## CERTONOTUS KRIECHBAUMER (HYMENOPTERA: ICHNEUMONIDAE), AN AUSTRALIAN GENUS NEWLY RECORDED IN SOUTH AMERICA<sup>1</sup>

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#### ABSTRACT

Certonotus is cited for the 1st time from temperate South America. The genus formerly was believed to be endemic to the Australian zoogeographical region and to some nearby islands. Certonotus invictus n. sp. and C. umbrarum n. sp. inhabit moist, cool Nothofagus woods of south Chile and adjacent Argentina. These species differ in many characters but may be distinguished most easily because C. invictus has slender, largely fulvous legs, while the legs of C. umbrarum are black with white markings and much more robust.

#### RESUMEN

Certonotus Kriechbaumer (Hymenoptera: Ichneumonidae), un género Australiano por primera vez citado de América del sur. Certonotus, cuyas especies están concentradas en la Región Australiana y que parecía estar restringida a dicha zona biogeográfica, es reportado ahora de América del Sur. Certonotus invictus n. sp. y C. umbrarum n. sp. habitan los húmedos y frescos bosques de Nothofagus del sur de Chile y partes adyacentes de la Argentina. Muchas características separan estas especies, las que pueden distinguirse más facilmente, porque en C. invictus las patas son relativamente tenues y de color mayormente anaranjado, mientras que C. umbrarum tiene las patas más robustas y negras con diseños blancos.

Certonotus, a genus of large labenine ichneumonids evidently parasitic on wood-boring coleopterous larvae, so far has been known only from Australia, Tasmania, New Guinea, New Zealand, and some associated islands. However, in 1964 the Chilean entomologist, Sr. Luís Peña G., generously gave me a single Certonotus captured in south Chile and obviously different from any of the Australian species. Since then, I have collected in South America every year, have returned several times to Chile, and have studied most of the important collections of Latin American Ichneumonidae, all without finding another Certonotus. Finally, in 1980, I received 2 more specimens obtained by Ing. Sergio Schajovskoi at Pucará in Neuquén Province of Argentina. One of these individuals is conspecific with Peña's Chilean Certonotus, but the other represents a trenchantly distinct species.

I describe the new South American Certonotus, offer a revised definition of the genus, and discuss the biogeographic implications of its presence in southern South America.

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#### GENUS Certonotus Kriechbaumer

Certonotus belongs to the Tribe Labenini of the Subfamily Labinae (as defined by Townes 1969: 194-6). Within these categories, it may be recognized by the following combination of characters: occipital carina broadly interrupted or absent dorsally; upper edge of pronotum with a deep, more or less V-shaped emargination; mesoscutum anteriorly rounded-off and without a transverse ridge, covered throughout by sharp transverse wrinkles; fore tibia apico-externally either with a broad and only moderately projecting triangular tooth or without a tooth; nervellus intercepted near middle; 8th tergite of female produced apicolaterally into a broad subligulate or subtriangular lobe; ovipositor sheath 1.1 as long as fore wing.

Certonotus much resembles the Neotropic genus Apechoneura Kriechbaumer but in Apechoneura the upper edge of the pronotum is much more shallowly notched, the front face of the mesoscutum is vertical and bears a salient transverse ridge, the areolet averages larger, the discoidella often arises from the mediella, and the ovipositor may be longer.

The Neotropic, Nearctic, and Australian *Labena* Cresson seems intimately related to both the foregoing genera and may represent the ancestral stock from which each was derived. *Labena* differs from *Certonotus* in its dorsally complete occipital carina, roundedly emarginate upper pronotal edge, lack of transverse mesoscutal wrinkling, presence on the fore tibia of a markedly outstanding thorn-like, apico-external spine, and apico-laterally unmodified female 8th tergite. Except for the upper pronotal contour, all these features likewise distinguish *Labena* from *Apechoneura*.

