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A POLYCLAD TURBELLARIAN FROM OYSTERS IN THE GULF OF CALIFORNIA

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RESUMO - Muitos platielmintes da cavidade inalante de *Ostrea angelica* no Golfo da California representam uma nova espécie, *Zygantroplana ups*, spec. nov.

ABSTRACT - Numerous flatworms from the incurrent mantle cavity of *Ostrea angelica* in the Gulf of California are a new species of *Zygantroplana*, *Z. ups*, spec. nov.

INTRODUCTION

Mrs. Constance E. Boone, Houston, Texas, found many flatworms in the incurrent mantle cavity of *Ostrea angelica* in the Gulf of California. She gave them for classification to one of us, and they were turned over to the other. By the posterior situation of the reproductive organs they belong to the genus *Zygantroplana* Laidlaw, 1906, and represent a new species, *Zygantroplana ups*, the third species of the genus with a stylet.

Phylum Platyhelminthes
Class Turbellaria
Order Polycladida
Suborder Acotylea
Sectio Schematommata
Family Leptoplanidae
Genus *Zygantroplana* Laidlaw, 1906

Laidlaw's generic diagnosis (1906:710) must be altered to comprise the now included species: "No tentacles", but the present species has tentacles.

"Eyes in clusters, the hindmost are the tentacular ones": The eyes are in four distinct clusters (*stylifera* , *ups*) or the cerebral ones in long rows, sometimes ending in

front of the tentacular clusters (*angusta, verrilli* (Bock , 1913:222), *henriettae, plesia*) or surpassing them backwards (*yrsa*) They are not always indicated in detail and vary with age; Verrill (1892:485) found the eyes in small specimens in straight, fusiform rows, in large ones the hindmost formed dorsal clusters of larger ocelli, the tentacular ones.

"Atrium in hindmost part of body"

"No granule vesicle": This is wanting in *yrsa*. (Fig. 11). It is poorly developed in *verrilli* and *clepeasta,* but is distinct in *angusta, henriettae, plesia, stylifera* and *ups*. (Fig. 12).

"Seminal vesicle hardly developed": It is strongly muscular in *plesia* (Fig. 9) and *yrsa*.

"Seminal ducts very long"

"Penis rather large and unarmed": The only big penis belongs to *ups* (Fig. 12) It is tiny in *angusta, plesia* and *yrsa* (Fig. 11) There is a strong stylet in *stylifera:* (Fig. 10) and *clepeasta*. In *ups* this is so delicate (Fig. 3) that it may have been missed in other species described as with an unarmed penis.

"Vagina very long"

"Lang's vesicle extremely large": so it is only in *verrilli*(Fig. 6).

"One or two gonopores" is doubtful character.

List of the species of *Zygantroplana*

1. *Leptoplana angusta* Verrill, 1892: 485, pl. 40, f 8, pl. 44, f. 2, 2a, 3.
   Stylochoplana angusta Hyman, 1939:139, f 9-11; 1940:467
   Zygantroplana angusta Hyman, 1953:310. Western Atlantic , Carolina.
   non *Stylochoplana angusta* Palombi, 1928; Pearse, 1938 ; Pearse & Littler, 1938; Marcus 1947:110, f. 14-16.
2. *Zygantroplana verrilli* Laidlaw, 1906:709, pl. 52, f.2. Cape Verde.
3. *Zygantroplana clepeasta* Kato, 1944:278, f 20, 21. Japan.
4. *Zygantroplana henriettae* Corrêa, 1949:176, f 1-22. Brazil.
   syn. *Stylochoplana angusta* Marcus, 1947:110, f.14-16.
5. *Zygantroplana plesia* Corrêa, 1949:200, f. 23-25. Brazil.
6. *Zygantroplana stylifera* Hyman, 1953:308, f 52-54. Gulf of California.
7. *Zygantroplana yrsa* Marcus, 1968:19, f 16-17 Curaçao.
8. *Zygantroplana ups,* spec. nov. Gulf of California.

