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Description of a Turbellarian Worm *Riedlia agyptica*, Nov. Gen. Nov. Sp. (Family-Goharidae) – From the Shallow Water of the Red Sea

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ABSTRACT. Thirty specimens of this worm were collected in May and July 1987 from a shallow lagoon at Ghardaga and North of Jeddah (Red Sea). They were found living around the brown algae, *Sargassum vulgare, Cystoceira myrica* and *Turbinaria decuneus*.

The worm is characterised by the possession of a well-developed sense organ which has 18-20 retractor muscle fibres. It is oval in shape and has a greenish brown coloration due to the presence of symbiotic brown algae (Zooxanthellae). It is about 0.8-1.00 mm in length and 0.3-0.4 mm in breadth. The worm does not have either eyes or pharynx.

The female reproductive system has no gonopore and it is formed of a well-developed bursa-seminalis connected to a cuticularised bursa mouthpiece directed ventrally, two left and right ovaries are present. The male reproductive system consists of a short cuticularised penis, a vesicula granulorum, two false seminal vesicles and two right and left testes.

Introduction

Few scientists have worked on Turbellaria in the Red Sea (Palombi, 1928; Melouk, 1940, 1941; Antonius, 1968; Beltagi *et al.*, 1983, 1992). Therefore more investigations, were carried out in the reef flat near Jeddah (Saudi-Arabia) and Ghardaga (Egypt), where communities of sea-weeds and sea-grasses are present.

Material and Methods

Specimens were collected from a shallow lagoon in North Jeddah and Ghardaga by means of a standard F.B.A. Zooplankton net of 23.6 meshes/cm mounted on a square frame. The surface layers of substrata were scooped up and vegetation swept through on extraction from samples. Living worms were examined microscopically under a vaselined cover slip using various degrees of compresses (see Young, 1970). The collected specimens were narcotised by using a saturated solution of eposn MgCl or $MgSO_4$. Specimens were fixed in 70% ethyl alcohol or neutral buffered formalin or bouins fluid, cleared in cedar-wood oil, blocked in paraffin wax, sectioned at 8 μm thickness, stained in mallory trichrome and mounted in Canada balsam. Reconstruction of the new species was drawn from the medio-sagittal position by the examination of transverse, longitudinal and frontal sections of the animal and using camera lucida.

Systemic Position

Phylum : Platyhelminthes, Gegenbaur, 1859.
Class : Turbellaria, Ehrenberg, 1831.
Order : Archoophora, Westblad, 1948.
Suborder : Acoela: Uljanin, 1870, Graff, 1905.
Genus : Riedlia Nov. Gen.
Riedlia agyptica, Nov. sp.

Results and Discussion

External Features: (Fig. 1a, 1b)

The animal is oval in shape (Fig. 1). The anterior border of the body is somewhat rounded while the posterior end is narrow and pointed, thus it is similar to *Convoluta bimaculta*, (Graff, 1882).

The worm is about 0.8 to 1.00 mm in length and about 0.3 to 0.4 mm in breadth, the dorsal part of the body is convex, while the ventral part is slightly flattened. Its coloration is nearly greenish brown, due to the presence of dark brown pigment granules (Fig. 1a, gbp) embedded in the epidermal, parenchymatous and the central parenchymatous tissues.

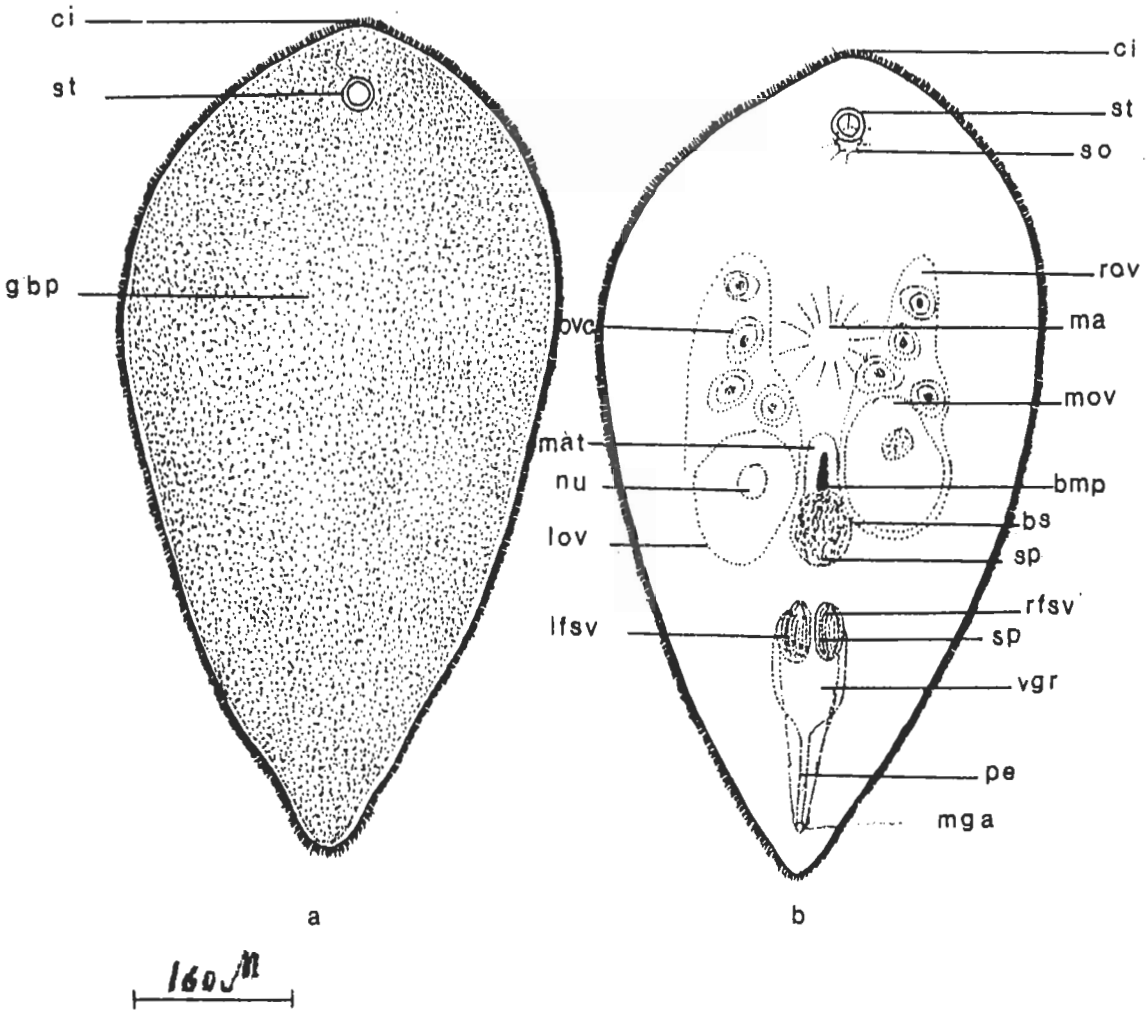

FIG. 1. *Riedlia agyptica*. nov. gen. nov. sp.
a) External features.
b) External features and internal organisation from squeezed preparation.

Also, symbiotic brown algae (Zooxanthellae) (Fig. 3-sba) are scattered in the 3 main strata. The eyes are absent as in *Amphiscolops gemelliporus* (Marcus, 1952). Most of the species of the genus *Anaperus* (Graff, 1882) and *Goharia obscura* (Beltagi and Eshky, 1992).

The statocyst (Fig. 1a-1b-3-StO) lies at the end of the first anterior eighth part of the body and has a diameter of about 35 mm.

General Organization (Fig. 1b-2)

The frontal organ lies at the anterior end (Fig. 2-fg). It is oval in shape and composed of compact cyanophilous gland cells (Fig. 2-agc) opening at the anterior tip of the body, by a common aperture (Fig. 2-afg) slightly shifted to the ventral side. It is located in between the brain mass and the anterior tip of the body. The epidermal layer of the worm is covered externally by a thick coat of fine cilia (Fig. 2-c1) which have uniform length and distribution, as in the case of *Goharia obscura* (Beltagi and Eshky, 1992).

