

**Two species of *Troglohyphantes* (Araneae: Linyphiidae) from Monti Lessini, northern Italy: *T. exul* n.sp., *T. ruffoi* Caporiacco**

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**Summary**

*Troglohyphantes exul* n.sp. is described (♂♀) from Monti Lessini, N. Italy, as a troglobitic peripheric isolate. Some comparative remarks on *T. scientificus* Deeleman-Reinhold are included. The new synonymy *T. paolettii* Brignoli, 1971 = *T. ruffoi* Caporiacco, 1936 is proposed, together with a discussion on the possibly polytypic nature of this species.

**Introduction**

The spider genus *Troglohyphantes* has attracted continued interest, both for its morphological and geographic diversity, since an early admirable revision (Fage, 1919). Recently, the species of the Southern Alps have been studied broadly by Brignoli (1971, 1975) and the Yugoslav species by Deeleman-Reinhold (1978) in her thorough monograph. Nevertheless, in the Eastern Alps the problems in this genus of microgeographic distribution and speciation in restricted habitats have not yet been exhausted. From recent field-work on Monti Lessini (N. Italy), a further troglobitic peripheric isolate *T. exul* n.sp. can now be described (leg. G. Caoduro, Verona), and a discussion on *T. ruffoi* Caporiacco, 1936 (= *T. paolettii* Brignoli, 1971, new synonymy) as a possibly polytypic species is included.

Abbreviations: CTh = Arbeitssammlung Thaler,

MCT = Museo civico di Storia naturale, Trieste,  
MCV = Museo civico di Storia naturale, Verona,  
NMW = Naturhistorisches Museum Wien.

***Troglohyphantes exul* n.sp. (Figs. 1-15)**

**Material examined**

Italy, Veneto, Verona, S. Ambrogio di Valpolicella (1, Map 1), Cava di S. Ambrogio, Caoduro leg., 1♂ without palps, 2♀ paratypes 27 Feb. 1983, MCV; 1♂ holotype, 4♀ paratypes 16 Sept. 1984, MCV.

**Etymology**

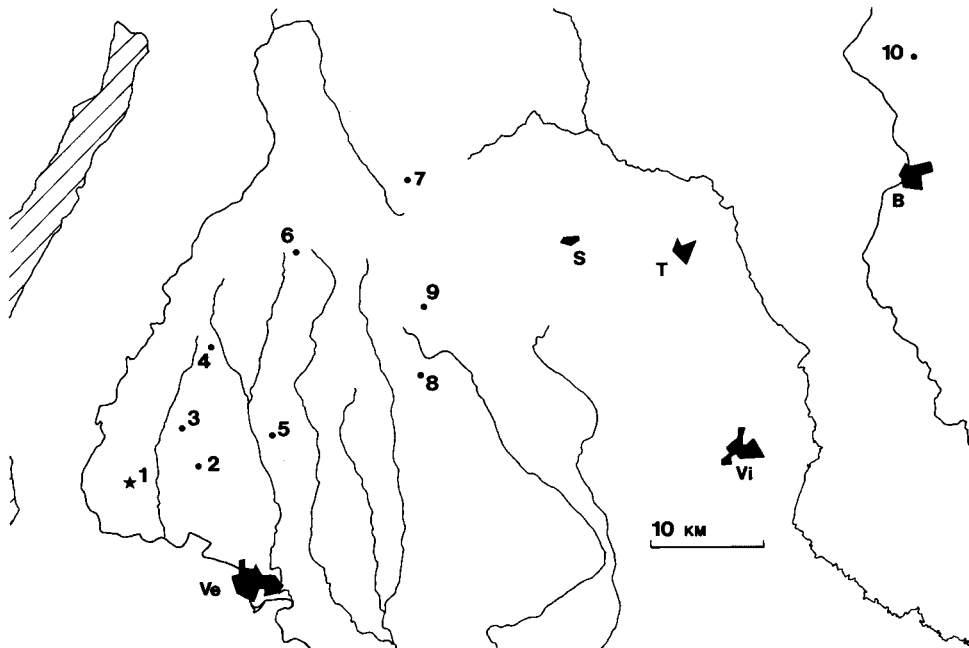
Latin noun in apposition, hence invariable, meaning exile, from the probable evolution of the species as a peripheric isolate.

**Diagnosis**

A small species with reduced eyes, characterised by palpal structures: tibia (Fig. 4), cymbium (Fig. 2), internal (Figs. 9, 10) and external (Fig. 15) branch of the lamella.

