

The huntsman spider genus *Cebrennus* : four new species and a preliminary key to known species (Araneae, Sparassidae, Sparassinae)

by Peter JÄGER*

Résumé

Quatre nouvelles espèces d'araignées du genre *Cebrennus* sont décrites: *C. intermedius* sp. n. (Arabie Saoudite, mâle), *C. logunovi* sp. n. (Turkménistan, mâle et femelle), *C. mayri* sp. n. (Oman, femelle) et *C. rungsi* sp. n. (Maroc, mâle et femelle). Une première description de la femelle de *C. aethiopicus* est donnée avec des spécimens d'Arabie Saoudite. Une diagnose du genre, fondée sur des caractéristiques génitales du mâle est proposée. *Cerbalopsis* est reconnu comme synonyme plus récent de *Cebrennus*. Une clé provisoire des espèces connues est aussi donnée. La présence d'espèces du genre *Cebrennus* au Turkménistan et en Oman élargit considérablement la distribution vers l'est du genre.

Summary

Four new spider species of the genus *Cebrennus* are described: *C. intermedius* sp. n. (Saudi Arabia, male), *C. logunovi* sp. n. (Turkmenistan, male and female), *C. mayri* sp. n. (Oman, female), and *C. rungsi* sp. n. (Marocco, male and female). First description of the female of *C.*

aethiopicus is given by means of material from Saudi Arabia. A generic diagnosis based on male genital characters is proposed. *Cerbalopsis* is recognized as a junior synonym of *Cebrennus*. A preliminary key to known species of the genus is given. The records of *Cebrennus* spp in Turkmenistan and Oman extend the eastern distribution range of the genus considerably.

Introduction

Species of the genus *Cebrennus* Simon 1880 (Araneae, Sparassidae, Sparassinae) are adapted to arid places like stone deserts or sand dunes. From recent knowledge the distribution range of the genus *Cebrennus* reach from Marocco in the West to Israel in the East. In spite of their wide distribution range, *Cebrennus* spp are rarely found in museum collections. Reasons may be the cryptic way of living in silken retreats as well as the fact that they are nocturnal spiders.

Eight nominal *Cebrennus* species have been listed so far: *C. aethiopicus* Simon 1880, *C. castaneitarsis* Simon 1880, *C. cultrifer* Fage 1921, *C. kochi* (Pickard-

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Cambridge 1872), *C. powelli* Fage 1921, *C. sparassoides* Caporiacco 1928, *C. tunetanus* Simon 1885, *C. waga* (Simon 1874). FAGE (1921) published a short review on *Cebrennus* with descriptions of two new species. Thereafter LEVY (1989) gave descriptions and illustrations of *C. kochi* and *C. castaneitarsis* from Israel. He synonymised *C. sparassoides* with *C. castaneitarsis*. LAWRENCE (1962) gave some comments on the systematic position of species of *Cebrennus* and *Cerbalus* in comparison to Namibian huntsman spiders.

JÉZÉQUEL & JUNQUA (1966) erected a new genus, *Cerbalopsis*, for one species, *Cerbalopsis villosa* Jézéquel & Junqua 1966. LEVY (1989) placed *Cerbalus concolor* Denis 1947 in this genus. Both species constitute a species group, in which special hairs at the male palp and a coiled distal part of the embolus are developed (figs 69 and 74, and JÉZÉQUEL & JUNQUA 1966). Eye position, chelicer dentition, special hairs and unique genital characters are considered by JÉZÉQUEL & JUNQUA (1966) diagnostic characters for the genus.

Cebrennus intermedius sp. n. represents an intermediate form between the two latter species and the other *Cebrennus* species. It has no coiled embolus part and no specialized hairs at the male palpus (as both former *Cerbalopsis* spp have), but a broad proximal part of its embolus and single (not fused) posterior teeth of chelicerae. The specialized hairs in *Cerbalopsis* spp are considered an adaptation to the digging behaviour in sandy habitats. As characters in male genitalia in former *Cerbalopsis* spp and other *Cebrennus* spp are synapomorphic (see genus diagnosis), *Cerbalopsis* turns to be a synonym of *Cebrennus*.

Dmitri LOGUNOV (Novosibirsk, Russia), Kirill MIKHAILOV (Moscow, Russia) and Uwe MOLDRZYK (Darmstadt, Germany) left some sparassid material of the genus *Cebrennus* at my disposal. During

examination, it seemed to be more favorable to include further material of this poorly known genus for a short review than to describe four single species.

Not all species of the genus *Cebrennus* could be examined. In spite of this I would like to propose a preliminary key to all species. For this purpose some illustrations of previous authors are re-drawn.

Material and methods

Abbreviations.

ALE, PME, AME, PLE refer to anterior lateral eyes, posterior median eyes, etc.

ALE-ALE, ALE-PLE etc. refer to interdistances between the eyes.

I-IV refer to the four pairs of legs.

PJ, consecutive number of specimens of the family Sparassidae examined by Peter Jäger.

Museum collections:

FMNH, Field Museum of Natural History, Chicago;

HECO, Hope Entomological Collections, Oxford;

HLMD, Hessisches Landesmuseum, Darmstadt;

MNHN, Muséum national d'Histoire naturelle, Paris;

MSNG, Museo Civico di Storia Naturale, Genova;

NHM, Natural History Museum, London;

NHMB, Naturhistorisches Museum, Basel;

SMF, Senckenberg Museum, Frankfurt;

SZMN, Siberian Zoological Museum, Novosibirsk;

ZMUM, Zoological Museum of the University Moscow.

Measurements are given in millimetres, those of holotype first, those of paratypes in parentheses. Spines are listed for each segment in the following order: prolateral, dorsal, retrolateral, ventral. The cymbium is divided in some

species into a proximal and a distal part. Both parts are recognized by a dorsal angle of the cymbium in lateral view. In drawings hairs are generally omitted. In addition to epigynum and vulva a schematic course of the internal female duct system is documented: an open circle represents the copulatory orifice, an arrow the end of the fertilization duct in direction of the uterus externus.

Total text of labels of each examined specimen is cited. Question marks behind a locality indicate that it could not be located. Question marks behind a museum collection indicate that the type material is most likely in the named collection, but was not traced. Comments are added in brackets.

Taxonomy

Cebrennus Simon 1880

Cebrenis SIMON 1874: 263 (gen. n.; preocc.).

Cebrennus SIMON 1880: 229, 331 (nom. n.; type species: *C. waga* (Simon 1874), designation by SIMON 1897: 48). FAGE 1921: 157-163. LEVY 1989: 155 ff.

Cerbalopsis JÉZÉQUEL & JUNQUA 1966: 965, 969 (gen. n.). LEVY 1989: 144. **Syn. nov.**

Diagnosis.

May be related to *Cerbalus* Simon 1897 and be distinguished from *Cerbalus* by the following characters. Males with filiform embolus at least in its distal half (in *Cerbalus* with broadened embolus). Embolus in its middle with bend (B), thereby dividable in a proximal (P) and a distal part (D) (figs 22, 49). Tegulum at its distal margin with subdistal edge, from which embolus arises prolaterally (e.g. figs 1, 34, 61, 73). In species with elongated basal part of embolus (*aethiopicus*, *castaneitarsis*, *waga*) this edge running across the tegulum to arising point of embolus (fig. 49). Females with membranous median part of epigynum, this variable in shape and size and

without transversal, bent rim as in *Cerbalus* (see LEVY, 1989: figs 48-49; WUNDERLICH, 1991: fig. 787), without hairs at median field of epigynum as in *Cerbalus* (e.g. *C. pulcherrimus*, *C. verneu*).

Redescription.

Sparassine spiders, medium to large (7.5-20 mm) in body length. Prosoma convex (fig. 26). Head region (anterior width of carapace) variable in relation to prosoma width (fig. 41; anterior width of carapace/carapace width: 0.55-0.83; in comparison, in *Cerbalus*: 0.67-0.78, in *Olios*: 0.47-0.63).

AME much larger than other eyes, the latter ones more or less equal in size (e.g. fig. 3; ALE/AME: 0.46-0.84; in comparison in *Cerbalus* 0.74-1.20); eye position sexual-dimorph: compare male, fig. 25 and female, fig. 31 or male fig. 76 and female fig. 85. Posterior eye row wide in relation to head region (e.g. fig. 3; width of posterior eye row/anterior width of carapace: 0.69-0.97; in comparison, in *Cerbalus* 0.60-0.69).

Spination with abnormally high variation, especially at metatarsi; usual pattern: femora I-III 323, IV 322, patellae 000, tibiae 2024, metatarsi (usually) I-III 2024, IV 3036. Scopulae at tarsi dense, at metatarsi distally dense, becoming sparser in proximal direction, in proximal third part of metatarsus very sparse or absent. Leg claws sexual-dimorph: in males comb-like (figs 6, 27), in females curved and with distal prominent tooth (fig. 32). Female palpal claw with one prominent distal tooth and about 10 short teeth (fig. 33). Trilobate membrane with reduced lateral projections, median hook distinct (figs 64, 71; compare to JÄGER, 1998).

Most species (except for *intermedius* and *concolor*) with fused retromarginal teeth on chelicerae (e.g. figs 10, 30).

Male cymbium in some species distally and (or) dorsally with patch of dense, scopula-like hairs (as in some *Cerbalus*

species). Female copulatory ducts with membrane part and glandular appendices.

Color. Bright or pale yellow to yellow-brown. Abdomen in a few species with indistinct darker pattern, ventrally without markings (in comparison *Cerbalus* with distinct dark ventral and dorsal markings).

Species included.

Cebrennus aethiopicus Simon 1880, *C. castaneitarsis* Simon 1880, *C. concolor* (Denis, 1947) **comb. nov.**, *C. cultrifer* Fage 1921, *C. intermedius* sp. n., *C. kochi* (O. P.-Cambridge 1872), *C. logunovi* sp. n., *C. mayri* sp. n., *C. powelli* Fage 1921, *C. rungsi* sp. n., ?*C. tunetanus* Simon 1885, *C. villosus* (JÉZÉQUEL & JUNQUA 1966) **comb. nov.**, *C. wagaie* (Simon 1874).

Note: *C. tunetanus* shows some characters (from drawings in FAGE 1921), which do not fully match with genus description and differ from other *Cebrennus* (e.g. shape of embolus, proximal hump of tegulum in lateral view). Examining type material is necessary to make statements to its generic position.

Distribution.

Northern Africa (Morocco, Algeria, Tunisia, Libya, Egypt, Sudan, Djibouti, Ethiopia, N-Somalia), Arabian peninsula (Israel, Saudi-Arabia, Oman), Central Asia (Turkmenistan).

Note. DENIS (1958) listed one juvenile specimen of an unidentified *Cebrennus* species from Afghanistan (Pirzada).

Relationships.

