

Anaperus ornatus N. sp.: A New Interstitial Acoelan Turbellaria from Marine Sediments in the Red Sea

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ABSTRACT. The new species *Anaperus ornatus* n. sp., was collected from the muddy and sandy bottom of a lagoon in front of the Hurghada station at the Red Sea in Egypt in July-August 1998. It is considered to be a new interstitial Acoelan Turbellaria from the Marine Sediments. The worm is dark brown due to the presence of zooxanthellae with scattered areas of different glittering colours. Each area is divided into 3 quite distinct pigmented parts. One of them has a golden coloration, the second is blue and the third one has a green coloration. It has a length of about 1/2 mm the Frontal Organ, the excitant organs and the antrum musculinum are totally missing.

A sperm ball is connected anteriorly with a cuticularized mouth piece extending vertically downwards towards the Ventral surface.

The animal possesses only one male genital aperture, a little distance before the posterior end leading directly to the muscular penis opening into the Vesicula granulorum which is connected with two false Vesicula Seminalis. The two testes are placed laterally, to a medio-dorsal Ovary.

Introduction

The intense study of marine fauna over the last three decades has led to an explosive increase in our knowledge of many animal groups. Surprisingly, in view of the previously demonstrated specimens, some Turbellarians being associated with mud, many new kinds of Acoelan Turbellarians have also been found in sand (Dorjes, 1968) which now contribute to one-third of all Acoel species. In sandy intertidal and subtidal zones of the galapagos Islands, the Acoelan Turbellarians exist with at least 25 species (Ulrich Ehlers and Dörjes, 1979 and Faubel, 1976). As few scientists had worked on Turbellarians of the Red Sea, especially at its north-west and east part (Palombi, 1928; Melouk, 1940. Antonius, 1968, Beltagi, 1983; Beltagi & Khafaji, 1984; and Beltagi, 1996). It was encour-

aging for us to continue such Taxonomic research works concerning the interstitial Turbellarians at the lagoon of the western zone of the Red Sea (Hurghada).

Materials and Methods

The area selected for this study is located near the Marine station at Hurghada. It is subjected to an extensive investigation.

The reef complex at the Hurghada Marine station is represented by a fringing reef connected to a raised coastal plain and followed by a lagoon seaward.

The bottom sediments range from coarse to fine-grained carbonates. No coral growth occurs, in the lagoon and the sediments are to a great extent fine muds.

The turbellarians and the sediments are collected from the lagoon and the reef flat, at depths reaching one meter, by using a dredge of a heavy steel frame with non-flexible bridge of steel rods and a bag of heavy-duty nylon netting with a finer-meshed inner lining.

Ten specimens of the flattened worms collected from the marine sediments 2 cm deep and fixed by sudden killing using hot sublimated Bouin's solution, without previous narcotization. After 48 hours fixation, the animals were washed and then preserved in 70% ethanol. Borax carmine, as well as Delafield's-haematoxylin, were used in staining W.M. preparations.

Serial transverse, longitudinal and median-sagittal sections were made at a thickness of 8-10

µm and drawings were based on reconstructions of these sections. Hamatoxylin-eosin was used for staining the serial sections, giving good results.

Taxonomic description:

- Order : Archoophora (Westblad, 1948)
- Sub-order : Proandropora Abursalia (Westblad, 1948)
- Familie : Anaperidae (Jurgens Dörjes, 1968)
- Genus : Anaperus (Graff, 1911)
- Species : Ornatus Nov. sp.

External Features: (Fig. 1)

The animal is nearly elongated and oval in shape. The anterior end is somewhat rounded while the posterior end is pointed. In this respect, it re-