The brain mass and its main nerve stems (Fig. 2-bm) are located immediately after the posterior end of the frontal organ and extend backwards for about 87.5 µm.

The brain mass (Fig. 2-4, bm) is semi-circular in shape and gives rise to 4 pairs of nerve stems. The aperture of the sensory organ (Fig. 2-aso) is located ventrally, just in the range of the third sixth region of the first anterior fourth part of the body.

The Mouth Aperture (Fig. 16-2 ma) is situated, nearly at the end of the first third part of the body, as described in *C. rhammifera* (Westblad, 1946), *C.*

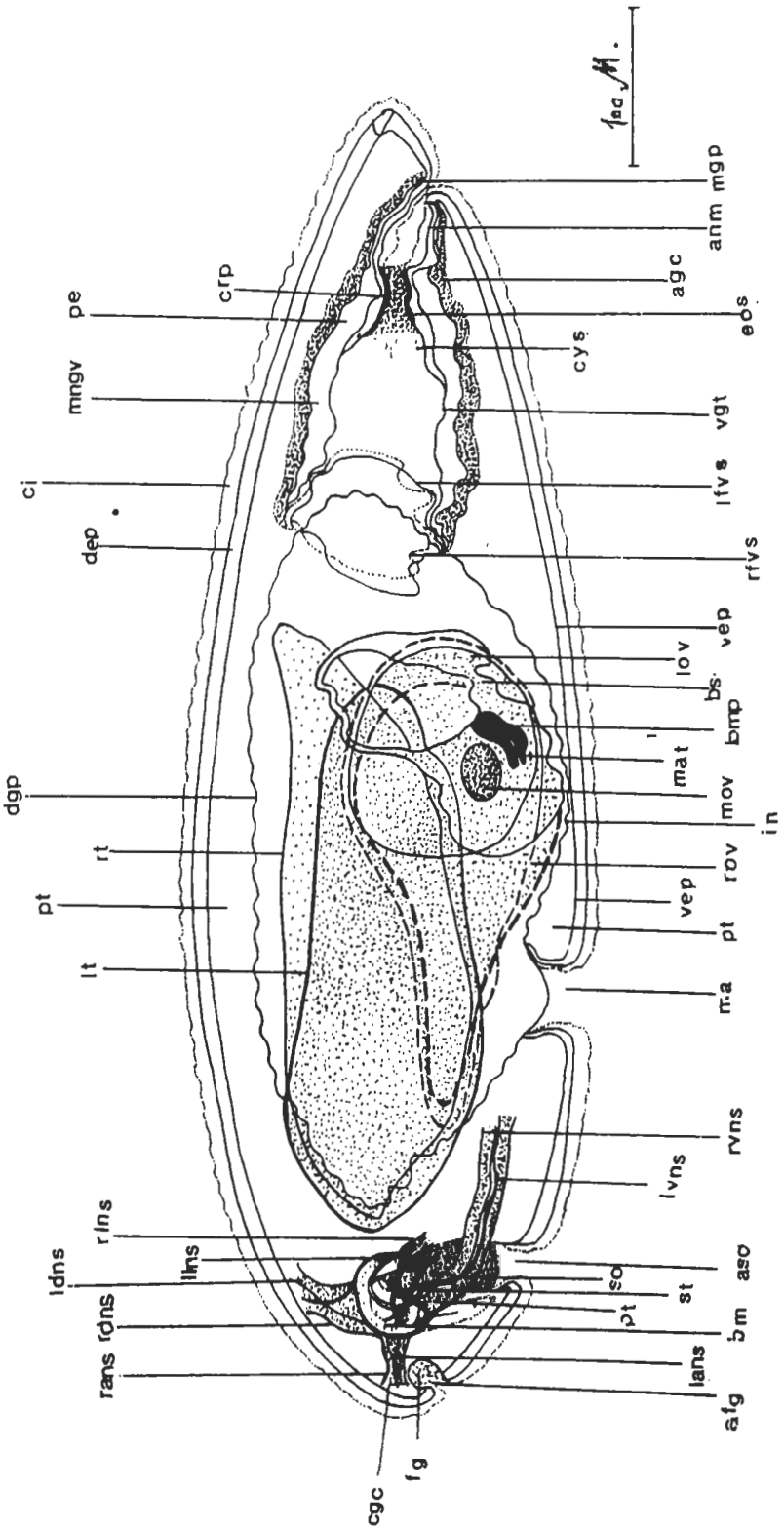

FIG. 2. *Riedlia agyptica*. nov. gen. nov. sp. Reconstruction of internal organisation.

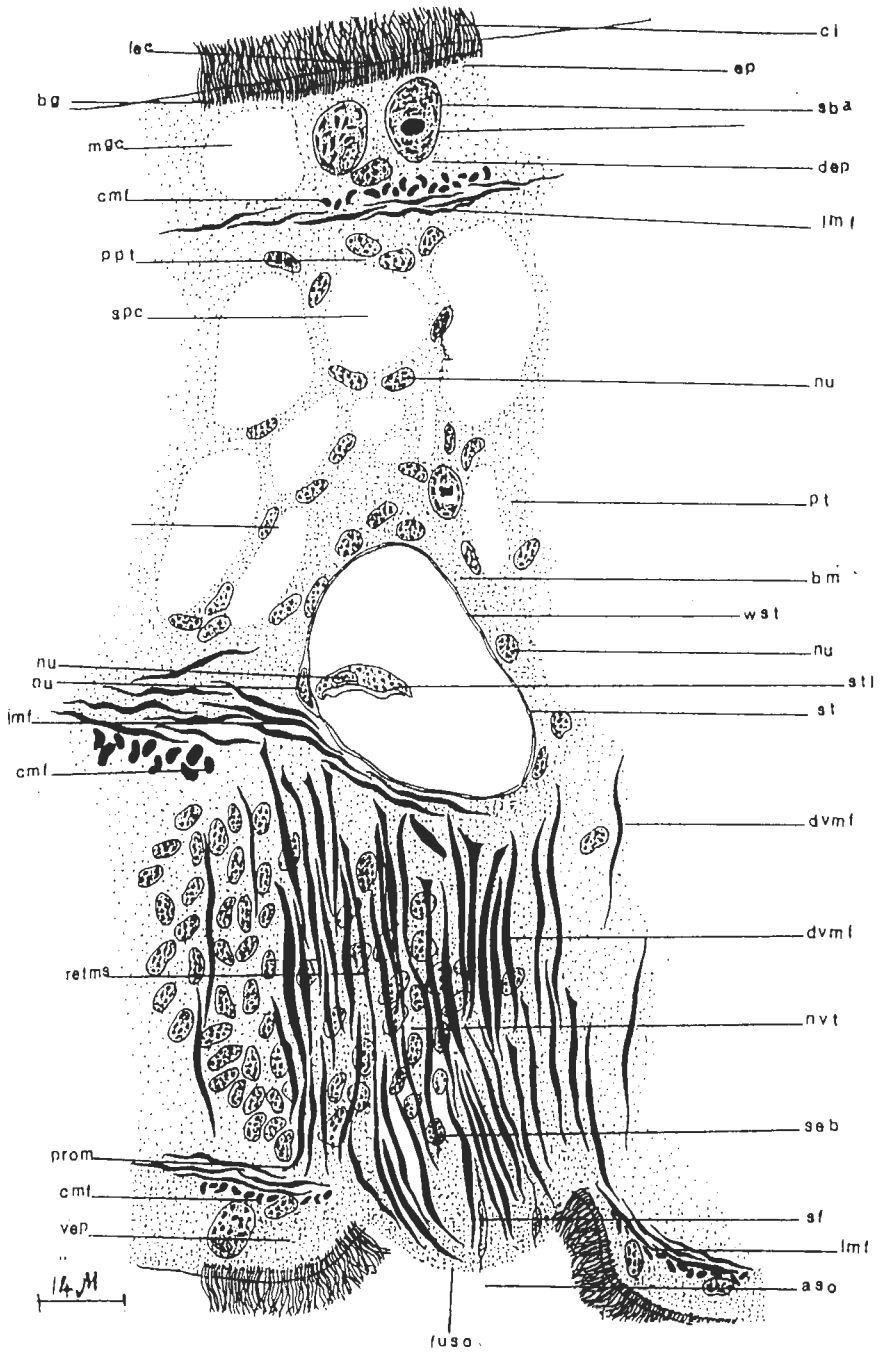

FIG. 3. *Riedlia agyptica*. nov. gen. nov. sp. Reconstruction of the sense organ.