Key to the species of *Zygantroplana*

1	Stylet present	2
-	No stylet seen	4
2	Granule vesicle poorly developed	*clepeasta*
-	Granule vesicle strong	3
3	Strong stylet, longer than vagina	*stylifera*
-	Delicate stylet, much shorter than vagina	*ups*
4	Granule vesicle present	5
-	Granule vesicle absent	*verrilli*

5	Lang's vesicle touches pharynx	*angusta*
-	Lang's vesicle distant from pharynx .. .	6
6	Granule vesicle cordiform ..	*plesia*
-	Granule vesicle longish	7
7	A single gonopore ..	*henriettae*
-	Two gonopores	*yrsa*

Zygantroplana ups, new species

Figures 1-3, 12

Material - Some fifty specimens, of which 6 were studied , from Puerto Don Juan, Mexico.

DESCRIPTION

The preserved specimens are of fairly uniform size , about 6 mm long by 3 mm wide when contracted. The shape is elongate oval, the ends evenly rounded, with a slight medial indentation at the hind end (Fig. 1) The epidermis is thin on the ventral side, twice as thick on the back. It has be - come loosened in large patches on many specimens. Below it there is a thin, colourless basement membrane. The colour of the specimens is from pigment under this membrane.

There are two rounded tentacles, at 1/7 - 1/5 the length from the anterior end. Each tentacle contains about 14 to 21 eyes, the largest of which measure up 50 µm. The ce rebral eyes are in rows or in patches, the largest are about 30 µm.

Their lenses are oriented in different directions,both in the cerebral eyes and in the tentacular ones. The dorsal side has a general ground colour of light reddish brown, and three broad evenly spaced longitudinal black stripes, one me dial and two submarginal. Both brown and black areas are clo sely set with small oval light tan spots. These tend to be smaller and to coalesce toward the midline. The ventral side generally has no superficial pigment, but is light grey from the abundant black granules in the parenchyma. The pharynx appears as a white, long and narrow mass with scalloped mar- gins. Near the posterior end in the midline, almost at the margin, is a slight papilla directed backward, which con - tains the reproductive opening.

To the sides of the median reproductive organs there are many dorsal ovaries and ventral testes among the fine branches of the digestive gland. The seminal ductules unite backwards and form the seminal duct, slightly widened as se- minal vesicle (Fig. 12). Then it enters the strongly muscu - lar granular or prostatic vesicle (Fig. 3) The ental part of this is globular and set off from the longish hind part by a slight constriction. The outgoing ejaculatory duct forms a small curve and enters the about 0,2 mm long penial bulb , which consists of loose muscle fibres (Fig. 3). The duct is continued into a delicate stylet, an about 0,08 mm long and 0,005 mm wide tube. In stained sections it is quite distinct. It was also visible in freshly clarified total specimens,but

after a week in balsam I did not find it any more. The tip of the bulb bears the male opening.

Dorsal to the male pore the female pore leads into the not very long vagina which is directed forward over penis and prostatic gland (Fig. 12). It is beset with cement glands. Over the prostate it bends dorsally backwards and receives the uterine ducts. Then it forms a strong Lang's vesicle, which in one specimen contains a ball of sperm. It ends behind the female pore, quite near the end of the body, farthest behind of all species. The space between vagina and hind end of pharynx contains the winding seminal ducts.

The uterine ducts lie to the sides of the median organs and enter the upper arm of the vagina, far behind, over the penial bulb (Fig. 2). They are wide even if they are empty, and reach forward to the hind end of the pharynx.

Distribution - Puerto Don Juan; cove at Punta que Malo, south side of Bahia de los Angeles, Gulf of California, Baja California, Mexico. Collected May 24, 1982, by Mrs. Constance E. Boone, Houston, Texas. Preserved in alcohol in the field.

Three of 28 specimens of *Ostrea angelica* Rochebrune, 1895, were found to have one or two worms in the incurrent mantle cavity. Probably the infestation is much higher, as a number of additional specimens were found in the detritus of the container in which the oysters were preserved. This oyster is abundant where these specimens came from. At a second locality Mrs. Boone found only a single small specimen of *O. angelica*, but it contained 37 specimens of the worm. No gross damage to the flesh was evident, except that the mantle was very thin, suggesting it was not being used for storing food (glycogen?). This oyster was found: "on shore line of Bahia de los Angeles, Gulf of California, May 27, 1982" Worms were not present in the three specimens of *O.angelica* in which the crab, *Pinnotheres sp.* occurred. Neither worms nor pea crabs were found in the other three species of oysters (1-12 specimens of each examined) found by Mrs. Boone on this collecting trip in Bahia de los Angeles.