According to LAWRENCE (1962), the North African genera *Cebrennus* and *Cerbalus* constitute a natural group with the Namibian genera *Leucorchestris*, *Microrchestris* and *Carparachne*. This cannot be confirmed, as both groups bear distinct differences in genital characters, e.g. males of *Leucorchestris* and *Microrchestris* possess elongated conductors, whereas in *Cebrennus* and *Cerbalus* the conductor is strongly reduced (JÄGER, in

print). Similar hairs at palpal femur and tibia in *Carparachne alba* Lawrence 1962 and *Cebrennus concolor* or *C. villosus* are considered convergently evolved structures, which show an adaptation to digging behaviour in sandy habitats.

Biology.

Cebrennus species seem to be adapted to arid desert-like habitats. Some species live in silken tubes in the soil or under stones. One species (*C. castaneitarsis*) lives on small plants (LEVY, 1989).

Species groups.

FAGE (1921) recognized two groups within the genus: one containing *aethiopicus*, *castaneitarsis* and *wagaie*, the second group containing *kochi*, *tunetanus* and *cultrifer*. Diagnostic characters for his classification are shape and size of embolus and retrolateral tibial apophysis. The first group constitute a natural group (monophylum), which is recognizable for example by male genitalia (figs 42, 47, 49). FAGE's second group is heterogeneous, considering their genitalia. Although not all known representatives can be associated to a distinct species group at present, three groups are proposed here:

1. *kochi* group (male retrolateral tibial apophysis standing off from tibia at right angle and with ventral excrescence; embolic bend hidden behind distal part of tegulum; female vulva with anterior sac-like structures). Species included: *kochi*, *logunovi*.

2. *wagaie* group (male retrolateral tibial apophysis slender, without excrescence; embolus in its middle with distinct and freely visible bend; in three species [*aethiopicus*, *castaneitarsis*, and *wagaie*] basal and distal part of embolus strongly elongated). Species included: *powelli*, *rungs*i, *aethiopicus*, *castaneitarsis*, and *wagaie*.

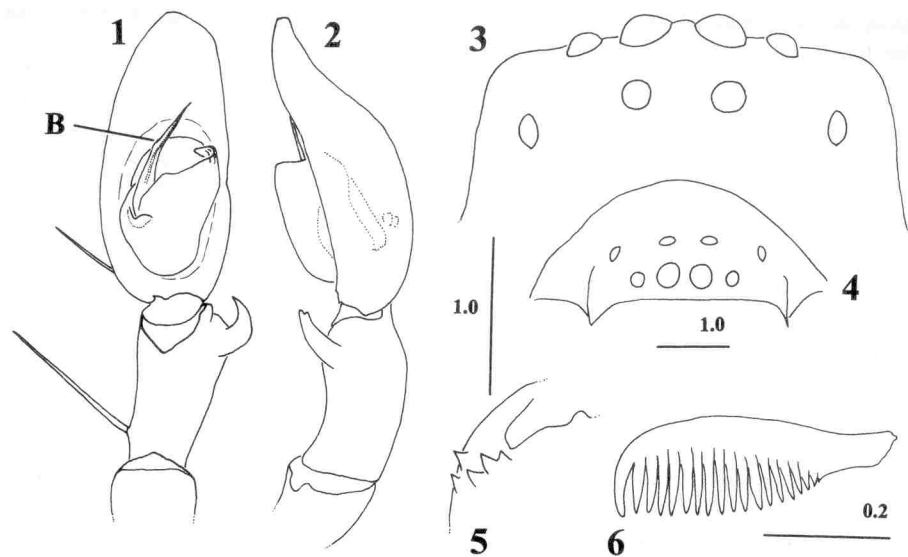
3. *villosus* group (embolus embedded in a special tegular cavity; retrolateral tibial apophysis may be reduced, then small femoral apophysis is present). Spe-

cies included: *concolor*, *intermedius*, and *villosus*.

Unassigned species: *cultrifer* (may be related to representatives of the *kochi*-group), *mayri* (probably related to *villosus* group, as similar structures in epigynum and vulva are present), *tunetanus* (see note above).

Preliminary key to *Cebrennus* species

- 1 – Males (that of *mayri* unknown). 2
- (1) Females (those of *cultrifer*, *intermedius*, and *concolor* unknown). 13
- 2 – Embolus nearly straight, retrolateral tibial apophysis bent, forming a semi-circle (fig. 1). *cultrifer*
- (2) Embolus bent. 3
- 3 – Distal and proximal part of embolus heavily elongated (figs 42, 47, 49), retrolateral tibial apophysis long and slender. 4
- (3) Embolus not heavily elongated; if so, retrolateral tibial apophysis reduced. 6
- 4 – Embolus arising in 6 o'clock position (fig. 42). *castaneitarsis*
- (4) Embolus arising in 4 o'clock position (figs 47, 49). 5
- 5 – Retrolateral tibial apophysis reaching distal tip of tegulum (fig. 47). *wagaie*
- (5) Retrolateral tibial apophysis not so long (fig. 49). *aethiopicus*
- 6 – Distal part of embolus elongated and coiled, embedded in a tegular cavity, retrolateral tibial apophysis reduced (figs 73, 69), palpal femur with a small apophysis (fig. 75). 7
- (6) Distal part of the embolus not coiled, retrolateral tibial apophysis not reduced. 8
- 7 – Small retrolateral tibial apophysis present, cymbium pointed (fig. 69). *concolor*
- (7) Retrolateral tibial apophysis absent, cymbium rounded (fig. 73). *villosus*
- 8 – Embolic bend freely visible (figs 22, 34). 9
- (8) Embolic bend hidden behind distal part of tegulum (figs 7, 17, 86). 11
- 9 – Retrolateral tibial apophysis longer than tegulum. *powelli*
- (9) Retrolateral tibial apophysis shorter than tegulum. 10
- 10 – Distal part of embolus screw-like, pointed proximally (fig. 61). *intermedius* sp. n.
- (10) Distal part of embolus slightly bent, pointed retrolaterally (fig. 34). *rungs*i sp. n.
- 11 – Retrolateral tibial apophysis with ventral excrescence, tip of embolus visible (figs 7, 17). 12
- (11) Retrolateral tibial apophysis without ventral excrescence, tip of embolus not distinctly visible (fig. 86). *tunetanus*
- 12 – Retrolateral tibial apophysis slender, ventral excrescence small (fig. 7). *logunovi* sp. n.
- (12) Retrolateral tibial apophysis stout, ventral excrescence large (fig. 17). *kochi*
- 13 – Median part of epigynum wider than long (figs 28, 53). 14
- (13) Median part of epigynum as long as wide or longer than wide. 16
- 14 – Epigynum with an anterior and lateral rim (fig. 28). *powelli*
- (14) Epigynum without additional rims (fig. 53). 15
- 15 – Epigynal ledges reaching posterior cavities (fig. 53), last (winding) part of fertilization duct in body length axis (fig. 54). *aethiopicus*
- (15) Epigynal ledges not reaching posterior cavities (figs 44, 46), last (winding) part of fertilization duct transversal to body length axis (fig. 45). *castaneitarsis*



Figures 1-6. — *Cebrennus cultrifer* Fage 1921 (male holotype). 1-2: male palp (1 ventral, 2 retrolateral). 3-4: eye position (3 dorsal, 4 frontal). 5: cheliceral dentition (ventral). 6: retrolateral claw of leg I (retrolateral). — B: bend.

- 16– Median part of epigynum narrow, anteriorly rounded (figs 37, 78). 17 (16) Median part of epigynum with other shape (figs 56, 88). 18
- 17– Median part of epigynum long, epigynum without lateral rims (fig. 78). *villosus*
- (17) Median part of epigynum short, epigynum with two pairs of lateral rims (fig. 37). *runsi* sp. n.
- 18– Epigynal ledges converging anteriorly (figs 56, 88). 19
- (18) Epigynal ledges diverging anteriorly (figs 12, 19, 21). 20
- 19– Median part of epigynum triangular, epigynal ledges straight (fig. 56). *mayri* sp. n.
- (19) Epigynal ledges with indentation (fig. 88). *tunetanus*
- 20– Epigynal ledges with “waist” (figs 19, 21). *kochi*
- (20) Epigynal ledges without “waist” (fig. 12). *logunovi* sp. n.

Cebrennus cultrifer Fage 1921 (figs 1-6)

Cebrennus cultrifer FAGE 1921: 164-165 (male holotype PJ 665, with label: el Kheider [S of Wahran (=Oran), lake region], Algerien. Examined. MNHN Paris 11922).

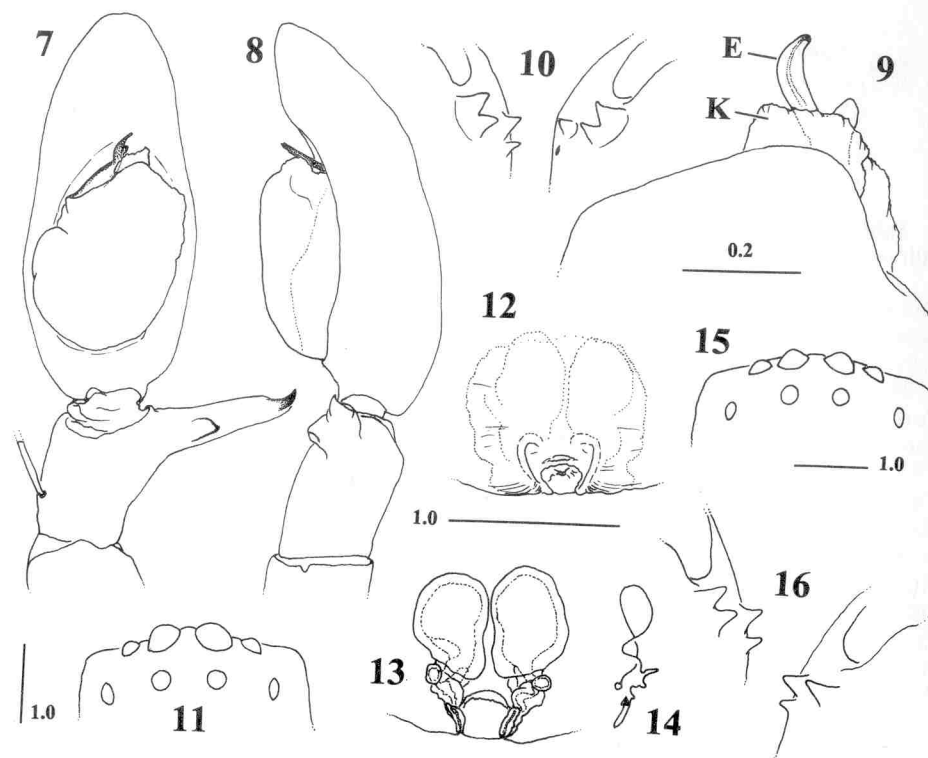
Diagnosis. Male embolus straight, pointed distally, embolic bend indistinct. Retrolateral tibial apophysis bent dorso-medially (fig. 1).

Redescription.

