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Binder 008, Aerobiotrematidae [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

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AEROBIOTREMATIDAE n. fam.

Family diagnosis.—Digenea with ventral acetabulum. Body robust, plump, with posterior region marked off from main body by circular ridge. Body parenchyma divided into dense peripheral layer and spongy central layer. Oral sucker and pharynx well developed, ceca sinuous. Acetabulum near anterior extremity. Testes juxtaposed, postacetabular. Vesicula seminalis and prostatic complex strongly developed, hermaphroditic duct present. Genital pore median between two suckers. Ovary compact, near posterior extremity. No Laurer's canal. Vitellaria forming grapelike bunches of large follicles, extending in posttesticular field. Uterus strongly distended with eggs, occupying all available space posterior, dorsal and anterior to testes; metraterm well differentiated. Excretory vesicle Y-shaped in general pattern, with arms uniting anteriorly and provided with numerous side branches running parallel to ceca. Parasitic in air bladder of fishes.

From Yamaguti, 1958

*Type genus: Aerobiotrema*¹⁾ n. g.

Aerobiotrema n. g.

Generic diagnosis.—Aerobiotrematidae: With characters of family. Oral sucker subterminal, directly followed by pharynx, esophagus turned back on itself; ceca very wide, with sinuous walls, terminating blindly at posterior extremity. Acetabulum smaller than oral sucker, nearly one third of body length from anterior extremity, not prominent over ventral surface. Testes voluminous, juxtaposed behind acetabulum; seminal vesicle elongate, winding behind intestinal bifurcation; pars prostatica surrounded by dense mass of prostate cells; ductus ejaculatorius joining metraterm to form hermaphroditic duct. No cirrus pouch. Genital pore about halfway between two suckers. Ovary situated beside shell gland near posterior extremity. Neither receptaculum seminis nor Laurer's canal. Uterus strongly distended with eggs, winding posterior, dorsal and anterior to testes; metraterm in direct continuation of hermaphroditic duct; eggs small, round, embryonated. Excretory vesicle Y-shaped; arms with numerous side branches, uniting dorsal to pharynx. Parasitic in air bladder of teleosts.

Genotype: *A. muraenesocis* n. sp.

From Yamaguti, 1958

Habitat: Air-bladder of *Muraenesox cinereus*.

Material and locality: Two mature specimens; Tamano Aquarium at Shibukawa, Tamano City, Okayama Prefecture.

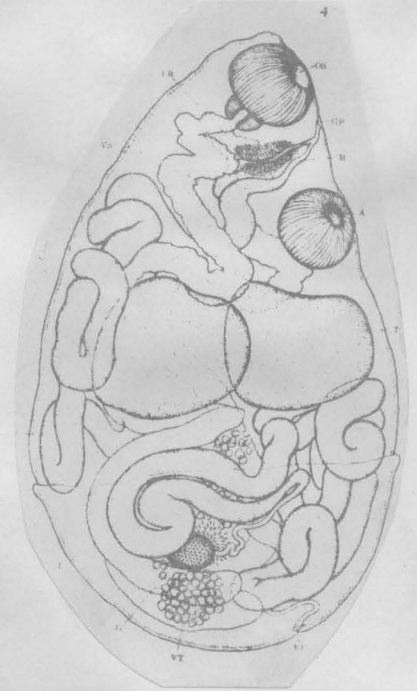
Body plump 13.5 mm long¹⁾, rounded at two extremities; the hemispherical posterior region covered with smooth cuticle is delimited from the main body by a distinct circular ridge as shown in the free-hand sketch (Fig. 10). Forebody tapered anteriorly and curved a little ventrally; cuticle thick, transversely wrinkled ventrally, especially at the acetabular level. Between the genital pore and the acetabulum is a transversely elongated shallow depression clearly recognizable with a hand lens. On the sectioned preparations the body parenchyma consists of an outer layer of comparatively fine network of connective fibrils and an inner layer of spongy network of coarser fibrils, the open spaces of which contain very fine granules precipitated by **SCHAUDINN'S** fixative with glacial acid added. The oral and ventral suckers, pharynx, esophagus, terminal genitalia and peripheral uterine coils are embedded in the dense peripheral layer, while the other reproductive organs, intestinal ceca and excretory vesicle occupy the spongy central parenchyma.

