

# 犀牛线虫一新属新种——奇异副圆线虫

## *Parastrongylus paradoxus* gen. et sp. nov.

(线虫纲:圆线科,圆线亚科)

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1981年,北京动物园的独角犀 *Rhinoceros unicornis* 患肠炎死亡,解剖后自大肠中采得圆线科 Strongylidae 线虫 840 条,其中雄虫 377 条,雌虫 465 条。经鉴定为圆线豆科一新属新种。文中量度以毫米为单位。

### 副圆线虫属,新属 *Parastrongylus* gen. nov.

口囊呈亚球形,有内外叶冠,外叶冠的小叶细长,数多,背嵴发达,伸达口囊前缘。口囊内无齿。雄虫交合伞呈六边形,在腹肋、侧肋、外背肋和背肋末端各形成一突出角。腹肋、侧肋和外背肋基本上属于圆线虫型的模式排列;背肋仅一根,在靠近末端处向两侧各分出一对指状突。交合刺细长,有羽状膜。无引器。雌虫阴门位于身体中部稍后,子宫一前一后。寄生于犀牛的大肠。

模式种奇异副圆线虫,新种 *Parastrongylus paradoxus* sp. nov.

### 奇异副圆线虫,新种 *Parastrongylus paradoxus* sp. nov. (图1—8)

种的描述 具有属的特征。头部直,虫体的口囊后方部分,明显地缩细,形成颈部,口颌低,边缘圆;有 4 个偏中乳突和二个头感器。外叶冠的小叶细长,顶部尖细,各小叶的长度相等,数目在 250 个左右。内叶冠极为密集,细小。口囊发达,呈亚球形,中上部最宽,背壁上有一条明显的背嵴,通达口囊壁的前缘。在背嵴的侧壁上有大约 9 对背食道腺管的开口。口囊内无齿。颈乳突甚小。雄虫交合伞的各个肋均伸抵伞缘,将伞膜支撑为近似六边形的外观。腹肋、侧肋、外背肋和背肋末端的伞膜均向外突出,各肋之间的伞膜均相应地内凹为线弧形。其中以腹肋与前侧肋、中、后侧肋与外背肋、外背肋与背肋之间的凹陷最为明显。前侧肋与中、后侧肋之间的伞膜上则为一小凹陷。两个腹肋等长,并行直达伞缘。三个侧肋同起于一主干,开始并行,到全长的下  $2/3$  左右处,前侧肋弯向腹侧,直

本文于 1985 年 2 月 25 日收到。

狄伯雄、高齐瑜同志赠送解剖病料,汪明同志协助进行电镜扫描标本的制作,一并致以谢意。

达伞缘;中侧与后侧肋仍并行,略弯向背侧。外背肋与背肋同起于一主干,外背肋在近端 1/4—1/3 处分出;背肋主干在远端 1/4 左右处向两侧各伸出一个指状突,在靠近末端处

