Further records and descriptions of nematodes from rivers in the Kruger National Park (orders Enoplida, Chromadorida, Monhysterida, Mononchida and Araeolaimida)

ANNELIZE BOTHA and J. HEYNS

Botha, Annelize and J. Heyns. 1992. Further records and descriptions of nematodes from rivers in the Kruger National Park (orders Enoplida, Chromadorida, Monhysterida, Mononchida and Araeolaimida). *Koedoe* 35(2): 11-25. Pretoria. ISSN 0075-6458.

Descriptions are given of *Eutobrilus annetteae* (Joubert & Heyns, 1979), *Achromadora ruricola* (De Man, 1880) and *Monhystera somereni* Allgén, 1952, incorporating additional information obtained during the present study. New distribution records are given for *Mononchus aquaticus* Coetzee, 1968, *M. truncatus* Bastian, 1865, *Mylonchulus minor* (Cobb, 1893), *Chronogaster africana* Heyns & Coomans, 1980 and *Ironus longicaudatus* De Man, 1884. Morphometric data are tabulated, and where appropriate, illustrations are also given.

Key words: *Eutobrilus*, *Achromadora*, *Monhystera*, *Mononchus*, *Mylonchulus*, *Chronogaster*, *Ironus*, taxonomy, Kruger National Park.

Annelize Botha and J. Heyns, Department of Zoology, Rand Afrikaans University, P.O. Box 524, Auckland Park, 1006, Republic of South Africa.

Introduction

In three previous papers on nematodes from rivers in the Kruger National Park, we reported on genera of the order Dorylaimida (Botha & Heyns, 1991; 1992a; 1992b). The present paper reports on several genera of the orders Enoplida, Chromadorida, Monhysterida, Mononchida and Araeolaimida.

Materials and methods

For materials and methods see our previous paper (Botha & Heyns, 1991). All specimens are in the collection of the Department of Zoology, Rand Afrikaans University. All measurements are in μm , except body length which is in mm.

Family: Tobrilidae Filipjev, 1918

Eutobrilus annetteae (Joubert & Heyns, 1979) Tsalolikhin, 1981

Syn: *Tobrilus annetteae* Joubert & Heyns, 1979

(Fig. 1A-J & 2A). Morphometric data in Table 1.

Female

Medium-sized nematode, with relatively slender body. Heat-relaxed body posture almost straight, sometimes slightly ventrally curved. Tail slightly dorsally curved in specimens from Kruger National Park (Fig. 1J). Cuticle relatively thin: 2-3 μm on the neck; 2-3 μm at mid-body, and 2-4 μm on dorsal side of tail. Cuticle with fine transverse striae, and with subdorsal and subventral rows of setae over entire body length. Mesocuticle with radial elements over entire body, rather more prominent towards tail region (Fig. 1I).

Lip region confluent with body, about one half as wide as body at base of oesophagus (Fig. 1A). Lips fused, and rather rounded in outline. Amphid only observed in one specimen, which presented a dorso-ventral view; amphid aperture situated at about 12,5 μm from anterior end. Cephalic setae about 5-8 μm long. Stoma cubic-shaped and sclerotized in three areas (Fig. 1B-D). Teeth small, tooth pockets well developed and overlapping (Fig. 1B-D). The first tooth located at about 17-20 μm from the anterior end, with the second one 3-4 μm further back. Oesophagus cylindroid, narrowing slightly in the region of the nerve ring, which is situated at about 111-117 μm from anterior end. Hemizonid observed in two specimens, situ-

ated posterior to nerve ring. With a well-developed oesophago-intestinal valve. Two glandular structures observed at base of oesophagus (Fig. 1A & E) which are similar to those described by Swart & Heyns (1988) in *Eutobrilus heptapapillatus* (Joubert & Heyns, 1979). First seta on body located at about 27-36 μm from anterior end. Intestine about 8 cells in circumference, cells packed with small to medium light green granules. Rectum length about 0,7-1,2 times anal body diameter. Tail region contains three well-developed caudal glands as well as a number of nuclei. Three coelomocyte-like structures present in anal region. Tail tapers gradually beyond the anus with posterior one-third almost cylindrical (Fig. 1H). Subterminal setae absent.

