Dorylaimoidea (Nematoda) from the Kruger National Park

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Nygolaimus elainnae n.sp. is described and compared with *Nygolaimus directus* Heyns, 1968. Complete descriptions are also given of *Labronema mauritiense* Williams, 1959, recorded here for the first time from South Africa, and *Discolaimium sublatum* Heyns, 1963, a new record from the Kruger National Park. The following are also new records: *Discolaimium monoplanus* Heyns, 1963 and *Xiphinema brevicolle* Lordello & Da Costa, 1961, while *Eudorylaimus diadematus* (Cobb in Thorne & Swanger, 1936) Andrassy, 1959, *Discolaimium major* Thorne, 1939, *Xiphinema elongatum* Schuurmans Stekhoven & Teunissen, 1938 and *Xiphinema variabile* Heyns, 1966 have been recorded from the Park before.

Key words: Dorylaimoidea, taxonomy, Kruger National Park, Nematoda.

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Introduction

Relatively little taxonomic work has been done on terrestrial nematodes from national parks in South Africa. Even so, random samples have been taken in the Kruger National Park since about 1964 and reports on this material have appeared in several publications (for a list of these, see Botha & Heyns 1990). The present paper reports on Dorylaimoidea found in soil samples taken by the second author in the central part of the park during August, 1988.

All measurements, except total body length are given in μm in the text as well as in the tables. Curved structures, e.g. spicules, were measured along the curved median line.

All slides are in the collection of the Department of Zoology, Rand Afrikaans University.

Descriptions

Nygolaimus elainnae n.sp.
(Fig. 1A-G). Morphometric data in Table 1.

Female

Medium sized nematode, with slender body. Heat-relaxed body posture ventrally curved in the form of the letter "J" (Fig. 1G). Cuticle thin: 1,5-2,5 μm on the neck; 1,5-2,5 μm at mid-body; 2,5-3,5 μm at the tail tip. Transverse striae in exocuticle faint, rather more prominent around tail. Lateral chord about one quarter of the body diameter at the base of the oesophagus. Lateral, ventral and dorsal pores obscure.

Lip region set off by a constriction, about one third as wide as body at base of oesophagus (Fig. 1C). Lips rounded. Since all specimens present a dorsoventral or semi-lateral view, it was not possible to get a lateral view of the amphid. Tooth deltoid, its length slightly more than one half the lip region width. Guiding ring single (Fig. 1B). Oesophagus anteriorly not thickened, basal expanded part about three quarters the length of oesophagus (Fig. 1A). Cardia distinct, conoid, cardiac glands slightly ovoid, measuring 10 μm x 5-5,5 μm . Position of oesophageal gland nuclei and their openings as follows ($n=1$): DO=34,8; DN=37,7; S1O1=45,5; S1N1=46,2; S1O2=45,6; S1N2=46,6; S2O and S2N obscure.

Fig. 1 *Nygolaimus elainnae* n.sp.: A. Anterior region of body; B. Dorsoventral view of head of female; C. Shape of head; D. Posterior branch of female reproductive system; E. Posterior region of body of female; F. Tail of male; G. Heat-relaxed body posture of female.

Table 1
Morphometric characters of *Nygalaimus elainnae* n.sp.

	Holotype	Paratypes	
	1 ♀	4 ♀♀	3 ♂♂
<i>n</i>	1,77	2,0	(1,87-2,18)
L(mm)	47	48	(43-51)
a	2,6	3,0	(2,7-3,5)
b	44	59	(57-61)
c	1,6	1,4	(1,2-1,5)
c'	61	61	(58-63)
V%	15	15	(15-16)
Width of lip region	8	9	(7,5-10)
Tooth length	6	6	(5-7)
Guiding ring from anterior end	680	664	(580-760)
Length of oesophagus	38	42	(37-46,5)
Body width	108	122	(109-138)
Distance from head to vulva	40	34	(31-36)
Tail length	25	25	(24,5-26,5)
Anal body diameter	25	19	(11-20)
Length of rectum	32,5	34,5	(26-42)
Length of prerectum	—	—	—
Length of spicules	—	26	(20,5; 32; 25)

Intestinal cells packed with yellow-brown granules. Junction between intestine and pre-rectum sometimes indistinct due to the granules. Distinct sphincter at junction of pre-rectum and rectum. Prerectum length 1,1 to 1,6 times anal body diameter. Tail dorsally convex, ventrally slightly concave with bluntly rounded terminus (Fig. 1E). Mostly two pairs of caudal pores present.