Male. Carapace length 5.2, carapace width 4.1, abdomen length 4.1, abdomen width 3.0. Spination: femur I-III 323, IV 321, patella 000, tibia 2024, metatarsus I-III 2024, IV 3036. Chelicerae with 2 anterior and 3 posterior teeth (fig. 5). For detailed description see FAGE (1921).

Female unknown.

Distribution. Known only from the type locality (fig. 89: 3).



Figures 7-16. — *Cebrennus logunovi* sp. n. (male and female paratypes). 7-8: male palp (7 ventral, 8 retrolateral). 9: male distal part of tegulum (ventral). 10: male cheliceral dentition (ventral). 11: male eye position (dorsal). 12: female epigynum (ventral). 13: female vulva (dorsal). 14: schematic course of female duct system (dorsal). 15: female eye position (dorsal). 16: female cheliceral dentition (ventral). — E: embolus, K: conductor.

Cebrennus logunovi sp. n. (figs 7-16)

Cebrennus sp.: MIKHAILOV & FET, 1994: 514, 523.

Type material. 1 male holotype (PJ 1346, with label: Turkmenistan, Mary Area, Bairam-Ali Distr., ca. 63 km SW of Utch-Adzhi, 37° 40'N, 62° 24'E, 21.04.1993, D.V. Logunov leg.), – 1 male paratype (PJ 1345, with label: Turkmenistan, Chardzhou Area, Chardzhou Distr., Karakum Desert, Repetek Nature Reserve, 38° 33'N, 63° 11'E, 22.04.1993, coll. D.V. Logunov; deposited in SMF), – 1 male paratype (PJ 1347, with label:

Turkmenistan, Chardzhou Area, Farab Distr., ca. 77 km NNE of Repetek, ?Elbashchi, 39° 12'N, 63° 33'E, V.I. Kaplin leg.), – 1 male paratype (PJ 1344, with label: Turkmenistan, Chardzhou Area, Chardzhou Distr., Karakum Desert, Repetek Nature Reserve, 38° 33'N, 63° 11'E, 3.05.1967, V.K. Kuznetsov leg.), – 1 female paratype (PJ 1343, with label: Turkmenistan, Mary Area, Kuska Distr., ca. 12 km N of Chemenibit, 35° 31'N, 62° 30'E, 18.04.1993, A.A. Zyuzin leg.), except for PJ 1345 (SMF) all in SZMN. – 1 male paratype (PJ 1372, with label: 1 male, ZMMU, Turkmenia, Repetek, 5.05.1972, leg. V.I. Kuznetsov), – 1 male paratype (PJ 1373, with label:

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Pp	1.9 (1.7-2.1)	0.8 (0.8-0.9)	0.9 (0.9)		2.2 (1.9-2.4)	5.8 (5.4-6.3)
I	6.5 (6.5-7.1)	2.0 (1.9-2.3)	5.5 (5.6-6.0)	6.1 (6.1-6.5)	1.8 (1.6-1.7)	21.9 (21.9-23.6)
II	7.2 (7.1-7.8)	2.1 (2.0-2.3)	6.1 (6.1-6.5)	6.5 (6.6-7.2)	1.8 (1.6-1.8)	23.7 (23.4-25.6)
III	5.8 (5.9-6.4)	1.9 (1.7-2.0)	4.3 (4.4-5.0)	4.8 (4.8-4.9)	1.5 (1.4-1.7)	18.3 (18.3-20.0)
IV	7.2 (7.1-7.9)	1.9 (1.7-2.1)	5.3 (5.4-6.1)	6.0 (6.0-6.3)	1.7 (1.6-1.7)	22.1 (22.0-24.1)

Table I. — Measurements of palp and legs of male *Cebrennus logunovi* sp. n., holotype with paratypes in parentheses (in millimetres).

Cebrennus sp. male, ZMMU, Turkmenia, Repetek, on wall, 2.05.1982, leg. V.A. Krivokhatskiy), — 4 males paratypes (PJ 1374-1377, with label: 4 males, ZMMU, Turkmenistan, Repetek, 6.V.1972, V.I. Kuznetsov leg.), — 4 males paratypes (PJ 1377-1381, with label: 4 males, ZMMU, Turkmenia, Repetek, 4.05.1972, leg. V.I. Kuznetsov), — 1 male paratype (PJ 1382, with label: 1 male, ZMMU, Turkmenia, Repetek, 23.04.1972, leg. V.I. Kuznetsov; deposited in SMF), — 1 male paratype (PJ 1383, with label: ZMMU, 1 male, Turkmenia, Repetek, 3.05.1972, V.I. Kuznetsov leg.), except for PJ 1382 (SMF) all in ZMUM.

Derivatio nominis. In honour to one of the collectors, my friend and colleague Dmitri Logunov; noun in genitive.

Diagnosis. Closely related to *C. kochi*, may be distinguished by following characters. Males. Distal part of embolus slightly bent. Retrolateral tibial apophysis slender, ventrally with small excrescence (fig. 7). Females. Anterior parts of vulva large, balloon-like (fig. 13). Epigynal ledges diverging anteriorly, without a "waist" (fig. 12).

Description.

Male. Carapace length 4.3 (3.5-5.0), carapace width 3.5 (3.4-4.1), anterior width of carapace 2.3 (2.0-2.7), carapace height 1.3 (1.1-1.3), abdomen length 4.4 (3.8-4.8), abdomen width 3.1 (2.8-3.4).

Eyes: AME 0.36 (0.31-0.42), ALE 0.24 (0.22-0.25), PME 0.20 (0.21-0.22), PLE 0.21 (0.21-0.22), AME-AME 0.18 (0.17-0.20), AME-ALE 0.08 (0.07-0.11), PME-PME 0.38 (0.31-0.44), PME-PLE 0.45 (0.37-0.51), AME-PME 0.27 (0.25-

	Fe	Pa	Ti	Mt	Ta	Total
Pp	1.9	0.7	1.3		1.7	5.6
I	5.5	2.0	4.5	5.0	1.6	18.6
II	6.0	2.0	5.1	5.4	1.8	20.3
III	4.9	1.9	3.7	3.9	1.4	15.8
IV	6.1	2.0	4.5	5.0	1.6	19.2

Table II. — Measurements of palp and legs of female *Cebrennus logunovi* sp. n., paratype (in millimetres).

0.30), ALE-PLE 0.34 (0.28-0.35), clypeus AME 0.14 (0.15-0.16), clypeus ALE 0.20 (0.17-0.24).

Leg formula: 2413. Spination: palpus 11 (2/3) 0, 000, 1000, femur I 3 (2) 23, II 323, III 3 (2) 23 (2/1), IV 3 (2) 22 (1), patella 000, tibia 2024 (3), metatarsus I 202 (1) 4 (3), II-III 2024, IV 3036. Measurements of palp and legs as in table I.

Scopulae at metatarsi very sparse.

Chelicerae with 2 (1, n=1) anterior and 2 (3, n=1) posterior teeth (fig. 10).

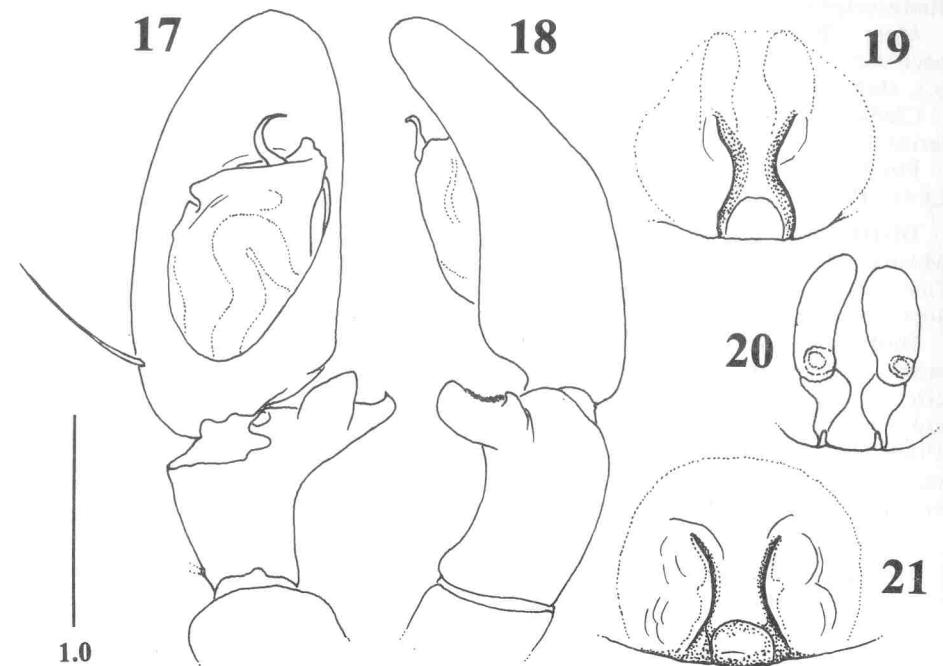
Color. Bright yellowish. Abdomen dorsally with slight dark markings.

Female. Carapace length 4.8, carapace width 4.0, anterior width of carapace 3.0, carapace height 1.4, abdomen length 7.0, abdomen width 5.9.

Eyes: AME 0.42, ALE 0.30, PME 0.23, PLE 0.24, AME-AME 0.22, AME-ALE 0.16, PME-PME 0.43, PME-PLE 0.66, AME-PME 0.31, ALE-PLE 0.45, clypeus AME 0.15, clypeus ALE 0.20.

Leg formula: 2413. Spination: palpus 010, 000, 0000, 1 (0) 000, femur I 223, II 323, III+IV 221, patella 000, tibia I-II 2024, III 2024 (3), IV 2024, metatarsus I-III 2024, IV 3036. Measurements of palp and legs as in table II.

Scopulae as in male.



Figures 17-21. — *Cebrennus kochi* (Pickard-Cambridge 1872). 17-18: male palp (17 ventral, 18 retrolateral; SMF 4474). 19, 21: female epigynum (ventral). 20: female vulva (dorsal) — (19-20 after LEVY 1989; 21 after FAGE 1921).

Chelicerae with 2 anterior and 2 (left chelicera with 1) posterior teeth (fig. 16). Color as in male.

Distribution. E-Turkmenistan, Mary and Chardzhou Area, mostly Karakum Desert (fig. 89: 21-24).

Biology. The specimens were caught by pitfall-traps near holes of mouse-sized rodents. MIKHAILOV & FET (1994) list *C. logunovi* (sub *Cebrennus* sp.) as "Karakum psammophile endemic".

Cebrennus kochi (O. P.-Cambridge 1872) (figs 17-21)

Heteropoda kochii O. P.-CAMBRIDGE 1872: 312, pl. XIV, fig. 13 (sp. n.; male, female syntypes from Jerusalem, Israel, HECO B.1416. Not examined).

Cebrenis kochi: SIMON 1874: 266.

