



A New Species of the Genus *Carniella* Thaler & Steinberger from the Nepal Himalayas (Araneae: Theridiidae)

Andrei V. Tanasevitch¹ and Yuri M. Marusik^{2,3,4,*}

¹A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninsky Prospekt 33, Moscow 119071, Russia

²Institute for Biological Problems of the North FEB, Russian Academy of Sciences, Russia

³Zoology and Entomology, University of the Free State, Bloemfontein 9300, South Africa

⁴Zoological Museum, Biodiversity Unit, FI-20014 University of Turku, Finland

ABSTRACT

A new species, *Carniella nepalensis* sp. n., is described from eastern Nepal. The male of new species is most similar to *C. forficata* (Gao and Li, 2014) and clearly differs by the shape of the embolus. The type locality of new species is northwesternmost for the genus in Asia.

Article Information

Received 02 April 2018

Revised 22 May 2018

Accepted 31 May 2018

Available online 19 June 2020

Authors' Contribution

AVT conceived the idea of the study. AVT and YMM analyzed the data, created images and wrote and edited the manuscript.

Key words

Comb-footed spiders, Asia, New taxa.

INTRODUCTION

Carniella Thaler & Steinberger, 1988, is a small genus of theridiid spiders distributed in Eurasia and Africa (World Spider Catalog, 2018). Eleven species of *Carniella* are restricted to southeastern Asia, and two others, including the type species, *C. brignolii* Thaler & Steinberger, 1988, are known from Europe and Namibia (World Spider Catalog, 2018). The genus has never been revised, but all species are well illustrated. Most are known by one sex only: three species are known from females and five from males. All representatives of the genus are very small, the total length ranges from 0.82 to 1.3 mm. Males of *Carniella* can be very easily recognized due to a type of clypeal rostrum that is bent upwards. The genus has several characters unknown or untypical for theridiids, e.g., the basal position of the paracymbium, the modified tip of the cymbium, the high carapace in the female, the lack of the epigynal scuta (but with well developed epigastral scutum in the male) is well developed, the basal part of the embolus with outgrowth, and others.

While studying material from Nepal, we recognized that tiny specimens sorted as Linyphiidae belong to *Carniella*. A literature search revealed that the specimens from Nepal belong to a new species that we describe here.

MATERIALS AND METHODS

This paper is based on material taken by Jochen Martens and Wolfgang Schawaller in Nepal, deposited at the Senckenberg Museum, Frankfurt on Main, Germany (SMF). Two paratypes are kept at the Zoological Museum of the Moscow State University (ZMMU). The sample number is given in square brackets. All specimens are preserved in 70% ethanol and studied using a MBS-9 stereo microscope. Specimens were photographed using a Canon 70D camera attached to an Olympus SZX16 stereomicroscope. Digital images were prepared using "CombineZP" and Zerene Stacker image stacking software. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in millimetres.

Carniella Thaler & Steinberger, 1988

Carniella Thaler and Steinberger (1988: 998), Wunderlich (1995: 553), Wunderlich (2008: 250) and Gao and Li (2014: 17).

Marianana Georgescu (1989: 89).

Type species

Carniella brignolii Thaler & Steinberger (1988), by original designation (from Austria).

Comments

Brief diagnoses are given in the papers mentioned

* Corresponding author: yurmar@mail.ru

0030-9923/2020/0001-0001 \$ 9.00/0

Copyright 2020 Zoological Society of Pakistan

above. The genus can be easily recognized by the modified male carapace with a clypeal rostrum (Fig. 1A, B), by the proximal position of the paracymbium (vs. anterior in all other theridiids except *Tekellina* Levi, 1953 (cf. Figure 2A-D in Marusik and Omelko, 2017) and by the lack of an epigynal plate (epigyne not sclerotised). As in all minute araneoids, tarsi in *Carniella* are longer than the metatarsi (Wunderlich, 1995).

While studying new species from Nepal we noticed

some other characters in *Carniella* either not mentioned or not emphasized in other papers. Both sexes have an equally high carapace in profile (Fig. 1A, D); fovea of the carapace absent; male has epigastral scutum (Fig. 1C and Fig. 2 in Wunderlich, 1995); the labium is fused with the sternum (Fig. 1C); the sternum is almost triangular, not truncate posteriorly and extends between coxae IV (Fig. 1C, F); females have an unsclerotised epigynal plate; both sexes have no book lungs (Fig. 2E).