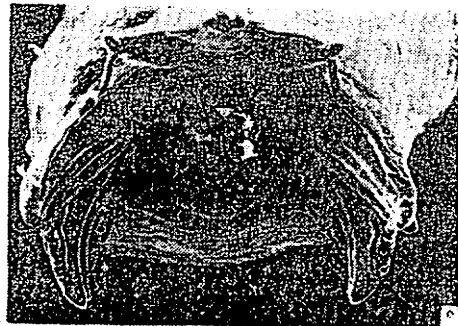
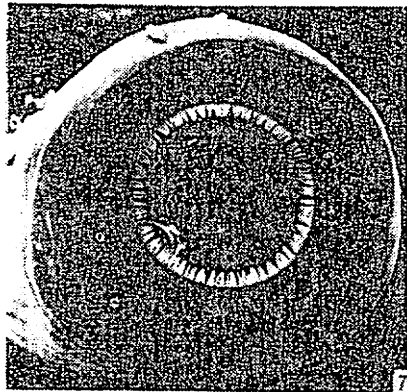
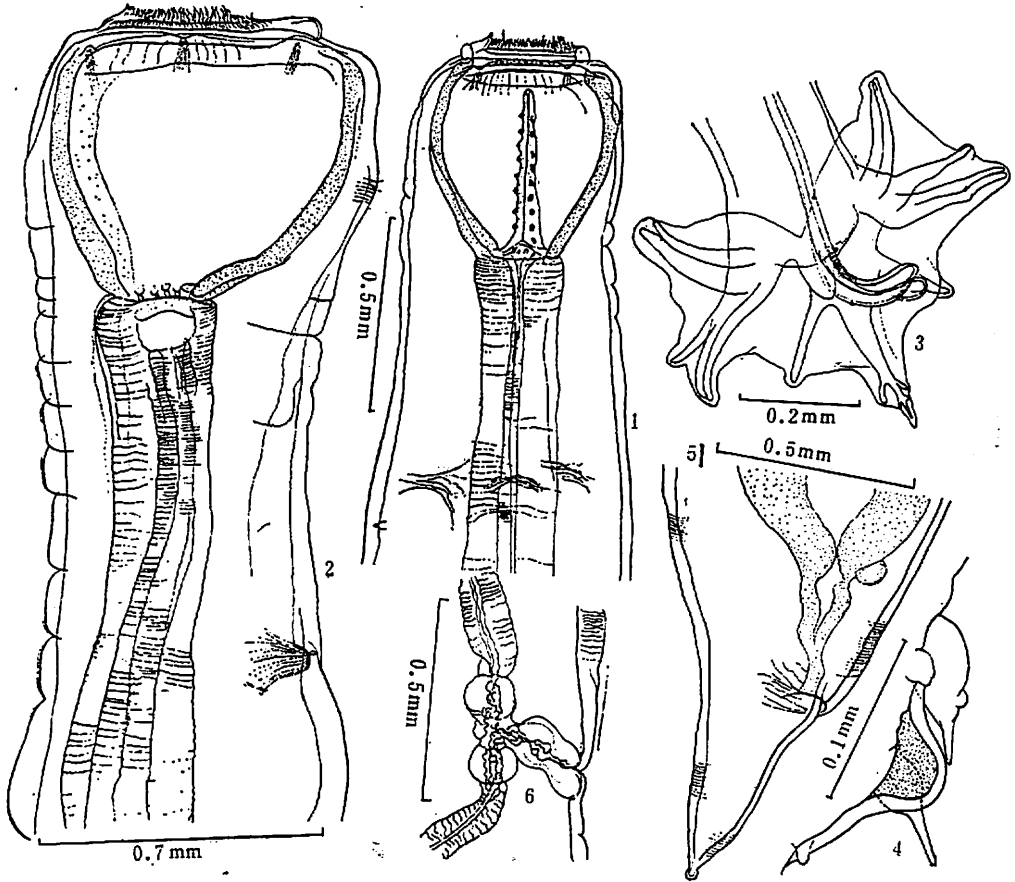


图 1—8. 奇异副圆线虫 *Parastrongylus paradoxus* gen. et sp. nov.

1. 前端腹面 (anterior extremity, ventral view) 2. 前端侧面 (anterior extremity, lateral view) 3. 雄虫交合伞腹面观 (male bursa, ventral view) 4. 雄虫生殖锥腹面观 (genital cone, ventral view) 5. 雌虫尾端侧面观 (tail end of female, lateral view) 6. 雌虫阴门部侧面观 (vulva region, lateral view) 7. 头顶面观 (scanning electron micrograph of en face view) 8. 交合伞 (scanning electron micrograph of bursa, showing bursal membrane and rays)

向两侧又各分出一个指状突,前一对较长,后一对较短。主干末端尖细。生殖锥的腹唇宽而长,两侧各有一个乳头形突起,背唇短,两侧稍后方各有一个大的附属物,其顶端各有一个指状突。整个生殖锥呈圆锥形外观,较长,末端常伸达外背肋起始部之稍下方。交合刺细长,褐色,有细横纹,周围有羽状膜包裹,末端圆钝弯曲。无引器。雌虫阴门位于体中部稍后,阴门前体长与阴门后体长之比约为5:4,无唇;有一短的阴道,稍向前方倾斜,排卵器亦短。尾部短。肛门以后逐渐变细,尾端有一小结。

