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A NEW ITCH MITE (ACARINA : PROSTIGMATA : PSORERGATIDAE) FROM THE SOUTH AFRICAN BUSH SQUIRREL *PARAXERUS CEPAPI* (*)

Results of the Namaqualand-Namibia Expedition of the King Léopold III Foundation for the Exploration and Protection of Nature (1980)

BY

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(With eight figures in the text)

ABSTRACT

Psorergates paraxeri sp. n. is described, figured and compared to related species. A new group within the genus *Psorergates* is formed, and a key to groups is given.

INTRODUCTION

During the Namaqualand-Namibia Expedition 1980 of the King Léopold III Foundation one of us (F. S. L.) had the opportunity to examine specimens of the bush squirrel, *Paraxerus cepapi*.

The Psorergatids found on this host differ from all described species. Together with *P. glaucomys* AH. et al., 1973 and *P. dremomydis* GIESEN *et al.* (in press), this new species shares the characteristic of the presence

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of a tibial spine IV and these three species cannot be arranged into any of the recognized groups of the genus.

The new species will be figured and described below and its systematic position will be discussed.

For comparison with the two described species from sciurimorph hosts and species to be described in the future, all measurements are given in tabulated form in micrometers (μm).

Psorergates paraxeri sp. n.

F e m a l e (Holotype) (Fig. 1). — Disc-shaped uncolored mites with the characteristics of genus *Psorergates* TYRELL, 1883 (sensu. FAIN,

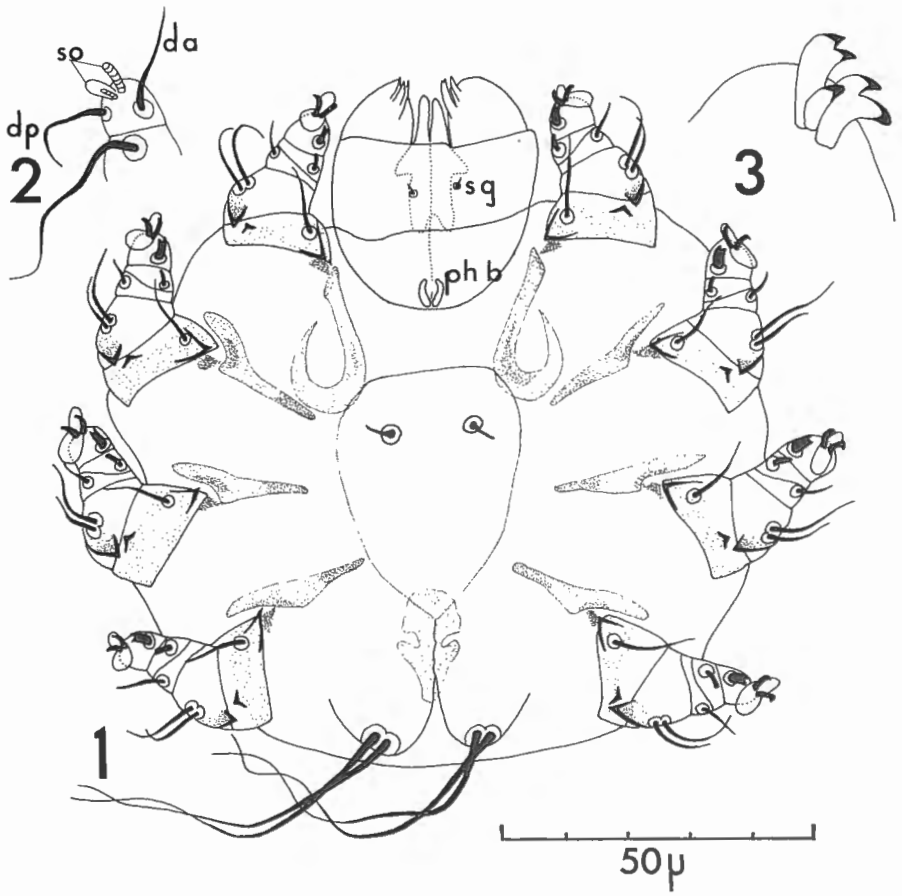

Fig. 1-3. — *Psorergates paraxeri* sp. n. (female, holotype).
1 : venter; 2 : tarsus and tibia of leg I in dorsal view;
3 : palpaltarsus of a squashed paratype.