In addition to the "traditional" diagnostic characters discussed above, many Labena show other noteworthy differences from Certonotus as represented in South America. For example, I have in hand specimens of L. grallator (Say), the type species, as well as representatives of undescribed species from Panamá, Ecuador, and Bolivia. These differ collectively from Certonotus invictus Porter and C. umbrarum Porter by the following features: eye strongly emarginate just above antennal socket (slightly emarginate in Certonotus); parapsidal furrows and notauli absent or obsolete (traceable in Certonotus); upper end of prepectal carina slopes anteriad and terminates at or near front margin of mesopleuron (prepectal carina of Certonotus is nearly vertical and ends far from front margin of mesopleuron); pleural carina absent between base of propodeum and spiracle (strong in Certonotus); 1st gastric sternite ends at or near level of spiracles (well beyond spiracles in Certonotus); female mid tibia medially inflated and twisted, basally narrowed (unmodified in Certonotus); female hind coxa without a strong, triangular projection below toward base; metacarpellan hamuli mostly separated by more to much more than the length of each hamulus (uniformly close-set in Certonotus); 2nd recurrent approximately vertical on lower 1/2, outcurved on upper 1/2 (in Certonotus deeply and triangularly angled proximad with vertex of angle near mid-height of vein).

Certonotus, Labena, and Apechoneura have scores of species each and include numerous undescribed forms. As comprehensive revisions of these conspicuous but rare genera become possible, it will undoubtedly be necessary to redefine them as well as to split off some new taxa.

#### Key to South American Species of Certonotus

- 1'. Hind femur black, 3.8 as long as deep; hind tibia and tarsus black with white markings; hypostomal carina very strongly raised between juncture with occipital carina and base of mandible; scutellum with a transverse carina at apical 0.6; mesopleural suture scarcely foveolate; area-basalis open behind; 3rd pleural area 2.0 as high as long; 1st gastric tergite 2.7 as long as wide at apex, with numerous longitudinal wrinkles between base and spiracle but without well defined dorso, dorso-lateral, or ventrolateral carinae; 2nd recurrent at basal 1/4 of areolet

2. Certonotus umbrarum n. sp.

# 1. Certonotus invictus Porter, New Species (Fig. 1, 3, 5, 6)

FEMALE: Color: antenna black with flagellum mostly pale yellow on segments beyond 21, except for some dusky on last 4 or 5 segments; palpi pale brown; head black with yellow on most of clypeus, a dull yellow line on facial orbit, a large brighter yellow spot on vertical orbit, and a broad brownish yellow band on subdorsal 1/4 of hind orbit; mesosoma black with dull yellow on basal 1/2 of tegula; gaster shining black, in places with some obscure brown staining; fore and mid legs pale fulvous with a little dusky on base of coxa, on apex of trochantellus and base of femur, and at least slightly on last tarsomere, especially apicad; hind leg similar to fore leg but with bright fulvous on coxa, trochanters, and femur, tibia more dully fulvous on basal 1/3 but otherwise mostly black except for obscure brown staining toward apex, and tarsus rather dull fulvous with brownish apicad on last segment; wings uniformly medium brown with a subtle yellowish sheen, stigma black with ventral margin narrowly yellowish brown.

Length of fore wing: 18.8-22.3 mm. Hypostomal carina: between base of mandible and occipital carina forming a moderately strong flange that becomes higher apicad and which at its juncture with occipital carina is 0.05 as high as length of 1st flagellomere. Clypeus: with disc mostly smooth, weakly concave mesad and a little swollen on lateral 1/3, lateral margins not reflexed. Face: silky-shining with well developed trans-biased wrinkling on upper 1/2 and with punctures mostly small and sparse; 0.69-0.76 as high as wide. Temple: in dorsal view moderately receding and slightly rounded off. Mesoscutum: throughout with very long and outstanding, overlapping but not really dense setae. Scutellum: at apical 0.6 on median 1/3-1/2 with a strongly raised arcuate carina that extends ventrad and partially delimits a semicircular area on the steeply declivous hind face of the sclerite.