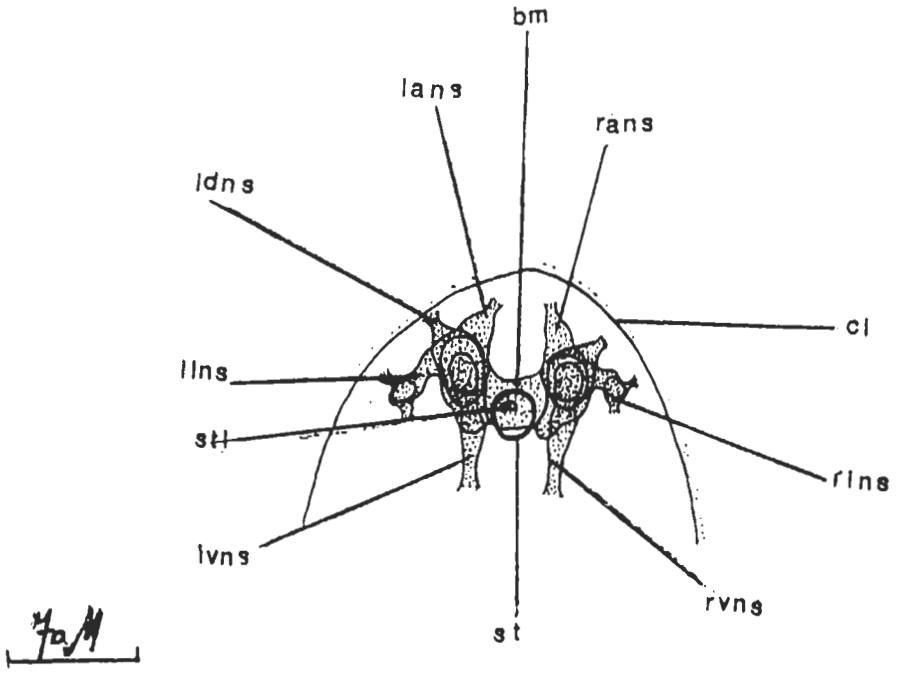

FIG. 4. *Riedlia agyptica.* nov. gen. nov. sp. Reconstruction of the brain, nerve stems and statocyst.

hensni (Bohmig, 1895), *C. confusa* (Graff, 1879), *C. japonica* (Kato, 1951) and *C. westbladi* (Marcus, 1949).

It leads directly to the digestive parenchyma (Fig. 2-13 dgp), beginning just a little distance after the brain mass, till the place where the vesicula granulorum (Fig. 2-vgr).

The Reproductive System: (Fig. 16-2)

1. The female genital apparatus (Fig. 1b-2-5-9-10) consists of one bursa seminalis (Fig. 1b-2-5-bs) with its mouth piece (Fig. 2-5, bmp) which is strongly cuticularized and surrounded by its matrix. The antrum femininum (vagina) and the female genital aperture are missing. The two right and left ovaries (Fig. 1b-2, rov, Lov) are extending latero-ventrally on both sides quite separated from each other.

2. The male genital apparatus (Fig. 1b-2-6) begins with the male genital aperture (Fig. 2-6, mga) which leads to a long antrum musculinum connected to a mascularized penis (Fig. 6-pe).

3. Right and left testes (Fig. 2-6, rt, lt), are extending on the dorso-lateral part of the body.

Epicytium (Fig. 2-3-5)

The body of the worm, is covered by an outer coat of cilia (Fig. 2-3-5-ci) which have an equal length and distribution through the whole body. Its length is about 10 mm. The outer epidermal layer is syncytial in structure and is interrupted by mucus secreting gland cells (Fig. 3-5 mgc).

The dorsal epithelial layer (Fig. 2-3-5, dep) has the same thickness as the ventral epithelial layer (Fig. 2-3-5 vep.) Thus it resembles *C. saliens* (Graff, 1905) and *C. norvegica* (Westblad, 1946). The necks of the subepidermal mucus land cells (Fig. 5-6-9, mgc) penetrate the epidermal layer and open to the outside. Their bulbs are embedded in the peripheral parenchymatous tissue (Fig. 3-ppt).

The most striking fact is that the dorsal epithelial layer, constains a large number of symbiotic algae (Fig. 3-5-sba) more than that present in the ventral epithelial layer.

The epicytium has oval and spherical nuclei.

The symbiotic algae (Zooxanthellae) existing in the epicytium, are different in shape and size and are embedded mostly in vacuoles.

The basement membrane is missing.

The Musculature: (Fig. 3-5-6)

The muscular system is well-developed and is divided into two parts :

1. The subepidermal muscle layer.
2. The parenchymatous muscle fibres.

1. The subepidermal muscle fibres (Fig. 3-5-6). They are composed of an outer layer of circular muscle fibres (Fig. 3-5-6, cmf) and an inner layer of longitudinal muscle fibres (Fig. 3-5-6, lmf). In this respect, it

