

Nopyllus, a new South American Drassodinae spider genus (Araneae, Gnaphosidae)

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RESUMO. *Nopyllus*, um novo gênero de Drassodinae sul-americano (Araneae, Gnaphosidae). *Nopyllus* gen. nov. é proposto para incluir *Apopyllus isabelae* Brescovit & Lise, 1993 e *Nopyllus vicente* sp. nov. do sul do Brasil. *Nopyllus* gen. nov. é próximo de *Apodrassodes* e *Apopyllus*, pode ser diferenciado de ambos os gêneros pela ausência de escudos abdominais dorsais nos machos, ausência de apófise média no bulbo copulatório, pelo címbio curvo, estreito e reniforme e pela presença de uma conspícua projeção basal do címbio.

PALAVRAS-CHAVE. Região Neotropical, Brasil, *Apopyllus*, taxonomia.

ABSTRACT. *Nopyllus* gen. nov. is proposed to include *Apopyllus isabelae* Brescovit & Lise, 1993 and *Nopyllus vicente* sp. nov. from southern Brazil. *Nopyllus* gen. nov. is close to *Apodrassodes* Vellard, 1924 and *Apopyllus* Platnick & Shadab, 1984, can be distinguished from both genera by the absence of a dorsal abdominal scutum in males, the absence of a median apophysis on bulb, the curved, narrow and reniform cymbium, and by the presence of a very conspicuous cymbial basal projection.

KEYWORDS. Neotropical Region, Brazil, *Apopyllus*, taxonomy.

South American gnaphosid species with long embolus are nowadays included in Drassodinae (PLATNICK & SHADAB, 1984; PLATNICK, 1990). The South American drassodines are distributed in two genera: *Apodrassodes* Vellard, 1924 and *Apopyllus* Platnick & Shadab, 1984 (PLATNICK, 2013). *Apodrassodes* includes ten species with the type species *A. guatemalensis* (F. O. P.-Cambridge, 1899), widely distributed from Mexico to meridional South America.

The genus *Apopyllus* is nowadays represented by nine Neotropical species. The genus was proposed by PLATNICK & SHADAB (1984) and since then, only one species was added to the genus, namely *A. isabelae* Brescovit & Lise, 1993. According to PLATNICK & SHADAB (1984), *Apopyllus* is most probably related to *Apodrassodes* due to the elongate embolus supported by a membranous tegular extension at the male palp. However, female genitalia are not quite similarly shaped in both genera, presenting smaller plates and long coiled ducts in *Apopyllus* and a rather larger plate and less coiled ducts with an anterior excavation covered by a short protruding scape in *Apodrassodes* (PLATNICK & SHADAB, 1983, 1984).

Examining the gnaphosid material from Southern Brazilian museum collections, large number of *Apopyllus* specimens were found. However, my attention was particularly directed to some smaller and pale male specimens from Vicente Dutra country, in the state of Rio Grande do Sul. These specimens show male palp features very similar to those described for *A. isabelae*, including the absence of the “characteristic *Apopyllus* median apophysis” (BRESCOVIT & LISE, 1993:110, figs 8, 9). After a closer examination of these specimens and the

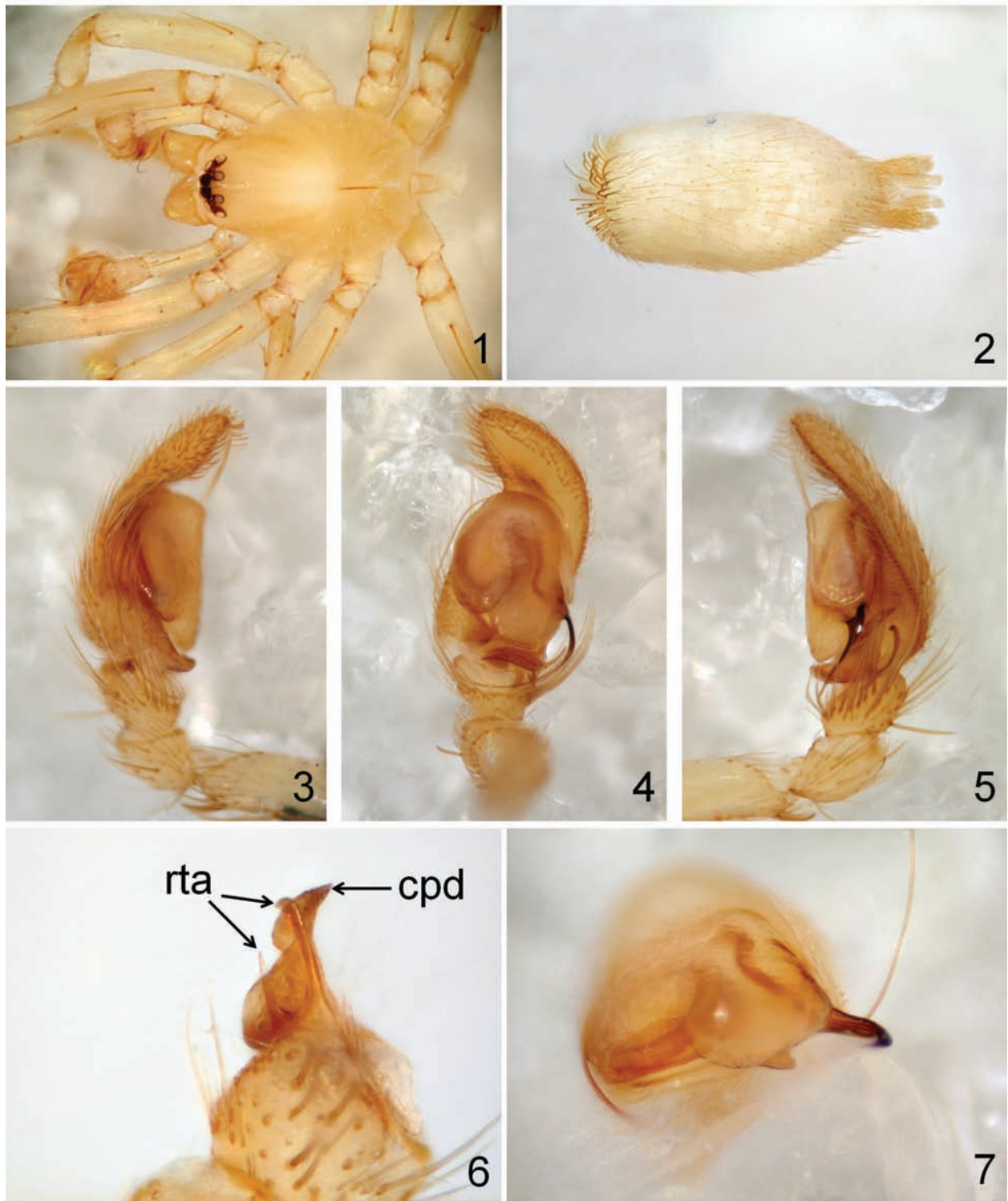
holotype of *A. isabelae*, it seemed that the males found at Rio Grande do Sul belong actually to an undescribed species. Based on the absence of median apophysis, on the inconspicuous “cymbial incision” *sensu* PLATNICK & SHADAB (1984:6, figs 11, 12), presence of a cymbial basal projection, presence of a groove in almost the entire extension of the retrolateral border of cymbium covered with angular setae, and absence of dorsal abdominal scuta in all the examined males, it is proposed a new genus to include both species

