

Two remarkable relict Arachnids from northern Italy: *Sabacon simoni* Dresco (Opiliones: Ischyropsalididae), *Louisfagea rupicola* (Simon) (Araneae: Tetragnathidae?)

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Summary

Distribution and affinities of two arachnids of extraordinary interest from northern Italy are discussed: *Sabacon simoni* Dresco, *Louisfagea rupicola* (Simon). The male of *S. simoni* is described for the first time, *L. rupicola* is compared with *Pimoa altiocolata* (Keyserling) from North America. Both species indicate ancient faunistic relationships between the southern parts of the Holarctic region (Reinig 1937, Lindroth 1957), congeneric or closely allied species existing in the Iberian peninsula, in the Himalayas, in Japan and neighbouring countries, and in North America.

Introduction

Though the number of described arachnid species is increasing from year to year, only a small proportion are really well known, many others being known at most by their key characters and from a few stations. Certainly, arachnid taxonomy will profit most by revisionary work and by the re-evaluation of faunas (Turnbull 1973, p. 323). Nevertheless, uncommon species of extraordinary interest may be treated separately.

The two species from northern Italy reported below show unusual morphological characters. They stand rather isolated within the Italian fauna, their nearest relatives living widely separated in other dispersal centres of the arboreal Holarctic fauna (in the sense of DeLattin 1967, p. 324), in the Iberian peninsula, in the Himalayas, in Japan and neighbouring regions, and in North America. These taxonomic groups are present discontinuously in the south of the whole Holarctic region, and they may be regarded as "tertiary relicts" (Reinig 1937, Lindroth 1957). The two species thus stress the importance of the adriato-

mediterranean dispersal centre, which is already well documented in other organisms (e.g. Barbero 1967, Balletto 1969, Bono & al. 1970), especially in the famous amphiatlantic salamander *Hydromantes genei* (Temminck & Schlegel) (Amphibia Caudata: Plethodontidae) (Wahlert 1957, p. 275).