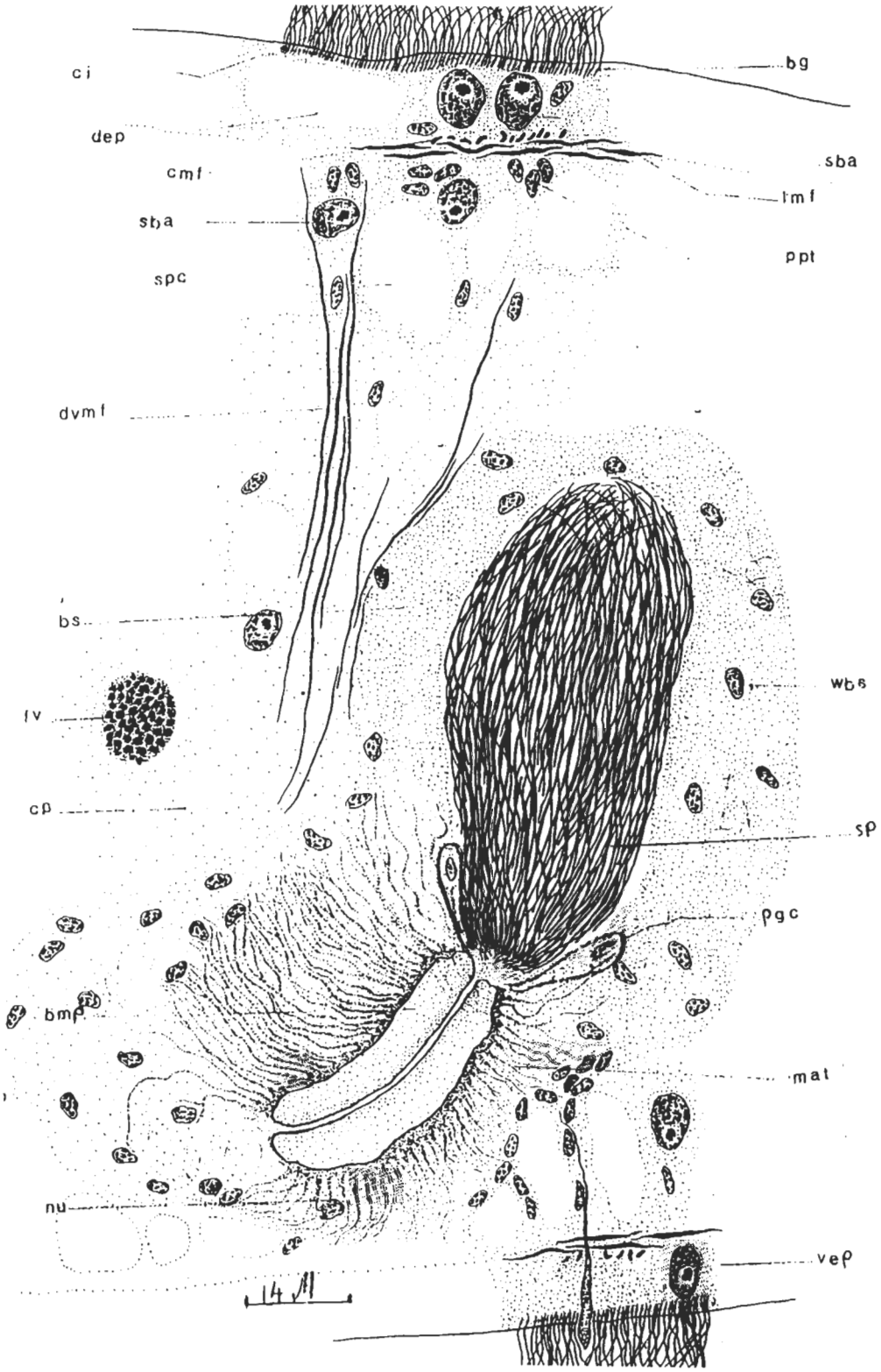

FIG. 5. *Riedlia agyptica*. nov. gen. nov. sp. Reconstruction of the female genital system. (L.S.).

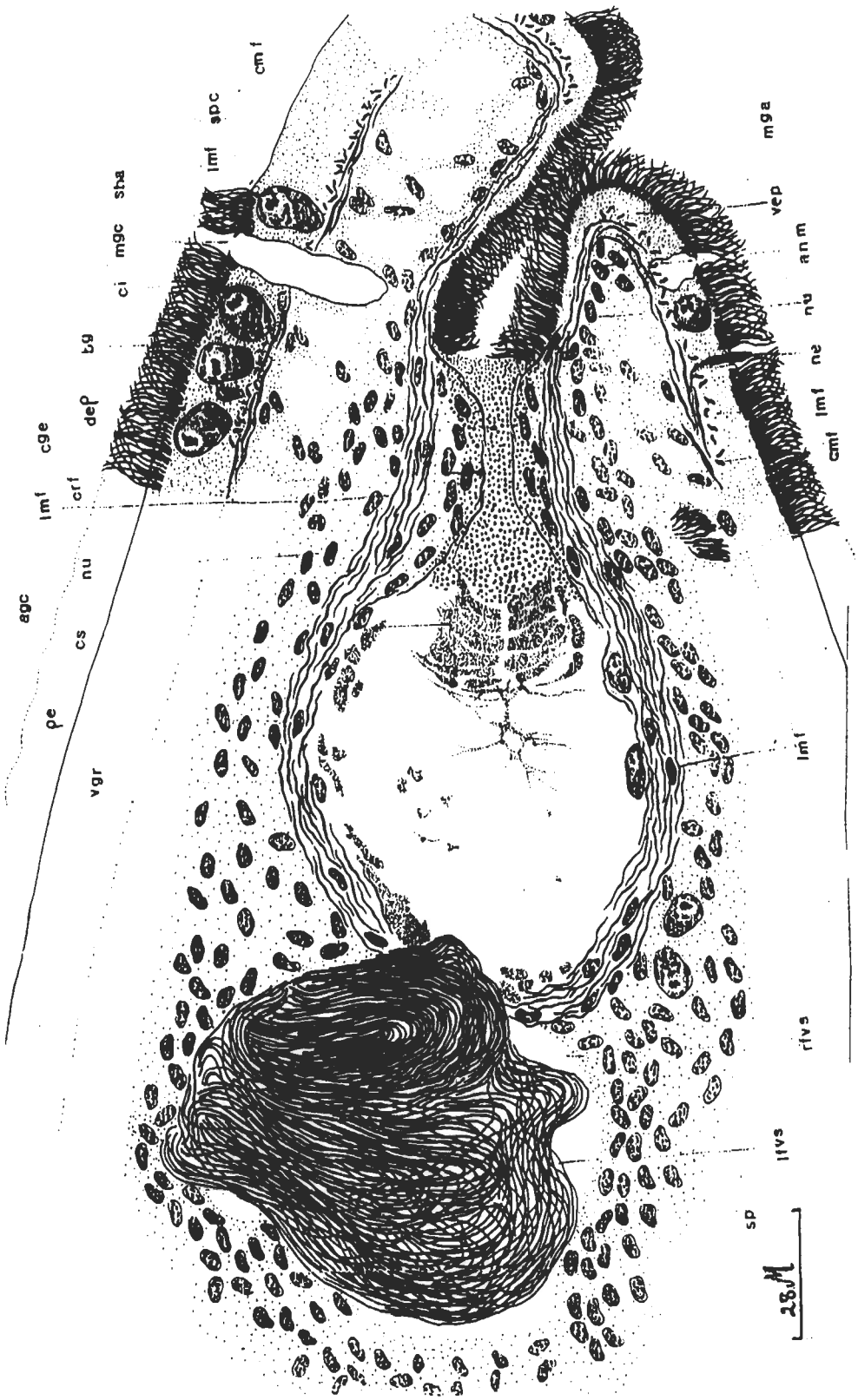

FIG. 6. *Riedlia agyptica*. nov. gen. nov. sp. Reconstruction of the male genital system.

differs from *Convoluta thauma* (Marcus, 1952), and *Convoluta macroposthia* (Steinbock, 1931).

The thickness of the dorsal subepidermal muscle layer is about 8.1 μm, while that of the ventral layer is about 5.6 μm. Each longitudinal muscle fibre (Fig. 3-5-6, lmf) has a thickness of about 1.4 μm, while the circular muscle fibre (Fig. 3-5-6, cmf) has a thickness of about 0.9 μm.

2. *The parenchymatous muscle fibres.* is formed of a well developed dorso-ventral muscle fibres (Fig. 5-dvmf) as known in most species of the genus *Convoluta* (Orsted, 1843).

The dorso-ventral muscle fibres (Fig. 3-dvmf) extend in the plasmatic beams of the parenchymatous tissue, crossing the central parenchyma on their way (Fig. 5-cp) and the digestive parenchymatous tissue (Fig. 2-dgp).

The circular muscle fibres (Fig. 3-5-6 cmf) are very few and scattered in the parenchymatous tissue.

Strong dorso-ventral muscle fibres are seen, also in between the eggs and the follicular parts of testes.

The dorso-ventral muscle fibres (Fig. 3-5-6, dvmf) take part in the construction and function of the sense organ (Fig. 3-7 so).

The Digestive Parenchyma: (Fig. 2-10, dp)

It begins with the mouth aperture (Fig. 1b-2-10, ma) which is situated ventrally nearly, at the end of the first third of the body, similar to *C. rhammifera* (Westblad, 1946, Marcus, 1949), *C. japonica* (Kato, 1951). It is nearly circular in shape, having a diameter of about 35.0 μm.

The mouth leads directly to the endocytium (Fig. 13-en) which extends anteriorly a little distance behind the brain mass.

Many food vacuoles (Fig. 5-13, fv), are scattered inside the endocytial tissue. Symbiotic brown algae (Fig. 3-5-6, sba) are also embedded in the endocytial tissue (the intestine). A pharynx is missing.

