HELMINTHS OF THE DEER MOUSE, (Peromyscus maniculatus) FROM NORTHERN COLORADO

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have occurred among common loons along the shore of Lake Michigan, losses which seem to be due to Type E botulism (Kaufman and Fay, Michigan State Univ. Agric. Exp. Sta. Quar. Bull. 47: 236-242, 1964; Fay, Kaufman, and Ryel, Univ. Michigan Great Lakes Res. Div. Pub. 13: 36-46, 1965). Although Type E toxin has frequently been demonstrated in the tissues of the loons from the Lake Michigan area both by Fay and Kaufman's laboratories and by our own laboratory at the Patuxent Wildlife Research Center (Locke and Bagley, Fish and Wildl. Ser. Circ. No. 226: 13-14, 1965), captive loons have not been available to accurately determine the levels of toxin needed to produce botulism in loons.

In October, 1965 an apparently immature male common loon was discovered in a weakened condition along the edge of a road in Minnesota and forwarded to the Patuxent Center for use in our studies on Type E botulism. Four days after arrival at the Patauxent Center the loon was placed outdoors in a holding pen similar to those described by Cornwell and Hartung (Jour. Wildl. Mgmt., 27: 290-292, 1963). During the first 4 or 5 days the loon swam actively and dove after small fish (bluegills and goldfish) which were placed in the tank. On the 6th and 7th days the loon gradually stopped swimming, then stopped eating and was found dead on the 8th day.

At necropsy the loon was found to be in good flesh and weighed 7 pounds. There was still a considerable amount of both subcutaneous and abdominal fat. The heart weighed 44.5 gms. and there was a marked valvular endocarditis. Plaques of *Aspergillus* were growing on the adventitia of many of the great vessels leading into the heart. The lungs were consolidated, with irregular areas of hemorrhage, and contained several small mycotic granulomas. Air sacs were thickened, opaque, and there were widely disseminated mycotic granulomas throughout all the thoracic and abdominal air sacs. The liver was light tannish brown in color, weighed 135 gms. and appeared normal grossly. The gall bladder was distended with bile and, in that condition, weighed 7.5 gms. The spleen appeared normal; it measured 21.5 mm long and weighed 3 gms.

Microscopically the lung contained several typical granulomas with *Aspergillus* hyphae. Sections of lung tissue stained by the periodic acid-Schiff technique contained a flowing sheet-like PAS positive material which had spread along and covered the alveolar capillary beds. Along the edge of this PAS positive material were distinct branching, septate hyphae typical of *Aspergillus sp.* which blended into the more amorphous sheet. Relatively few hyphae were seen extending into the lumens of the tertiary bronchi. Sections stained with H & E showed a typical cellular reaction to this spreading fungal sheet.

Loons have the reputation of being extremely difficult to keep in captivity and the rapidity of the spread of *Aspergillus* hyphae along the capillary bed suggests that loons might be highly susceptible to this mycotic infection.

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HELMINTHS OF THE DEER MOUSE, (Peromyscus maniculatus) FROM NORTHERN COLORADO

It is well known that the deer mouse, *Peromyscus maniculatus*, is host to a large number of parasites, many of which infect other rodents. Grundmann and Frandsen (1960, J. Parasitol. 46: 673-677) showed that the deer mouse with its high population density, omnivorous diet, and wide distribution, must be considered responsible for maintaining and distributing non-host-specific parasites amongst other rodents in different ha-

bitats. Since it is of zoological interest to have a knowledge of the parasite fauna of wild mammals in any region, a survey of the helminth parasites of the deer mouse may provide insight to parasitism in other rodent populations as well.

Eighty-eight deer mice collected from Cache la Poudre Canyon, Larimer County, northern Colorado, during the summer of 1964 were examined for helminth parasites. Four species of nematodes were found. The names of the parasites, number of hosts infected, per cent infection and location within the host are given below.

1. *Physaloptera sp.* (juveniles in tissues); 2; 2.3 per cent infected; stomach (a new host record).
2. *Mastophorus numidica* (Seurat, 1915); 33; 37.5 per cent infected; stomach.
3. *Rictularia coloradensis* Hall, 1916; 2; 2.3 per cent infected; small intestine.
4. *Trichurus perognatha* Chandler, 1945; 5; 5.7 per cent infected; caecum.

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A RAPID GEL DIFFUSION PRECIPITIN TEST FOR CONTAGIOUS BOVINE PLEUROPNEUMONIA[1]

During a recent outbreak of contagious bovine pleuropneumonia (CBPP) in Kenya, three tests used for diagnosis of this disease were re-evaluated. It was found that the slide agglutination serum test (SAST) in conjunction with agar gel diffusion test (AGT) for circulating antigen, detected 100% of cattle with CBPP whereas the complement fixation test failed to detect 6% of these cases (Shifrine and Gourlay, 1966, Bull. Epiz. Dis. Afr., in press).

Both AGT and SAST require little equipment and can readily be performed in the field, which is of great advantage under the present conditions in East Africa. The disadvantage of the AGT is that it requires 24 hours or more before the results of the test can be observed. Various modifications, therefore, were tried in an attempt to obtain results within a few hours. The modification that was developed is based on the quantitative gel assay of Feinberg (Feinberg, J. G., 1959, Immunology, 2: 346), using prediffused plates.

The AGT was done in petri dishes as previously described (Gourlay, R. N., 1964, Vet. Sci., 5: 473). Wells were cut in the agar with a cutter which consisted of a center well (11 mm in diameter) circled by 6 wells (6 mm in diameter); the distance between the center and peripheral wells was 3 mm. Hyperimmune bovine antisera against *Mycoplasma mycoides*, the causative organism of CBPP, were placed in the center well and the plate left for o ne to three days at room temperature. Sera from 73 cattle suspected of having CBPP were placed in the peripheral wells. Precipitin lines appeared after 4 to 6 hours using prediffused plates. When the conventional AGT (both reagents placed in the wells at the same time) was used, precipitin lines appeared after one to two days. Moreover, sera from 2 infected animals produced a negative test in the conventional AGT and positive test using the prediffused plates.

The use of the modified AGT for circulating antigen in conjunction with the SAST facilitates rapid field evaluation of cattle suspected of having CBPP.

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[2] Employed by the U.S. Department of Agriculture, Agricultural Research Service, Animal Disease & Parasite Research Division, Plum Island Animal Disease Laboratory, Greenport, Long Island, New York.