***Sabacon simoni* Dresco (Opiliones: Ischyropsalididae)**

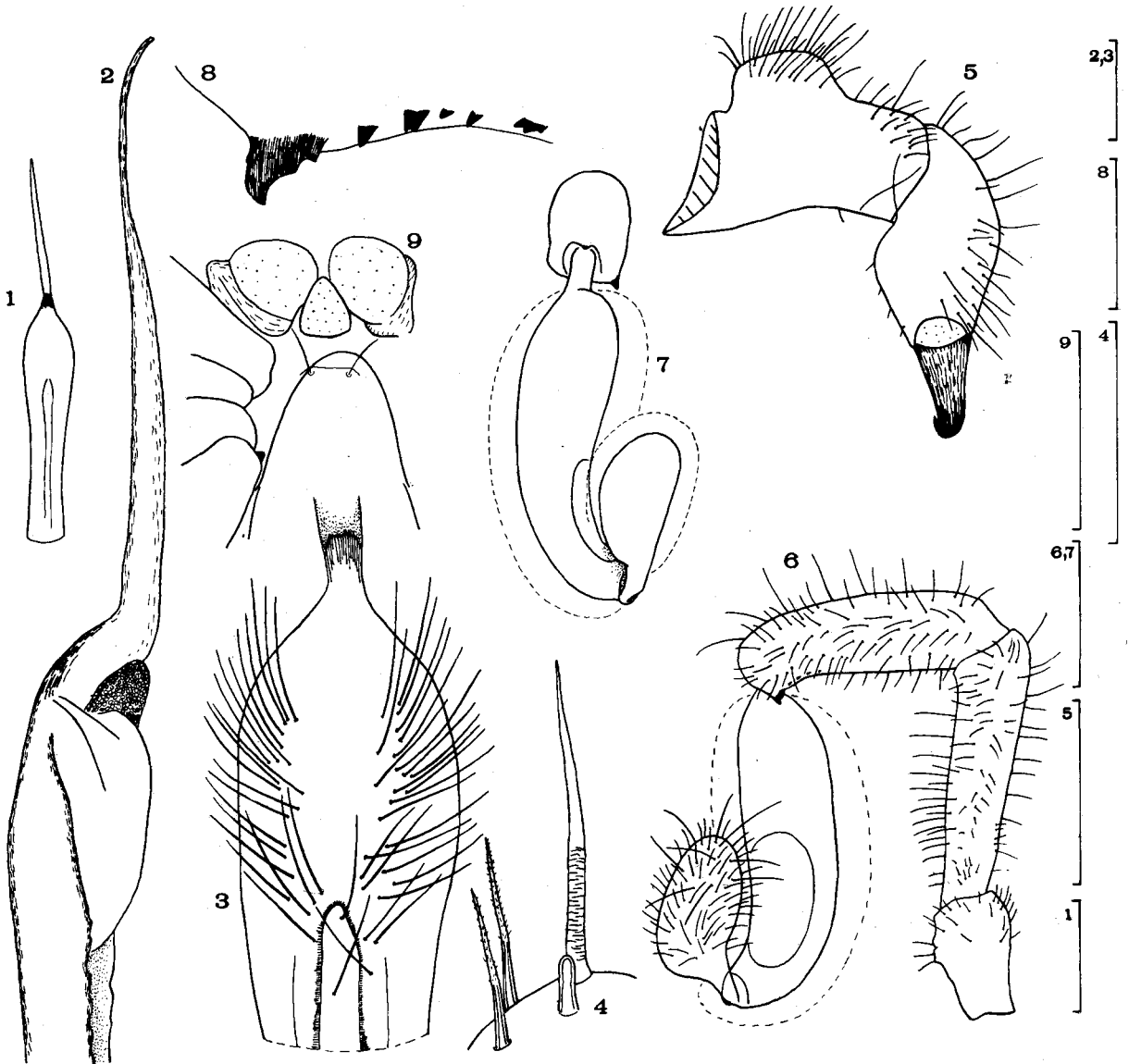
Figs. 1-9

Records

Italy, Toscana: Alpi Apuane, Turrite Secca near Castelnuovo ca 900 m, 6 ♂♀. Appennino Toscano, Abetone ca 800 m, 5 ♂♀; Pso. di Cerreto ca 1150 m, 5 ♂♀. Records between 15-20 October 1975.

Description (♂)

Measurements (in mm): Length of body 2.0-2.9, of femur I-IV 1.6/2.6/1.7/2.4, of leg II 14.3 (2.6 + 0.9 + 2.7 + 4.0 + 4.1). Body soft, smooth and pale, with scutum laminatum. **Coloration:** carapace yellowish brown, brownish purple near margins, eye tubercle almost black, abdomen brownish purple, ventrally with a pale median region, the heavily sclerotized penis being visible through the integument. Eye tubercle without ornamentation, body without granulations, with numerous setae. Two paramedian spines present on 2nd thoracic tergite, sternum (Fig. 9) with 2 stout setae, resembling the situation found in juveniles of *Ischyropsalis* (Hadzi 1942, p. 69, 71). There exists a sexual dimorphism in the position of these setae: in the female they stand much closer together and originate from a common sclerotized base. **Sternal region** (Fig. 9): labium small, endite lacking on coxae II/III, being recognizable on coxa IV as a minute spur. **Chelicera** (Fig. 5): proximal article with low glandular elevation, distal article unarmed. **Palpus** (Fig. 6): 3.4 (0.9 + 0.9 + 1.1 + 0.5) mm. Patella cylindrical, distally with a prolateral-ventral row of minute teeth (Fig. 8). Tibia (Fig. 7) swollen and slightly curved, together with the tarsus densely covered with bristles of 2 peculiar types already recognized by Hansen & Sørensen (1904, p. 26): "plumose hairs" which occur also in *Hesperonemastoma* (Gruber 1970, p. 131, fig. 14b) and "articulated" macrosetae (Fig. 4). **Penis** (Figs. 1-3): Length 1.7 mm, shaft long and thin, ventrally concave. Glans slightly broadened, dorsally sclerotized, with many long bristles in 2 longitudinal rows, ventrally soft,



Figs. 1-9: *Sabacon simoni* Dresco (δ). 1 Penis (from above); 2 Glans and stylus (lateral view); 3 Glans (from above); 4 Two "plumose hairs" and 1 macroseta from the tip of the palpal tarsus (also 1 enigmatic sensillum); 5 Chelicera (lateral view); 6 Palpus (mesal view); 7 Palpus (frontal view); 8 Teeth of the palpal patella; 9 Sternal region. Scale lines: 0.10 mm (Figs. 2-4, 8), 0.50 mm (Figs. 1, 5-7, 9).

membranous. Stylus long and tapering, its base sharply bent downward and forward.

