

DENDROCOELOPSIS AMERICANA (HYMAN, 1939)
FROM CHRISTIAN SCHOOL CAVE,
THE OZARK PLATEAU, OKLAHOMA, U. S. A.
(TURBELLARIA, SERIATA, TRICLADIDA, PALUDICOLA)

by

MASAHARU KAWAKATSU, CARYN C. VAUGHN
and ROBERT W. MITCHELL

INTRODUCTION

In December of 1991, VAUGHN (a member of the Oklahoma Biological Survey, University of Oklahoma) collected a small number of specimens of white cave planarian from a subterranean pool of Christian School Cave, Adair County, Oklahoma, U. S. A. (cf. VAUGHN & CERTAIN, 1992). This cave is situated in the Ozark Plateau; its coordinates are 36° 07' N and 94° 45' W (see KAWAKATSU & MITCHELL, 1984, p. 7, fig. 2; the cave is close to Bat Cave, First Cave and Ozark Cave represented as St. 1).^{*1}

A single specimen, well-preserved with Bouin's fluid (fixed in February, 1992), was sent to KAWAKATSU for taxonomic study. The collection, designated as KAWAKATSU's Speciment Lot No. 2052, was cut in serial sagittal section at 7 micrometers. Staining was done with Delafield's hematoxylin and erythrosin. VAUGHN also supplied her collection data and copies of local papers on Oklahoma caves and their faunae to KAWAKATSU.

KAWAKATSU's data, including photographs and sketches of the preserved specimen, photomicrographs of parts of genital organs and a pencil sketch of the copulatory apparatus, were sent to MITCHELL for taxonomic discussion. And, we identified the species as *Dendrocoelopsis americana* (HYMAN, 1939) (*olim Sorocelis americana*). Although this cave is listed as one of localities of *Den. americana* (cf. BLACK, 1971), no taxonomic description was given in that publication. Accounts of both external morphology and genital anatomy based upon our sample will be given in the present paper.

DESCRIPTION

Order SERIATA BRESSLAU, 1933
Suborder TRICLADIDA LANG, 1884
Infraorder PALUDICOLA HALLEZ, 1892
Family D e n d r o c o e l i d a e HALLEZ, 1892

Genus *Dendrocoelopsis* KENK, 1930
Dendrocoelopsis americana (HYMAN, 1939)

External features. Photographs in Fig. 1 (A and B) show the external appearance of the preserved, sexually mature specimen. This specimen measured 6 to 7 mm in length and approximately 1.5 mm in width at the widest part of the body. The specimen is unpigmented. There are small eyes arranged in 2 short, longitudinal bands, one on each side of the midline at the head region (the left eyes, 9 in the number, and the right, 8 in the number). The pharynx is inserted at about the middle of the body. The genital pore opens at about the mid-level of the postpharyngeal region (Fig. 1 A). An adhesive organ was recognized as a weakly developed pit at the middle of the antero-ventral portion of the body (Fig. 1 B).



Fig. 1. *Dendrocoelopsis americana*, the preserved specimen from Christian School Cave. No. 2052-a. A: dorsal view; B: ventral view. Small arrow indicates the mouth; the large arrow, the genital pore.

Internal features. The general histology has no peculiarities. Dorsal testes and a pair of ovaries were observed in the slides examined.

A sagittal view of the copulatory apparatus is shown in Fig. 2; pertinent photomicrographs of the apparatus are shown in Fig. 3 (A-D). Since the genital anatomy and histology of this species have been well studied by HYMAN (1939; loc.: Bat Cave, Oklahoma, *i. e.*, the type locality), KENK (1972, 1973; loc.: Brown Spring, Arkansas) and KAWAKATSU & MITCHELL (1984; loc. Soda Water Well, Texas), only a brief, comparative anatomy of the copulatory apparatus of this sample is given here.

