

STUDIES ON THE PARASITES OF ZEBRAS. IV. *CYLICODONTOPHORUS REINECKEI* N.SP. (NEMATODA: STRONGYLIDAE) FROM THE BURCHELL'S ZEBRA, *EQUUS BURCHELLI ANTIQUORUM* H. SMITH, 1841 AND THE MOUNTAIN ZEBRA, *EQUUS ZEBRA HARTMANNAE* MATSCHIE, 1898

ROSINA C. SCIALDO-KRECEK¹ and F. S. MALAN²

ABSTRACT

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A new species of nematode, *Cylicodontophorus reinecke*, was collected from Burchell's zebra, *Equus burchelli antiquorum* H. Smith, 1841, in both the Etosha National and Kruger National Parks and from mountain zebra, *Equus zebra hartmannae* Matschie, 1898, in the Namib Naukluft Park in South West Africa/Namibia.

These nematodes have an external leaf-crown with longer elements than those of the internal leaf-crown and a well-developed dorsal gutter. The very well-developed oesophageal funnel is both wider and deeper than the buccal capsule.

INTRODUCTION

Fourteen out of 34 Burchell's zebra, *Equus burchelli antiquorum* H. Smith, 1841, culled in both South West Africa/Namibia and the Republic of South Africa, and 1 out of 3 mountain zebra, *Equus zebra hartmannae* Matschie, 1898, culled in South West Africa/Namibia, harboured 1-487 adult *Cylicodontophorus*, predominantly in the caecum and ventral colon.

These helminths belong to the genus *Cylicodontophorus* as defined by Lichtenfels (1975), and since they cannot be assigned to a known species they are designated *Cylicodontophorus reinecke* n.sp. after Professor R. K. Reinecke.

Description of *Cylicodontophorus reinecke* n.sp.

Type host

Equus burchelli antiquorum H. Smith, 1841 from Etosha National Park, South West Africa/Namibia

(19°15'S, 14°31'E and 19°8'S, 15°55'E) and the Kruger National Park (25°12'S, 31°36'E, and 24°24'S, 32°2'E).

Material examined

A total of 15 female and 10 male nematodes were examined in detail and subsequently 2 males and 2 females were dissected to determine the number of elements of external and internal leaf-crowns. Three intact males and 3 intact females have been deposited in the Onderstepoort Helminthological Collection (No. T2165, T2166).

One female paratype of *Cylicodontophorus bicoronatus* (USDA National Parasite Collection, No. 9599) as well as 3 male and 3 female *C. bicoronatus* (USDA National Parasite Collection, No. 33350) were examined.

Description

The principal measurements are listed in Table 1.

TABLE 1 Principal measurements of 10 males and 15 females of *Cylicodontophorus reinecke* n.sp. (All measurements in μm unless otherwise stated)

	Male			Female		
	Range	\bar{X}^1	S.D. ²	Range	\bar{X}^1	S.D. ²
Total length (mm).....	7,15-12,26	10,43±1,6		10,87-15,73	13,42±1,5	
Width.....	439-585	551±46,1		475-695	602,2±49,6	
Head width.....	146-212	174,8±18,5		159-266	198,2±26,4	
Buccal capsule:						
Depth.....	39-52,8	46,66±4,82		13-19	18,2±2,1	
Width.....	13-19,8	16,16±3,3		46-52	49,2±3,09	
No. of elements:						
External leaf-crown*.....	17-18	—		18-22	—	
Internal leaf-crown*.....	15	—		14-19	—	
Oesophagus:						
Length.....	558-752	631,1±53,2		640-778	709,4±39,6	
Width.....	158-212	186,3±19,4		198-270	230,2±21,3	
Distance of excretory pore from base of buccal capsule.....	226-412	301,1±50,02		231-429	341,5±64,12	
Dorsal ray:						
Length.....	385-465	435,7±29,2		—	—	
Width.....	332-532	402,6±61,36		—	—	
Spicule length (mm).....	1,276-1,662	1,440±133,9		—	—	
Distance from anus to tip of tail.....	—	—		79-133	111,4±16,7	
Distance from vulva to tip of tail.....	—	—		186-292	234,5±30,54	
Eggs:						
Length.....	—	—		76-106	67,5±41,05	
Width.....	—	—		39-59	50,3±5,21	

* Counted in 2 males and 2 females
 \bar{X}^1 = Mean S.D.² = Standard deviation

¹ Department of Parasitology, Faculty of Veterinary Science, University of Pretoria, P.O. Box 12580, Onderstepoort 0110