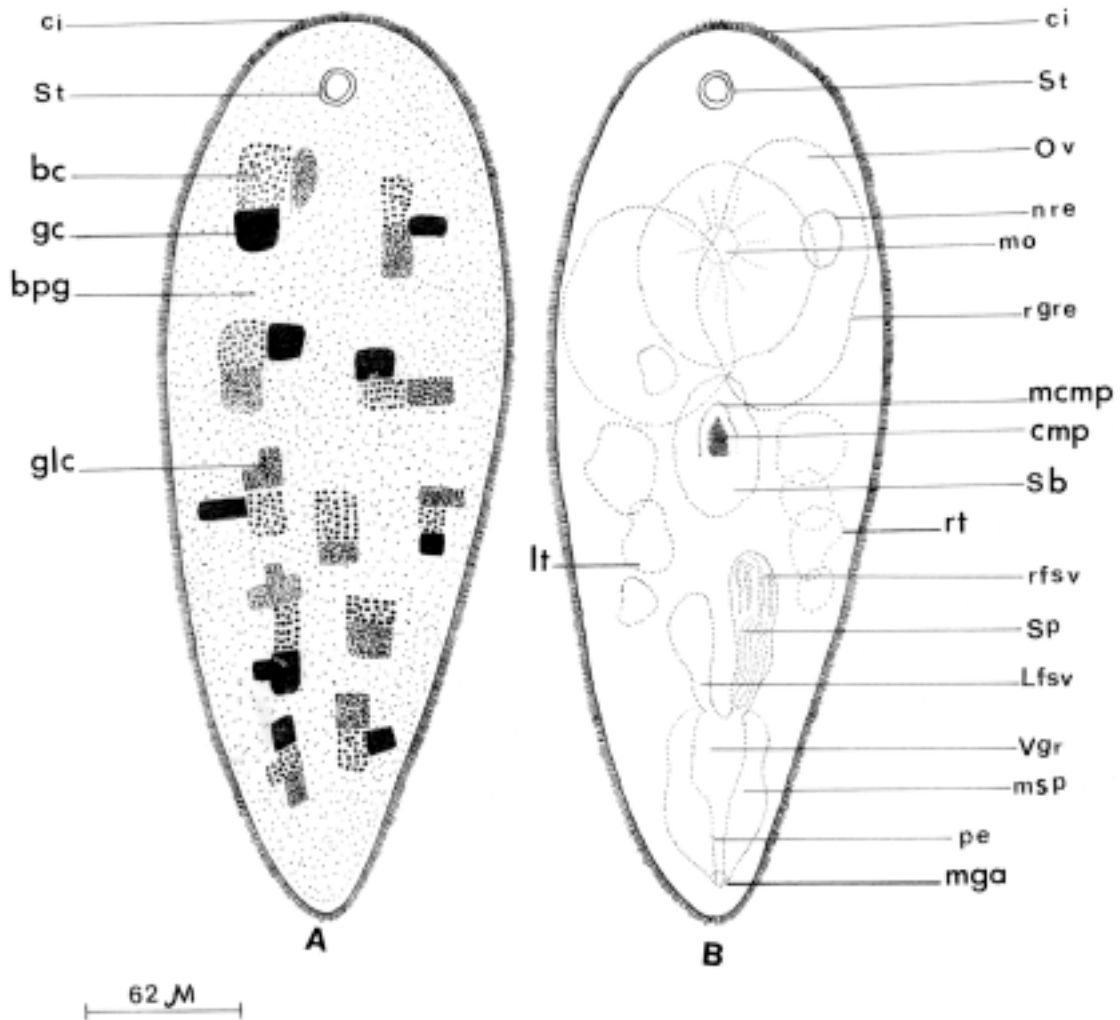


FIG. 1. A. External features (*Anaperus ornatus*, n. sp.).
 B. Reconstruction from squeezed specimen (*Anaperus ornatus*, n. sp.).

sembles to that described by Graff, 1882, concerning *Convoluta bimaculata*, *Convoluta groenlandica* (Levinsen, 1879), Steinböck, 1931), and *Anaperus australis* (Westblad, 1952, p. 6).

The length of the animal is about 0.3-0.5 mm. The breadth, from 0.1-0.2 mm. The dorsal part of the body is convex, while the ventral part is concave, thus resembling *Convoluta convoluta* (Graff, 1905) and *Convoluta macnae* (Marcus, 1957) and *Convoluta Cenata* (Marcus Du Bois-Reymond, 1955). The animal has several scattered colored areas, which are elongated consisting of glittering golden, bluish and green parts. In this respect the animal differs completely from most of the known species of the genus *Convoluta* (Orsted, 1943), and the genus *Anaperus* (Graff, 1911). The statocyst is situated after the anterior tip of the body for a distance of about 21.0 μm . The diameter of the statocyst is 21.0 μm . The brown coloration of the body is mainly due to the existence of the symbiotic brown algae (zooxanthellae). In this respect, the animal resembles *Convoluta flavibacillum* (Jensen, 1878), *Convoluta Convoluta* (Graff, 1905), *Convoluta henseni* (Böhming, 1895), *Convoluta macnae* (Marcus, 1957), and *Anaperus Trifurcatus* (Beltagi, 1983), *Amphiscolops marinelliensis* (Beltagi & Khafaji, 1984). They are embedded in the parenchymatous and endocytial tissues. The eyes are totally missing.

General Organization: (Fig. 2)

The body is oval in shape and begins anteriorly with the brain mass (Fig. 2 bm) which is situated in the parenchymatous tissue, at a distance of about 21.0 μm from the anterior tip. The brain mass gives rise to three main pairs of nerve stems (Fig. 2, ns): one pair is dorsal, the second one is lateral and the third one is ventral.

The lateral pair nerve stems (Fig. 2 llns, rlms) give rise posteriorly to two longitudinal lateral nerves. The brain mass extends into a region of about 21.0 μm in length. It is surrounding the statocysts (Fig. 1.2, St) from all sides, as in the case of *Anaperus tvaerminnensis* (Luther, 1912) and *Anaperus trifurcatus* (Beltagi, S., 1983). The eyes and the frontal gland are missing, and in this respect, it differs from all the known species of the genus *Anaperus*. The mouth opening (Fig. 1.2, mo)

is situated at the end of the first third part of the body. It is a rounded space situated at the ventral surface of the body. It leads directly to the endocytium (Fig. 2 en) which extends anteriorly a little distance after the brain mass, and goes posteriorly until nearly the end of the second third part of the body.

