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SIRO VALLEORUM N. SP.

A NEW CYPHOPHTHALMID FROM THE ITALIAN ALPS

(ARACHNIDA: OPILIONES: SIRONIDAE)

RIASSUNTO: Una nuova specie di opilione cifoftalmo, *Siro valleorum* n. sp., è descritta ed illustrata sulla base di materiale proveniente dalle Alpi Bergamasche e Bresciane. *Siro valleorum* è molto vicino, per aspetto generale e morfologia genitale, a *Siro rubens* (Latreille, 1804); se ne distingue per la forma dell'adenostilo, per la forte carena sull'opercolo anale del maschio, per il più marcato allungamento degli ultimi segmenti dell'opistosoma della femmina (con l'opercolo anale che diviene dorso-terminale), per le maggiori dimensioni del corpo e per le zampe più lunghe e sottili (tarso I almeno 4 volte più lungo che largo). Lo spostamento dell'opercolo anale della femmina in posizione terminale è considerato un carattere apomorfo. *Siro valleorum* e *Siro rubens* sembrano formare un gruppo naturale all'interno del genere; la differenziazione delle due specie, in considerazione del lento ritmo evolutivo dei Cyphophthalmi, è probabilmente legata agli eventi geologici del Neogene.

ABSTRACT: *Siro valleorum* n. sp. from the Provinces of Bergamo and Brescia (northern Italy) is described and illustrated, with ecological and biogeographical remarks. The new species appears to be closely related to *Siro rubens* (Latreille, 1804); the terminal position of anal plate in female is thought to be an apomorphic character.

KEY WORDS: Arachnida, Opiliones, *Siro valleorum*, Alps, Italy.

INTRODUCTION: The only opilionid of the genus *Siro* hitherto known from Italy was *Siro duricorius* (Joseph, 1868), which appears to be restricted, as for Italy, to the extreme north-eastern montane districts, from the Province of Bolzano to Friuli (Martens, 1978: fig. 68).

Recently, some specimens of *Siro* have been collected from the southern Italian Alps, in the Provinces of Bergamo and Brescia; these specimens are thought to be a new species.

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***Siro valleorum* n. sp.**

Diagnosis: Species of *Siro* closely related to *Siro rubens* (Latreille, 1804), from which it is readily distinguishable by the shape of male adenostyle, the high median ridge on male anal plate, the shape of female anal region, and by having larger body and longer and slender legs (length/width ratio in tarsus I ≥ 4). No other cyphophthalmid occurs in the range of this species.

Derivatio nominis: *Siro valleorum* is dedicated to Dr. Marco Valle, who collected most specimens of the new species, and to the memory of his father Dr. Antonio Valle, arachnologist and former Director of the Museo Civico di Scienze Naturali of Bergamo.

Type material: Holotype, male. Province of Bergamo, Colzate, slope of Mt. Alben near Baite Sedernello, 1300 m a.s.l., 13.VI.1990, leg. M. Valle (MSNB). Paratypes. Same data as holotype (6♂ 7♀ MSNB, 3♂ 3♀ MTSN, 1♂ 1♀ NHMW, 1♂ 1♀ SMF); same site as holotype, 17.VII.1988, leg. M. Valle (1♂ MTSN); same site as holotype, 19.VII.1989, leg. G. Buttarelli & M. Valle (1♂ MSNB); Province of Bergamo, Oneta, slope of Mt. Alben, Val Gerona, 1200 m a.s.l., 13.VI.1990, leg. M. Valle (1♀ MSNB); Province of Bergamo, Serina, Piano Palla, 1300 m a.s.l., 9.VII.1989, leg. M. Valle (1♂ MSNB); Province of Bergamo, Monte Pora, 9.V.1989, leg. R. Sciaky (2♂ MT); Province of Brescia, Pezzoro, 23.IV.1989, leg. R. Sciaky (1♂ MT).

Acronyms: MSNB: Museo Civico di Scienze Naturali, Bergamo; MT: personal collection of Michele Tedeschi, Milano; MTSN: Museo Tridentino di Scienze Naturali, Trento; NHMW: Naturhistorisches Museum, Wien; SMF: Senckenberg Museum, Frankfurt am Main.