Stylochus oculiferus (Girard, 1853) was reported from oyster beds by Hyman (1940:466); and one specimen of *Zygantroplana yrsa* ona a pearl oyster (Marcus, 1968:20). *Hoplopla na inquilina* was found in prosobranch gastropods. None of the other species of *Zygantroplana* was mentioned from mollusks.

REMARKS

Zygantroplana stylifera was described from Angel de la Guardia Island, very near the localities of the present species, but it is distinguished by its enormous stylet.

Verrill (1892:486) found that "the posterior region is usually so altered by contraction, that the reproductive organs are evidently much altered in form and position in nearly all cases and therefore vary in different specimens from the same lot" Two gonopores were found in *plesia* (Corrêa,

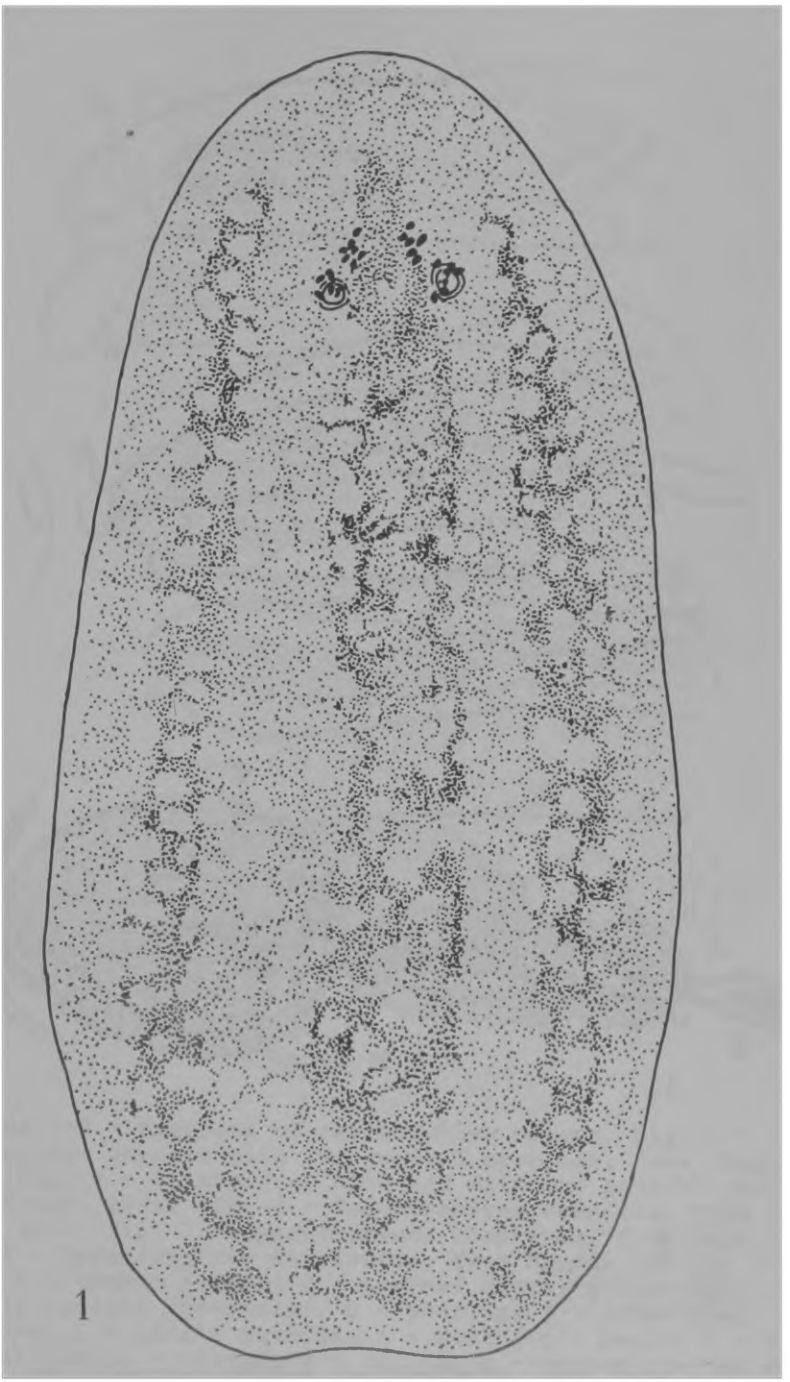


Fig. 1 - *Zygantroplana ups*, dorsal aspect of preserved worm, 6 mm long.