Cebrennus kochi: SIMON 1880: 332. STRAND 1913: 159. (1 male + 1 juv., PJ 751, with label: [Palästina] Jaffa-Rehoboth, J. Akaroni, 26.04.1913/SMF 4473. Examined). STRAND 1915: 156 (1 male PJ 741, with label: [Palästina] Jaffa-Rehoboth, J. Akaroni, 26.04[?].1913/SMF 4474. Examined). LEVY 1989: 155, figs 84-93.

Diagnosis. Closely related to *C. logunovi* sp. n., may be distinguished by following characters. Males. Distal part of embolus bent strongly. Retrolateral tibial apophysis stout, ventrally with large excrescence (fig. 17). Females. Anterior parts of vulva slender, sac-like (fig. 20). Epigynum with a "waist", i.e. epigynal ledges diverging anteriorly and posteriorly (figs 19, 21).

Redescription.

Male. Carapace length 4.1-7.1, carapace width 3.5-6.5, abdomen length 4.1-6.1, abdomen width 3.0-4.5.

Chelicerae with 2 anterior and 4-7 posterior teeth.

For detailed description of female see LEVY (1989).

Distribution. Israel (Mt. Hermon, Moshav Meron, Zemah, Ma'ayan Zevi, Giv'at Brenner, Jerusalem, Be'er Sheva, Jordan valley) (fig. 89: 10-12).

Biology. Individuals are found under stones in capsular retreats with a semi-circular door. Adult males and females are found from February to May (LEVY 1989). The species inhabit a vertical range from sea level to 1650 meter elevation (LEVY 1989: Mt. Hermon).

Cebrennus powelli Fage 1921 (figs 22-33)

C. powelli FAGE 1921: 157, 163, fig. 3 (a-d) (sp. n.; 1 male, 2 females syntypes, with label: Beni Amar, Maroc. MNHN. Examined. Hereby 1 male [PJ 706] is designated as lectotype, 2 females [PJ 707, 708] as paralectotypes).

Diagnosis. Most likely related to *C. rungsi* sp. n., may be distinguished by following characters. Males. Embolus with distinct shape. Retrolateral tibial apophysis shorter, reaching only proximal half of tegulum (fig. 34). Females. Median part of epigynum longer than wide. Epigynal ledges anteriorly interrupted (fig. 37). Fertilization ducts running in posterior direction (figs 38, 39).

Redescription.

Male. Carapace length 6.5, carapace width 5.5, abdomen length 6.7, abdomen width 4.7. **Female** carapace length 7.2-7.3, carapace width 6.0-6.2, abdomen length 8.3-9.3, abdomen width 6.5-7.0. Chelicerae with 2 anterior and 5 (male) or

6 (female) posterior teeth (figs 24, 30). Leg claws in males dorsally convex, comb-like, i.e. with uniform teeth (fig. 27), in females dorsally concave, distal tooth distinctly longer (fig. 32). For detailed description see FAGE (1921).

Distribution. Known only from the type locality (fig. 89: 2).

Cebrennus rungsi sp. n. (figs 34-41)

Type material. 1 male holotype (PJ 684, with label: Maroc-Sud, region du Sous, Joly et Rungs, 7-XII-1946), 1 female paratype (PJ 683, with same data as holotype) MNHN.

Derivatio nominis. In honour to one of the collectors, Mr Rungs; noun in genitive.

Note. The species was recognized by Lucien BERLAND, but he did not describe it. He added the name "*Cebrennus rungsi* Berland" on a label to the specimens. I follow his intention with pleasure to name this species after the collector, Mr Rungs.

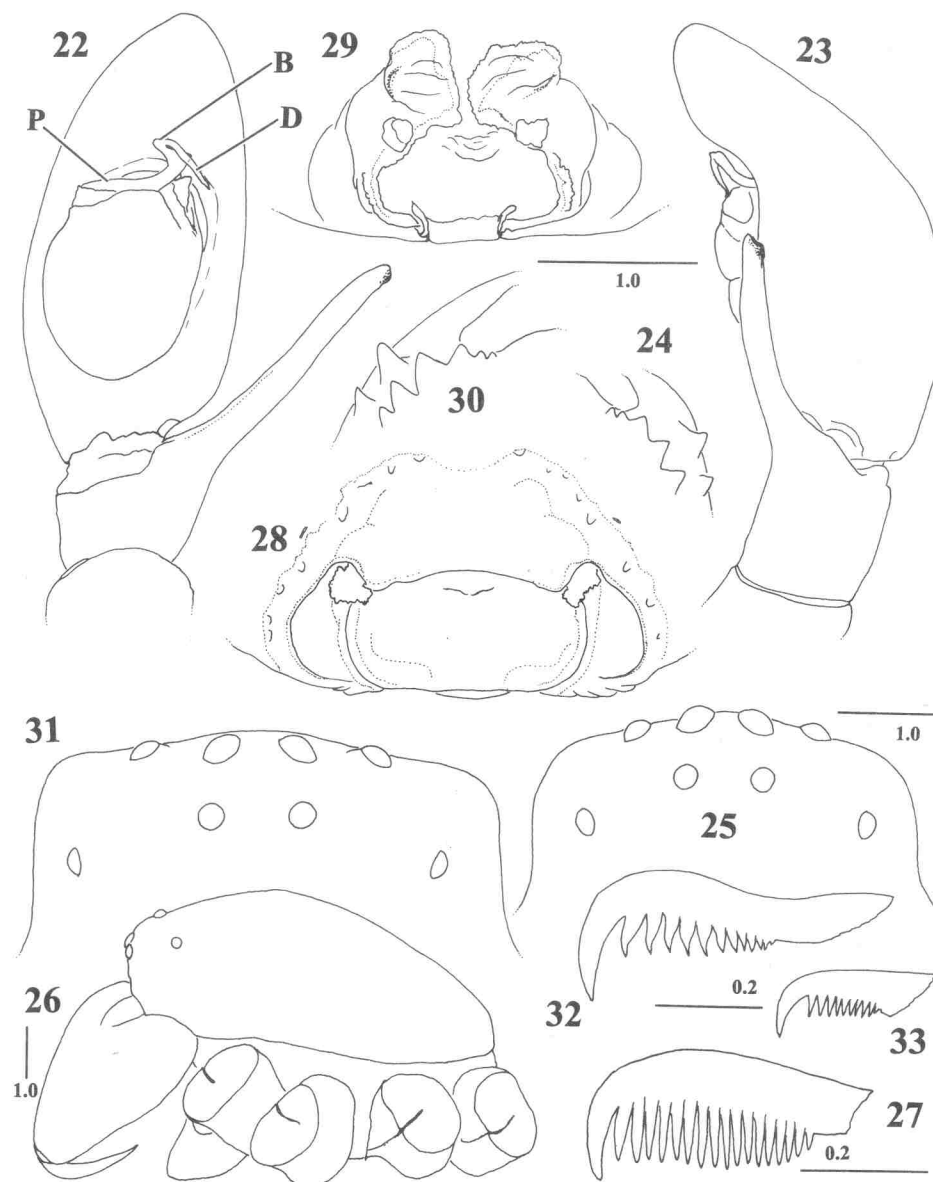
Diagnosis. Most likely related to *C. powelli*, may be distinguished by following characters. Males. Embolus with distinct shape. Retrolateral tibial apophysis shorter, reaching only proximal half of tegulum (fig. 34). Females. Median part of epigynum longer than wide. Epigynal ledges anteriorly interrupted (fig. 37). Fertilization ducts running in posterior direction (figs 38, 39).

Description.

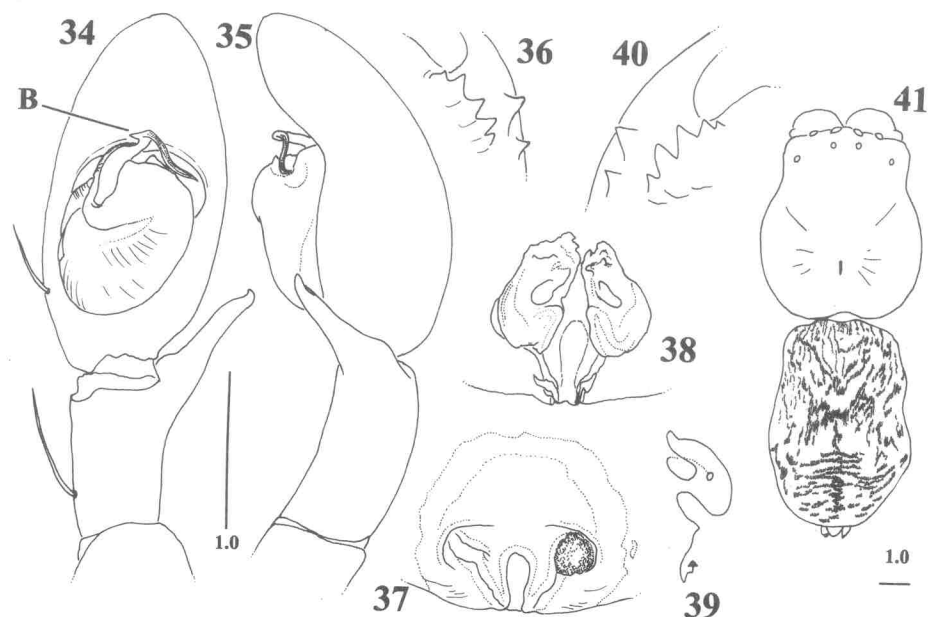
Male. Carapace length 6.3, carapace width 5.1, anterior width of carapace 3.2, carapace height 2.2, abdomen length 5.3, abdomen width 4.0.

Eyes: AME 0.34, ALE 0.28, PME 0.25, PLE 0.23, AME-AME 0.30, AME-ALE 0.21, PME-PME 0.42, PME-PLE 0.86, AME-PME 0.28, ALE-PLE 0.68, clypeus AME 0.22, clypeus ALE 0.22.

Leg formula: 2413. Spination: palpus ???, 000, 1000, femur I 223, II 3 (4) 23, III



Figures 22-33. — *Cebrennus powelli* Fage 1921 (male lectotype, female paralectotype). 22-23: male palp (22 ventral, 23 retrolateral). 24: male cheliceral dentition (ventral). 25: male eye position (dorsal). 26: male prosoma (lateral; trochanter to tarsus of legs and palp omitted). 27: male retrolateral claw of leg I (retrolateral). 28: female epigynum with two copulation plugs (ventral). 29: female vulva (dorsal). 30: female cheliceral dentition (ventral). 31: female eye position (dorsal). 32: female retrolateral claw of leg I (retrolateral). 33: female palpal claw (retrolateral). — B: bend, D: distal part of embolus, P: proximal part of embolus.



Figures 34-41. — *Cebrennus rungsi* sp. n. (male holotype, female paratype). 34-35: male palp (34 ventral, 35 retrolateral). 36: male cheliceral dentition (ventral). 37: female epigynum with one copulation plug (ventral). 38: female vulva (dorsal). 39: schematic course of female duct system (dorsal). 40: female cheliceral dentition (ventral). 41: female prosoma and opisthosoma (dorsal). — B: bend.