MATERIAL AND METHODS

The material studied are deposited in the arachnological collections of the Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, RS (MCN, curator R. Ott), Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS (MCTP, A. A. Lise) and Museu de Zoologia da Universidade de São Paulo São Paulo, SP (MZSP, Ricardo Pinto-da-Rocha), all in Brazil. Description format follows OTT (2012) and palp terminology follows PLATNICK & SHADAB (1983; 1984) and BRESCOVIT & LISE (1993).

Abbreviations in the text: AME, anterior median eyes; ALE, anterior lateral eyes; PM, cheliceral promargin; PLE, posterior lateral eyes; PME, posterior median eyes; RM, cheliceral retromargin; RTA, palpal retrolateral tibial apophysis; MA, tegular median apophysis.

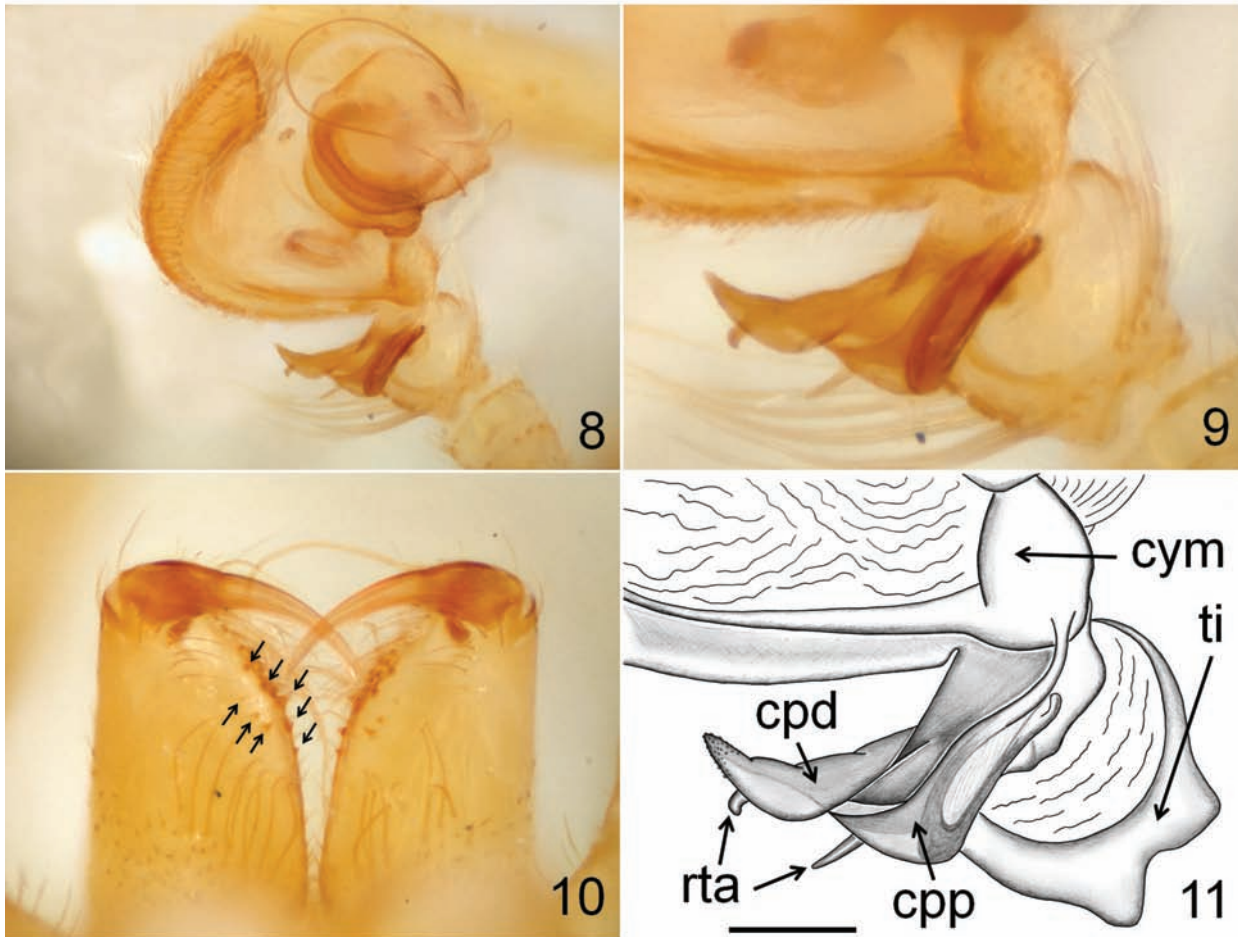
Incident light images were taken through a stereomicroscope and compound microscope with an attached digital camera and processed with Helicon Focus multi-range program. Drawings were made using