Female didelphic, amphidelphic (Fig. 1D). Ovaries reflexed dorsally. *Pars dilatata oviductus* and *pars dilatata uteri* separated by a sphincter muscle. Ovejector not clearly differentiated. Vagina weakly muscular, reaching 37-41% of corresponding body diameter. Vulva a transverse slit without sclerotized lips. Uterus packed with sperm cells. No eggs observed in reproductive system.

Male

Male similar to female but slightly smaller, with a narrower lip region.

Position of oesophageal gland nuclei and their openings as follows ($n=2$): DO=46,8 and 41,2; DN=50 and 43,4; S₁₀=51,7[†];

S₁N₁=57,4 and 52 ; S₁O₂=52[†] ; S₁N₂=57,9 and 52,9; S₂O and S₂N obscure ($n=1$).

Male diorchic, testes opposed. Spicules short and robust; lateral guiding pieces present but indistinct (Fig. 1F). One pair of adanal supplements anterior to cloacal opening. Ventromedian supplements difficult to observe because the anterior part of the body is folded over the posterior part.

Diagnosis

Nygalaimus elainnae n.sp. resembles *N. directus* Heyns, 1968. It can be distinguished from *N. directus* females from Australia and England by its somewhat greater body size (L=1,77-2,18 mm versus 1,32-1,82 mm and 1,42- 1,46 mm respectively); a smaller tooth (7,5-10 µm versus 11-13 µm and 11,5-12,3 µm respectively); thicker cuticle at mid-body (2,5-3,5 µm versus 1-1,5 µm and 1-1,3 µm respectively), and by its somewhat greater tail length (31-40 µm versus 22-29 µm and 26 µm respectively). *N. elainnae* n.sp. can be distinguished from *N. directus* females from South Africa by its thicker cuticle at mid-body (2,5-

3,5 µm versus 1,3 µm), and by its somewhat greater tail length (31-40 µm versus 25-31 µm). *N. elainnae* can also be distinguished from *N. directus* by tail shape since in *N. elainnae* the tail is dorsally convex and ventrally slightly concave. Males were found in the new species but not in any of the populations of *N. directus*.

Type locality and habitat

Holotype, four females and three male paratypes were collected by J. Heyns in August 1988 among roots of unidentified grasses near the Letaba River (at the look-out, north of the Letaba Camp).

Type specimens

Holotype female on slide 4222, paratypes on slides 4217, 4220 and 4222 in the collection of the Department of Zoology, Rand Afrikaans University.

Eudorylaimus diadematus (Cobb in Thorne & Swanger, 1936) Andrassy, 1959

Morphometric data in Table 2

Eudorylaimus diadematus was redescribed by Andrassy in 1959. Heyns & Lagerwey (1965) reported it for the first time from the Kruger National Park, among the roots of grasses just outside the Punda Maria Camp.

Table 2
Morphometric characters of *Eudorylaimus diadematus* (Cobb, in Thorne & Swanger, 1936) Andrassy, 1959