In the slides of our specimen from Christian School Cave, the genital anatomy can be summarized as follows: penis bulb large and moderately muscular; symmetrical penis papilla moderate and conical in form; the penis lumen, continued from an anterior, tubular, common sperm duct, consists of two sections, *i. e.*, an anterior, moderately large, rounded bulbar cavity and a

*1. For the name of this cave, see the section "Additional Notes on the Distribution of *Dendrocoelopsis americana*."

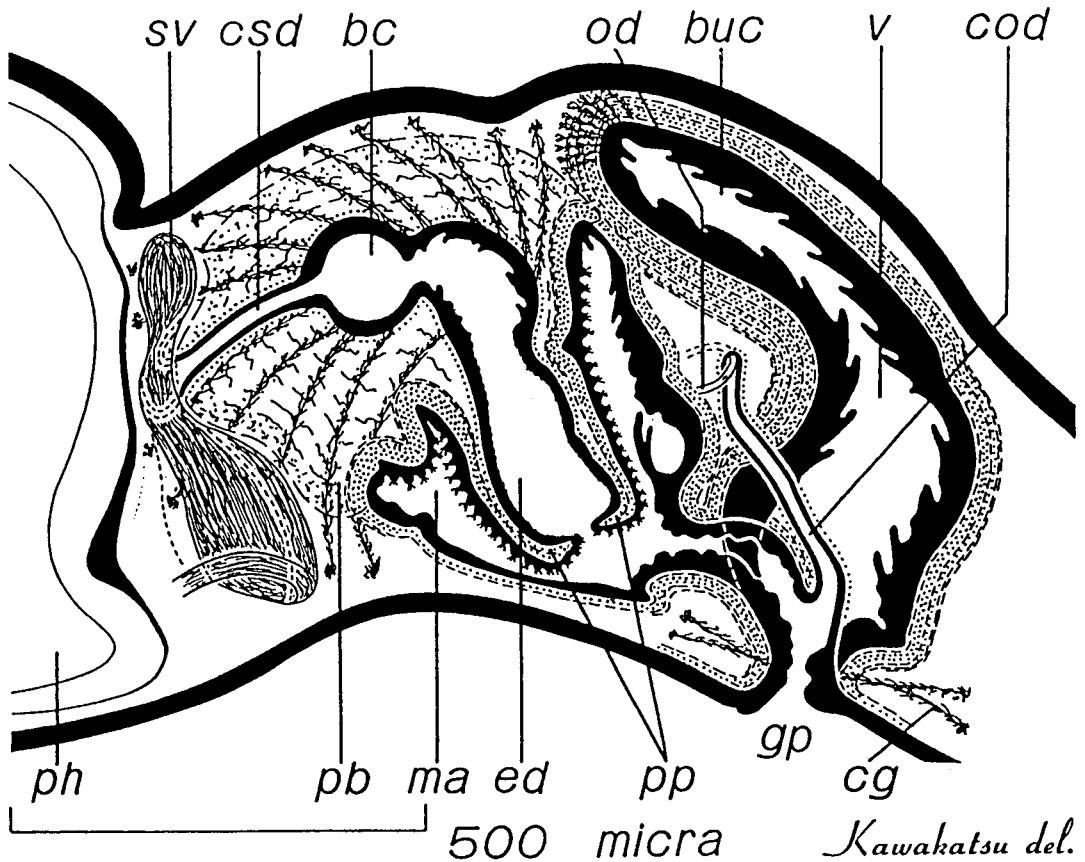


Fig. 2. *Dendrocoelopsis americana*, semidiagrammatic sagittal view of the copulatory apparatus (No. 2052-a). bc, bulbar cavity; buc, bursal canal; cg, cement gland; cod, common ovovitelline duct; csd, common sperm duct; ed, ejaculatory duct; gp, genital pore; m, mouth; ma, male genital antrum; od, ovovitelline duct; pb, penis bulb; ph, pharynx; pp, penis papilla; sv, spermiducal vesicle; v, vagina.

posterior, wide, tubular ejaculatory duct which opens at the tip of the papilla; the covering epithelium with "wart-like protuberances packed with short, pointed spines" is conspicuous on the surface of the middle and posterior sections of penis papilla; male genital antrum cup-shaped and receiving the common ovovitelline duct at the roof of its terminal portion; without copulatory bursa; bursal canal a blindly closed, wide tube covered by a thick layer of muscle, opens at the genital pore.

Remarks on taxonomy. The penial anatomy of the Christian Cave specimen described above (Figs. 2 and 3 A-D) is very similar to that of HYMAN's (1939) description and figures of the Bat Cave specimen (on pp. 280-283, pl. II, figs. 6-9). In her figure (*op. cit.*, fig. 6), an ejaculatory duct is represented by a short and narrow tube; a short common "oviduct" is entering the rear wall of the male antrum. Judging from HYMAN's (*op. cit.*) sagittal view of the copulatory apparatus, her type specimen seems to have strongly contracted when the animal was killed (chemicals used for the fixation of her sample are uncertain).

KENK's (1973) figure of the sagittal view of the Brown Spring specimen (on p. 11, fig. 9; see also 1972, p. 62, fig. 86) is possibly preserved in a moderately elongated state. There are no essential

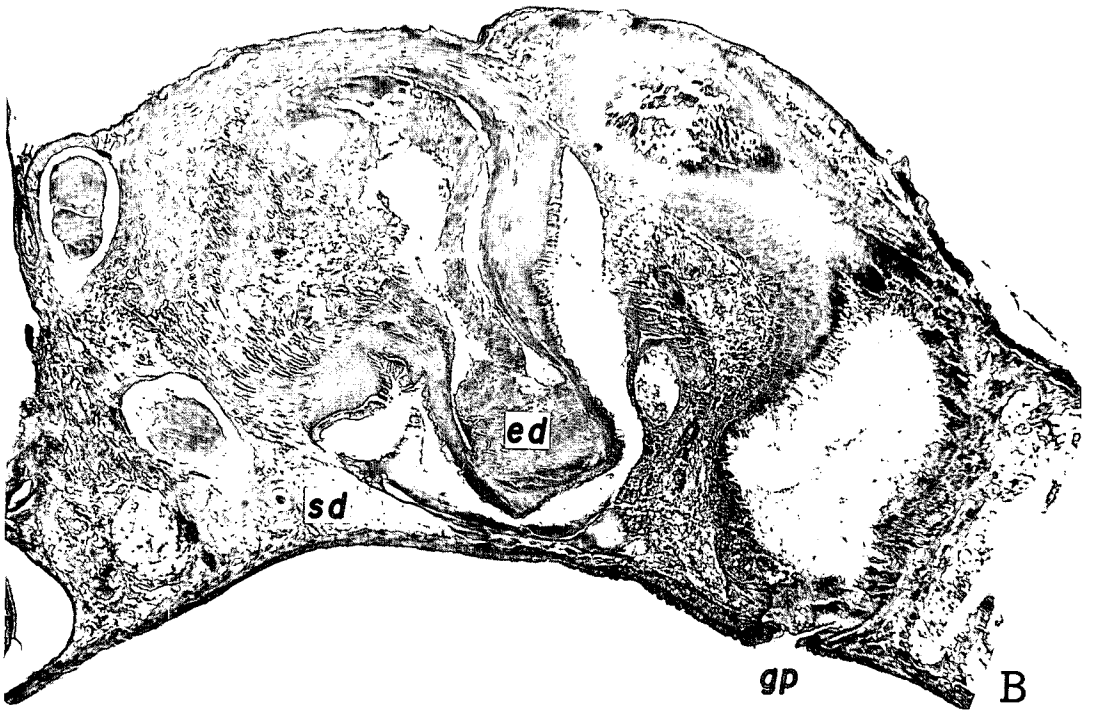
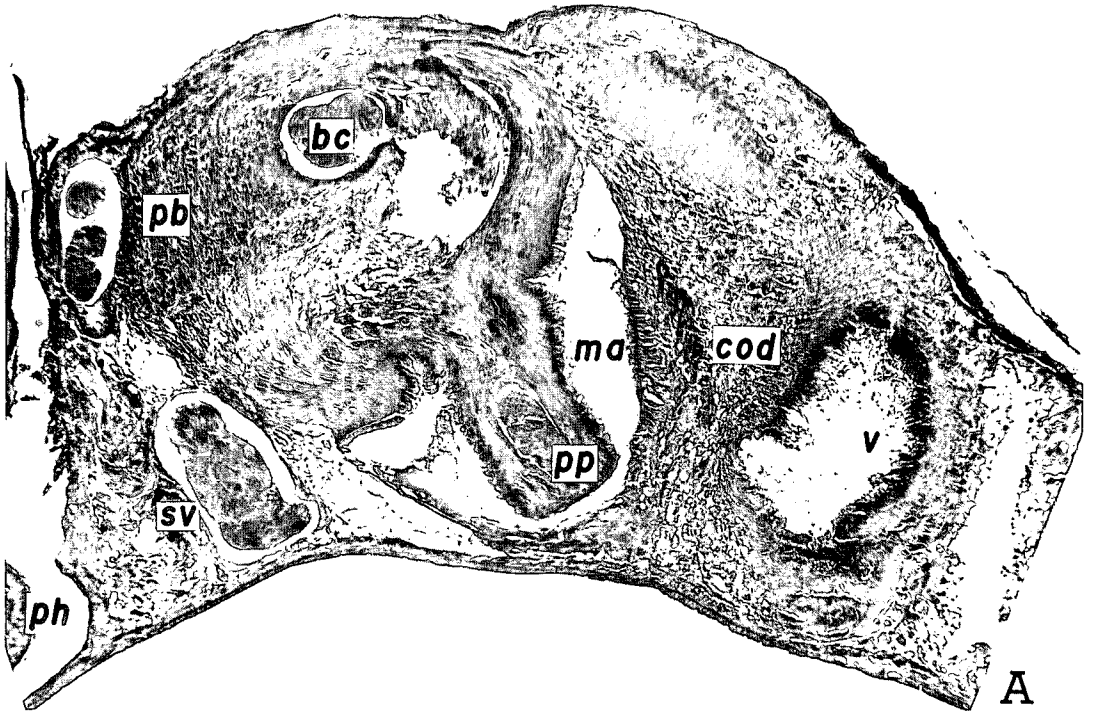
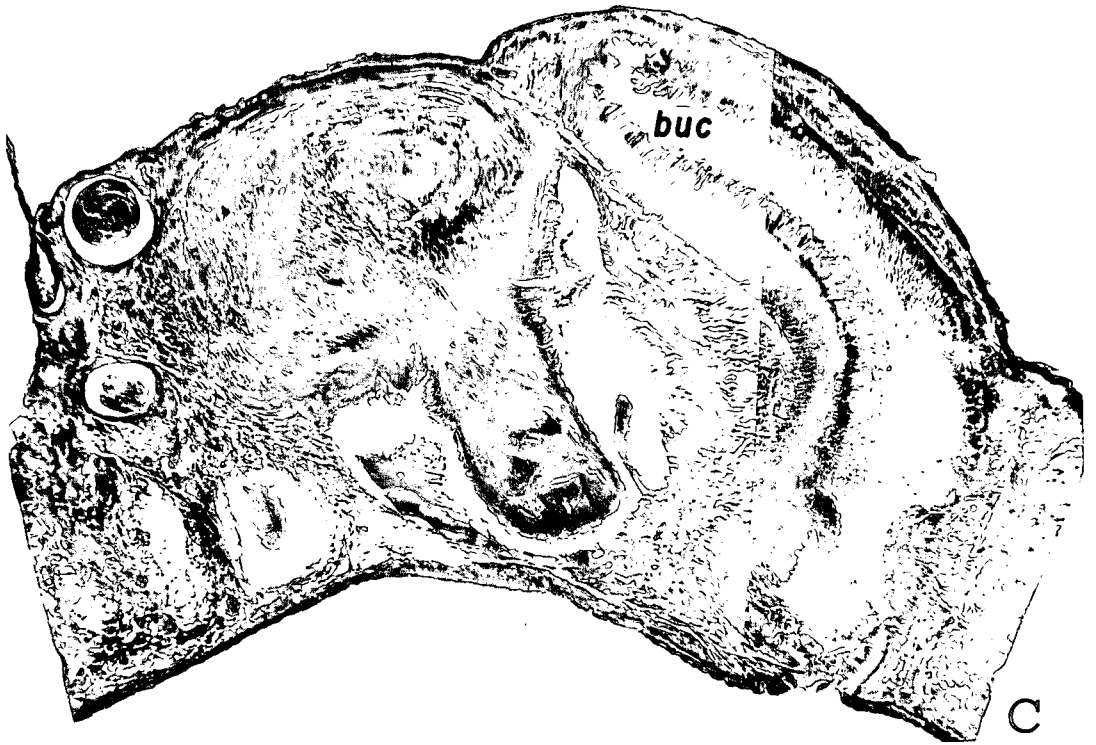
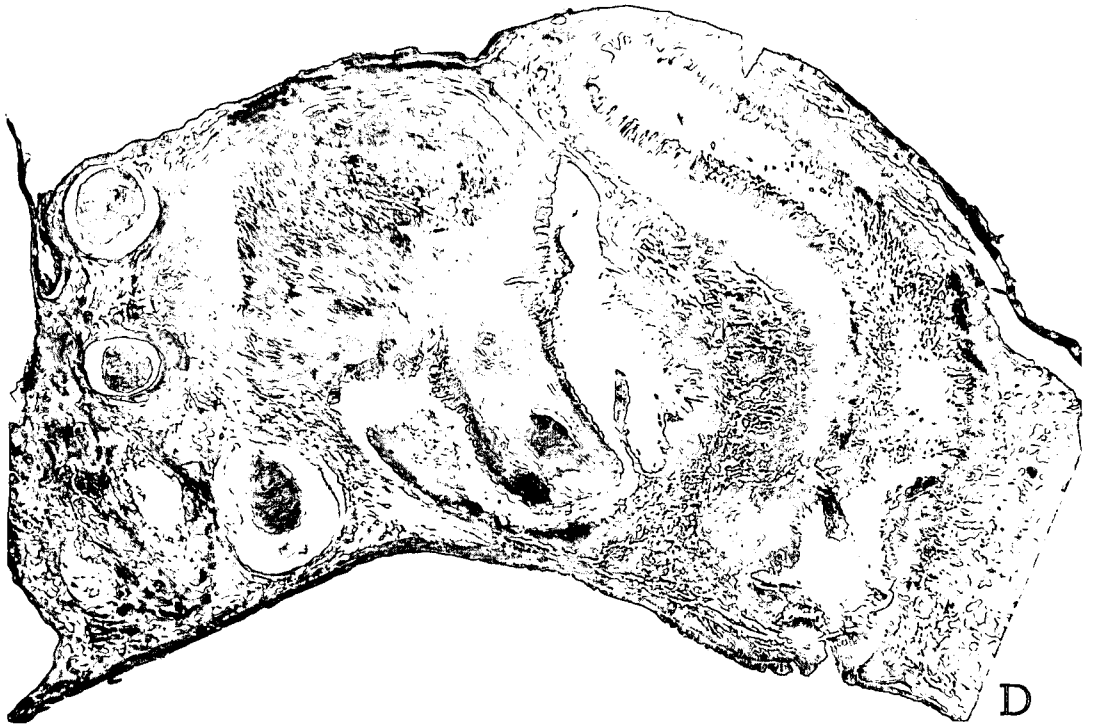


Fig. 3. *Dendrocoelopsis americana*, photomicrographs of sagittal sections of the copulatory apparatus (No. 2052-a). A-D: Near mid-sagittal sections. buc, bursal canal; cod, common ovovitelline



C



D

duct ; csd, common sperm duct ; ed, ejaculatory duct ; gp, genital pore ; ma, male genital antrum ; pb, penis bulb ; pp, penis papilla ; sd, sperm duct ; v, vagina.



Fig. 4 (top). Bluff by Christian School Cave. Entrance is to the right.
Photo by Mr. S. HENSLEY.



Fig. 5 (middle). Entrance to Christian School Cave.
Photo by Mr. S. HENSLEY.



Fig. 6 (bottom). Looking out from entrance to Christian School Cave.
Photo by Mr. S. HENSLEY.

differences in the penial anatomy of our Christian Cave specimen and KENK's (*op. cit.*) Brown Spring specimen.

The penial anatomy of the Soda Water Well specimen (KAWAKATSU & MITCHELL, 1984, p. 5, fig. 1, pl. III, figs. A-E) is different from that of the Christian School Cave specimen in having a small bulbar cavity and a narrow, tubular ejaculatory duct. There may be a slight degree of anatomical variation in this cave-dwelling species.

Material. One set of serial sagittal sections (Specimen No. 2052-a, 4 slides) is retained in KAWAKATSU's Laboratory, Fuji Women's College, Sapporo, Japan.

Additional Notes on the Distribution of *Dendrocoelopsis americana*

A brief account of 4 *Dendrocoelopsis* species distributed in the United States was given in a previous paper by KAWAKATSU & MITCHELL (1984), together with a zoogeographical discussion of *Dendrocoelopsis americana* (on pp. 6-8, fig. 2). The following is an additional note about Oklahoma Caves in the Ozark Plateau where cave planarians have been recorded.

There may be confusion about the name of "Christian School Cave." BLACK (1971, p. 4) wrote about the Oklahoma Records of "*Sorocelis americana*" in Adair Co. as follows :

"Bat Cave, Ozark Region of northeastern Oklahoma, near the town Kansas, Oklahoma, spring from small caves near Bat Cave ; Christian School Study Cave, Christian School Annex 1, 2 and 3 ; Little Bat Cave."

"Comment : Troglobite. Bat Cave (Christian School Study Cave) is the type locality of this planarian.... These planarians are numerous in Christian School Study Cave and also present in springs and small caves in the immediate area."

A photograph showing 3 live specimens from Christian School Study Cave is printed in fig. 1 on page 3 of BLACK's paper (*op. cit.*). Our material discussed herein appears to have collected from the "Christian School Study Cave" (not Bat Cave !) of BLACK (*op. cit.*).

ACKNOWLEDGEMENT

We are indebted to Mr. Steve HENSLEY for permitting us to use photographs of Christian School Cave reproduced from his color transparencies (Figs. 4-6 in the present paper).

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Addresses of the Authors :

Dr. Masaharu KAWAKATSU, Professor of Biology, Biological Laboratory, Fuji Women's College, Kita-16, Nishi-2, Kita-ku, Sapporo, Hokkaidô) 001, Japan.

Dr. Caryn C. VAUGHN, Zoologist, Oklahoma Natural Heritage Inventory, Oklahoma Biological Survey, The University of Oklahoma, 111 E. Chesapeake Street, Norman, Oklahoma 73019-0575, U. S. A.

Dr. Robert W. MITCHELL, Professor of Biology, Emeritus, Texas Tech University. (Home address : Route 3, Box 921, Bandera, Texas 78003, U. S. A.).

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