Figs 1-7. *Nopyllus isabelae* comb. nov. 1, carapace, dorsal; 2, abdomen, dorsal. Left palp: 3, prolateral; 4, ventral; 5, retrolateral; 6, palpal tibia, retrolateral; 7, bulb, posterior (cpd, cymbial basal projection distal fold; rta, retrotibial apophysis).

printed image as model and compound microscope and stereomicroscope as three dimensional shape confirmation tools. Electron scanning microscope (SEM) images were taken using a Jeol-JSM-5200 with attached SLR digital camera. Before mounting SEM material was prepared using 80-90-100% Ethanol sequence and by last step drying out in

a small vial containing a small piece of cotton imbibed with Ether, for 24 hours. Posteriorly to the mounting process, stubs were dried out for 24 hours under a normal tungsten filament lamp. *Apopyllus* cf. *silvestrii* (Simon, 1905) scanning material from Roça da Estância, Mampituba, RS, Brazil, 01.XI.2006, A. Gonçalves leg. (MCN 49397).



Figs 8-11. *Nopyllus isabellae* comb. nov., ♂ (8, 9, 11, right palp; 9, 11, detail of cymbial basal projection): 8, ventral; 9, ventral; 10, chelicerae posterior; 11, ventral (cpd, cymbial basal projection distal fold; cpp, cymbial basal projection proximal fold; cym, cymbium; rta, retrolateral tibial apophysis; ti, tibia). Scale 0.1 mm.

Latitude and longitude coordinates of municipalities from Google Earth®. All measurements are in millimeters.

Nopyllus gen. nov.

(Figs 1-40)

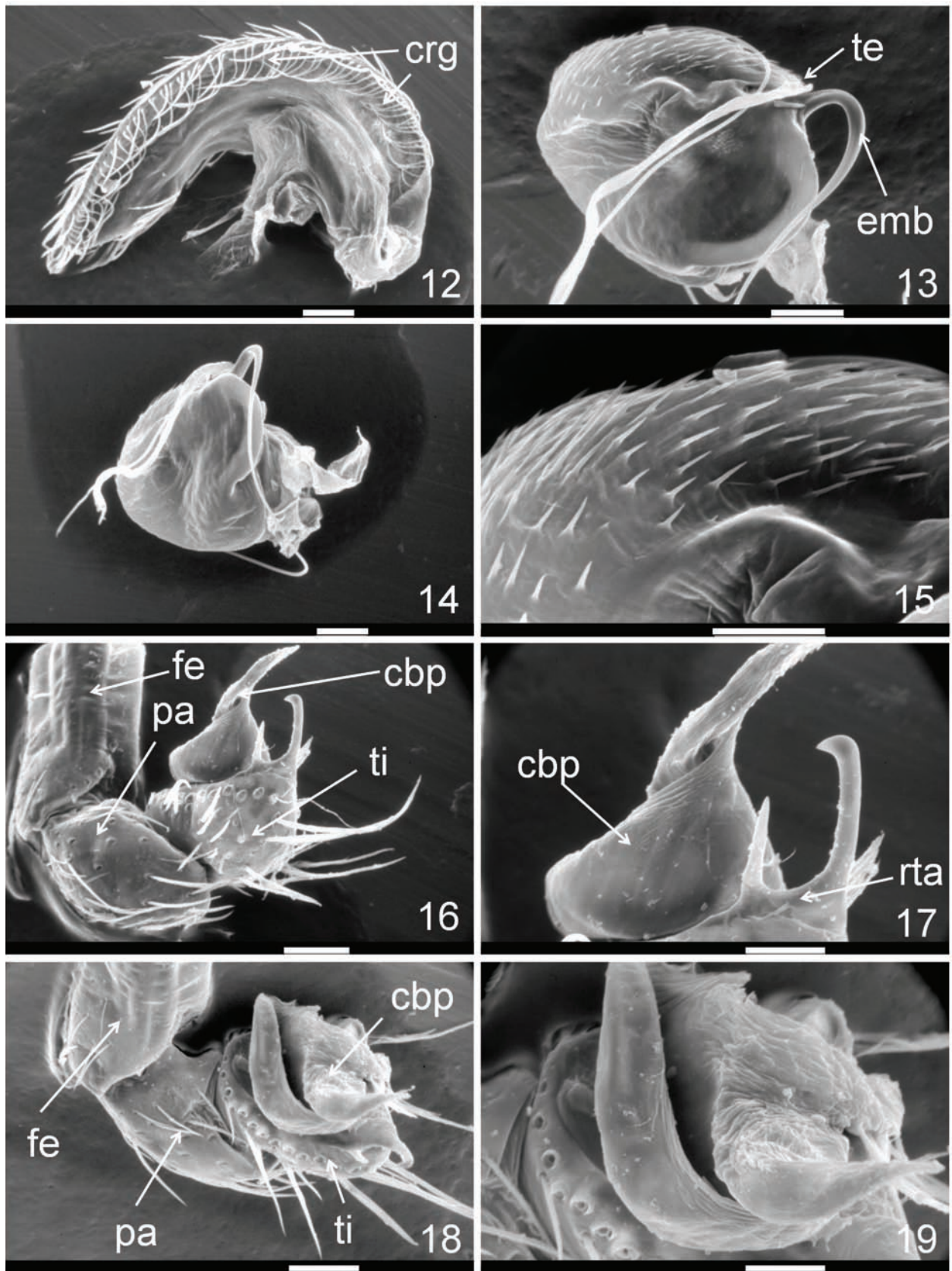
Type species. *Apopyllus isabellae* BRESCOVIT & LISE, 1993:109.

Etymology. The generic name is a contraction between “no” (English negative term) and the generic name *Apopyllus*, and is masculine in gender.