Description, male (figs. 1-12): General aspect close to *Siro rubens*. Dorsum with pebbled cuticle and sparse setation; front border of prosoma straight or slightly sinuous, in lateral view not raised. Ozophores slightly excavated at the anterior margin of tip. Prosoma enlarged (greatest width

of body) behind ozophores. Posterior margin of tergite VIII trilobed (in a single specimen quite straight). Ventral thoracic complex and gonostome as in fig. 12. Anal plate subrounded, with a high and thin median ridge. Chelicerae and pedipalps typical. Legs comparatively long and slender, tarsus I at least 4x as long as wide. Adenostyle at about one-third of length of tarsus IV; base of adenostyle subcylindrical, with lateral pore; distal pore, adenostyle lamelliform, lanceolate more or less enlarged, more or less curved. Colour yellow-brown, legs slightly lighter. Penis shape close to *Siro rubens*. Movable fingers long and thin, curved outwards distally, longer than the median membranous lobe; basal part of movable fingers enlarged in mamillary lobes. Dorsal surface of ventral plate of penis with minute denticles. Setae as in fig. 10.

Measurements in mm, 18 male specimens: mean \pm S.D. (range).

Body length: 1.72 ± 0.04 (1.64-1.80).

Width across tips of ozophores: 0.84 ± 0.03 (0.80-0.88).

Greatest width (prosoma behind ozophores): 0.98 ± 0.02 (0.94-1.01).

Length/width ratio: 1.76 ± 0.05 (1.66-1.84).

Tarsus I, length: 0.49 ± 0.01 (0.47-0.52).

Tarsus I, width: 0.117 ± 0.005 (0.11-0.13).

Tarsus I, length/width ratio: 4.21 ± 0.13 (4.00-4.46).

More detailed measurements were carried out for a dissected male paratype from Colzate.

Body: length 1.75; width across ozophores 0.83; greatest width 0.98; L/W ratio 1.79.

Chelicerae: basal article 0.83 long, 0.18 wide; distal article 0.75 long; movable finger 0.28 long.

Pedipalps: femur 0.41, patella 0.27, tibia 0.30, tarsus (without claw) 0.28.

Legs (tarsal claw excluded):

leg I: femur 0.57, patella 0.27, tibia 0.34, metatarsus 0.23, tarsus 0.48 (0.12 wide, lateral view);