Oral sucker spherical, 1.7-2.1 mm in diameter, subterminal, with overhanging preoral lip formed by body wall, directly followed by muscular pharynx 0.9 mm long by 0.96 mm broad. Esophagus constricted at very beginning, but greatly expanded elsewhere, directed posterodorsally and then turning ventrad to bifurcate behind pharynx. Ceca very wide throughout their length, with sinuous walls, forming an abrupt turn in front of testes, and encircling the latter, behind which they form another acute turn to encircle the ovarian complex, finally terminating blindly at posterior extremity near dorsal cuticle. Acetabulum spherical, embedded in body parenchyma about one-third of body length from anterior extremity.

Testes rounded rectangular in lateral view, 3.3 mm in greatest dorsoventral diameter, lying in direct contact with each other behind level of acetabulum between two ceca, surrounded dorsally by uterine coils, each giving off its own vas efferens from near anterodorsal corner. Two vasa efferentia running forward convergently, uniting to form elongate sigmoid vesicula seminalis, which is wider distally than proximally, attaining maximum width of 0.4 mm. Pars prostatica 0.7 mm long, widest (0.25 mm) at base, surrounded by flask-shaped compact mass of gland cells, situated dorsoventrally about midway between pharynx and acetabulum, followed by comparatively short (0.4 mm long) ejaculatory duct which is lined with thick smooth cuticle and opens along with the metraterm into the ductus hermaphroditicus. The latter, appearing as a direct continuation of the metraterm, is 0.7 mm long by 0.15 mm wide and opens outside in the median line a little behind the mouth aperture.

Ovary small, ovoid, 0.8×0.4 mm, situated about middle of posterior portion demarcated from main body, left of shell gland, with long axis dorsoventral. Shell gland large, enclosed in fibrous capsule in front of distal end of ceca; ootype large, surrounded by radiating gland ducts; receptaculum seminis and Laurer's canal absent. The uterine duct, winding in the spongy parenchyma on the left of the ovary, proceeds toward the periphery; after forming a transverse coil on the right of the ovarian complex the uterus turns back to the left side and extends longitudinally, occupying the whole ventral area between the posterior extremity and the testes, then running dorsad behind the testes forms two longitudinal loops on the dorsal side of the testes and ceca. Finally it comes to lie in front of the testes, where the terminal uterus passes between the two vasa efferentia and leads into the metraterm beside the pars prostatica. Metraterm 1.0 mm long, lined with thick smooth cuticle and provided with inner circular and outer longitudinal muscles. Eggs round, embryonated, 16-18 μ in diameter. Vitellaria divided into bunches of large rounded follicles, extending longitudinally on each side of ovarian complex, between the latter and ceca, as well as in intercecal field just posterior to testes.

Excretory vesicle Y-shaped in general pattern; the stem originating from the terminal pore ascends in the central region, then on the left of the ovarina complex, and bifurcates at the level of the anterior end of the vitellaria; two arms apparently uniting dorsal to pharynx, sending off numerous, long or short, partly anastomosing, side branches, most of which lie close to the ceca medial, ventral, or lateral to them.



This genus is characterized by the main body being demarcated from the hemispherical posterior extremity by a circular ridge, and by the vitellaria forming grape-like bunches of large follicles and being confined to the post-testicular intercecal field, and by the Y-shaped excretory arms being provided with numerous side branches running parallel to the winding ceca. In view of these characteristics it undoubtedly represents a distinct family, though resembling *Isoparorchis* SOUTHWELL, 1913, in gross internal anatomy and habitat.

The new family, for which Aerobiotrematidae is proposed, is defined as follows and placed near the Isoparorchidae.