² Hoechst Research Farm, P.O. Box 124, Malelane 1320

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The worms are small to medium sized. The mouth collar is high, the lateral papillae are inconspicuous and submedian papillae short and conical. The walls of the buccal capsule are thick and of nearly uniform thickness (Fig. 1, 2). The external leaf-crown (ELC) consists of

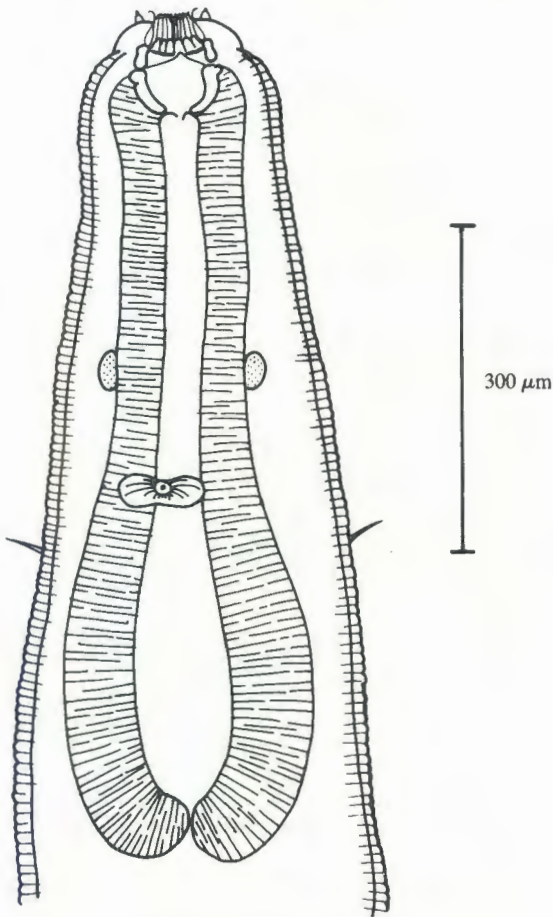


FIG. 1. Anterior extremity of *Cylicodontophorus reineckeii*, dorsal view

17–22 elements and, while longer and more salient than the elements of the internal leaf-crown (ILC), are approximately equal in number (ILC = 14–19 elements). The elements of the ILC are inserted at a considerable depth in the buccal capsule (Fig. 3). When viewed dorsally, the dorsal gutter is present and well-developed (Fig. 4). The oesophageal funnel is well-developed, heavily sclerotized and larger by one half than the buccal cavity. The buccal capsule is broader than deep. If a line is drawn along the outer surface of the buccal cavity and oesophageal funnel a large rounded cup shape would be formed. The oesophagus is long, and the nerve ring, situated in the middle of the oesophagus, is distinct. The excretory pore is immediately anterior to the cervical papillae, 301–341 μm , from the base of the buccal capsule.

The dorsal lobe of the male bursa is of moderate length and unnotched (Fig. 5). The dorsal ray is divided throughout its length as well as branched proximally and again halfway along its length, in all 3 branches. The externodorsal ray is slender and comparable to the lateral and ventral rays. Each of the postero-, medio- and externolaterals arises separately. The postero- and mediolaterals are of approximately equal length, while the externolateral is shorter and more slender. The ventral rays are fused together for most of their length, but are separate at their tips. The genital cone and dermal collar are not prominent. Both gubernaculum and genital cone are illustrated in Fig. 6 & 7. Very delicate genital appendages are included but were not evident in most specimens examined. The filiform spicules are equal in length with hook-shaped tips.

The female tail is rounded, with a conical point (Fig. 8). The distance of the anus and vulva from the tip of the tail is 79–133 μm and 186–292 μm respectively. The vagina is moderate in length, the ovijectors being paired. The pars ejectrix has a powerful sphincter and is longer than the pars haustrix, which contains the greatest number of eggs (Fig. 9). The eggs are moderate in size, measuring 76–106 μm long and 39–59 μm wide.