The Nervous System: (Fig. 2-4)

The brain mass (Fig. 2-4, bm) is semi-circular in shape, as in *Childia groenlandica* (Westblad, 1945), having a convex dorsal part and an acute concave ventral one, thus, it differs from *Goharia obscura* (Beltagi *et al.*, 1992). It bears a great similarity to the bridge form type of brain mass, existing in *C. convoluta* (Muller, 1806), and *C. flavibacillum* (Jensen, 1878). The nuclei of the nerve cells (Fig. 3-nu) are mostly spherical in shape.

The brain mass gives rise to 4 main parts of nerve stems :

1. A pair of anterior nerve stems (Fig. 2-4-rans, Lans)

They are right and left nerve stems. They originate from the anterior part of the brain mass and extend towards the anterior tip. They give rise to numerous nerve branches, supplying the anterior parenchymatous tissue and the epithelial layer in that region. These fine nerve branches, play an important role in the neuro-sensory functions.

2. A pair of dorsal nerve stems (Fig. 2-4, rdns, Ldns)

They are right and left dorsal nerve stems. They originate from the dorsal part of the brain mass and extend upwards, until the dorsal subepidermal muscle layer. Each nerve stem, gives rise to numerous fine nerve branches, which supply the dorsal subepidermal layer and the dorsal parenchymatous tissue.

The thickness of the brain mass which acts as a bridge, connecting the two dorsal nerve stems, is about 14.0 μm.

3. A pair of lateral nerve stems (Fig. 2-4, rlns, LLns)

They are right and left lateral nerve stems. They originate nearly at the middle part of the lateral region of the brain mass. Each lateral nerve stem, extends laterally for a short distance and then divides into 2 parts: one part extends to the marginal subepidermal part of the body, and the second vertical part extends ventrally, till it reaches the ventral subepidermal region.

4. A pair of ventral nerve stems (Fig. 2-4, rvns, Lvns)

They are right and left nerve stems which extend ventrally, giving rise to very fine nerve branches supplying the ventral epidermal layer and the ventral parenchymal tissue. It is quite obvious that the fine nerve branches of the ventral nerve stems participate mainly in the construction of the sense organ (Fig. 2-3, so). The neuro-sensory mass of the sensory organ (Fig. 2-3-7-8, so) is situated between the free endings of the 2 ventral nerve stems, a pair of longitudinal ventral nerve (Fig. 2-4) originate from the 2 distal part of the ventral nerve stem.

The Sense Organ: (Fig. 1b-2-3-7-8, so)

The most important and characteristic organ of this worm, is its peculiar sense organ which is quite different from that described in *Goharia obscura* (Beltagi and Eshky, 1992). It has an oval aperture (Fig. 2-3-4-7-8, aso). It is situated ventrally, nearly in the middle of

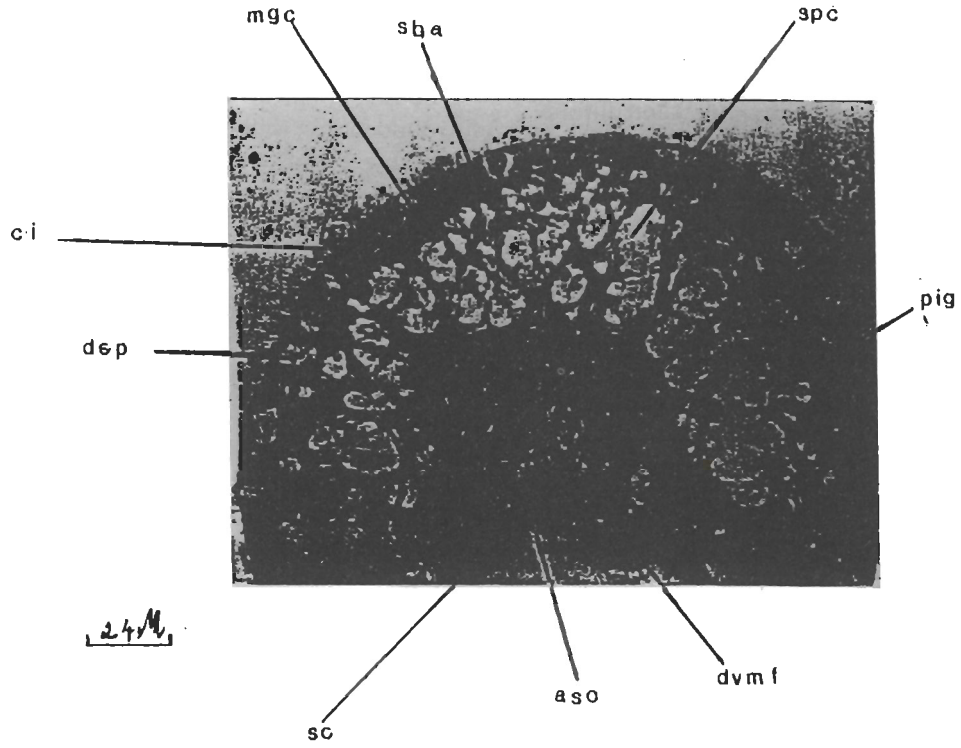

FIG. 7. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the sensory organ.

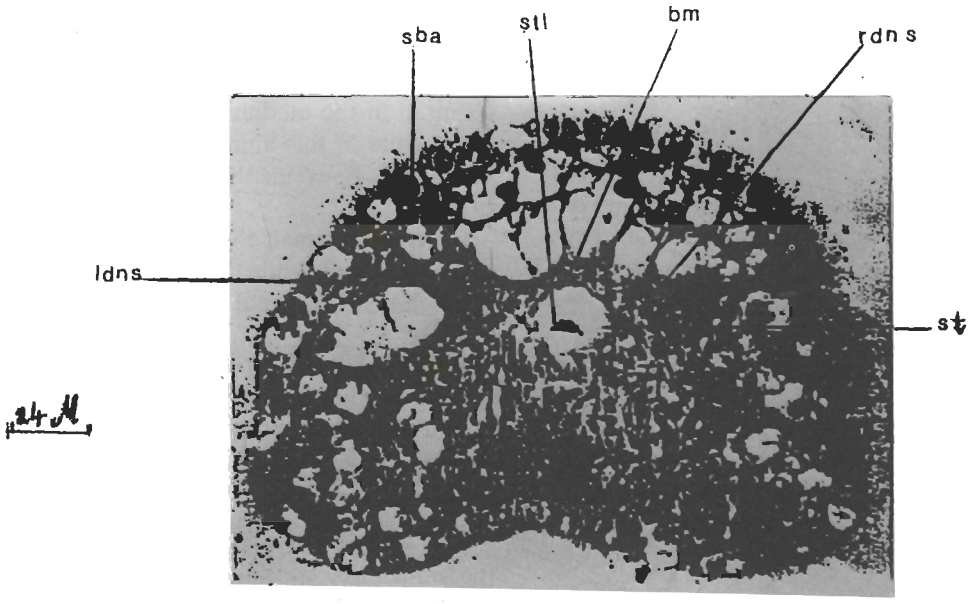

FIG. 8. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the brain and statocyst.

the first fourth part of the body. It is formed by sunk ventral epidermal layer (Fig. 2-3-7-8, vep). It is surrounded, on all sides by equal cilia (Fig. 3-ci) as in *Goharia obscura* (Beltagi and Eshky, 1992) and differs from *Stenostomum* (Kepner and Cash, 1915).

It leads directly to the basal part or fundus (Fig. 3-fuso) of the sensory pit. It is concave in shape, thus differing from *Goharia obscura* (Beltagi and Eshky, 1992) but similar in this respect to *Stenostomum* (Kepner and Cash, 1915). The fundus of the sensory pit, is devoid absolutely of cilia.

The nerve tissue mass of the sensory organ, is located ventrally between the 2 ventral nerve stems (Fig. 3 rvns, lvns) which extend from the brain mass, it differs from *Gohara obscura* (Beltagi and Eshky, 1992). It is in the form of a bulb (Fig. 3-so) which has a maximal diameter of about 42.0 μm.

