

PARACOOPERIA HORAKI N. SP. (NEMATODA: TRICHOSTRONGYLIDAE) FROM THE NYALA TRAGELAPHUS ANGASI GRAY, 1849

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ABSTRACT

BOOMKER, J., 1986. *Paracooperia horaki* n. sp. (Nematoda: Trichostrongylidae) from the nyala *Tragelaphus angasi* Gray, 1849. *Onderstepoort Journal of Veterinary Research*, 53, 161-165 (1986).

A new species of *Paracooperia* Travassos, 1935 was found in small numbers in the small intestines of 36 out of 68 nyala *Tragelaphus angasi* Gray 1849 in the Mkuzi, Ndumu and Umfolozi Game Reserves, Natal.

The worms, for which the name *Paracooperia horaki* is proposed, can be differentiated from the closely related *Paracooperia devossi* Boomker & Kingsley, 1984 by the absence of ridges on 1 of the branches of the spicules, the slightly longer branches of the tips of the dorsal ray and the large hemispheric knobs on the ends of the spicules. Furthermore, the branch of the spicules that bears the hook-like process is about two thirds the length of the spicule in *P. devossi* and almost the entire length of the spicule in *P. horaki*. The ovigerous females of *P. horaki* have 2 or 3 expanded ridges in front of the vulva that form vulvar flaps. The females without eggs resemble those of *P. devossi* and have only a single vulvar flap.

INTRODUCTION

During the recent survey of the parasites of nyala *Tragelaphus angasi* Gray, 1849 culled in the Mkuzi, Ndumu and Umfolozi Game Reserves in Natal, a new species of *Paracooperia* Travassos, 1935 was recovered from the small intestines of 36 out of 68 animals.

Only a few parasites were recovered from each animal, the most being 375 male and female worms found in a juvenile male culled in the Mkuzi Game Reserve. The type host selected was from this Reserve, since, with the exception of a single animal from the Ndumu Game Reserve, too few worms were recovered from the remaining nyala for a detailed description.

The parasites are described here as *Paracooperia horaki* n. sp. in honour of Prof. I. G. Horak of Rhodes University, Grahamstown, in recognition of his extensive efforts to expand the study of parasites of wild ruminants in this country.

DIAGNOSIS OF THE GENUS

Trichostrongylidae: Cooperiinae: Anterior end with a large cephalic vesicle; buccal capsule small, without teeth; cervical papillae small and difficult to see; well-developed synlophoe. Males with a symmetrical bursa, dorsal lobe indistinct; spicules equal, relatively short, well-sclerotized and complex; gubernaculum absent; genital cone relatively simple. Female amphidelphic, vulva in posterior half of the body; tail tapering to a more or less acute point.

Description of *Paracooperia horaki* n. sp.

Type host

Tragelaphus angasi Gray, 1849, from the Mkuzi Game Reserve, Natal, Republic of South Africa.

Material examined

T. angasi from the type locality, syntype specimens (Onderstepoort Helminthological Collection, No. T 2171), 17 male, 7 female worms.

T. angasi from the type locality, paratype specimens (Onderstepoort Helminthological Collection, No. T 2172), 5 male, 5 female worms.

T. angasi from the Mkuzi Game Reserve, Natal, 6 animals, 10 male and 17 female worms.

T. angasi from the Ndumu Game Reserve, Natal, 4 animals, 6 male and 9 female worms.

T. angasi from the Umfolozi Game Reserve, Natal, 11 animals, 27 male and 13 female worms.

Description

The principal measurements are listed in Table 1.

Small worms that are sometimes spirally coiled. A well-developed cephalic inflation is present. The mouth is surrounded by 3 small lips. The oesophagus has the usual cylindrical shape and is slightly thickened distally. The excretory pore is situated near the distal end of the oesophagus and the nerve ring is indistinct. Small cervical papillae that are difficult to see are present slightly distal to the excretory pore.