	Tshokwane picnic area	Engelhard Dam	Skukuza
<i>n</i>	3 ♀♀	7 ♀♀	4 o o
L(mm)	1,44 (1,26-1,56)	1,38 (1,29-1,52)	1,2 (1,1-1,29)
a	23 (23-24)	26 (23-30)	23 (21-25)
b	4,0 (3,6-4,3)	4 (3,7-4,5)	3,7 (3,5-3,8)
c	29 (27-34)	30 (27-34)	25 (22-27)
c'	1,71 (1,5-1,89)	1,7 (1,5-1,88)	2 (1,88-2,4)
V%	51 (50-52)	49 (48-50)	50 (48-51)
Width of lip region	17 (16,5-18)	16 (16-17)	16 (15,5-16,5)
Odontostyle	19 (18,5-19)	18 (17-19)	18 (17-19)
Width of odontostyle	3,7 (3,5-4)	3 (3-3,5)	3
Odontophore	32 (30-33,5)	31 (30-33)	31 (30-33)
Total stylet length	51 (48,5-52,5)	49 (47-51)	49 (47,5-50)
Stylet aperture	8 (7-8)	7,5 (6,5-8)	8 (7-8,5)
Stylet aperture as % of stylet length	41 (37-43)	42 (38-46)	43 (41-45)
Guiding ring from anterior end	9,5 (8,5-11)	9 (8-9,5)	8 (7-9)
Length of oesophagus	362 (347-375)	343 (315-380)	331 (310-355)
Body width	60 (54,5-65)	52 (51-55,5)	52 (50-58)
Distance from head to vulva	73 (65-78,5)	68 (61,5-74)	61 (57-66)
Length of vagina	26 (25-27)	24 (21-31)	23,5 (22,5-25)
Vagina length as % of body diameter	43 (40-49,5)	46 (41-48)	45 (43-48)
Tail length	50 (46-56)	46 (42-51)	46 (45-48)
Anal body diameter	29 (27-30)	27 (24-31)	24 (23-25)
Length of rectum	37 (32-43)	44 (37-50)	40 (39-41)
Length of prerectum	74 (60-85)	68 (54,5-83)	56 (51-63)
Width of lateral field	9 (8-10)	9 (8-9,5)	9 (6,5-10,5)
Cuticle: on the neck	2,7 (2,5-3)	3 (3-3,5)	3 (2,5-3,5)
at mid-body	3,5	4 (3-5)	3,5 (3-4)
on tail (dorsal)	4,8 (4,5-5)	4 (4-4,5)	4 (4-5)
around tail tip	15,7 (15-16)	12 (11-13)	18 (16-19)
Amphid aperture	10 [♂]	9 [♂]	9,5 ^{♀♀}

♂ *n* = 1

♀♀ *n* = 2

The present specimens of *E. diadematus* are similar to those of Heyns & Lagerwey (1965).

Locality, habitat and specimens

Three females collected from the Tshokwane picnic area, (slides 4149, 4252 and 4154), seven from the look-out near Engelhard Dam (slides 4177-4180 and 4184) and four from the Skukuza Camp, (slides 4202 and 4203) by J. Heyns in August 1988 among roots of grasses.

***Labronema mauritiense* Williams, 1959**
(Fig. 2A-G). Morphometric data in Table 3.

Female

Relatively robust nematode, of medium length. Heat-relaxed body posture almost straight (Fig. 2G). Cuticle thin: 4-4,5 μ m on the neck, 4-5 μ m at mid-body, 7-8,5 μ m on the dorsal side of the tail and 6-7 μ m around the tail tip. Cuticle consists of thin outer and middle layers and thick inner layer of which only the inner two layers are shown in the figures. Transverse striae in exocuticle and with faint radial striae towards the tail. Lateral chord about one tenth body diameter at base of oesophagus, with small cells. Lateral and ventral pores indistinct. Dorsal pores about 7, limited to the anterior part of the neck.

Lip region set off by a constriction, about one quarter as wide as body at base of oesophagus. Lips angular. Amphid stirrup-shaped, in lateral view appearing to be divided into two parts, aperture about one half width of lip region (Fig. 2B). Length of odontostyle 1,2 to 1,3 times lip region width. Stylet aperture about one third stylet length. Stylet width about one sixth stylet length. Odontophore distinct, rod-like. Guiding ring appearing double. Hemizonid situated anterior to nerve ring. Anterior part of oesophagus, around odontophore, not thickened. Oesophago-intestinal disc absent; cardia conoid, varying in length (Fig. 2A and C). Position of oesoph-

ageal gland nuclei and their openings as follows ($n=2$): DO=54 and 54,6; DN=58 and 58,9; S₁O₁=68,6 and 69,9; S₁N₁=68,8 and 70; S₁O₂=74 and 75; S₁N₂=74,5 and 75; S₂O₁=85,8 and 86,8; S₂N₁=85 and 84,9; S₂O₂=86 and 88; S₂N₂=85 and 86,4.