The neuro-sensory tissue of the sensory organ, is characterised from the other nerve tissues, by the presence of large numbers of the oval nuclei of the neuro-sensory cells, accumulated together in this tissue as in *G. obscura* (Beltagi and Eshky, 1992) and *Stenostomum* (Kepner and Cash, 1915).

Strong and well-developed dorso-ventral muscle fibres (Fig. 3-dvf) surround the neuro-sensory bulb only on the right and left sides. They are from 18 to 20 in number. The maximal length of each dorso-ventral muscle fibre is about 28.0 μm.

Protractor muscle fibres (Fig. 3-pmf) of the sensory bulb, are considered to be an extension of the ventral subepidermal muscle fibres.

Most of the dorso-ventral muscle fibres act as retractors of the sensory bulb.

The ventral part of the fundus is lined by the nerve endings of the nerve cells, placed in the neuro-sensory tissue of the bulb as in *Anaperus tvaerminensis* (Luther, 1912).

The thickness of the rod-shaped sensory fibre (Fig. 3-sf) is about 2.10 μm and its length is about 8.4 μm.

The sense organ is formed of an aperture which is situated at the ventral surface, nearly in the middle zone of the 1st anterior fourth part of the body and it leads to the concave base or fundus of the sensory organ (Fig. 7-fuso) which is devoid of cilia or any mucus layer.

It is supplied with nerve endings and Luther's sense organs. The neuro-sensory tissue of the organ, is located between the 2 ventral nerve stems, extending vertically from the brain mass and then posteriorly.

It has well-developed dorso-ventral muscle fibres on both right and left sides, and also posteriorly.

The dorsal part of the sensory bulb (Fig. 3-seb) is surrounded by well-developed longitudinal muscle fibres (Fig. 3-lmf).

The whole sensory organ is surrounded by the parenchymatous tissue (Fig. 3-pt). Very few brown pigment granules are scattered in the neuro-sensory tissue of the sense organ.

It is very important to recognise the main difference between the structure of the sense organ of *G. obscura* (Beltagi and Eshky, 1992) and that of this worm, which can be summarized as follows :

1. In *G. obscura* the statocyst is situated after the sense organ, while in this animal, it is located dorsally to the sense organ.
2. In *G. obscura* the median dorso-ventral nerve commissure of the brain mass, forms a principal part of the sense organ, while in this animal it is totally missing.
3. In *Goharia obscura* the strong and well-developed dorso-ventral muscle fibres surround and penetrate the median ventral nerve commissure of the brain mass, while in this animal, the dorso-ventral muscles surround the neuro-sensory bulb on right and left sides and posteriorly but they are absent at the anterior end.
4. Well-developed longitudinal muscle fibres surround the dorsal surface of the neuro-sensory bulb which are totally absent in *G. obscura*.
5. In *G. obscura,* the neuro-sensory bulb is connected with the ventral part of the brain mass, represented in the median-dorso-ventral nerve commissure, while in this animal, the neuro-sensory bulb is situated in between the right and left ventral nerve stems.
6. In this animal, the fundus of the neuro-sensory bulb is concave, while that of *Goharia obscura* is in the form of a narrow canal directed posteriorly.

Statocyst: (Fig. 1a-1b-2-3-4-8, st)

It is situated nearly at the end of the 1st anterior eighth past of the body. It is oval in shape, its length reaches about 35.0 μm and its diameter is about 30.0 μm.

The statocyst is surrounded by the ventral part of the brain mass especially on its dorsal and lateral sides.

Its wall is very thin, containing an oval nucleus (Fig. 3-st, nu) having a length of 7.0 μm and its breadth about 1.4 μm.

The statolith is a concave ventral one similar to *C.*

uljanini and *C. subtilis* (Graff, 1882) and also *C. obscura* (Beltagi and Eshky, 1992).

The Frontal Organ: (Fig. 2-fo)

It is composed of several elongated flask shaped cyanophilous gland cells (Fig. 2-cgc). It is spherical in shape, having a diameter of about 21.0 μm and is embedded in the parenchymatous tissue.

These gland cells are compacted together in the form of a bundle. It has a common aperture, situated at the anterior tip of the body. The diameter of the aperture reaches about 7.0 μm and it is devoid of cilia.

The frontal gland is mainly situated between the anterior tip of the body and the anterior surface of the brain mass. In this respect, it resembles *C. schultzii* (Schmidt, 1852), *C. confusa* (Graff, 1879) *C. japonica* (Kato, 1951), and differs from *C. thauma* and *C. macnaei* (Marcus, 1957).

The Reproductive System (Fig. 2-5-6--12)

The female genital system: (Fig. 2-5-9-10)

It is formed of an oval bursa seminalis (Fig. 2-5, bs) located in the central parenchymatous tissue and it is surrounded by a well developed tissue. It is filled with thread-like foreign sperms (Fig. 5-sp).

The bursa seminalis is connected antero-ventrally with its cuticularized bursa mouth piece (Fig. 2-5-9, bmp) which has a length of about 35.0 μm, similar to *C. karlingi* (Westblad, 1946). It becomes narrower at its anterior end. The maximal diameter of the bursa mouth piece is about 21.0 μm and reaches about 7.0 μm at its anterior part, also, it has an inner narrow canal having a diameter of about 2.8 μm.

The bursa mouthpiece is embedded in its matrix (Fig. 2-5-9, mat).

The bursa mouthpiece opens freely and anteriorly in the peripheral parenchymatous tissue.

Pear-shaped gland cells (Fig. 5, pgs) open in between the bursa seminalis, and the bursa mouthpiece. This cyanophilous type of gland cells, open inside the narrow canal of the bursa mouthpiece and they are from 4-6 in number.

The animal possesses, 2 separated right and left ovaries (Fig. 2-9-10, rov, Lov) which are extending ventrally.

Each ovary begins anteriorly by the oogonia, the ovocytes and ends with the mature eggs or ova (Fig. 2-9-10, mov) resembling in this respect, *Goharia obscura* (Beltagi and Eshky, 1992) and *Convoluta*

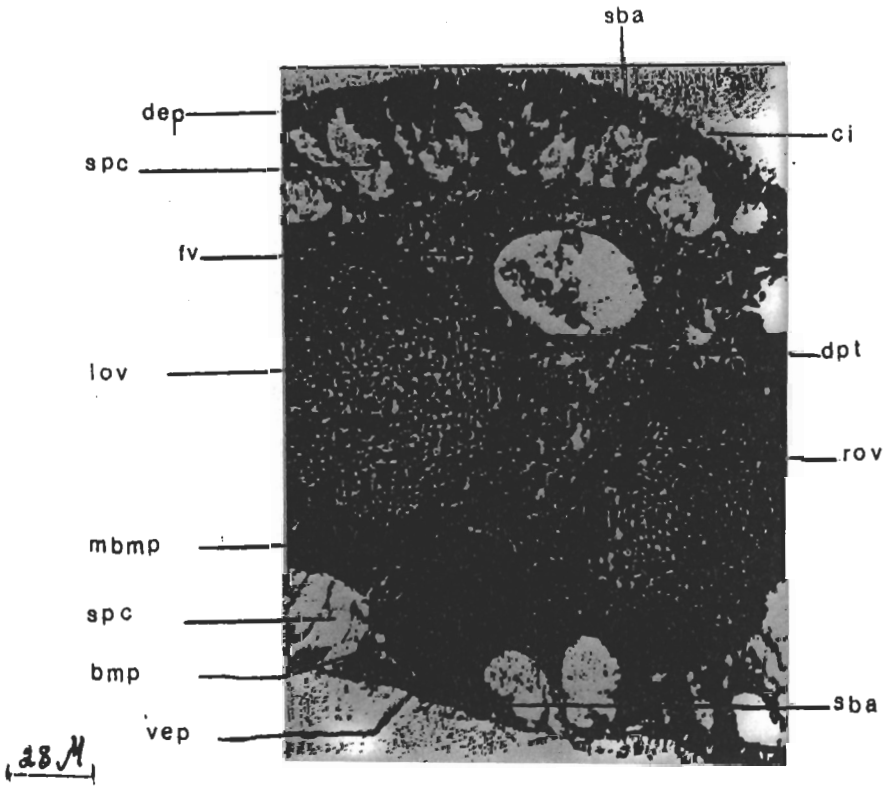

FIG. 9. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the female genital system showing the 2 ovaries and burser mouthpiece.