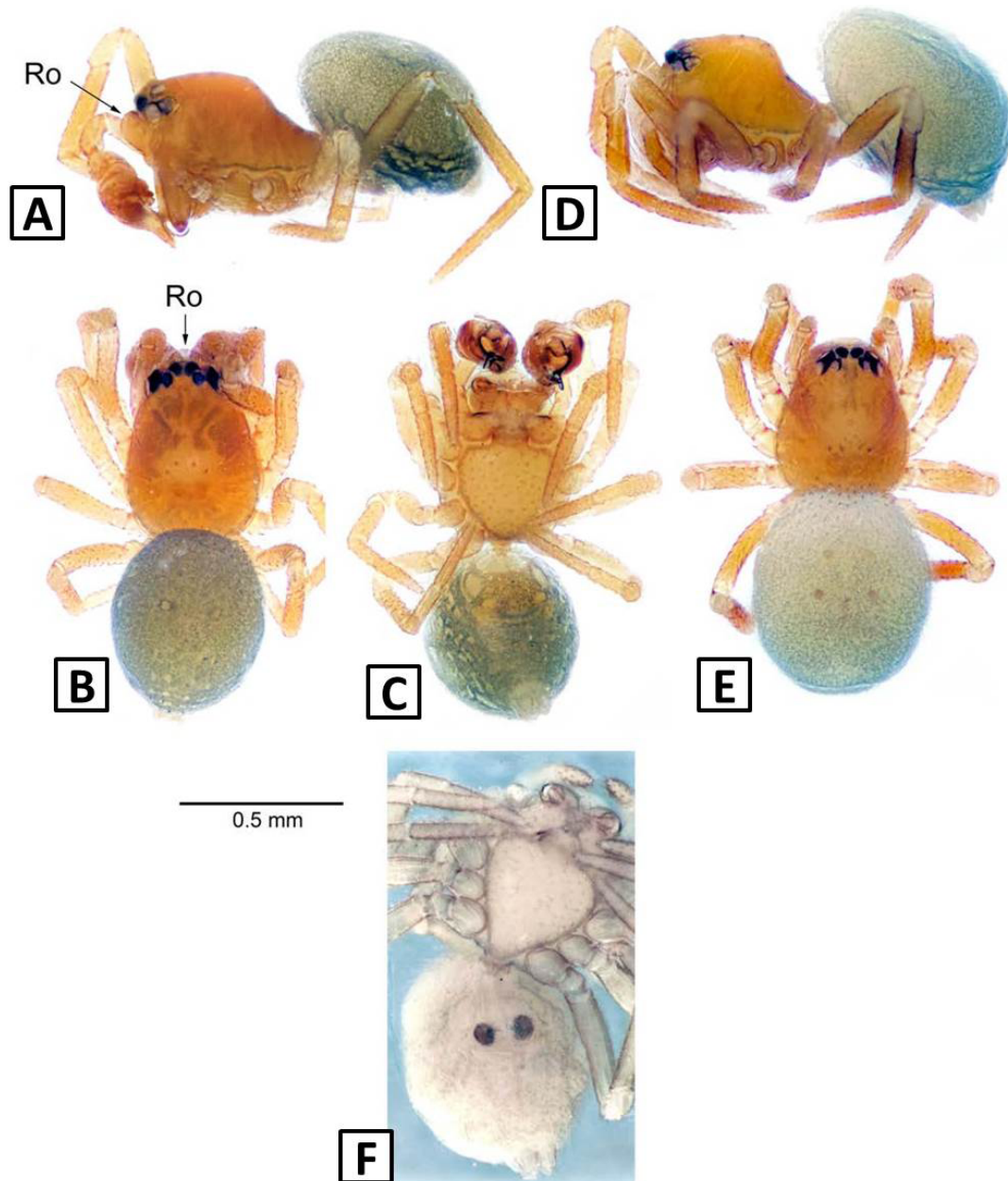


Fig. 1. Male (A-C) and female (D-F) of *Carniella nepalensis* sp. n., paratypes. A and D, lateral view; B and E, dorsal view; C and F, ventral view. Ro, rostrum.