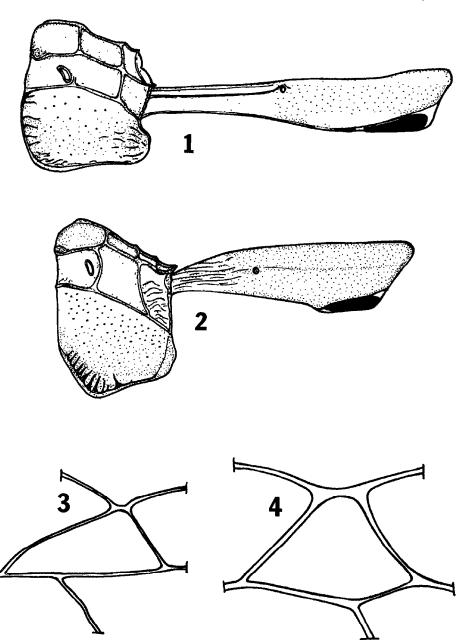


Fig. 1-4. 1) Certonotus invictus,  $\circ$  Paratype. Lateral view of propodeum and 1st gastric tergite; 2) Certonotus umbrarum,  $\circ$  Holotype. Lateral view of propodeum and 1st gastric tergite; 3) Certonotus invictus,  $\circ$  Paratype. Areolet; 4) Certonotus umbrarum,  $\circ$  Holotype. Areolet.

Prepectal carina: very broadly and sharply angled rearward on upper mesosternum and lower mesopleuron, above which it curves forward almost as strongly and finally bends back again to terminate on about upper 0.4-0.3 of mesopleuron. Mesopleural suture: coarsely foveolate. Mesopimeron: practically throughout with very long, overlapping setae. Metapleuron:

lower division on disc with numerous, very widely spaced small punctures that emit unusually long and overlapping setae. Submetapleural carina: a high, percurrent, foveolate flange that becomes gradually a little higher basad. Mesosternum: with median longitudinal sulcus strong and foveolate. Propodeum: area-basalis strongly defined, approximately rectangular; areola 0.6-0.8 as wide at apex as long, varying from almost parallel-sided throughout to considerably narrowed between costulae and base; 1st lateral area with very long, outstanding and overlapping setae; 2nd lateral area with some very long, outstanding setae; 2nd pleural area 0.70-0.75 as high as long, 3rd abscissa of basal trans-carina becoming obsolete dorsally; 3rd pleural area 1.0 as high as long, profoundly concave, scarcely wrinkled. First gastric tergite: 3.5-5.0 as long as wide at apex; dorsal carinae traceable about 2/3 the distance from base to spiracle; dorso-lateral carina strong from base to spiracle; ventro-lateral carina sharp throughout. Second gastric tergite: thyridium 1.0-2.0 as long as wide. Ovipositor: sheathed portion 1.1 as long as fore wing. Fore femur: 5.0-5.4 as long as deep. Fore tibia: on apex above with a stout, triangular tooth which is best seen in front view; apical spur with an almost percurrent translucent ventral flange that averages 1/3 as high as sclerotized portion of spur and is vertically truncate subapically. Hind femur: 5.7-6.0 as long as deep. Wing venation: 2nd recurrent inserted at apical 0.3 of areolet; ramellus absent; intercubitella 0.53-0.58 as long as radiella; costella strong but translucent pale brown; 16-17 metacarpellan hamuli.

MALE: Unknown.

VARIATION: The paratype shows only the following differences from the holotype: no yellow on facial orbit, yellow on base of tegula dull and inconspicuous, length of fore wing 18.8 mm (versus 22.3 mm), face 0.69 (versus 0.76) as high as wide, prepectal carina reaching upper 0.4 (versus 0.3) of mesopleuron, areola 0.8 as wide at apex as long (versus 0.6) and considerably narrowed based of costulae (versus almost parallel-sided throughout), 1st gastric tergite 5.0 as long as wide at apex (versus 3.5), and thyridium 2.0 as long as wide (versus 1.0).

