

A revision of the spider genera *Caesetius* and *Psammoduon* (Araneae, Zodariidae)

Rudy Jocqué

Koninklijk Museum voor Midden-Afrika B-3080, Tervuren, Belgium

The genera *Caesetius* Simon and *Psammoduon* Jocqué are revised. The former now contains seven species: the type species *C. murinus* Simon, *C. schultzei* Simon and *C. flavoplagiatus* Simon are three species for which the males are described here for the first time, as well as *C. spenceri* (Pocock) comb. nov., the type species of *Cydrelichus*, *C. politus* Simon, the type species of *Tryssoclitus*, *C. bevisi* (Hewitt) and *C. inflata* sp. n., described from both sexes. *Psammoduon* comprises three species, which appear to be strongly adapted to a burrowing life in sandy desert or dune habitats. They are *Psammoduon deserticola* (Simon), of which *Caesetius deserticola lüderitzi* Simon and *Caesetius masculinus* Lawrence are placed as junior synonyms, *Psammoduon arenicola* (Simon) comb. nov. and *P. canosum* (Simon) comb. nov. Males of the latter two species are described for the first time. *Caesetius* and *Psammoduon* are considered sister groups; they share a mesal group of spinules on the chelicerae and a strongly developed subtegulum on the male palp, as well as, a strongly recurved posterior eye row, with eyes far apart. They are separated by the domed profile without dip of the carapace and precoxal sclerites in *Caesetius*, and the strongly tapering legs with "accessory digging claws", fans of long spines, and plumiform trichobothria in *Psammoduon*.

INTRODUCTION

The genus *Caesetius* was erected by Simon (1893a) for a single species (*C. murinus*) from South Africa. Later (1893b), a second species (*C. politus*) was placed in that genus. The description of that species was based on a single juvenile specimen. Simon (1910) added five more species to *Caesetius* and transferred *C. politus* to the new genus *Tryssoclitus*. In the same paper, Simon stated that *Caesetius* is clearly composed of two groups. In the meantime Pocock (1900) had created the genus *Cydrelichus*, again on the basis of a juvenile specimen of the type species *Cydrelichus spenceri*. Jocqué (199x) found that the type specimens of *C. spenceri* Pocock and *T. politus* Simon are in fact congeneric with *Caesetius* and both these genera were therefore synonymised with the latter. On the other hand, the second group which Simon defined in his 1910 paper proved to be so different from the first group that it deserved generic status. Therefore, the genus *Psammoduon* was erected. It now contains three species, whereas for *Caesetius* itself, seven species are mentioned here.

The following other than usual abbreviations have been used mainly in the description of the leg spination:

2*, 3* . . . n* means 2, 3 or n spines in a row.

pl, d, rl, v: prolateral, dorsal, retrolateral, ventral

pf, mf, df: proximal, median or distal fan; referring to the transverse rows of hairs on the legs of *Psammoduon* and some *Caesetius*. disp.: spines dispersed i.e. not in an obvious row nor in pairs

AW, PW, L: anterior width, posterior width and length of MOQ (median ocular quadrangle)

Acronyms used for museums and institutions are as follows:

- AMNH: American Museum of Natural History, New York
 BMNH: British Museum (Natural History), London
 CAS: California Academy of Sciences
 MHNG: Musée d'Histoire naturelle, Genève
 MNHN: Muséum National d'Histoire Naturelle, Paris
 MRAC: Musée royal de l'Afrique Centrale, Tervuren
 NCP: National Collection of Arachnida, Pretoria
 NMSA: Natal Museum, Pietermaritzburg
 NMBA: National Museum Bloemfontein, Arachnida
 NMZ: National Museum, Zimbabwe, Bulawayo
 SAM: South African Museum, Cape Town

SMWN: State Museum Windhoek,
Namibia
TM: Transvaal Museum, Pretoria
ZMB: Zoologisches Museum, Berlin
All measurements are in mm.

DESCRIPTIONS

CAESETIUS Simon

Caesetius Simon 1893a: 419; Jocqué 1990: xx.
Cydrelichus Pocock 1900: 325. *Tryssoclitus* Simon 1910: 185.

Type species:

Caesetius murinus Simon (1893a), by original designation.

DIAGNOSIS

Representatives of the genus *Caesetius* are recognized by the following combination of characters: a field of spinules on the mesal side of the chelicerae and a strongly recurved posterior row of eyes, with eyes far apart—two features it has in common with *Psammoduon*—but distinguished from *Psammoduon* by the presence of precoxal sclerites, domed carapace, lack of extra digging claws and presence of normal trichobothria.

DESCRIPTION

Medium sized to large spiders (6.4–12.0). Carapace with smooth integument clothed with fine hairs, with some long hairs between fovea and eyes; longly oval, widest point between fovea and eyes, narrowed in front to about 0.65 times maximum width in females, to about 0.60 times maximum width in males; highest point of profile just before fovea. Clypeus relatively low. Eyes in two rows; anterior row strongly procurved as viewed from in front, much narrower than strongly recurved posterior row. All eyes circular. Anterior median eyes (AME) dark, remainder pale. Anterior lateral eyes (ALE) or posterior lateral eyes (PLE) the largest. AME and posterior median eyes (PME) close together. ALE at one to two diameters from AME; ALE at 5 to 6 diameters from PLE. Median ocular quadrangle (MOQ) rectangular, c. 1.5 to 2 times as long as broad. Height of clypeus 1.5 to 3 times diameter of ALE. Chelicerae long, with large condyle, densely covered with spines in front, mesally forming dense brush, without marginal teeth. Fangs short, broad. Chilum (see Jocqué, 199x) single: broad triangle with several hairs. Endites short, broad; with terminal scopula, and field of spinules behind it. La-

bium roughly quadrangular, with rounded anterior margin. Sternum triangular, slightly longer than wide in females, 1.2 to 1.4 times longer than wide in males; one or three pairs of crescent-shaped sclerites, here called precoxal sclerites, between sternum and coxae III or between sternum and coxae II, III and IV, partly or entirely lacking in males. Leg formula 4132 or 4312 (the subadult female of *Cydrelichus spenceri* has 4123). Spination: a few dorsal spines on femur I, no further spines on leg I; leg II with some dorsal spines on femora and prolateral and ventral spines on tibiae and metatarsi. Femora III and IV with some mediadorsal spines and distal dorsal transversal row. Numerous dispersed spines on patellae, tibiae, metatarsi and tarsi III and IV. Tarsi with more or less dense scopula, sometimes extending onto metatarsi and tibiae. Metatarsi III and IV slightly swollen at tip, with ventral cluster of hairs. Tarsi laterally flattened with spini-form scopula; two tarsal claws with about eight teeth; with sclerotized swelling at place of third claw. Trichobothria in two rows on tibiae, in one row on metatarsi and tarsi. Hinged hair present on tibiae I and II. Male palp: tibia with lateral apophysis; cymbium with numerous spines; strongly swollen bulbus showing subtegulum; embolus short, relatively broad; tegular apophysis small, inconspicuous, partly membranous. Female palp not swollen, tarsus short, not flattened but tapering towards tip, bearing claw with few teeth, surrounded by numerous spines. Abdomen oval, densely coated with hairs. Four muscle points dorsally. Six spinnerets: anterior ones longer, larger than third and smallest second pair. Epigyne with central concavity, in front with overhanging lip. Spermathecae situated near posterior margin of epigyne, touching; broad copulatory ducts starting near anterior margin. Epiandrum present.

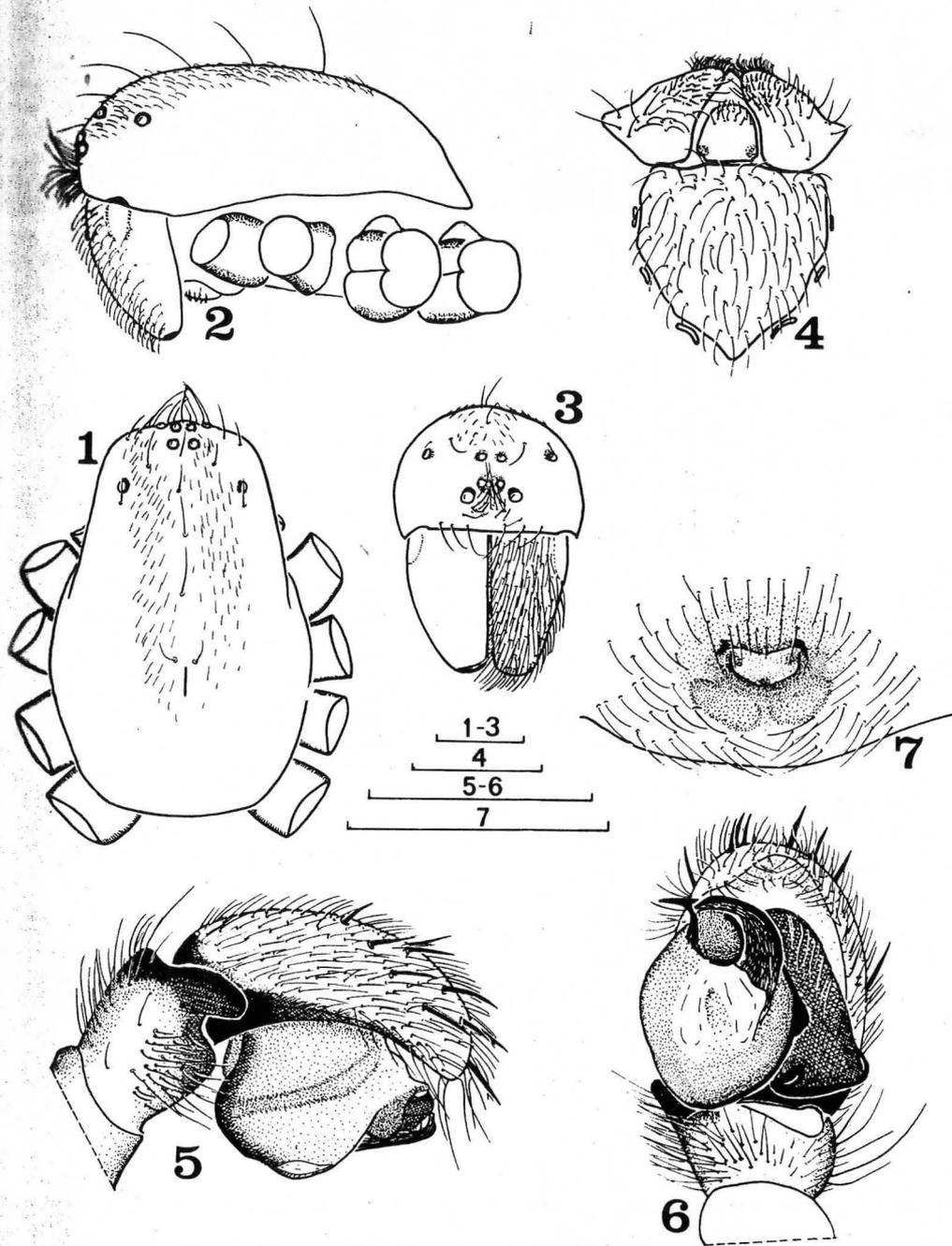
DISTRIBUTION: South Africa, Namibia, Mozambique.