Relationships

Agnarsson (2004) and Agnarsson *et al.* (2007), based on cladistic analysis, placed *Carniella* close to *Robertus* O. Pickard-Cambridge, 1879 and *Pholcomma* Thorell, 1869. Wunderlich (2008) considers the genus among Pholcommatinae, but this subfamily does not include *Robertus*. Two genera of Pholcommatinae have similar modification to the male carapace, *Magnopholcomma*

Wunderlich (2008) and *Proboscidula* Miller (1970). Both the copulatory organs and somatic characters in *Pholcomma* and *Carniella* differ from one another (*i.e.*, the position of the paracymbium, the shape of the embolic base, the presence/absence of the embolic apophysis and book lungs, *etc.*), and therefore the position of *Carniella* requires further clarification.

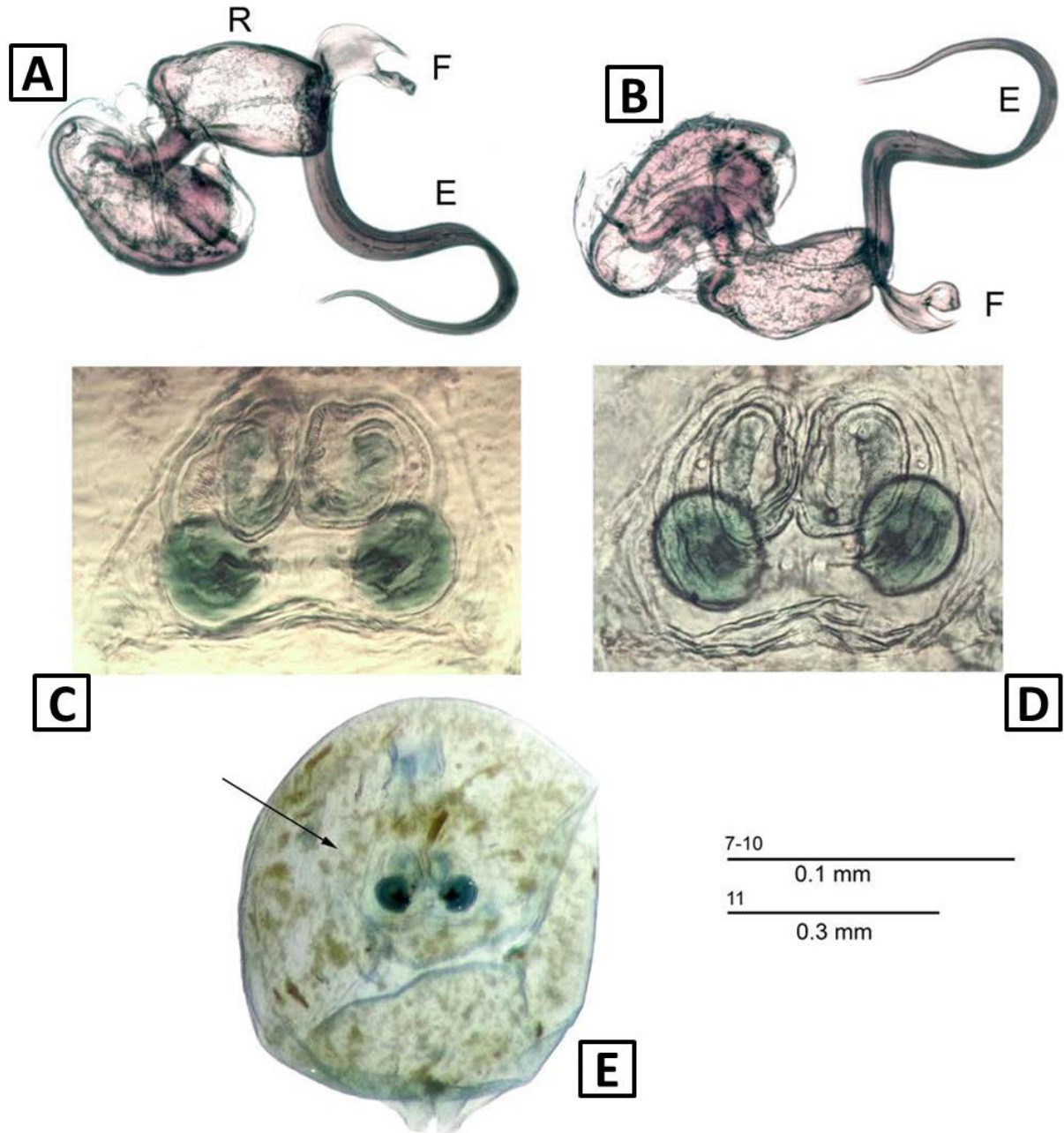


Fig. 2. *Carniella nepalensis* sp. n., paratypes, male (A, B) and female (C-E). A and B, embolus, different aspects; C and D, vulvae, ventral view; E, abdomen, ventral view, arrow indicates lack of book-lungs. E, embolus; F, fork; R, radix.