Intestinal cells packed with distinct yellow-brown granules. Prerectum length 3 to 4 times anal body diameter. Rectum length 1,4 times anal body diameter. Distinct sphincter at junction of prerectum and rectum. Tail convex-conoid, bluntly rounded (Fig. 2E). Three or four pairs of caudal pores present.

Female didelphic, amphidelphic (Fig. 2D). Ovaries reflexed dorsally or ventrally. *Pars dilatata oviductus* and *pars dilatata uteri* separated by a sphincter muscle. Ovejector clearly demarcated. Uterus convoluted. Vagina weakly muscular, reaching 38-46% of corresponding body diameter. Vulva a transverse slit with sclerotized lips. No sperm cells or eggs observed in reproductive system.

Male

Similar to female, except posterior part of body more strongly ventrally curved to form the letter "J" (Fig. 2I); oesophageal gland nuclei slightly more posteriorly situated ($n=1$) DO=57; DN=61,7; S₁O₁=71,5; S₁N₁=72,5; S₁O₂=76,9; S₁N₂=77; S₂O₁=87; S₂N₁=86,2; S₂O₂=87,8; S₂N₂=86,8; prerectum up to 5 times anal body diameter. Male diorchic, testes opposed, not reflexed. Anterior and posterior testes 235 μ m and 246 μ m long, respectively. Sperm cells elongate-ovoid. Spicules relatively slender, 62 μ m long; lateral guiding pieces 12 μ m. One pair of adanal supplements anterior to anus, and a single ventromedian row of 21 supplements, the posterior three supplements relatively far apart, the others more or less contiguous.

Note

Labronema mauritiense from the Kruger National Park agrees almost completely with the description by Williams (1959) of *L. mauri-*

Fig. 2. *Labronema mauritiense* Williams, 1959: A. Anterior body region of female; B. Shape and location of amphid; C. Cardiac region; D. Posterior branch of female reproductive system; E. Posterior body region of female; F. Posterior body region of male; G. Heat-relaxed body posture of male and female.

Table 3
Morphometric characters of *Labronema mauritiense* Williams, 1959

	Skukuza		Mauritius	
			Our measurements	From Williams (1959)
<i>n</i>	4 ♀♀	1 ♂	6 ♀♀	2 ♂♂
L(mm)	1,61 (1,49-1,69)	1,50	1,22 (1,15-1,26)	1,5
a	24 (24-25)	24	21 (20-24) ^{††}	33
a'	30 (26-35) [‡]	29	23 (20-27)	—
b	3,95 (3,5-4,1)	3,8	3,55 (3,4-3,7)	4,3
c	61 (49-66)	58	57 (50-52)	54-60
c'	0,8 (0,7-0,88)	0,76	0,8 (0,77-0,86)	1,2
V%	57 (55-58)	—	60 (59-61)	—
Width of lip region	18 (18-18,5)	18,5	17 (16-17,5)	—
Odontostyle	24 (23-25,5)	23	23 (22-24)	—
Width of odontostyle	4 (4-4,5)	4	4 (4-4,5)	—
Odontophore	31 (30-34,5)	30	30 (29-31)	—
Total stylet length	55 (53-57,5)	53	53 (52-55)	—
Stylet aperture	9,5 (9-11)	9	10 (9-10)	—
Stylet aperture as % of stylet length	41 (39-43)	39	42 (38-44)	—
Guiding ring from anterior end	11 (11-12)	12	11,5 (11-12)	—
Amphid aperture	8 (8-9) [‡]	8	9 (9-9,5)	—
Length of oesophagus	410 (394-424)	390	342,5 (330-365)	—
Body width	66 (60-70,5)	63	58,5 (51-64,5)	—
Distance from head to vulva	92 (85-96)	—	7 (69,5-77)	—
Tail length	27 (25-30)	26	21 (20-25)	20 [†]
Anal body diameter	33 (31,5-34,5)	34	27 (24-29)	24,5 [†]
Length of rectum	45,5 (43,5-51)	—	—	—
Length of prerectum	121 (95-139)	175	—	—
Length of spicules	—	62	62	49 [†]
Lateral guiding pieces	—	12	—	15 [†]
Number of supplements	—	23	—	12,21,22 and 24 ^{‡‡}

[‡]*n*=3

^{‡‡}*n*=4

[†]Measurements calculated from original sketches

^{††}Specimens flattened

tiense from sugarcane fields in Mauritius. Williams described the amphids as triangular and undivided, but examination of Mauritian specimens (courtesy of Dr. J.R. Williams) revealed the amphids to be similar to those of the present specimens, viz. stirrup-shaped and divided into two parts.