1959 a, b). Body length, including gnathosoma 113, width 103. Measurements of paratypes with averages are given in table I.

Subequal, laterally inserted legs equally spaced along podosoma, and gnathosoma as long as legs I.

TABLE 1

Comparative data of *Psorergates* species (« sciuricola » group), females.

	P. paraxeri			*P. dremomydis*		*P. glaucomys*
	Holo-type	$\bar{x}$ (n = 8)	Min-max	$\bar{x}$ (n = 11)	Min-max	(n = 1)
Body length	113	123	(113-137)	115	(110-124)	122
Body width	103	108	(100-113)	103	(98-122)	106
Shield length	76	87	(76- 93)	73	(70- 75)	83
Shield width	83	86	(81- 93)	77	(76- 78)	79
Length setae terminal	55	60	(55- 63)	75	(67- 80)	60
trochanter	11	13	(11- 15)	11	(10- 12)	8
femora I-III	15	16	(15- 17)	19	(17- 22)	11
femur IV	13	16	(13- 20)	22	(19- 25)	11
genua I-III	5	6	(5- 7)	9	(8- 9)	6
genu IV	7	6	(5- 9)	19	(17- 22)	15
tibia	23	23	(21- 25)	26	(23- 32)	22
2nd lateral shield seta	11	11	(10- 12)	8	(7- 10)	5
Ventral setae	6	6	(5- 6)	5	(5- 6)	8
Distance ventral setae ...	14	11	(9- 14)	14	(12- 16)	14
No of setae femur IV	2	2		2		2
No of clawpoints	1	1		1		1
No of points tarsal spine	2	2		1		1
Palpaltibial setae p. ...	14	14	(13- 15)	13	(12- 13)	10
Gnathosomal setae ...	4	4	(4- 5)	5	(4- 6)	4

Venter (Fig. 1). Cuticle of venter smooth. Epimera with more sclerotized median part, beneath ventral surface All epimera separate; I recurved outward to an almost completed loop, II-IV with lateral prolongations along the trochanters. One pair of ventral setae with median distance between. Genital opening at level of legs IV in form of a longitudinal slit between paramedian lobes, each of them carrying a pair of long terminal setae. Genital atrium as figured without sclerotized ducts into body. Anus absent.

Legs subsequal with five free segments. Trochanter with poorly sclerotized acute spur, arising from ventral surface, piliform seta at the base of this spur and a smaller distal spur opposite to femoral spur. Femur with a small acute, strongly sclerotized spur and a pair of unequal setae, the proximal seta about $^2/_3$ of length of the distal one.

Genua I-IV each with one seta of subequal length. Tibia with a single-tined blunt spine and dorsally with a relatively long, piliform seta (Fig. 2). Tarsus with two single-tined claws a bilobed empodium (larger part ventral to claws, smaller part dorsal between claws), a ventral thick, double-tined spine and two dorsal setae (d.a. and d.p.). The posterior member of this setal pair is lacking on legs IV. Tarsi I and II dorsally with two solenidia (so), the smaller inside a thin cuticular envelop.

Dorsum (Fig. 4) with sclerotized, punctate, circular shield. Soft cuticle peripheral to circular shield striated as figured. Three pairs of relatively long setae, somewhat broadened in their center, near lateral border; one pair of minute anteromedian (am) setae in large hairrings.

Gnathosoma relatively broad, with two-segmented palps. Gnathosoma setae short and bilobed (Fig. 7). Subgnathosomal (sg) setae in front of pharyngeal bulb (ph. b). Palpaltibia with relatively strong, blunt distal seta, a tiny seta and sclerotized acute tibial spur. One small seta on palpaltarsus. Palpaltarsus inserted ventro-medially with two double-pointed clawlike setae and one spine (Fig. 3). Fixed digit of chelicerae with four sawlike dentacles (Fig. 8) and stinging bristles.