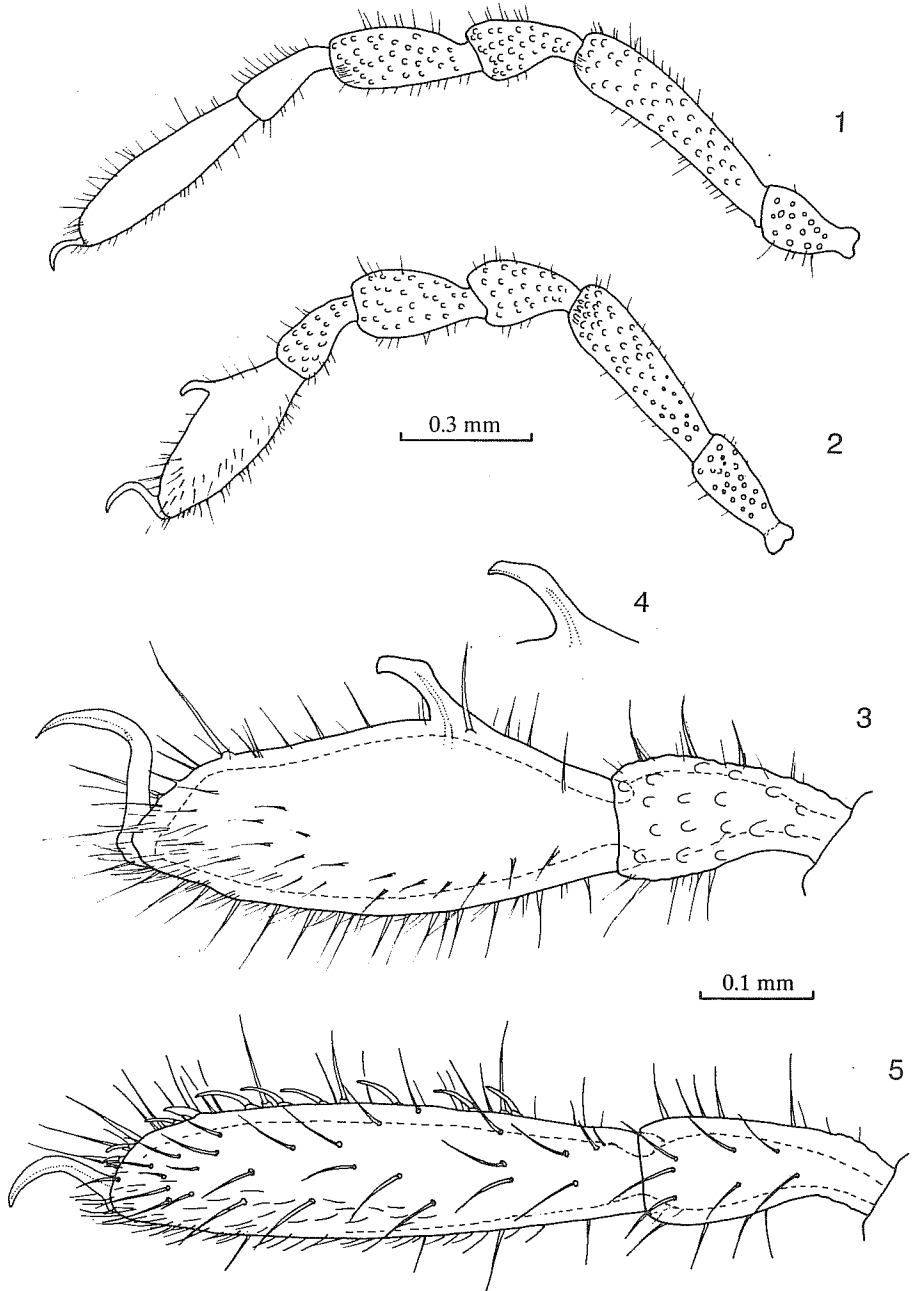
leg II: femur 0.48, patella 0.24, tibia 0.32, metatarsus 0.21, tarsus 0.44 (0.12 wide, lateral view);

leg III: femur 0.37, patella 0.22, tibia 0.25, metatarsus 0.20, tarsus 0.39 (0.10 wide, lateral view);