Affinities, distribution

Following Dresco's key (1952), the specimens fall clearly within the species *S. simoni*, leg dimensions and palpus being in accordance. Thus, the species has been rediscovered near its type locality, the Forêt de Turini, Alpes Maritimes. Furthermore, the glandular elevation of the chelicera is much lower than in *S. paradoxus* Simon and in *S. vizcayanus* Simon. *S. franzi* Roewer, which is also short-legged and known from only 2 females from Sierra de Ancares, Spain, should be easily distinguished by its chelicera and its palpal tibia (Roewer 1953, Dresco 1955). Kraus (1961) refers 1♀ from Portugal (see also Rambla 1967) and 1 juv. from north-western Spain to *S. simoni*. These identifications might be questioned and should be corroborated by further captures.

Habitat, observations

S. simoni was found in moist ravines in woodland at about 1000 m a.s.l. It matures rather late like many other members of the genus, perhaps thereby having escaped more regular observation. Two mites were found attached to the cheliceral elevation and to the mesal surface of the palpal tibia resp.: *Histiosoma sapromyzae* (Dufour) (Acaridida: Anoetidae), *Bakerdania pannonica* (Willmann) (Tarsonemida: Pygmephoridae). Their identification is gratefully acknowledged to Dr. S. Mahunka (Budapest).

Discussion

Knowledge of the taxonomy and distribution of the genus *Sabacon* has accumulated rather slowly over many decades, since Roewer (1914, p. 123) synonymized the six nominal species then recognized (from western Europe, Siberia, North America) into two. The genus deserves more general interest for its curious palpal morphology (the functional significance of the reflexed tarsi still being obscure), for its fossil history, being present already in the Baltic amber (Roewer 1939) and for its highly discontinuous distribution. Quite recently, careful descriptive and revisionary work on some faunas covering arboreal refuges during the Pleistocene epoch yielded a surprising richness in *Sabacon*-spp.: the Himalayas (Martens 1972, 6 spp.), Japan (Suzuki 1974, 9 spp.), and North America (Shear 1975, 6

spp.). Regrettably information on the 4 European species from the Iberian peninsula and from France (Dresco 1952, 1955, Roewer 1953) must be regarded still as insufficient even for taxonomic purposes: the genital organs have not been illustrated and 2 species were known only from females. The specimens reported above thus provide valuable complementary information. The European range of the genus is widened into northern Italy, adding *S. simoni* to the Italian fauna, it having escaped the attention of Caporiacco (cf. Dresco 1952, p. 124) and it also was not mentioned by Marcellino (1970). Furthermore, its male is characterized for the first time.

Louisfagea rupicola (Simon) (Araneae: Tetragnathidae?)