Caesetius murinus Simon
(Figs 1–7)

Caesetius murinus Simon 1893b: 316 (descr. ♀); Simon 1893a: 417 (fig. 385, 386); Simon 1910: 182 (descr. ♀).

Type material: holotype female: South Africa, Cape (MNHN 15233) (examined).

DIAGNOSIS: Females of *C. murinus* can be recognized by the relatively short and broad



Figures 1-7. *Caesetius murinus* 1. carapace, dorsal view; 2. ibid., lateral view; 3. ibid., frontal view, hairs omitted on right chelicera; 4. sternum, endites and labium; 5. male palp, lateral view; 6. ibid., lateral view; 7. epigyne, ventral aspect. (scale lines = 1.00 mm).

central concavity of the epigyne with procurved anterior and posterior margins. Males can be recognized by the short, rounded, dorsolateral tibial apophysis, the strongly curved embolus touching the tegular apophysis, and by the thick dorsolateral apophysis situated in the middle of the anterior, lateral margin.

DESCRIPTION

Female: total length 9.25, carapace 4.00 long, 2.67 wide.

Colour: carapace medium brown, slightly paler in cephalic area, with numerous fine

Legs: Spination

	F	P	T	Mt	t
I	d4*pl1	-	v1	-	-
II	d4*pl1	pl1	pl3*v1-2-2	v2-2-2	-
III	d4*df5rl1	pl5d3rl2	20 disp	24 disp	-
IV	d4*df5rl1	pl4d3rl2	20 disp	24 disp	-

Measurements

	F	P	T	Mt	t	Tot
I	2.04	0.83	1.42	1.46	1.04	6.80
II	1.75	0.83	1.13	1.29	0.87	5.88
III	1.83	0.91	1.21	1.67	0.96	6.59
IV	2.58	1.33	1.75	2.62	1.12	9.42

Epigyne (Fig. 7): central concavity rather short with procurved posterior and anterior margin; spermathecae shining through behind posterior margin of central hole.

Male: Total length 8.71; carapace 3.92 long, 2.71 wide.

Colour: carapace uniform reddish brown sparsely beset with fine recumbent silvery hairs and some stronger erect dark hairs in the middle and dense cluster on clypeus. Chelicerae and legs medium brown, sternum pale brown. Abdomen densely covered with short

Legs: Spination

	F	P	T	Mt
I	d4*pl1rl1	-	v2-2-2pl2*	v2-2-2pl2*
II	d3*pl1rl1	-	v2-2-2pl2*	v2-2-2pl3*
III	d2*rl1df5	17 disp	21 disp	22 disp
IV	d5*rl1df5	17 disp	22 disp	25 disp

silvery hairs and a few stronger and darker hairs between fovea and eyes. Clypeus with dense cluster of hairs. Chelicerae and legs medium to dark brown. Sternum pale brown. Abdomen mottled with grey and white, with pale marks on dorsum. Eyes: AME (0.095 diameter) slightly less than their diameter apart, at same distance from ALE, 1.7 times as large. PME (0.11 diameter) slightly less than their diameter apart, about five times that distance from PLE, 1.2 times as large. MOQ: AW = 0.84 PW; AW = 0.6 PW.

Clypeus 0.32 high, about twice the diameter of ALE, with dense cluster of hairs.

recumbent silvery hairs hiding the faint pattern of black and white mottlings.

Eyes: AME (0.10) slightly more than their diameter apart, at 0.6 times that distance from ALE which are 1.2 times as large. PME slightly less than their diameter apart, at three times their diameter from PLE which are 1.1 times as large. MOQ: AW = 0.9 PW; AW = 0.1.3 L. Clypeus 0.45 high or 3.5 times the diameter of ALE; with dense cluster of hairs.

Sternum: 1.29 wide; 1.5 long.

Measurements

I
II
III
IV

Palp (Figs 8-10) apophysis towards, to physis.

Remark: *C. murina* alone and known or belong to spines are fans of sp

OTHER South Africa Malkin (C

DISTRIBUTION sula and C

Caesetius (Figs 8-1

Caesetius fl.

Type material Little N Schultze

Legs: Spi

I
II
III
IV

Measurements

I
II
III
IV

Measurements

	F	P	T	Mt	t	Tot
I	2.12	0.92	1.38	1.42	1.08	6.92
II	1.92	0.92	1.13	1.38	1.04	6.38
III	2.13	1.04	1.29	1.96	1.13	7.55
IV	2.63	1.21	1.79	2.79	1.29	9.72

Palp (Figs 5–6): tibia with broad dorsolateral apophysis; embolus very strongly curved outwards, touching the hook-shaped tegular apophysis.

Remark: The attribution of this male to *C. murinus* is speculative since it was taken alone and because some other species are known only from the female sex. It could well belong to *C. schultzei* but in that species the spines are much shorter and there are no distal fans of spines on femora III and IV.

OTHER MATERIAL EXAMINED: 1 ♂: South Africa, Clanwilliam, 11.IX. 1949, B. Malkin (CAS).

DISTRIBUTION: South Africa: Cape peninsula and Clanwilliam.

Caesetius flavoplagiatus Simon (Figs 8–12)

Caesetius flavoplagiatus Simon 1910: 182 (descr. ♀).

Type material: female holotype: South Africa, Little Namaqualand, Steinkopf, VII.1904, Schultze (ZMB 29238) (examined).

Legs: Spination

	F	P	T	Mt
I	d2*pl1	–	pl1v1–2	–
II	d3*pl1	–	pl3*v1–2	v2–2–2rl1pl1
III	d4*dr4	pl4*d1–2rl2*	20 disp	25 disp
IV	d4*dr5	pl4*d1–2rl2*	21 disp	25 disp

Measurements

	F	P	T	Mt	t	Tot
I	1.62	0.75	1.25	1.25	0.88	5.75
II	1.45	0.88	0.67	1.04	0.71	4.75
III	1.50	0.83	0.92	1.29	0.79	5.33
IV	2.04	0.96	1.42	2.17	0.88	7.46

DIAGNOSIS: Females of this species are recognized by the elongate central concavity of the epigyne with a short, rather pointed anterior lip, males by the presence of precoxal sclerites on leg II, the elongate sternum (L/W = 1.4), and the far dorsal tibial apophysis with a mesally indented tip.

DESCRIPTION

Female (values for the female from MNHN in brackets): total length 6.73 (8.08); carapace 3.21 (3.42) long, 2.04 (2.13) wide.

Colour: carapace medium brown, sparsely covered with fine silvery hairs, few dark hairs between fovea and eyes; cluster of hairs on clypeus poorly developed. Chelicerae medium brown; sternum and legs pale brown; abdomen with black and white pattern on dorsum (Fig. 8), pale spot in front followed by narrower line behind it and patch in front of spinnerets; sides dark grey with large pale spot in middle; venter pale with few small darker spots. Eyes: AME (0.09) 2/3 their diameter apart and at slightly further from ALE, 1.2 times as large; PME 0.7 times their diameter apart and very slightly larger than PME; at 4.5 times their diameter from PLE, which are 1.3 times as big. Clypeus 0.15 high or 1.5 times the diameter of an ALE. Cluster of hairs rather small.

Epigyne (Fig. 12): central concavity rather broad, widened in back; anterior margin with short triangular lip ending in sharp tip.

Male: Total length: 6.41; carapace 3.08 long, 1.92 wide, narrowed in front to 0.60 times maximum width.

Colour: carapace orange brown, sparsely covered with fine black hairs, some silvery hairs around fovea. Chelicerae and legs medium brown, sternum pale brown. Abdomen with pale pattern on dark background, pale patches beset with broadened white hairs: large pale patch in front, followed by two faint pale

broad chevrons, again followed by row of four white patches in front of spinnerets; sides dark with large pale patch in middle; venter dark with two longitudinal pale stripes.

Carapace roughened. Eyes: AME (0.075) slightly less than their diameter apart, only half as far from ALE, 1.3 times as large; PME exactly as large as AME and as far apart; separated from PLE by slightly less than five times their diameter; PLE as large as ALE. MOQ :AW = PW; AW = 0.70 L.

Sternum 1.41 long, 1.03 wide. Crescent-shaped precoxal sclerites only in front of coxae II.

Legs: Spination

	F	P	T	Mt
I	d3*pl1	—	v1-2pl1	v2-2-2-2-2
II	d3*pl1	—	v1-1-2pl1-1	v2-1-2-2pl1
III	d4*dr4	pl3*d1-2rl2*	17disp	18 disp
IV	d4*dr5	pl3*d1-2rl2*	20disp	23 disp

Measurements

	F	P	T	Mt	t	Tot
I	1.83	0.75	1.50	1.54	1.12	6.75
II	1.46	0.67	1.08	1.25	0.88	5.34
III	1.63	0.83	1.04	1.67	0.92	6.09
IV	2.17	0.92	1.67	2.41	1.13	8.30

Male palp (Figs 9–11): tibia with broad dorso-lateral apophysis with broadly rounded tip. Embolus broad and short, curved outward. Tegular apophysis small, semi-membranous.

REMARK: There is some doubt to the identity of this male which was not taken together with females of the species. The elongate sternum and the hair cover of carapace and abdomen are quite different from the female although these may all be sexual dimorphisms.