The Female Reproductive Organ: (Fig. 1B, 2)

This organ lacks the female genital aperture and the antrum femininum (vagina). The sperm ball (Fig. 1B, 2 sb) is located in a large oval space situated in the endocytial tissue. It has a length of about 56.0 μm . The animal resembles in this respect most of the known species of the genus *Anaperus*, differing completely from all the known species of the genus *Convoluta* with the exception of the *Convoluta macnae* (Marcus, 1957).

The cuticularized mouthpiece (Fig. 1B, plate 2 cmp) which is connected to the ventral part of the sperm ball extends vertically downward towards the ventral surface. Its length is about 19.6 μm . While its breadth is about 9.8 μm . The mouthpiece is surrounded by its matrix (Fig. 1B, plate 2 mcmp) and is lamellated. The ovaries (Fig. 1B, 1 plate 2. ov) are unpaired and single. Thus, it resembles that described by Westblad, 1952. Concerning *Anaperus australis*.

The most striking fact is that the large pipe eggs (Fig. 1B, 2 pl. Lgre) are all united together and placed dorsally, while the small unripe eggs are separated from each other and placed ventrally. The male genital aperture (Fig. 1B, plate 2 mga) is situated at a distance of about 14.0 μm before the posterior end, nearly as in the case of *Anaperus australis* (Westblad, 1952), *Convoluta macroposthia* (Steinböck, 1931). It is rounded in shape, having a diameter of about 7.0 μm and it leads directly to a muscular and tubular penis (Fig. 1B, plate 2 Pe) having a length of about 42.5 μm , which extends anteriorly and is connected with the vesicula granulorum (Fig. 1B, plate 2 vgr) filled with eosinophilous secretion made of coarse particles formed by the epithelial layer lining the vesicula granulorum, as in the case of *Anaperus tvaerminnensis* (Luther, 1912). It is connected with right and left false seminal vesicles (Fig. 1B, plate 2 vsv, lpsv). The antrum masculinum is totally missing. A right and left testes (Fig. 1B, plate 2 rt, lt),

