

Parasites of South African wildlife. XVII. *Ostertagia triquetra* n. sp. (Nematoda: Trichostrongylina) from the grey rhebuck, *Pelea capreolus* (Forster, 1790)

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ABSTRACT

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Re-examination of *Teladorsagia hamata* (Mönnig, 1932) Durette-Desset, 1989 reported from grey rhebuck, *Pelea capreolus* (Forster, 1790) proved it to be a new species of *Ostertagia* Ransom, 1907. The new species, for which the name *Ostertagia triquetra* n. sp. is proposed, differs from *Teladorsagia hamata* in the configuration of the bursal rays (2-1-2 in the former, 2-2-1 in the latter), and in that the interno-dorsal branch of the spicules bears a process that is triangular and convex in the new species, but concave and shaped like an ice-cream scoop in *Teladorsagia hamata*.

Ostertagia triquetra has so far been found only in grey rhebuck in the Eastern Cape Province while *Teladorsagia hamata* was recorded from springbok, *Antidorcas marsupialis* (Zimmerman, 1780) and gemsbok, *Oryx gazella* (Linnaeus, 1758) in the western part of the country.

Keywords: Nematoda, *Ostertagia triquetra*, *Pelea capreolus*

INTRODUCTION

Horak, De Vos & De Klerk (1982), Boomker (1990) and Boomker & Horak (1992) recorded *Teladorsagia hamata* (Mönnig, 1932) Durette-Desset, 1989 from grey rhebuck, *Pelea capreolus* (Forster, 1790) in the Bontebok National Park, Eastern Cape Province. Subsequent re-examination of the material, however, proved it to be a new species of *Ostertagia* Ransom, 1907. The new species, for which the name *Ostertagia triquetra* n. sp. is proposed, is described here and compared to *Teladorsagia hamata*, which it closely resembles as regards the

principal measurements and the configuration of the spicules.

MATERIALS AND METHODS

Specimens were initially examined in water and, when necessary, cleared in lactophenol or phenol-alcohol. Temporary *en face* preparations and cross-sections of the mid-body of male and female specimens were made and mounted in lactophenol. The spicules were dissected out of several males and also examined in lactophenol. All drawings were made with a compound microscope and a drawing tube, and measurements were derived from these drawings. The nomenclature of the bursal rays used here is that of Durette-Desset & Chabaud (1981).

No specimens of *Teladorsagia hamata* were available for study and the measurements provided in Table 1 are those of Mönnig (1932).

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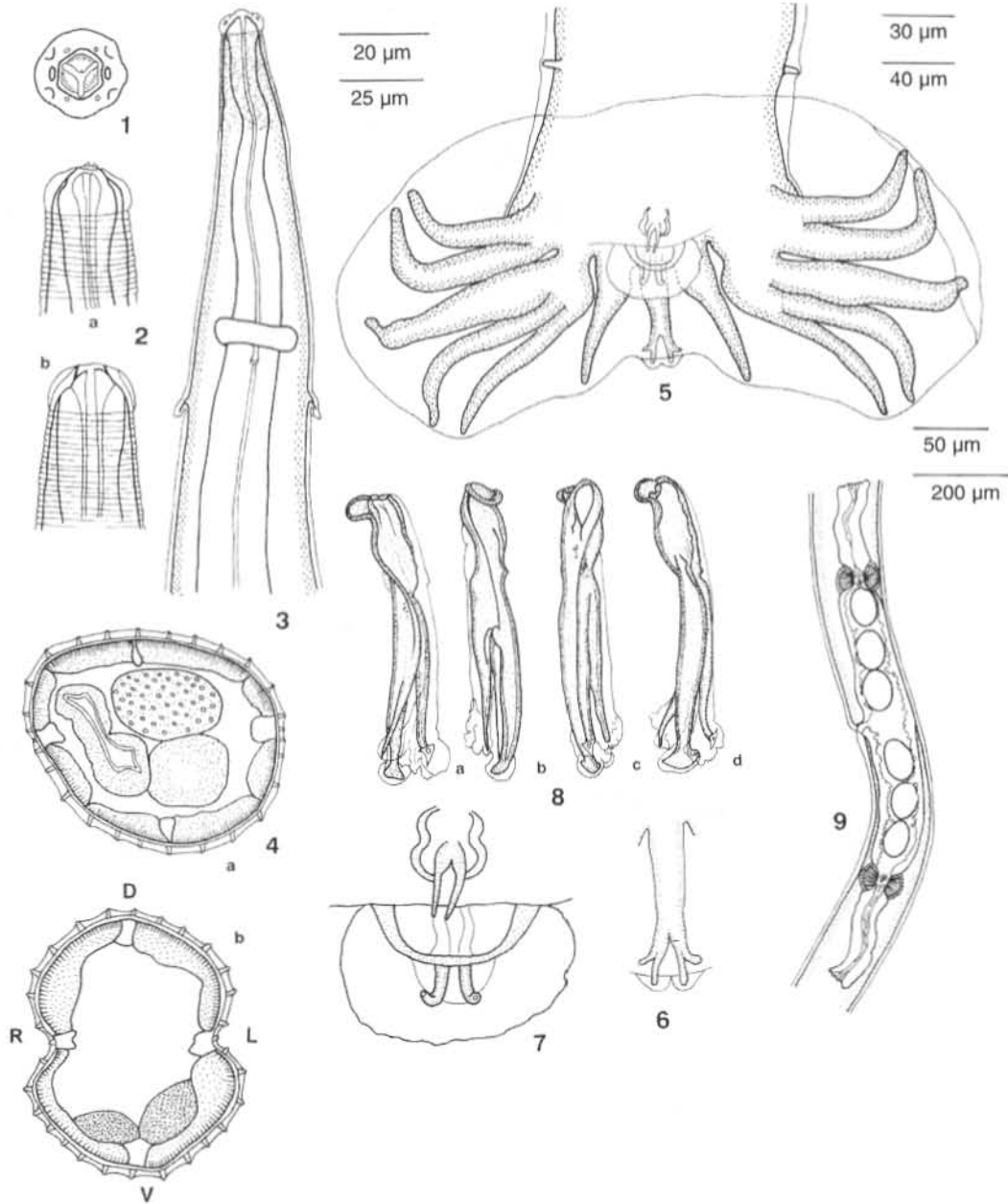