OTHER MATERIAL EXAMINED: 1 ♀: South West Africa, Schultze (MNH 17347); 1 ♂: Namibia, Lüderitz, Namuskluft 88, 11–15.IX. 1973 (SMWN 35807).

DISTRIBUTION: Little Namaqualand in South Africa and southern part of Namibian coast.

Caesetius spenceri (Pocock) **comb. nov.**
(Figs 13–14)

Cydrellichus spenceri Pocock 1900: 325 (descr. subadult ♀).

Type material: subadult female (pinned in alcohol): South Africa, Port Elizabeth, H.A. Spencer (BMNH 01.2.25; under *Cydrellichus algoensis* *nom. nud.*) (examined)

DIAGNOSIS: in the present state of our knowledge it is impossible to diagnose a subadult female on the specific level.

DESCRIPTION

Subadult female: total length 11.9; carapace 5.03 long, 3.28 wide.

Colour: carapace and chelicerae dark brown; sternum orange brown; legs and palps medium brown, darkened towards extremity.

Abdomen grey with four darker muscle points, dense cover of dark brown hairs; venter with four longitudinal paler lines.

Carapace slightly rugose.

Eyes: AME (0.09) two thirds their diameter apart, similar distance from ALE, 1.7 times as large. PME (0.13) 0.7 times their diameter apart, twice their distance from slightly smaller PLE.

Legs: spination typical for the genus with few spines on leg I and II, numerous short spines on legs III and IV.

Legs: Measurements

	F	P	T	Mt	t	Tot
I	2.70	1.11	2.07	1.69	1.27	8.85
II	2.28	1.06	1.59	1.59	1.27	7.79
III	2.12	1.16	1.32	1.69	1.16	7.47
IV	2.91	1.54	2.12	2.91	1.17	10.69

Male and female unknown.

OTHER MATERIAL EXAMINED: none.

DISTRIBUTION: only known from type locality

Caesetius politus Simon

Caesetius politus Simon 1893b: 316 (descr. juv.)

TRYSSOCLITUS POLITUS, Simon 1910: 185 (type of new genus)

Type Material: South Africa, Transvaal, Makapan (MNHN 15313) (examined).

DESCRIPTION

Juvenile: Total length 4.17; carapace 1.71 long, 1.13 wide.

Colour: Carapace and chelicerae pale brown, sternum and legs yellow; abdomen: dorsum grey with series of seven chevrons in front of spinnerets; sides mottled; venter pale with two longitudinal dark stripes.

The specimen is a small juvenile of which it is impossible to determine the sex. It has the diagnostic features of the genus but it is considered superfluous to give a detailed description of it.

Caesetius schultzei Simon (Figs 15—17, 31)

Caesetius schultzei Simon 1910:183 (descr. ♀).
Caesetius murinus Benoit 1974: 436 (misidentification).

Type material: holotype female: South Africa, Little Namaqualand, Kamaggas, VII.1904, Schultze (ZMB 29 581) (examined).

DIAGNOSIS: Females of this species are recognized by the pear-shaped central concavity in the epigyne, the male by the relatively long, rather sharp, lateral tibial apophysis.

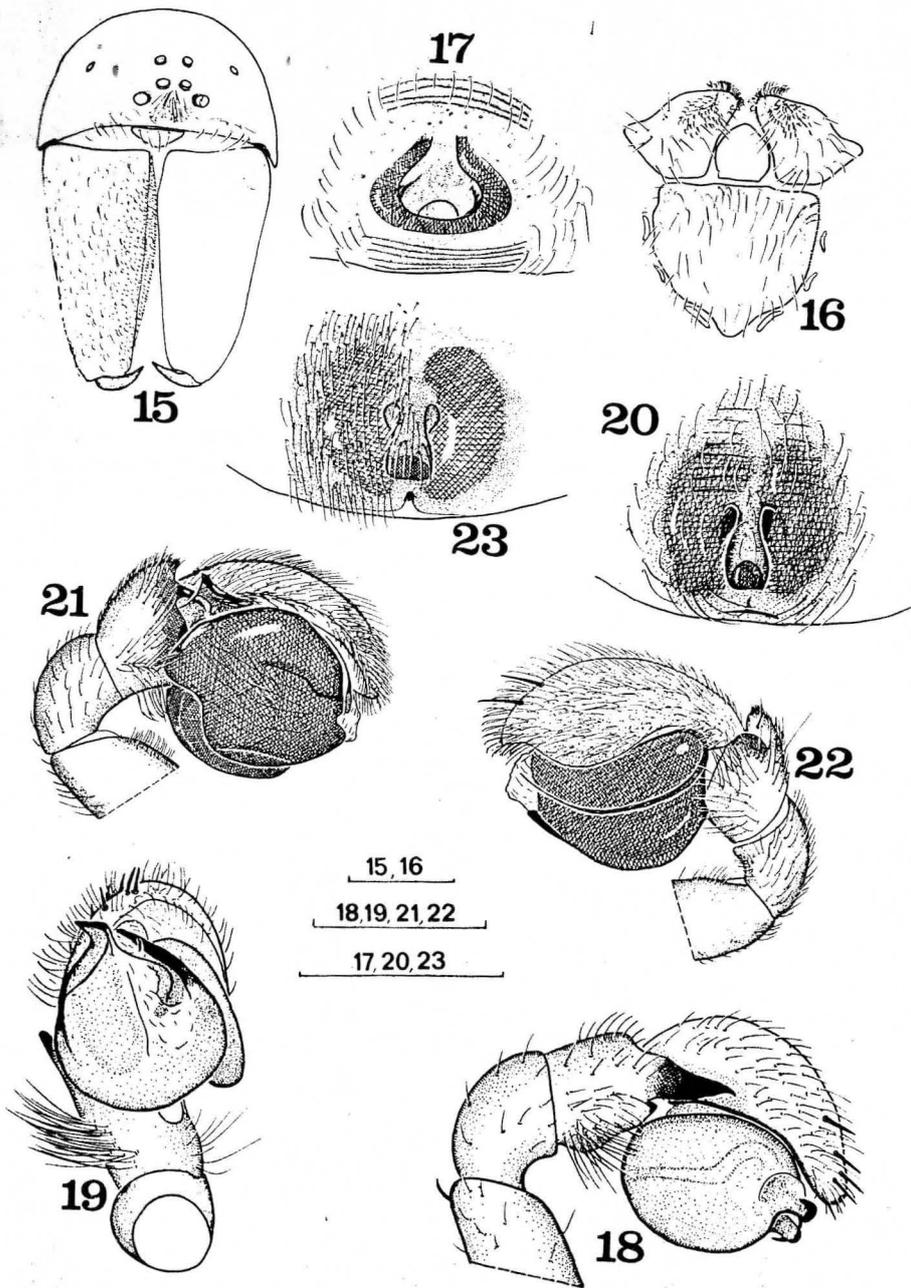
DESCRIPTION

Female (values for the female from Cape Town in brackets): total length 9.41 (9.24); carapace 4.17 (3.96) long, 2.92 (2.71) wide.

Colour: Carapace medium brown, cephalic part paler, sparsely covered with pale silvery hairs; cluster of darker, stronger hairs on clypeus. Chelicerae medium brown. Sternum and legs pale brown, femora slightly darker. Abdomen mottled with grey and white, on dorsum with pale median stripe, on venter with four longitudinal dark lines, dorsally with numerous reddish hairs.

Eyes: AME (0.09) slightly more than their diameter apart, at 1.3 times that distance from ALE which are 1.4 times as large. PME (0.10)

Figures 15
sternum,
ventral view
Plate 21.



Figures 15–19. *Caesetius schultzei* 15. carapace, frontal view, hairs omitted on left chelicera; 16. sternum, endites and labium; 17. epigyne, ventral aspect. 18. male palp, lateral view; 19. *ibid.*, ventral view. Figure 20. *Caesetius bevisi* 20. epigyne, ventral aspect. Figure 21–23. *Caesetius inflatus* 21. male palp, lateral view; 22. *ibid.*, ventral view; 23. epigyne, ventral aspect, hairs omitted on left side. (scale lines = 1.00 mm).

slightly more than their diameter apart and at 6 times that distance from PLE which are 1.3 times as large. MOQ: AW = 0.87 PW; AW =

0.67 PW. Clypeus 0.33 high or 2.5 times the diameter of ALE; with cluster of hairs. Sternum slightly wider (1.50) than long (1.46).

Legs: Spination

	F	P	T	Mt
I	d4*pl1	-	pl1v1	-
II	d4*pl1	-	pl3*v2-2-2	v2-2-2
III	d2*rl1df4	pl1-3-1d1-2rl2	17 disp	19 disp
IV	d4*rl1df5	pl1-3-1d1-2rl2	24 disp	24 disp

Measurements

	F	P	T	Mt	t	Tot
I	1.92	0.92	1.33	1.25	0.96	6.38
II	1.79	0.96	1.08	1.25	0.87	5.96
III	1.96	1.00	1.21	1.75	0.92	6.83
IV	2.50	1.25	1.79	2.54	1.12	9.21

Epigyne (Fig. 17): with pear-shaped central concavity with broad, sclerotized lateral rim.

Abdomen broadly rounded.

Male: Total length 7.51; carapace 3.75 long, 2.75 long.

Colour: Carapace brownish orange, slightly paler in middle. Legs yellowish brown, tibiae, metatarsi and tarsi of anterior pairs paler.

Abdomen pale grey with faint pattern of short brownish hairs. Eyes: AME (0.11) slightly less than their diameter, at only 0.35 times that distance from ALE which are 1.1 times as large. PME (0.10) slightly less than their diameter apart, at 5 times that distance from PLE which are 1.05 times as large. MOQ: AW = 1.03 PW; AW = 0.81 PW. Clypeus 0.27 high or 2.1 times the diameter of an ALE; with cluster of hairs. Sternum slightly longer (1.41) than wide (1.35).