**Male**

Measurements (mm): Total length 2.9, carapace 1.29 long, 1.13 wide, length femur I 2.49. Colour: Prosoma and legs, especially chelicerae and femora, reddish-yellow, abdomen whitish. Head not much elevated, with weak spines; eyes reduced, AME absent, others very small, diameters 0.02-0.04 mm, widely spaced, without pigmented rings. Chelicerae (Fig. 3): Stridulating file rather dense, 4 minute teeth on posterior margin. Leg chaetotaxy (symbols according to Van Helsdingen, 1968):



Map 1: Distribution of *Troglohyphantes exul* n.sp. (1) and of *T. ruffoi* Caporiacco (2-10). **B** Bassano del Grappa, **S** Schio, **T** Thiene, **Ve** Verona, **Vi** Vicenza. **1** Sant'Ambrogio; **2** Grotta di Veja, com. Negrar, type locality of *T. ruffoi*; **3** Com. Marano, type locality of *T. paolettii*; **4** Sant'Anna d'Alfaedo; **5** Grotta Damati; **6** Rif. Podestaria (Brignoli, 1975: 14); **7** Rif. Balasso; **8** San Bortolo; **9** Campodalbero; **10** Road to M. Grappa, 1050 m.

Fe	I	d d' l'
Fe	II-III	d
Ti	I	(d l') (l' l'') (l' l' d) (l'_a l''_a)
Ti	II	d (l' l'') (l' l' d) (l'_a l''_a)
Ti	III	d (l' d) (l'_a l''_a)
Ti	IV	d (l' d l') (l'_a l''_a)
Mt	I-II	d l'
Mt	III-IV	d

Spination slightly variable as evidenced by differences within the holotype.

Palp (Figs. 1-2, 4-11, 15): Tibia without apophysis, distal margin flattened, with a retrolateral ridge (r), Fig. 4. Cymbium with a short dorsal horn, proximal end deeply excavated, Fig. 2. Paracymbium, Fig. 5, suprategulum, Fig. 6. Embolic division, Figs. 7, 11, 15. Lamella distinct, outer branch with an anterior projection (p), lamellate and spatulate distally; inner branch complicated, Figs. 9, 10, with a rod-like terminal process (pr). Embolus, Fig. 8.

#### Female

Measurements (mm,  $n = 3$ ): Total length 3.0, carapace 1.24-1.29 long, 0.96-0.98 wide, length femur I 2.34-2.42. Colour, eyes, chelicerae and leg chaetotaxy as in male.

Epigyne (Figs. 12-14): Strongly protuberant,

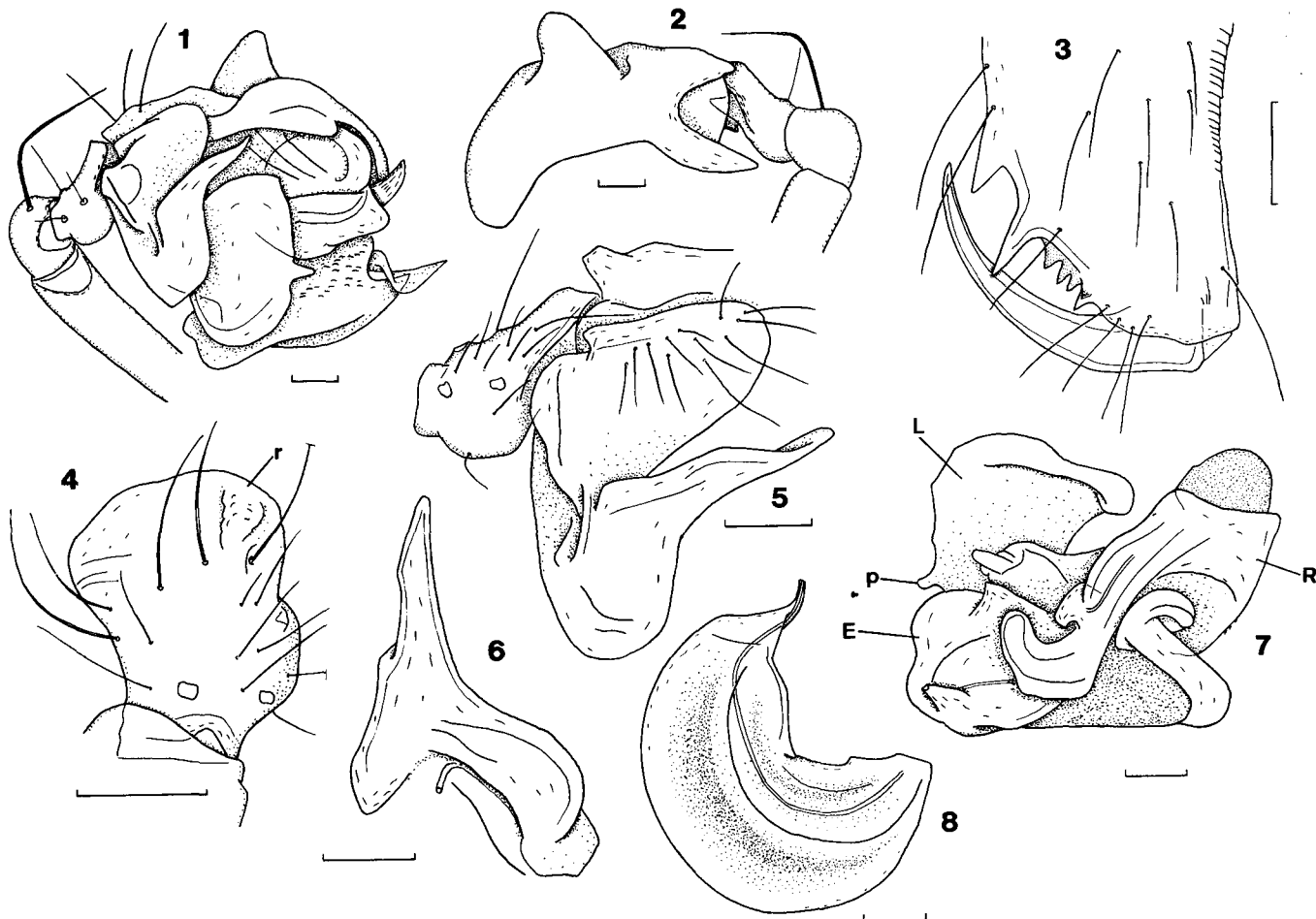
posterior borders oblique, margins of proximal part of scape strongly convergent.