323, IV 323 (2), patella 000, tibia I 2014, II-IV 2024, metatarsus I-III 2024, IV 3036.

Chelicerae with 2 anterior and 5 posterior teeth (fig. 36).

Color: as in female.

Female. Carapace length 6.2, carapace width 5.3, anterior width of carapace 4.4, carapace height 2.3, abdomen length 7.1, abdomen width 4.9.

Eyes: AME 0.43, ALE 0.33, PME 0.25, PLE 0.25, AME-AME 0.41, AME-ALE 0.35, PME-PME 0.58, PME-PLE 1.10, AME-PME 0.33, ALE-PLE 0.83, clypeus AME 0.21, clypeus ALE 0.22.

Leg formula: 2413. Spination: femur I 3(2)23, II 323, III+IV 321, patella 000, tibia 2024, metatarsus I 2024, II 2(1)024, III 2024, IV 3036.

Chelicerae with 2 anterior and 5 posterior teeth (fig. 40).

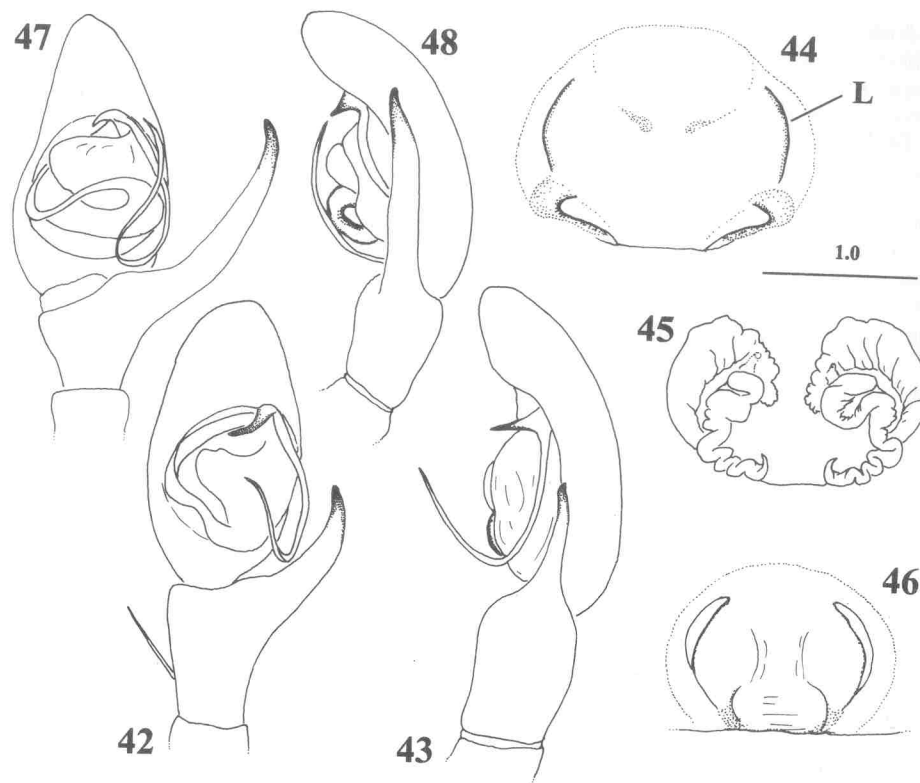
Color. Yellowish, with distinct abdominal pattern (fig. 41).

Distribution. Only known from the type locality (fig. 89: 1).

Note. Near Agadir a river called "Oued Sous" flows into the sea. South of this river exist a region called "As-Sus". Likely one of these two localities is the type region of the species.

Cebrennus castaneitarsis Simon 1880 (figs 42-46)

C. castaneitarsis SIMON 1880: 333 (sp. n.; male holotype, Algeria, Oran [=Wahran], MNHN? Not examined). SIMON 1897: 38, figs 36, 38, 40. STRAND 1908: 9.



Figures 42-48. — 42-46: *Cebrennus castaneitarsis* Simon 1880. 42-43 male palp (42 ventral, 43 retrolateral), 44, 46 female epigynum (ventral), 45 female vulva (dorsal). — 47-48: *Cebrennus wagaie* (Simon 1874), male palp (47 ventral, 48 retrolateral). — L: lateral ledges of epigynum. — 44-45 after LEVY 1989; 42-43, 46-48 after FAGE 1921.

FAGE 1921: 159, fig. 1 (a-c). CAPORACCO 1928: 94 (juv.). LEVY 1989: 159, figs 94-99.

C. sparassoides CAPORACCO 1928: 94-95. (sp. n., male holotype from Porto Bardia, Libya, MSNG. Not examined), SCHENKEL 1937: 388 (juv.). fig. 6. LEVY 1989: 159 (syn. n.).

Diagnosis. Males may be distinguished from related *C. wagaie* and *C. aethiopicus* by the following characters. Embolus arising in a 6 o'clock-position. Retrolateral tibial apophysis reaching the middle of tegulum (fig. 42). Females may be distinguished from related *C. aethiopicus* by the length of lateral epigynal

ledges, these reaching not the posterior cavities (figs 44, 46), last (winding) part of fertilization duct transversally to body length axis (fig. 45).

Redescription

Male. Carapace length 4.1-7.1, carapace width 3.5-6.5, abdomen length 4.1-6.1, abdomen width 3.0-4.5. Chelicerae with 2 anterior and 4-7 posterior teeth. For detailed description see LEVY (1989).

Distribution. Algeria (Wahran), Tunisia, Libya (Porto Bardia), Israel (Kefar Adummim, Yeroham) (fig. 89: 3, 8 & 13).

Note. The record of *C. castaneitarsis*, listed in STRAND (1908 : Ethiopia, Hamam-bou-Hadjar), may concern the closely related *C. aethiopicus*.

Biology. Individuals spin white cap-sular retreats, 10-20 mm in diameter (LEVY 1989: 162, fig. 99). These are attached to heads of low plants or spider webs (*Latrodectus* sp., *Stegodyphus* sp.). The spider sit inside with folded legs. One semicircular door is cutted by the spider into its retreat. Adult males and females are found in Israel from October to February (LEVY 1989).

***Cebrennus aethiopicus*
Simon 1880**
(figs 49-55)

C. aethiopicus SIMON 1880: 334 (sp. n., male holotype from Massaua [=Mits'iwa], Nubia [=Eritrea]. MNHN? Not examined), 1897: 41. PAGE 1921: 158-162, fig. 1 (d,e).

Material examined. 1 male (PJ 1348, with label: Saudi Arabien, W. Büttiker/Jeddah [= Gidda, Djidda], 31.I.1984/ Sparassidae male [Heteropodidae]). 1 female (PJ 1349, with label: Saudi Arabien, W. Büttiker/Wadi Hanaq, 100 m, 10.II.1984, 22°49' N, 39°22' E/ female Heteropodidae, g[enus]. ?, det. J. A. Murphy 1988.). 1 female (PJ 1350, with label: Saudi Arabien, W. Büttiker/Harithi, 20./21. [?] 1985, 21°18' N, 40°18' E/ female Heteropodidae, g[enus]. ?, det. J. A. Murphy 1988. [Formerly dried out; no measurements were taken]), all NHMB.

Diagnosis. Males may be distinguished from related *C. waggae* and *C. castaneitarsis* by the following characters. Embolus arising in a 4 o'clock-position. Retrolateral tibial apophysis reaching distal half of tegulum (fig. 49). Females may be distinguished from related *C. castaneitarsis* by the length of the lateral epigynal ledges, these reaching the posterior cavities (fig. 53), last (winding) part of

fertilization duct in body length axis (fig. 54).

Redescription of male.

Carapace length 6.6, carapace width 5.5, anterior width of carapace 3.5, carapace height 1.5, abdomen length 5.9, abdomen width 3.6.

Eyes: AME 0.49, ALE 0.32, PME 0.29, PLE 0.32, AME-AME 0.24, AME-ALE 0.17, PME-PME 0.48, PME-PLE 0.66, AME-PME 0.40, ALE-PLE 0.56, clypeus AME 0.15, clypeus ALE 0.23.

Leg formula: 2413. Spination: palpus 130, 000, 0000, femur I 323, II 323(4), III 323, IV 322, patella 000, tibia 2024, metatarsus I-III 3034, IV 3036. Measurements of palp and legs as in table III.

Chelicerae with 2 anterior and 4 posterior teeth (fig. 52).

Color. Yellow-brown, distal parts of legs darker. Prosoma and opisthosoma without markings.

Description of female

Carapace length 7.9, carapace width 6.0, anterior width of carapace 4.8, carapace height 2.5, abdomen length 8.8, abdomen width 7.8.

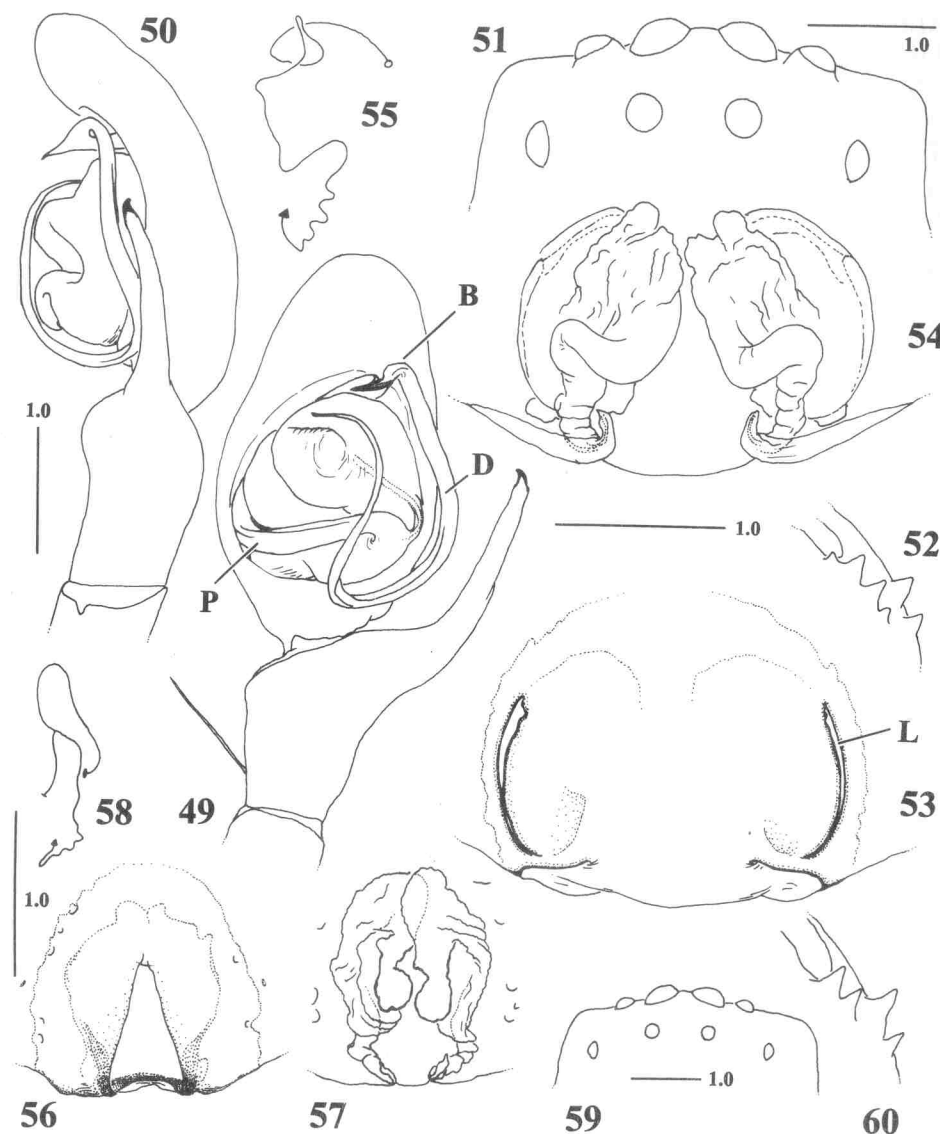
Eyes: AME 0.50, ALE 0.36, PME 0.35, PLE 0.35, AME-AME 0.33, AME-