M a l e . — General body shape and setation similar to female. Genital opening in midline 17 µm behind anterior margin of circular dorsal shield (Fig. 5). Genital setae and antero-median setae in trapezoid position. Penis long and simple; enclosed in a tube-like penal sheath (Fig. 5).

Caudal part of venter with a single median lobe without tongue-shaped sclerotized shield, and with a pair of long terminal setae (Fig. 6).

Measurements in table II.

D e v e l o p m e n t a l s t a g e s . — Shape and body-formation similar to other species of genus *Psorergates*.

Egg slightly oval, length range 69-98, width range 64-91.

Fig. 4-8. — *Psorergates paraxeri* sp. n., (female holotype, male allotype).
4 : female dorsum; 5 : male dorsum; 6 : male, venter, caudal part;
7 : gnathosomal seta, detail of a paratype;
8 : fixed digit of chelicera, detail of a squashed paratype.

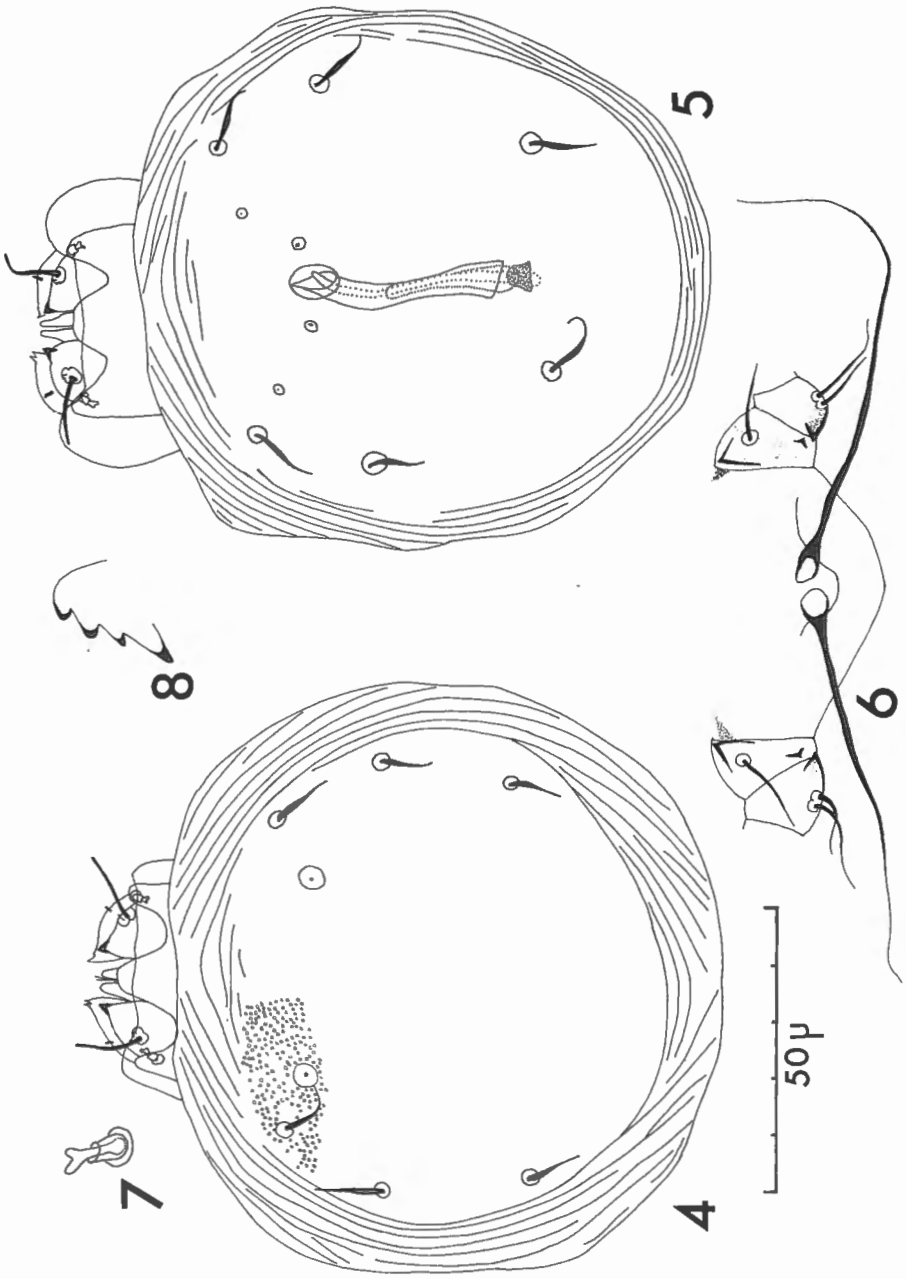
5
8
6
7
4
50μ

TABLE 2

Comparative data of *Psorergates* species (« sciuricola » group), males.

	P. paraxeri			*P. dremomydis*		*P. glaucomys*
	Holo-type	$\bar{x}$	Min-max (n = 8)	$\bar{x}$	Min-max (n = 10)	(n = 1)
Body length	123	124	(113-135)	100	(89-107)	121
Body width	98	100	(91-108)	84	(74- 95)	101
Shield length	84	86	(81- 92)	71	(67- 74)	84
Shield width	84	83	(75- 90)	80	(64- 75)	78
Length setae terminal	78	87	(78- 94)	79	(77- 80)	91
trochanter	13	12	(11- 13)	9	(9- 10)	8
femora I-III	16	17	(15- 18)	17	(14- 20)	12
femur IV	22	18	(16- 22)	22	(19- 23)	12
genua I-III	7	6	(5- 7)	8	(6- 9)	8
genu IV	7	6	(6- 7)	18	(17- 19)	23
tibia	23	27	(23- 32)	24	(22- 25)	21
2nd lateral shield seta	11	12	(8- 14)	9		5
Ventral setae	8	5	(4- 8)	5	(5- 6)	8
Distance ventral setae ...	13	11	(9- 13)	14	(12- 16)	15
No of setae femur IV	2	2		2		2