Female didelphic, amphidelphic (Fig. 1F & G). The female genital tract consists of a relatively short and muscular uterus, a very short *pars dilatata oviductus*, a very short oviduct and a reflexed, well-defined ovary. Sphincter muscle between uterus and *pars*

dilatata oviductus not well developed, and sometimes obscure. Oviduct cells not clearly observed. The oviduct enters the ovary dorsally, very close to the end of the germinal zone, and when the ovary is observed in a dorso-ventral view, it appears as if the germinal zone is bifid (Fig. 1F & G and Fig. 2A). Vagina weakly muscular. Vulva a transverse slit with no sclerotized labia. One to three eggs observed in each uterus, measuring 55-63,5 μm x 27,5-35 μm ($n=9$), shell excluded.

Male unknown.

Remarks

The original description of *Eutobrilus annetteae* was based on specimens collected at Elgin in the Cape Province. The present specimens are similar to the type population. According to the original description the mean width of the stoma is 14,9 μm , but examination of the type specimens shows it to be about 8,6 μm , which is similar to the 8,6 μm of the present specimens. The largest

Table 1
Morphometric characters of *Eutobrilus annetteae* (Joubert & Heyns, 1979)

Locality	Crocodile River	Elgin (type population) Our measurements
<i>n</i>	3 Females	6 Females
L(mm)	1,41;1,75;1,89	1,56(1,44-1,72) ^b
a	35,7;37,2;33,8	28,1(23,6-30,4) ^b
a'	-	38,8(35,3-43,3)
b	5,0;5,7;6,3	5,6(5,3-5,9)
c	6,6;7,3;7,3	6,7(6,4-7,1)
c'	8,0;7,7;8,2	7,7(5,8-8,4)
V%	45,4;44;42,9	44(42,7-47,2)
Lip region width	23;26,5;26	26,5(23-30)
Stoma length ^a	25;27;26	27(25-29)
Stoma width	9;9;8	8,6(5,5-11,5)
First tooth from anterior end	17;19,5;18	19,5(18,5-20)
Second tooth from anterior end	21;23;22	22(21,5-24)
Nerve ring from anterior end	111;112,5;117	-
Oesophagus length	280;305;300	278(270-290)
Distance from head to vulva	64;77;81	69(64-74)
Body width	36;47;56	56(49-66)
Tail length	212,5;239,5;259,5	233(221-257)
Rectum length	-;29;39	31(28-37)
Anal body diameter	26,5;31;31,5	31(27-38)

^a Stoma length measured from anterior end of head to base of second tooth pocket.

^b Specimens flattened.

Fig. 1. *Eutobrilus anetteae* (Joubert & Heyns, 1979). A. Anterior region of female; B. Lateral view of paratype female head; C. and D. Dorso-ventral and lateral view of female head (Kruger National Park population); E. Region at base of oesophagus; F. and G. Female reproductive system; H. Female tail; I. Cuticle with radial elements; J. Heat-relaxed body posture of two females.

Fig. 2. *Eutobrilus annetteae* (Joubert & Heyns, 1979). A. Part of anterior female reproductive system, showing the basal end of the ovary (bar equals 6.9 μm).

specimens found in the Kruger National Park are slightly longer than the largest type specimens (1,89 mm vs 1,72 mm).

Locality and habitat

Specimens collected in three localities in the Crocodile River, namely: in a stagnant pool under the bridge at Malelane Gate; in river sediment at the staff picnic area near Malelane Gate and near the weir at the Van Graan Dam, all collected by A. Botha and W. Liebenberg in November, 1990.

Specimens

Specimens from the Kruger National Park on slides W2782, W2784 and W2795; type specimens from Elgin on slides W1230, W1231, W1234, W1235 and W1240.

Family: Cyatholaimidae Filipjev, 1918

Achromadora ruricola (De Man, 1880)
Micoletzky, 1925

(Fig. 3A-G). Morphometric data in Table 2.