TABLE 1 The principal measurements, in mm, of *Paracooperia horaki*

	Males	Females
Length	4,04 -5,22	4,58 -5,40
Width	0,104-0,152	0,120-0,156
Head width	0,032-0,042	0,036-0,048
Length of cephalic inflation	0,020-0,028	0,020-0,028
Width of cephalic inflation	0,044-0,056	0,052-0,064
Distance of excretory pore from anterior end	0,212-0,288	0,216-0,336
Distance of nerve ring from anterior end	0,144-0,240	0,204-0,240
Distance of cervical papillae from anterior end	0,260-0,340	0,272-0,316
Oesophagus length	0,368-0,448	0,380-0,448
Spicule length	0,280-0,308	—
Combined length of ovjectors and sphincters	—	0,232-0,352
Distance of vulva from tip of tail	—	0,136-0,192
Distance of vulva from anus	—	0,720-0,912
Distance of anus from tip of tail	—	0,816-1,088
Eggs (<i>in utero</i>), length	—	0,072-0,088
width	—	0,040-0,044

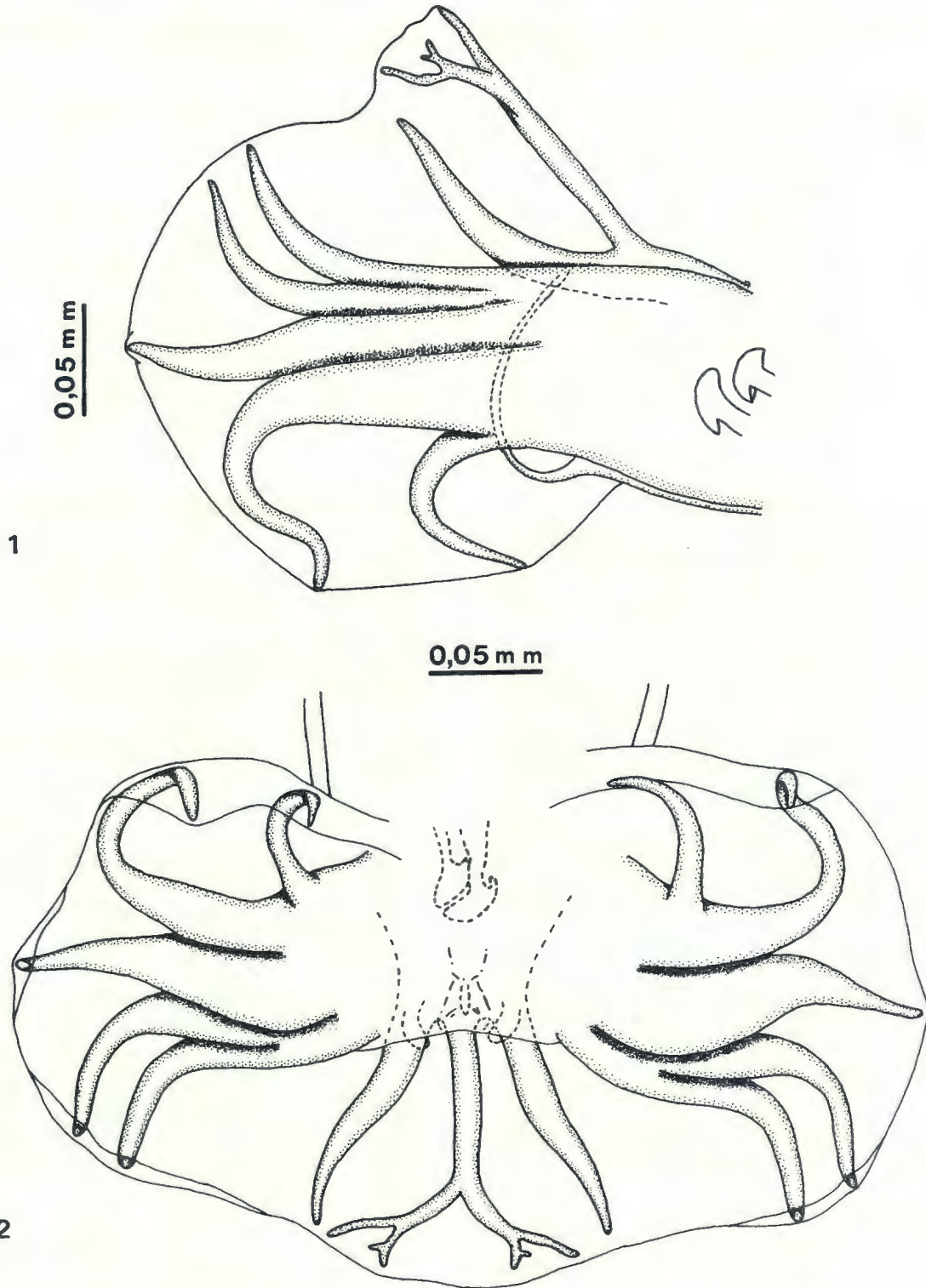


FIG. 1 Bursa of *P. horaki*, lateral view

FIG. 2 Bursa of *P. horaki*, ventral view

The male bursa has the typical shape of the genus, with 2 large lateral lobes and an indistinct symmetrical dorsal lobe. The anteroventral ray is slender and widely separated from the posteroventral ray which is considerably thicker; both curve anteriorly. The lateral bursal rays diminish in size posteriorly; the anterolaterals extend laterally or curve only slightly anteriorly, while the medio- and posterolateral rays curve posteriorly (Fig. 1). The externodorsal rays arise from the base of the dorsal ray and almost reach the bursal margin. The dorsal ray bifurcates only at its distal end, each branch dividing

again to form a slender, longer, outer branch and a shorter, bifurcated, inner branch (Fig. 2). Prebursal papillae were not seen.

The spicules are equal and complex and each consists of a main stem and 2 branches that are enclosed in moderately well-developed membranous alae (Fig. 3). The main stem ends in a large hemispherical knob. One of the branches is more heavily sclerotized than the other and terminates in a hook-like process, the tip of which bears a poorly sclerotized, filamentous appendage. The hook-like process appears different in different views