	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.9	1.1	1.3		3.5	8.8
I	9.2	2.9	8.1	9.6	2.4	32.2
II	10.2	3.0	9.4	10.3	2.4	35.3
III	8.5	2.7	7.7	7.9	2.0	28.8
IV	10.0	2.6	8.3	9.6	2.2	32.7

Table III. — Measurements of palp and legs of male *Cebrennus aethiopicus* Simon 1880 (in millimetres).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	3.1	1.4	2.0		2.8	9.3
I	8.5	3.1	6.9	7.5	2.2	28.2
II	9.2	3.4	7.6	8.0	2.3	30.5
III	5.3	2.2	3.8	4.2	1.4	16.9
IV	9.0	3.0	7.0	7.6	1.8	28.4

Table IV. — Measurements of palp and legs of female *Cebrennus aethiopicus* Simon 1880 (in millimetres).



Figures 49-60. — 49-55: *Cebrennus aethiopicus* Simon 1880 (from W Saudi Arabia, Gidda). 49-50: male palp (49 ventral, 50 retrolateral). 51: male eye position (dorsal). 52: male cheliceral dentition (ventral). 53: female epigynum (ventral). 54: female vulva (dorsal). 55: schematic course of female duct system (dorsal). — 56-60: *Cebrennus mayri* sp. n. (female holotype). 56: epigynum (ventral). 57: vulva (dorsal). 58: schematic course of female duct system (dorsal). 59: eye position (dorsal). 60: cheliceral dentition (ventral). — B: bend, D: distal part of embolus, P: proximal part of embolus.

ALE 0.35, PME-PME 0.60, PME-PLE 1.02, AME-PME 0.49, ALE-PLE 0.84, clypeus AME 0.29, clypeus ALE 0.28.

Leg formula: 2413. Spination: palpus 130, 000, 1000, 1000, femur I-III 323, IV 322, patella 000, tibia 2024, metatarsus I-II 2034, III 3034, IV 3036 (4046). Measurements of palp and legs as in table IV.

Chelicerae with 2 anterior and 5 (left chelicera with 7) posterior teeth.

Color: as in male, but chelicerae distinctly distinct red-brown.

Distribution. Eritrea (Mits'iwa), Keiren?, Djibouti, Saudi-Arabia (Gidda, Wadi Hanaq, Harithi); Somalia? see also note in *C. castaneitarsis* (fig. 89: 14-18).

***Cebrennus wagae* (Simon 1874)**
(figs 47-48)

Cebrenis wagae SIMON 1874: 265, pl. 5, fig. 1 (sp. n., 1 male holotype from Constantine, Algeria. MNHN? Not examined).

Cebrennus wagae: SIMON 1880: 332; 1885: 14; 1897: 39, 48. FAGE 1921: 159, 162, fig. 1 (f,g).

Diagnosis. Males may be distinguished from related *C. castaneitarsis* and *C. aethiopicus* by the following characters. Embolus arising in a 6 o'clock position. Retrolateral tibial apophysis reaching the distal tip of tegulum (fig. 47). Females unknown.

Description.

See SIMON (1874) and FAGE (1921).

Distribution. N-Algeria (Constantine, Bou Saada, Enfida?).

***Cebrennus mayri* sp. n.**
(figs 56-60)

Type material. 1 female holotype (PJ 1342, with label: Oman 1986, W. Büttiker/Oman Eastern Sand Project/Mintirib, 269m, 1986, 22°25'N; 58°49'E; Res. Camp., 18.-26.III./ female Hetero-

	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.1	1.0	1.3		2.0	6.4
I	6.2	2.5	4.8	5.6	1.6	20.7
II	6.7	2.4	5.3	5.8	1.7	21.9
III	5.3	2.2	3.8	4.2	1.4	16.9
IV	6.9	2.0	4.7	5.3	1.5	20.4

Table V. — Measurements of palp and legs of female *Cebrennus mayri* sp. n., holotype (in millimetres).

podidae, *Cebrennus*? sp., det. J. A. Murphy 1988). NHMB.

Derivatio nominis. In honour of Prof. Dr Ernst Mayr, for his efforts and achievements in the fields of taxonomy, systematics and phylogeny; noun in genitive.

Diagnosis. Females epigynum with triangular median part (fig. 56). Vulva with two distinct roundish structures (fig. 57).

Description.

Female. Carapace length 5.5, carapace width 4.4, anterior width of carapace 3.5, carapace height 1.7, abdomen length 6.0, abdomen width 3.6.

Eyes: AME 0.48, ALE 0.22, PME 0.23, PLE 0.22, AME-AME 0.24, AME-ALE 0.20, PME-PME 0.55, PME-PLE 0.62, AME-PME 0.41, ALE-PLE 0.57, clypeus AME 0.13, clypeus ALE 0.21.

Leg formula: 2143. Spination: palpus 020, 000, 1000, 1000, femur I-II 323, III 221, IV 321 (332), patella 000, tibia 2024, metatarsus I-III 2024, IV 303 (2) 5. Measurements of palp and legs as in table V.

Chelicerae with 2 anterior and 2 posterior teeth (fig. 60).

Color. Yellow brown. Abdomen dorsally with thin and slight dark lines.

Male unknown.

Distribution. Only known from the type locality (fig. 89: 20).

***Cebrennus intermedius* sp. n.**
(figs 61-67)

Type material. 1 male holotype (PJ 1365, with label: Chicago Nat. Hist.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Pp	3.2 (3.2)	1.5 (1.4)	1.7 (1.9)		3.0 (3.0-3.4)	9.4 (9.5-9.9)
I	10.1 (10.3-10.5)	3.4 (3.3-3.5)	8.6 (8.5-8.8)	10.6 (9.9-10.1)	2.8 (2.7-2.8)	35.5 (35.1-35.2)
II	11.4 (11.2-12.0)	3.6 (3.5-3.6)	9.8 (9.2-9.7)	11.7 (10.8-11.1)	3.0 (2.8-2.9)	39.5 (38.0-38.8)
III	9.5 (9.5-9.7)	3.1 (2.9-3.2)	7.6 (7.3-7.5)	8.9 (8.3-8.4)	2.3 (2.3)	31.4 (30.6-30.8)
IV	11.5 (11.8-12.0)	3.2 (3.0-3.2)	8.9 (8.7-9.1)	11.0 (10.2-10.4)	2.7 (2.5-2.6)	37.3 (36.6-36.9)

Table VI. — Measurements of palp and legs of males *Cebrennus intermedius* sp. n., holotype with paratype in parentheses (in millimetres).

Museum, 3 spiders, Dhahran, opp. Bahrain Is., Saudi Arabia, Col. + pres. by T.C. Barger + L.M. Snyder, Rec'd IV:5:44), 2 males paratypes (PJ 1366, 1367, with same data as holotype) FMNH (PJ 1365, 1366), SMF (PJ 1367).

Derivatio nominis. The specific name is derived from the intermediate systematic position of this new species between the *villosus* group and other *Cebrennus* species, e.g. *C. rungsi* sp. n. (lat. intermedius = intermediate); adjective.

Diagnosis. Males. Distal part of embolus screw-like, pointed proximally (fig. 61).

Description.

Male. Carapace length 7.2 (7.1-7.4), carapace width 6.3 (5.9-6.1), anterior width of carapace 3.7 (3.5-3.8), carapace height 2.1 (2.0), abdomen length 7.0 (6.6-7.8), abdomen width 5.0 (4.1-5.5).

Eyes: AME 0.49 (0.53-0.56), ALE 0.35 (0.34-0.36), PME 0.34 (0.29-0.30), PLE 0.35 (0.34), AME-AME 0.22 (0.17), AME-ALE 0.015 (0.08-0.09), PME-PME 0.55 (0.55-0.57), PME-PLE 0.059 (0.58-0.59), AME-PME 0.43 (0.43-0.49), ALE-PLE 0.43 (0.42-0.49), clypeus AME 0.28 (0.28-0.29), clypeus ALE 0.36 (0.31-0.35).

Leg formula: 2413. Spination: palpus 13 (2) 1, 000, 1000, femur I-III 323, IV 322, patella 000, tibia I-III 2024 IV 2024 (3), metatarsus I-III 3024, IV 3036. Measurements of palp and legs as in table VI.

Chelicerae with 2-3 (with 1 in left chelicera of one specimen) anterior and 4-5 posterior teeth (fig. 66).

Retrolateral tibial apophysis slightly curved in ventral view (fig. 61), nearly straight and with tiny tip bent dorsally in lateral view (fig. 62). Embolus arising in 10 o'clock position, its proximal part broad. Tegulum extended prolaterally over the margin of cymbium, distally with rounded hump, retrolaterally with cavity, in this tip of embolus. Membranous remnant of conductor visible in retrolateral view. Distal part of cymbium as long as one half of its proximal part (figs 61-63).

Color. Yellow-brown, abdomen ventrally lighter; remainders of whitish hairs at coxae, trochanter and margin of carapace. Body likely covered with hairs as in other *Cebrennus* spp.

Female unknown.

