

THE CLAM HOSTS OF *NAJADICOLA INGENS* (K.) ACARINA
IN A QUEBEC LAKE¹

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THE NORTH AMERICAN water-mite, *Najadicola ingens* (Koenike), according to the observations of Koenike (1895), Wolcott (1899), and Humes and Jamnback (1950), lives as a parasite in the gill chambers of various fresh-water clams. On the basis of data then available Humes and Jamnback (1950) concluded that in the New England area *Anodonta cataracta* Say seemed to be the preferred host, *Elliptio complanatus* Solander next in preference, and *Lampsilis radiata* (Gmelin) the least preferred. They found *N. ingens* in 16 (89 per cent) of 18 *L. radiata* from Lake Massawippi, Province of Quebec, Canada. One *L. radiata* from Lake Champlain at Sandbar State Forest Park in Milton, Vermont, also contained *N. ingens*. *L. radiata* from fourteen other localities where mites were present in either *E. complanatus* or *A. cataracta* were unparasitized.

The exceptionally high incidence of the mites in Lake Massawippi indicated the desirability of further study. Accordingly, this lake was revisited and large samples of clams gathered from a strip of shoreline about 500 feet long at the southern end of the lake near the town of Ayers Cliff. On May 27, 1950, 65 *A. cataracta*, 299 *E. complanatus*, and 237 *L. radiata* were collected, and on September 1, 1951, 22 *A. cataracta*, 231 *E. complanatus*, and 141 *L. radiata* were obtained, making a total of 87 *A. cataracta*, 530 *E. complanatus*, and 378 *L. radiata*, or 995 clams in all.

The specimens of *E. complanatus*, whose average length was 74 mm. (49-93 mm.), were entirely without mites. The specimens of *A. cataracta*, whose average length was 87 mm. (57-112 mm.), were only rarely parasitized (3 out of 87 or 3.5 per cent). Only four specimens of *N. ingens* were recovered from these three clams.

Eighty-six per cent of the specimens of *L. radiata*, whose average length was 82 mm. (45-112 mm.), were parasitized (79 per cent in the 1950 group and 98 per cent in the 1951 collection). The number of *N. ingens*

found in a single clam ranged from 1 to 32, with all four gills capable of harboring the mites. The distribution of the 32 mites found in a single *L. radiata* which measured 90 mm. in length was as follows: left outer gill—1 male 4 females, left inner gill—4 males 6 females, right inner gill—5 males 4 females, right outer gill—4 males 4 females. A total of 2375 mites (1235 males and 1140 females) was recovered from *L. radiata*, the average number per parasitized clam being 7.4. Humes and Jamnback (1950) reported only 1.7 mites per parasitized *E. complanatus* and 1.8 per parasitized *A. cataracta*.

Humes and Jamnback (1950) found a distinct preference in location of the mites in *A. cataracta* (where they almost invariably lived in the outer gills) and in *E. complanatus* (where they nearly always occurred in the inner gills). A preference in location exists also in *L. radiata*, where the distribution of the mites was as follows: left outer gill—478 mites, left inner gill—742, right inner gill—737, and right outer gill, 418. There is thus a tendency to live as parasites in the inner gills of *L. radiata* more often than in the outer ones, but any or all of the gills may be parasitized.

In *L. radiata* a parasitized suprabranchial chamber usually contained only a pair of mites, one male and one female, in its anterior half. The suprabranchial chamber seems to be the site for oviposition, since egg masses occurred only there. Conspicuous papillae occurred on the walls of the chamber around the mites, having been apparently induced by their feeding. Varying numbers of both sexes of mites occurred along the distal margins of the gills between the gill lamellae.

In the May 27, 1950, collection of *L. radiata* no egg masses of *N. ingens* were found. Apparently oviposition begins in Lake Massawippi sometime after that date. In the September 1, 1951, collection 38 per cent of the parasitized *L. radiata* contained already hatched or dead egg masses of the mite. These data may be compared with the observation

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of Humes and Russell (1951) that *N. ingens* in a New Hampshire pond breeds in *A. cataracta* only during June, July and August.

These observations indicate that in Lake Massawippi, at least, *L. radiata* is very frequently and heavily parasitized by *N. ingens*, while *E. complanatus* and *A. cataracta*, though living side by side with *L. radiata*, are not at all or only rarely parasitized. Although the mites may parasitize all four gills, they show a definite preference for the inner gills. If mites are present in a suprabranchial chamber, they usually consist of a male and a female. Varying numbers of both sexes occur in the distal margins of the gills between the gill lamellae.

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