Female

Small nematode, with robust body. Heat-relaxed body posture almost straight, except for the posterior part which is ventrally curved to form a letter J (Fig. 3G). Cuticle thin: 1 µm at the neck; 1-1,5 µm at mid-body and 1-1,5 µm at dorsal side of tail. Cuticle with distinct transverse striations, carrying rows of punctations and a few scattered setae. Lateral chords slightly less than, to one half body width at base of oesophagus, appearing granular with large cells which are grouped in pairs (Fig. 3C).

Lip region confluent with body, and slightly less than one half as wide as body at base of oesophagus. Lips relatively well developed and rather rounded in outline (Fig. 3A & B). Ten thin cephalic and labial setae present, measuring about 4-5 µm. Amphids spiral, located from opposite base of dorsal tooth to

slightly posterior of base of stoma (Fig. 3B). Stoma funnel-shaped, and weakly sclerotized, with a well developed dorsal tooth and a subventral tooth 2-2,5 µm further back. Twelve chitinous ribs present at anterior end of sclerotized stoma. Musculature of basal oesophageal bulb divided in three parts by two transverse interruptions (Fig. 3A); basal bulb one fifth to one fourth total oesophageal length. Hemizonid observed in one female; situated slightly posterior to the rather inconspicuous nerve ring.

Intestinal cells packed with light green granules; intestine about eight cells in circumference. Junction between intestine and rectum in some specimens not clearly observed. Rectum length about 2,4-3,1 times anal body diameter. Tail elongate-conoid, tapering gradually to a bluntly rounded terminus (Fig. 3D). Three caudal glands present lying in tandem, opening with a duct in a terminal spinneret.

Female didelphic, amphidelphic (Fig. 3E & F). Genital system short. Ovaries reflexed ventrally. Oviduct broad, cells not clearly differentiated; part nearest to vagina slightly expanded but no distinct *pars dilatata oviductus* or sphincter observed. Uterus when not containing an egg, very short and indistinct. Vagina weakly muscular. Vulva a transverse slit, lips in most specimens protruding. One egg at a time in each uterus measuring 45-56 µm x 25-26,5 µm ($n = 4$).

Male not found.

Remarks

Achromadora ruricola is a cosmopolitan species which was first reported from the Netherlands (De Man, 1880). The present specimens, representing the first report from southern Africa, agree with the description of the type population except for being somewhat more robust ($a = 18,1-24,9$ vs 25-30).

Our specimens also agree closely with those reported from Denmark (Micoletzky, 1925) and from the Canadian high Arctic (Mulvey, 1969). They differ from the Danish speci-

mens by being slightly larger ($L = 0,53-0,71$ mm compared with $L = 0,36-0,62$ mm), with a larger b-ratio ($b = 5,4-6,6$ compared with $b = 5,4-5,9$), a larger stoma ($8-11\ \mu\text{m}$ long compared with $7\ \mu\text{m}$), and a slightly larger c-ratio ($c = 6,6-8,1$ vs $c = 5,9-7,4$). These differences in ratio are probably all the result of larger body size. They differ from the Canadian specimens by being slightly longer ($L = 0,53-0,71$ mm compared with $L = 0,51-$

which agrees with the maximum stoma length recorded in our specimens.

Locality and habitat

Fourteen females collected from different localities in the Sabie River: in sand from the river bank between the Nkulu picnic area and Lower Sabie Camp; in sand near the confluence of the Sabie and Sand rivers, in sand

Table 2
Morphometric characters of Achromadora ruricola (De Man, 1880)