Legs: Spination

	F	P	T	Mt
I	d4*pl1	-	v2-1-1-1-2	v2-2-2
II	d4*pl1	-	v2-1-1-1-2	v2-2-2
III	d4*df4rl1	pl1-3d1-2rl2	pl3d6**rl3v2-2-2	16disp
IV	d4*df5rl1	pl1-3d1-1-2rl2	pl5**d6**rl3v2-2-2	18disp

Measurements

	F	P	T	Mt	t	Tot
I	2.08	0.96	1.50	1.54	1.13	7.21
II	1.83	0.83	1.25	1.42	1.04	6.38
III	1.46	1.00	1.29	1.79	0.96	7.00
IV	2.33	1.21	1.67	2.46	1.08	8.76

Palp (I tapering point; ing to iv. To with r

Remar this m eve siz ent fro mens appear that th ence is when the ey

OTHI-
I ?:
Benoit
Cape
Upper
1901,
Cape

DIST

Caese:
Fig.

Tysoo

Type
wala
(red)

Spina:

I

II

III

IV

Meas

I

II

III

IV

mes the
rs. Ster-
.46).

Palp (Figs 18—19): Tibia with relatively long, tapering, dorsolateral apophysis with sharp point; embolus almost straight slightly tapering toward apex, tiny hook in front of extremity. Tegular apophysis strongly curved, short, with rounded apex.

Remark: As for *C. murinus*, the attribution of this male to *C. schultzei* is only tentative. The eye sizes and position appear to be very different from the figures; however, when the specimens are examined together, the differences appear less spectacular. This is due to the fact that the eyes are small and the slightest difference in distance is translated into a high factor, when distances are expressed as functions of the eye size.

OTHER MATERIAL EXAMINED:

1 ♀: South Africa, Cape Town, 1966, P. Benoit (MRAC 133 713); 1 ♀: South Africa, Cape Peninsula, foot of Devil's Peak, above Upper Mill stream, under stone on slope, VIII. 1901, W. Purcell (SAM); 1 ♂: South Africa: Cape Point, 1903, Hermann (SAM).

DISTRIBUTION: West coast of South Africa.

Caesetius bevisi (Hewitt) **comb. nov.**
(Fig. 20)

Trysocolitus bevisi Hewitt 1916: 219, fig. 14 (descr. ♀).

Type material: South Africa, Zululand, Ngxwala Hills, VI.1915, L. Bevis (NMSA) (examined).

DIAGNOSIS: The species is easily recognized by the strongly developed scopula on metatarsi and tarsi, and by the epigyne with long lip reaching the posterior border of the central concavity, a character shared with *C. inflatus*; it differs from that species by the much lower number of spines on the posterior legs and the longer sternum.

DESCRIPTION

Female: Total length 11.32, carapace 5.08 long, 3.41 wide.

Colour: Carapace dark chestnut brown, sparsely covered with fine silvery hairs; dense cluster of fine hairs on clypeus. Chelicerae and femora of legs dark brown; remainder of legs and sternum medium brown. Abdomen mottled with white and grey on dorsum and sides; venter pale with three longitudinal black lines.

Eyes: AME (0.15) their radius apart, 1.2 times their diameter from ALE which are 1.3 times as large. PME (0.13) slightly more than their diameter apart, 4.5 times their diameter from PLE which are 1.3 times as large. MOQ: AW = 0.95 PW; AW = 0.76 L. Clypeus 0.43 high, about three times the diameter of an ALE. Sternum longer (1.96) than wide (1.63), only one pair of precoxal sclerites, in front of coxae III.

Legs: Tarsi and metatarsi with dense scopula, dense cover of hairs extending on entire tibia I, including dorsal and lateral sides, and on entire metatarsus and tarsus II. Ventral spines on tibiae longer than diameter of segment.

Spination

	F	P	T	Mt
I	—	—	—	—
II	—	—	v2-1-1	v1-1-2
III	d1-1-2	pl4*d3*r1	15 disp	12 disp
IV	d1-1-2	pl4*d3*r1	15 disp	12 disp

Measurements

	F	P	T	Mt	t	Tot
I	2.96	1.41	2.21	lost	lost	
II	2.50	1.29	1.67	1.67	1.13	8.25
III	2.50	1.42	1.54	1.88	0.88	8.21
IV	3.08	1.67	2.17	2.83	1.42	11.18

of short
atly less
nes that
imes as
ir diam-
m PLE
AW =
27 high
E; with
r (1.41)

Epigyne (Fig. 20): central concavity shallow; anterior lip very long, reaching posterior rim of concavity, provided with some long hairs.

Male unknown.

OTHER MATERIAL EXAMINED: none.

DISTRIBUTION: only known from type locality.

Caesetius inflatus sp.nov.
(Figs 21-23)

Caesetius bevisi, Lessert 1936: 232 (descr. ♀) (misidentification).

Type Material: Holotype male: South Africa, Transvaal 35 mi. S. of Louis Trichardt, 1000 m, 26.III.1958, E. Ross & R. Leech (CAS)

Paratype female: together with Ht

DIAGNOSIS: The male of this species is easily recognized by the strongly swollen tegulum, the very narrow and slender tegular apophysis and the narrow and slender embolus. The epigyne has a frontal lip which reaches the posterior rim of the central concavity, a character shared with *C. bevisi*. It differs with that species by the much greater number of spines

Spination:

	F	P	T	Mt
I	d3*	-	v2-2-2	v1-1
II	d3*	-	v1-1-2-2	v2-1-1-2
III	d3*-2	pl5d4rl1	d5pl5v2-2-2rl3*	16 disp
IV	d3*-2rl1	pl7d4rl2	d6pl6v2-2-2rl4	22disp

Measurements

	F	P	T	Mt	t	Tot
I	2.13	0.88	1.62	broken	lost	
II	1.67	0.83	1.25	1.21	0.83	5.79
III	1.67	0.91	1.08	1.33	0.83	5.84
IV	2.08	1.00	1.50	1.92	1.04	7.54

Palp (Figs 21-22): Tibia with short dorsolateral apophysis, truncated tip. Cymbium with basolateral excrescence. Tegulum strongly swollen occupying entire lateral aspect of bulb; distal end with very thin apophysis; embolus long and slender, originating on proximal dorsomesal side of tegulum.

on the posterior legs and the broader sternum (L/W = 1.06 against 1.20 in *C. bevisi*).

ETYMOLOGY: *inflatus* (Latin: swollen) refers to the tegular swelling of the male palp.

DESCRIPTION

Male: Total length 6.91; carapace 3.58 long, 2.48 wide.

Colour: Carapace and chelicerae dark chestnut brown with sparse recumbent silvery hairs, sternum and legs reddish brown; abdomen dark grey, mottled with white; with thin pale longitudinal median line and 5 thin chevrons in front of spinnerets. Muscle points reddish. Venter pale with three ill-defined longitudinal dark blotches.

Eyes: AME (0.13) 0.4 times their diameter apart, 0.5 times that distance from ALE which are 0.9 times as large. PME (0.09) 1.3 times their diameter apart, 4 times their diameter from PLE which are 1.3 times as large. MOQ: AW = PW; AW = 0.84 L. Clypeus 0.32 high, 2.7 times diameter of ALE. Cluster of hairs restricted to interocular space. Sternum with only one precoxal sclerite in front of coxae III.

Legs: Tarsi and metatarsi with scopula. Ventral spines on tibiae longer than the diameter of the segment.

Female: total length 9.16; carapace 3.58 long, 2.48 wide.

Colour: Carapace dark brown; abdomen dark brown; legs reddish brown.

Legs: Spination

I	
II	
III	
IV	

Measurements

I	2
II	1
III	1
IV	2

Epigyne (Fig. 20): anterior lip divided with densely covered with hairs.

OTHER MATERIAL EXAMINED: Mozambique VI.1927, 1 female; Mozambique, Ponta da Ilha, post of Coimbatore Younga (T)

DISTRIBUTION: southern to southern South Africa

Remark: The female of *C. inflatus* described in this paper is a new material is

PSAMMO

Caesetius (see *Psammodyon*)

DIAGNOSIS: Represented by the following characters: chelicerae with two tarsal

der sternum
visi).

swollen) re-
male palp.

e 3.58 long,

dark chestnut
silvery hairs,
n; abdomen
with thin pale
n chevrons in
ints reddish.
longitudinal

their diameter
n ALE which
09) 1.3 times
their diameter
large. MOQ:
eus 0.32 high,
aster of hairs
Sternum with
t of coxae III.

opula. Ventral
diameter of the

1-2

P

o

Tot

5.79

5.84

7.54

ating on proxi-
n.

pace 3.58 long,

Colour: Carapace medium brown, with sparse dark hairs. Chelicerae, sternum and legs reddish brown; abdomen as in the male.

Eyes: Relative size and position as in male.

Sternum 1.33 mm wide, 1.42 mm long.

Legs: Spination

	F	P	T	Mt
I	d3*	-	-	-
II	d3*	-	-	v1-1-3
III	d2*-2rl1	pl7d4rl2	d6pl5v2-2-2rl3*	14 disp
IV	d3*-2rl1	pl7d4rl2	d6pl8v2-2-2rl4	16 disp

Measurements

	F	P	T	Mt	t	Tot
I	2.21	1.12	1.54	1.25	0.92	7.04
II	1.88	0.92	1.21	1.21	0.88	6.09
III	1.88	1.04	1.17	1.50	0.92	6.51
IV	2.42	1.17	1.71	2.38	1.17	8.84

Epigyne (Fig. 23): Central concavity shallow; anterior lip long, reaching posterior rim, provided with some long hairs; entire epigyne densely covered with hairs.

OTHER MATERIAL EXAMINED: 1 ♀: Mozambique, Inhacoro, 16°44'S 34°15'E, VI.1927, P.Lesne (MHNG); 1 ♀: Mozambique, Pomene 22°59'S, 35°35'E, sifted compost of coastal bush, 1.V.1974, Endrödy-Younga (TM 15304).

DISTRIBUTION: Mozambique, west of southern tip of Malawi and southern coast; South Africa, vicinity of Louis Trichardt.

Remark: The SMWN (38973) has an isolated female of an undescribed species of this genus; its description will be postponed until more material is available.

PSAMMODUON Jocqué

Caesetius (sectio 2) Simon 1910: 182.
Psammoduon Jocqué, 199x: xx.