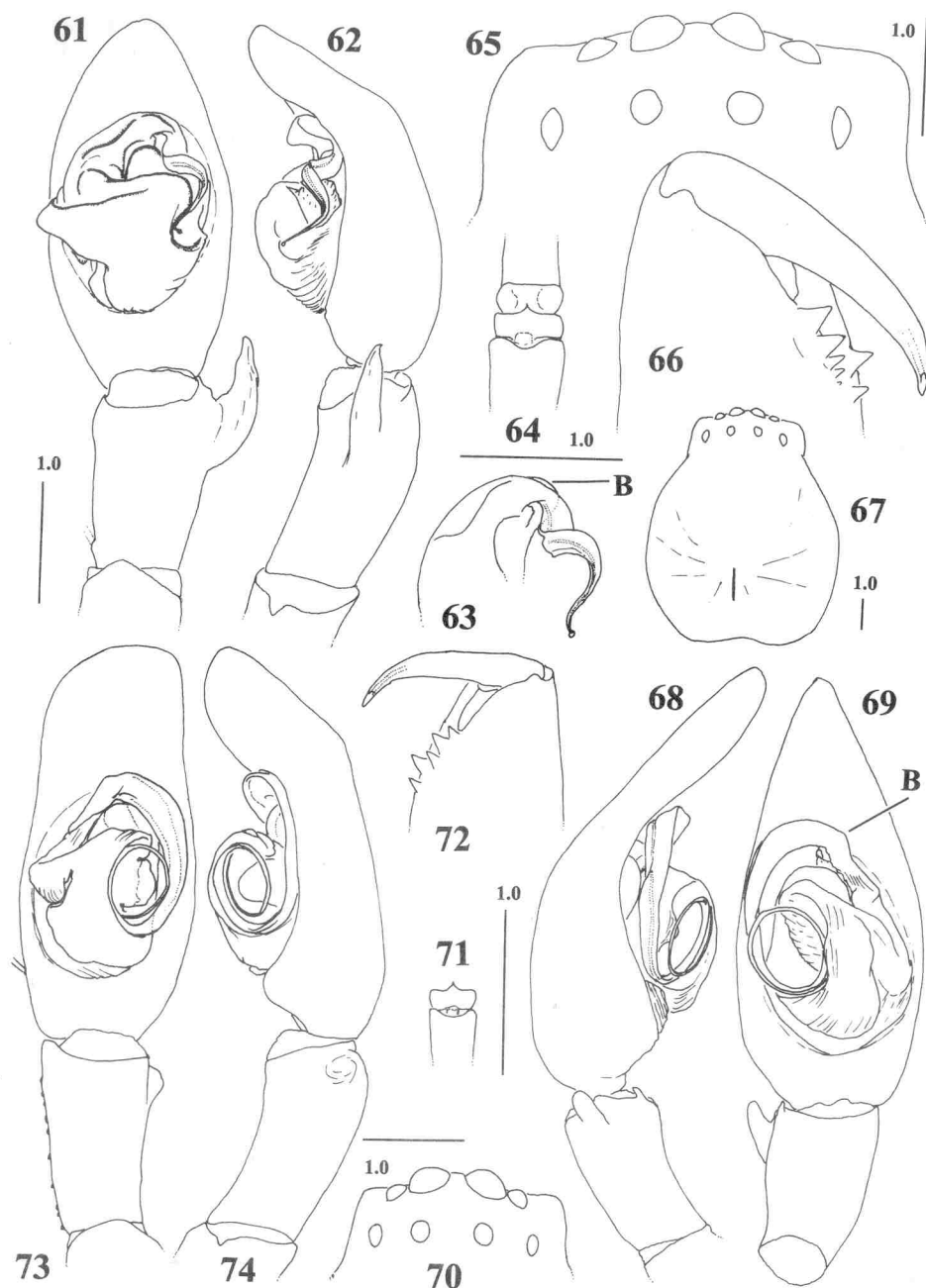
Distribution. Only known from the type locality (fig. 89: 19).

Cebrennus concolor
(Denis 1947) comb. nov.
(figs 68-72)

Cerbalus concolor DENIS 1947: 52-53, pl. III, figs 1-3 (sp. n., 1 male holotype, PJ 1371, with label: near Zeitoun, Siwa, Egypt. Sand dunes, 30 August 1936, Omer-Cooperativa Exped. 1935, BM 1936.2.12.1070. Examined) NHM.

Cerbalopsis concolor: LEVY 1989: 144 (comb. n.)

Diagnosis. Males. Distal part of embolus coiled 1.5 times (figs 68-69). Closely related to *C. villosus*. May be distinguished from the latter by the presence of a distinct retrolateral tibial apophysis and



	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.5	0.9	1.0		2.7	7.1
I	8.1	2.2	7.1	7.8	1.8	27.0
II	9.1	2.5	8.1	8.5	1.9	30.1
III	7.1	2.2	5.7	6.1	1.6	22.8
IV	8.6	2.3	7.1	7.6	1.7	27.3

Table VII. — Measurements of palp and legs of male *Cebrennus concolor* (Denis, 1947), comb. nov. (in millimetres).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	4.5	1.7	1.9		3.7	11.8
I	13.4	4.5	11.1	12.2	2.7	43.9
II	14.5	4.5	12.5	13.3	3.1	47.9
III	12.1	4.0	9.5	10.4	2.6	38.6
IV	14.3	4.0	11.4	11.9	3.0	44.6

Table VIII. — Measurements of palp and legs of male *Cebrennus villosus* (Jézéquel & Junqua, 1966), comb. nov. (in millimetres).

the pointed cymbium, distinct gap between rounded part of embolus and tegulum present (fig. 69).

Redescription.

Male. Carapace length 4.8, carapace width 4.0, anterior width of carapace 2.2, carapace height 1.3, abdomen length 4.2, abdomen width 3.2.

Eyes: AME 0.48, ALE 0.25, PME 0.21, PLE 0.21, AME-AME 0.11, AME-ALE 0.00, PME-PME 0.43, PME-PLP 0.35, AME-PME 0.28, ALE-PLP 0.31, clypeus AME 0.11, clypeus ALE 0.21.

Leg formula: 2413. Spination: palpus 120,000,0000, femur I 223, II 323, III-IV 222, patella 000, tibia 2024, metatarsus I 202(1)4, II 2024, III 2024(3), IV 3035. Measurements of palp and legs as in table VII.

Chelicerae with 2 anterior and 3 posterior teeth (fig. 72).

Figures 61-74. — 61-67: *Cebrennus intermedius* sp. n. (male holotype). 61-62: palp (61 ventral, 62 retrolateral). 63: embolus (ventral) with a drop on its tip. 64: trilobate membrane of metatarsus (dorsal). 65: eye position (dorsal). 66: cheliceral dentition (ventral). 67: prosoma (dorsal). — 68-72: *Cebrennus concolor* (Denis, 1947) comb. nov. (male holotype). 68-69: palp (68 ventral, 69 retrolateral). 70: eye position (dorsal). 71: trilobate membrane of metatarsus (dorsal). 72: left chelicera (ventral). — 73-74: *Cebrennus villosus* (Jézéquel & Junqua 1966) comb. nov., male palp (73 ventral, 74 retrolateral). — B: bend.

Retrolateral tibial apophysis small and blunt. Embolus arising in 9 o'clock position, first part of its distal half curved parallel to the margin of tegulum. Tegulum distally with rounded hump, retrolaterally with cavity, in this distal coils of embolus. Distal part of cymbium elongated and flattened in lateral view, as long as its proximal part.

Color: holotype was dried out formerly; see description in DENIS (1947).

Female unknown.

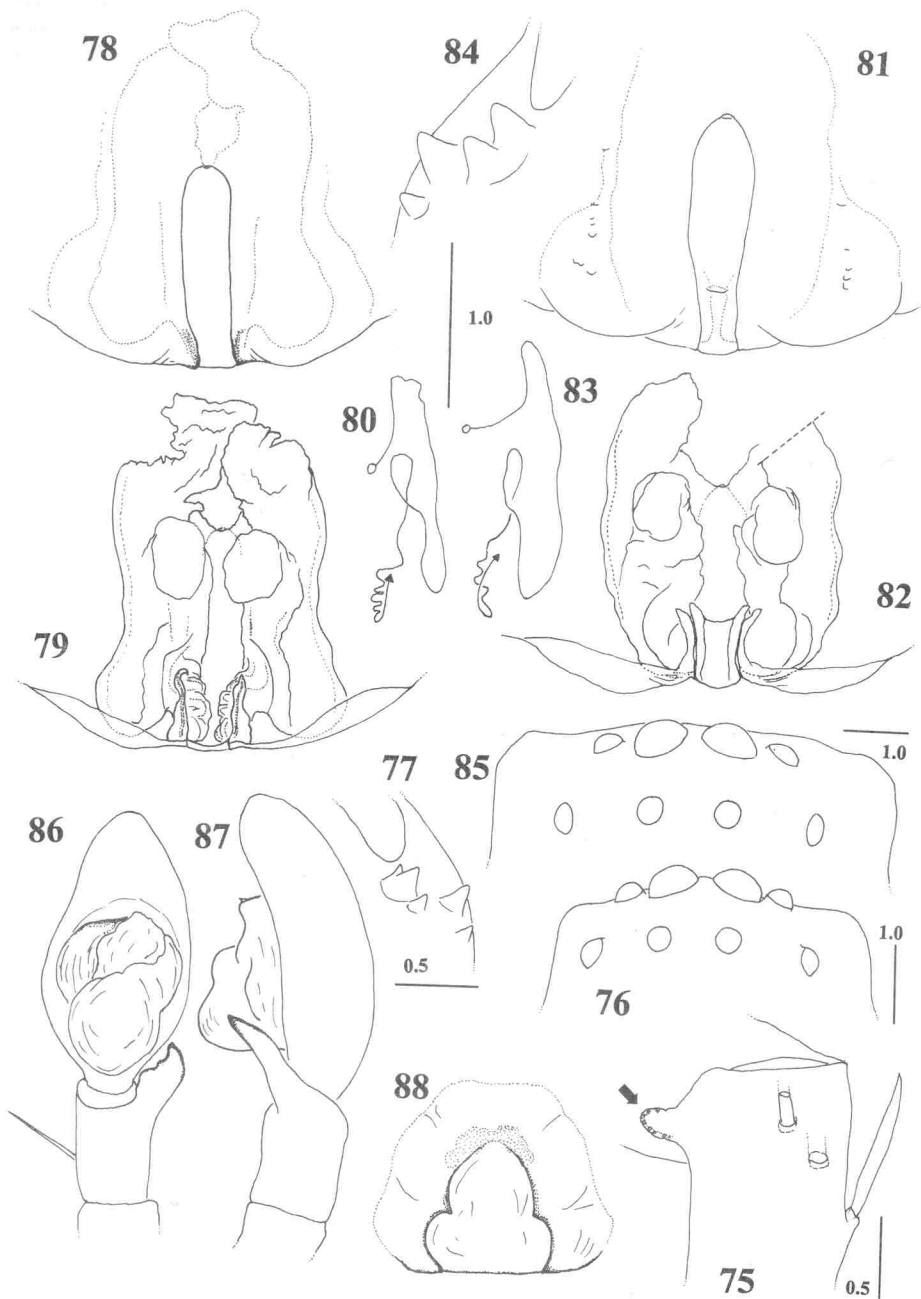
Distribution. Only known from the type locality (fig. 89: 9).