FIG. 1–9 *Ostertagia triquetra* n. sp.

FIG. 1 En face view of the head. Scale bar: 25 µm

FIG. 2 Ventral (a) and lateral (b) views of the head. Scale bar: 25 µm

FIG. 3 Dorsal view of the anterior part of a female. Scale bar: 50 µm

FIG. 4 Cross-section at mid-body of (a) a female and (b) a male; L—left, R—right, D—dorsal and V—ventral aspect of the body. Orientation of (a) is the same as that of (b). Scale bar: 30 µm

FIG. 5 Male bursa, ventral view. Scale bar: 40 µm

FIG. 6 Dorsal ray, showing the membranous extensions of the dorsal lobe. Scale bar: 25 µm

FIG. 7 Composite drawing of the genital cone and accessory bursal membrane, ventral view. Scale bar: 20 µm

FIG. 8 The right spicule in (a) ventromedian and (d) median views, showing the internoventral branch to the left and the internodorsal branch to the right in the latter figure. The ventral and dorsal aspect of the left spicule are illustrated in (b) and (c), respectively. Scale bar: 50 µm

FIG. 9 Left lateral view of the vulvar region and ovejector. Scale bar: 200 µm

**DESCRIPTION OF *OSTERTAGIA TRIQUETRA*
n. sp.**

Synonymy

Ostertagia hamata sensu Horak, De Vos & De Klerk (1982), Boomker (1990) and Boomker & Horak (1992) *nec* Mönnig, 1932.

Type host

Pelea capreolus (Forster, 1790), from the Bontebok National Park, Swellendam, South Africa.

Material examined

Holotype male, allotype female, eight male and four female paratypes, all housed in the collection of the Muséum National d'Histoire Naturelle (MNHN), Paris, France, No. MNHN 431 MD; additional material from several grey rhebuck, 20 males and 20 females.

Etymology

The species name is derived from the Latin meaning 'triangular' *a propos* the triangular tip of the interno-dorsal branch of the spicules.

Description

The principal measurements are listed in Table 1.

Small nematodes with a small cephalic vesicle. The mouth is hexagonal and without lips. The dorsal lobe of the oesophagus immediately below the buccal ring appears tooth-like and has a small canal. Four external labial and four cephalic papillae are present, and the amphids are comparatively large (Fig. 1). The cephalic vesicle is followed by an area of fine transverse striations (Fig. 2). The oesophagus is indistinctly divided into an anterior muscular and a posterior glandular part, the division being slightly behind the nerve ring (Fig. 3). The excretory pore is near the laterally situated deirids. On cross-section at the mid-body, the males have 25–30 longitudinal cuticular ridges and the females 28–34, the lateral three or four of which appear smaller than the rest. In some male specimens the dorsolateral and ventrolateral ridges are slightly curved towards the dorsal and ventral aspects of the body, respectively, while the dorsal and ventral ridges are perpendicular to the body surface (Fig. 4A). The lateral synlophes is illustrated in Fig. 10.