#### Remarks

In the Southern Alps of Italy, between the rivers Adige/Etsch and Isonzo/Soča, there are two other troglolyphitic *Troglolyphantes* species with strongly reduced eyes, namely *T. scientificus* Deeleman-Reinhold and *T. juris* Thaler. They are each known from a very restricted area in Friuli, from caves near Tarcento and near Spilimbergo respectively (Deeleman-Reinhold, 1978; Thaler, 1982). Both species are clearly allied to some surface dwellers of the adjoining Alps, *T. juris* to *T. sbordonii* Brignoli, for *T. scientificus* see below. Possibly the evolution of such a cave species started from a surface population confined in peripheric isolation due to certain glacial events (Paoletti, 1978, 1980).

*T. exul* n.sp. apparently stands rather isolated from these eastern species. Admittedly the cymbium bears a horn, but the lamella is very different. Neither is it possible to indicate affinities with the surface-dwelling *Troglolyphantes* of Monti Lessini, *T. ruffoi* Caporiacco and *T. lessinensis* Caporiacco.

*Troglolyphantes scientificus* Deeleman-Reinhold (Figs. 16-18)



Figs. 1-8: *Troglolyphantes exul* n.sp. ♂ holotype (1-2, 4-8), ♂ without palps (3). 1 ♂ palp, lateral view; 2 Cymbium, mesal view; 3 ♂ chelicera, ventral view; 4 ♂ palpal tibia, dorsal view; 5 Paracymbium; 6 Suprategulum; 7 Embolic division, mesal view; 8 Embolus, ventral view. Scale lines = 0.1 mm. Abbreviations: E = embolus, L = lamella, R = radix, p = anterior projection, r = retrolateral ridge.

*Material examined*

Italy, Friuli-Venezia Giulia, Udine, Grotta nuova di Villanova (type locality), Paoletti leg., 1♀ 2 Sept. 1973, CTh. Grotta di Taipana, Platischis, Beraldo leg., 1♂ 2 April 1977, CTh. Grotta Doviza, com. Lusevera, Gasparo leg., 2♀ 6 March 1981, NMW, MCT. Buca del Diavolo, com. Prepotto, Gasparo leg., 1♂ 2 April 1981, MCT.

*Comparative remarks*

The specimens agree well with the detailed original description. Furthermore, they originate from the type locality and from surrounding caves. The inner branch of the lamella (Fig. 17) shows perfect agreement with the homologous structure of *T. latzeli* Thaler, a surface dweller in the Julian Alps and in the Karawanken range, indicating close relationship (Thaler, 1986).

*Troglohyphantes ruffoi* Caporiacco (Figs. 19-43)

*T. ruffoi* Caporiacco, 1936: 85-87, figs. 1-5, ♂♀ from 2 caves near Verona, lost (Brignoli, 1971: 186).

*T. ruffoi*. Brignoli, 1971: 186-189, figs. 86-91, ♂♀. Type locality restricted to Grotta di Veja, selection of neotype (examined).