Locality, habitat and specimens

Four females and four males collected by J. Heyns in August 1988 among the roots of grasses in the Skukuza Camp. Specimens on slides 4194 and 4199.

Discolaimium sublatum Heyns, 1963.

(Fig. 3A-F). Morphometric data in Table 4.

Female

Small nematode, with slender body. Heat-relaxed body ventrally curved in the shape of a question mark (Fig. 3F). Cuticle relatively thin: 1-1,5 µm on neck; 1,5-2,5 µm at mid-body; 1,5-2 µm around tail tip. Distinct transverse striae in subcuticle. Lateral chord about one quarter body diameter at base of oesophagus, with 25-27 conspicuous irregularly spaced gland cells.

Lip region set off by a constriction (Fig. 3B); slightly less than one half as wide as body at base of oesophagus. Lips slightly angular. Length of odontostyle slightly greater than lip region width. Stylet width about one sixth lip

region width. Odontophore obscure. Guiding ring single. Anterior part of oesophagus around odontophore slightly expanded. Basal expanded part of oesophagus 46% of total length of oesophagus (Fig. 3A). Oesophageal gland nuclei indistinct. Cardia hemispheroid. Intestinal cells large, conspicuous. Junction between intestine and prorrectum sometimes indistinct. Prorrectum length equal to or slightly greater than anal body diameter. Rectum length about equal to anal body diameter. Tail convex-conoid, bluntly rounded. Caudal pores indistinct.

Female didelphic, amphidelphic (Fig. 3D). Ovaries reflexed dorsally. *Pars dilatata oviductus* and *pars dilatata uteri* separated by a sphincter muscle. Ovejector clearly demarcated. Vagina reaching 36-41% of corresponding body diameter. Vulva a transverse

slit with sclerotized lips. No sperm cells or eggs observed in reproductive system.

Males unknown.

Note

The present specimens of *Discolaimium sublatum* are similar to the specimens which Heyns (1963) described from Rustenburg, Transvaal.

Locality, habitat and specimens

Four females collected by J. Heyns in August 1988 among the roots of grasses at the Tshokwane picnic area. Specimens on slides 4144, 4145 and 4147.

Discolaimus major Thorne, 1939

Morphometric data in Table 5

Table 4
Morphometric characters of *Discolaimium sublatum* Heyns, 1963

	Specimens from Tsokwane	Type specimens from Rustenburg From Heyns (1963)
<i>n</i>	4 ♂	7 ♂
L(mm)	0,9 (0,85-0,95)	0,87 (0,8-0,93)
a	34 (34-35)	29 (26-33)
b	4,1 (4,0-4,5)	3,6 (3,4-4,0)
c	47 (45-49)	45 (39-51)
c'	1,2 (1,1-1,4)	—
V%	47 (44-49)	49 (46-55)
Width of lip region	10 (10-11)	10,5 [†]
Odontostyle	12 (11-13)	11 [†]
Width of odontostyle	2	1,5 [†]
Odontophore	18	—
Total stylet length	30 (29-31)	—
Stylet aperture	6 (5,5-6)	5 [†]
Stylet aperture as % of stylet length	51 (50-55)	45 [†]
Guiding ring from anterior end	5	5,5 [†]
Length of oesophagus	217 (210-225)	—
Length of basal expanded part of oesophagus	100,5	— (98-102)
Width of basal expanded part of oesophagus	14 (13-15,5)	—
Distance from head to vulva	43 (40-44,5)	—
Body width	26,5 (25,5-27,5)	—
Tail length	19 (18-21)	19 [†]
Anal body diameter	16 (15-17)	17 [†]
Length of rectum	15 [†]	—
Length of prorrectum	19 [†]	—

[†] *n*=1

[†] Measurements calculated from original sketches

Fig. 3. *Discolaimium sublatum* Heyns, 1963: A. Anterior body region of female; B. Shape of head; C. Lateral field; D. Posterior branch of reproductive system of female; E. Posterior body region of female; F. Heat-relaxed body posture of female.