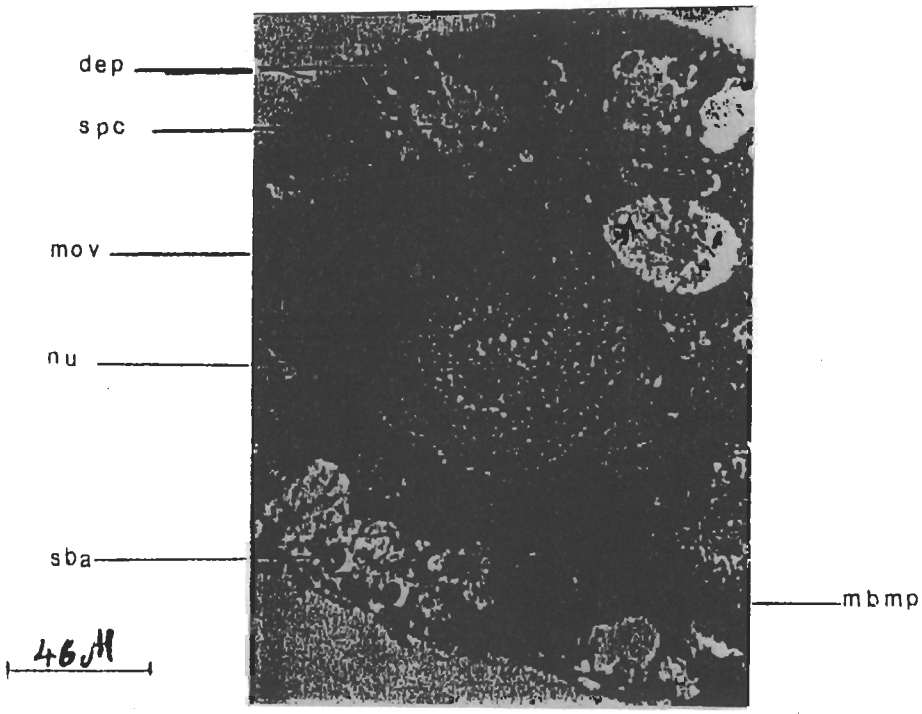

FIG. 10. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the female system showing a mature ovum and bursa mouthpiece.

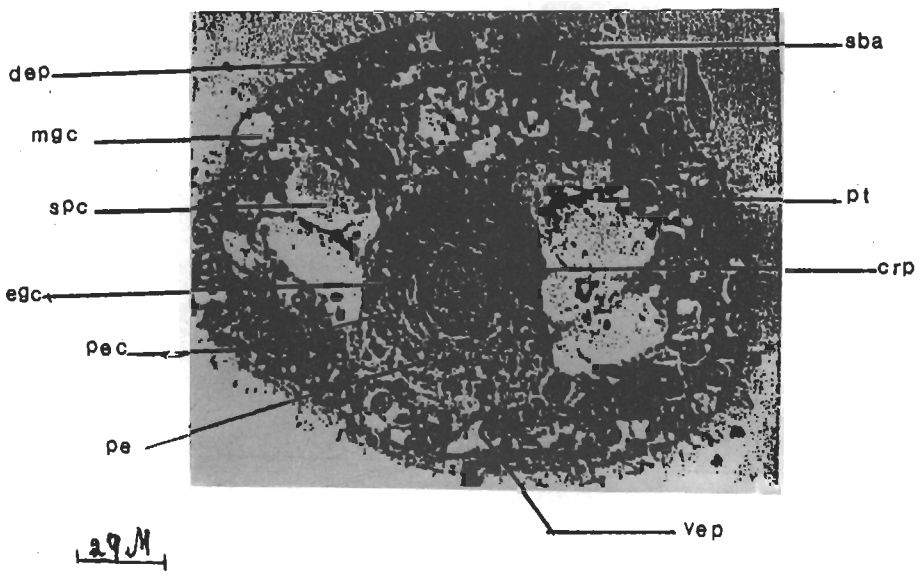

FIG. 11. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the male genital system showing the penis, eosinophilous gland cell, and the cuticularised-rods of the penis.

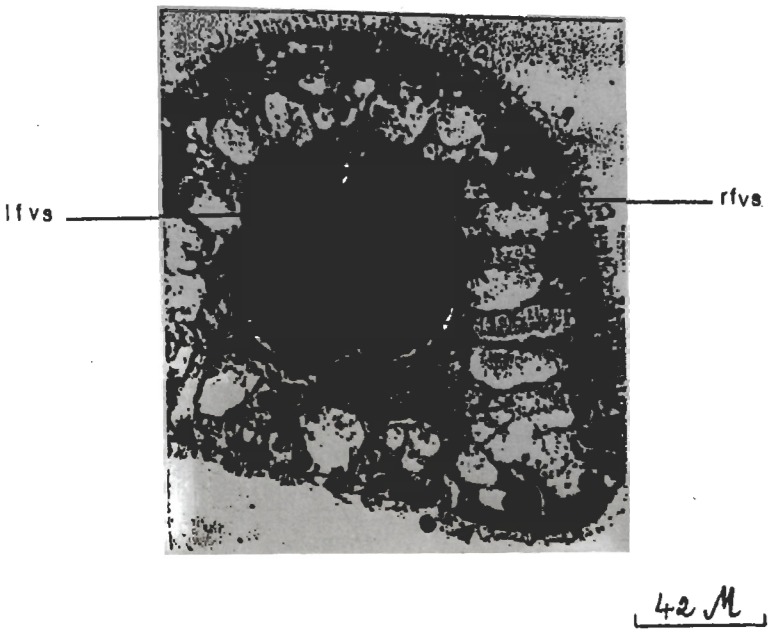

FIG. 12. *Riedlia agyptica.* nov. gen. nov. sp. T.S. in the male genital system showing the 2 false vesicles.

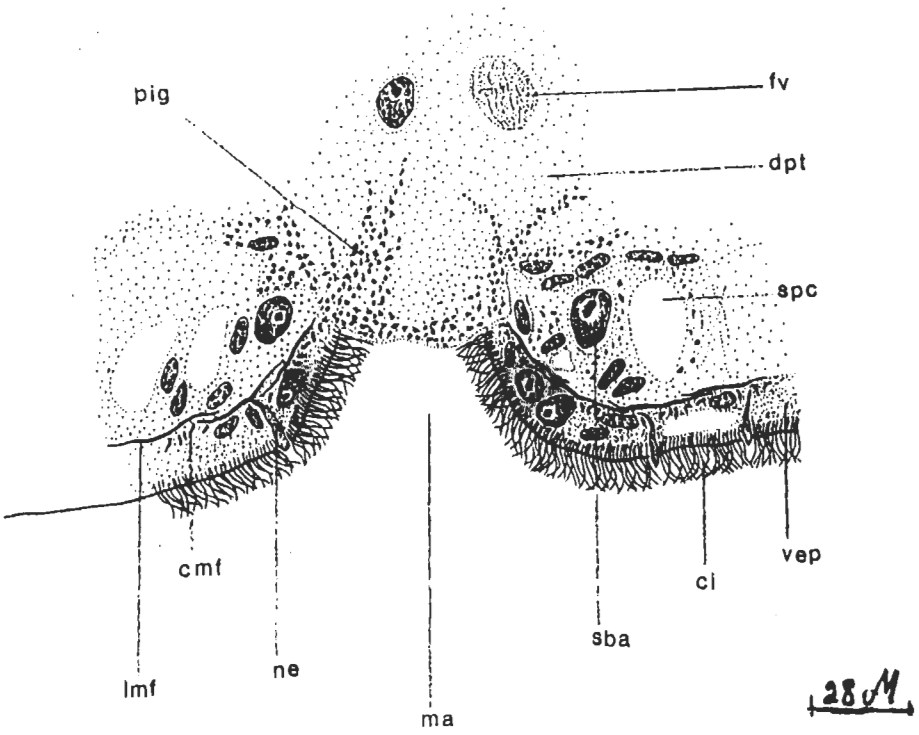

FIG. 13. *Riedlia agyptica.* Mouth and digestive parenchyma (Endocytium).

paradoxa (Graff, 1879).