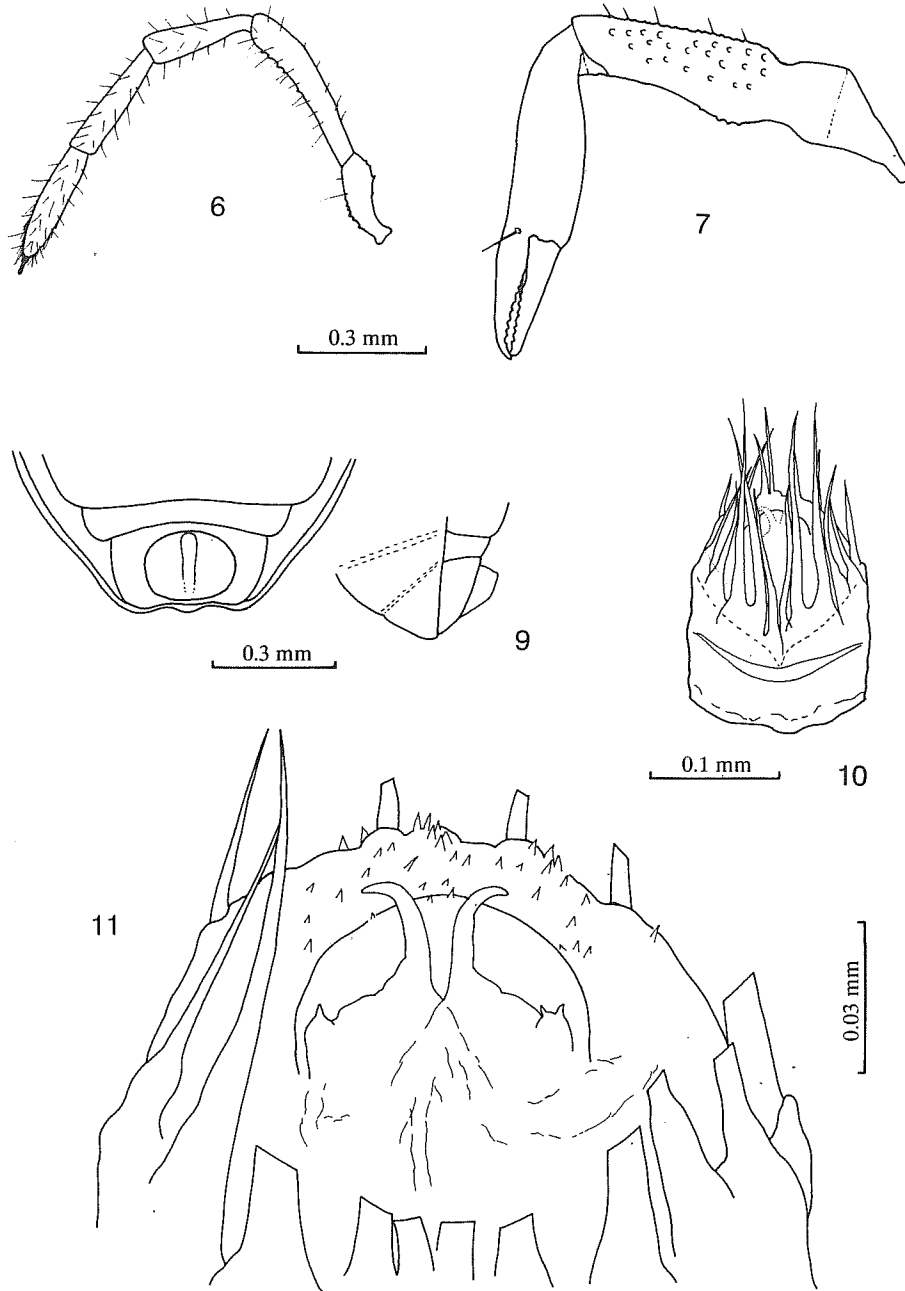
leg IV: femur 0.46, patella 0.26, tibia 0.30, metatarsus 0.22, tarsus 0.44 (0.17 wide, height of adenostyle 0.056, lateral view).

Penis: 0.195 long, 0.144 wide.

Description, female (figs. 13-16): Nonsexual characters as in male. Tarsus IV elongated, with the greatest width distally, near claw. Posterior part of body showing a peculiar shape. Tergite VIII and sternite VII (sensu-



Figs. 1-5. *Siro valleorum* n. sp., male paratypes from Mt. Alben. 1: leg I, lateral view; 2: leg IV, lateral view; 3: tarsus IV, lateral view; 4: adenostyle of another specimen, lateral view; 5: tarsus I, lateral view.



Figs. 6-11. *Siro valleorum* n. sp., male paratype from Mt. Alben. 6: pedipalp, lateral view; 7: chelicera, lateral view; 8: anal region, ventral view; 9: idem, lateral view; 10: penis, dorsal view; 11: distal part of penis, dorsal view (most setae cut off to show movable fingers, median membranous lobe and ventral plate).

Juberthie, 1967) very elongated, distally not attenuated; corona analis subcylindrical, wider distally, protruding between tergite VIII and sternite VII to form the end of opisthosoma; sternite VII and corona analis with long disto-lateral setae; anal plate (without median ridge) at the posterior edge of corona analis, thus dorso-terminal instead of ventral as usual in Sironidae. The shape of the anal region is identical in all the specimens and it does not result from temporary protrusion of the free segments of the opisthosoma. Ovipositor long, typical.

Measurements in mm, 13 female specimens: mean \pm S.D. (range).

Body length: 1.91 ± 0.04 (1.81-1.99).

Width across tips of ozophores: 0.85 ± 0.02 (0.82-0.90).

Greatest width (prosoma behind ozophores): 1.00 ± 0.02 (0.98-1.04).