FIG. 2. Anterior extremity of *Cylicodontophorus reineckeii*, medial, dorsoventral view of external leaf-crown and buccal capsule walls, 400 DIC (disc interferon contrast)



FIG. 3. Anterior extremity of *Cylicodontophorus reineckeii*, medial, dorsoventral view of external leaf-crown and internal leaf-crown inserted deeply in buccal capsule wall, 500 DIC



FIG. 4. Anterior extremity of *Cylicodontophorus reineckeii*, dorsal view of dorsal gutter and conical submedian papillae, 400 DIC

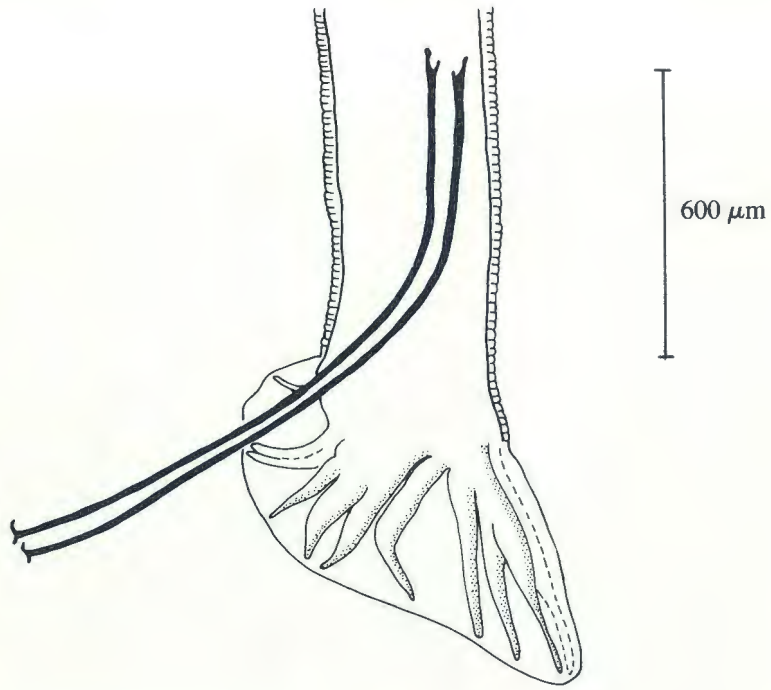


FIG. 5. Posterior extremity of *Cylicodontophorus reineckeii* male, lateral view

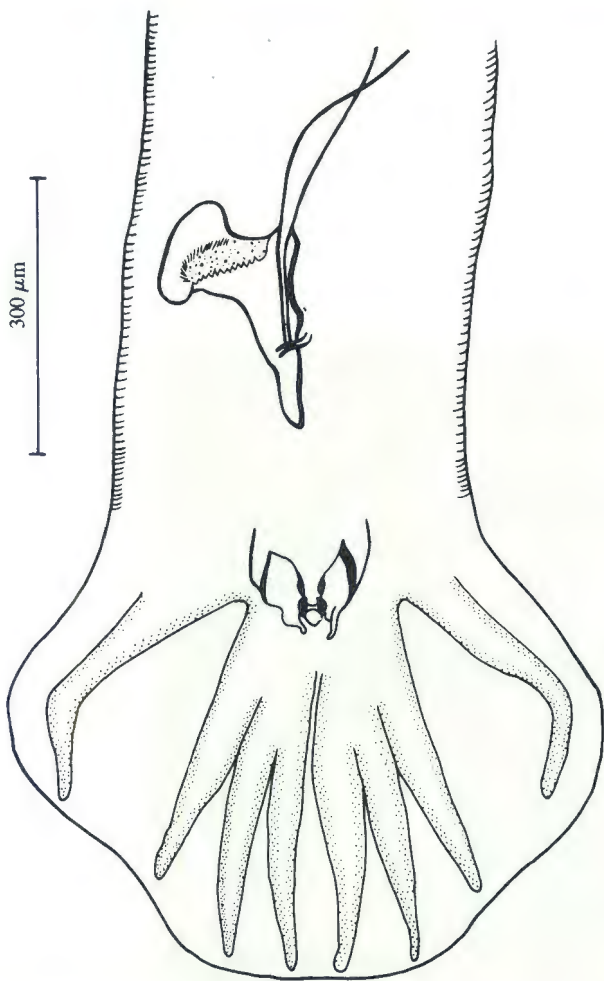


FIG. 6. Posterior extremity of *Cylicodontophorus reineckeii* male, ventral view. Note gubernaculum and genital cone



FIG. 7. High magnification of gubernaculum of male. Note tips of spicules over half the distance through the gubernaculum. 200 DIC