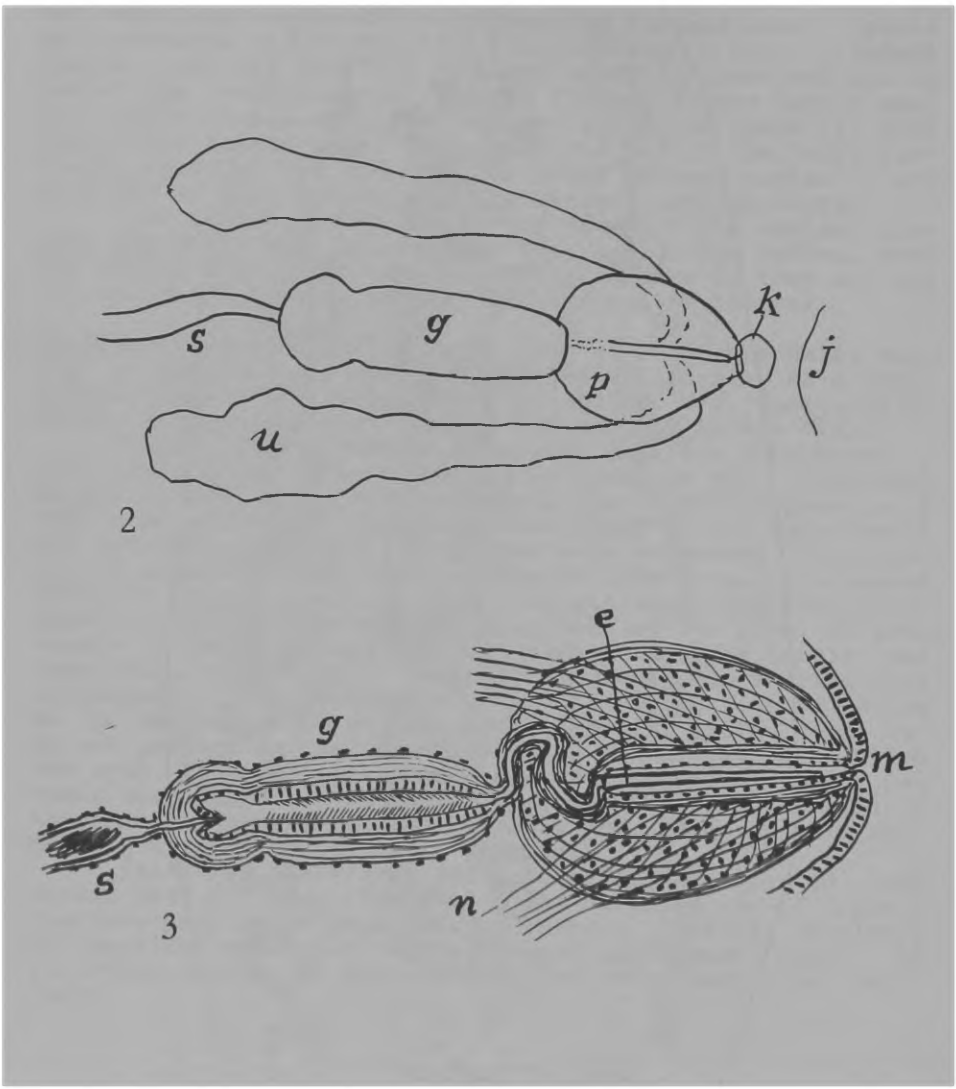
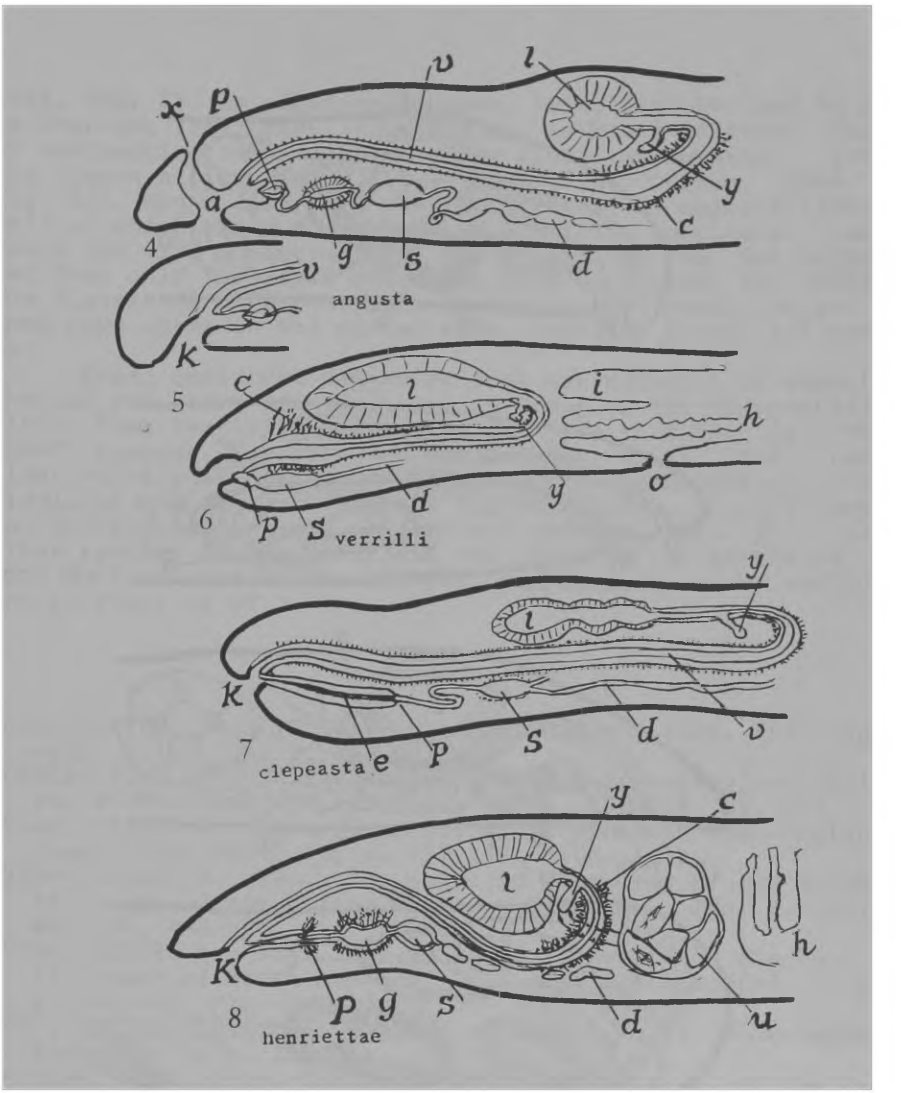