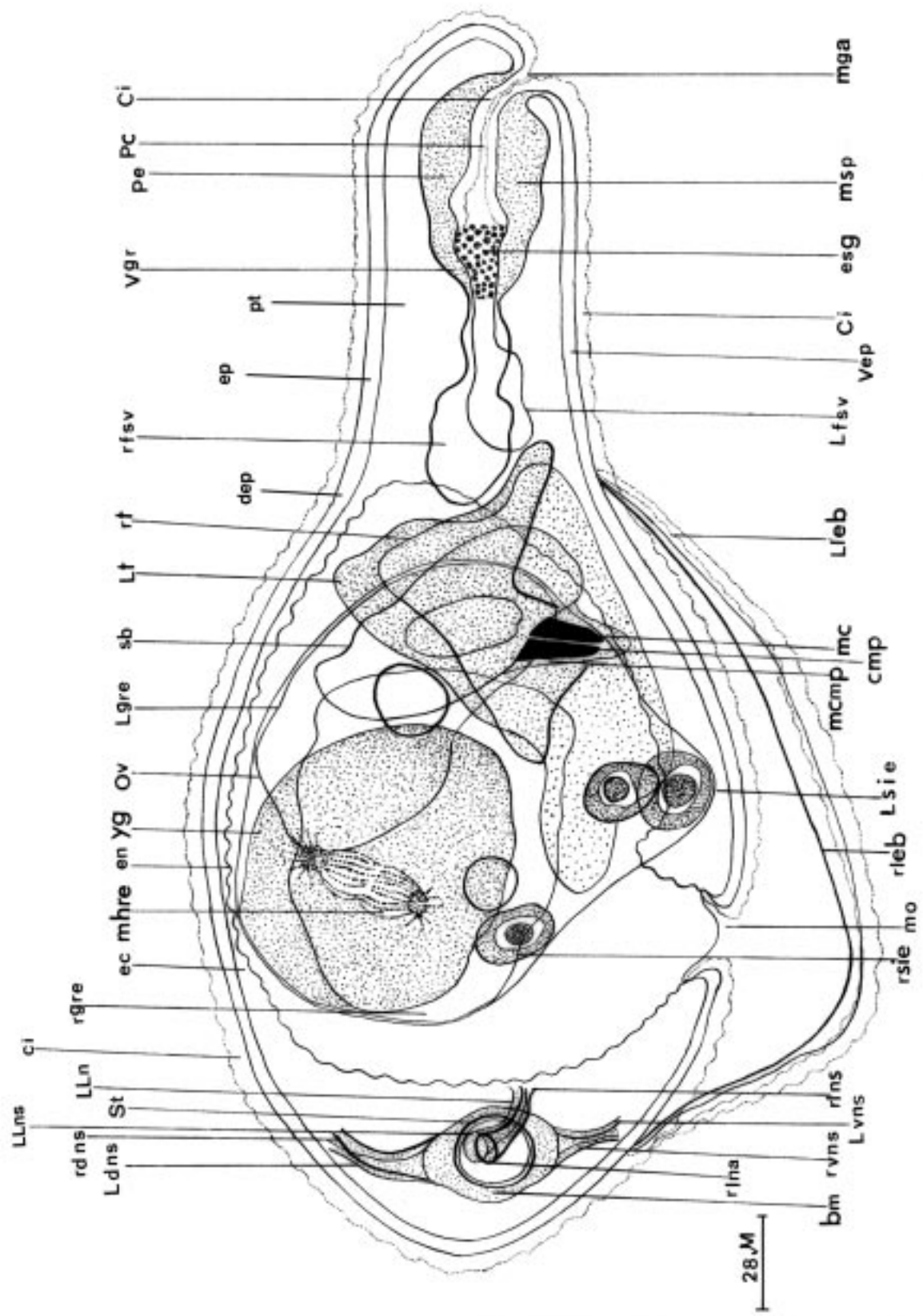


FIG. 2. Reconstruction of *Anaperus ornatus*. n. sp. from serial transverse sections.

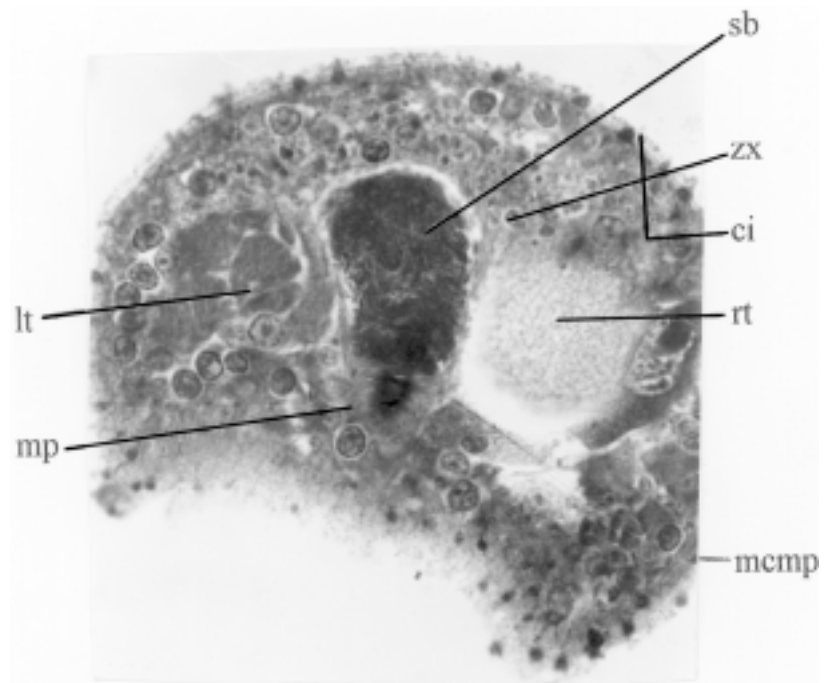


PLATE 1. *Anaperus ornatus*, n. sp. (T.S. in the reproductive region).

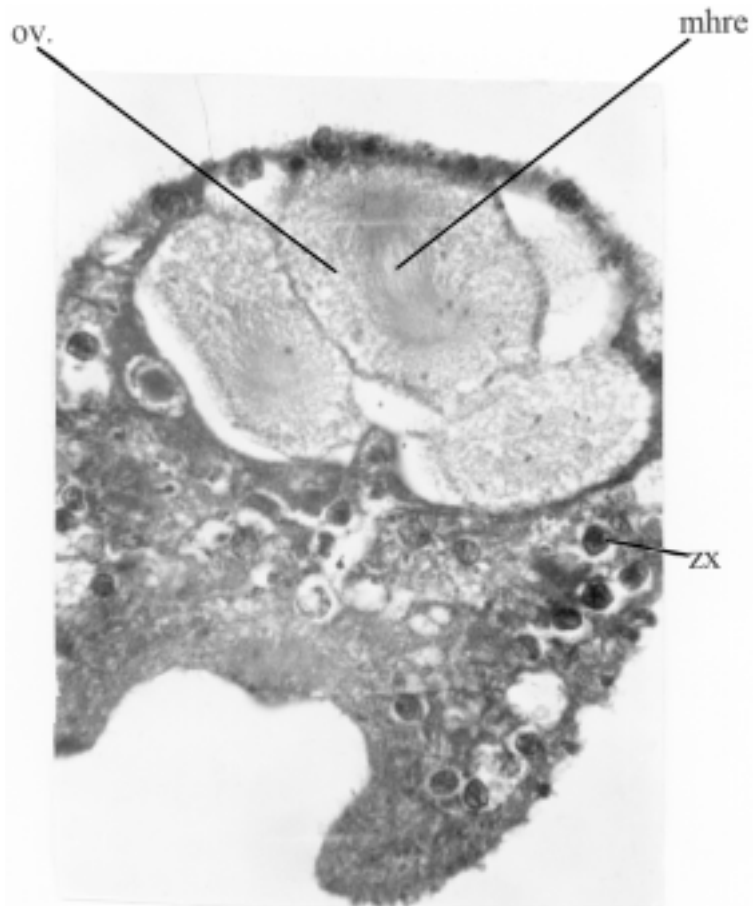


PLATE 2. *Anaperus ornatus*, n. sp. (T.S. in the region of ovary).

are paired and separated from each other and placed laterally to the ovaries in both sides. They are follicular in structure.