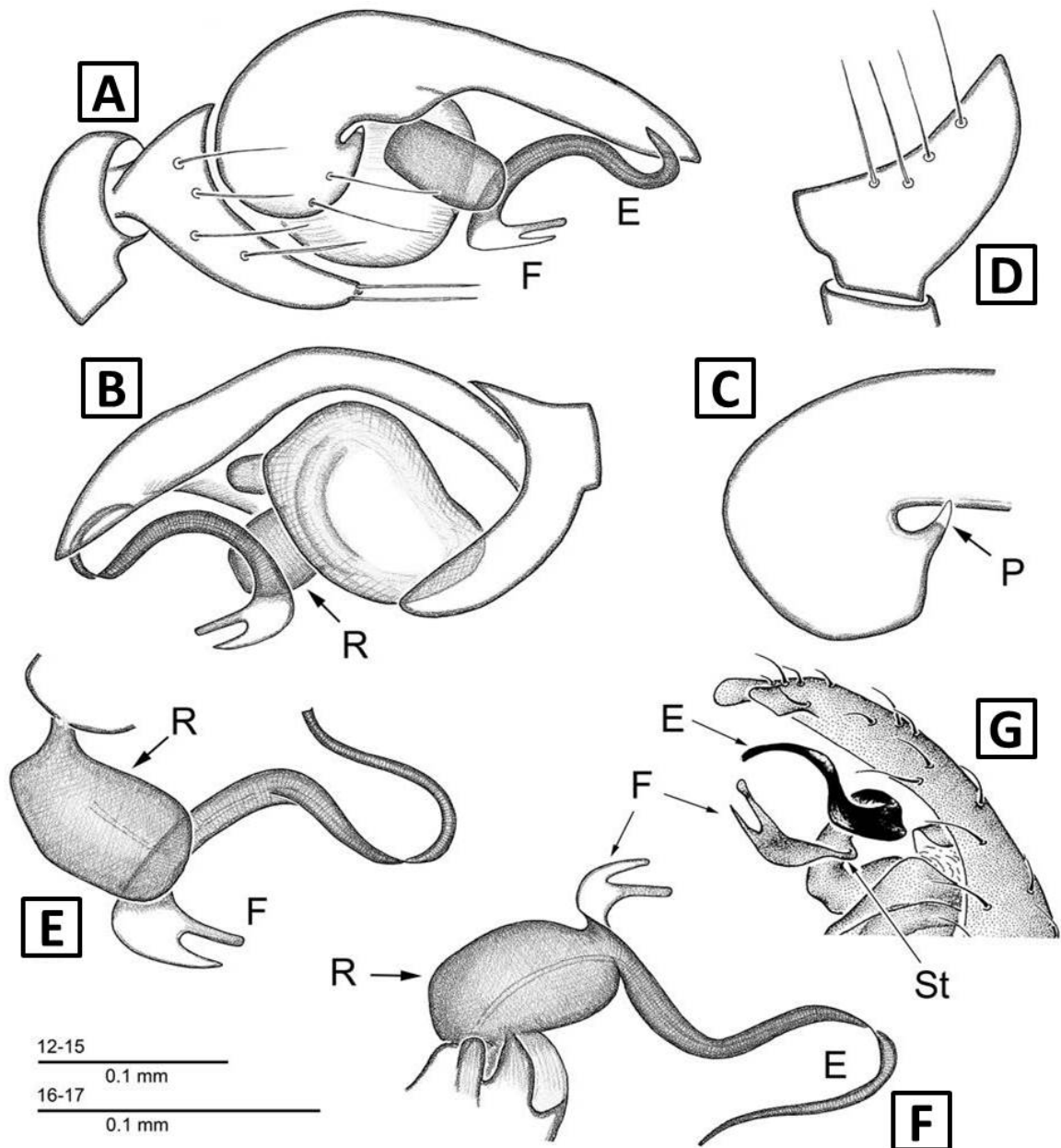


Fig. 3. Male palps of *Carniella nepalensis* sp. n., paratype (A-F) and *C. forficata* (G); A and B, right palp, retrolateral and prolateral views, respectively; C, proximal part of cymbium, lateral view; D, palpal tibia, dorsal view; E and F, embolus, different aspects; G, distal part of palp after Gao and Li (2014, Fig. 16A), not to scale. E, embolus; F, fork; R, radix; P, paracymbium; St, stem of fork.

