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A REDESCRIPTION OF *TRICASSA DESERTICOLA* SIMON, 1910, REPRESENTING THE TRICASSINAE, A NEW SUBFAMILY OF WOLF SPIDERS (ARANEAE, LYCOSIDAE)

by

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ABSTRACT

A detailed redescription is provided of *Tricassa deserticola* SIMON, 1910 after the discovery of male material. The species occurs along the south-western coast of Africa and has a distinctive genitalial structure. Its taxonomic position is discussed and a new subfamily, the Tricassinae, is proposed to accommodate this very peculiar spider species.

Key words : Araneae, Lycosidae, Tricassinae, *Tricassa,* Africa, taxonomy.

INTRODUCTION

Tricassa deserticola was discovered along the coast of Namibia, at Lüderitzbucht, during the 1903-1905 expeditions of the « Königliche Preussischen Akademie der Wissenschaften » and described by SIMON in 1910. Unfortunately, the very short Latin description of the two female type specimens (SIMON, 1910 : 213) is not accompanied by an illustration. The original description does not reveal the unusual habitus of this spider, which upon superficial examination does not ressemble a lycosid. The same applies to ROEWER's (1959-1960) redescription and illustration. His drawing (fig. 521, p. 942) of the epigyne is misleading and gives the impression of an « inverted T », so common in other lycosids.

Besides the type material, two females, only one report on other specimens is available : PENRITH and KENSLEY (1970) caught spiders on a supralittoral sandy beach during their study on rocky shores near Lüderitz ; the whereabouts of the specimens is unknown. The species is also listed by LAWRENCE (1965) and by GRIFFIN and DIPPENAAR-SCHOEMAN (1991).

Recently, several specimens of what appeared to be *Tricassa deserticola* were sent to us for identification. Two samples from separate localities in Namibia

included both males and females. Considering the lack of good illustrations of this peculiar spider and the fact that its position within the Lycosidae was unclear, a detailed redescription and an analysis of its taxonomic position seemed necessary.

Both SIMON (1910) and ROEWER (1959-1960) classified the species within the Lycosidae. This view is supported by the absence of the tibial apophysis on the male palp and by the typical eye arrangement found in *Tricassa,* both considered synapomorphies of the Lycosidae (DONDALE, 1986). Information on the behaviour of the species (carrying of egg cocoon and/or pulli ?) would corroborate this placement.

However, *Tricassa deserticola* cannot be placed in any of the existing subfamilies of Lycosidae. The species has several peculiarities which necessitate the erection of a new taxon at the subfamily level. In this paper, we describe the male for the first time, provide a detailed redescription of the female and discuss the taxonomic position of *Tricassa.*

ABBREVIATIONS

Material was provided by the following institutions :

MRAC = Musée Royal de l'Afrique Centrale, Tervuren, Belgium (R. Jocqué).
NCP = National Collection of Arachnida Pretoria, South Africa (A. S. Dippenaar-Schoeman).
NMSA = Natal Museum, Pietermaritzburg, South Africa (P. Croeser),
ZMB = Zoologisches Museum, Berlin, Germany (M. Moritz).

Other abbreviations used in the text are :

MNHN = Musée National d'Histoire naturelle, Paris, France
CW = Carapace width in mm.
CL = Carapace length in mm.
TL = Total length in mm.
AME = Outer diameter of one anterior median eye in mm
PME = Outer diameter of one posterior median eye in mm.
IV/CL = Ratio of total length of leg IV to carapace length.

DESCRIPTIONS

Tricassinae n. subfam.

Diagnosis : Representatives of the subfamily are recognized by the long anterior spinnerets, the large shaft-like, longitudinal median apophysis in the male palp, the simple epigyne with papillose surface of the scape and the long winding copulatory ducts in the female.

Type genus : Tricassa SIMON, 1910, with one species.