***Fpicytium:* (Fig. 2 – ep)**

The body of the animal is covered externally by a thick coat of cilia (Fig. 1,2-ci) which are also lining the orifices of the body. In this animal, the cilia are somewhat thick, having a length of about 5.6 μm . The basal bodies of the cilia are very fine. The inner endings of the cilia are short and they are swimming freely in the plasmatic material of the epithelial layer. The nuclei of the epithelial layer are embedded in the epicytial cytoplasm, thus resembling in this respect that described by Luther 1912, concerning *Anaperus tvaerminnensis*, *Convoluta flavibacillum*, *Convoluta Salinis* (Graff, 1905), *Convoluta norvegica*, *Convoluta karlingt* (Westblad, 1946), *Convoluta Sordida* (Graff, 1879) and *Convoluta urua* (Marcus, 1954) and *Anaperus trifurcatus* (Beltagi, 1983).

Each nucleus is oval in shape and small in size, having a diameter of about 2.80 μm . The most striking fact is that the plasmatic material of the epithelial layer is interrupted by the bodies of the intergumentary gland cells, for example, the mucous gland cells, each of which has a flask-shaped structure, having a length of about 7.0 μm , and a thickness of about 2.80 μm . They are more abundant at the dorsal epithelial layer than at the ventral one. It is worthwhile to notice that the dorsal epithelial layer (Fig. 2-dep) is thicker than the ventral one. It is also observed that the epicytial layer is penetrated by elongated oval sack-shaped organs, each of which possesses a dark coloration, even after staining with mallory. It has a moderate length of about 8.04 μm and a breadth of about 4.20 μm . It is filled with coarse irregular particles together with very fine elongated threads, thus forming a network shape. Most of these structures are considered to be pigment cells, nearly as that described by Luther (1912, p. 20), concerning *Anaperus tvaerminnensis*. These pigment cells are numerous at the dorsal epithelial layer than at the ventral one.

***Ectocytium:* (Fig. 2 ec)**

The parenchymatous tissue (Fig. 2-pt) is formed of a compact syncytial plasmatic substance which is stained dark blue by mallory. The nuclei are

scattered irregularly in the tissue. Each nucleus is nearly oval in shape, having a diameter of about 2.80 μm . Large symbiotic brown algae (zooxanthellae) are embedded in the parenchymatous tissue, and in this respect the animal resembles *Convoluta macnae* (Marcus, 1957) and *Anaperus trifurcatus* (Beltagi, 1983). Each algal cell is nearly oval in shape, having a diameter of about 9.20 μm . The body of the algal cell is round in shape, having a moderate diameter of about 1.40 μm . The nucleus (Fig. 2 nu) of the algal cell is oval in shape, having a diameter of about 2.80 μm . The symbiotic algal cell is embedded in a vacuole in the parenchymatous tissue, having a diameter of about 14.0 μm , and thus isolating the algal cell from the surrounding tissue. They are different in size and are more concentrated at the dorsal part of the body and the ventral one. The frontal gland is missing. In this respect, the animal differs from all the known species of the genus *Anaperus*.

***The Muscular System:* (Fig. 2)**

It is formed of the sub-epidermal muscle layer, which is composed of:

1. An outer circular muscle layer (Fig. 2 cml)
2. An inner longitudinal muscle layer (Fig. 2 lml)

In this respect, the animal differs from *Anaperus sulcatus* (Beklemeschew, 1914, p. 2-4) and from *Convoluta thauma* (Marcus, 1952), *Convoluta Macrophosthia* (Steinbock, 1931, p. 4), *Anaperus tvaerminnensis* (Luther, 1912), and *Anaperus gardineri* (Graff, 1912). The thickness of the subepidermal muscle layer is about 2.10 μm , while the diameter of the longitudinal muscle fiber is about 1.4 μm . It is worthwhile to notice that the parenchymatous muscular fibers are very weakly developed, and it is very difficult to observed and follow them. In this respect the animal differs from most of the known species of both genera *Convoluta* and *Anaperus*.

***Endocytium:* (Fig. 2 en)**

It begins with the mouth aperture (Fig. 1,3 ma) which is situated at the ventral surface, nearly at the end of the first third part of the body. In this respect, the animal resembles *Anaperus australis* (Westblad, 1946), *Convoluta hanseni* (Bohmig,

1895), *Convoluta confusa* (Graff, 1905), *Convoluta japonica* (Kato, 1951) *Convoluta Westbladi* (Marcus, 1949).

