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Dendrocoelum
(Dendirocoelides) Benazzii
N. Sp. from the Cave of Stiffe
(Abruzzo)

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DENDROCOELUM (DENDROCOELIDES) BENAZZII N. SP.
FROM THE CAVE OF STIFFE (ABRUZZO)

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(received March 8, 1973)

INTRODUCTION

The Dendrocoelum subject of this paper comes from the cave of Stiffe (S. Demetrio né Vestini, L'Aquila, Abruzzo, m 605) where it was found by Dr. V. Sbordoni on 30th June 1971.

Several specimens, fixed and preserved in alcohol at 70⁰, were sent to Prof. Benazzi, who kindly entrusted them to me for determination.

On macroscopic examination of one of the specimens it was immediately apparent that we were dealing with a typical troglobiont as it was both blind and completely devoid of pigment. Its measurements were relatively small, about 10 mm in length and about 4 mm in width. Dr. Sbordoni had also sent live specimens, which however had not withstood laboratory conditions. An attempt was made to prepare the specimens whole in order to examine and count the number of intestinal branches, but as the animals had become excessively curved during fixation, they fragmented and therefore could not be examined in this way.

Among the samples sent, I chose for histological preparation the ones which appeared flatter and more sexually mature; four of these samples were embedded in paraffin, sectioned at a thickness of 8 μ, stained with haemotoxilin of Ehrlich and eosin and mounted in Canada balsam. I then used the two specimens which proved to be most suitable for the present study.

MORPHOLOGICAL CHARACTERISTICS

The pharynx is very voluminous and the alimentary pore is found at about the level of the copulatory bursa; in one specimen a part of the pharynx was inserted between the copulatory bursa and the bulb of the
musculo-glandular organ. Examination of the internal musculature of the pharynx confirms that this triclad belongs to the family Dendrocoelidae.

The testes are numerous and mainly ventral, but can also be found in the dorsal region and in the median zone of the animal; they stretch from immediately behind the ovaries and almost reach the caudal extremity of the animal. These testes show the various phases of spermatogenesis and the presence of numerous spermatozoa confirms the full maturity of the animal.

The male copulatory apparatus is a muscular penis, in the form of a long cylindrical papilla and a voluminous bulb containing a very wide seminal vesicle which continues into an ejaculatory duct opening into the apex of the papilla. The cavities are lined by a thin epithelium. The vesicle is filled with a mass of eosinophilous secretion. The organ shows no traces of flagella. The deferents are inserted laterally into the seminal vesicle. The musculo-glandular organ situated ventrally from the penis is also very voluminous, pear-shaped and it projects from the genital pore which opens out posteriorly at a point about two thirds along the length of the animal; it is positioned almost parallel to the penis with a wide cavity and has a very powerful musculature.

Fig. 1 — cb = copulatory bursa; sv = seminal vesicle; dc = deferent canal; ed = ejaculatory duct; mgo = musculo-glandular organ; bc = bursa canal; ma = male atrium; co = common oviduct; cga = common genital atrium.
The female reproductory apparatus is formed by a copulatory bursa which occupies the whole width of the animal and is lined by a rather thin epithelium followed by a rather narrow canal with few muscular fibres and has several constrictions especially in its last stretch where it then becomes more muscular and lined by a rather thin epithelium.

The rather long male atrium is funnel-shaped and is narrow underneath the penis. In the last stretch it consists of a rather thick musculature and particularly the fibres of its median region are powerful; it is lined with a simple epithelium in the superior tract, multistratified all along the length of the thin canal. At the level of its opening into the common atrium it receives only one very short oviduct, as the oviducts join just before they open out into the atrium. In this region there is a large mass of eosinophilous glands (of the shell).

**DIFFERENTIAL DIAGNOSIS**

On the basis of the above described characteristics I can safely attribute my planarian to the subgenus *Dendrocoelides* (De Beauchamp 1910), given the simplicity of the copulatory system and the absence of flagella. It is not, however, possible to identify it with any known species, because of the fact that the muscular penis has a very large seminal vesicle and instead the male atrium is rather narrow; besides there cannot be seen any swelling or strong muscular development at the tip of the bursa canal, but only simple constrictions and a light increase in muscular fibres. The deferents are inserted laterally into the seminal vesicle.

I retain it suitable to call this new species *Dendrocoelum (Dendrocoelides) benazzii* in gratitude to Prof. Benazzi for the material given me.

As regards to its systematic affinities I can say that the known *Dendrocoelum* species of the Italian caves are very different from our present species. *Dendrocoelum (Dendrocoelides) italicum* Vialli (1937) from the caves of Brescia has only dorsal testes which can be found just up to the distal end of the pharynx, and its penis shows no distinction between bulb and free part; apart from these characteristics it is more similar to *Dendrocoelides collini*, a species which was found in the caves of Villanova (Udine) (Del Papa, 1950). *D. benazzii* is quite different from the other known *Dendrocoelum*, the one which was found in the cave of Cavassola (Liguria) i.e. *Dendrocoelum beauchampi*, which I also described (1952) and is more similar to *Eudendrocoelum* than to *Dendrocoelides*. 
As for the other known *Dendrocoelides*, a brief description follows of their geographical distribution and of their characteristics as compared to those of the species described in this paper.

**Algeria**

*D. (Dendrocoelides) vaillanti* DE BEAUCHAMP 1954. It has two small eyes. The testes are rather small, the muscular part of the penis bulb is not very well developed, the male atrium is in the form of a long canal and the shell glands are not very well developed.