*T. prope ruffoi* Brignoli, 1971: 189, fig. 96, ♀ from Grotta Damati.

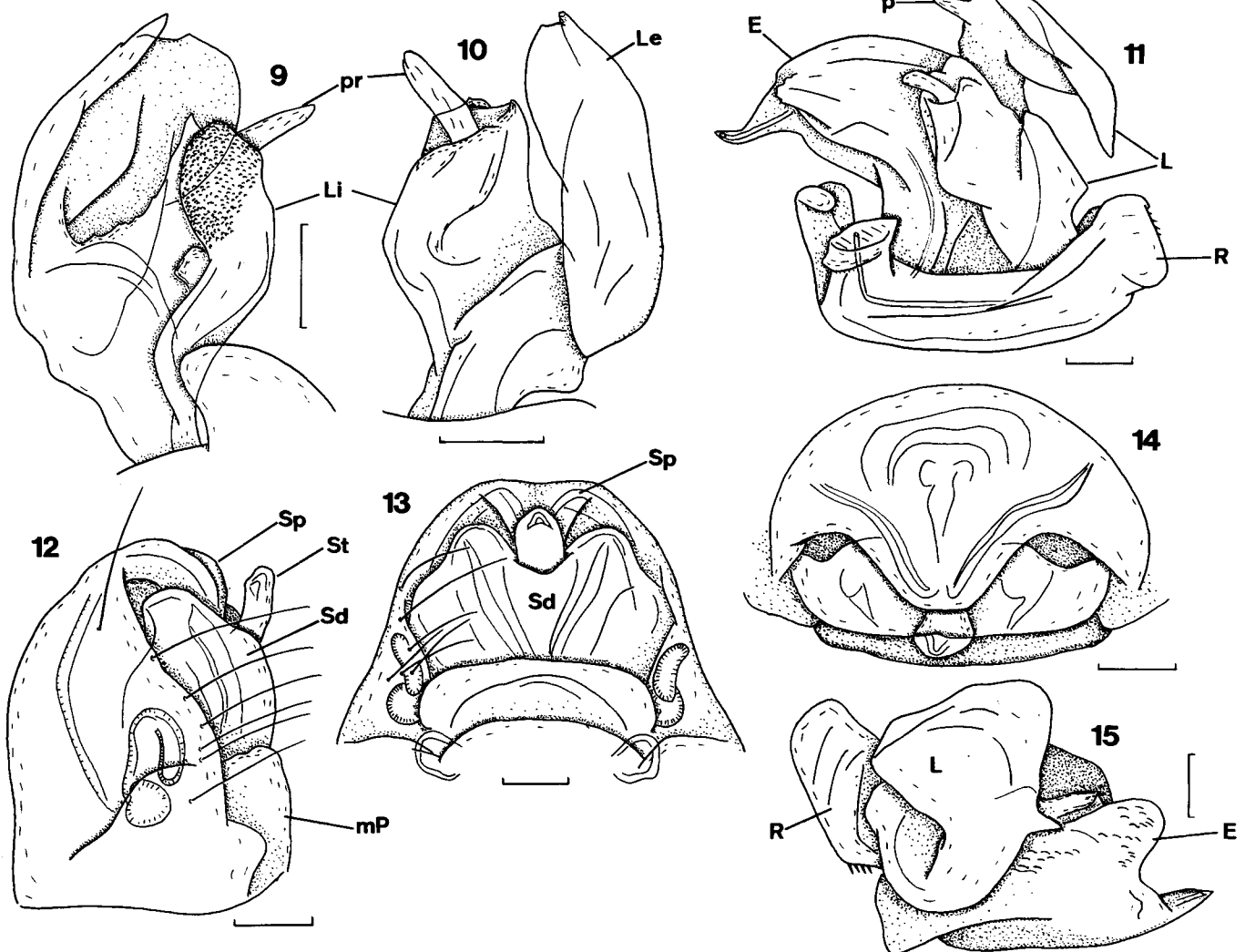
*T. paoletti* Brignoli, 1971: 189-192, figs. 92, 94, 95, 97, ♂ from Verona, Spluga del Maso, com. Marano di Valpolicella. New synonymy.

*T. prope paoletti*. Brignoli, 1975: 14, fig. 25, ♂ from Podestaria (examined).