No of clawpoints	1	1		1		1
No of points tarsal spine	2	2		1		1
Palpaltibial setae p. ...	14	14	(11- 16)	11	(9- 13)	12
Gnathosomal setae ...	4	4		4		4
Length penis	41	42	(40- 45)	25	(24- 26)	35
Length penis sheath ...	40	40	(38- 45)	18		10
Distance genital setae ...	14	13	(12- 14)	9		10
Distance a.m. setae ...	32	30	(29- 32)	22	(20- 23)	20

Host and locality. — *Paraxerus cepapi* (SMITH), Zoutpansberg 22°58′ S, 29°56′ E. Collected by ROBERTS, July 1923. Host in collection of Transvaal Museum coll. no. 3596.

Paraxerus cepapi, Mahalapye, Botswana, collected by Sr. K. CAMERIK O. S. U. on 10 December 1979. Host in collection of Transvaal Museum, Pretoria.

Pathogenity. — The mites were found in swollen hair follicles of fore- and hindlegs. The cyst-like swollen hair follicles, protruding slightly above the skin surface, were found filled with mites in all developmental stages and larger amounts of hyperkeratinized skin scales.

Deposition of types. — Holotype, allotype and paratypes within South African Institute for Medical Research, Pretoria. Other paratypes in Institut Royal des Sciences Naturelles de Belgique, Bruxelles; British Museum (Natural History), London; U. S. National Museum of Natural History (Smithonian Institution), Washington D. C.; Field Museum of Natural History, Chicago; The Acarology Laboratory, Colombus, Ohio; Department of Entomology, Georgia State University, Athens; Rocky Mountain Laboratory, Hamilton, Montana; Rijksmuseum van Natuurlijke Historie, Leiden; Institut de Médicin Tropical « Prins Léopold », Antwerp; Zoologisches Institut und Zoologisches Museum, Hamburg; Bishop Museum, Honolulu, Hawaii; Biological Sciences Group, University of Connecticut and in collection of the authors.