Length/width ratio: 1.91 ± 0.03 (1.85-1.95).

Tarsus I, length: 0.49 ± 0.01 (0.47-0.50).

Tarsus I, width: 0.117 ± 0.001 (0.11-0.12)

Tarsus I, length/width ratio: 4.19 ± 0.10 (4.07-4.39).

More detailed measurements were carried out for a dissected female paratype from Colzate.

Body: length 1.93; width across tips of ozophores: 0.87; greatest width 1.00; L/W ratio 1.93.

Chelicerae: basal article 0.84 long, 0.19 wide; distal article 0.78 long; movable finger 0.27 long.

Pedipalps: femur 0.44, patella 0.28, tibia 0.31, tarsus (without claw) 0.28.

Legs (tarsal claw excluded):

leg I: femur 0.58, patella 0.28, tibia 0.36, metatarsus 0.24, tarsus 0.50 (0.12 wide, lateral view);

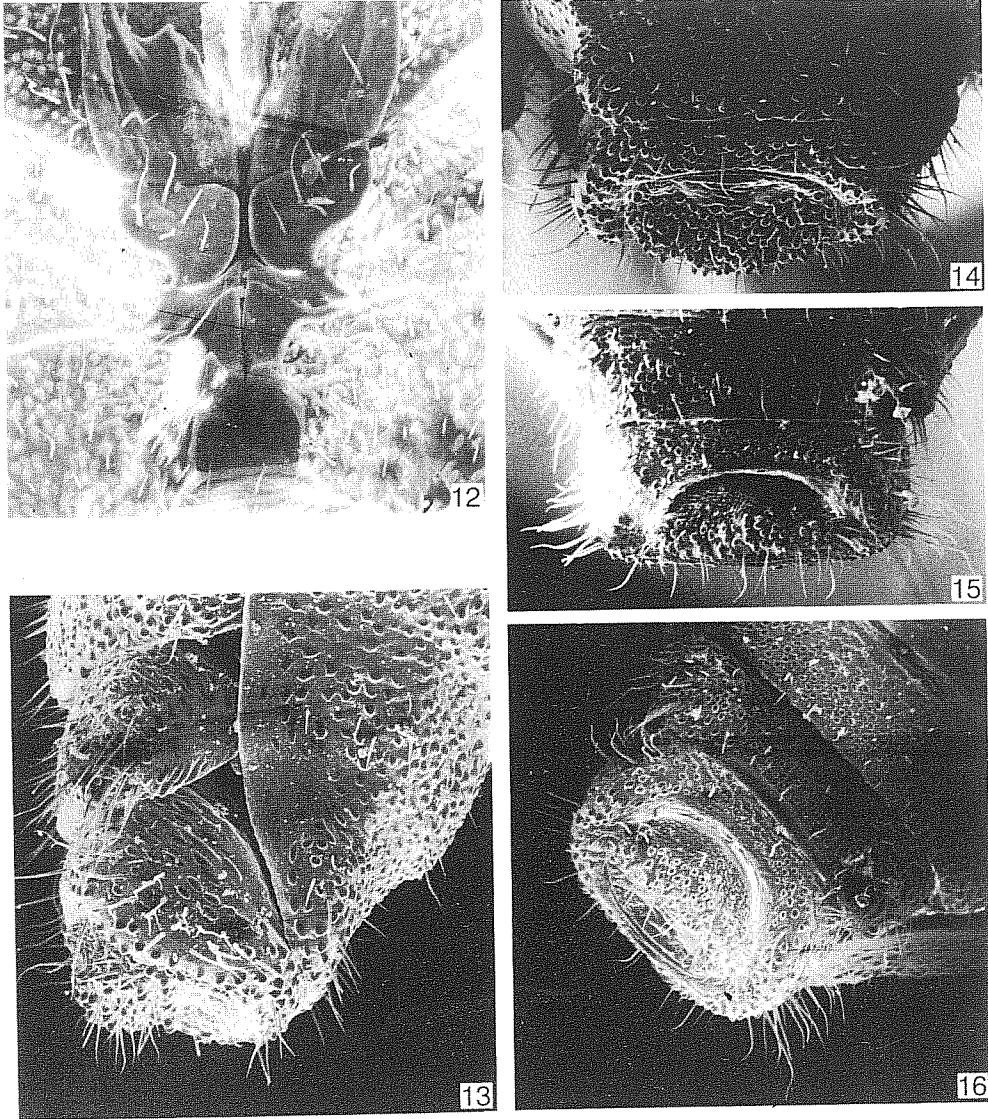
leg II: femur 0.52, patella 0.26, tibia 0.32, metatarsus 0.21, tarsus 0.48 (0.12 wide, lateral view);