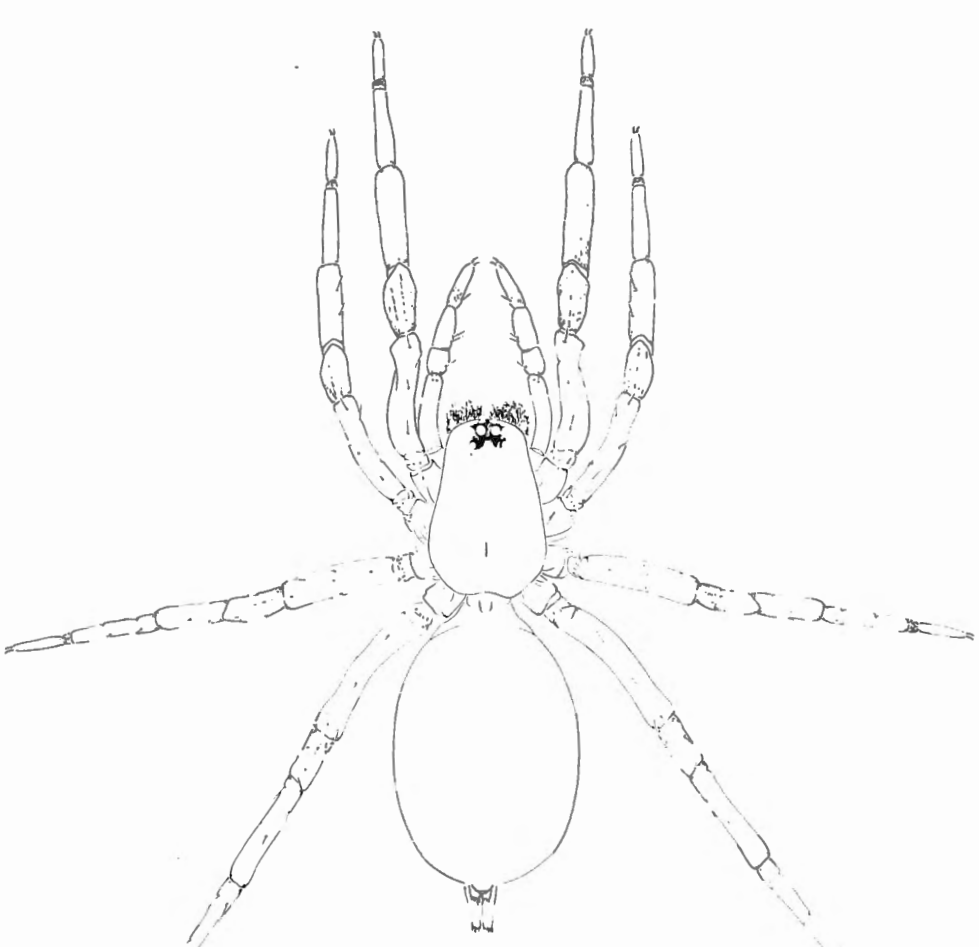
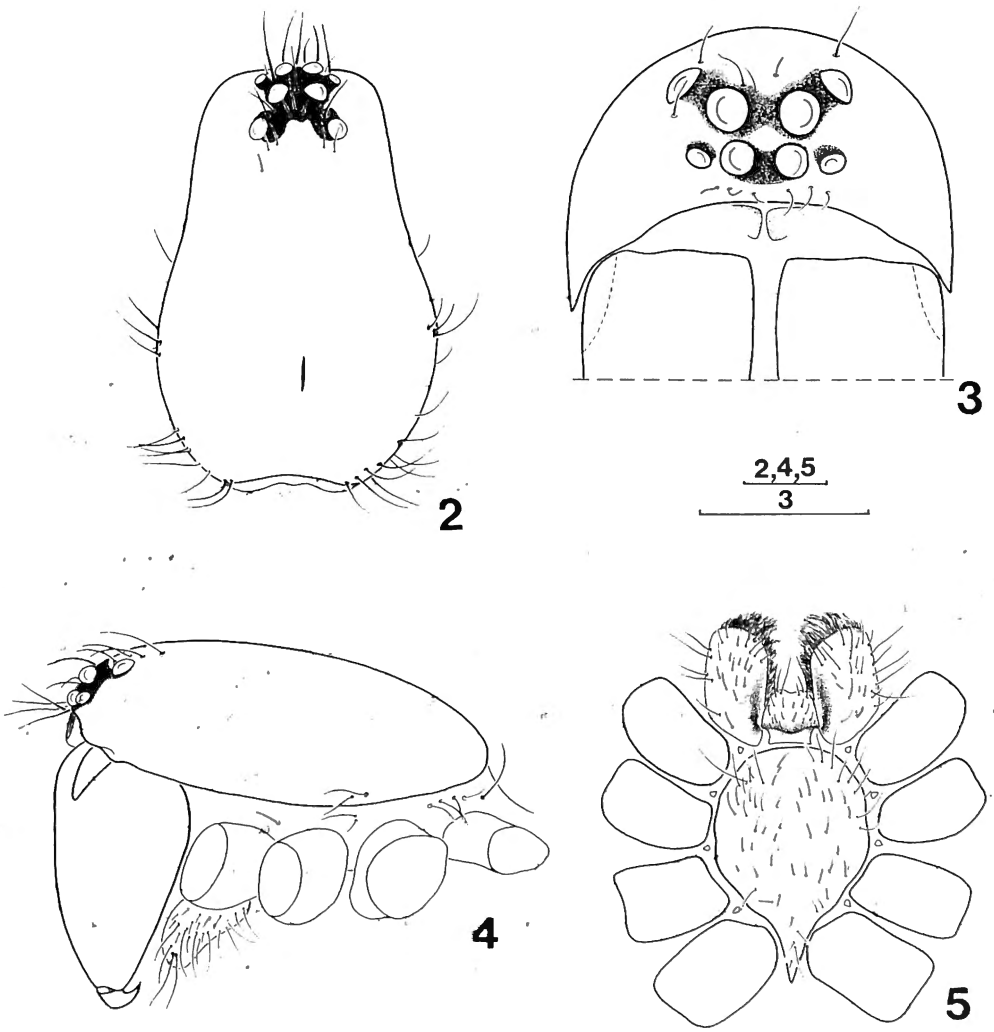