TYPE MATERIAL: Holotype  $\mathfrak{P}$ : CHILE, Arauco Province, Pichinahuel, Cord. Nahuelbuta, 31-XII-1958, G. Barria. Paratype  $\mathfrak{P}$ : ARGENTINA, Neuquén Province, Pucará nr. San Martín de los Andes, 640 m, X-1971, S. Schajovskoi. Holotype in Florida State Collection of Arthropods, Gainesville. Paratype in collection of Fundación Miguel Lillo, Universidad Nacional de Tucumán, Argentina:

RELATIONSHIP: Certonotus invictus seems but distantly related to the sympatric C. umbrarum. It differs from umbrarum by the key characters and also in such features as its smooth (instead of trans-striate) clypeal disc, unreflexed lateral margins of clypeus, sparsely punctate face with considerable wrinkling dorsad (face densely punctate but scarcely wrinkled in umbrarum), densely (instead of sparsely) setose mesoscutum, biangulate (instead of bisinuate) prepectal carina, moderately (instead of very strongly) raised submetapleural carina, deep and foveolate mesosternal sulcus, and absence of a ramellus.

FIELD NOTES: For a week in December 1969 I collected at the paratype locality of *C. invictus*, on Lago Lacar between the Chilean border and San Martín de los Andes, Argentina. The area bestrides an ecotone annectant

between the Valdivian and Deciduous Forest Districts of the Subantarctic Life Zone (as these communities are defined by Cabrera and Willink 1973: 97-101). It is dominated by Nothofagus forests. On the pre-Andean slopes the deciduous N. pumilio (Poepp. & Endl.) is prominent. At low altitude near Lago Lacar (where most collecting was done) there are dense, lofty forests of the evergreen Nothofagus dombeyi (Mirb.) Bl., and of such deciduous species as N. antarctica (Forest. f.) Oerst., N. obliqua (Mirb.) Bl., and N. procera (Poepp. & Endl.) Oerst. Chusquea, a large bambusacean cane, and the hygrophile myrtacean tree, Myrceugenella apiculata (DC.) Kaus., also characterize this distinctive flora.

Pucará has a cool, wet, almost ceaselessly windy climate. The annual temperature averages about 10° C, and yearly rainfall oscillates between 1000 and 2000 mm. There is essentially no summer, although occasional maxima of 22-25° C may be registered between November and February, but winters are mild, with average minima not falling much below freezing.

Ichneumonids abound in the humid woodlands of Pucará, where they fly from September to May, with an extraordinarily pronounced maximum in December. During my fieldwork at Pucará, I found no Certonotus but did collect about 1500 specimens belonging to Calliephialtes, Eruga, Polysphincta, Coccygomimus, Netelia, Clasis, Macrogrotea, Bilira, Surculus, Anacis, Dochmidium, Dotocryptus, Trachyshyrus, Alophophion, Scallama, Thymebatis, and a host of other genera.

SPECIFIC NAME: From the Latin adjective *invictus*, "invincible", used here in reference to the imposing size of this splendid wasp and in honor of the great Chilean nation.

# 2. Certonotus umbrarum Porter, NEW SPECIES (Fig. 2, 4, 7, 8)

FEMALE: Color: antenna black with flagellomeres 20-30 white and last flagellomere (31) white on basal 1/2 and brownish black apically: palpi white with some dusky staining; head and mesosoma shining black; gastric tergites shining black with white markings as follows: 1st tergite with an ovoid area near apex dorso-laterally and with a narrow subapical band on median 0.6 of dorsum; 2nd tergite with a broad, somewhat irregular band on all but base and apex of lateral margin and with a narrow subapical band on median 0.8 of dorsum; 3rd-5th tergites similar to 2nd but with both lateral and dorso-subapical white bands successively a little narrower and the subapical white bands tending to reach farther laterad; 6th tergite like preceeding but with lateral and subapical white bands substantially narrower and the subapical band several times briefly interrupted; 7th tergite with a subapico-lateral white band that is interrupted on whole dorsum of tergite; 8th tergite with a small white area medially on apex; legs with coxae shining black; fore trochanter shining black with whitish narrowly on apex; fore trochantellus narrowly black above and mostly white below; mid and hind trochanter and trochantellus almost wholly shining black; fore femur shining black with a small white blotch on apex dorso-posteriorly and with a very broad, basally narrowed and finally effaced, dorsal and dorso-anterior white band; all tibial spurs white; fore tibia white; fore tarsus white with black briefly on apex of 1st and 2nd segments, a little more broadly on apex