Cebrennus villosus (Jézéquel & Junqua 1966) comb. nov. (figs 73-85)

Cerbalopsis villosa JÉZÉQUEL & JUNQUA 1966: 970 (sp. n.; 3 males, 10 females, some juveniles, syntypes from Algeria, Sahara, Grand Erg. MNHN? Not examined).

Material examined. 1 female (PJ 1338, with label: Tunisia, N of Grand Erg Oriental, Jebil Nature Reserve, 80 km S of Douz, near: 32°49'N, 09°01'E, U. Moldrzyk leg.), 1 female (PJ 1357, with label: Tunisie 1998, 29.08.98, Ort: J3, Biotop: Sand, leg. Margens) all HLMD. 1 male, 1 female (PJ 172, 173, without label [the vial was located within the HUBERT's collection from Nepal]) MNHN.

Diagnosis. Males. Distal part of embolus rolled up 1.5 times, retrolateral tibial apophysis totally reduced, cymbium not pointed, no gap between rounded part of embolus and tegulum present (figs



	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Pp	4.1-4.4	1.8-2.0	2.3-2.6		4.1-4.3	12.3-13.3
I	11.2-11.8	4.1-4.5	8.6-9.2	9.5-10.6	2.6-2.7	36.0-38.8
II	12.5-13.0	4.1-4.7	9.5-10.5	10.7-11.6	2.7-2.8	39.6-42.5
III	9.7-10.6	3.9-4.0	7.0-7.6	7.8-8.4	2.3-2.6	30.7-33.2
IV	12.5-12.9	3.7-4.2	8.9-9.5	9.6-10.5	2.5-2.7	37.2-39.8

Table IX. — Measurements of palp and legs of females *Cebrennus villosus* (Jézéquel & Junqua, 1966), comb. nov. (in millimetres).

73, 74). Tiny apophysis at palpal femora present (fig. 75). Females. Median part of epigynum slit-like with rounded anterior end (figs 78, 81).

Redescription.

Male. Carapace length 8.9, carapace width 7.5, anterior width of carapace 4.3, carapace height 2.1, abdomen length 10.2, abdomen width 7.1.

Eyes: AME 0.66, ALE 0.36, PME 0.35, PLE 0.34, AME-AME 0.25, AME-ALE 0.08, PME-PME 0.60, PME-PL 0.71, AME-PME 0.53, ALE-PL 0.63, clypeus AME 0.22, clypeus ALE 0.29.

Leg formula: 2413. Spination: palpus 120, 001, 0000, femur I-III 323, IV 322, patella 000, tibia 2024, metatarsus I-III 2024, IV 3035. Measurements of palp and legs as in table VIII.

Chelicerae with 2 anterior and 3 posterior teeth (fig. 77). Long setae frontally at chelicerae, forming a semi-circle, this opened to the bottom.

Row of long setae retrolaterally at femur, prolaterally at patella, tibia and tarsus of palpus. Distal part of cymbium as long as one third of its proximal part (fig. 74).

Color. Yellowish-brown, dark claw-tufts at legs and palpi. Without pattern.

Female. Carapace length 8.5 (9.3), carapace width 6.4 (8.1), anterior width of carapace 4.9 (6.1), carapace height 2.5

(2.2), abdomen length 9.1 (10.8), abdomen width 7.6 (8.8).

Eyes. AME 0.70(0.70), ALE 0.42 (0.41), PME 0.35 (0.38), PLE 0.35 (0.42), AME-AME 0.21 (0.22), AME-ALE 0.18 (0.20), PME-PME 0.64 (0.87), PME-PL 0.87 (0.88), AME-PME 0.53 (0.56), ALE-PL 0.70 (0.87), clypeus AME 0.29 (0.30), clypeus ALE 0.34 (0.36).

Leg formula: 2413. Spination: palpus 020, 000, 0000, 0000, femur I+II 323, III-IV 322, patella 000, tibia 2024, metatarsus I-III 2024, IV 3036. Measurements of palp and legs as in table IX.

Chelicerae with 2 anterior and 2 (right chelicera with 3) posterior teeth (fig. 84).

Color as in male. In fresh specimen (PJ 1338) color brighter (pale yellow). The living specimen remembered with its shimmering body on *Carparachne* spp. from the Namib Desert.

Distribution. S-Tunisia, Algeria (Sahara: Grand Erg) (fig. 89: 7).

Biology. JÉZÉQUEL & JUNQUA (1966) gave information on the biology of this species. As it was possible to observe one female specimen in captivity, some additional observations on the biology are listed below.

One living female specimen was captured by Uwe Moldrzyk in S-Tunisia. At the type locality he observed an amount

Figure 75-88. — 75-85: *Cebrennus villosus* (Jézéquel & Junqua 1966) comb. nov. 75: male tip of palpal femur (retrolateral). 76: male eye position (dorsal). 77: male cheliceral dentition (ventral). 78, 81: female epigynum (ventral). 79, 82: female vulva (dorsal). 80, 83: schematic course of female duct system (dorsal). 84: female cheliceral dentition (ventral). 85: female eye position (dorsal). — 86-88: *Cebrennus tunetanus* Simon 1885. 86-87: male palp (86 ventral, 87 retrolateral). 88: female epigynum (ventral) — (86-88 after FAGE 1921).

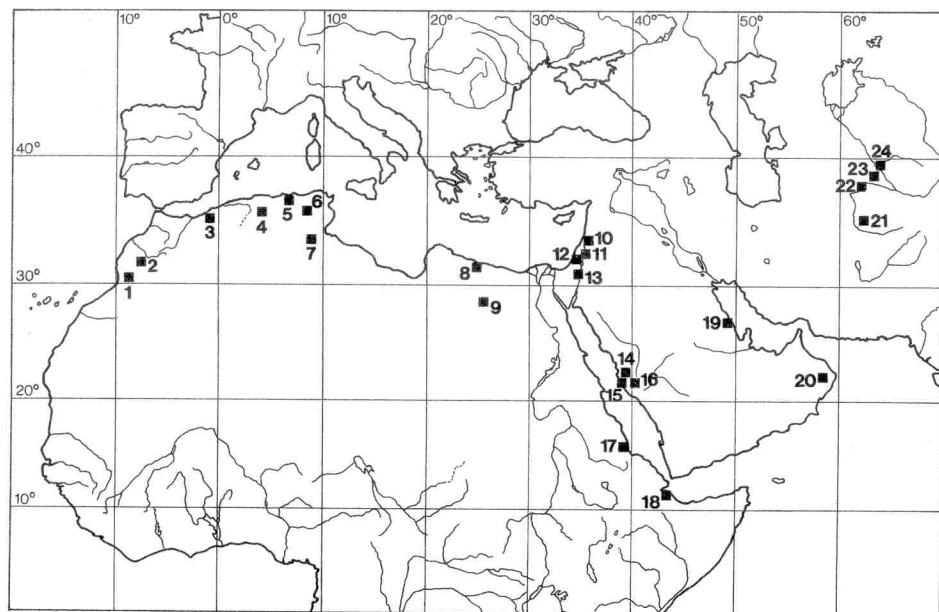


Figure 89. — Distribution of *Cebrennus* in North Africa, Arabian Peninsula and Central Asia. 1: Sous (*C. rungsi* sp. n.; see note below species description). 2: Beni Amar (*C. powelli*). 3: Wahran (*C. cultrifer*, *C. castaneitarsis*). 4: Bou Saada. 5: Constantine (4-5: *C. waga*). 6: El Kef (*C. tunetanus*). 7: Douz (*C. villosus*). 8: Porto Bardia (*C. castaneitarsis*). 9: Siwa (*C. concolor*). 10: Mount. Hermon. 11: Jordan valley. 12: Jerusalem, Be'er Sheva (10-12: *C. kochi*). 13: Yeroham (*C. castaneitarsis*). 14: Wadi Hanaq. 15: Gidda. 16: Harithi. 17: Mits'iwa. 18: Djibouti (14-18: *C. aethiopicus*). 19: Dhahran (*C. intermedius* sp. n.). 20: Mintirib (*C. mayri* sp. n.). 21: Chemenibit. 22: Utch-Adzhi. 23: Repetek. 24: Elbashchi (20-24: *C. logunovi* sp. n.).

of silken, sand-covered tubes, whose distal parts towered above the soil surface. The empty tubes were easily recognized, because the sand around the tube was blown away by the wind. They were found in a high abundance as well in the sand dunes as in the transition zone of the dunes to the rocky areas of the Grand Erg, S-Tunisia (Moldrzyk in litt.). In the same area at least three other spider species of the following families built tubes in the sand (Filistatidae, Gnaphosidae, Lycosidae, ?Philodromidae). A new *Cerbalus* sp. was described by JÄGER (in print). It dig also tubes in loose sand.

One living specimen was transferred to Germany, where I was able to study its

behaviour. It was kept in a plastic box (20 cm × 40 cm), which was filled with fine sand (a layer of ca. 15 cm). It was fed with larvae and adults of the beetle *Tenebrio molitor*. The observed behaviour may be influenced by the artificial conditions. The female burrowed at night-time a small tube (3 cm long and 1.5 cm wide), which led vertical in the sand. The opening was closed with a silken layer, which was camouflaged with sand and later with remnants of prey. In following days it made several new tubes, some remained open, some were closed. At night-time the spider came out walking around. When feeding the spider at day-time, two different ways of prey capture

could be observed: in one case, when the tube was closed, the prey was bitten through the silken threads (as in species of the genus *Atypus*) and was pulled down in the tube slowly. When the tube remained open and prey was detected, the spider put the legs out of the tube and caught e.g. a beetle by touching it with the scopulae of its tarsi and metatarsi and pulling it to the chelicerae.

The threatening attitude could be observed when disturbing the spider: it stands on the tips of the tarsi, raised high above the ground. The behaviour resembles that described by LAWRENCE (1962) for *Leucorchestris* spp. and *Carp-arachne* spp.

A cocoon was built inside the tube. The ground layer of the cocoon was attached on a vertical margin of the tube. Some (of the unfertilized) eggs flowed at the bottom of the tube. After covering the remaining eggs with a silken layer, the eggs on the ground were eaten by the female. Afterwards, the cocoon was covered with sand.

Cebrennus tunetanus Simon 1885 (figs 86-88)

C. tunetanus SIMON 1885: 14-15. (sp. n., 1 male + some juv., syntypes from El-Kef and Enfida. MNHN? Not examined). SIMON 1897: 39. FAGE 1921: 159-163., fig. 2 (d-f).

Diagnosis. Males. Tegulum with distinct proximal hump in lateral view (fig. 87). Females. Epigynal ledges converging anteriorly, with indentation in the middle (fig. 88).

Description.

See SIMON (1885) and FAGE (1921).

Distribution. Tunisia (El Kef, Enfida?) (fig. 89: 6).

Relationships. See note in genus description.

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