*Material examined* (localities see Map 1, nos. 4, 5, 7-10)

Italy, Veneto, Mt. Lessini, (4) Sant'Anna d'Alfaedo, Ponte di Veja 602 m, in pitfalls, Chiavegato leg., 3♂ 1♀ 20 July 1980, CTh. (5) Grotta Damati 620 m, Caoduro leg., 3♀ 2 Oct. 1978, MCV; Kahlen leg., 1♂ 18 March 1984, NMW. (7) Rif. Balasso 1000 m east of Pian d. Fugazze, Thaler leg., 2♂ 2♀ 10 Oct. 1969, NMW. (8) San Bortolo 870 m, Thaler leg., 1♂ 27 April 1984, CTh. (9) Campodalbero 1330 m, Thaler leg., 1♂ 27 April 1984, CTh. Dolomiti, (10) Road from Bassano to Mt. Grappa 1050 m, Thaler leg., 2♂ 28 Sept. 1977, CTh.

The specimens apparently agree well with the descriptions. The most conspicuous characters



Figs. 9-15: *Troglohyphantes exul* n. sp. 9 Lamella, ventral view; 10 Lamella, dorsal view; 11 Embolic division, dorsal view; 12 Epigyne, lateral view; 13 Epigyne, posterior view; 14 Epigyne, ventral view; 15 Embolic division, lateral view. Scale lines = 0.1 mm. Abbreviations: E = embolus, L = lamella, Le, Li = exterior (interior) branch of lamella; mP = median plate; R = radix, Sd, Sp = distal (proximal) part of scape, St = stretcher, p = anterior projection, pr = terminal process.

provided by the palpal organ can be recognised in the drawings published: prominent patella and outgrowths of the cymbium.