MALES: The bursa has two large lateral lobes and a smaller dorsal lobe, which is indistinctly demarcated

(Fig. 5). In some specimens the bursa is somewhat asymmetrical, the left lobe being slightly larger than the right one. The bursal rays have the 2-1-2 pattern. The pre-bursal papillae are large and easily visible; the tips of rays 2 and 3 are close to each other and both reach the bursal margin. Rays 4–6 have a common origin; ray 4 is thick, and its tip is some distance from rays 5 and 6 and also from the bursal margin; it curves toward rays two and three. Rays 5 and 6 become progressively thinner; they are close together with converging tips, the latter being near the bursal margin; both curve towards ray 8, which is relatively thick. The dorsal ray is short and bifurcates in the distal quarter, each branch in turn dividing into ray 9, which is small and papilla-like, and ray 10, which is undivided. The tip of ray 10 is enclosed in what appears to be membranous extensions of the dorsal lobe (Fig. 5 and 6). The genital cone is conspicuous and membranous, with fairly long ventral raylets. A large semi-circular accessory bursal membrane with two slender dorsal raylets is present (Fig. 7).

The spicules are equal and well sclerotized. Each consists of a stout main "handle" and three branches. The externo-lateral branch bears ends in a shoe-like process and bears two branches of almost the same length. The shorter (interno-ventral) branch ends acutely, while the longer (interno-dorsal) branch is curved and bears a convex, triangular shoe. The tips of the two internal branches are covered by transparent membranes that extend cranially along the medial aspect of the spicules (Fig. 8). The 'ostertagiid' window is situated in the middle of the spicules. A lightly sclerotized gubernaculum, spoon-shaped in ventral view (Fig. 9), is present and it appears as if its rounded distal tip is fixed in or close to the cloacal opening.

FEMALES: The uterus is didelphic and situated in the posterior part of the body. The ovejector is slightly asymmetric in that the anterior part is often longer than the posterior part. The vulva is a slightly raised transverse slit and vulvar flaps are absent (Fig. 9). The tail is finely cross-striated and ends in an ovoid knob. The eggs are segmented when laid.

DISCUSSION

We consider the new species as belonging to the genus *Ostertagia* because the bursa is of the 2-1-2 type, the dorsal lobe and rays are reduced in length when compared to that of the genus *Marshallagia* Orloff, 1933, the tip of ray 4 curves towards rays 2 and 3, while rays 5 and 6 curve towards ray 8 and

TABLE 1 The principal measurements, in micrometres (μm), of *Ostertagia triquetra* n. sp. and *Teladorsagia hamata* (Mönnig, 1932)

Measurement	<i>Ostertagia triquetra</i> Males		<i>Ostertagia triquetra</i> Females		<i>Teladorsagia hamata</i> (After Mönnig 1932)	
	Holotype	Paratypes (n = 8)	Allotype	Paratypes (n = 4)	Males	Females
Length	8 159	7 847-9 197	10 490	10 420-11 275	6 600-7 850	8 090-11 020
Width	104	97-139	139	120-160	90-110	116
Length of cephalic vesicle	17	12-17	14	12-14	N	N
Width of cephalic vesicle	29	27-29	28	21-29	22-28	22-29
Extent of transverse striations behind head	70	64-80	65	52-64	N	N
Distance of deirids from anterior end	312	293-352	314	243-282	330-420	330-420
Distance of nerve ring from anterior end	249	216-279	233	191-213	240-290	240-290
Distance of excretory pore from anterior end	289	261-321	284	227-253	At deirids	At deirids
Length of muscular oesophagus	230	216-251	223	219-237	N	N
Length of glandular oesophagus	334	334-397	334	355-404	N	N
Total length of oesophagus	564	560-648	557	574-641	710-800	710-860
Ratio of oesophagus length to body length	1:14.5	1:12.1-1:16.4	1:18.8	1:16.3-1:19.7	1:8.3-1:11.1	1:9.4-1:15.5
Length of left spicule	184	178-200	-	-	161-191	-
Length of right spicule	184	171-197	-	-	161-191	-
Length of gubernaculum	91	77-100	-	-	112	-
Length of tail	-	-	132	150-167	-	176-190
Distance of anus from vulva	-	-	1 680	1 686-1 928	-	1 130-1 584
Length of ovejector	-	-	1 069	951-1 055	-	150-230
Length of anterior infundibulum	-	-	219	180-215	-	N
Length of anterior sphincter	-	-	52	42-56	-	N
Length of anterior vestibulum	-	-	282	271-288	-	N
Length of posterior vestibulum	-	-	237	215-250	-	N
Length of posterior sphincter	-	-	42	42-49	-	N
Length of posterior infundibulum	-	-	237	194-229	-	N
Number of eggs, anterior part of uterus and ovejector	-	-	19	18	-	N
Number of eggs, posterior part of uterus and ovejector	-	-	18	13	-	N
Length of eggs	-	-	76	76-77	-	71
Width of eggs	-	-	44	44-46	-	39