Distribution

The genus has a rather unusual distribution: Central Europe, southeastern Asia and Namibia. Wunderlich (2008, p. 248) assumes that the presence of *C. brignolii* in Europe is a recent introduction. However, the range of this species is rather large: Belgium, Germany, Austria, Switzerland and Romania), and it occurs not only in

anthropogenic habitats, but also in natural habitats like debris block field (Austria), riparian zones of alpine streams (South Germany) or caves in Romania (Nentwig et al., 2018). Another species from outside the main range of the genus is *C. detriticola* (Miller, 1970) from Namibia. Although only known from the female, it is easily diagnosed as *Carniella*, based on its description and

the somatic characters and the shape of epigyne. In our opinion, the unusual range can be explained either by the contraction of a previously wide range or just improper sampling/identification of these tiny spiders. It seems that genus is present in Tasmania also (YM saw one female from the island that looks like *Carniella* sp.)

***Carniella nepalensis*, new species**

Fig. 1- 3

Type

Holotype: ♂ (SMF), NEPAL, Taplejung District, above Yamputhin (= Yamphudin), ca 27°27'N 88°00'E, left bank of Kabeli Khola, bushes, open forest, 1800–2000 m, 27–29.IV.1988, leg. J. Martens and W. Schawaller [#352].

Paratypes: 2 ♂♂, 2 ♀♀ (SMF), 1 ♂, 1 ♀ (ZMMU), collected together with the holotype.

Etymology

The specific name is a Latin adjective, referring to the region of origin, Nepal Himalayas.

Diagnosis

The male of *C. nepalensis* sp. n. is most similar to that of *C. forficata* Gao & Li, 2014, known from males collected in southern Yunnan, China (Gao and Li, 2014). The new species can be easily distinguished from *C. forficata* by the larger radix and embolus, as well as by a shorter stem of the embolic apophysis (cf. Fig. 3F, G). The new species has a less prominent modification to the cymbial tip and a shorter male palpal tibia. The female of the new species is most similar to the Namibian *C. detriticola* (cf. Fig. 2C, D; Miller, 1970, Plate 52, Figs. 1–5). The two species have small copulatory openings close to each other, whereas in other species known from females the epigynal atria are present. The new species differ by the copulatory ducts (anterior part) being longer than the receptacles vs. shorter than the receptacles.

Description

Male paratype: Total length 1.08. Carapace modified, clypeus with distinct rostrum (Fig. 1A, B), 0.57 long, 0.44 wide, 0.25 high, pale brown. Anterior median eyes black, others white. Chelicerae 0.20 long. Sternum triangular. Legs pale brown, almost yellow. Leg I, 1.38 long (0.48+0.15+0.27+0.21+0.27), IV, 1.32 long (0.41+0.14+0.29+0.21+0.27). Tarsi of all legs longer than metatarsi. Abdomen 0.60 long, 0.45 wide, pale grey. Palp as in Figure 3A–F. Tibia with extended prolateral tip, edges with set of long setae. Cymbium long and narrow, tip modified, with small flat projection; paracymbium (P) like

in all congeners located almost basally. Tegulum without distinct apophyses. Embolus complex, with large radix (R), embolus (E) long, filiform, with several bends; a short bifurcated apophysis (F) rising at the base of embolus.

Female: Total length 1.05. Carapace modified, cephalic part higher than thoracic one (Fig. 1D), 0.45 long, 0.38 wide, 0.25 high, pale brown. Chelicerae 0.21 long. Sternum triangular. Legs pale brown, almost yellowish. Leg I 1.00 long (0.27+0.14+0.21+0.15+0.23), IV 1.03 long (0.29+0.14+0.24+0.15+0.21). Abdomen 0.60 long, 0.51 wide, pale grey.