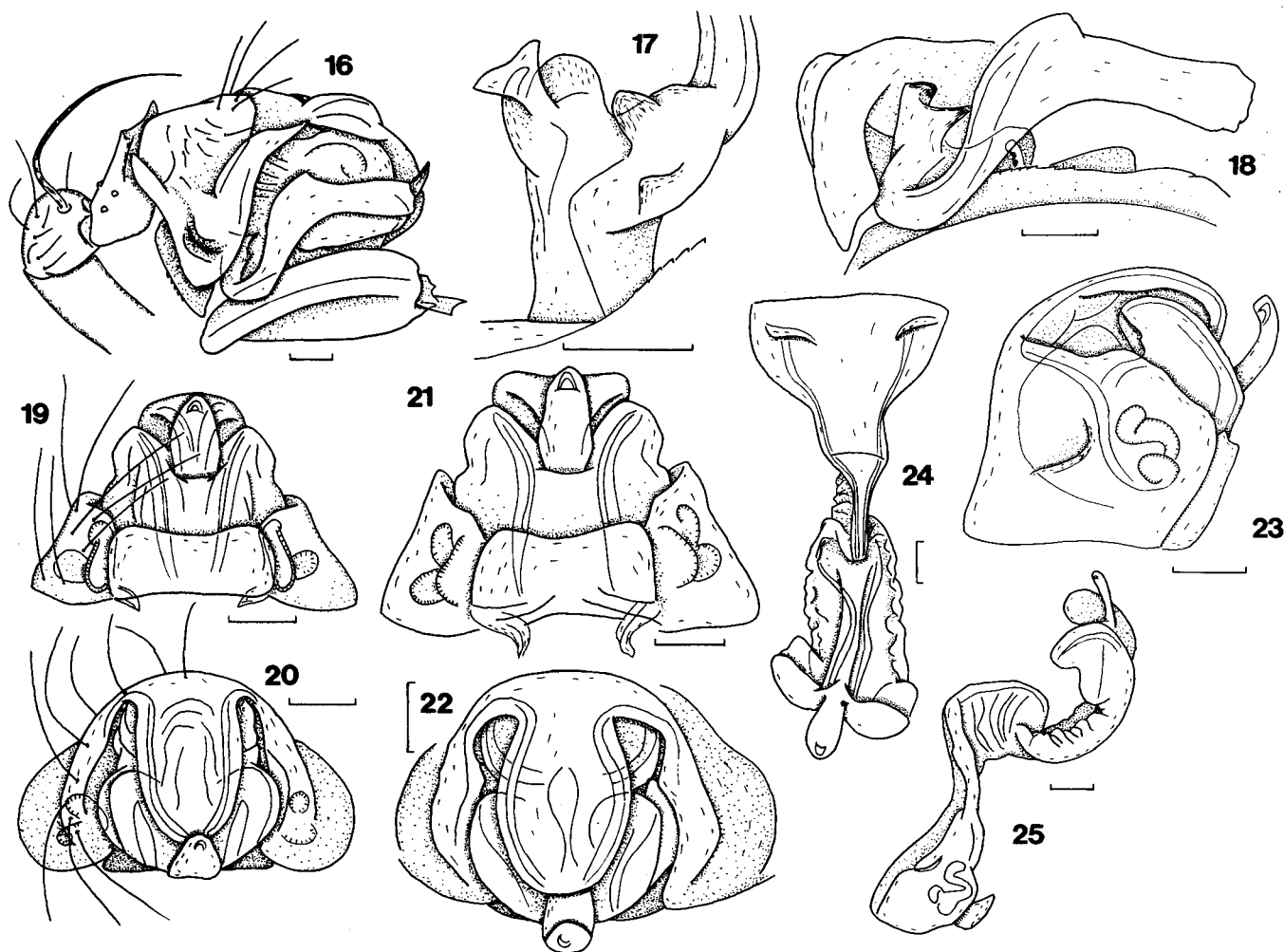
*Description (♂/♀)*

Measurements (mm,  $n = 7/4$ ): Total length 2.8-3.2 (2.8-3.6), carapace 1.16-1.31 (♂/♀) long, 0.98-1.13 (0.94-1.07) wide, length/width = 1.2, length femur I 1.79-1.98 (1.66-1.98), femur I/carapace length = 1.4-1.6 (♂/♀). Colour brownish-yellow, sternum and abdomen greyish. Head not much elevated, with weak spines, eyes normal. Stridulating file dense. Leg chaetotaxy:

Fe	I	d l'
Fe	II-III	d
Ti	I	d (l' d l'')
Ti	II	d (l' d)
Ti	III-IV	d d (l' l'')
Mt	I-III	d

Palp (Figs. 26-43): Patella strongly prominent dorsally, bearing 3 spines, Figs. 29, 30. Ventral and inner side of tibia convex, anterior margin excavated,

Fig. 28. Cymbium with a conical elevation in distal half and with a finger-like process pointing mesally in proximal half, separated by a deep dorsal cleft, Figs. 26, 27, 29. Inner edge of cymbium in most specimens evenly rounded, but in males from localities 7 and 9 with two small knobs, Fig. 27. Paracymbium, Fig. 31, transverse branch with a ventral off-shoot; suprategulum, Fig. 32. Embolic division: embolus Figs. 33-34, lamella Figs. 35-43. Due to the difference in lamella between *T. ruffoi* and *T. paoletti* described by Brignoli, these structures have been investigated more closely. Variation is slight in the inner branch and in the basal region of the outer branch (Figs. 40-43), but conspicuous in its F-shaped distal part (Figs. 35-39). There are differences in the length of the ventral process (v), in the end of the dorsal process (d) and in its curvature, process (d) being straight in 2♂ from locality 10 (Fig. 39). Apparently there is continuous variation from Fig. 35 to 38, and the author failed to recognise any specific difference. The slightly bifid base (b) of the outer branch agrees with *T. ruffoi* as shown by Brignoli (1971, fig. 91). As it cannot be recognised in lateral view, it is not shown in Brignoli's fig. 94.



Figs. 16-18: *Troglolyphantes scientificus* Deeleman-Reinhold. 16 ♂ palp, lateral view; 17 Lamella, dorsal view, distal part of exterior branch not shown; 18 Lamella, lateral view.

Figs. 19-25: *Troglolyphantes ruffoi* Caporiacco. ♀ from Rif. Balasso (19-20, 24-25), ♀ from Gr. Damati (21-23). 19-23 Epigyne, posterior view (19, 21), ventral view (20, 22), lateral view (23); 24, 25 Epigyne, scape extended, ventral view (24), lateral view (25). Scale lines = 0.1 mm.

Epigyne (Figs. 19-25): Protuberant, its posterior borders forming a right angle (Fig. 23). Side margins of basal part of scape slightly rounded, Figs. 20, 22.

#### Remarks

*T. ruffoi* has been collected outside caves under stones deeply embedded in the ground, and with pitfall traps. It is thus a surface dweller, able to colonise the cave environment. As a surface-dwelling species, it can be expected to have a rather wide distribution area as compared with its troglobitic congeners. By its palpal morphology (patella, cymbium, paracymbium), *T. ruffoi* is clearly separated from the other epigeic species of the region: *T. fagei* Roewer, *T. lessinensis* Caporiacco, *T. sbordonii* Brignoli (Brignoli, 1971; Thaler, 1982). Nevertheless, the specimens examined pose some questions on the true nature of this species. Considering the close agreement between the specimens from localities 2, 4-6, 8, *T. paoletti* (type locality no. 3) should be regarded as a synonym of *T. ruffoi* (type locality no. 2). Specimens from three more distant localities in the North and East are problematic. They differ discontinuously by the inner edge of the cymbium (Fig. 27, loc. 7, 9) and by the outer branch of the lamella (Fig. 39, loc. 10) respectively, the other