- Not applicable

N Not given

the synlophe is of the *Ostertagia* type (Durette-Desset & Cabaret 1994). Furthermore, the spicules are ornamented and a gubernaculum is present. These characteristics conform to those given for the genus by Gibbons & Khalil (1982) and Durette-Desset (1989).

The males of *Ostertagia triquetra* can be differentiated from those of *Teladorsagia hamata* in the pattern of the bursal rays (2-1-2 in the former and 2-2-1 in the latter) and the tip of the interno-dorsal branch of the spicules, which is bent and has a convex, triangular process in the former species, while it is straight and concave, like a shallow ice-cream scoop, in the latter. Furthermore, the externodorsal rays of *Teladorsagia hamata* are longer than those of *Ostertagia triquetra*. The females of the two species closely resemble each other but can be separated on the synlophe and the larger size of *Ostertagia triquetra*. The oesophagus of *Teladorsagia hamata* is also longer than that of *Ostertagia triquetra* as indicated by the smaller ratio of the length of the oesophagus and the total body length.

In view of the morphological and host differences, we consider *Teladorsagia hamata sensu* Horak *et al.* (1982), Boomker (1990) and Boomker & Horak (1992) to be a distinct species for which the name *Ostertagia triquetra* n. sp. is proposed.

Horak (1981) and Boomker (1990) categorize the helminths of antelope into definitive, occasional, accidental and host-specific parasites. *Ostertagia triquetra* should be considered as a host-specific parasite, since it has been recorded only from *P. capreolus* and from this host only in the Bontebok National Park.

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REFERENCES

- BOOMKER, J. 1990. A comparative study of the helminth fauna of browsing antelope of South Africa. D.V.Sc. thesis, Medical University of Southern Africa.
- BOOMKER, J. & HORAK, I.G. 1992. Parasites of South African wildlife. XIII. Helminths of grey rhebuck, *Pelea capreolus*, and of bontebok, *Damaliscus dorcas dorcas*, in the Bontebok National Park. *Onderstepoort Journal of Veterinary Research*, 59:175-182.
- DURETTE-DESSET, M.-C. & CHABAUD, A.G. 1981. Nouvel essai de classification des Nématodes Trichostrongyloidea. *Annales de Parasitologie Humaine et Comparée*, 56:297-312.
- DURETTE-DESSET, M.-C. 1989. Nomenclature proposée pour les espèces décrites dans la sous-famille des Ostertagiinae Lopez-Neyra, 1947. *Annales de Parasitologie Humaine et Comparée*, 64:356-373.
- DURETTE-DESSET, M.-C. & CABARET, J. 1994. The distances between cuticular ridges follow a Gaussian function in ostertagiine nematodes: the potential use of this phenomenon as a taxonomic criterion. *Systematic Parasitology*, 29: 13-22.
- GIBBONS, LYNDA M. & KHALIL, L.F. 1982. A key for the identification of genera of the nematode family Trichostrongylidae Leiper, 1912. *Journal of Helminthology*, 56:185-233.
- HORAK, I.G. 1981. Host-specificity and the distribution of helminth parasites of sheep, cattle, impala and blesbok according to climate. *Journal of the South African Veterinary Association*, 52:201-206.
- HORAK, I.G., DE VOS, V. & DE KLERK, B.D. 1982. Helminth and arthropod parasites of vaal ribbok, *Pelea capreolus*, in the western Cape Province. *Onderstepoort Journal of Veterinary Research*, 49:147-148.
- MÖNNIG, H.O. 1932. Wild antelopes as carriers of nematode parasites of domestic ruminants. Part II. 18th Report of the Director of Veterinary Services and Animal Industry, Union of South Africa: 53-172.