Discolaimus major was described from specimens collected in various parts of the U.S.A. and Spain. It has since been reported from North India (Siddiqi 1964), the Netherlands (Loof 1964) and Australia (Sauer & Annels 1985). Heyns (1963) first reported it from South Africa, from Rustenburg and Nelspruit in the Transvaal and Modder River in the Cape Province. Van der Vegte & Heyns (1963) reported it for the first time from the Kruger National Park.

Locality, habitat and specimens

Three females (slide 4213) collected by J. Heyns in August, 1988 among the roots of grasses, near the Letaba River (at a look-out, north of the Letaba Camp), and in the Skukuza Camp (slides 4217 and 4219).

Discolaimus monoplanus Heyns, 1963.

(Fig. 4A and B). Morphometric data in Table 6.

The description of *Discolaimus monoplanus* Heyns, 1963 was based on a single female from Rustenburg. The present specimen is similar to the holotype, except for the 'a' value (32 versus 23). However, examination of the holotype female showed it to be flattened, and the corrected a-ratio is 30,5 which is very close to a=32 in the present specimen from Skukuza.

The holotype female as well as the specimen from Skukuza are very similar to *Discolaimus brevis* Siddiqi, 1964, but can be distinguished from it by a different lip shape (compare Fig.

Table 5
Morphometric characters of *Discolaimus major* Thorne, 1939

	Letaba	Skukuza
<i>n</i>	1 ♀	2 ♀♀
L(mm)	2,20	1,93 ; 1,97
a	44	39 ; 42
b	4,2	4,3 ; 4,5
c	71	79 ; 85
c'	1,0	0,94 ; 0,88
V%	55	50 ; 47
Width of lip region	30	24 ; 26
Odontostyle	22	20 ; 20
Width of odontostyle	3,5	3 ; 3
Odontophore	42,5	37 ; 35,5
Total stylet length	64,5	57 ; 55,5
Stylet aperture	13,5	11 ; 11,5
Stylet aperture as % of stylet length	55	55 ; 58
Guiding ring from anterior end	10	8 ; 7,5
Amphid aperture	9	7 ; 7
Length of oesophagus	520	450 ; 435
Length of basal expanded part of oesophagus	328	223,5 ; 240
Width of basal expanded part of oesophagus	25	25 ; 25,5
Distance from head to vulva	121	97 ; 93
Body width	49,5	50 ; 47
Tail length	31	24,5 ; 23
Anal body diameter	31	26 ; 26
Length of rectum	34	25 ; 22
Length of prerectum	34	— ; —
Cuticle : on the neck	4	3 ; 3
at mid-body	4	3,5 ; 3
around tail tip	7,5	3,5 ; 5

IE of Heyns 1963 with Fig. 1 of Siddiqi 1964) and a longer tail (23 μ m versus 18-21 μ m). Between the oesophagus and cardia of *D. monoplanus* is a disc-shaped structure (Fig. 4A and B) which apparently is not present in *D. brevis*. The amphid of *D. monoplanus* is also different from that of *D. brevis* (funnel-shaped versus wineglass-shaped).

Locality, habitat and specimen

A single female was collected by J. Heyns in August 1988 among roots of grasses in the Skukuza Camp, on slide 4215.

Xiphinema brevicolle Lordello & Da Costa, 1961. Morphometric data in Table 7.

Xiphinema brevicolle was originally described from South America. The present specimens are similar to those reported by Heyns (1974a) from numerous localities in South Africa. This is the first record from the Kruger National Park.

Locality, habitat and specimens

Four females collected by J. Heyns in August 1988 among the roots of grasses from the Skukuza Camp on slides 4209 and 4213.