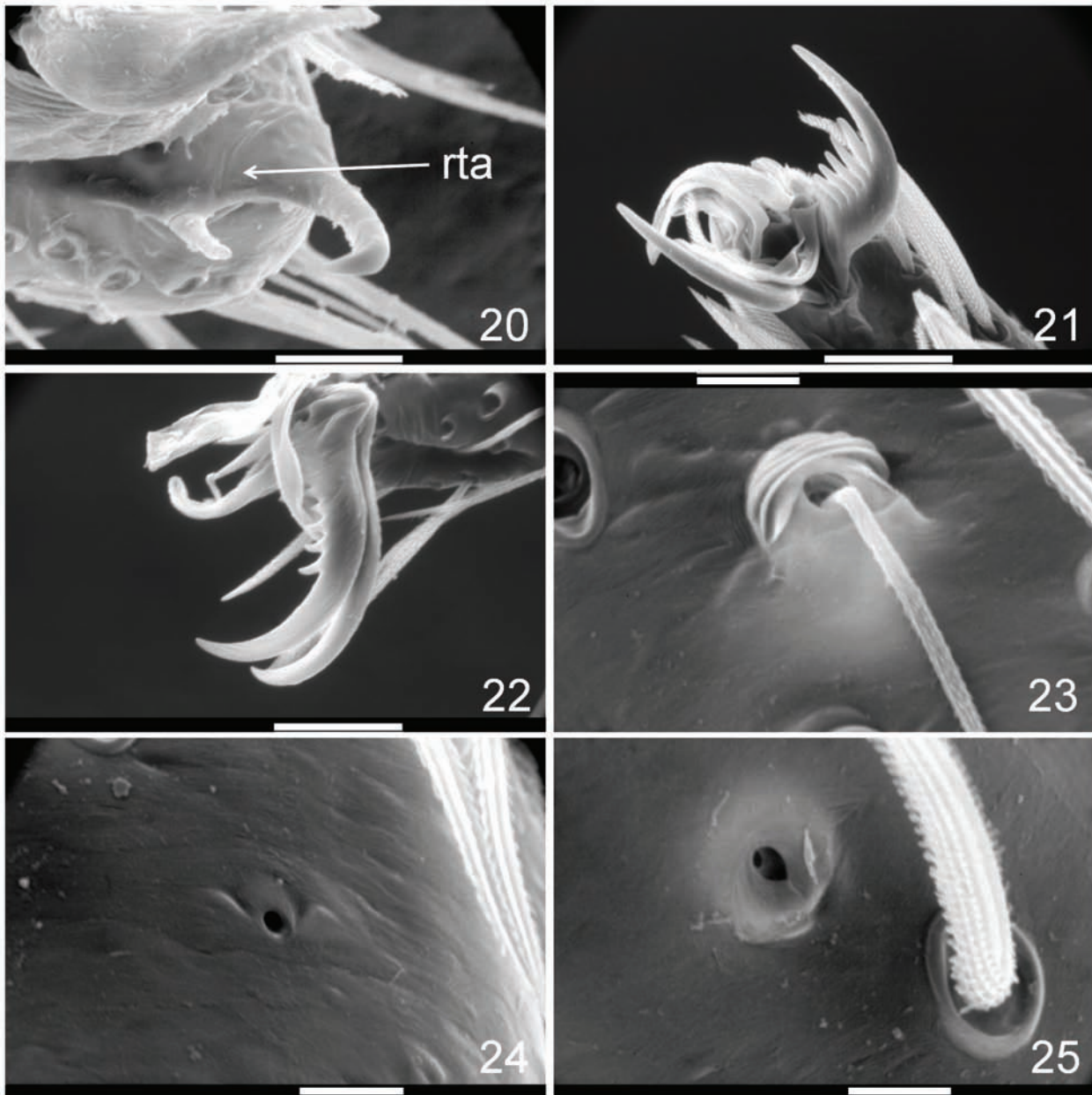
Diagnosis. *Nopyllus* gen. nov. seems to be close to the Neotropical genera *Apodrassodes* and *Apopyllus* by the long filiform embolus; it can be distinguished from both genera by the absence of a dorsal abdominal scutum in males (Figs 2, 26), absence of a median apophysis (Figs 4, 13, 14, 29, 34), the differently shaped tegular extension (Figs 13, 14, 34) and curved, narrow and reniform cymbium with retrolateral groove covered by angular curved setae in all its extension (Figs 12, 27, 29). *Nopyllus* gen. nov. can be also distinguished from *Apopyllus* by the inconspicuous cymbial incision (Figs 12, 33, 35), by the presence of a

cymbial basal projection (Figs 8, 9, 11), by the presence of sharp pointed scales at antero-retrolateral portion of tegulum (Figs 13, 15, 37) and by the RTA with two well developed processes. (Figs 6, 16-20, 32, 39, 40).

Description. Small yellowish spiders. Total length 2.11-2.82. Carapace oval in dorsal view; thoracic groove present at level of coxae III; eyes in two rows, anterior row recurved, posterior row slightly recurved; ALE the largest (Figs 1, 26). Clypeus height around AME radius. Chelicerae typically with five teeth on PM and three at RM. Endites rectangular; labium trapezoidal, narrowing anteriorly, half the length of endites in size (Fig. 27). Sternum rounded, widest around coxae II, posterior end very narrow and projecting between coxae IV (Fig. 27). Leg formula: 1, 4, 2, 3 or 4, 1, 2, 3; legs I and IV very close in size. Leg scopulae absent; tibia and metatarsi I and II with ventral rows of paired spines; tarsi of all legs with ventral rows of paired thin spines. Abdomen dorsal scutum absent (Figs 2, 26). Male palp with RTA formed by two processes (Figs 6, 16, 17, 32, 39, 40). Cymbium C-shaped, with retrolateral groove covered by angular curved setae in all its retrolateral extension (Figs 12, 31, 33); conspicuously grooved and twisted, meringue-shaped,



Figs 12-19. *Nopyllus isabetae* comb. nov., ♂: 12, cymbium ventral. Bulb: 13, ventral; 14, posterior; 15, detail, ventral. 16, fêmur+patella+tibia+cbp, retrolateral; 17, cbp+rta, retrolateral; 18, fêmur+patella+tibia+cbp, apical; 19, cbp, apical (cbp, cymbial basal projection; crg, cymbial retrolateral groove; emb, embolus; fe, femur; pa, patella; rta, retrotibial apophysis; ti, tibia). Scales: Figs 12-14, 16, 18 = 100 µm; 15, 17, 19 = 50 µm.



