by the manufacturer for the control of other helminthic infections in man. Trial of the drug in severe trichinosis in man should be considered.

The Effects of Dose and Age on the Uptake and Distribution of Vanadium-48 in the Albino Rat. DENNIS M. SOLLENBERGER and RICHARD J. VETTER, Bionucleonics Department, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana 47907.——Vanadium is an essential trace metal and is found widely throughout nature, but it is toxic and irritates the respiratory tract when encountered in large amounts. The effects of dose and age on the uptake and distribution of vanadium-48 in the albino rat were investigated in order to better understand the biological fate of vanadium and provide data to aid in setting safe environmental and occupational concentrations.

Vanadyl trichloride (VOCl_3) was administered intraperitoneally in various doses (0.0002, 1.0, 10, or 100 $\mu\text{g V}/100$ g body weight) to 250-g rats or at a concentration of 10 $\mu\text{g}/100$ g body weight to rats in three different age groups. Each dose contained 5 $\mu\text{Ci } ^{48}\text{V}$. The rats were sacrificed at 1/4, 1, 4, or 16 days after injection. All major abdominal and thoracic organs and femur were collected along with a sample of blood and leg muscle. Urine and feces were collected daily from the animals sacrificed at 16 days. The tissues highest in ^{48}V concentration (% dose/g) at 16 days were, in descending order, femur, kidneys, spleen, liver, and testes. The fraction of the total dose deposited in the femur was independent of the administered dose while the fraction deposited in other tissues was inversely proportional to dose. The fraction excreted increased with

dose. As age increased, the fraction of administered dose deposited in tissues decreased and the fraction excreted increased.

A Description of Growth and Skeletal Differentiation During Chick Wing Development. MARY AGNES FADERAN and ROBERT J. STARK, Department of Biology, Indiana University-Purdue University at Indianapolis, Indianapolis, Indiana 46205.——The relationship between growth, cell division, and cartilage differentiation during early limb development has been the subject of numerous investigations, but little is known about the relationship between growth and ossification of the skeletal elements. We have examined the development of the chick wing from 5 days of incubation to hatching to determine if growth and ossification were related and what such a relationship would indicate about controlling mechanisms. Rates of growth (elongation and diameter), the time ossification was initiated and the rates of ossification were determined for each of the skeletal elements in the wing. Growth was exponential with the rates for all of the elements decreasing twice, first at 8.5-9.5 days and again at 16-16.5 days of development. Ossification of the diaphysis was observed to initiate in all the elements except the phalanges by 8-8.5 days of development and by 9-9.5 days in the phalanges. Epiphyseal ossification was initiated in all of the elements by 15.5 to 16 days of development. The rate of growth was observed to be directly proportional to the degree of ossification. The patterns of growth and ossification suggest the initiating factor(s) must be specific in point of action on each element but influence all the elements in unison.

Reestablishment of Retinal-Tectal Specificity During Goldfish Optic Nerve Regeneration. S. ROBERT HANES and ROBERT J. STARK, Department of Biology, Indiana University-Purdue University at Indianapolis, Indianapolis, Indiana 46205.——The temporal-spacial sequence of retinal ganglion cell differentiation during normal eye development is sufficient to establish a nerve cable which, if the axons retain their relative positions, would in its projection onto the tectum reflect the relative positions of the ganglion cells in the retina. We have examined the pattern of retrograde peroxidase transport to determine if a similar temporal-spacial sequence is established during optic nerve regeneration. The optic nerve was severed in 3-4 inch goldfish and horseradish peroxidase injected at the lesion. The eyes were removed at regular postoperative intervals, sectioned, and peroxidase stained. The cell bodies of ganglion cells at the nerve-retina junction were the first labeled, with progressively more cells labeled laterally with time. The labeling progressed at a constant rate of 0.175 mm/hr from the nerve toward the retinal margin. This results in approximately a 22 to 34 hour differential between when the peroxidase reached and ganglion cells near the nerve and those on the margin. When this differential is translated into the initiation of axon regeneration it is sufficient to reestablish a cable and the specificity of the tectal projection.