Locality	Sabie River	Olifants River
<i>n</i>	14 ♀♀	4 ♀♀
L(mm)	0,64(0,53-0,71)	0,66(0,60-0,69)
a	22,1(18,1-24,9)	23,2(21,7-24,3)
b	5,9(5,4-6,6)	5,9(5,8-6,1)
c	7,5(6,6-8,1)	7,4(7,0-7,8)
c'	4,8(4,4-5,2)	5,2(5,0-5,3)
V%	45,1(43,5-47,8)	45(44,2-45,4)
Lip region width	12(10,5-14)	12(12-13)
Stoma length ^a	10(8-11)	10(8-10,5)
Stoma width	3	3
Dorsal tooth from anterior end	6(4-7)	6(5,5-7)
Subventral tooth from anterior end	7(5-9)	8
Amphid from anterior end	9(7,5-11)	8
	10(8-11,5)	10(9,5-10,5)
Length of cephalic setae	4(3,5-5)	4,5
Nerve ring from anterior end	59(55-61,5)	63;61
Length of basal bulb	25(21-27,5)	27(25-29)
Width of basal bulb	18(15-19)	17,5(16,5-18,5)
Body width	28(26,5-32)	28(26-30)
Anal body width	18(17-20)	17(16,5-18)
Tail length	85(79-92,5)	88(85,5-90)
Rectum length	49(42,5-55)	49(45,5-51,5)
Cuticle width : at the neck	1	1 :
: at mid-body	1(1-1,5)	1(1-1,5)
: at dorsal side of tail	1(1-1,5)	1
Egg (<i>n</i> = 3) : width	26(25-26,5)	26
: length	51,5(45-56)	50

^a Stoma length measured from anterior end to base of sclerotization.

0,60 mm), with a slightly longer tail (79- 92,5 μm vs 70-80 μm), and a slightly larger stoma (8-11 μm long vs 8 μm).

Andrássy (1968) reported specimens from Paraguay with a stoma length of 11 μm ,

between *Phragmites* near the Skukuza Camp, and in river sediment near the weir of the Lisbon Estates, west of Skukuza Camp, collected by A. Botha and J. Heyns in February, 1990. Four females collected at two different localities in the Olifants River: in river sediment near the western boundary of the park

and west of the confluence of the Letaba and Olifants rivers, collected by J. van Vuren in June, 1990.

Specimens

Specimens from Sabie River on slides W2556, W2558, W2638-W2640, W2648, W2651, W2653, W2657 and W2659; specimens from Olifants River on slides W2678, W2688 and W2700.

Family: Monhysteridae De Man, 1876

Monhystera somereni Allgén, 1952
(Fig. 4A-H) Morphometric data in Table 3.

The original description of *Monhystera somereni* was of females from Mt Kenya. Andrassy (1956 and 1968) found many females and only one male in the Ivory Coast, and only females in Paraguay. Goossens (1976) reported what is probably this species (or *M. africana*) from the Adrar mountains in Mauretania. Joubert & Heyns (1980) reported specimens of *M. somereni* from several localities in South Africa: in the Transvaal it was found in the Pretoria region at the Fountains and in the Hennops River; in the Vaal River complex at the Barrage, Vaal Dam and Parys; in the Witwatersrand region at Emmerentia Dam, Westdene Dam, Florida Lake and Natalspruit; in the western Transvaal at Boskop Dam and in the eastern Transvaal at Bronkhorstspuit. It was also found in the western Cape at Elgin and Koëlbaai, and in the eastern Cape in the Maitlands River near Port Elizabeth. The present specimens constitute the first record from the Kruger National Park.

Female

Relatively small, fairly slender nematode. Body almost straight when relaxed (Fig. 4H). Cuticle with fine transverse striae. Head confluent, about one third as wide as body at base of oesophagus (Fig. 4A & B). Cephalic setae short, about 4-4,5 μm in length. Stoma shallow, slightly sclerotized and V-shaped.

Amphids circular, situated just anterior to or opposite base of stoma, anterior rim of amphid 5-6 μm from anterior end of body. Oesophagus cylindroid, slightly broadening through basal one fifth. Cardia relatively large and mushroom-shaped (Fig. 4C & D); its length almost equal to the diameter of the oesophagus base. Nerve ring indistinct, situated at about the middle of the oesophagus. Ocelli absent. Hemizonid situated posterior to nerve ring. Excretory pore obscure, the indistinct excretory gland situated ventrally, posterior to the cardia (Fig. 4A).

Intestinal cells packed with brownish granules (Fig. 4C & D). Rectum length 0,9-1,35 times anal body diameter. Tail elongate-conoid, the distal third narrow, cylindroid with the terminal one third dorsally curved. Tail tip swollen, spinneret obscure. Two posterior caudal glands conspicuous, the third (anterior) one obscure. In its place a structure with a vacuolated appearance can be seen (Fig. 4F).