Epigyne as in Figures 1F, 2C and D: plate not sclerotised, edge of epigyne with dark, poorly defined margin; two round receptacles separated by one diameter, visible through integument (Fig. 1F), shape and location of copulatory openings indistinct; macerated epigyne with pair of white dots, that may correspond to fertilization ducts; copulatory ducts long, coiled, posterior part broad, about ½ of receptacle width, anterior loop of copulatory duct as long as receptacle.

Distribution

Known only from the type locality in eastern Nepal. It is the northwesternmost species of the genus in all of Asia.

ACKNOWLEDGEMENTS

We are grateful to Jochen Martens (Mainz, Germany) for providing us with the material he collected during his expeditions in the Himalayas, to Peter Jäger and Julia Altmann (SMF), who supplied us with the types under their care, and to Seppo Koponen (Turku, Finland) for allowing to use museum facilities. English of the early draft was kindly checked and corrected by Sarah Crews (San-Francisco, USA). These are results of the Himalaya Expeditions of J. Martens, No. 287 - J.M. sponsored by Deutscher Akademischer Austauschdienst and Deutsche Forschungsgemeinschaft.

Statement of conflict of interest

Authors have declared no conflict of interest.

REFERENCES

- Agnarsson, I., 2004. Morphological phylogeny of cobweb spiders and their relatives (Araneae, Araneoidea, Theridiidae). *Zool. J. Linn. Soc.*, **141**: 447–626. <https://doi.org/10.1111/j.1096-3642.2004.00120.x>
- Agnarsson, I., Coddington, J.A. and Knoflach, B., 2007. Morphology and evolution of cobweb spider male

- genitalia (Araneae, Theridiidae). *J. Arachnol.*, **35**: 334-395. <https://doi.org/10.1636/SH-06-36.1>
- Gao, C.X. and Li, S.Q., 2014. Comb-footed spiders (Araneae: Theridiidae) in the tropical rainforest of Xishuangbanna, Southwest China. *Zool. Syst.*, **39**: 1-135.
- Georgescu, M., 1989. Sur trois taxa nouveaux d'aranéides troglobies de Dobrogea (Roumanie). *Misc. Speol. Roman.*, **1**: 85-102.
- Levi, H.W., 1953. New and rare *Dipoena* from Mexico and Central America (Araneae, Theridiidae). *Am. Muse. Novitates*, **1639**: 1-11.
- Marusik, Y.M. and Omelko, M.M., 2017. A new species of *Tekellina* (Araneae, Araneoidea) from the Russian Far East. *Ent. Fennica*, **28**: 164-168.
- Miller, F., 1970. Spinnenarten der Unterfamilie Micryphantinae und der Familie Theridiidae aus Angola. *Publicações Culturais da Companhia de Diamantes de Angola*, **82**: 75-166.
- Nentwig, W., Blick, T., Gloor, D., Hänggi, A. and Kropf, C., 2018. *Spiders of Europe*, Version 03.2018. www.araneae.unibe.ch. [http://doi: 10.24436/1](http://doi:10.24436/1)
- Pickard-Cambridge, O., 1879. The spiders of Dorset: Araneidea. *Proc. Dorset Nat. Hist. Antiq. Field Club*, **1**: 1-235.
- Thaler, K. and Steinberger, K.H., 1988. Zwei neue Zwerg-Kugelspinnen aus Österreich (Arachnida: Aranei, Theridiidae). *Rev. Suisse Zool.*, **95**: 997-1004. <https://doi.org/10.5962/bhl.part.81946>
- Thorell, T., 1869. On European spiders. Part I. Review of the European genera of spiders, preceded by some observations on zoological nomenclature. *Nova Acta Regiae Soc. Sci. Upsaliensis*, **7**: 1-108.
- Wunderlich, J., 1995. Südostasiatische Arten der Gattung *Carniella* Thaler & Steinberger 1988, mit zwei Neubeschreibungen (Arachnida: Araneae: Theridiidae). *Beitr. Araneol.*, **4**: 553-558.
- World Spider Catalog, 2018. *World spider catalog*, Version 19.0. Natural History Museum, Bern, Switzerland. Available at: <http://wsc.nmbe.ch> (accessed on April 7, 2018).
- Wunderlich, J., 2008. On extant and fossil (Eocene) European comb-footed spiders (Araneae: Theridiidae), with notes on their subfamilies, and with descriptions of new taxa. *Beitr. Araneol.*, **5**: 140-469, 792-794, 796-800, 803, 819-859.