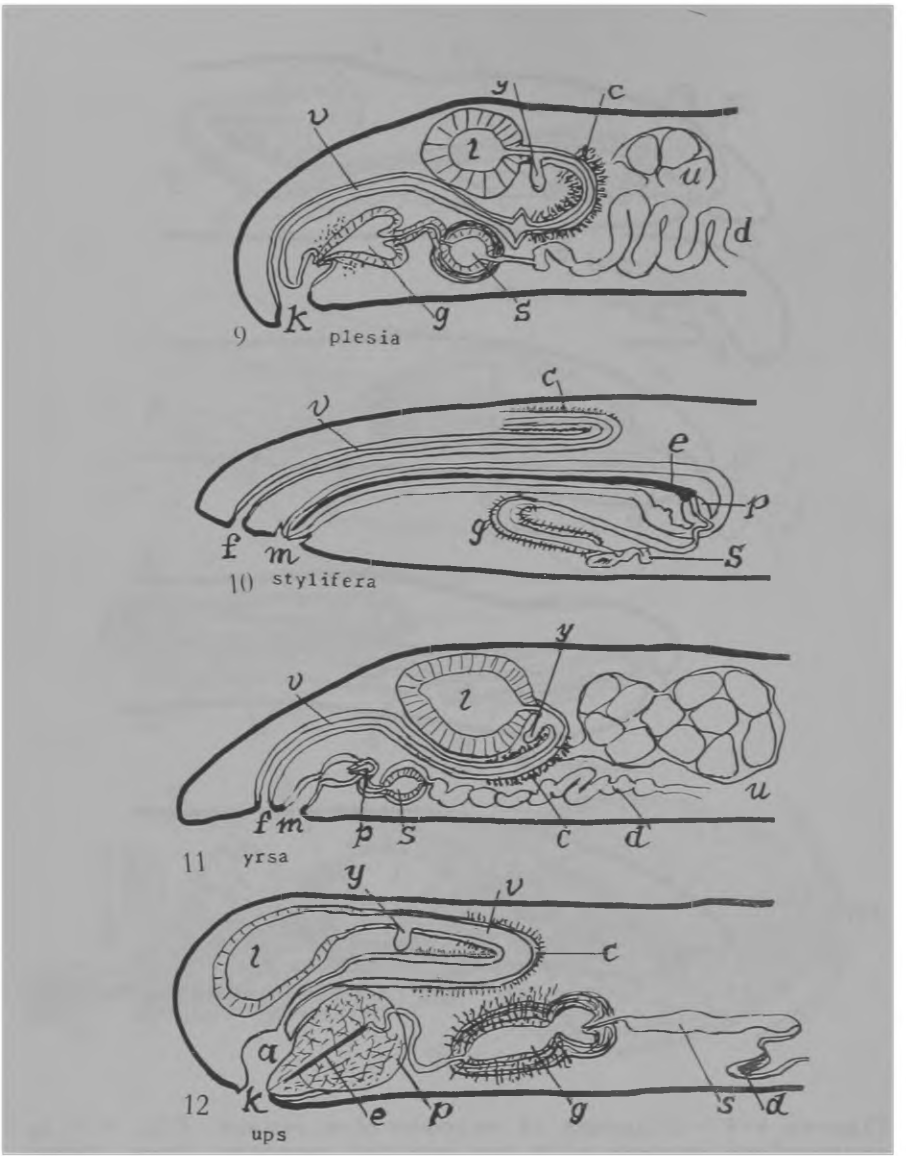