测量雄虫 10 条,体长 12.9—16.8,最大宽度 0.92—1.16,伞前宽 0.2—0.48。口囊宽 0.43—0.5,深 0.47—0.56。口囊壁厚 0.03—0.04。食道前端宽 0.21—0.368,后端膨大部宽 0.34—0.46。神经环距头端 1.025—1.10;颈乳突距头端 1.035—1.18;排泄孔距头端 1.0—1.65。交合伞自外背肋基部至背肋末端的长度为 0.18—0.26。两个交合刺等长,长度为 1.0—1.5。

测量雌虫 10 条,体长 17.3—20.4。口囊宽 0.53—0.7,深 0.55—0.74。口囊壁厚 0.03—0.05。食道长 2.48—2.79,前端宽 0.33—0.41,后端膨大部宽 0.31—0.48。神经环距头端 1.25—1.43;颈乳突距头端 1.14;排泄孔距头端 1.11—1.16。阴门距尾端 7.2—8.7,阴门部体宽 0.92—1.36。尾长 0.37—0.54;肛门处体宽 0.27—0.35。阴道长 0.27—0.55。

宿主 独角犀 *Rhinoceros unicornis*

寄生部位 大肠

模式标本 正模♂,配模♀,副模♂ 15 条,♀ 18 条。标本存放北京农业大学兽医学院寄生虫学教研室。

## 讨 论

根据山口所著蠕虫系(1961)的记载,寄生于哺乳动物的圆形亚科 Strongylinae 线虫有 13 个属,即囊口属 *Choniangium* Railliet, Henry et Bauche, 1914; 食道齿属 *Oesophagodontus* Railliet et Henry, 1902; 疣猴圆线属 *Colobostromylus* Sandground, 1929; 艾昆属 *Equinurbia* Lane, 1914; 獾圆属 *Okapistromylus* van den Berghe, 1937; 蓝索属 *Ransomus* Hall, 1926; 三齿属 *Triodontophorus* Looss, 1902; 阿尔夫属 *Alfortia* (Railliet, 1923) Skrjabin, 1933; 狸圆属 *Castorstrongylus* Chapin, 1925; 盆口属 *Craterostomum* Boulenger, 1920; 戴柯属 *Decrusia* Lane, 1914; 戴拉风属 *Delafondia* (Railliet, 1923) Skrjabin, 1933; 圆线属 *Strongylus* Mueller, 1780; 截至 1984 年并无新属的发现。属间的主要区别在于口囊的形状,内外叶冠的发达程度与小叶的长度和形状,口囊内有无牙齿,食道漏斗内有无齿与是否突入口囊;交合伞的形状和肋的排列,尤其是背肋的构造,和雌虫阴门的位置等等。新属的口囊内与食道漏斗内均无齿,这一特征足兹与口囊内有齿或有类似齿样构造、或食道漏斗内兼有小齿的 *Choniangium*, *Oesophagodontus*, *Colobostromylus*, *Triodontophorus*, *Okapistromylus*, *Strongylus* 和 *Delafondia* 七个属相区别。

新属有内、外叶冠,外叶冠的小叶细长,数目多,这一特征可与:①无内叶冠,外叶冠极不发达的 *Ransomus*; ②外叶冠有两种不同长度的小叶(并均匀交替排列)的 *Equinurbia*; ③外叶冠小叶宽阔,末端成穗状的 *Castorstrongylus* 和④外叶冠小叶宽阔,仅只 8 片的 *Craterostomum* 相区别。

又上述 11 个属均以背肋分两支、每支上又有不同数目的侧支，或同时分为多数支为重要特征。新属的背肋为一个独干，又与上述 11 个属显著不同。

就口囊构造来看，新属与 *Alfortia* 属近似，但后者的背肋分两支，各支上又生有两个侧支，这是个显著差别。就背肋构造看，新属与 *Decrusia* 相似，但仍有许多其它不同之处，如后者口囊呈半圆形，其内有齿，与新属截然不同。

综上论证，作者对这种线虫提出建立新属新种。

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## **PARASTRONGYLUS PARADOXUS GEN. ET SP. NOV.**

### **A NEW NEMATODE FROM THE LARGE INTESTINE OF THE RHINOCEROS**

(NEMATODA, STRONGYLIDAE: STRONGYLINAE)

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In 1981, the authors had an opportunity to collect nematodes from an autopsied rhinoceros (*Rhinoceros unicornis*) that died from a bad haemorrhagic enteritis. Among the nematodes collected from the large intestine there were more than 800 strongylid specimens, which seemed to belong to the genus *Strongylus* (*Alfortia*) by the head structure. But by careful examination, we found it differed from the other members of that genus and all the members of Strongylinae by the special structure of the bursa.