Female monodelphic, prodelphic (Fig. 4G). Distal end of ovary almost touching the cardia. Only one egg at a time in the uterus, except one female with three; eggs elongate ovoid, measuring 33-41 x 23-29 μm ($n = 6$). Vagina surrounded by a distinct sphincter muscle (Fig. 4E). Vulva a transverse slit without sclerotized lips.

No males found.

Remarks

The present specimens of *Monhystera somereni* Allgén, 1952 agree with the description and illustrations given by Joubert & Heyns (1980) except that their specimens have a slightly narrower lip region (8-12 μm compared with 12-13,5 μm) and the vulva can be situated slightly more anteriorly ($V = 60,5-62,0\%$ compared with $V = 61,7-64,9\%$).

Table 3
Morphometric characters of different populations of Monhystera somereni Allgén, 1952

Locality	Kruger National Park				Mt. Kenya	Ivory Coast	Paraguay	South Africa	Adar Mountains
	Sabie River				After Allgén	After Andrassy	After Andrassy	After Joubert & Heyns	After Goossens
	1 ♀	1 ♀	1 ♀	8 ♀ ♀	3 ♀	6 ♀ ♀	2 ♀	10 ♀ ♀	(1976)
<i>n</i>	0,94	0,95	0,98	1,02(0,93-1,06)	0,91;0,82;0,69	0,83-1,02	1,07-1,09	0,97(0,80-1,06)	9 ♀ ♀
L(mm)	30	29,2	32,7	29,4(27,7-31)	-24,8;24,7	28,6-35,1	31-38	30,6(27,6-34,8)	0,8-1,0
a	6,0	5,9	6,2	6,2(5,9-6,6)	5,32;5,53;4,77	5,0-6,4	6,2-6,4	6,0(5,3-6,5)	27-31
b	5,8	5,7	5,1	5,9(5,5-6,5)	6,12;6,24;5,77	5,1-6,6	5,4-5,6	5,6(4,9-6,7)	6,5-6,8
c	8,3	8,4	9,4	8,0(7,2-8,7)			9-10	9,1(7,6-10,4)	4,6-5,0
c'	63,3	63	61,8	63(61,7-64,9)	64,3;63,7;-	53,8-61,8	60-62	61,0(60,5-62,0)	9
V%	13	12	13,5	12,7(12-13,5)			11	10,6(8-12)	56-59
Lip region width									12-12,5
Distance from amphid to front end									11,5 ^b
Diameter of amphid	4	4	4	4,0(4-4,5) ^a		4,3-4,8	6-7	5,4(4,0-6,5)	4,0 ^a
Length of cephalic setae	4	4	4	4,0(4-5)	5	2,3-3,0	3,5	3,5(3,0-4,0)	3
Length of oesophagus	156	160	158	165(148-178)			3	3,5(3,0-4,0)	
Body width	31	32,5	30	34,7(32,5-37)					
Distance from head to vulva	595	598	606	572(574-671)					
Length of vagina	16	17	13	16(15-18) ^a					
Distance from vulva to anus	193	178	198	198(185-209)					
Anal body diameter	19,5	20	20,5	21,9(20,5-24,5)					
Tail length	162	168	192	174(159-184)	155		19 ^b	171(144-191)	166 ^b
Rectum length	22	27	22	22(18-25,5) ^a			167 ^b		
Length of spicules						39,8			
Length of lateral guiding pieces						5,3			

a $n = 6$

^b Measurements calculated from original illustrations.

Fig. 3. *Achromadora rucicola* (De Man, 1880). A. Anterior region of female; B. Lateral view of female head; C. Lateral chord; D. Female tail; E. and F. Female reproductive system; G. Heat-relaxed body posture of two females.

Family: Mononchidae Filipjev, 1934

Mononchus aquaticus Coetzee, 1968
Morphometric data in Table 4.