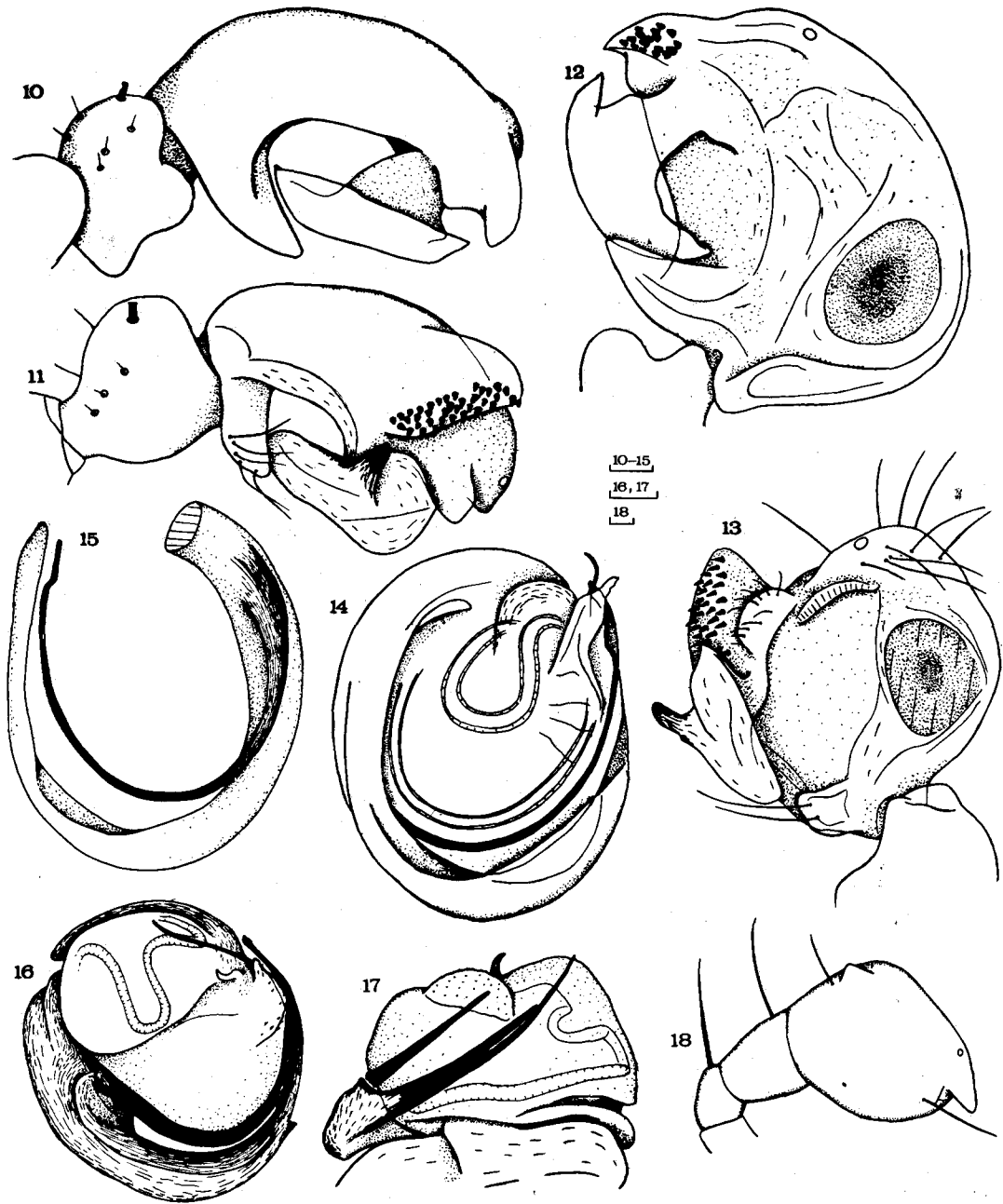
Figs. 11, 13, 16-18 (compared with *Pimoa altioculata* (Keyserling), Figs. 10, 12, 14-15)

Labulla rupicola, Simon (1929, p. 624, 741); *L. (Metella) r.*, Fage (1935, p. 179); *Labulla r.*, Dresco & Hubert (1971, p. 200); *Louisfagea r.*, Brignoli (1971, p. 161, 1975, p. 12).

Distribution, records

As summarized by Brignoli, the species is known from France (Déps. Var, Alpes-Maritimes) and from Italy: Piemonte, Liguria, Toscana. The records reported below extend its range both to the north (Cottian Alps, near Torino) and to the south (Pratomagno near Firenze). Hence *L. rupicola* may be regarded as a relict in the adriatomediterranean dispersal centre, whose range cannot yet be defined exactly. We might expect it to extend more to the south on the peninsula, but it is almost certainly missing in the Insubrian region, in the Lombardy and in the eastern and northern Alps. So this mountainous species should reach its northernmost limit somewhere in Piemonte.

Italy, Toscana: Appennino Toscano, Montemignaiolo-Pratomagno 850 m, 1♀; Abetone 800 m, 1♀; Pso. di Cerreto ca 1000 m, 1♀; Grondola-Pontremoli ca 720 m, 1♀. Alpi Apuane, Turrice Secca near Castelnuovo ca 900 m, 1♂ 1♀. *Liguria:* Near Giusvalla 500 m, 2♀; near Murialdo ca 500 m, 4♀; Conca Giovetti near Massimino-Bagnasco 800 m, 1♀. *Piemonte:* Near Ovada 250 m, 1♂1♀; Ormea-Viozene 600-1200 m, 3♀; V. Gesso 1040 m, 1♀; Bagnolo Piemonte 1050 m, 1♀; Giaveno near Torino 950 m, 4♀. Records from



Figs. 10-18: *Louisfagea rupicola* (Simon). 11 Male right palp, patella and cymbium (lateral view); 13 Cymbium (ventral); 16 Tegulum and embolic division (ventral); 17 Tegulum and embolic division (lateral view); 18 Palp of subadult male. *Pimosa altiocolata* (Keyserling). 10 Male right palp, patella and cymbium (lateral view); 12 Cymbium (ventral); 14 Tegulum and embolic division (ventral); 15 Embolic division (dorsal). Scale lines: 0.10 mm.