Fig. 1. — *Tricassa deserticola* — habitus of the female (scale = 1 mm).

Tricassa deserticola SIMON, 1910

Diagnosis :

Since *T. deserticola* is the only representative of the subfamily so far described, the species is diagnosed by the same characters.



Figs 2-5. *Tricassa deserticola* — 2-4. Female carapace, dorsal view (2), frontal view (3) and lateral view (4). - 5. sternum, labium and endites.
(Scale = 0.5 mm).

Type material :

Holotype ♀ : Namibia (South West Africa), Lüderitzbucht (ZMB 8566) (examined)

Paratype ♀ : same locality as Holotype (MNHN) (not examined)

Other material examined : South Africa : 1 ♂, 1 ♀ : Cape Province, Buffels Bay, Cape of Good Hope (34°19′ S — 18°26′ E), 25-29.X.1985, C. Griswold, J. Doyen and T.M. Griswold (NMSA). 1 ♂, 1 ♀ : Cape Province, Namaqualand, Port Nolloth, beach traps, VIII.1990,

A.M. McLachlan (MRAC 172.655). 3 ♂♂, 3♀♀ : Cape Province, Port Nolloth, beach traps, VIII.1990, A.M. McLachlan (NCP 91/77).

Distribution : Western coast of southern Africa, from Lüderitzbucht in the north to the Cape Peninsula in the south.

Description male (Figs 6-8, 12-13)

Measurements (mean, range, n = 3) : CW = 1.99 (1.80-2.16), CL = 2.72 (2.45-2.92), TL = 5.36 (4.60-5.88), AME = 0.14 (0.12-0.15), PME = 0.18 (0.17-0.19), IV/CL = 4.74 (4.66-4.86).