Mononchus aquaticus was originally described from Gobabeb, Namibia. Specimens were also reported from several localities in South Africa: from Upington and Worcester in the Cape Province, Makatini Flats in Natal and Pretoria in the Transvaal (Coetzee, 1968). The present specimens, which represent the first report from the Kruger National Park, are similar to the type specimens and most other populations from South Africa. They only differ from the specimens from Upington by being slightly more slender ($a = 32,6-44$ compared with $a = 26-28$), from the specimens from the Makatini Flats by having a relatively shorter oesophagus ($b = 4,2-5$ compared with $b = 4$), and from the Pretoria specimens by being slightly shorter ($L = 1,11-1,45$ mm compared with $L = 1,8$ mm).

Locality and habitat

Twelve specimens collected from three different localities in the Sabie River: in sand in a stagnant pool between the Nkuhlu picnic area and Lower Sabie Camp, in sand among *Phragmites* at the weir east of Lower Sabie Camp and in river sediment, just east of Nwatindlopfuspruit, collected by A. Botha and J. Heyns in February, 1990. Six specimens in three different localities in the Olifants River: in river sediment just east of the western border of the park; in sediment at the weir east of the western border of the park and in sediment just east of the weir, collected by J. van Vuren in June, 1990. Five females from river sediment in the Luvuvhu River, near the picnic area north-west of Pafuri, collected by J. Heyns in February, 1991.

Specimens

Specimens from Sabie River on slides W2541, W2581, W2601, W2604, W2605, W2608, W2610, W2611, W2625 and W2626; specimens from Olifants River on slides W2680, W2685, W2691, W2701,

W2704 and W2744; and specimens from Luvuvhu River on slides W2815 and W2835.

Mononchus truncatus Bastian, 1865
For list of synonyms, see Andrssy (1985)
Morphometric data in Table 4.

Mononchus truncatus was reported from numerous localities in the Cape Province, Orange Free State and Transvaal, South Africa by Coetzee (1968). Since Coetzee (1968) presented no morphometrical data for these populations, our specimens were compared with those described from the Transvaal and Orange Free State by De Bruin & Heyns (1992a), from which they differ only in a slightly smaller c' -ratio ($c' = 5,3-7,6$ compared with $c' = 7,0-9,5$) and a slightly bigger variation in tail length ($179-272$ μm compared with $220-250$ μm).

Locality and habitat

Four specimens collected from two different localities in the Sabie River: from the river bank between the Nkuhlu picnic area and Lower Sabie Camp and in sand near the weir of the Lisbon Estates west of Skukuza Camp, collected by A. Botha and J. Heyns in February, 1990. Three specimens collected in river sediment near the weir of the Van Graan Dam in the Crocodile River, collected by A. Botha and W. Liebenberg in November 1990. One specimen collected from river sediment near the old Pafuri picnic area, north of Pafuri, collected by J. Heyns in February, 1991.

Specimens from Sabie River on slides W2546, W2566 and W2656; specimens from Crocodile River on slide W2796 and specimen from Luvuvhu River on slide W2853.

Family: Mylonchulidae Jairajpuri, 1969

Mylonchulus minor (Cobb, 1893) Andrssy, 1958

Syn: *M. hawaiiensis* (Cassidy, 1931) Andrssy, 1958
Morphometric data in Table 4.

Fig. 4. *Monhystera somereni* Allgén, 1952. A. Anterior region of female; B. Lateral view of female head; C. and D. Cardia region; E. Vagina region; F. Female tail; G. Reproductive system of female; H. Heat-relaxed body posture of female.

Table 4
Morphometric characters of *Mononchus aquaticus* Coetzee, 1968; *M. truncatus* Bastian, 1865 and *Mylonchulus minor* (Cobb, 1893)

