Observations on Malameba locustae from Chortoicetes terminifera
Cultures in Australia

The parasitic amoeba Malameba locustae has been isolated from laboratory cultures of the Australian plague locust, Chortoicetes terminifera, and the Australian plague grasshopper, Austroicetes cruciata, kept in Adelaide, South Australia. This is the first report of M. locustae from Australia, and it extends the known host range of the parasite.

Trophozoites and cysts of M. locustae were examined in squashes of Malpighian tubules in saline and in stained preparations. The trophozoites were usually spherical, but irregular forms were common and blunt pseudopodia were often seen in fresh preparations. Active movement at room temperature was observed. The cysts were oval and most had a thick refractile cell wall.

Measurements of 100 cysts from the Malpighian tubules of each of three locusts were made. The mean length (±SE) of cysts in fresh saline squashes from C. terminifera was 12.58 ± 0.11 μm, and the mean width was 7.53 ± 0.07 μm. These measurements agree well with those reported by J. E. Henry (J. Invertebr. Pathol. 11, 224-233, 1968) for M. locustae from Melanoplus spp.

J. M. I. Donaldson (Phytophylactica 3, 103-106, 1971) stated that viable cysts of M. locustae did not stain with methyl violet, and used the technique for detecting dead cysts. It was found here that cysts kept at 100°C for 4 hr were normal in appearance, but stained heavily with vital dyes, as did cysts exposed to a solution of hypochlorite containing 10% available chlorine for 15 min at room temperature.

Because M. locustae is probably transmitted by fecal contamination of food, and by cannibalism of dead and dying locusts by healthy locusts, it was necessary to maintain strict hygiene in locust cultures. To minimize the risk of cross-infection, cages were built with mesh floors, through which fecal material could drop. J. E. Henry (loc. cit.) reported that the drug Thypyramathe was useful in reducing the level of infection in infected locusts, and as a prophylactic. A 1% solution of the drug was given to the locusts in the drinking water for several generations after detection of the parasite. The observation that exposure of cysts to hypochlorite solutions made them permeable to vital dyes suggested that they were killed, although the infectivity of these cysts was not tested, and led to the use of a hypochlorite solution containing 5% available chlorine for washing equipment. Two years after the outbreak of M. locustae, the parasite was difficult to find in the culture of locusts; about 1 in 20 locusts being infected. Because the use of the drug Thypyramathe was not continued, it seems likely that the practices adopted for hygiene were responsible for maintaining the low incidence of the parasite.

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Received February 20, 1973

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