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ON CERTAIN CRUSTACEOUS PARASITES OF FRESH-WATER FISHES.

By D. S. KELLICOTT, Buffalo, N. Y.

At the Buffalo meeting of this Society, August, 1879, I was permitted to read a general paper on "Certain Crustacea Parasitic on Fishes from the Great Lakes." This paper, with figures, appeared in the Proceedings of that meeting, page 53 and following. At that time I was uncertain about the identity of any one of the three species referred to, and gave such facts as I had observed concerning each of them. I have since secured or obtained access to the literature pertaining to these forms, and I am of the opinion that two of them have not been mentioned elsewhere. The one called the External Herring-Sucker I take to be identical with *Lernaepoda coregoni*, S. I. Smith. (Report of the Commissioner of Fish and Fisheries, 1872-73, page 664, plate III, figure 17.) It was found by Mr. J. W. Milner on the White-fish, *Coregonus albus*. I have found it nearly every month of the year on the Lake Herring, *Coregonus artedii*.

The form described as the Gill Herring-Sucker, and also the Rock-Bass Sucker, I think have not been elsewhere described. So I offer below a brief description of each, with names, referring to the paper cited above for a general account and figures.

Achtheres Corpulentus, n. s.

Very stout, head nearly as long as the body, and nearly as broad; body broadly ovate; arms long, attenuated toward their union; the pedicled *bullae* a broad disc, brown. The second pair of

jaw-feet are robust, reaching to extremity of rostrum; terminal joint obtusely rounded, and bearing one minute hook at end. The mandibles with seven teeth; the mandible curves over at apex to form the first strong, blunt tooth; the second is the longest, while succeeding ones gradually diminish in length; on one mandible the lowermost two or three are rather obscure. The ovisacs are broad at base, tapering towards the apex; a little longer than the body, and are turned upwards so that they rest above the back of the animal; there are about eight rows of eggs at the base, and not more than four at the apex.

Entire length of body from mouth to extremity of body, 7 $m.m.$; greatest breadth of body, 3.25 $m.m.$; breadth of *bulla*, 3 $m.m.$; length of ovisacs, 4.25 $m.m.$

Found in the gill cavities of *Coregonus artedii*, taken in the Niagara river. (Figs. 1-3, plate I, vol. 1, Proc. of the A. S. M.)

Achtheres Ambloplitis, n. s.

Body broad, ovate; the apex somewhat acuminate; rostrum short; arms long, robust; *bulla* distinctly peduncled, globular; second jaw-feet inserted almost between the arms; terminal joint attenuated to a claw.

Ovisacs cylindrical; length about equal to the width of the body.

Entire length from *bulla* to end of egg tubes, 5.2 $m.m.$; length of body from the mouth to apex of abdomen, 2.7 $m.m.$; length of ovisacs, .93 $m.m.$

Found on gill arches of the Rock Bass, *Ambloplites rupestris*, taken from Shiawassee river, Mich. (Figs. 6 and 7, plate III, vol. 1, Proc. of the A. S. M.)

I have regarded the above as belonging to the genus *Achtheres*, because they have "Branchiform appendages, separate below and united only at the end; with prehensile, or anchor-like appendages; with the posterior foot-jaws situated very near the arms; with the body short, and thorax articulated." (M. Edwards.) I may add, also, that they appear to belong rather to *Basanistes* after immersion in alcohol, or soon after death, if left in water. While living, especially young individuals, show plainly the articulation of the thorax.

Lerneocera Pectoralis, n. s.

Body of young examples nearly straight,—of old ones, strongly bent and clavate; abdomen represented by three lobes, the upper extending far over the insertion of the ovisacs, and obtusely rounded; horns three, the two lateral ones three or four pronged; the dorsal one stout, and forked at apex.

Ovisacs claviform.

Entire length, 7.5 $m.m.$; width of anchor appendages, 1.7 $m.m.$

Found in the axilla of Red-finned Shiner, *Luxilus cornutus*, Jordan, taken in Shiawassee river, Mich.

Late in July and early in August, 1881, I found this form quite abundant at Corunna, Mich. I took in all about a dozen; all but two were in reddish lumps back of the pectoral fins.

This species resembles the one which occurs on the Cat-fish, (Des. in Vol. 2, Proc. A. S. M., page 41), but differs in size, *Pectoralis* being but little more than half as long as *Tortua*, the "horn" on the back is forked in the former, and simple in the latter; the egg-tubes of this are relatively shorter and clavate, like those of *Cruciata*, (Vol. 1, Proc. A. S. M., page 64, plate I, fig. 1, e.) Again the terminal hairs on abdomen of this one arise from elongated tubercles and are smooth, while in the other they are plumose; these hairs are rarely seen on old specimens.

The first four pairs of swimming feet are of the usual pattern, and more easily seen than on our other species; the fifth pair are also easily seen, standing just above the place of attachment of the ovigerous sacs, they differ from the others in having a shorter basal piece, with external tubercle with long seta and a distal broad, hand-like joint with bristles on its outer edge.

In transparent examples the lobular expansion of the alimentary canal extending out into the base of the horns can be well seen; it is also plain that the back and forth pulsations of the canal is due to the muscular walls of this sac and the muscular termination of the canal attached at the abdominal extremity.

The young of this species, when it leaves the egg, is a nauplius of oval outline, length .00027 $m.m.$ It has two pairs of swimming organs, obscurely jointed, distally biramous, with hairs; anten-

næ rather stout, terminated by two hairs. Eye, black, double. Posterior extremity of body supplied with two spines.

The young are exceedingly lively. After darting about for a few strokes, they come to rest, with the last pair of limbs at right angles to the body and the middle pair thrown forward, with the antennæ in line with the body. After a brief rest they again dart about. They were watched for several hours, but no change observed to take place.