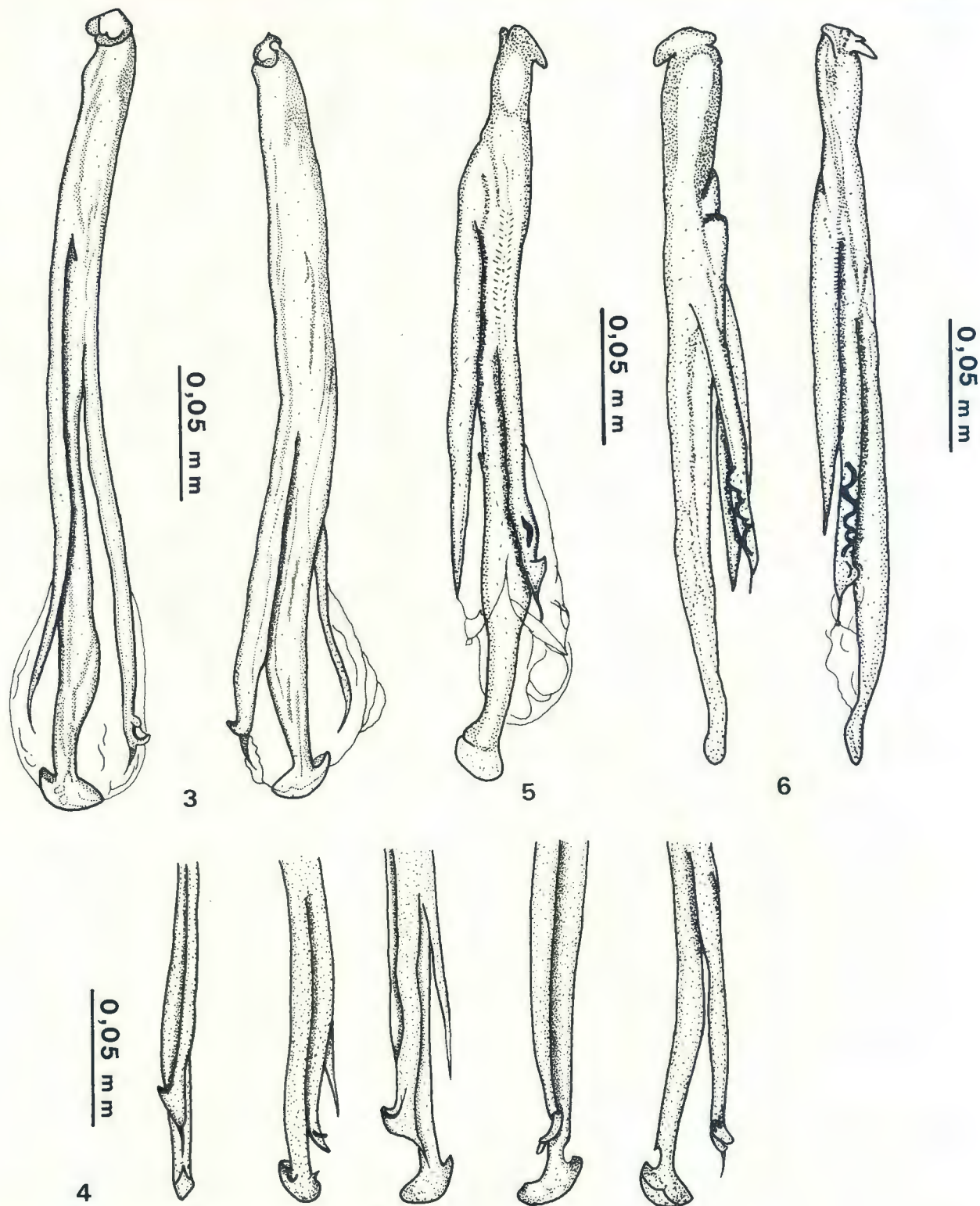


FIG. 3 Spicules of *P. horaki* in ventrolateral and dorsolateral views

FIG. 4 Tips of the spicules of *P. horaki*, illustrating the differences in appearance in different views

FIG. 5 A spicule of *P. devossi*, lateral view

FIG. 6 The spicules of *P. tragelaphi*

(Fig. 4) and the branch ends near the distal end of the main branch. For comparative purposes the spicules of *Paracooperia devossi* Boomker & Kingsley, 1984 and *Paracooperia tragelaphi* Gibbons & Khalil, 1980 are illustrated in Fig. 5 and 6, respectively. The genital cone is relatively simple (Fig. 7).

The synlope is similar to that of the other *Paracooperia* species in that there are 10 ridges, the dorsolateral

ones of which are large, the ventrolateral ones smaller and the dorsal and ventral ones the smallest (Fig. 8).

The females are larger than the males. The vulva is situated in the distal third of the body. Vulvar flaps, consisting of 3 expanded cuticular ridges in front of the vulva and a single expanded ridge behind the vulva, are present in egg-bearing females (Fig. 9a). Females without eggs have single pre- and post-vulvar flaps (Fig. 9b).