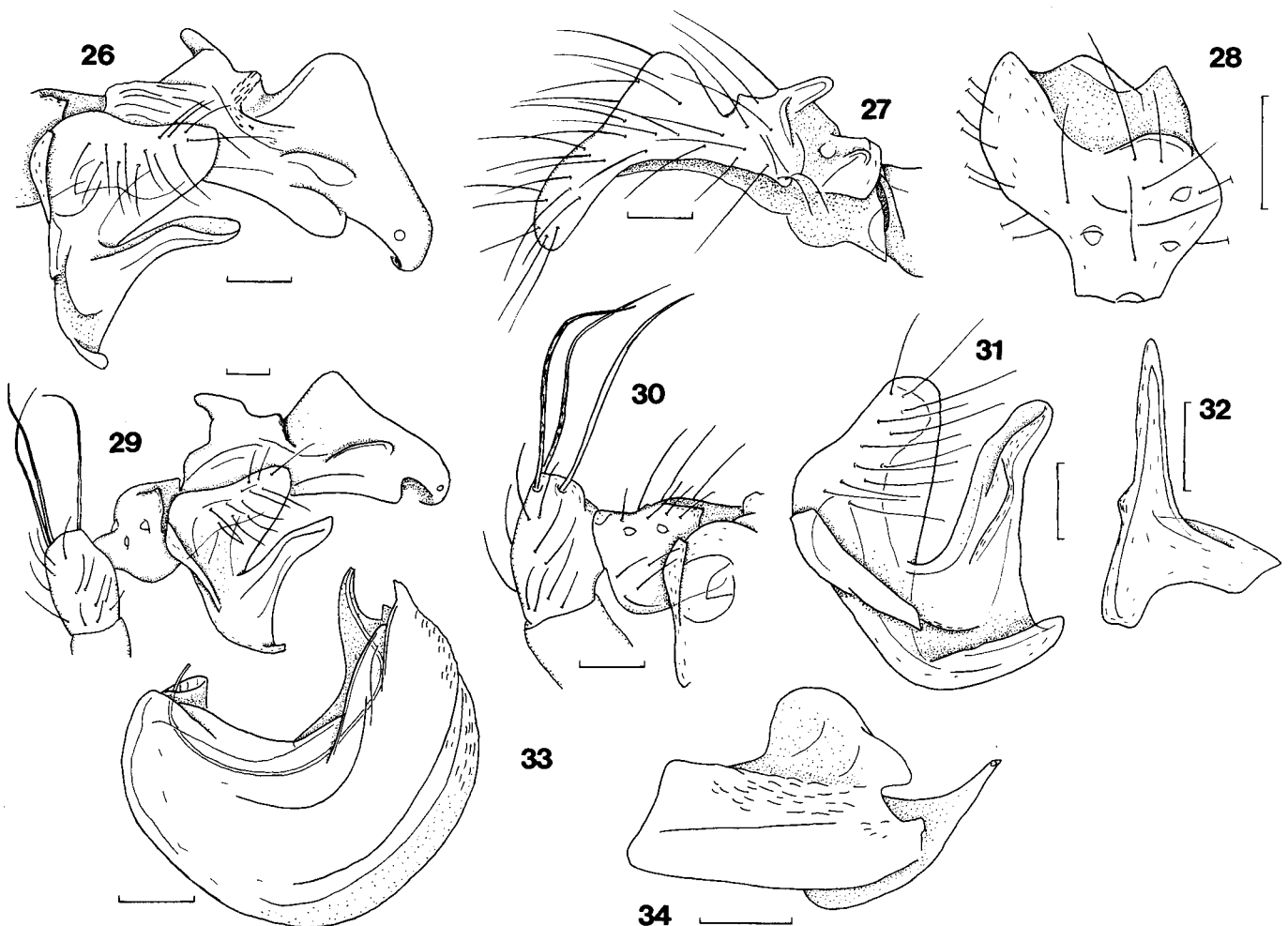
taxonomic characters being concordant. From two localities outside this range *T. ruffoi* has been recorded from females only: Borgo-Valsugana (Thaler, 1967) and Colli Berici (Brignoli, 1971). These records need corroboration by the capture of males. Further field work will elucidate whether *T. ruffoi* should be regarded as polytypic or even as a superspecies.