Xiphinema elongatum Schuurmans Stekhoven & Teunissen, 1938

Morphometric data in Table 7

Table 6
Morphometric characters of *Discolaimus monoplanus* Heyns, 1963 and *Discolaimus brevis* Siddiqi, 1964

	<i>D. monoplanus</i> Specimen from Skukuza	<i>D. monoplanus</i> Holotype from Rustenburg	<i>D. brevis</i> From Siddiqi (1964)
<i>n</i>	1 ♀	1 ♀	1 ♀
L(mm)	0,84	0,79	0,94
a	32	23	35
b	3,5	3,7	3,4
c	36	32	45
c'	1,3	1,4	1,0
V%	45	44	43
Width of lip region	15	17,5	16
Odontostyle	13	12	14
Width of odontostyle	2	3	—
Odontophore	21	20,5	25
Total stylet length	34	32,5	39
Stylet aperture	8	7	9 [‡]
Stylet aperture as % of stylet length	62	58	64 [‡]
Guiding ring from anterior end	5	6	—
Amphid aperture	7	6	—
Length of basal expanded part of oesophagus	124	111	145
Width of basal expand part of oesophagus	14,5	16	15
Distance from head to vulva	38	34,5	—
Body width	26	34	—
Tail length	23	25	18-21
Anal body diameter	18	18,5	17-18,5
Length of rectum	14	13	17 [‡]
Length of prerectum	19,5	16,5	13 [‡]
Cuticle: on neck	2	2,5	—
at mid-body	2,5	2	—
around tail lip	2,5	2,5	—

[‡] Measurements calculated from original sketches

Fig. 4. *Discolaimus monoplanus* Heyns, 1963. A. Cardiac region of holotype female; B. Cardiac region of female from Skukuza.

Xiphinema elongatum was originally described from Zaire. Heyns (1974b) recorded it from the Kruger National Park, as well as from numerous other localities in southern Africa.

Locality, habitat and specimens
Four females collected by J. Heyns in August

1988 among roots of grasses from Skukuza Camp, on slides 4204 and 4201.

Xiphinema variable Heyns, 1966
Morphometric data in Table 7

When Heyns (1966) described *Xiphinema variable*, a widespread and common species

Table 7
Morphometric characters of *Xiphinema* species from the Kruger National Park

Species	<i>X. brevicolle</i>	<i>X. elongatum</i>	<i>X. variable</i>	
<i>n</i>	5 ♀♀	4 ♀♀	3 ♀♀	3 ♂♂
L (mm)	1,84 (1,78-1,93)	2,13 (2,04-2,27)	2,44 (2,42-2,47)	2,42 (2,30-2,50)
a	40 (39-41)	58 (55-62)	88 (86-90)	88 (88-89)
b	6,4 (5,9-6,8)	6 (5,9-6,2)	8,5 (8,1-9,1)	8,2 (8,1-8,5)
c	67 (63-71)	35 (33-37)	40 (39-43)	62 (61-64)
c'	1,02 (1,0-1,05)	2,6 (2,4-2,7)	3,9 (3,5-4,1)	1,85 (1,8-1,9)
V%	50,5 (49,5-52)	39,5 (39-40)	50 (49-51)	—
Width of lip region	12 (12-13)	12 (12-13)	11 (10-11)	11 (11-11,5)
Odontostyle	89 (86-91)	93 (90-95)	65,5 (63,5-67)	65 (64-67)
Odontophore	55 (52-56)	59 (56,5-61,5)	47 (44-49)	48 (48-49)
Guiding ring from anterior end	71 (69-74)	78 (73-80)	55 (53-56)	56
Length of basal expanded part of oesophagus	68 (65-72)	87 (78-95)	77 (70-82)	77 (68-82)
Width of basal expanded part of oesophagus	17 (16-17)	17 (16-18)	12 (12-13)	12
Tail length	28 (26-30)	61 (59-64)	61 (56-64)	39 (36-41)

in the northern areas of South Africa, he recorded five populations from the Kruger National Park. He reported that the specimens from the Letaba Camp had longer tails and a more anteriorly situated vulvas than the type population from Louis Trichardt as well as most other populations studied. The present specimens, also from the Letaba area, show the same deviation in tail length and vulva position.

Locality, habitat and specimens

Three females and three males collected by J. Heyns in August 1988 among roots of grasses near the Letaba River (at the look-out, north of the Letaba Camp), on slides 4225, 4226 and 4234.

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