Figs 20-25. *Nopyllus isabelae* comb. nov., ♂: 20, rta, apical; 21, leg I claws, apical; 22, leg IV claws, lateral; 23, trichobotrium, dorsal; 24, organ (?), dorsal; 25, tarsal organ, dorsal (rta, retrotibial apophysis). Scales: Figs 20-22 = 50 µm; 23, 25 = 10 µm; 24 = 5 µm.

with a retrolateral, basal projection (Figs 8, 9, 11, 16-19, 39). Tegulum rounded, anteriorly covered with spine-shaped scales (Figs 13, 15, 37), tegular extension as a single, membranous, narrow and grooved structure, MA absent (Figs 13, 14, 34, 36-38). Embolus long and filiform, originating at retrolateral portion of tegulum (Figs 5, 13, 30, 34).

Females. Unknown.

Distribution. São Paulo and Rio Grande do Sul, Brazil.

***Nopyllus isabelae* (Brescovit & Lise, 1993) comb. nov.**
(Figs 1-21)

Apopyllus isabelae BRESCOVIT & LISE, 1993:109,

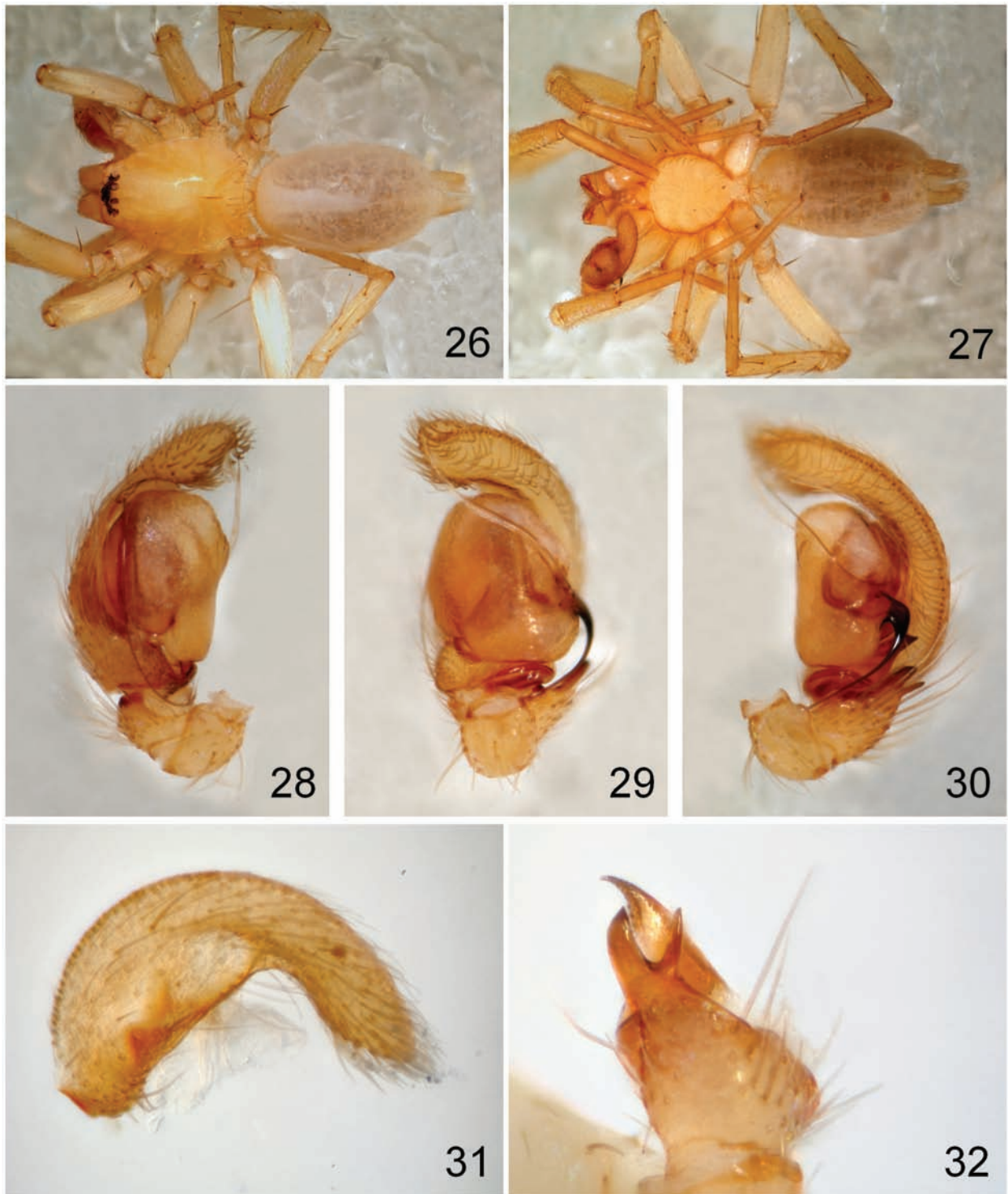
figs 8-10; ♂ holotype from Fazenda Goldfarm, Botucatu (22°52'56"S, 48°26'39"W), São Paulo, Brazil; 18.I.1988; Rinaldi, I.M.P. & Forti, L. C. leg., deposited in MZSP 63144; examined.

Note. Male holotype original number UEPB 908, from Universidade Estadual Paulista, Botucatu; this collection and type material is now at MZSP.