Locality	<i>Mononchus aquaticus</i>			<i>Mononchus truncatus</i>			<i>Mylonchulus minor</i>	
	Sabie River	Olifants River	Luvuvhu River	Sabie River	Crocodile River	Luvuvhu River	Sabie River	
<i>n</i>	12 ♀♀	6 ♀♀	5 ♀♀	4 ♀♀	3 ♀♀	1 ♀	1 ♀	
L(mm)	1,35(1,27-1,45)	1,25(1,11-1,39)	1,35(1,29-1,45)	1,84(1,66-2,00)	1,91(1,79-2,04)	2,02	1,17	
a	37,8(34,6-44)	36(32,6-37,9)	37(33,1-39,7)	31,7(30,9-32,9)	33,8(31,4-36,9)	32,6	26,9	
b	4,6(4,3-4,9)	4,4(4,2-4,5)	4,7(4,4-5)	3,9(3,5-4,3)	4,5(4,4-4,6)	4,3	3,8	
c	10,5(9,9-11,8)	10,3(9,2-10,9)	10(9,6-10,5)	7,7(7,4-8,2)	9,7(8,9-10,6)	9,5	25,4	
c'	5,1(4,7-5,5)	5(4,7-5,6)	5,4(5-5,6)	6,8(6,4-7,4)	6,3(5,3-7,6)	5,6	1,6	
V%	52,9(50-54,7)	53,2(51,9-55)	52,3(49,6-53,9)	56,5(53-59,5)	53,4(52,4-54,9)	54,5	56,4	
Lip region width	19(17,5-20,5)	19,4(19-20)	18(16,5-20)	25,6(25-26)	27(25-30)	27	26	
Stoma length	26,5(24-28)	27(25-27,5)	27(27-28)	47(44-48)	40(37,5-42)	43,5	24,5	
Stoma width	11(9-12)	8,8(8-9)	9,4(9-10)	17(16-17,5)	15,8(15,5-16)	15	12,5	
Stoma wall width	1	1	1	1,5	1,5	1,5	1	
Dorsal tooth apex as % of stoma length	19,5(17,6-22)	20,8(18-22)	19,8(18,5-21,4)	27(25-29,5)	22,9(17,1-26,7)	25,3	20,4	
Nerve ring from anterior end	99(93-107)	99(90-104,5)	100(96,5-108)	131(123-141)	125(116-132,5)	139	84	
Oesophagus length	293(270-310)	282,5(260-310)	286(265-310)	486(425-550)	425(410-455)	465	310	
Body width	36(33-40,5)	33(30-38)	36,5(32,5-39)	58(50,5-63)	57(48,5-65)	62	43,5	
Distance from head to vulva	71,5(67,5-75,0)	66(60-72,5)	70,4(67-76)	104(93-115)	102(94,5-112)	110	66	
Egg length	-	-	92 ^a	80 ^a	67(58-79)	68,73	-	
Egg width	-	-	31,5 ^a	38 ^a	37(36-40)	41,5-42	-	
Tail length	129(119-141)	121(106-134)	137(123-143)	241(223-272)	197(179-212)	213	46	
Anal body diameter	25(23,5-26,5)	24,4(22,5-26)	25,5(23-27)	36(33-37)	35(33,5-38)	38	29	
Rectum length	24(23-27,5)	22(20,5-23,5)	23(19-23,5)	33(30-38)	30(29-32)	34	23	
Cuticle width: at the neck	2,5(2-3)	2,5(2-3)	2	4(3-4,5)	3,5(3-4,5)	3,5	2	
: at mid-body	2,7(2-3)	2,5	2,5(2-3)	3(2,5-4)	3,7(3-4)	4	3	
: at dorsal side of tail	3(2,5-4)	3(2-3,5)	3(2,5-3,5)	4(3-4,5)	4(3,5-5)	3	4	

^a *n* = 1

^b The method of measuring the stoma is the same as described by De Bruin & Heyns (1992a)

Table 5
Morphometric characters of *Ironus longicaudatus* De Man, 1884 from Levuvhu River in the Kruger National Park

<i>n</i>	6 ♀♀
L(mm)	1,99(1,91-2,07)
a	60,3(57,7-62,6)
b	6,9(6,6-7,2)
c	3,2(2,9-3,6)
c'	31,3(28,2-34,5)
V%	38,9(37,9-40,1)
Lip region width	16(15,5-16,5)
Stoma length	90,5(75,5-102)
Stoma width at broadest point	4,2(3,5-5)
Amphid aperture	6
Nerve ring from anterior end	138(133,5-142,5)
Oesophagus length	289(275-295)
Distance from head to vulva	77(76-81)
Body width	33(30,5-35)
Vagina length	15,5(15-16)
Tail length	633(578-690)
Anal body diameter	20(19-21)
Rectum length	24(21,5-26)
Eggs: length	167,5 ^a
: width	24,5 ^a
Cuticle: on the neck	2(1,5-2)
: at mid-body	2(1,5-2)
: on dorsal side of tail	2
L' (mm)	1,34(1,28-1,49)
a'	40,9(38,9-43,8)
b'	4,7(4,5-5,1)
V%'	57,4(54,4-59,8)