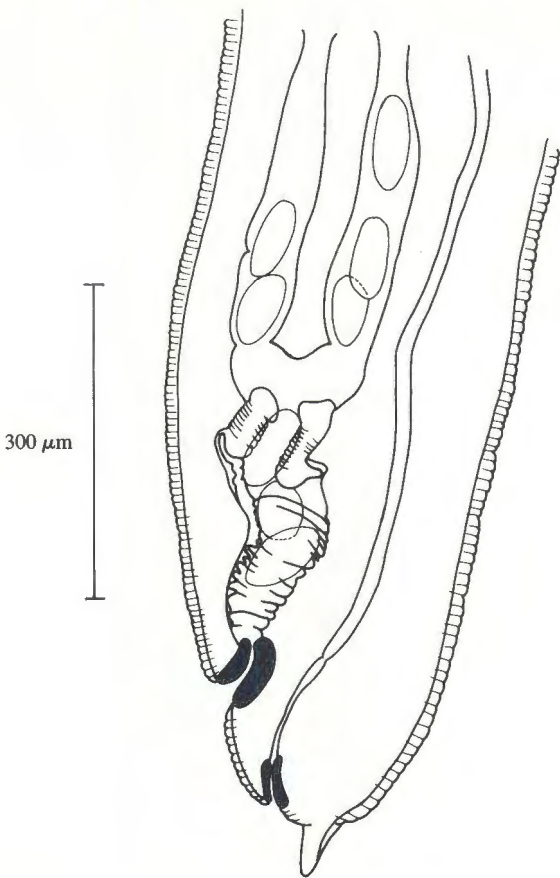


FIG. 8. Posterior extremity of *Cyclicodontophorus reineckeii* female, lateral view

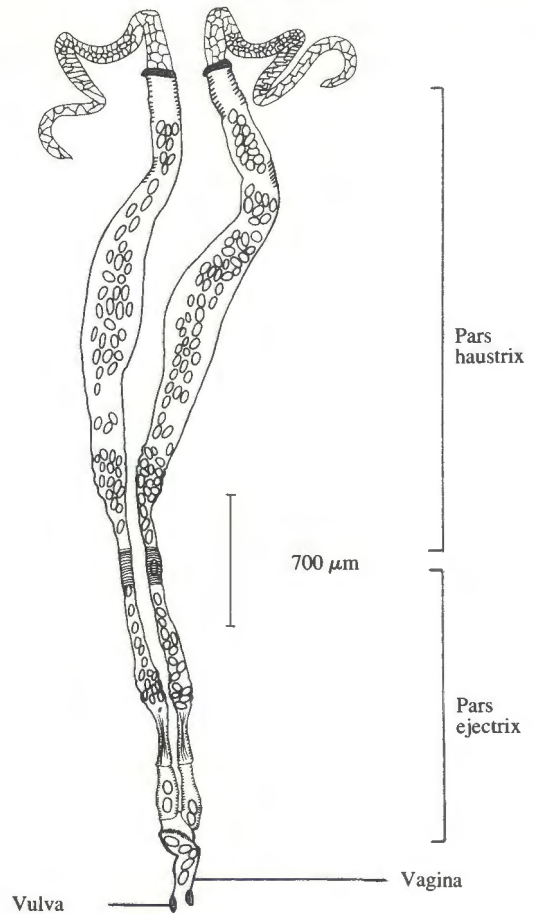


FIG. 9. Genital tract of *Cyclicodontophorus reineckeii* female

DISCUSSION

Four species of *Cyclicodontophorus* have been described, namely, *C. bicoronatus* (Looss, 1900), *C. euproctus* (Boulenger, 1917), *C. mettami* (Leiper, 1913) and *C. schuermanni* (Ortlepp, 1962). According to Looss (1900), *C. bicoronatus* has shorter buccal capsule walls and a smaller oesophageal funnel than *C. reineckeii* and moreover has longer spicules and a longer dorsal ray. While the elements of the ELC and ILC of *C. bicoronatus* are equal in size (Looss, 1900), the ELC elements of *C. reineckeii* are twice the length of the ILC. All 3 remaining species have longer ILC than ELC elements (Boulenger, 1917; Leiper, 1913; Ortlepp, 1962). In addition all of the known species have a greater number of ELC elements (range of 30–60) and a greater number of ILC elements (range of 25–46) (Boulenger, 1917; Leiper, 1913; Ortlepp, 1962) compared with 17–22 ELC and 14–19 ILC elements of *C. reineckeii*. The only species previously reported in zebras, *C. Schuermanni*, has a very long dorsal ray (Ortlepp, 1962).

This new species is characterized by (1) long ELC elements, few in number and (2) a large very well-developed, oesophageal funnel.

The description of the genus, according to Lichtenfels (1975), should be altered such that the total body length is 7–16 mm and not 7–14 mm. In addition, the ILC

elements may be both longer or shorter, broader and less numerous than the ELC elements. This is changed from ILC elements, which are usually longer, broader and less numerous than the ELC elements.

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