Carapace : uniformly pale yellowish white, without median or lateral coloured bands as present in many other lycosids. Profile domed, not falling sharply towards posterior margin as in female.

Sternum : uniform, yellowish white.

Clypeus : very narrow, much narrower than diameter of AME. Uniform pale, no colour difference with carapace. With some long hairs pointing forward. Chilum double, with two sclerites almost as wide as high, with faint lateral margin.

Chelicerae : relatively long and narrow. Pale yellow (compare with female) with two teeth on inner margin.

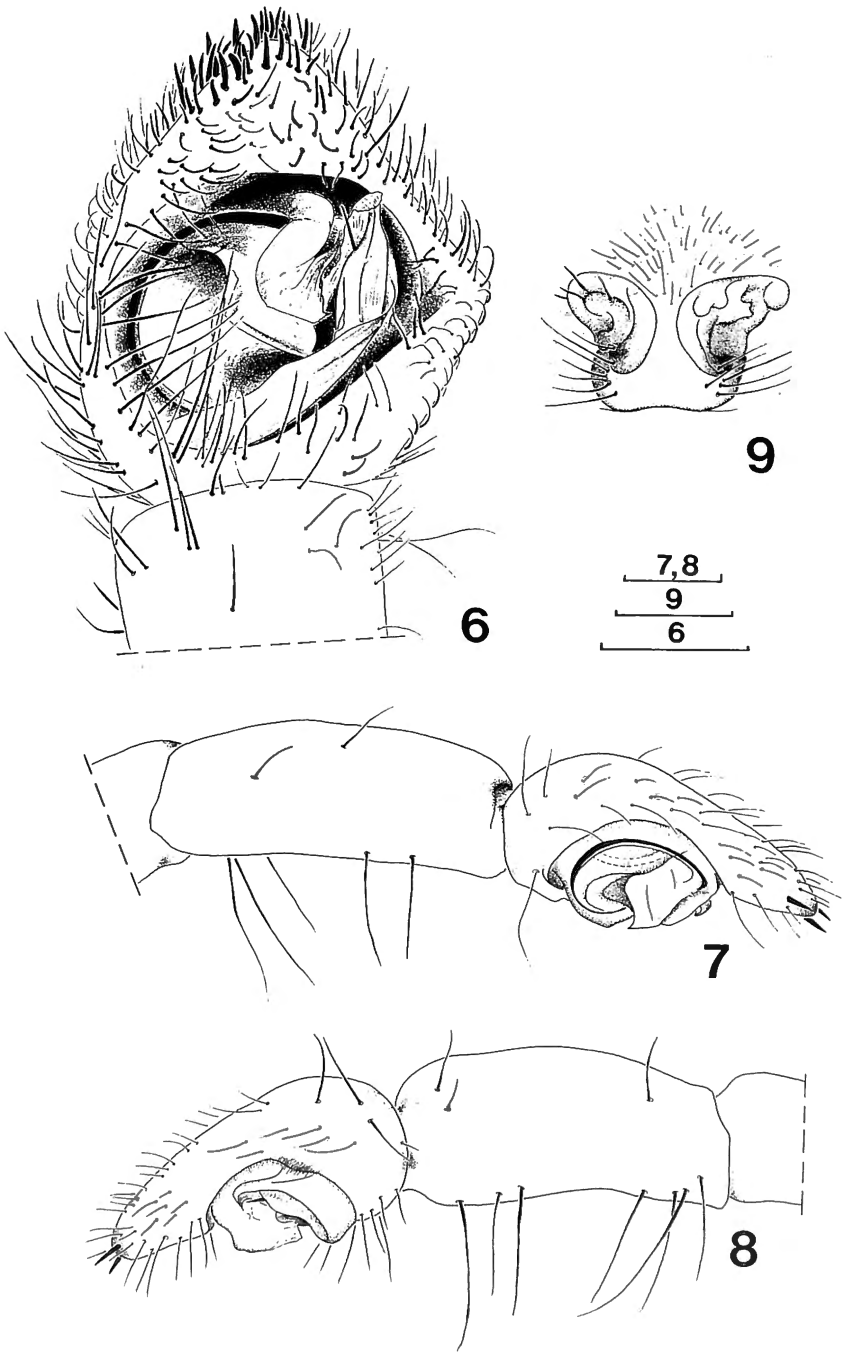
Eyes : anterior and posterior row clearly recurved. AME at least twice the diameter of ALE. PME enlarged but not strikingly so, only slightly larger than AME (see measurements). PLE only about one diameter from PME. Anterior row of eyes wider than second row of eyes. Ocular field with black patches and a few hairs.