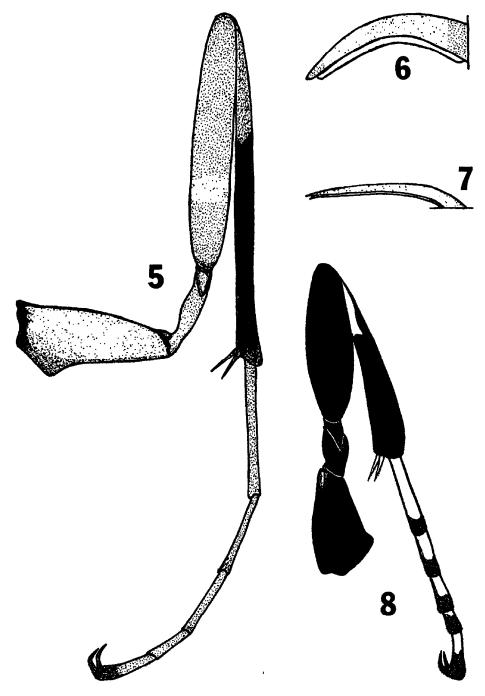


Fig. 5-8. 5) Certonotus invictus,  $\mathcal{Q}$  Paratype. Lateral view of hind leg, showing color pattern and general proportions; 6) Certonotus invictus,  $\mathcal{Q}$  Paratype. Spur of fore tibia, showing translucent ventral lamella; 7) Certonotus umbrarum,  $\mathcal{Q}$  Holotype. Spur of fore tibia, showing translucent ventral lamella; 8) Certonotus umbrarum,  $\mathcal{Q}$  Holotype. Lateral view of hind leg, showing color pattern and general proportions.

of 3rd segment, on almost all of 4th segment, which becomes dully whitish below, and on apical 1/2 of 5th segment; mid femur shining black with a large, basally much tapered, anterio-dorsal white area occupying most of distal 0.6 except near apex; mid tibia white with black broadly below on apical 0.7 and narrowly throughout on apex; mid tarsus white with black markings much as those described for front tarsus except that those on apices of segments 1 and 2 are broader and that on 3 occupies more than apical 1/2 of segment; hind femur shining black; hind tibia black with white on most of basal 0.3 above and 0.4 below; and hind tarsus about as described for mid tarsus; wings hyaline with stigma black.

Length of fore wing: 12 mm. Hypostomal carina: between base of mandible and occipital carina unusually elevated and becoming a very high flange apicad, at juncture with occipital carina 0.23 as high as length of 1st flagellomere. Clypeus: disc largely trans-striate, gently concave almost throughout, lateral margins conspicuously reflexed. Face: shining with abundant, moderately small, sharp, uniformly distributed punctures that mostly are separated by at least 1.0 their diameters; 1.1 as high as wide. Temple: in dorsal view moderately rounded and a little receding. Mesoscutum: with setae mostly short and widely spaced. Scutellum: at apical 0.6 on median 2/5 with a strong transverse carina that sets off the steeply declivous apical face. Prepectal carina: broadly bisinuate but not angled on upper mesosternum and lower mesopleuron. Mesopleural suture: smooth, foveolate only in extreme lower hind corner. Mesepimeron: practically glabrous, except for some long setae on upper 1/3. Metapleuron: lower division on disc polished, the upper 1/2 with numerous moderately small punctures that emit long and overlapping setae, the lower 1/2 almost impunctate and glabrous. Submetapleural carina: very strongly raised, bluntly triangular, highest at about mid point, margined by gross foveae. Mesosternum: median sulcus fine, weakly impressed, scarcely foveolate. Propodeum: area-basalis not defined, open posteriorly; combined area-basalis and areola 1.5 as wide at apex as long and considerably narrowed basad of costula; 1st lateral area with rather few, very long, well spaced setae; 2nd lateral area practically glabrous; 2nd pleural area 1.3 as high as long; 3rd abscissa of basal trans-carina strong throughout; 3rd pleural area 2.0 as high as long, gently concave, strongly wrinkled except dorsad. First gastric tergite: 2.7 as long as wide at apex; dorsal carinae obsolete; dorso-lateral carina not distinguishable among the many irregularly longitudinal wrinkles extending between base and spiracle; ventro-lateral carina obsolete basad of spiracle and absent between spiracle and apex. Second gastric tergite: thyridium large, 0.5 as long as wide. Ovipositor: sheathed portion 1.1 as long as fore wing. Fore femur: 3.8 as long as deep. Fore tibia: with a broad. vestigial, appressed tooth on dorsal margin apically; tibial spur more delicate than in C. invictus, the translucent ventral flange about 1/4 as high as sclerotized part and terminated by an oblique truncation so that the apex of the spur appears asymmetrically bifid. Hind femur: 3.7 as long as deep. Wing venation: 2nd recurrent inserted at basal 0.4 of areolet; ramellus well developed; intercubitella 0.80 as long as radiella; costella strongly sclerotized, dark brown; 10 metacarpellan hamuli.