Diagnosis. *N. isabelae* comb. nov. can be recognized by the RTA ventral process shorter and sharply pointed and the dorsal one longer and slightly hooked distally (Figs 6, 16, 17).

Description. See BRESCOVIT & LISE, 1993:106 for the male; female unknown.

Additional description. Legs: tarsi of legs I and IV



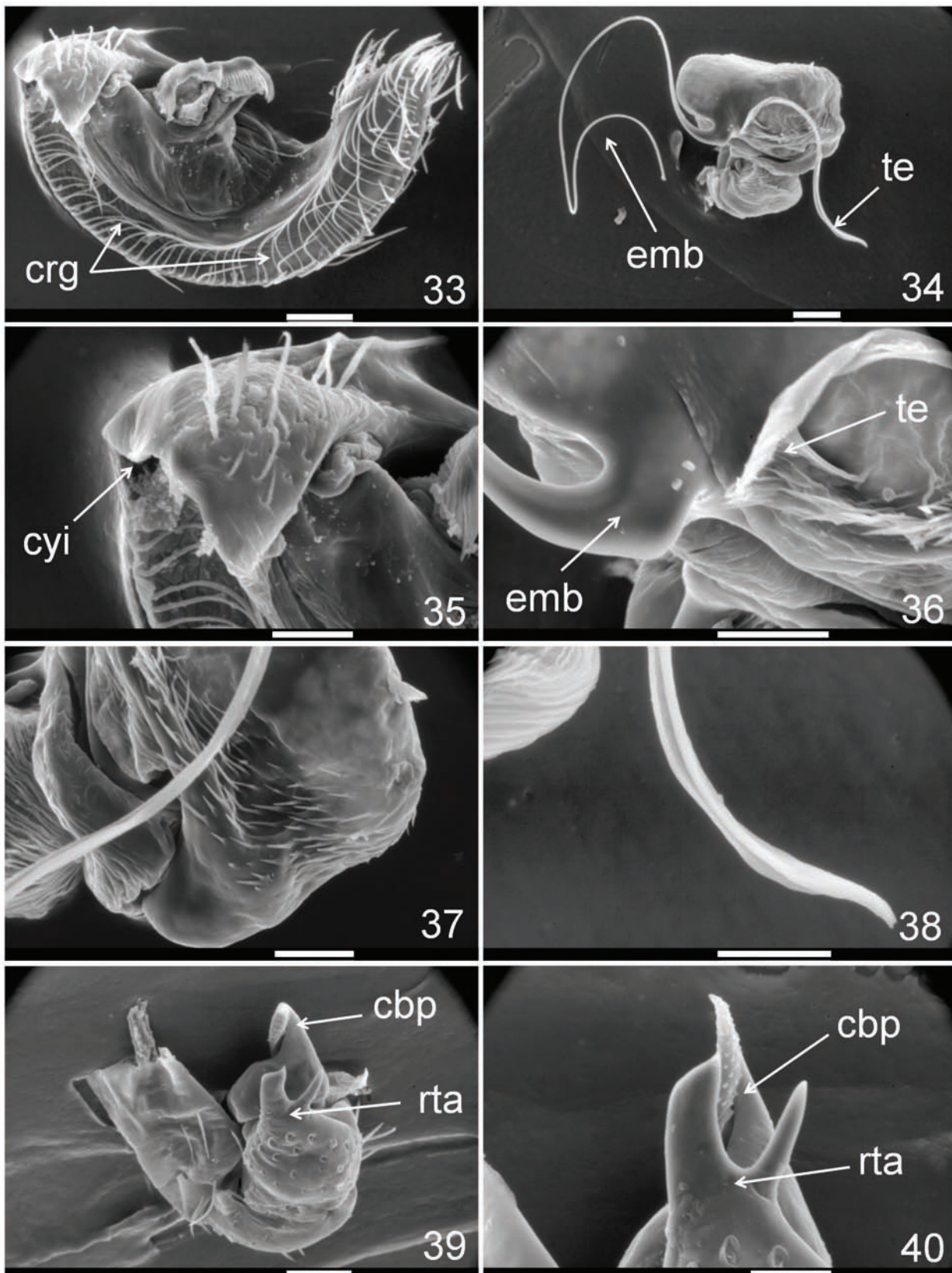
Figs 26-32. *Nopyllus vicente* sp. nov., ♂: 26, dorsal; 27, ventral. Left palp: 28, prolateral; 29, ventral; 30, retrolateral; 31, cymbium, dorsal; 32, palp tibia, retrolateral.

with pectinate claws (Fig. 21); teeth of tarsal claws of leg IV reduced in size (Fig. 22); trichobothrium base (tarsus, leg I) as in Fig. 23; tarsal organ rounded, raised and dome-shaped (Leg I) as in Fig. 25; unknown organ on the distal third of tarsus of leg I as in Fig. 24.