Abdomen : almost completely uniformly pale yellow (no abdominal colour pattern), sometimes with a pink glimmer or somewhat transparent showing main blood vessel. With a group of stronger hairs on its dorso-basal edge. Venter uniformly pale yellow.

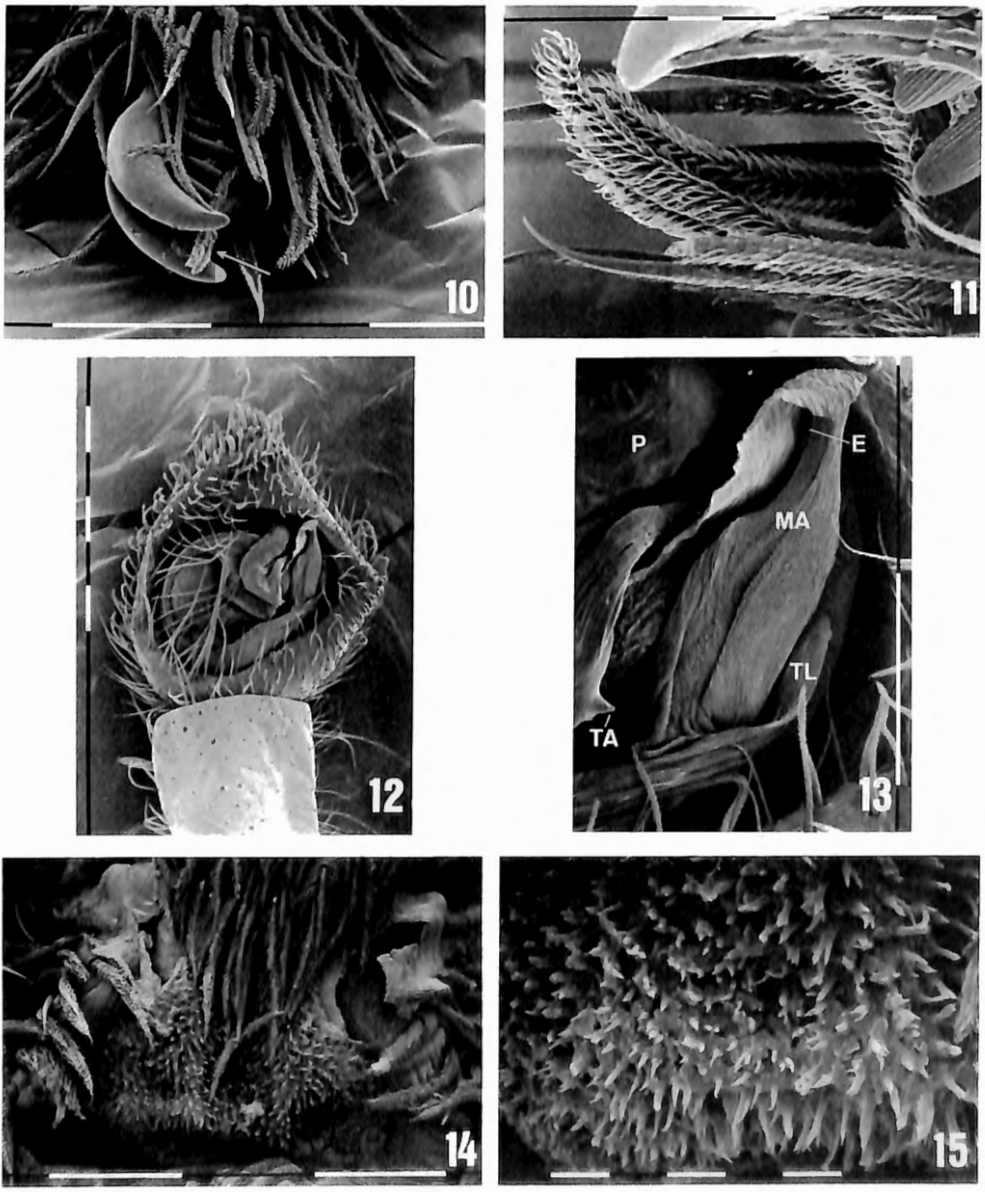
Spinnerets : uniformly pale. Anterior spinnerets cylindrical and strikingly elongated ; apical segment twice as long as basal one.