**Czechoslovakia**

*D. (Dendrocoelides) mrazeki* (VEJDOSKY, 1805). It has a long penis with a retractile papilla, the deferents have their outlet in the middle of the seminal vesicle. The male atrium communicates with the common atrium through a pore. I wish to point out that this species has also been found in Austria and Germany.

*D. (Dendrocoelides) carpathicum* KOMAREK 1926. It has a small pharynx. The bursa canal is enlarged. This species is also found in Poland.

**France**

*D. (Dendrocoelides) regnardi* (DE BEAUCHAMP 1919). It has dorsal testes, its penis is short, it has a long, narrow, male atrium, the posterior part of the bursa canal is enlarged.

*D. (Dendrocoelides) tuzetae* GOURBAULT, 1905. It has ventral testes, a simple and parenchymarose penis, the oviduct is long.

*D. (Dendrocoelides) barbei* DE BEAUCHAMP, 1956. The testes are generally dorsal, the common oviduct longitudinally positioned, there are few shell glands.

*D. (Dendrocoelides) lescherae* GOURBAULT, 1970. It has two small eyes. The testes are more frequently dorsal, the penial epithelium is raised and papillous.

*D. (Dendrocoelides) coiffati* DE BEAUCHAMP, 1956. It has two very small eyes, the testes are prevalently dorsal. The penis is short and muscular. Sometimes a communication between the genital and the intestinal tracts can be found at the level of the bursa canal.

*D. (Dendrocoelides) collini* (DE BEAUCHAMP 1919). It has ventral or dorsal testes, the penis is tubular, the deferents have their outlet at the base of the wide seminal vesicle; the base of the bursa canal has a very powerful circular musculature; the musculo-glandular organ has a sphe-
rical shape. This species has also been found in Belgium and as already said in Italy.

**JUGOSLAVIA**

*D. (Dendrocoelides) spelaeum* (KENK, 1924). It has a very short musculo-glandular organ with a wide glandular cavity.

*D. (Dendrocoelides) kenki* DE BEAUCHAMP, 1937. It has dorsal testes just up to the level of the copulatory bursa; a diaphragm separates the two atria.

*D. (Dendrocoelides) abditum* KENK, 1940. It has dorsal testes, a short penis bulb; the bursa canal has very developed musculature.

**LUXEMBURG**

*D. (Dendrocoelides) warnimonti* HOFFMANN 1963. It has a very narrow seminal vesicle.

**RUMANIA**

*D. (Dendrocoelides) sphaerophallus* (DE BEAUCHAMP, 1929). It has an ellipsoidal-globular penis, showing a short ventral canal with a circular sphincter for an orifice; the bursa canal is very wide and lobed.

*D. (Dendrocoelides) chappuisi* (DE BEAUCHAMP, 1932). Its testes are most frequently dorsal; it has narrow deferents, no real seminal vesicle, the bursa canal is enlarged at its base.

*D. (Dendrocoelides) clujanum* CODREANU 1943. It has dorsal testes, its deferents have their outlet in the inferior part of the seminal vesicle. The communication between the male and the common atrium is very wide.

*D. (Dendrocoelides) recovitzai* DE BEAUCHAMP 1949. Its testes are dorsal, the common oviduct is very long, there is a wide communication between the two atria.

*D. (Dendrocoelides) banaticum* CODREANU & BALCESCO 1967. Syn. *D. (Dendrocoelies) codreanui* GOURBAULT 1967. It has dorsal testes, the penis has a short bulb with weak fibres. The common oviduct is obstructed by the bursa canal.

*D. (Dendrocoelides) atriostrictum* and *D. (Dendrocoelides) debeauchampianum* CODREANU & BALCESCO 1967, according to Gourbault and de Beauchamp should perhaps be assigned to the preceding species.

*D. (Dendrocoelides) tismanae* CODREANU & BALCESCO 1967 has a cylindrical penis with dorsal-ventral and circular fibres which cause a constriction at the middle of the papilla.
D. (Dendrocoelides) stenophallus Codoreanu & Balcesco 1957. Syn. D. (Dendrocoelides) dumitrescuae Gourbault 1967. It has many testes limited to the prepharingeal region, its penis has a small bulbar region and a long papilla without a seminal vesicle, the deferents have their outlet in the lower part of the large ejaculatory duct. 
D. (Dendrocoelides) orghidani Codoreanu & Balcesco 1967 has a solid penis with a short bulb and a long spindle-shaped papilla.

Hungary

D. (Dendrocoelides) hankoi (Gelei, 1927) has a short globular musculo-glandular organ.

* * *

Our planarian is the first dark-dwelling Dendrocoelum reported to have been found in the caves of Abruzzo.

The holotype and three paratypes are conserved in the Benazzi planarian collection at the Institute of Zoology and Comparative Anatomy of the University of Pisa.

Summary

A new species of a cave-dwelling and blind Dendrocoelidae, i.e. Dendrocoelum (Dendrocoelides) benazzi, is described; its most important differential characteristics are: testes mainly ventral and distributed on the whole body length, very large seminal vesicle, with laterally and ventrally inserted deferents, the penis bulb with thick muscles, cylindrical papilla, rather narrow male atrium and an almost uniform bursa canal.

This is the first specimen of Dendrocoelidae found in a cave of the Abruzzi region.
REFERENCES