MALE: Unknown.

TYPE MATERIAL: Holotype 9: ARGENTINA, Neuquén Province, Pucará nr.

San Martín de los Andes, 640 m, 30-I-1974, S. Schajovskoi. Holotype in colleciton of Fundación Miguel Lillo, Universidad Nacional de Tucumán, Argentina.

RELATIONSHIPS: This is a distinctive species with no close relatives among either the South American or the Australian Certonotus.

FIELD NOTES: Certonotus umbrarum inhabits the same temperate Nothofagus forests already discussed under my treatment of C. invictus.

SPECIFIC NAME: From the Latin noun *umbra*, "shadow" or "shade", used here in the genitive plural and chosen with regard to this species' dank, storm-swept habitat.

#### DISCUSSION

The South American species here assigned to *Certonotus* fit well in this primarily Australian genus, as diagnosed by modern descriptive taxonomists (Townes 1969: 196-8). Assuming that such phenotypic resemblance connotes also close evolutionary relationship, *Certonotus* becomes another member of the temperate-adapted biota that is shared in impressive numbers and diversity between the Antarctic Beech Forests of austral South America and those of south Australia (Kuschel 1960: 540-50). The genus perhaps originated in some part of the Southern Hemisphere. Then it could have dispersed between South America and Australia via Antarctica, which had a benign climate during the Cretaceous and early Tertiary and which also at that time seems to have offered direct land connections between the 2 southern continents.

Interestingly, 2 genera which show affinity to *Certonotus* have similar distributions. *Labena*, which belongs to the same tribe and is surely a close relative, ranges through North, Middle, and South America (including south Chile) as well as Australia. *Labium*, a more distantly associated genus included by Townes in the same subfamily, has many Australian species but also a single representative in southeast Brasil.

Their apparent extreme rarity constitutes another remarkable attribute of the South American *Certonotus*. Sr. Luís Peña has collected unceasingly in Chile for more than 3 decades and Ing. Sergio Schajovskoi spent more than 10 years at Pucará, where he was active with nets and Malaise Traps and entertained a host of visiting entomologists. It seems incredible that such protracted and assiduous labor should have yielded only 3 specimens of these

### ACKNOWLEDGEMENTS

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# PSEUDACHORUTES (PSEUDACHORUTES) QUADRISETOSUS, A NEW SPECIES OF COLLEMBOLA FROM FLORIDA (HYPOGASTRURIDAE, NEANURINAE)

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#### ABSTRACT

A new species, *Pseudachorutes* (*Pseudachorutes*) quadrisetosus Snider, is described from Florida. It bears similarities to *Pseudachorutes* (*Pseudachorutes*) curtus Christiansen and Bellinger (1980), but can easily be separated on the number of tenacular teeth, dental setae and mucro shape. The type locality is Lee County, Florida, collected from *Nymphaea odorata* Aiton.

#### RESUMEN

Una nueva especie, *Pseudachorutes* (*Pseudachorutes*) quadrosetosus Snider se describe desde Florida. Tiene similaridades a *P. curtus* Christiansen y Bellinger (1980), pero se puede distinguir de aquel facilmente por el número de dientes tenaculares, setas dentales, y la forma del mucro. La localidad del tipo es el Condado de Lee, