

***Meristocotyle provitellaria* sp. nov. (Digenea: Meristocotylidae) from *Varanus salvator* in China**

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Wei Liu, Qing-Kui Li, Hsiu-Hui Shih and Zhao-Zhi Qiu (2002) *Meristocotyle provitellaria* sp. nov. (Digenea: Meristocotylidae) from *Varanus salvator* in China. *Zoological Studies* 41(3): 283-287. *Meristocotyle provitellaria* sp. nov., from the lungs and gastrointestinal track of *Varanus salvator* from Guangxi Province, China, is described. Compared with *M. varani*, the only other species in the family Meristocotylidae, the new species is smaller; its vitelline follicles are distributed only preacetabularly; its testes are diagonal; and its ovary and Mehlis's gland are in a more posterior position. Accordingly, diagnoses of the family Meristocotylidae and the genus *Meristocotyle* are revised. <http://www.sinica.edu.tw/zool/zoolstud/41.3/283.pdf>

Key words: New species, *Meristocotyle*, Meristocotylidae, Digenetic trematode, Monitor.

Fischthal and Kuntz (1964) reported the species *Meristocotyle varani* and established the subfamily Meristocotylineae. However, they did not know into which family this subfamily should be placed. Yamaguti (1971) reexamined the type specimen, revised the description, and emended it by establishing a new family, Meristocotylidae, which has only 1 species, *M. varani*.

In 1998, a monitor (*Varanus salvator*) brought from Guangxi Prov. for exhibition was found to have died in the Tianjin Natural History Museum. On examination, 20 adult flukes were found in the gastrointestinal track (the exact section in which they occurred, the stomach or intestine, was not verified); more than 30 flukes, mainly immature (there were also a few adults, but they were relatively smaller than those found in the gastrointestinal track), were found in the lungs. The host and habitat are similar to those of *M. varani*, and just as in *M. varani*, our specimens have a significant bipartite acetabulum. We observed these specimens and then concluded that they are a new species of the family Meristocotylidae.

MATERIALS AND METHODS

Flukes were fixed in 10% formalin. Fifteen adults and 6 immature specimens were flattened and stained with aluminum potassium sulfate-carmin. (One adult specimen was not flattened and was stained with Mayer's hemalum.) Specimens were dehydrated and mounted in Canada balsam. In addition, 1 adult was dehydrated and observed under scanning electron microscope, and 3 adults were serially sectioned. Measurements given in this description are in millimeters, except those for eggs, which are in micrometers. All measurements were taken from 5 whole-mounted, flattened adults measured on slides. Illustrations were made with the aid of a drawing tube.

***Meristocotyle provitellaria* sp. nov.**

(Figs. 1-3)

Host: *Varanus salvator* (Varanidae).

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Habitat: Adults mainly in the gastrointestinal track with a few adults and immature specimens in the lungs.

Locality: Guangxi Prov., China. N23°, E107°.

Specimens: Deposited in the Department of Biology, Nankai Univ.

Description: Body 3.45-5.37 long by 0.82-1.53 wide. Tegument unarmed. Forebody somewhat flattened ventrally but with an incurved margin. Anterior end rounded. Hindbody conical, with posterior end tapering into a blunt point. Forebody-hindbody-length ratio 1: 0.71 to 1: 0.83. Preoral lobe 0.055-0.094 by 0.273-0.390. Oral sucker subterminal, 0.414-0.547 by 0.367-0.586. Acetabulum divided internally into anterior and posterior portions, each cup-shaped and enclosed by a common rim. Anterior portion 0.492-0.641 by 0.625-0.758. Posterior portion 0.523-0.609 by 0.633-0.804. Prepharynx, measured in 1 speci-

men, 0.063 by 0.078 (both prepharynx and esophagus usually present yet very short, not apparent in some specimens). Pharynx well developed, 0.195-0.313 by 0.273-0.406. Ceca simple, terminating at the level of the posterior portion of acetabulum. Excretory pore terminal.

Testes 2, globular or oval, smooth, contiguous, oblique ventrally in the anterior part of hindbody; usually left testis anterior. Anterior testis 0.273-0.469 by 0.313-0.453. Posterior testis 0.297-0.586 by 0.250-0.406. Cirrus sac cylindrical, well developed, 1.25-1.95 long by 0.172-0.258 wide, extending from the acetabular level to genital pore. The proximal 1/5 of its posterior end containing a narrow convoluted seminal vesicle. Remainder occupied by a pars prostatica surrounded by dense prostate cells. Genital pore left of median line at the level of pharynx, protuberant ventrally (Fig. 2).

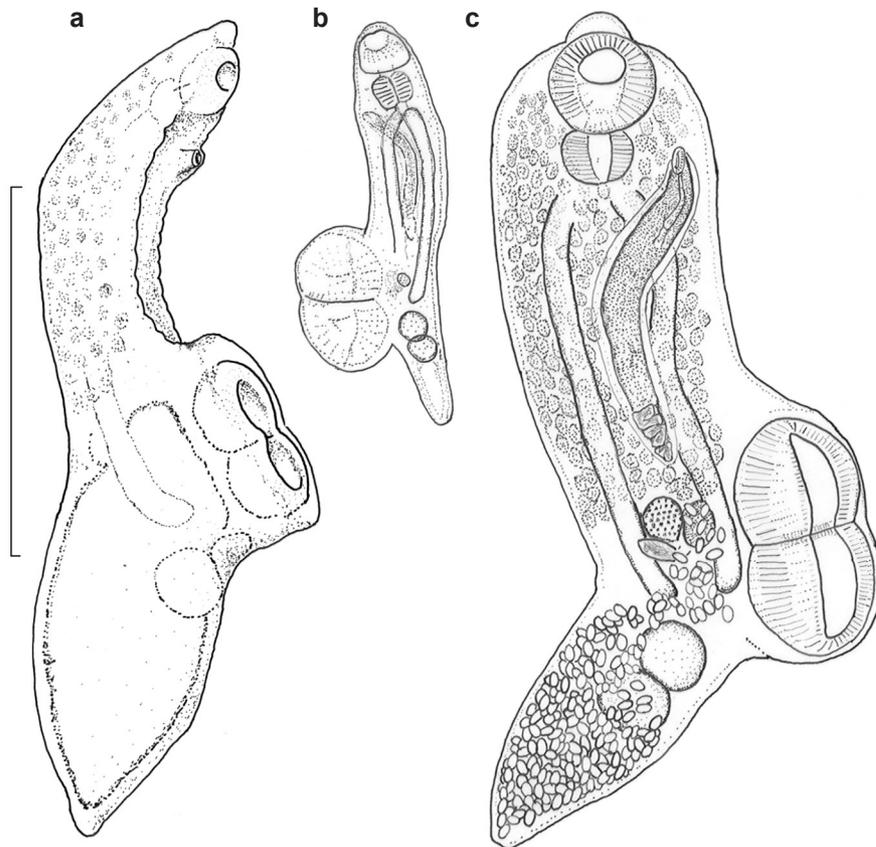


Fig. 1. *Meristocotyle provitellaria*, sp. nov. a. Mature specimen (found in the lungs) in its natural shape. b. Immature specimen (dorsal view). c. Whole-mounted holotype of *M. provitellaria*, sp. nov. In the illustration of the holotype and the immature (b and c), testes seem to be in tandem. This is because they are positioned laterally. We also have specimens in which the hindbody is mounted in a dorso-ventral position, and whose testes can be observed to be undoubtedly diagonal. We can also observe this in the unflattened specimens (e.g., in 1a). Scale bar = 2.0 mm.

Ovary rounded, smooth, 0.156-0.273 by 0.117-0.219, on right, at the level of anterior part of acetabulum. Mehlis's gland 0.203-0.234 by 0.156-0.211, closely sinistral to ovary. Seminal recepta-

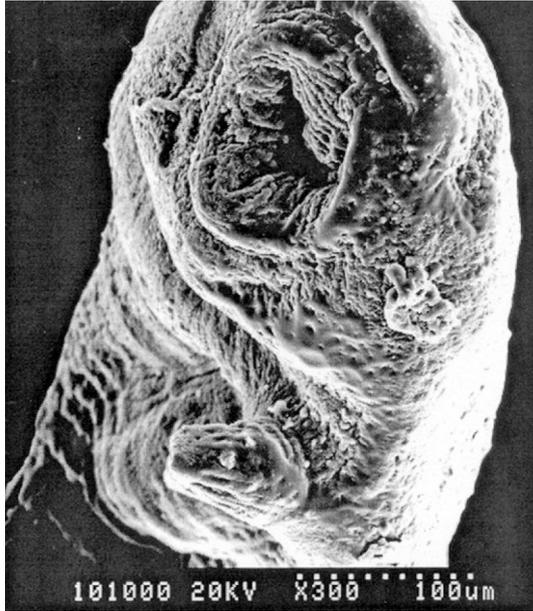


Fig. 2. Scanning electron micrograph of forebody, showing the oral sucker and protruding genital pore.

cle 0.242-0.273 long, 0.094-0.117 wide, transverse, immediately postovarian. Laurer's canal winding, overlapping seminal receptacle, opening into a left-dorsal insunk pocket at the level of the posterior part of acetabulum (Fig. 3). Vitelline follicles extending continuously throughout almost the entire dorsal plane of forebody, from the level of oral sucker to the level of anterior portion of acetabulum (but normally not overlapping ovary). In younger adults (with fewer follicles) vitelline follicles gathered in bunches. Uterus descending to the posterior extremity and then ascending to genital pore, coiled in hindbody. Eggs numerous, 74-86 μm by 39-51 μm . No eggs found in forebody, due to uterus being difficult to trace there, even in serial sections.

Meristocotylidae Fischthal & Kuntz, 1964

Family diagnosis: Digenea with bipartite ventral acetabulum, well apart from the pointed posterior extremity. Oral sucker and pharynx well developed. Preoral lobe present. Ceca simple, terminating some distance short of the posterior extremity. Testes 2, symmetrical or diagonal, in anterior hindbody or dorsally to acetabulum. Cirrus sac cylindrical, long, enclosing convoluted

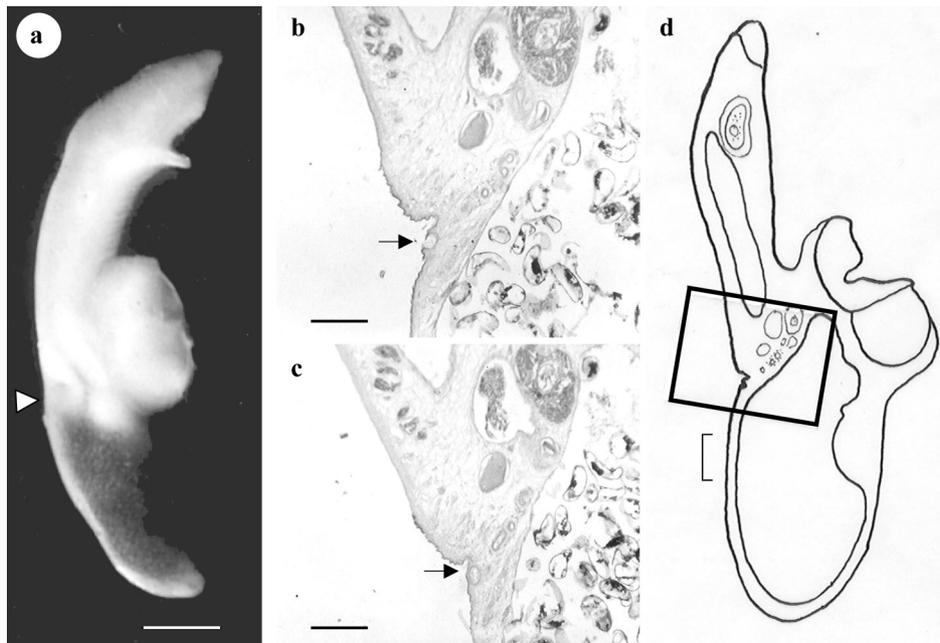


Fig. 3. Illustration of Laurer's canal. a. Micrograph of an unflattened specimen showing the position of the opening of Laurer's canal. b, c. Two micrographs of serial sagittal sections illustrating that Laurer's canal (arrows) is winding, finally opening dorsally into an insunk pocket. d. Sketch showing the frame position of b and c. Scale bars: 1.6 mm in a; 0.2 mm in b, c; 2 mm in d.

seminal vesicle and long part of prostatica. Genital pore submedian, at the level of pharynx. Ovary submedian, anterior to testes. Seminal receptacle and Laurer's canal present. Uterus descending to the posterior extremity and then ascending to genital pore. Vitelline follicles numerous, tending to form groups. Excretory vesicle tubular, very long, with a terminal pore. Life history unknown. Reptilian parasites.

Meristocotyle Fischthal & Kuntz, 1964

Generic diagnosis: Meristocotylidae. Cuticle smooth, forebody approximately flat ventrally with incurved margins. Hindbody forming a blunt cone. Preoral lobe present. Oral sucker subterminal. Acetabulum divided internally into 2 equal portions, anterior and posterior, enclosed by a common rim. Prepharynx and esophagus present, very short. Pharynx well developed. Ceca simple, terminating some distance short of the posterior extremity. Testes 2, symmetrical or diagonal, in anterior hindbody or dorsally to acetabulum. Cirrus sac cylindrical, well developed, thick-walled, extending from the preacetabular level to genital pore; enclosing a narrow convoluted seminal vesicle. Most of the remaining sac occupied by pars prostatica. Genital pore sinistral to the median line at the level of pharynx, slightly projecting ventrally. Ovary relatively small, rounded, before testes, Mehlis's gland closely sinistral to ovary. Seminal receptacle immediately postovarian. Laurer's

canal winding, opening dorsally approximately at the level of acetabulum. Vitelline follicles numerous, located widely in lateral fields or dorsal plane. Uterus descending to the posterior extremity and then ascending to genital pore. Eggs moderately large, numerous. Reptilian parasites.

DISCUSSION

Differences between *M. varani* and *M. provitellaria* are listed in table 1.

Fischthal and Kuntz (1964) thought that post-mortem wandering might be why the adult was found in the stomach (suggesting that the lungs may be the normal habitat), but this is still unproven.

Former family diagnosis have been revised, because there were statements (e.g., 'testes symmetrical') based only on the case of *M. varani* which are not appropriate now.

Yamaguti (1971) found, near the distal end of Laurer's canal in a specimen of *M. varani*, a round vesicle lined with a layer of flat epithelia and surrounded by a dense mass of gland cells. This organ apparently opens dorsally using a large round pore. (The original authors of *M. varani* mentioned no such structure.) In his family diagnosis, Yamaguti (1971) coined the term 'Fischthal's organ' for this structure. But he also stated he was not very sure about that structure for he had only 1 adult specimen on hand. In our

Table 1. Main feature differences between *M. varani* and *M. provitellaria*

	<i>M. varani</i>	<i>M. provitellaria</i>
Body size (mm)	9.425 x 2.709	3.45-5.37 x 0.82-1.53
Ovary and Mehlis's gland	Preacetabular, at level of end of cirrus sac	At the level of middle or anterior portion of acetabulum
Testes	Symmetrical, 1 on each side of posterior portion of acetabulum	Diagonal, contacting each other, postacetabular
Vitelline follicles	Mainly in lateral fields, confluent just postpharyngeal, along ceca from level of intestinal bifurcation to cecal ends, interrupted at the level between ovary and testes; found in both forebody and hindbody	Almost extending throughout forebody with no interruption (no separate parts found in hindbody)

new species, Laurer's canal overlaps the seminal receptacle, so we could examine Laurer's canal in a very few whole-mounted specimens. We found that the opening of Laurer's canal is in an insunk pocket. In serial sections, we found no typical structure representing 'Fischthal's organ'. This may represent an inter-species difference or just be a matter of observation. Confirming this organ requires further research on additional Meristocotylidae species. Therefore, we eliminated the statement about Fischthal's organ from the family diagnosis.

Some observed features vary depending on the extent of fluke maturity. In older adults, as the eggs increase in number, the hindbody becomes relatively bigger than the forebody. The egg-filled uterus occupies the hindbody and overlaps the testes and even the entire area of the acetabulum. There are more and denser vitelline follicles, and the fields of follicles extend more posteriorly. In younger adults with fewer eggs, the course of the

uterus is easy to trace in the hindbody, and thus the organs, especially the testes, can be well observed. The vitelline follicles are sparser, and can be observed gathering in a bunched pattern. The holotype we chose was a moderately mature adult.

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寄生於巨蜥之複殖吸蟲新種前黃分杯吸蟲 (*Meristocotyle provitellaria* sp. nov.)記述(複殖目：分杯科)

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本文記述一吸蟲新種前黃分杯吸蟲(*Meristocotyle provitellaria*)，成熟的成蟲個體寄生於巨蜥 *Varanus salvator*(中國廣西省)的腸道，未成熟的成蟲則寄生於肺。此新種和分杯科(*Meristocotylidae*)僅有的另一種吸蟲 *M. varani* 的特徵區別為：體型較小；辜丸斜列於後體部前部，而不是對稱排列於腹吸盤兩側；卵黃腺濾泡不間斷地分布在前體部，而不是間斷地分布在前體和後體；卵巢、梅氏腺等生殖器官則更靠後端。此外本文亦修訂了對分杯科(*Meristocotylidae*)和分杯屬(*Meristocotyle*)的描述。

關鍵詞：新種，分杯屬，分杯科，複殖吸蟲，巨蜥。

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