#### ***Parastrongylus* gen. nov.**

Diagnosis Mouth directed straight forward; buccal capsule subglobular; without teeth; leaflets of external leafcrown long and slender, more than 200, leaflets of internal leafcrown very small and crowded. Dorsal ridge well-developed, reaching to the anterior margin of the buccal capsule, and the dorsal oesophageal gland opens into the buccal capsule through a number of pores situated in this ridge. Male bursa hexagonal in shape, forms prominent angles at the tips of vential, lateral, dorsal, and external dorsal rays. The arrangement formula of ventral, lateral and externodorsal rays is more or less typical as that of the other strongylids. Dorsal ray single, two small digitations arise laterally near its distal fourth, also two more small digitations close to its posterior extremity. Spicules long and slender, provided with pectinated membrane.

Gubernaculum absent. Vulva near commencement of posterior third of body. Amphidelphic. Tail short and conical. Parasites of *Rhinoceros*.

Type species: *Parastrongylus paradoxus* sp. nov. Male, 12.9—16.8 mm., female, 17.3—20.4 mm, in the large intestine of *Rhinoceros unicornis*.

This genus is closely related to *Strongylus* (*Alfortia*), by its structure of the buccal capsule, but it differs from the former genus by the structure of the male bursa, by the arrangement of the dorsal ray, and by pectinated spicules.

*Parastrongylus paradoxus* sp. nov. (figs. 1—8)

Size and shape Ten males measure 12.9—16.8 mm. in length and 0.92—1.16 mm. in greatest breadth of the body. Ten females vary from 17.3—20.4 mm., their greatest breadth is at the vulva region, varies from 0.92—1.36 mm..

Head. Mouth directed straight forward; mouth collar low. The external leafcrown consists of about 250 long and slender elements. They are of the same size, and with sharp points. The internal leafcrown consists of many small and crowded elements. Buccal capsule subglobular. Dorsal ridge well developed, reaching to the anterior margin of the buccal capsule, and containing the gutter of the dorsal oesophageal gland, which opens into the buccal capsule through a number of pores. Without teeth in buccal capsule.

Posterior extremity of the male. The arrangement formula of ventral-lateral ray system and external dorsals are more or less typical as those of the other strongylids. Dorsal ray single, two small digitations arise laterally near its distal fourth, also two more small digitations close to its posterior extremity. Bursal membrane hexagonal in outline, forms prominent angles at the tips of ventral, lateral, dorsal, and external dorsal rays, the margins between those rays are incurved. The genital cone is conical, rather prominent. The spicules are long and slender, and provided with pectinated membrane.

Posterior extremity of the female. Tail short and conical. Vulva near the commencement of posterior third of the body.

Specimens: Holotype male; allotype female; paratypes 15 males and 18 females. All specimens collected from the large intestine of *R. unicornis* from Beijing Zoo, in 1981. Specimens are deposited in the Department of Veterinary Medicine, Beijing Agricultural University.

**Ascaridia galli infection:** Hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in globulins and hence A/G ratio was reduced.

**Double infection:** Hyperproteinemia resulted due to hyperalbuminemia and the globulin level registered a drop thereby causing an elevation in A/G ratio.

**Triple infection:** The total protein level remained normal but the increase in albumins and depletion in globulins resulted in the elevation of A/G ratio.

**Quadruple infection:** The total protein level remained normal but the increase in albumins and depletion in globulins resulted in the elevation of A/G ratio.

#### In Pullets:

**Raillietina tetragona infection:** The total protein and albumin levels did not alter but the globulin fraction increased and hence the A/G ratio registered a drop.