The mouth aperture is rounded in shape having a diameter of about 14.0 μm . It is considered to be a space in between the ventral epithelial layer, as described by Marcus, concerning *Convoluta cenata* (1955). The inner border of the mouth is not sunk into the endocytial tissue. No gland cells open into the place of connection between the mouth and the endocytium. It leads directly to the endocytial tissue. The pharynx is absent, thus it resembles most of the known species of the Genus *Anaperus* and differs greatly from *Convoluta Schultzii* (Schmidt, 1852), *Convoluta sordida* (Graff, 1879), *Convoluta locazii* (Graff, 1891), *Convoluta hipparchia* (Pereyaslawzewa, 1892), *Convoluta subtilis* (Graff, 1982), *Convoluta albomaculata* (Pereyaslawzewa, 1892) *Convoluta Variabilis* (Pereyaslawzewa, 1892) *Convoluta convoluta* (Muller, 1806), *Convoluta confusa* (Graff, 1905), *Convoluta pelagica* (Löhner and Micoletzky, 1911), and *Convoluta thauma* (Marcus, 1952).

The plasmatic substance of the endocytial tissue is somewhat compact and is extending anteriorly beginning nearly from the middle part of the first third region of the body till about the end of the second third part of the body. The nuclei of the endocytial tissue are scattered irregularly. Each nucleus is nearly oval in shape, having a diameter of about 8.20 μm . In some part of the endocytial tissue, one can observe that plasmatic material is interrupted by the presence of the coarse granules having a dark yellowish coloration. Some of them are rounded thus having a diameter of about 4.20 μm and others are smaller than this size.

These coarse particles may be considered as excretory products. Symbiotic slgae are rarely found embedded in the endocytial tissue. They have the same shape and structure as that found in the parenchymatous tissue.

The Nervous System: (Fig. 2)

It is considered to be a sub-muscular nerve plexus. It is formed of the brain mass (Fig. 2 bm) which gives rise to three nerve roots, and thus the animal differs greatly from *Convoluta styliifera* and *Veridi punctata* and *karlingii* (Westblad, 1946)

which have a basal nervous system. The plasmatic material of the brain mass consists of rounded nuclei each of which has a diameter of about 2.80 μm .

The brain mass gives rise to three pairs of nerve roots:

1. The Dorsal Pair of Nerve Roots: (Fig. 1 dnr)

They are coming out from the dorsal part of the brain mass and extending upwards dorsally, thus supplying the anterior dorsal region of the parenchymatous tissue and also the dorsal sub-epidermal region with very fine nerve branches.

2. The Lateral Pair of Nerve Roots; (Fig. 2 lnr)

They are originating from nearly the middle lateral part of the brain mass and are extending toward the lateral sides, right and left. Each nerve root extends laterally to a distance of about 23.80 μm thus giving rise to very fine nerve branches which supply the antero-lateral region of the parenchymatous tissue and also epithelial layer. The lateral pair of nerve roots gives rise to a pair of latero-longitudinal nerves (Fig. 2, 1ln) which extend for a little distance posteriorly.

3. The Ventral Pair of Nerve Roots: (Fig. 2 vnr)

They start from the ventral part of the brain mass and extend downward to the ventral surface. Each ventral nerve root gives rise to many fine nerve branches, supplying the anterior ventral region of the parenchymatous tissue, and also the ventral epithelial layer.

The Sense Organs

The Statocyst: (Fig. 1,2 st)

It is situated anteriorly after the anterior tip of the body at a distance of about 21 μm . The statocyst is embedded completely inside the brain mass and is surrounded from all sides by its nervous tissue. Its breadth is about 28.0 μm and its height is about 16.80 μm . The wall of the statocyst (Fig. 2 wst) is thin, having a thickness of about 0.70 μm .

Inside the statocyst, a rounded statolith (Fig. 2 stl) is situated in the middle and somewhat shifted

dorsally. The eyes are totally absent and thus the animal resembles most of the species of the genus *Anaperus* (Graff, 1912). Luther's sensory organs are missing. Thus, it differs from *Convoluta flavibacillum* (Jensen, 1878), *Convoluta westbladi* (Marcus, 1949), *Convoluta vexillaria* (Marcus, 1948), *Anaperus tvaerminnensis* (Luther, 1912).

The Reproductive System

The Female Genital System: (Fig. 2 fgs)

The animal possesses no female genital aperture, as in the most known species of the genus *Anaperus* (Graff, 1912), and also the vagina is missing. It is worthwhile to notice that there is a large oval sperm ball (Fig. 2 sb) situated inside a space embedded in the endocytial tissue as in the case of *Anaperus rebullus* (Westblad, 1945, p. 53).

It has no definite particular wall or tissue surrounding the sperm mass. Which has a length of about 56.0 μm and a maximal breadth of about 35.0 μm . The mouthpiece (Fig. 2, mp) is strongly cuticularized and it is attached to the ventral part of the sperm ball. It is extending straight at a vertical position. In this respect, the animal differs from *Anaperus rubellus* (Westblad, 1945, p. 53). It is flat and opens into the ventral peripheral parenchymatous tissue (Fig. 2 ppt). The length of the cuticularized mouthpiece (Fig. 2 cmp) is about 19.50 μm . The breadth of its proximal end is about 9.80 μm , while that of its free distal end is about 4.20 μm . The mouthpiece is penetrated in the middle part by a fine canal, having a diameter of about 1.40 μm . The mouthpiece is surrounded by its matrix (Fig. 2 mat) from all sides, except the connecting part between the mouthpiece and the space where the sperm mass is lying. The length of the tissue of the matrix is about 28.0 μm while its breadth is about 23.80 μm . At the basal part of the mouthpiece 3 to 4 cyanophilous gland cells (Fig. 2, cgc) are embedded in the space. Each gland cell has a pear shaped structure, having a length of about 7.0 μm and a width of about 4.20 μm .