DIAGNOSIS

Representatives of this genus can be recognized by the following combination of characters: chelicerae with median field of spinules, carapace with dip in dorsal profile; leg I and II with two tarsal claws and an extra pair of digging

claws; posterior legs with fans of long, supple hairs.

ETYMOLOGY: The combination of *Psammon* (Greek: sand) and *duon* (Gr.: to dive), *Psammoduon*, refers to the habit of these spiders to dig into the sand. The gender is neuter. Because of their strange habit of flipping over to their back when burrowing they have been called back-flip spiders (E.Griffin, pers. comm.).

DESCRIPTION

Medium-sized (5.0-13.0), densely haired spiders. Carapace (Fig. 32) widest between coxae III and IV, strongly narrowed in front to half its maximum width in males, to 0.55 times maximum width in females. Profile (Fig. 33) with marked dip between high cephalic part and lower thoracic part; fovea well marked. Colour quite variable: carapace and chelicerae pale yellow to medium brown; sternum yellow to orange; legs pale yellow to dark brown; abdominal pattern composed of tegument colours and hair colours, simple (*P. deserticola*) or complex (*P. arenicola*).

Eyes small, in two rows: anterior row pro-curved, posterior row strongly recurved and much broader than anterior; all eyes circular; AME dark, remainder pale; AME their diameter apart and as far from ALE which are of the

same size; PME about their diameter apart and at about 5 times that distance from PLE which are slightly larger. MOQ: AW about equal to PW but length approximately 1.3 times anterior width. Clypeus high, 3 to 6 times diameter of ALE in some species with dense cluster of hairs, usually denser in females. Chilum single, variable in shape, densely haired. Chelicerae (Figs 24–25, 33–34) rather long; densely haired in front, with median field of dense spinules; no teeth; fangs almost as long as thick at base. Endites (Fig. 35) triangular, strongly tapering, with narrow anteromesal scopula. Labium triangular; sternum longer than wide, slightly narrowed in front; without additional sclerites between it and coxae.

Legs: formula 4321; anterior pairs short and thick, strongly tapering; few ventral spines on tibiae and metatarsi but tarsi, metatarsi, tibiae and patellae, densely covered with short, sometimes club-shaped hairs. Femora sometimes with a fine dorsal spine but always with long fine hairs; posterior pairs with numerous long flattened hairs arranged in fans, on femora, patellae and tibiae. Hinged hairs sometimes present. Two claws; third claw lost but replaced by two thick upturned spines (Figs 26–27) which can be considered accessory digging claws. Vestige of the third claw present in *P. arenicola*. No claw tufts. Scopula only in male of *P. arenicola*. No trichobothria on tibiae and metatarsi, but few short plumiform ones on t (Figs 29–30).

Abdomen globular or oval. Spinnerets as usual in Zodariidae but apparently retractable. Colulus represented by group of hairs. Tracheal spiracle narrow. Tracheal system reduced to two short stems not reaching further than half the length of the abdomen. Booklungs strongly developed, filling base of anterior half of abdomen.

Male palpus: Tibia with lateral apophysis. Cymbium with numerous small spines; bulbus strongly bulging; embolus short, originating on mesal side of tegulum, broad and truncated at tip; tegular apophysis broad, situated at terminal end of tegulum; subtegulum strongly swollen. Female palp with conical, densely spined short tarsus and mesally spined metatarsus. Claw finely dentate. Epigynum rather flat with central concavity. Spermathecae near posterior margin, touching; entrance ducts broad, starting in front.

TYPE SPECIES: *Caesetius deserticola* Simon 1910

DISTRIBUTION: dunes and sandy areas in southwestern Africa.

NATURAL HISTORY

The habit of flipping over when burrowing was mentioned first by Newlands & De Meillon (1986). I have observed the habit several times with spiders in captivity. In contrast to most other Zodariidae, these spiders do not usually construct silken retreats when hiding in the sand. However, they do to moult and silken retreats with the cast off skin can be found in the sand. The spiders are rarely seen on the surface and three juveniles of *P. deserticola* that were kept in captivity for six months never came to the surface voluntarily. Of about ten specimens of *P. canosum*, also kept in the laboratory, some males came to the surface at rare occasions.

Newlands & De Meillon (1986) suggested that they would rest upside down just under the surface, stalking passing animals. This was corroborated by my observations on captive *P. canosum*. It is not known what they prey on, although it has been suggested that they would eat Thysanura, which are common in the dunes. In captivity, *P. deserticola* did not eat a single item, although a large array of possible prey were offered. According to E. Holm (pers. comm.) these spiders only come out during windy spells and then run on the slipface just a few centimeters under the lee of the dunes' crest. Likely prey would be beetles of the genus *Vernayella* (Tenebrionidae) which are only a few mm large and abound on the surface during windy periods. J. Henschel (in litt.) mentions that *P. canosum* in captivity will eat mealworms and also come to the surface to drink from moist cotton wool. This is supported by own observations. *P. canosum* appears to be much less fastidious in its choice of prey than the other species.

Psammoduon deserticola (Simon) (Figs 24–30, 32–40)

Caesetius deserticola Simon 1910: 183 (descr. ♀)
Caesetius deserticola lüderitzi Simon 1910: 184 (descr. ♀)
syn. nov.
Caesetius masculinus Lawrence 1938: 10 (fig. 4) (descr. ♂)
syn. nov.
Caesetius deserticola, Lawrence 1965: 10 (fig. 4 c, d) (descr. ♂); Benoit 1974: 88; Newlands & De Meillon, 1986: 44.
† *Psammoduon deserticola*, Jocqué 199x: xx. (descr. ♂ ♀).

The subspecies *C. d. lüderitzi* (which should have been written *C. d. luederitzi*), is synony-

la Sittus

ARCAS

wing was
Meillon
ral times
to most
usually
g in the
d silken
ound in
on the
cola that
is never
out ten
in the
urface at

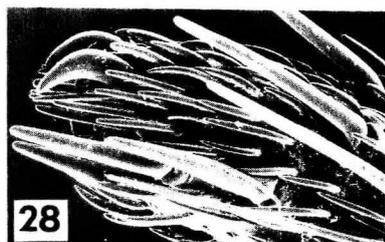
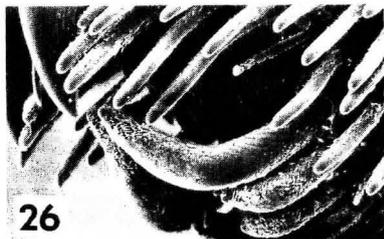
ted that
der the
his was
captive
ey prey
at they
mon in
did not
rray of
ling to
s only
run on
the lee
uld be
brion-
ge and
eriods.
nosum
o come
cotton
ations.
idious
ies.

scr. ♀)

eser. ♂)

(descr.
44.
♀).

would
ony-



Figures 24–31. *Psammoduon deserticola* 24. chelicerae, mesal view of spinule field; 25. *ibid.*, detail; 26. tip of P1, showing “digging claws”; 27. *ibid.*, detail; 28. tip of leg III;—29. Leg I, tarsal trichobothrium; 30. *ibid.*, bothrium; Figure 31. *Caesetius schultzei* 31. tip of leg I.

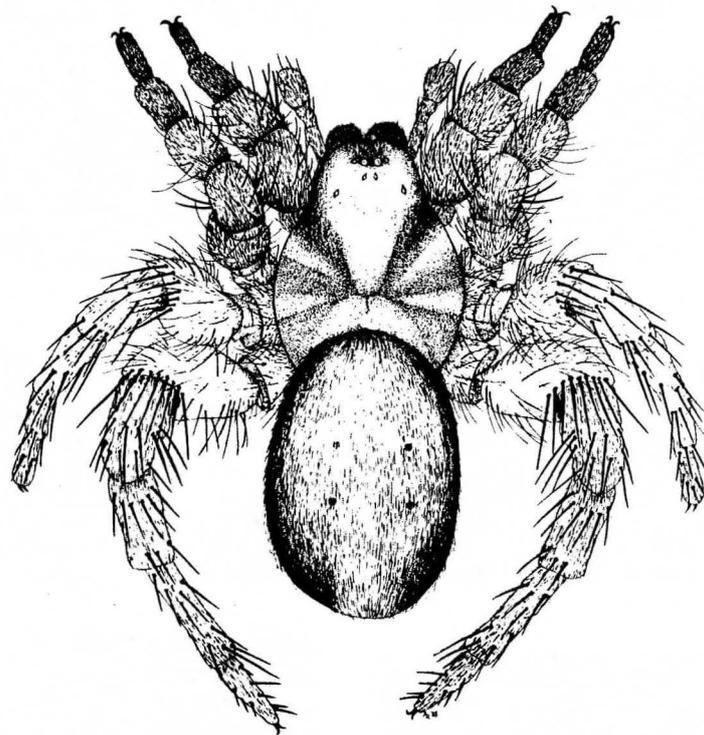


Figure 32. *Psammoduon deserticola*: subadult male, habitus (scale line = 1.00 mm).

mized with the nominal form. Two specimens from the same locality were identified by Simon as belonging to this subspecies. The holotype (ZMB) is indeed the smallest of all females of *P. deserticola* available but its epigyne is identical to that of the holotype of the nominal form. The other specimen (MNHN) falls entirely within the range of the examined specimens of the nominal form.

C. masculinus Lawrence is most likely a male of *P. deserticola* (Simon) although its type locality is the southernmost locality of the species and falls within the range of *P. canosum* (Simon). Lawrence (1938, 1965) indeed supposed that *C. masculinus* is the male of *P. canosum*. Although this is very unlikely to be the case, some doubt remains about the identity of the specimen, which was not examined by me. It is not in the TM where it is supposed to be deposited. Fig. 4 in Lawrence's (1938) description is said twice to be a mesal view which it is certainly not. This can be seen by comparing it to Figs 36, 37 and 38. Tibial apophyses are not visible from the inside and a large part of the subtegulum is only seen from

that point of view. The shape of the tibial apophyses is not entirely in accordance with that of *P. deserticola*, but this may be a question of orientation. At a certain angle the slightly bifid extremity of the lateral apophysis is difficult to see and appears short and truncated.