leg III: femur 0.35, patella 0.23, tibia 0.25, metatarsus 0.19, tarsus 0.42 (0.10 wide, lateral view);

leg IV: femur 0.46, patella 0.25, tibia 0.28, metatarsus 0.21, tarsus 0.45 (0.11 wide, lateral view).

Ovipositor: 1.07 long.

Distribution and ecology: *Siro valleorum* n.sp. is known from 5 localities of the southern Italian Alps, in the Provinces of Bergamo (30 specimens) and Brescia (1 specimen). Most records come from Mt. Alben, at an elevation of 1200-1300 m. The specimens have been collected from April to July; usually they were recovered under stones in litter from beech wood (*Fagus sylvatica* Linn.), also at the boundary between wood and pasture. A specimen was collected under a stone in a mixed deciduous (*Fagus* and *Alnus*) and conifer (*Picea abies* Linn.) wood.



Figs. 12-16. *Siro valleorum* n. sp., paratypes from Mt. Alben, SEM. 12: gonostome and ventral thoracic complex of male (x 106); 13: end of opisthosoma of female, lateral view (x 97); 14: idem, dorso-posterior view (x 97); 15: idem, ventral view (x 97); 16: idem, ventro-posterior view (x 97).

Relationships: *Siro valleorum* n.sp. belongs to the group of European (and North American? see Shear, 1980) species characterized by movable fingers of penis bent outwards distally (*Siro* s. str. sensu Juberthie, 1967). *Siro valleorum* is closely related, by general shape of body and penis, to *Siro rubens* (Latreille, 1804), from which it can be easily separated by the characters given in the diagnosis. *Siro carpathicus* Rafalski, 1956, another species of *Siro rubens*-group, is readily distinguishable from the new species by the shape of adenostyle, penis and anal region of female, and by its smaller size.

Siro valleorum and *Siro rubens* share the posterior elongation of opisthosoma in female; this character confirms the close relationship between the two species, which form a natural group within the genus. In *Siro rubens* the anal plate is still ventral; in *Siro valleorum* the protrusion of the anal region is far stronger, and the anal plate turns dorso-terminal. The anal plate in ventral position of Cyphophthalmi is regarded by Hammen (1985) as a secondary translocation from the ancestral terminal position; Juberthie (1970) regards the subterminal position of the anal plate, e.g. in *Parapurcellia rumpiana* (Lawrence, 1939), as an apomorphic character. With regard to *Siro valleorum*, the protrusion of the female anal region (with terminal anal plate and a system of setae) is very likely an apomorphic character; it appears to be a synapomorphy (autapomorphy?) of the group *Siro rubens/Siro valleorum*. The different degree of elongation of the anal region in the two species shows the direction of character modification.

Concerning age and biogeographic meaning of the differentiation between *Siro rubens* and *Siro valleorum*, only speculations are possible. *Siro rubens* occurs in southern France, at southern and south-western edge of the Massif Central (Juberthie, 1967). *Siro valleorum* comes from a district of the Italian Alps which appears to be rich in endemic taxa, also in opilionids. The occurrence of endemisms in this area is often thought to be related to Quaternary ice age; but such hypothesis does not fit the biogeographic evidence of a slow rate of evolution in Sironidae (see Shear, 1980, and Juberthie, 1989). Hypothesizing a rate of differentiation related to that suggested by Juberthie (1989) for *Parasiro coiffaiti* Juberthie, 1956, and *Parasiro minor* Juberthie, 1958, the disjunction between *Siro rubens* and *Siro valleorum* should be connected with Neogene geological events.

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