In this respect, the animal resembles *convoluta macnae* (Marcus, 1957). The gland cells open directly into the fine canal which is situated in the middle part of the cuticularized mouthpiece and that by very fine narrow necks having a maximal thickness of about 1.05 μm and a length of about

4.2 μm . The sperms are nearly filling the space situated in the endocytial tissue, and all the sperms are altogether compact. Each sperm is short and thick having a maximal length of about 8.40 μm and a thickness of about 1.05 μm . The space containing the sperm mass and the mouthpiece, are situated nearly at the middle region of the second third part of the body.

The female genital system possesses in addition to that, an unpaired and single ovary (Fig. 2 ov, PL. 2) which begins anteriorly nearly at the beginning of the last third region by two large and ripe eggs (Fig. 2 pl. re), one on the right side and the other nearly on the middle part of the body. They are situated dorsally. The right ripe egg is oval and its diameter is about 105.0 μm . The nucleus of the ripe egg shows the first stage of mitotic division (Fig. 1, 2, mhre).

The Male Genital System: (Fig. 2)

It is located ventrally a little distance of about 14.0 μm before the posterior end, thus resembling *Anaperus australis* (Westblad, 1952). The male genital aperture (Fig. 1,2 mga) is rounded having a diameter of about 7.0 μm . The antrum masculinum is absent, thus differing from most of the known species of the genus *Anaperus* (Graff, 1912).

The male genital aperture leads directly to the muscular penis (Fig. 2 pe) which is extending anteriorly in the form of a thick muscular tube. The length of the penis reaches about 42.0 μm . The penial canal (Fig. 2 pc) is an extension of the ventral epithelial layer. It is internally lined by cilia (Fig. 2 ci), having a length of about 5.60 μm . This penial canal is surrounded by a thick muscular (Fig. 2 msp) having a thickness of about 21.0 μm which is considered to be an extension from the ventral sub-epidermal muscle layer.

The penial canal is surrounded by circular and longitudinal muscle fibers (Fig. 2 cmf, 1 mf). The epithelial layer of the penis is sunk under the muscular sheath. The penis is connected anteriorly with the vesicula granulorum (Fig. 2 vgr) which is sac-shaped. It is surrounded by a thin muscular sheath which is an extension of the thick muscular mass of the penis. The vesicula granulorum is nearly filled with large coarse granules, stained rosy-red with saurefuchsin. The animal in this respect re-

minds of what Luther had described concerning *Anaperus tvaerminnensis* (Graff, 1912). The granular secretion is formed by the eosinophilous gland cells (Fig. 2 egc) which are embedded within the epithelial cells of the vesicula granulorum. The vesicula granulorum is connected anteriorly with a right and left false seminal vesicles (Fig. 2 rfsv, 1 fsv). The two false vesicles are filled with sperms, which are thick and short. Each false seminal vesicle is embedded in a space in the central endocytial tissue. The right and left testes (Fig. 2 rt, lt) are follicular in structure, and are separated from each other. The testes are located laterally to the unpaired ovary.

The Systematic Relation

The animal is related to the tribe *Proandropora* according to the classification of Westblad (1948, p. 56) owing to the following reasons:

1. It possesses only a male genital aperture.
2. The bursa seminalis is missing.

On the other hand, the animal is also related to the genus *Anaperus* (Graff, 1911) according to the following:

1. The animal has no pharynx.
2. It has a follicular testis.
3. The bursa seminalis is absent.

Diagnosis

The animal is considered to be a new species owing to the following characteristic features:

1. The color of the animal is dark brown with scattered areas of glittering colors. Each region is divided into three quite distinct pigmented parts. One of them has a golden coloration; the second, a blue coloration and the third one has a green coloration.
2. The frontal organ is absent.
3. The excitant organs are completely absent.
4. The brain mass consists of three pairs of nerve roots; one dorsal, the second lateral and the third ventral.
5. The antrum masculinum is totally missing.

Occurrence

This new species was collected from the muddy bottom of a lagoon at a depth of about 7.0 meters. This location is situated about 300 meters south-

ward, and away from the laboratory of the marine biological station at Hurghada in Egypt. It is not abundant as only 10 specimens had been collected during July and August 1998.