Fig. 2 - Hind part of clarified worm in ventral view.
Fig. 3 - Male organ, from horizontal sections. e - stylet; g - granule vesicle (prostate); j - hind end of body; k - gonopore; m - male aperture; n - penial retractors; p - penis; s - seminal vesicle; u - uterus.



Figures 4-8 - Diagrams of reproductive organs. Fig. 4 - *Zygantroplana angusta* with two genital openings, from Hyman, 1939. Fig. 5 - *Z. angusta*, hind end with one genital opening from Hyman, 1939 Fig. 6 - *Zygantroplana verrilli*, from Laidlaw, 1906. Fig. 7 - *Zygantroplana clepeasta*, from Kato, 1944 Fig. 8 - *Zygantroplana henriettae*, from Marcus 1947. a - antrum; c - cement glands; d - seminal ducts; e - stylet; g - granule vesicle (prostate); h - pharynx; i - intestine; k - gonopore; l - Lang's vesicle; o - mouth; p - penis; s - seminal vesicle; u - uterus; v - vagina; y - common uterine duct



Figures 9-12 - Diagrams of reproductive organs Fig. 9 - *Zygantroplana plesia*, from Correa, 1949. Fig. 10 - *Zygantroplana stylifera*, from Hyman, 1953. Fig. 11 - *Zygantroplana yrsa*, from Marcus, 1969. Fig. 12 - *Zygantroplana ups*, spec. nov. a- antrum; c - cement glands; d - seminal ducts; e - stylet; f - female aperture; g- granule vesicle (prostate); k - gonopore; l - Lang's vesicle; m - male aperture; p - penis; s - seminal vesicle; u - uterus; v - vagina; y - common uterine duct.

1949, fig. 25) in *stylifera* (Hyman, 1953, fig. 54) and in *yr sa* (Marcus, 1968, fig. 17) They are so close together that by contraction they might possibly appear as opening into the common atrium, as, e.g., in *henriettae* (Corrêa, 1949 , fig. 22) Hyman discussed the gonopores of *Z. angusta* (1940: 467) of which she sectioned two of Verrill's specimens, and found one with a single pore, the other with two. She supposed that only the riper specimens have two pores. The animal she figured is different from the above mentioned, its se - cond pore opens on the dorsal side. Possibly it was not normal.

Hyman could not determine from her material of *angusta*, whether the uteri are confluent in front of the pharynx(1939 :140), "but Verrill's statements indicate that this is the case" However, Verrill does not mention it in his text (1892:485-6); in his figure (pl. 44) they end behind the middle of the pharynx. Hyman's figure 9 (1939, pl. 141) does not distinguish between ovaries and uterine eggs. In all other species of *Zygantroplana* the uteri do not extend be - yond the hind part of the pharynx, and they are never confluent in front of it.

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