Legs : uniform, pale yellow, without darker patches or annulations. Legs long and slender, IV/CL relatively high (compare with female). Patella rather elongated. Tibia I with two pairs of long ventral spines and one additional, smaller apical pair (compare with female). Coxae clearly notched. Three tarsal claws, dorsal pair strong and relatively short with about six long ventral teeth. Tip of tarsi with curved modified hairs (Fig. 10, arrow ; Fig. 11).

Palp : elongated, with relatively long femoral and tibial segments. All segments pale yellow, same colour as legs and carapace, without any darker patches. Palpal tibia ventrally with widely spaced, long, slender hairs (length about one diameter of the tibia). Cymbium short, robust, retrolaterally angularly produced. Embolus very long with medio-apical insertion. Median apophysis and tegular lobe functioning as conductor.



Figs 6-9. *Tricassa deserticola* — 6-8. male palp, ventral view (6) mesal view (7) and lateral view (8). - 9. epigyne.
(Scale = 0.2 mm).



Figs 10-15. *Tricassa deserticola* — 10-11. tip of tarsus with modified hairs (10, arrow) and detail (11). - 12-13. male palp in ventral view, E = embolus, MA = median apophysis, P = palea, TA = terminal apophysis, TL = tegular lobe. - 14-15. epigyne, ventral view (14) and detail of scape (15).
(Scale = 0.1 mm in Figs 10-12, 14 ; scale = 0.01 mm in Figs 13, 15).

Description female (Figs 1-5, 9, 14-17)

Measurements (mean, range, n = 3) : CW = 2.32 (2.00-2.55), CL = 3.21 (2.86-3.50), TL = 7.84 (6.58-9.10 (abdomen swollen)), AME = 0.15 (0.13-0.18), PME = 0.20 (0.18-0.22), IV/CL = 3.26 (3.06-3.48).

Carapace : colour pale yellow, as in male. Shape somewhat more elongated than in male with widest point behind middle. Highest point of profile just behind ocular area, sharply falling towards posterior margin.

Sternum : pale yellow, as in male.

Clypeus : narrow and pale, as in male, but with more long hairs pointing forward. Chilum double, with two sclerites almost as wide as high and faint lateral margin.

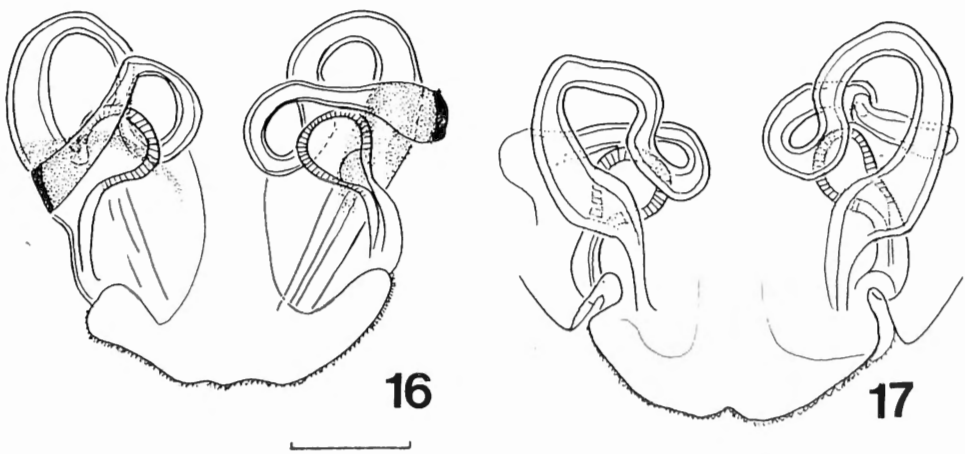
Chelicerae : relatively long, stronger than in male, chestnut brown (compare with male). Inner margin with two teeth.