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List of Abbreviations

bc	blue coloration
bm	brain mass
bpg	brown pigment granules
cmf	circular muscle fiber
ci	cilia
cmp	cuticularized mouth piece
cmf	circular muscle fibers
dep	dorsal epithelial layer
dnr	dorsal nerve root
ec	ectocytium
en	endocytium
egc	eosinophilous gland cell
esg	eosinophilous granules
fgs	female genital system
gc	green coloration
glc	golden coloration
ldns	left dorsal nerve stem
lfsv	left false seminal vesicle
lgre	left big riped egg
lleb	left lateral edge of the body
lml	longitudinal muscle layer
lln	left lateral nerve
llns	left lateral nerve stem
lmf	longitudinal muscle fibers
lnr	lateral nerve root
lsie	left small immature egg cell
lt	left testis
mhre	mitosis of half-ripped egg
mp	mouth piece
mo	mouth opening
msp	muscular sheath of penis
nre	nucleus of ripe egg
ns	nerve stem
nu	nucleus
ov	ovary
pc	penial canal
pe	penis
pt	parenchymatous tissue
ppt	peripheral parenchymatous tissue
rbre	right big ripe egg
rdns	right dorsal nerve stem
rfsv	right false seminal vesicle
rleb	right lateral edge of the body
rin	right lateral nerve
rins	right lateral nerve stem
rt	right testis
rsie	right small immature egg cell
rvns	right ventral nerve stem
sb	sperm ball
sp	sperm
st	statocyst
vep	ventral epithelial layer
vgr	vesicula granulorum
vnr	ventral nerve root
yg	yolk granules
wst	wall of statocyst
zx	zooxanthella

Anaperus ornatus N. sp.: A New Interstitial Acoelan Turbellaria from Marine Sediments in the Red Sea

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ABSTRACT. The new species *Anaperus ornatus* n. sp., was collected from the muddy and sandy bottom of a lagoon in front of the Hurghada station at the Red Sea in Egypt in July-August 1998. It is considered to be a new interstitial Acoelan Turbellaria from the Marine Sediments. The worm is dark brown due to the presence of zooxanthellae with scattered areas of different glittering colours. Each area is divided into 3 quite distinct pigmented parts. One of them has a golden coloration, the second is blue and the third one has a green coloration. It has a length of about 1/2 mm the Frontal Organ, the excitant organs and the antrum musculinum are totally missing.

A sperm ball is connected anteriorly with a cuticularized mouth piece extending vertically downwards towards the Ventral surface.

The animal possesses only one male genital aperture, a little distance before the posterior end leading directly to the muscular penis opening into the Vesicula granulorum which is connected with two false Vesicula Seminalis. The two testes are placed laterally, to a medio-dorsal Ovary.

Introduction

The intense study of marine fauna over the last three decades has led to an explosive increase in our knowledge of many animal groups. Surprisingly, in view of the previously demonstrated specimens, some Turbellarians being associated with mud, many new kinds of Acoelan Turbellarians have also been found in sand (Dorjes, 1968) which now contribute to one-third of all Acoel species. In sandy intertidal and subtidal zones of the galapagos Islands, the Acoelan Turbellarians exist with at least 25 species (Ulrich Ehlers and Dörjes, 1979 and Faubel, 1976). As few scientists had worked on Turbellarians of the Red Sea, especially at its north-west and east part (Palombi, 1928; Melouk, 1940. Antonius, 1968, Beltagi, 1983; Beltagi & Khafaji, 1984; and Beltagi, 1996). It was encour-

aging for us to continue such Taxonomic research works concerning the interstitial Turbellarians at the lagoon of the western zone of the Red Sea (Hurghada).

Materials and Methods

The area selected for this study is located near the Marine station at Hurghada. It is subjected to an extensive investigation.

The reef complex at the Hurghada Marine station is represented by a fringing reef connected to a raised coastal plain and followed by a lagoon seaward.

The bottom sediments range from coarse to fine-grained carbonates. No coral growth occurs, in the lagoon and the sediments are to a great extent fine muds.

أنابيرس أورناتس : نوع جديد من التيربلاريا اللاجوفية البيئية من الرواسب البحرية بالبحر الأحمر

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المستخلص . تم جمع النوع الجديد من ديدان التيربلاريا « أنابيرس أورناتس » من القاع الرملي والطيفي للاجون أمام محطة الأحياء المائية بالغرديقة بمياه البحر الأحمر المصرية ، وذلك في يوليو ١٩٩٨ م ، وتعتبر نوع جديد تم اكتشافه من الديدان المفلطحة رتبة التيربلاريا اللاجوفية الموجودة بين حبيبات الرواسب البحرية القاعية . وتتميز هذه الدودة بأن لونها بني غامق تتخلله مساحات مختلفة من الألوان الزاهية البراقة ، وكل ماسة تنقسم إلى ثلاث مناطق الأولى ذات لون ذهبي والثانية ذات لون أزرق والثالثة ذات لون أخضر .

ويرجع اللون البني إلى وجود طحالب بنية وحيدة تكافلية والعضو الأمامي والأعضاء المثيرة والمدخل العضلي غير موجود ، ويتكون الجهاز التناسلي الأنثوي من كرة منوية ، والتي تتصل بالجزء الفمي الكيتيني والذي يتجه إلى الجزء السفلي من الناحية البطنية .

ويوجد للدودة فتحة تناسلية ذكرية بالقرب من الطرف الخلفي لجسم الحيوان والذي يؤدي إلى القضيب العضلي الذي يفتح في الحوصلة الحبيبية التي تتصل بحوصلتين منويتين كاذبتين ، وتقع الخصيتان جنباً بالنسبة للمبيض الوسط ظهري .