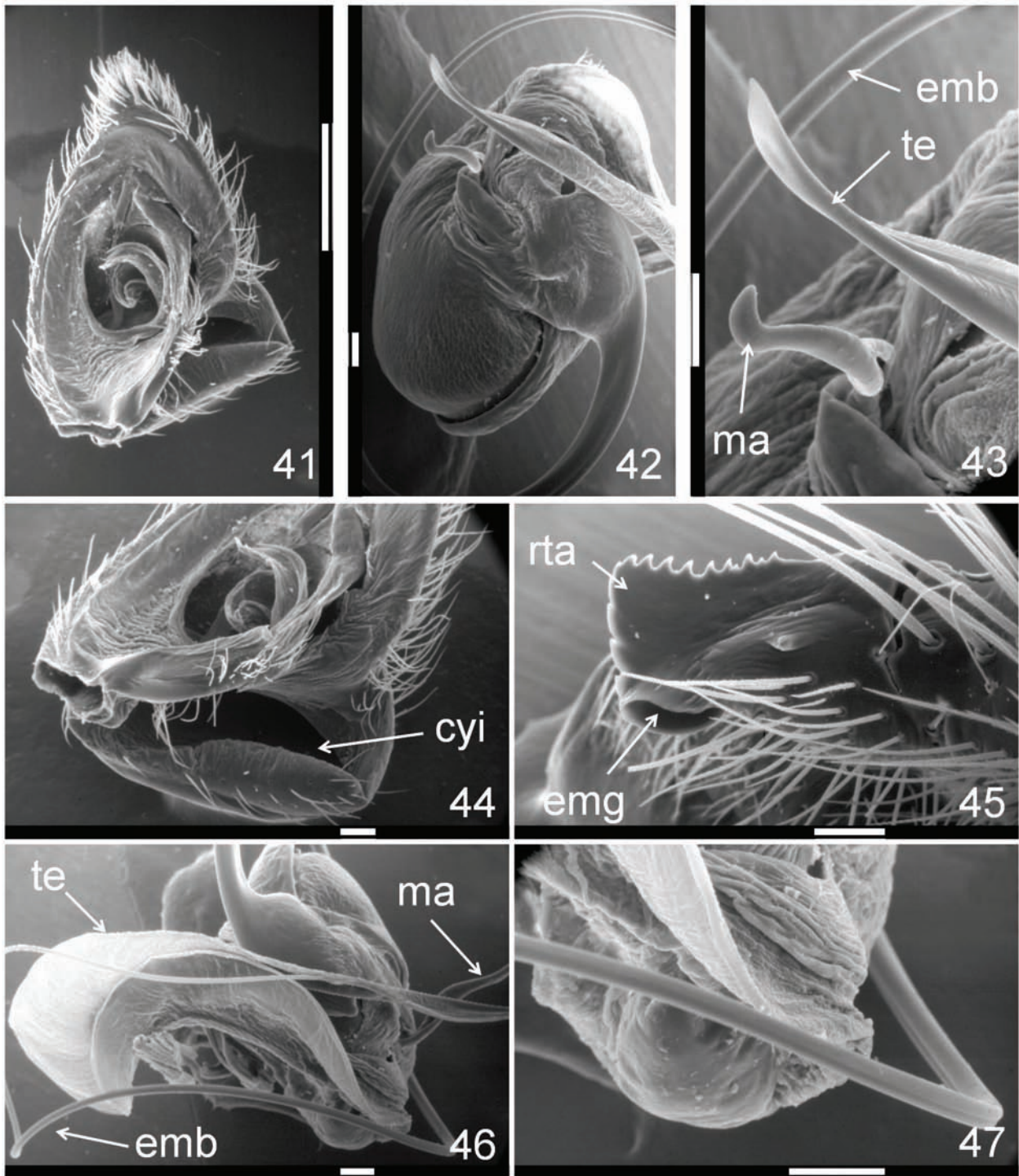
Variation. Carapace length 1.15-1.43.

Other examined material. BRAZIL. **São Paulo:** Botucatu (22°52'56"S, 48°26'39"W], Fazenda Edgardia, ♂, 07.XII.1987, Rinaldi, I. M. P. & Forti, L. C. leg., (MZUSP 62720); Fazenda Butignoli, ♂, 23.XII.1986, Rinaldi, I. M. P. & Forti, L. C. leg. (MCN 49396).

Distribution. Known only for the type locality.



Figs 33-40. *Nopyllus vicente* sp. nov., ♂. Cymbium: 33, ventral; 35, basal detail, ventral; Bulb: 34, retrolateral; 36, detail, retrolateral; 37, retrolateral; 38, te, apical detail. 39, cbp+rta, apical; 40, rta, retrolateral (cbp, cymbial basal projection; crg, cymbial retrolateral groove; cyi, cymbial incision; emb, embolus; rta, retrotibial apophysis; te, tegular extension). Scales: 33, 34, 39 = 100 μ m; 35-38, 40 = 50 μ m.



Figs 41-47. *Nopyllus* cf. *silvestrii*, ♂. Cymbium: 41, ventral; 44, ventro-retrolateral. Bulb: 42, ventro-retrolateral; 43, dito, detail; 46, retrolateral; 47, anterior detail, retrolateral. 45, rta, dorsal (cyi, cymbial incision; emb, embolus; emg, embolus guide; ma, median apophysis; rta, retrotibial apophysis; te, tegular extension). Scales: 41 = 500 μ m; 42-47 = 100 μ m.

***Nopyllus vicente* sp. nov.**

(Figs 22-36)

Type material. Holotype ♂ from Vicente Dutra (27°10'00"S, 53°24'13"W), Rio Grande do Sul, Brazil, V.2006, T. Freitas leg., deposited in MCTP 19922. Paratypes: 2♂ same data of holotype (MCTP 37172, MCN 49395).

Etimology. The noun in apposition is taken from the type locality.

Diagnosis. *Nopyllus vicente* sp. nov. can be recognized and distinguished from *N. isabelae* comb. nov. by the RTA ventral process stout, with oblique distal end and the dorsal one narrow and sharply pointed (Figs 32, 39, 40).