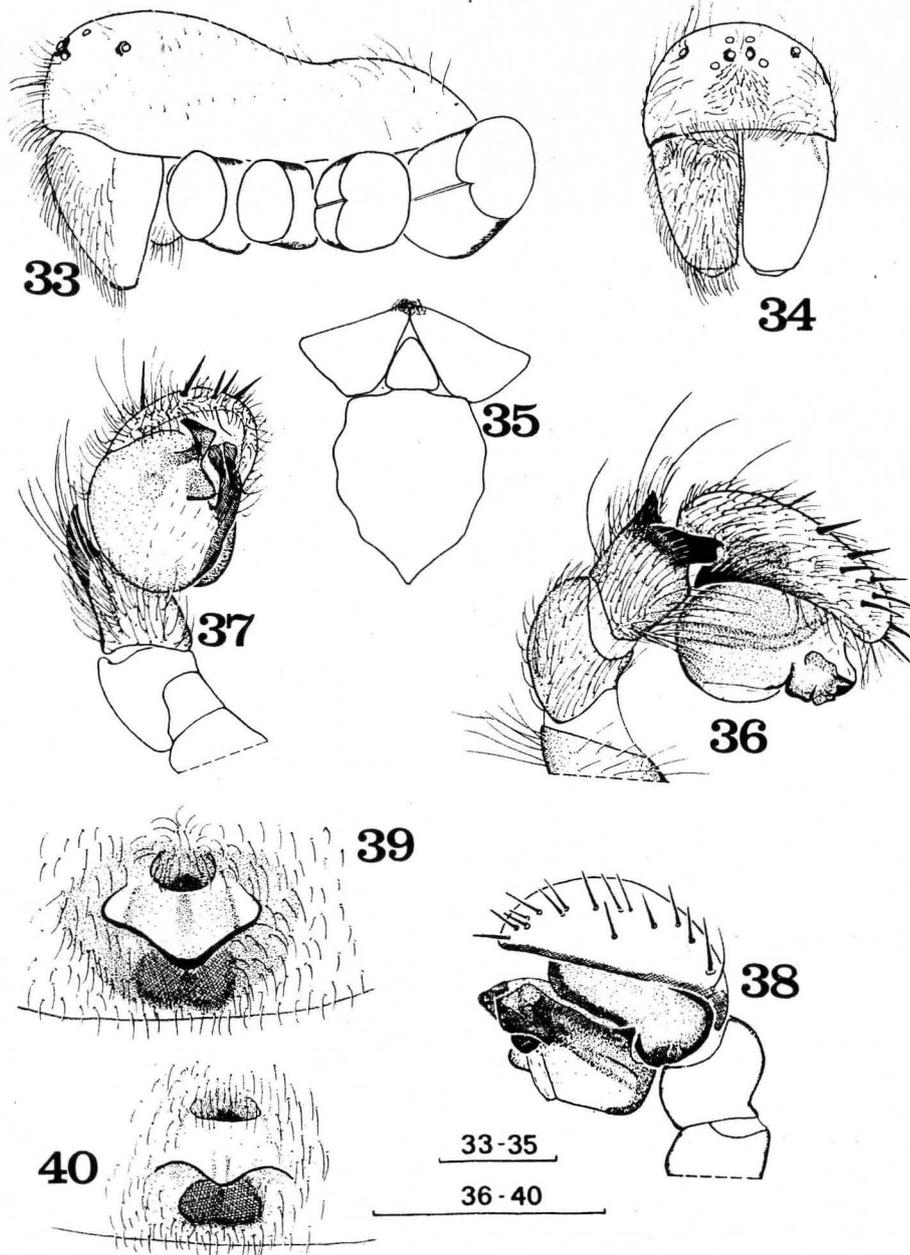
Type Material: Holotype female, Namibia, Walvisbaai, Rooibank, V. 1905, L. Schultze (MNHN 13465) (examined).

Paratype: 1 female: same data as holotype (ZMB 29585) (examined).

DIAGNOSIS: Representatives of this species can be recognized by the pale dorsum of the abdomen; the male has a slightly bifid tibial apophysis; the epigyne has a short overhanging lip in front and a sharply marked rim in the back of the central concavity.

DESCRIPTION

Male (range in brackets): Total length 5.84 (5.00–6.00); carapace 3.29 (2.58–3.58) long, 2.46 (2.08–3.00) wide.



Figures 33-40. *Psammoduon deserticola* 33. carapace, lateral aspect; 34. *ibid.*, frontal view, hairs omitted on left chelicera; 35. sternum, endites and labium, hairs omitted; 36. male palp, lateral view; 37. *ibid.*, ventral view; 38. *ibid.*, mesal view, hairs omitted; 39. epigyne, ventral aspect; 40. *ibid.*, specimen from Homeb dunes. (scale line = 1.00 mm).

mm).

of the tibial
ordance with
ay be a ques-
in angle the
ral apophysis
ort and trun-

le, Namibia,
L. Schultze

as holotype

of this species
lorsum of the
ly bifid tibial
t overhanging
ed rim in the

il length 5.84
(8-3.58) long,

Colour: Carapace yellowish orange, paler in cephalic area, with dark margin. Sternum yellow. Chelicerae, femora and sides of other leg segments orange; dorsal and ventral sides yellow. Abdomen white on dorsum, dark grey on sides; venter pale grey in middle, with large reniform patch on either side.

Carapace sparsely beset with long hairs.

Eyes: AME (0.06) 1.25 times their diameter apart and at 0.8 times their diameter from the ALE which are as large. PME (0.05) 2.5 times their diameter apart and at 5 times their diameter from the PLE which are slightly larger (0.06). MOQ: AW = 0.91 PW; AW = 0.77 I.

Chilum poorly delimited; broadly triangular with some hairs.

Legs: Spination

	F	P	T	Mt	t
I	-	-	v2*pl3*	v3*	-
II	-	-	v2-1-2	v1-1-4	-
III	df11	pf9mf3	pf7mf13df7	pf8mf9df6	12disp
IV	df11	pf8mf7	pf5mf9df5	pf8mf7df6	12disp

Measurements

	F	P	T	Mt	t	Tot
I	1.75	0.87	0.83	0.83	0.68	4.96
II	1.58	0.83	0.79	0.83	0.67	4.71
III	1.79	1.08	1.08	1.46	1.00	6.42
IV	2.29	0.88	1.29	1.75	0.96	7.17

Palp (Figs 36-38): lateral apophysis broad; tip slightly bifid, both prongs rounded; dorsal apophysis short, blunt at tip; embolus short, broad, slightly indented, grooved at tip; tegular apophysis broad, curved outward, sharp tip.

Female (range in brackets): Total length 7.49 (6.41-9.57); carapace 3.75 (3.16-4.08) long, 2.68 (2.16-3.00) wide

Colour as in male; dorsum sometimes with faint grey pattern of two short longitudinal stripes in middle followed by small transversal patch. Further as male.

Epigyne (Figs 39-40): with central concavity, in front a relatively narrow lip; posterior rim usually procurved but sometimes sinuous and rarely recurved.

VARIATION

There is much variation in colour; males are sometimes darker with pale hairs; the abdomen sometimes has a scutum-like area on the dorsum and dark sides with brownish hairs,

OTHER MATERIAL EXAMINED:
NAMIBIA: 1 ♂, 1 ♀: Khan, 1965, K.

Friedrichs (MRAC); 1 ♀ Lüderitz, Heioab, Diamond area, 25-26. X. 1977, S. Louw & M.-L. Penrith (SMWN); 1 ♀, 2 juv.: Lüderitz, Obib dunes, 21 km N Obib Mtn., 19. IX. 1973 (SMWN); 1 ♀, 1 juv. (no label) (TM); 2 juv. Gobabeb, 20. V. 1965, J. Potgieter (TM); 1 ♀, 3 juv.: Rooibank near Walvisbaai, 29. X. 1987, sifting dune sand near crest, E. Griffin & R. Jocqué (MRAC); 1 ♀ (holotype of *C.d.lüderitzi*) Prince of Wales Bay, 1903, Schultze, (ZMB 29239); 1 ♀ (paratype of *C.d.lüderitzi*): Prince of Wales Bay, Slutze (sic; probably lapsus for Schultze) (MNH 15226); 1 ♂, 1 ♀, 2 juv.: Kuiseb road near Gobabeb, 18. II-20. III. 1983 (NCP); 1 ♀: Homeb dunes, SE 2316 AC, in sand under grass, 3. X. 1984 (SMWN); 1 ♂: Swakopmund, Swakop River mouth, S. Bank, sand-diving on slip face of dune; 12. XII. 1981, J. Irish (SMWN); 1 ♀ Swakop River Mouth, dunes II. 1974, M. & B. Irwin (AMNH); 1 ♀, 7 juv.: Tsandebvlei, SE 2315CD, in sand under bushes, 26. X. 1985, E. Griffin (SMWN); 1 ♂: 2km W Grillenthal, Diamond area 1, 26°59'S, 15°20'E, in sand under hummock, 30. IX. 1982, J. Irish (SMWN); 1 ♀ Lüderitz, Rosh Pinah,

28°
Dia
15'
juv
195
DIS
and
to I

Pla
Fig
Car
Typ
des
lan
am

DI
miz
has
larg
tip
Leg

I
II
III
IV
Me
I
II
III
IV
Ho
Pal
cur
and
lat
th
var

diameter from the 2.5 times their diameter larger = 0.77 L.

triangular

28°02'S, 16°50'E, J. Tebje (SMWN); 1 ♂: Diamond area, Klinghardtts Mts. 27°24'S, 15°42'E, 2. X. 1982, J. Irish (SMWN); ♂, ♀, nov.: Gobabeb (NMSA); 1♀: Gobabeb, V. 1959, R. Paulian (NMZ A276).

DISTRIBUTION: West coast of South Africa and Namibia, from Swakopmund in the north to Port Nolloth in the south.

Psammoduon canosum Simon comb. nov. (Figs 41–45)

Caesetius canosus Simon 1910: 184 (descr. ♀).

Type material: Holotype female (by original designation): South Africa, Little Namaqualand, IV. 1905, L. Schultze (ZMB 29 560) (examined).

DIAGNOSIS: *P. canosum* males can be recognized by the shape of the palpal tibia, which has a single dorsolateral apophysis which is large, curved down and forward, not bifid at tip; females have an epigyne with an oval

central concavity with a sclerotized short straight anterior rim.