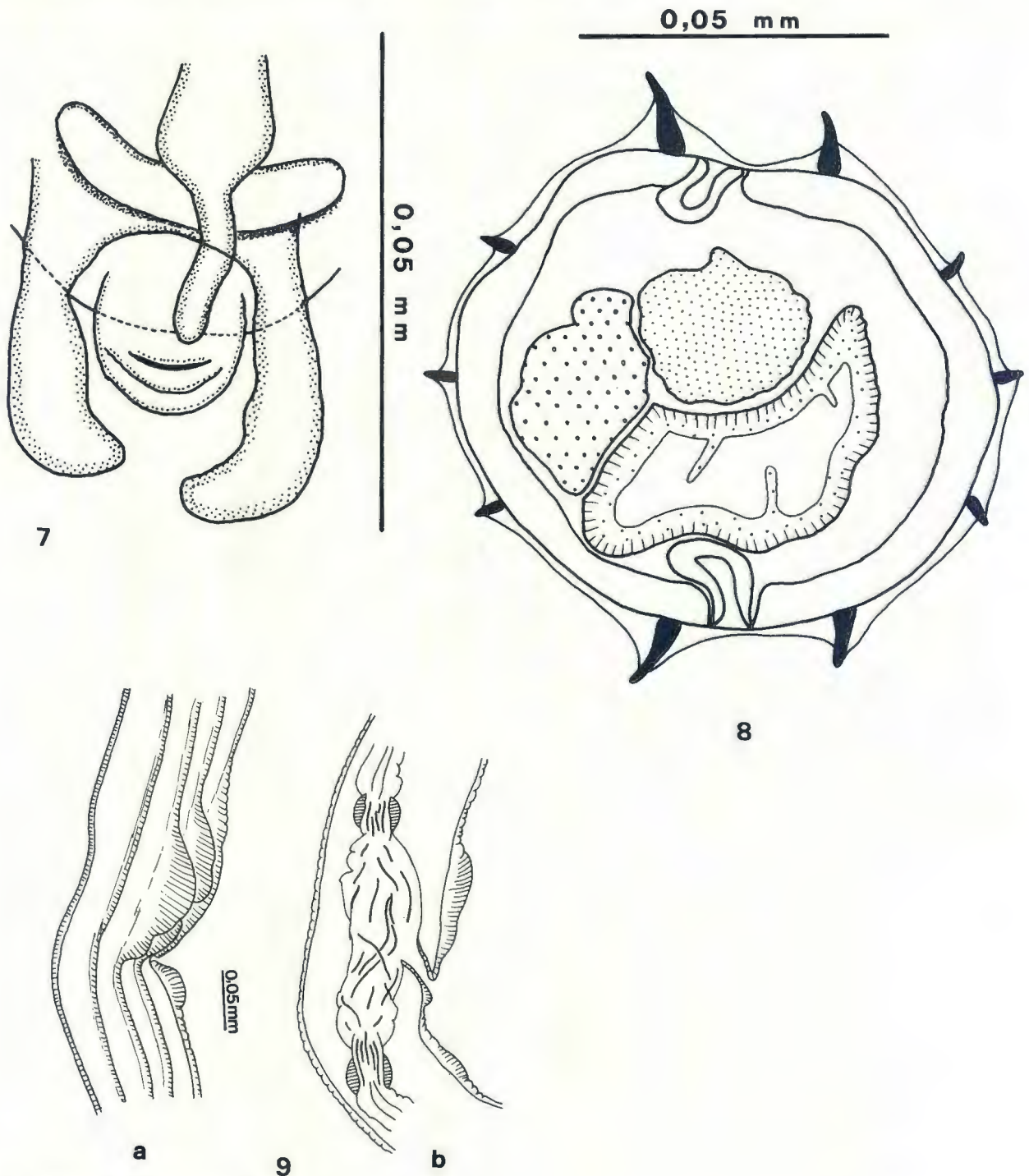


FIG. 7 The genital cone of *P. horaki*

FIG. 8 The synlophe of *P. horaki*

FIG. 9 The vulvar region of the females of *P. horaki*; (a) an egg-bearing female showing the 3 pre-vulvar flaps and (b) the single pre-vulvar flap of a female without eggs

The ovjector is well developed and the uterus is amphidelphic (Fig. 9b). The eggs are thin-walled and are segmented when laid.

DISCUSSION

In her revision of the genus *Paracooperia*, Gibbons (1978) recognized 5 valid species of which *Paracooperia nodulosa* (Schwartz, 1928), *Paracooperia serrata* (Mönnig, 1931) and *Paracooperia daubneyi* (Daubney, 1933) have spicules 0,2 mm or longer. Subsequently Gibbons & Khalil (1980) and Boomker & Kingsley (1984) added *P. tragelaphi* and *P. devossi*, respectively, both of which have spicules longer than 0,2 mm.

P. horaki is closely related to both *P. devossi* and *P. tragelaphi* as far as the principal measurements and the configuration of the spicules are concerned. The differences between *P. devossi* and *P. tragelaphi* have been discussed by Boomker & Kingsley (1984).

P. horaki differs from *P. devossi* in that the main branches of the spicules end in large hemispherical knobs and that there are no ridges. The characteristic hook that is present on the more heavily sclerotized branch of *P. devossi* is also present in *P. horaki*. This branch is considerably longer in *P. horaki*, extending down to near the termination of the main branch, while in *P. devossi* the branch is only approximately two thirds