#### Acknowledgements

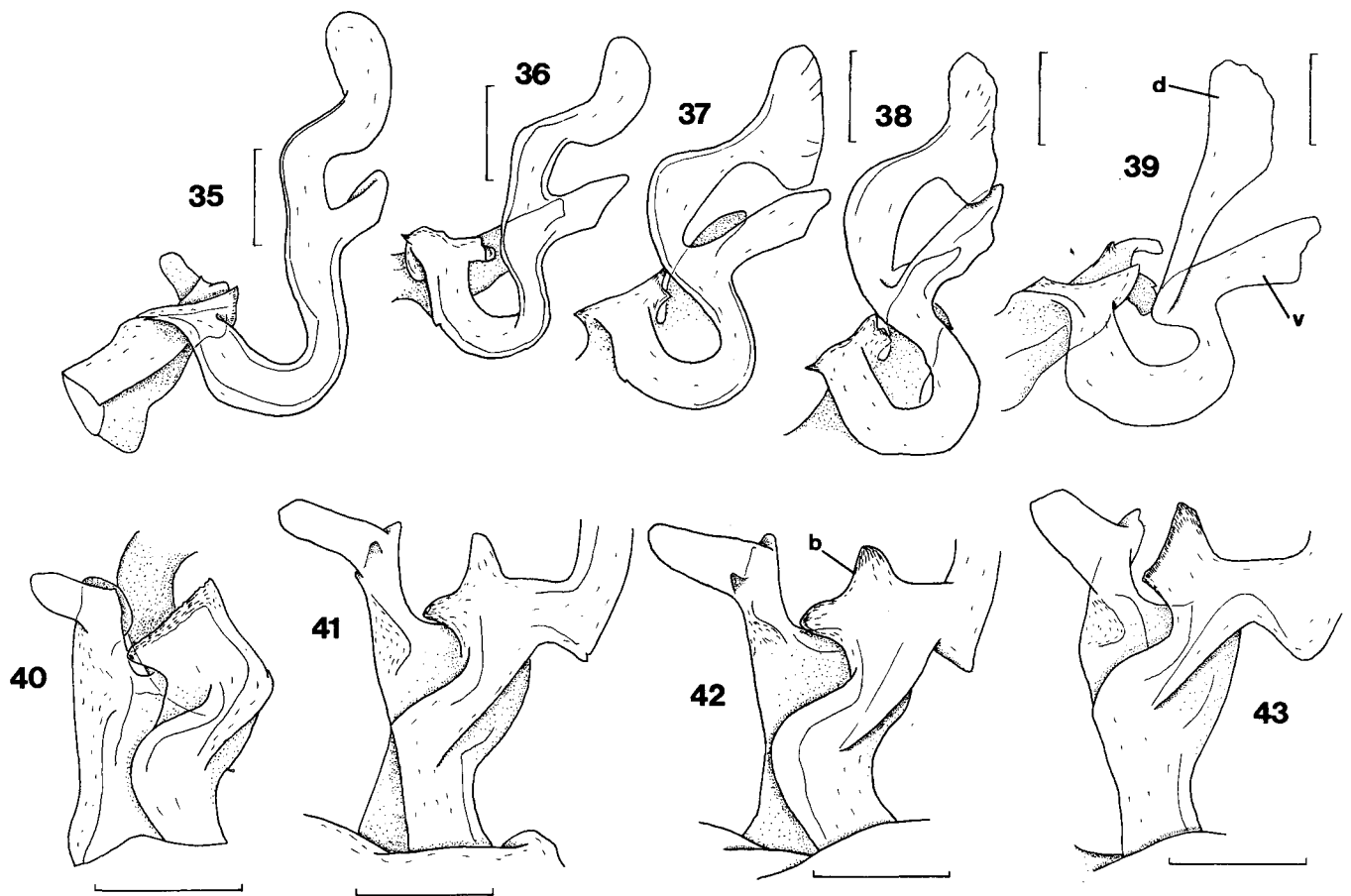
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Figs. 26-34: *Troglodyphantes ruffoi* Caporiacco. Males from Rif. Balasso (26-28, 30-33) and from Mt. Grappa (29, 34). **26, 27, 29** ♂ palp, without palpal organ, lateral view (26, 29), mesal view (27); **28** ♂ palpal tibia, dorsal view; **30** ♂ palpal patella and tibia, lateral view; **31** Paracymbium; **32** Suprategulum; **33, 34** Embolus, dorsal view (33), lateral view (34). Scale lines = 0.1 mm.



Figs. 35-43: *Troglolyphantes ruffoi* Caporiacco. Males from Rif. Balasso (35, 40), Campodalbero (36), Gr. Damati (37, 41), S. Bortolo (38, 42), M. Grappa (39, 43). **35-39** Lamella, lateral view; **40-43** Lamella, dorsal view, distal part of exterior branch omitted. Abbreviations: b = bifid base of outer branch, d = dorsal process, v = ventral process.

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