DESCRIPTION

Male (range in brackets): Total length: 8.47 (6.25–8.47); carapace 4.33 (3.58–4.33) long, 3.33 (2.41–3.33) wide.

Colour: Carapace medium brown, slightly paler in middle and in front of fovea; with faint radiating striae; with recumbent silvery hairs, denser in the middle, and few erect black hairs in cephalic area. Chelicerae medium brown, sternum medium brown slightly paler in middle, with many dark hairs and few silvery ones in middle; legs medium brown with darker femora. Abdomen: Dorsum pale cream with faint darker patches in middle, largest patches in between reddish muscle points; sides dark grey, mottled with white; venter pale with some dark patches.

Eyes: AME (0.10) 0.8 times their diameter apart, 0.7 times that distance from ALE, 1.3 times as large. PME (0.09) slightly more than their diameter apart, 4.5 times that distance from the PLE which are 1.4 times as large. MOQ: AW = PW; AW = 0.8 L. Clypeus 0.45 high or 3.5 times diameter of ALE.

Legs: Spination

	F	P	T	Mt	t
I	d2*	–	pl10	pl4v1	–
II	d2*	–	v2*pl13	v2–3–1–a3pl4	v2
III	df11	pf3mf10	pf7mf9df	35 disp	15 disp
IV	df10	pf9df7	pf6mf9df12	37 disp	17 disp

Measurements

	F	P	T	Mt	t	Tot
I	2.25	1.13	1.13	1.13	0.79	6.42
II	1.92	1.00	1.04	1.25	0.83	6.05
III	2.83	1.42	1.42	2.17	1.17	9.01
IV	2.92	1.58	1.67	2.67	1.08	9.92

Hinged hairs present on tibiae I and II.

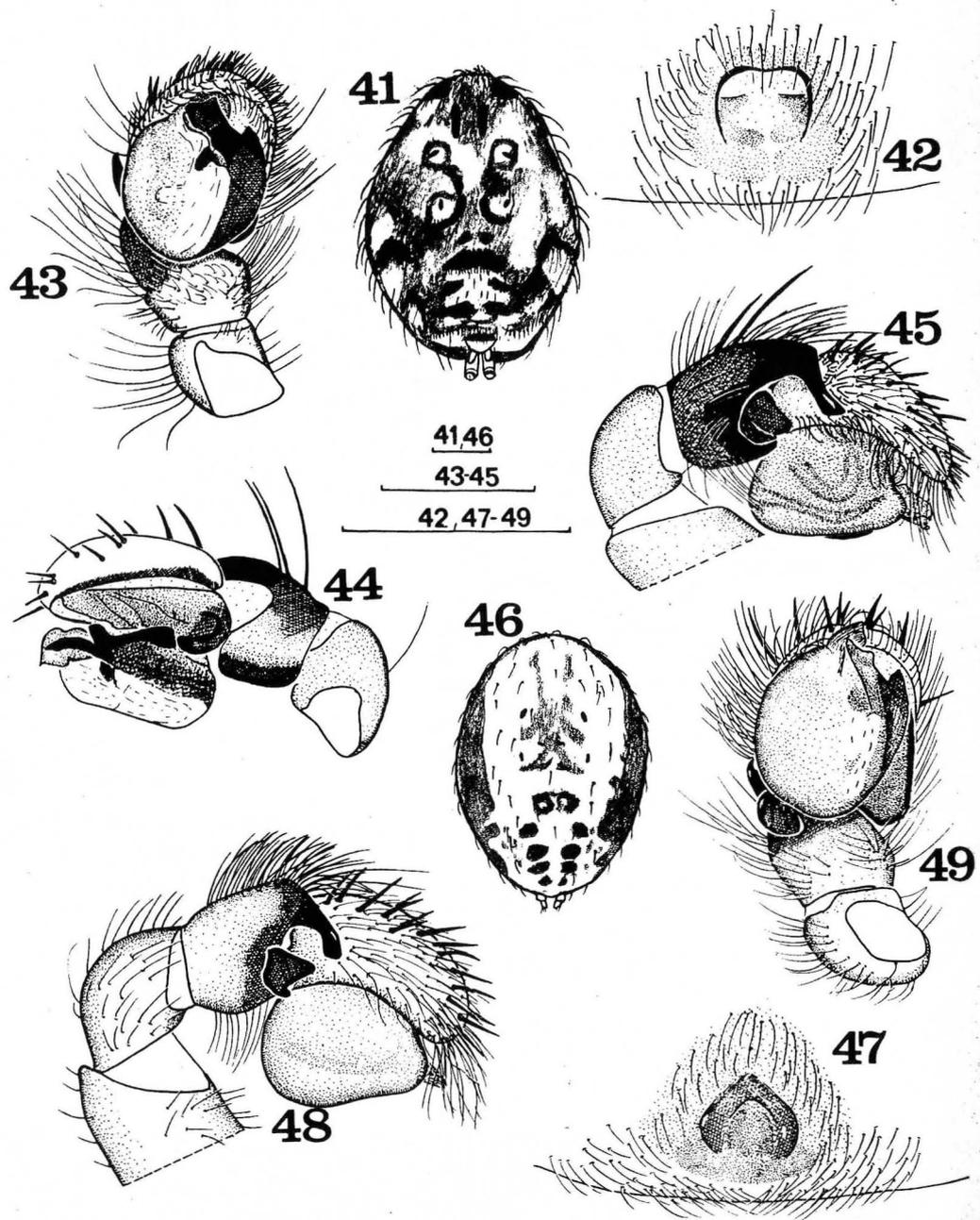
Palp (Fig. 43–45): Tibia with long, down-curved dorsolateral apophysis slightly widened and truncate at tip. Cymbium with large basolateral knob, fitting in ventral concavity of tibial apophysis. Embolus short, broad, curved outward, with medio-mesal toothlike excres-

cence; extremity broadly truncated, lying against foliate tegular apophysis.

Female (range in brackets): Total length 7.75 (7.75–13.08); carapace 4.33 (4.33–6.24) long, 3.16 (3.16–4.41) wide.

Colour (Fig. 41), relative eye size and disposi-

Heioab, Louw & Lüderitz, 19. IX. (TM); 2 ter (TM); ai, 29. X. Griffin & C. d. Lüderitz; probably); 1 ♂, 1 abeb, 18. eb dunes, . X. 1984 cop River p face of /N); 1 ♀ , M. & B. bvllei, SE X. 1985, rillenthal, , in sand J. Irish Pinah,



Figures 41–45. *Psammoduon canosum* 41. abdomen, dorsal aspect of female; 42. epigyne, ventral view; 43. male palp, ventral view; 44. *ibid.*, mesal view, hairs omitted; 45. *ibid.*, lateral view. Figures 46–49. *Psammoduon arenicola* 46. abdomen, dorsal aspect of female; 47. epigyne, ventral view; 48. male palp, lateral view; 49. *ibid.*, ventral view. (scale line = 1.00 mm).

... leg spination and relative leg length as in male.

Epigyne (Fig. 42): with oval central concavity with thick, sclerotized, almost straight anterior rim.

VARIATION: There is quite a bit of variation in the abdominal pattern, the shape of the epigyne and the palp. The abdominal dorsal pattern ranges from an almost entirely white background with a few darker patches to a very dark background with a contrasting central stripe, almost as in *P. arenicola*. The central concavity in the epigyne is variable in shape and ranges from longly oval to broadly oval. The opening is always larger than it is in *P. arenicola*. The shape of the male palpal tibial apophysis is puzzling. In some specimens the inner, dorsal edge of the apophysis is smooth and runs almost parallel with the outer edge; however in other ones there is an excrescence on this inner edge which can vary greatly in extent and is relatively long and pointed in some specimens.

OTHER MATERIAL EXAMINED:

SOUTH AFRICA: Clanwilliam District: 1 ♂, 1 ♀: Lamberts Bay, SE 3218 AB, sifted from sand dunes, 6. VII. 1975, Schultze (TM; 1 ♀ MRAC); 2 juv.: Suurfontein, 32°06'S 18°24'E, white dunes, 21. X. 1987, S. Louw (NMBA); 1 ♂: Skerpheuvel, 32°18'S 18°23'E, under red sand, 22. X. 1987, A. Wells (NMBA); Piketberg District: 1 ♂, 2 ♀, 1 juv.: Elandsbaai, 32°19' 18°19'E, under soil, 22. X. 1987, A. Wells & E. Visagie (NMBA); 4 ♂, 2 ♀, 3 juv.: Lang Vlei, 32°45'S 18°30'E (NMBA, 1 ♂ and 1 ♀ in MRAC); Vredenburg District 1 ♂, 3 ♀, 6 juv.: Oliphants Kraal, 32°51'S 18°09'E, dug out of sand, 23. X. 1987, A. Wells & L. Lots (NMBA); Malmesbury District: 2 juv.: Rondeberg 33°27'S 18°14'E, beach dunes, 25. X. 1987, entomol. staff (NMBA); Vredental District: 1 ♀: Ratelfontein, 32°04'S 18°35'E, 22. X. 1987, under soil, L. Lotz (NMBA); Heidelberg District: 1 juv.?: Witsand 34°24'S 0°50'E, under sand, 30. X. 1987 L. Lotz (NMBA) (this is the only record on the south coast of this genus, the specific identification is doubtful); Other localities: 1 ♂, 1 ♀: "Cap", Raffray (MNHN); 9 juv.: Western Cape Prov., Klover (lapsus for Klawer?), 12. XI. 1949, B. Malkin (CAS); 2 juv.: Papendorp, 2 m, 6. I. 1967, E. Ross & K. Lorenzen (CAS). 1 ♂: Montagu, XI. 1919, R. W. Tucker

(SAM). NAMIBIA: 1 ♀: Oranjemund, Diamond area I, 10. IX. 1980, S. Louw (SMWN).

DISTRIBUTION: West coast of South Africa from the Orange river mouth in Namibia down to the Vredenburg area north of the Cape; perhaps also present on the south coast but the only juvenile found near Witsand cannot be identified with certainty. The only real inland locality (Montagu) may have been mislabelled.