the length of the main branch. The hook seems to be present only in the *Paracooperia* species from the tragelaphine antelope, since it was not seen in specimens of *Paracooperia raphiceri* Ortlepp, 1939 and *P. serrata*, nor was it mentioned by Gibbons (1978). Furthermore, the median branches of the tip of the dorsal ray are short and thick in *P. devossi* and longer and more slender in *P. horaki*.

It is interesting to note that the 3 *Paracooperia* spp. so far recovered from the *Tragelaphus* spp. follow a distinct pattern as far as the morphology of the spicule is concerned. In *P. tragelaphi* from the bushbuck from East Africa the spicules terminate in slight distensions and there are 3–4 ridges on the hook-bearing branches. In *P. devossi* from Natal (Boomker, Keep & Flamand, 1984) and the Kruger National Park, the spicules end in ovoid knobs and there is only 1 ridge, while the spicules of *P. horaki* end in large hemispherical knobs and ridges are not present.

It is possible that the 3 *Paracooperia* spp. had a single common ancestor and that, because of geographical isolation brought about by natural phenomena or human activities, the 3 species evolved separately in tragelaphine antelope from the eastern part of the continent. It would be interesting to determine if the mountain nyala,

Tragelaphus buxtoni, which occurs in isolated mountains in Ethiopia, harbours an as yet undescribed but comparable *Paracooperia* species.

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