

Late embryogenesis and morphogenesis of the cotylocidium larva of *Rohdella amazonica* (Trematoda: Aspidogastrea)

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Background. Aspidogastrea, a basal taxon of Trematoda, is regarded as being among the most primitive of neodermatan flatworms. Understanding the developmental biology and larval morphology of its members might lead to better understanding of the phylogenetic relationships among this and more derived groups such as the Digenea and Cestoda.

Objectives. Late stages of embryogenesis and morphogenesis of the cotylocidium larva of *Rohdella amazonica*, an aspidogastrea parasite of fish, were studied to reveal the functional and developmental ultrastructure of the larva, as well as phylogenetically relevant characteristics of the embryos and larvae.

Material and Methods. Gravid worms were removed from the intestine of naturally infected banded puffer fish *Colomesus psittacus*, collected from the Bay of Marajó, Paracauri River (Pará, Brazil), and processed by standard methods of transmission electron microscopy (TEM).

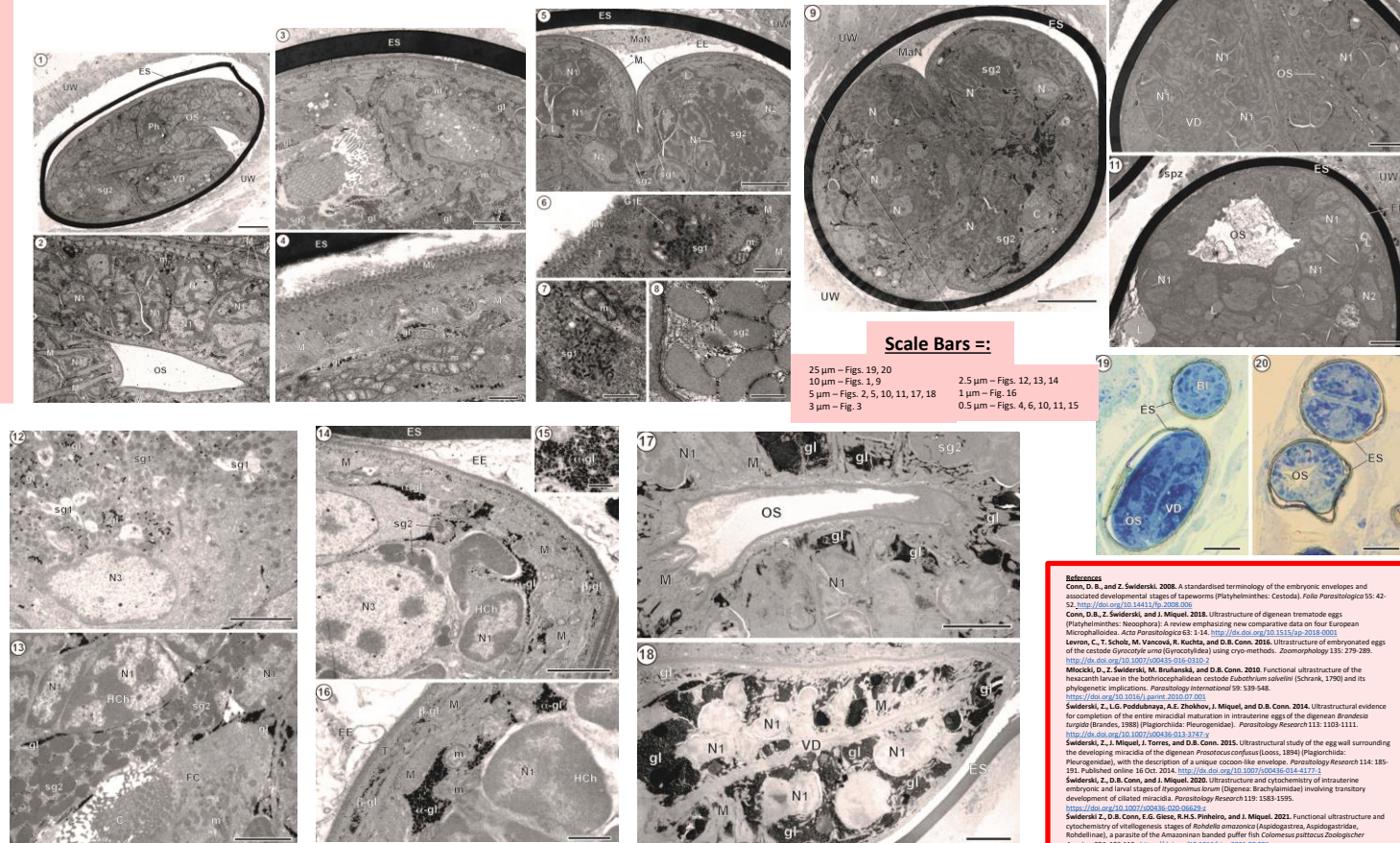
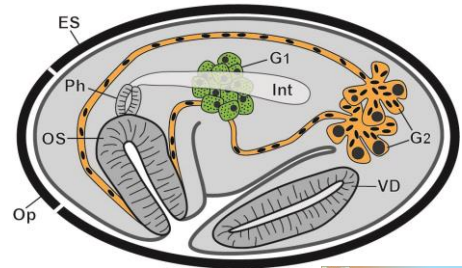
Results. During late cleavage and rearrangement of the blastomeres, the vitelline syncytium that plays a role in eggshell formation and nutrient provision to the embryo completes its apoptotic degeneration as the embryonic mass grows substantially. Early larval morphogenesis involves cellular positioning that defines antero-posterior polarity of the differentiating larva. Progressing through larvigenesis, the anterior end forms a muscular oral sucker surrounding the mouth, which leads inward into the pharynx and expanding digestive cavity. At the posterior end, a large disc forms as a precursor to the eventual ventral disc. The fully formed cotylocidium, still within the eggshell, is flexed ventrally, bringing the two poles into near juxtaposition. The neodermatan tegument with outwardly projecting small microvilli becomes fully formed, as two granular regions, myocytes, and a protonephridial system occupy the rest of the body's interior.

Conclusion. The ultrastructural features described here are very similar to those reported for *Aspidogaster limacoides* from fish and *Cotylogaster occidentalis* from molluscs, but differ from the more diverse miracidia of digeneans, which have been studied more extensively.

Figure Abbreviations

α-gl – alpha glycogen	MaN – macromere nucleus
β-gl – beta glycogen	MiN – micromere nucleus
Bl – blastomeres	Mv – microvilli
C – ciliary tuft	N – nucleus
EE – embryonic envelope	N1 – nucleus type 1
ES – eggshell	N2 – nucleus type 2
ER endoplasmic reticulum	N3 – nucleus type 3
FC – flame cell	OS – oral sucker
G1 –gland type 1	Op – operculum
G2 – gland type 2	Ph – pharynx
G1E – exit of gland type 1	sg1 – secretory granule type 1
gl – glycogen	sg2 – secretory granule type 2
HCh – heterochromatin	spz – spermatozoan
Int – intestine	T – tegument
L – lipid droplet	m – mitochondria
M – myofibrils	UW – uterine wall
	VD – ventral disc

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