Description. Male (MCTP 19922, holotype). Coloration yellowish (Figs 26, 27); carapace, endites, chelicerae, legs and spinnerets yellowish, sternum yellowish with darker borders; metatarsi and tarsi slightly darker; cymbium darker, slightly orange. Abdomen: dorsally pale gray with longitudinal darker gray spotted lateral areas; ventrally with gray spotted areas in all its length. Total length 2.53. Carapace 1.12 long, 0.92 wide. Clypeus 0.04. Chelicerae length 0.41. Chelicerae teeth: PM 5; RM 2-3 (very small). Eye diameters and interdistances: AME 0.04, ALE 0.06, PME 0.04, PLE 0.04, AME-AME 0.02, AME-ALE 0.015, PME-PME 0.03, PME-PLE 0.06, ALE-PLE 0.02. Leg formula: 1, 4, 2, 3. Leg segment length: I – femur 1.12/ patella 0.62/ tibia 1.08/ metatarsus 0.82/ tarsus 0.69/ total 4.33; II – 0.95/ 0.49/ 0.69/ 0.66/ 0.59/ 3.38; III – 0.79/ 0.39/ 0.59/ 0.62/ 0.56/ 2.95; IV – 0.95/ 0.62/ 0.85/ 0.82/ 0.66/ 3.91. Leg spination: femur, I-II d1-1-0, III-IV d1-1-2, I p0-0-1; tibiae, I v7 pairs in rows (full length), II v5 pairs in rows (full length), III-IV d1-1-0, v1-2-2, III p0-0-1, r0-1-1, IV p0-1-1, r1-1-1; metatarsi, I v5 pairs in rows (full length), II v3 pairs in rows (full length), III d0-1-2, v2-0-1, p-r1-0-2, IV d1-0-1, v1-1-2, p0-0-1, r1-0-1. Tarsi also with ventral paired rows of very weak spines, I 7 pairs, II-III 6 pairs, IV 8 pairs. All femora with ventral paired rows of slightly enlarged setae; I 12 pairs, II 11 pairs, III 6 pairs, IV 9 pairs. Palp spination: femur, d0-1-1; patella, p0-1-0; tibia, d0-1-0, cymbium, d0-2-0. Palp (as for the genus, except noted): RTA with two processes, ventral one stout with oblique distal end and the dorsal one narrow and sharply pointed; cymbial basal projection folded and twisted, with stout tip covered by small denticles (Figs 32, 39, 40); tegulum with spine-like scales restricted to the front and ventro-retrolateral area (Fig. 37).

Variation. Total length, 2.11-2.53; carapace length, 1.06-1.12. Cymbium dorsal spines, 0-0-0 to 0-2-0. Chelicerae PM teeth 2-3 in same specimen, as also between specimens.

Distribution. Known only for the type locality.

DISCUSSION

According to PLATNICK (1990) there is no generally accepted subfamilial classification for the Gnaphosidae, being Drassodinae used merely as “wastebasket...for genera which do not obviously belong to other subfamilies”. However, *Apodrassodes* and *Apopyllus* are placed by the same author at Drassodinae. MURPHY (2007) tried another approach for grouping the Gnaphosidae genera and placed both genera in a group named “*Echemus* group”. He characterized this group by the plain colored abdomen and by the males with dorsal abdominal scutum. The absence of dorsal scutum in males of *Nopyllus* do not agree with Murphy’s “*Echemus* group” characters. Anyway, as stated by MURPHY (2007), this grouping proposition is only “for identification purpose” and it may not reflect the evolutionary relationships between genera. According to PLATNICK & SHADAB (1984) *Apodrassodes* and *Apopyllus* are

closely related based on the presence of a long embolus and a membranous tegular extension. Since the genus described here also presents these structures (but see discussion about the homology of tegular extension below), it could be related to *Apodrassodes* and *Apopyllus*. The absence of a dorsal scutum in *Nopyllus* could be a secondary loss. This question, however, can only be answered after a formal phylogenetic analysis of gnaphosid genera.

The presence of a median apophysis in *Apodrassodes* was noted by PLATNICK & SHADAB (1983) but is not diagnosed in *Apopyllus* by PLATNICK & SHADAB (1984). However, the presence of a median apophysis at the male palp bulb in *Apopyllus* seems to be obvious, as an usually long, well sclerotized and hooked structure originating from the tegulum near the base of the embolus (see PLATNICK & SHADAB, 1984:3, 6; figs 1, 11). Both genera presents only two accessory structures to the embolus, the “tegular extension”, originating from the anterior portion of tegulum (well developed in *Apopyllus* and reduced in *Apodrassodes*), and the tegular median apophysis, arising from tegulum near the embolus base. The latter sclerite is conspicuous in *Apopyllus* and somewhat hidden by the embolus in *Apodrassodes*.

In *Nopyllus* only a single structure accessory to the embolus can be found: a membranous, elongated and grooved structure (Figs 13, 14, 34, 36-38). Although it was also identified as the “tegular extension” in this paper, it apparently does not originates at the anterior portion of the tegulum (Figs 13, 14, 34, 36) as in *Apodrassodes* and *Apopyllus* (Figs 42, 46, 47). In *Nopyllus* the referred structure originates retrolaterally to the tegulum, near the embolus base (Figs 34, 36), in a similar placement as expected for the “tegular median apophysis” of *Apopyllus* (Figs 42, 43, 46), but it seems not to share its shape or function. The possible homology between “tegular extension” and “conductor” should be also considered. In most cases the conductor should be a well recognizable sclerite at Gnaphosidae male palp bulb, rather as the median apophysis which can be present or absent (UBICK *et al.*, 2005).

The cymbial incision observed in *Apopyllus* species (Figs 41, 44) is apparently reduced (Fig. 35) with the cymbial proximal portion strongly modified into the cymbial basal projection in *Nopyllus* (Figs 8, 9, 11), as noted by BRESCOVIT & LISE (1993:106). The main function of the cymbial incision or cavity in *Apopyllus* seems to be the accommodation of terminal embolus loop (PLATNICK & SHADAB, 1984:2). In the case of *Nopyllus* the accommodation of the embolus loop seems to be regarded to cymbial basal projection that acts probably in similar way of a “paracymbium”. In *Nopyllus* the RTA is also quite differently shaped than in *Apopyllus*. In the former the RTA is represented by two relatively simple processes (Figs 17, 40) and in the latter the RTA is folded and complex, also very possibly with an embolus supporting function (Fig. 45; see also PLATNICK & SHADAB, 1984:2, 3; figs 1, 2).

Based on the very long embolus and the strongly

modified cymbium it is suggested that *Nopyllus* is closer to *Apopyllus* than to any other neotropical gnaphosid. *Apopyllus* still holds a possible synapomorphy that is not shared with *Nopyllus*, the typical folded RTA. *Nopyllus* also have some presumptive exclusive characters, like the curved and narrow reniform cymbium with retrolateral groove covered by angular curved setae and the sharp pointed scales at antero-retrolateral portion of tegulum.

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