The male genital system: (Fig. 1b-2--6-11-12)

It begins with the male genital aperture (Fig. 1b-2-6-mga) which is rounded and located ventrally nearly at the middle of the last third part of the body. It leads to the antrum musculinum (Fig. 2-6-anm). Getting wider anteriorly which is considered to be as an extension of the ventral epidermal layer.

The antrum musculnum is surrounded by accessory gland cells (Fig. 6-agc) having a thickness of 8.40 μm. The subepidermal muscle layer, lining the antrum musculinum is somewhat weak and thin. It is a continuation of the ventral subepidermal muscle layer (Fig. 6-11). The penis (Fig. 2-6-11, pe) is connected anteriorly with the antrum musculum having a length of about 35.0 μm. The maximal diameter of the penial canal (Fig. 6-11, Pec) is about 14.0 μm. It is sometimes, filled with granular secretion, formed by the accessory genital gland cells which are surrounding the penial muscular sheath from outside. It is of the eosinophilous type as in the case of *Convoluta diva* (Marcus, 1948) and *Childia groenlandica* (Westblad, 1945).

The penis leads anteriorly to an oval vesicula granulorum (Fig. 2-6-vgr) as in *Goharia obscura* (Beltagi and Eshky, 1992). It is an extension of the muscle layer surrounding the penis.

The accessory gland cells (Fig. 6 agc) surrounding the vesicula granulorum are considered to be of the cyanophilous type.

The vesicula granulorum is connected with a left and right false seminal vesicles (Fig. 2-6-12 lfvs-rfvs). Each false seminal vesicle, is filled with sperms which have a curved thread form (Fig. 6-sp).

The right and left testes, (Fig. 1b-2, rt, lt) are extending dorsally in the parenchymatous tissue. They are follicular in structure as in *Convoluta hanseni* (Marcus, 1949).

The Systemic Relation

The animal is related to the tribe *Proandropora bursalia* (Westblad, 1948) as it possesses a well developed bursa seminalis and the male reproductive aperture is situated ventrally, and the penis is cuticularized. On the other hand, the animal belongs to the family *Goharidae*.

As the mouth aperture is situated at the ventral surface, the pharynx is absent. The sensory pit is located at the anterior end. Vagina and female reproductive aperture are totally missing. The male reproductive aperture is found near the posterior end.

The animal is related to a new genus *Riedlia* as the animal with the characters of the family, it possesses the other following distinctive features :

1. It possesses only one bursa mouthpiece, which is cuticularized.
2. The animal has a distinct and well developed bursa seminalis with a central cavity.
3. The male reproductive aperture is situated at the ventral side.
4. The penis is cuticularized.
5. The sensory pit is lying ventrally to the statocyst.
6. The retractors of the sensory pit are extending from the ventral part of the neuro-sensory bulb till the dorsal part of it, just lying ventrally to the statocyst.

Diagnosis

This animal is a new species according to the following facts :

1. The number of the retractors of the sensory pit ranges from 18-20 in number.
2. The mouthpiece of the bursa seminalis is directed ventrally just in contact with the peripheral parenchymatous tissue, and opening freely in it. The length of the bursa mouthpiece is about 35.0 μm.
3. The penis is short, cuticularized and filled with the eosinophilous granular secretion formed by the accessory gland cells which are surrounding the penis.
4. The presence of the greenish-brown pigment granules which are scattered irregularly in the epicytium, ectocytium, and the endocytium.

It is more concentrated at the dorsal than the ventral part of the body.

List of Abbreviation

afg	aperture of frontal gland.
agc	accessory gland cell.
anm	antrum musculinum.
aso	aperture of sense organ.
bg	basal granule.
bm	brain mass.
bmp	bursa mouthpiece.
bs	bursa seminalis.
cgc	cyanophilous gland cell.
ci	cilia.
cmf	circular muscle fibre.
crp	cuticularized rod of penis.
cs	cyanophilous secretion.
dep	dorsal epidermal layer.
dgp	digestive parenchyma.
dpt	digestive parenchymatous tissue.
dvmf	dorso-ventral muscle fibre.
dgc	eosinophilous gland cell.
en	enteron.
ep	epithelium.
fg	frontal gland.

fuso	fundus of sensory organ.
fv	food vacuole.
gbp	greenish brown pigment.
in	intestine.
lans	left anterior nerve stem.
ldns	left dorsal nerve stem.
lfsv	left false seminal vesicle.
lmf	longitudinal muscle fibre.
llns	left lateral nerve stem.
lt	left testis.
lvns	left ventral nerve stem.
ma	mouth aperture.
mat	matrix.
mbmp	matrix of the bursa mouthpiece.
mga	male genital aperture.
mgc	mucus gland cell.
mgp	male genital pore.
mov	mature ovum.
mvgr	muscle layer of vesicula granulorum.
ne	nerve ending.
nu	nucleus.
nvt	nerve tissue.
ovc	ovocyte.
Pe	Penis.
Pec	Penial canal.
Pig	Pigment granule.
Pgc	Pear-shaped gland cell.
PPt	Peripheral parenchymatous tissue.
Prom	Protractor muscle of Penis.
Pt	Parenchymatous tissue.
rdns	right dorsal nerve stem.
rfsv	right false seminal vesicle.
rlns	right lateral nerve stem.
rov	right ovary.
rt	right testis.
rvns	right ventral nerve stem.
sba	symbiotic brown alga.
seb	sensory bulb.
sf	sensory fibre.
spc	space filled with fluid substance.
so	sense organ.
stl	statolith.
wbs	wall of bursa seminalis.
wst	wall of statocyst.

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وصف لدودة التربيلاريا : « ريديليا إجيبتيكا » جنس جديد ونوع جديد (عائلة جوهاريدى) من المياه الضحلة للبحر الأحمر

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المستخلص: تم جمع ثلاثون عينة من هذه الدودة في شهري مايو ويوليو ١٩٨٧ من مياه اللاجونات الضحلة بالغردقة وشمال جدة بالبحر الأحمر.

وقد وجدت حول الطحالب البنية سارجاسم فولجار وسيستوسيرا مايريكا وتيربيناريا ديكينس.

وتتميز هذه الدودة بأن لها عضو حسى متطور له من ١٨ إلى ٢٠ ليفة عضلية مرجعة. والحيوان بيضاوي الشكل ذو لون بني مخضر نظرا لوجود الطحالب البنية التكافلية وطوله يصل ما بين ٨ر٠ إلى ١ م وعرضه ما بين ٣ر٠ إلى ٤ر٠ م، وليس له عيون وبلعوم. ويتركب الجهاز التناسلي الأنثوي من كيس منوي جيد التكوين متصل بقطعة فمية كيتينيه إلى الناحية البطنية، كما يوجد مبيض أيمن وآخر أيسر. والفتحة التناسلية الأنثوية غير موجودة. ويتكون الجهاز التناسلي الذكري من قضيب كيتيني قصير وحوصلة حبيبية وحويصلتين منويتين كاذبتين كما توجد خصية يمنى وأخرى يسرى.