Eyes : position and relative size exactly as in male ; ocular field also with black patches, but with more long hairs.

Abdomen : pale yellow to white.

Spinnerets : pale yellow to white. Anterior pair elongated and with apical segment twice as long as basal one.

Legs : Uniformly pale yellow, without darker patches or annulations. Much more robust than in male. Patellae and tibiae with many, short hairs ; to some extent organised in rows (on patellae). Patella, tibia, metatarsus and tarsus of leg I spineless, of leg II with very few spines (compare with male). Spines shorter and thicker than in male.



Figs 16-17. *Tricassa deserticola* : vulva, cleared in methyl salicylate — 16. dorsal view. - 17. ventral view.
(Scale = 0.1 mm).

Palp : uniformly pale yellow, same colour as carapace. Relatively long and strong. Tarsus somewhat darkened at tip, mainly due to occurrence of very dense, short spines on all sides. Tarsal claws strongly developed and relatively long (ca.0.24 mm), only slightly bent with some minute teeth at its very base (in contrast to leg claws).

Epigyne : consists of a simple median plate with a striking papillose surface (high magnification necessary).

Vulva : with entrance ducts long and winding. Copulatory openings near anterior lateral margin of epigyne. Large distal entrance ducts open ventrally into spermathecae but appear to be produced somewhat beyond that point. Fertilization ducts directed outwards and backwards, then curved inwards.

DISCUSSION

Habitat and behaviour of *Tricassa deserticola*

Little is known on the habitat and behaviour of this species. It seems to be restricted to coastal areas where it prefers sandy beaches. According to PENRITH and KENSLEY (1970) it does not occur in the sandy areas below high-water level of spring tides. It most probably makes a burrow in the sand although it is possible that adult males, in contrast to females, are no longer capable of making a new burrow (this can be deduced from their morphology, cf. ZYUZIN, 1990). Such a dimorphism has been recorded in other wolf spiders (ALDERWEIRELDT and JOCQUÉ, 1991), but requires confirmation from field or laboratory observations for this particular species.

Based on records of females with swollen abdomina, it is probable that egg cocoons are produced during October. This is the only element of the life cycle of *Tricassa* known at present.

Ethological data on this species would be of interest to establish if it behaves like a typical lycosid. It is not known if the female of *Tricassa* carries her egg cocoon attached to the spinnerets and the pulli on her abdomen as is the case in all other Lycosidae. Both characters are considered as synapomorphies of the Lycosidae (DONDALE, 1986).

Taxonomic position of *Tricassa*

As summarized by DONDALE (1986), the taxon Lycosidae is based on three autapomorphies. The first is the peculiar eye arrangement. Although the eye arrangement of *Tricassa* fits the general pattern known for typical Lycosidae, there are some small, but significant differences. The posterior median eyes are slightly larger than the anterior median eyes but the difference is much less pronounced than in most other lycosids. The distance between the posterior lateral and the posterior median eyes is small since the posterior lateral eyes are not shifted as far backwards as in typical Lycosidae. The eye arrangement thus resembles, to some

extent, that of other families, such as Pisauridae, Ctenidae, Zoridae or Zoropsidae. However, the genus does not belong in any of the latter three families because of the presence of three tarsal claws.