Psammoduon arenicola (Simon) comb. nov.
(Figs 46–49)

Caesetius arenicola Simon 1910: 184 (descr. ♀).

Type Material: Lectotype female (by present designation): Cape Peninsula, Simonstown, 1893, E. Simon (MNHN 15255) (examined). The tube contains four more juveniles and one adult female of *P. canosum* which are probably from another locality; Simon often put several specimens which he considered to be conspecific, in the same tube.

DIAGNOSIS

Females of this species can be recognized by the epigyne with small central concavity with broad sclerotized rim in front and on the sides and by the typical abdominal pattern composed of black and white hairs. Males have a similar pattern; the palp is similar to that of *P. canosum* but the tibial apophysis has a distal downwards inclination and the embolus is much narrower.

DESCRIPTION

Female (values for other females in brackets): Total length 8.66 (8.57, 8.82); carapace 4.33 (4.33, 4.58) long, 3.08 (3.00, 3.08) wide.

Colour: Carapace medium brown with two broad lateral bands and narrow black margin; with long black erect and shorter silvery recumbent hairs. Chelicerae medium brown. Sternum medium brown, paler in middle, with black and silvery hairs. Legs medium brown with femora darker. Abdomen with intricate dorsal pattern of black, white and brown hairs (Fig. 46); sides and venter with contrasting black and white patches.

Carapace rather elongate with shallow dip in front of fovea.

Eyes: AME (0.10) 0.8 times their diameter apart, 1.1 times that distance from AME which

42

45

49

e, ventral
ral view.
e, ventral

are 1.2 times as large. PME (0.08) 1.3 times their diameter apart, 5.5 times that distance from PLE which are 1.5 times as large. MOQ: AW = 0.95 PW; AW = 0.78 L. Clypeus 0.38

high, 3 times the diameter of ALE; with a dense cluster of long dark hairs. Chilum crescent-shaped, with 9 hairs. Sternum 1.6 wide, 1.7 long.

Legs: Spination

	F	P	T	Mt	t
I	d4*	-	v2*	-	-
II	d4*	-	v2*	v1-2-2	v
III	d3*df8	pf4mf8df7	pf7mf8df8	26 disp	12 disp
IV	d3*df10	pf5mf5df6	pf7mf8df9	32 disp	18 disp

Measurements

	F	P	T	Mt	t	Tot
I	2.00	1.08	1.08	0.92	0.71	5.79
II	1.88	1.00	1.00	1.00	0.75	5.62
III	2.29	1.29	1.41	2.04	1.16	8.21
IV	2.83	1.46	1.71	2.83	1.25	10.09

Epigyne (Fig. 47): With small central concavity, broadly rimmed in front and on sides.

Male: Total length 6.84; carapace 3.71 long, 2.71 wide.

Colour: Carapace dark reddish brown with slightly paler median band and dark margin; silvery hairs denser on median band and in eye region; clypeus with dense cluster of dark hairs. Sternum medium brown, paler in middle with long dark and silvery hairs. Legs dark brown, femora darker, tarsi paler. Abdomen with complex dorsal pattern basically as in female but median pale band almost continu-

ous and contrasting, sides dark. Venter pale with dark blotches. Epiandrum strongly developed.

Eyes: AME (0.08) slightly less than their diameter apart, slightly more than that distance from ALE which are 1.2 times as large. PME (0.07) 1.3 times their diameter apart, 5.3 times that distance from ALE which are 1.6 times as large. MOQ: AW = 1.09 PW, AW = 0.83 L. Clypeus 0.40 high or 4 times the diameter of an ALE.

Sternum 1.62 long, 1.41 wide.

Legs: Spination

	F	P	T	Mt
I	d4*rl1	-	v9pl9	v7
II	d4*pl2rl2	-	v8pl2	v7 pl2
III	d3*pl1df8	mf7pl7df5	26 disp	30 disp
IV	d3*pl1df9	mf7pl7df7	26 disp	36 disp

Fans on patellae and tibiae III and IV are not as well pronounced as in female or other species of the genus. On tibiae mainly, spines appear

dispersed rather than arranged in fans. Tarsi I and II with poorly developed scopula.

Measurements

I	1
II	1
III	1
IV	2

Male palp (down, near wards incli excrescence rounded, n

OTHER M South Afri Kommetjie ♂: Cape J Stephen (C of Muizenl

DISTRIBUT on the Cap

DISCUSSI The gener clearly stro phies such spinules at tegulum at species of obviously *Psammodes* short spine nus which of *Psammodes* sister grou rived genu strongly t and modi claws" and tarsi. The the enorm another p characters *P. canosu* species, I adapted t tions are other two

A domed and the p are autap

Measurements

	F	P	T	Mt	t	Tot
I	1.93	0.92	0.96	1.00	0.71	5.42
II	1.75	0.79	0.96	0.96	0.71	5.17
III	1.92	0.96	1.17	1.75	1.08	6.88
IV	2.50	1.04	1.54	2.42	1.17	8.67

Male palp (Fig. 48–49): tibial apophysis curved down, near the extremity with slight downwards inclination. Embolus with strong lateral excrescence in middle of its length; distal tip rounded, not broadened as in *P. canosum*.

OTHER MATERIAL EXAMINED: 2 ♀: South Africa, Cape Peninsula, Simonstown, Kommetjie, 6. III. 1979, J. Prins (MRAC); 1 ♂: Cape Peninsula, Hout Bay, E. Ross & Stephen (CAS); 3 ♀: Cape Peninsula, dunes N of Muizenberg, V.1989, R. Legg (MRAC).

DISTRIBUTION: Only known from dunes on the Cape Peninsula.

DISCUSSION

The genera *Caesetius* and *Psammoduon* are clearly strongly related. They share apomorphies such as the mesal group of cheliceral spinules and a male palp with a swollen subtegulum and short flat embolus. Some of the species of *Caesetius* have characters which are obviously in a less advanced state than in *Psammoduon* as for instance the distal fan of short spines on femora III and IV in *C. murinus* which is apparently perfected in members of *Psammoduon*. These genera are considered sister groups. *Psammoduon* is clearly the derived genus with several autapomorphies: the strongly tapering legs with fans of long spines and modified hairs, the accessory "digging claws" and the plumiform trichobothria on the tarsi. The strongly reduced tracheal system and the enormous book lungs must be considered another pair of synapomorphies. Not all these characters could be checked in *P. arenicola* and *P. canosum*. It is clear that from the three species, *P. deserticola* is the most strongly adapted to living in sand and that its adaptations are more pronounced than in those of the other two species.

A domed carapace without a dip in the profile and the presence of precoxal sclerites (1 or 3) are autapomorphies for *Caesetius*. A dipped

profile is typical for Zodariidae with strong digging adaptations and appears to be plesiomorphic in the Cydrelineae. It is not known if members of the genus *Caesetius* are also sand-diggers but the number of spines on legs III and IV suggests they are. The presence of scopulae on the other hand is rather rare in Zodariidae and this may indicate a complex life style. But apparently, they have not reached the same specialisation as members of *Psammoduon*.

Caesetius bevisi and *C. inflatus* are rather aberrant by the strongly developed scopulae on the legs, the spination which is rather poor as compared with the other representatives of the genus, the position of the eyes (AME less than their radius apart), the presence of only one pair of precoxal sclerites, and mainly the palpal conformation with very thin tegular apophysis and embolus. These characters may justify the erection of a separate genus if additional material corroborates that point of view.

ACKNOWLEDGEMENTS

I am very much indebted to the following persons for the loan of material: J. Heurtault (MNHN), E. Griffin (SMWN), A. Dippenaar (NCP), M. Moritz (MB), J. Minshull (NMZ), C. Griswold and P. Croeser (NMSA), N. Platnick (AMNH), P. Hillyard (BMNH), J. Prins and H. Robertson (SAM), W. Haacke (TM), J. Pulawski and D. Ubick (CAS), B. Hauser (MHNG) and L. Lotz (NMBA). Special thanks go to E. Griffin and B. Curtis (both SMWN) for their guidance and hospitality during my trip in Namibia and to N. Platnick for his comments on an earlier version of the manuscript. I acknowledge a travel grant from the Belgian National Fund for Scientific Research. Mr A. Reygel is thanked for the habitus drawing of *P. deserticola*. I thank K. Wouters from the Koninklijk Belgisch Instituut voor Natuurwetenschappen for help with the SEM micrographs.

REFERENCES

- BENOIT, P.L.G. 1974. Notules arachnologiques africaines. III. Revue Zoologique africaine 88: 427–436.
- HEWITT, J. 1916. Descriptions of several species of Arachnida in the collections of the Durban Museum. Annals of the Durban Museum 1: 217–227.

JOCQUÉ, R. 1990. A generic revision of the spider family Zodariidae (Araneae). *Bulletin of the American Museum of Natural History* 200.

LAWRENCE, R. F. 1938. Transvaal Museum expedition to South West Africa and Little Namaqualand, May to August 1937. *Annals of the Transvaal Museum* 9: 215-226.

LAWRENCE, R. F. 1965. New and little known arachnida from the Namib Desert, South West African Scientific Papers of the Namib Desert Research Station 27: 1-12

LESSERT, R. De 1936. Araignées de l'Afrique orientale portugaise, recueillies par MM. P. Lesne et H.-B. Cott. *Revue suisse de Zoologie*. 43: 207-306.

NEWLANDS, G. & DE MEILLON, E. 1986. Spiders, Struik pocket guides to southern Africa. Struik Publishers, Cape Town, pp 64.

POCOCK, R. I. 1900. Some new Arachnida from Cape Colony. *Annals and Magazine of Natural History* (7) 6: 316-333.

SIMON, E. 1893a. *Histoire naturelle des Araignées*. Paris 1 (2) 1893, 257-488.

SIMON, E. 1893b. *Etudes arachnologiques*. XL. Descriptions d'espèces et de genres nouveaux de l'ordre des araignées.—*Annales de la Société entomologique de France* 62: 299-330.

SIMON, E. 1910. Arachnoidea, Araneae (II) in Schultze L. *Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Südafrika*. *Denkschriften Der Medizinisch Naturwissenschaftlichen Gesellschaft zu Jena* 16: 175-218.

Manuscript received November 1989; accepted May 1990