**Raillietina echinobothrida infection:** Hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in globulins and hence A/G ratio registered a drop.

**Raillietina cesticius infection:** Hypoproteinemia resulted due to the depletion in both albumin and globulin fractions, more markedly in globulins and hence the A/G ratio was elevated.

**Ascaridia galli infection:** Hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in albumins and hence the A/G ratio was elevated.

**Double infection:** Hyperproteinemia resulted due to hyperalbuminemia, but the globulin level remained normal and hence A/G ratio was elevated.

**Triple infection:** Hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in albumins and hence the A/G ratio was elevated.

**Quadruple infection:** Hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in albumins and hence a slight elevation in A/G ratio was noticed.

To summarize, in healthy (uninfected) fowls, the pullets possess higher levels of total protein than cockerels. This was due to the higher quantity of both albumins and globulins, but the increase was more marked in globulins and hence the A/G ratio of pullets was lower than cockerels. In infected cockerels, hyper or hypoproteinemia was observed. The A/G ratio was elevated because of the depletion in globulins (hypoglobulinemia) and increase in

albumins (hyperalbuminemia). In infected pullets, mostly hyperproteinemia resulted due to the increase in both albumin and globulin fractions, but more markedly in albumins and hence the A/G ratio was elevated.

4 August 1986; Revised 29 September 1986

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#### PLACENTA OF RHINOCEROS (*RHINOCEROS UNICORNIS L*)

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THE knowledge of reproductive organs and their accessories is important in the study of the reproductive biology of a particular species of animal. The placenta is the transitory reproductive organ, developed in the uterus of the mammal after conception, which facilitates the supply of nutrition from

the mother to the growing embryo. It lodges the latter in an aquatic state, essential for prenatal development. Roberts<sup>1</sup> and Arthur<sup>2</sup> elaborated the morphological structure and placentation of several domestic animals.

The several aspects of biology of the *Rhinoceros unicornis*, the one-horned Rhinoceros available in North East India have not been elaborately studied. Although there are stray reports or popular articles, very little information regarding the different ecological aspects of the species is known. Young<sup>3</sup> reported that the uterus of Rhinoceros is bicornuate and the placenta is of diffuse type (epithelio-chorial) with a large allantoic sac. Rhinoceros is a perissodactyl-like soliped animal. In the present study, a placenta of a female Rhinoceros was procured from the Assam State Zoo, Guwahati, Assam and we report certain unique characteristics of the placenta of the *R. unicornis*. In fact this is the first report on the anatomy of the placenta of *R. unicornis*.

The placenta of the 16-year-old Rhino (height-1.5 m, length-2.6 m) was collected, after it gave birth to a male calf. It was cleaned, after made free from the amniotic fluid and other exudates. It was thin in structure and became transparent after washing. The placenta of *R. unicornis* could be placed under deciduate-type, as there was very little damage done to the maternal uterine tissue. The anatomical structure of the amniochorial surface to the villi are in apposition with endometrium - forming numerous villi and microvilli (figures 1-3). The weight of the placenta was 2400 g and the length of gravid and non-gravid horns is 102 cm and 48 cm respectively (figure 2). The umbilical cord is distinct and 5 cm in length. The area of attachment with the endometrium is found all over the amniochorial surface. The present study agrees with that of Roberts<sup>1</sup> and Arthur<sup>2</sup> on the placenta of the mare, where the villi are seen in the amniochorial surface and this was classified under diffuse-type of placenta. It is neither like that of primates nor ruminants, rather it simulates with that of horse or the pig where there is loose attachment of the placenta with the internal tissue of the uterus of the mother. It shows that there are less possibilities of bleeding and eruption of the uterine tissue sac. It is diffuse as in humans but unlike that in ruminant. The point of attachment between maternal placenta and foetal part is innumerable.

Authors like to thank Dr M. M. Barua, Veterinary Officer of Assam State Zoo for providing the placenta of Rhinoceros.



Figures 1-3. Placenta of *Rhinoceros unicornis* 1. showing the amniochorial surface with numerous villi and microvilli; 2. with gravid and non-gravid horn; 3. umbilical cord of the placenta.

18 September 1986; Revised 14 November 1986

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