^a *n* = 1

Mylonchulus minor was reported from numerous localities in the Transvaal, Orange Free State, Natal and Cape Province, South Africa by De Bruin & Heyns (1992b). The present specimen, however, represents the first report from the Kruger National Park. It agrees with the above mentioned specimens, especially the specimen reported from Komatipoort, Transvaal, from which it differs only in being slightly longer (*L* = 1,17 mm compared with *L* = 0,87 mm), with a longer tail (46 µm compared with 34 µm).

Locality and habitat

Specimen collected in the Sabie River, in sand among *Phragmites* near the weir east of Lower Sabie Camp, collected by A. Botha and J. Heyns in February, 1990.

Specimen on slide W2591.

Family: Plectidae Oerley, 1880

Chronogaster africana Heyns & Coomans, 1980

Measurements: *L* = 1,81 mm; *a* = 67; *a'* = 77; *b* = 6,8; *c* = 7,3; *c'* = 13,7; *V* = 48%; lip region width = 10 µm; stoma length = 8 µm; stoma width = 4 µm; length of basal bulb = 18 µm; tail length = 247 µm; rectum length = 19,5 µm.

The original description of *Chronogaster africana* was based on specimens from several localities in the Transvaal (Boskop Dam

near Potchefstroom, Natalspruit in Alberton and The Kloof at Rustenburg) and from Krom River near Humansdorp in the Cape Province. The present specimen agrees with the types except for a slightly wider lip region (10 μm compared with 7,5-8,5 μm) and a slightly longer tail (247 μm compared with 194-241 μm). Excretory pore not observed.

Locality, habitat and specimen

One female collected from sand among the roots of *Phragmites* near the weir in the Sabie River, east of Lower Sabie Camp; collected by A. Botha and J. Heyns in February 1990.

Specimen on slide W2589.

Family: Ironidae De Man, 1876

Ironus longicaudatus De Man, 1884
Morphometric data in Table 5.

Ironus longicaudatus was first described from Germany. It has since been reported from Uganda (Andrássy, 1964), India (Khera, 1976) and the former Soviet Union (Tsalolikhin, 1987). This is the first report from southern Africa. Our specimens agree especially well with the population from the former Soviet Union in having a large stoma (75,5-102 μm compared with 90-110 μm) and very long tail (578-690 μm compared with 500-900 μm). They differ though in being slightly shorter ($L = 1,91\text{-}2,07\text{ mm}$ vs $L = 2,00\text{-}3,00\text{ mm}$) and more slender ($a = 57,7\text{-}62,6$ vs $a = 35\text{-}55$). In body length they agree better with the populations from Germany, Uganda and India. On the other hand, they differ from the type population in being slightly more slender ($a = 57,7\text{-}62,6$ vs $a = 45\text{-}50$) and having a relatively shorter oesophagus ($b = 6,6\text{-}7,2$ compared with $b = 6,0\text{-}6,5$). They likewise differ from the Ugandan population by the relatively shorter oesophagus ($b = 6,6\text{-}7,2$ compared with $b = 4,3$) as well as by a smaller c- ratio ($c = 2,9\text{-}3,6$ vs $c = 5,5$), more anteriorly situated vulva ($V = 37,9\text{-}40,1\%$ compared with $V = 47\%$), and a slightly shorter stoma (75,5-102

μm compared with 115 μm). From the Indian population they differ by having a larger stoma (75,5-102 μm vs 60 μm) and a longer tail (578-690 μm compared with 465 μm).

Locality, habitat and specimens

Six females collected from mud in the Luvuvhu River near the picnic area north-east of Pafuri, collected by J. Heyns in February, 1991. Specimens on slides W2808, W2810 and W2811.

Acknowledgements

We thank Prof. J.H. Swanepoel of the Rand Afrikaans University for the translation of Russian articles.

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