DISCUSSION

From Sciurid hosts hitherto three species of *Psorergates* have been described : *P. glaucomys* AH. *et al.*, 1973 from *Glaucomys volans* in U. S. A., *P. dremomydis* GIESEN *et al.* (in press) from *Dremomys rufigenis* in Malaysia, and this new species from *Paraxerus cepapi* in South Africa. These species from different parts of the world share some characteristics, which separate them from the other groups within the genus *Psorergates* LUKOSCHUS *et al.*, 1967; LUKOSCHUS, 1968; LUKOSCHUS *et al.*, 1971;

— tibial spine on legs IV present,
— tarsal spines strong,
— gnathosoma seta short, bilobed, with subequal length of lobes,
— dorsal seta on tibiae I-IV relatively long.

We regard these characteristics for definition of a new group « sciuricola » within genus *Psorergates*.

The genera and species of family Psorergatidae are parasitic on a wide range of hosts : Chiroptera, Insectivora, Primates, Carnivora, Lagomorpha, Rodentia and Artiodactyla. Such a distribution, as in the other wide-spread parasitic mite families Demodicidae, Myobiidae, Listrophoridae and Sar-

coptidae, may suggest parallel host-parasite evolution from common ancestors. In these families the most primitive genera or representatives have been recorded from marsupials. Although representatives from marsupials are not presently known, we predict more primitive species will be found from which the evolution of known genera and species can be deduced through « reductions » and secondary adaptations.

The genus *Psorergates* may be regarded to have evolved from ancestors by the reduction of the fourth pair of dorso-lateral setae, which are still present in the genera *Psorobia* and *Psorergatoides*.

The *Psorergates* species parasitic on Insectivora and Myomorphic rodents do not possess a spine on tibia IV, contrary to those from Sciumorphic rodents. Presence of this spine in Sciurid hosts may be parallel to evolutionline where Sciurimorpha are regarded for older than Myomorpha.

Such a tibial spine is also present in the species parasitic on *Tupaia*.

A key to the characteristics of groups within *Psorergates* is given :

1. — Tibial spine on leg IV present . . . . . 2.
   — Tibial spine on leg IV reduced . . . . . 3.

2. — Genual setae I-IV setiform, length of proximal seta of femora I-IV at least 1/2 of distal seta, gnathosomal setae short with subequal lobes . . . . . « sciuricola » group.
   — Genual setae I-IV reduced to short spines, proximal femoral setae reduced to short spines, gnathosomal seta long, with pronounced unequal lobes . . . . . *Psorergates tupaiae*.

3. — Dorso-anterior setae of tarsi varying in length from subequal to about half as long as dorso-posterior setae, genu IV seta shorter than femora IV seta . . . . . 4.
   — Dorso-anterior setae of tarsi less than 1/2 of dorso-posterior setae or absent, genu IV seta longer than femur IV seta . . . . . « insectivora » group.

4. — Strong sexual dimorphism of palpaltibial and gnathosomal setae, distance between ventral setae more than 20 . « dissimilis » group.
   — Without marked sexual dimorphism of palpaltibial and gnathosomal setae . . . . . 5.

5. — Seta on genu IV distinctly longer than genua I-III setae . . . 6.
   — Seta on genu IV short and subequal to genua I-III setae . . . . . « muricola » group.

6. — Second lateral shield seta longer than 20, distance between ventral setae shorter than 5 . . . . . *Psorergates musculinus*.

— Second lateral shield seta shorter than 15, distance between ventral setae lager than 8 . . . . . 7.

7. — Two sclerotized ducts running from genital atrium into body, genital atrium without sclerotization, length of ventral setae shorter than 8, dorsal shield almost circular . . . . « apodemi » group.

— Genital ducts absent, genital atrium sclerotized, length of ventral setae more than 9, dorsal shield distinctly oval . « gliricola » group.

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