The second synapomorphy of the Lycosidae is the loss of a retrolateral apophysis on the male palpal tibia, as in *Tricassa deserticola*. Therefore it cannot be assigned to the Pisauridae.

Because of a lack of ethological information, it is not known if the third synapomorphy of the Lycosidae, *i.e.* active transport of the egg sac attached to the mother's spinnerets and of the young spiderlings on her abdomen, is present in *Tricassa*.

There are several peculiarities which make this species unusual within the Lycosidae. It has a very pale colour, with hardly any pattern, although this is also the case in some sand-dwelling *Arctosa* spp. (DONDALE, pers. comm.). Moreover, it is almost hairless, in contrast to the very hairy abdomen of most lycosids. Apart from the femur, the first leg of the female is spineless (cf. Fig. 1).

The structure of the genital organs is unusual for a lycosid. The embolus is very long, inserts medio-apically and is accomodated by a tegular process (tegular lobe) and a median apophysis (Figs 6, 12, 13), which probably act as a functional conductor. The palea is well developed and bears a very small, pointed terminal apophysis (Fig. 13). In the female, the papillose surface of the median plate of the epigyne is special (Figs 14, 15).

In discussing the systematic position of *Tricassa* we followed the classification proposed by DONDALE (1986). He divided the Lycosidae into five subfamilies : Sosippinae, Venoniinae, Allocosinae, Pardosinae and Lycosinae. ZYUZIN (1985), in his study on Palaearctic wolf spiders, added two new subfamilies : Evippinae and Wadicosinae. The representatives of the Sosippinae (*e.g.* the genus *Sosippus,* cf. BRADY, 1962) are characterized by the absence of a terminal apophysis and a palea. Moreover the embolus lies among a cluster of tegular processes and the tegular groove functions as conductor (DONDALE, 1986). In *Tricassa,* the terminal apophysis is, although small, clearly present and the median apophysis and tegular lobe act as conductor. The Venoniinae have a small and short embolus, situated distally (DONDALE, 1986 ; see also LEHTINEN and HIPPA, 1979) whereas the embolus of *Tricassa deserticola* is very long. *Tricassa* cannot be included in the Allocosinae either. It lacks the typical beaklike terminal apophysis and the median apophysis with two pointed processes (see DONDALE, 1986 ; DONDALE and REDNER, 1983). The Allocosinae lack a median septum in the epigyne, present in *Tricassa*.

The Pardosinae are characterized by the tooth-like terminal apophysis situated retrolaterally on the palea surface (DONDALE, 1986). Its tip is directed towards the tip of the embolus and conductor. As can be seen in Figs 6, 12, 13 and the description of the male, this structure is also found in *Tricassa deserticola*. The position and morphology of the toothlike terminal apophysis in *Tricassa* suggest that it might be homologous with that of the Pardosinae. On the other hand, *Pardosa* possesses a consistent synapomorphy absent in *Tricassa* : the shaftlike conductor along the basal margin of the palea extending to the retrolateral margin of the bulbus.

The large, exposed functional conductor of *Tricassa* illustrated in Fig. 13 excludes this species from *Pardosa* and the Pardosinae. Other differences between the typical representatives of the Pardosinae (genus *Pardosa*) and *Tricassa* exist but these might be interpreted as specific adaptations of *Tricassa deserticola* to its way of life.

ZYUZIN (1985) erected the subfamily Wadicosinae to accommodate the genus *Wadicosa,* characterized by the strongly developed, sclerotized tegular outgrowths which point outwards. These are absent in *Tricassa,* thus clearly excluding this species from the Wadicosinae. Finally, the Evippinae is characterized by the mesoapical insertion of the embolus in a wide and deep groove and by the vaulted tegulum. Females are characterised by the presence of pale epigynal atria (ZYUZIN, 1985). These characters are absent in *Tricassa.*

These comparisons show that *Tricassa deserticola* has a very unusual genital structure and that this justifies the establishment of a new subfamily.

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