Liguria and Piemonte between 29 September-9 October 1972, from Toscana between 15-21 October 1975.

Taxonomy

The species has been assigned to *Labulla* (Linyphiidae) and to *Metella* (preoccupied, Argiopidae: Tetragnathinae *sensu* Simon 1894, 1929, Fage 1931). In any case, its palpal organ deviates from that of the type species *Labulla thoracica* (Wider) to such a degree (compare Merrett 1963, p. 377), that a separate genus, *Louisfagea* Brignoli (1971, p. 161, see also Fage 1946) should be fully justified. As already pointed out by Brignoli (1971, p. 163, "sia il bulbo che la vulva . . . ricordano pochissimo le tipiche condizioni dei Linyphiidae"), the cymbium and palpal organ may even demonstrate that the genus cannot be placed within Linyphiidae at all (Figs. 11, 13, 16-17). The cymbium is flat and nearly circular, the alveolus lying eccentrically near its prolateral margin (Fig. 13). There exist strange modifications at its retrolateral margin. The paracymbium is not a separate sclerite, but a thumb-like projection at its base, followed by a malleiform apophysis, which is surmounted dorsally by a conical protuberance with many black denticles at its outer/anterior surface (Fig. 11). There are projections already in the subadult palp (Fig. 18). A most peculiar character is shown by the embolic division (Figs. 16, 17), which is bent to a half circle around the tegulum. Distally, it is split into 3 tapering processes, the innermost being the embolus.

The correct familial affiliation of the species is a puzzling problem. Moreover, the limitation of families in the whole large superfamily Araneoidea has become obscured through the discovery of "intermediate species" (Levi & Levi 1962, p. 5), the group thus needing a "relimitation of families" (Lehtinen 1967, p. 396). Apparently the palpus of the poorly known genus *Cyatholipus* (from South Africa and the West Indies) presents a striking similarity. The figures given by Simon (1894, p. 711) also show the paracymbium as a solid basal hook without articulation, and they indicate furthermore a retrolateral projection on the cymbium and a circular embolic division. *Cyatholipus* has been placed by Simon within Tetragnathinae, and by Petrunkevitch (1928) within Theridiosomatinae. Since Fage originally placed his *Metella* close to *Meta* (1931), and since Locket, Mil-

lidge & Merrett (1974) have replaced *Meta* into Tetragnathidae, perhaps *Louisfagea* could also be placed within that family, at least provisionally (see also Brignoli 1975, p. 13).

As Fage (1946) and Brignoli have already recognized, close relatives to *L. rupicola* are found in North America. These were also originally described within *Labulla*, e.g. by Gertsch & Ivie (1936), but were removed later to *Pimosa* Chamberlin & Ivie (1943), the type species being *P. hespera* (Gertsch & Ivie) from California. Through the kind cooperation of Dr P. van Helsdingen (Leiden), which is gratefully acknowledged, I had the opportunity to compare with *P. altiocolata* (Keyserling) (Figs. 10, 12, 14-15). The thumb-like paracymbium, the eccentric alveolus and the malleiform apophysis correspond, a small protuberance with black denticles also being present (Figs. 10, 12). The embolic division is again almost circular, splitting into an inner embolus and an outer, ribbon-like process (Figs. 14, 15). These homologies corroborate the close relationship.

Affinities, discussion

Apparently the distribution of the genera *Louisfagea* and *Pimosa* is limited to several arboreal dispersal centres of the Holarctic fauna. The other species of *Louisfagea* are known from the Iberian peninsula (atlantomediterranean centre, *L. breuili* (Fage), Fage 1931, 1935) and from the Himalayas (nepalian centre, *L. crista* (Fage), Fage 1946), the genus *Pimosa* being distributed in western North America from California to British Columbia, Chamberlin & Ivie (1943), Gertsch (1951). They may be considered as refugional relicts, as remnants of a pre-Pleistocene holarctic area across the Asian continent.

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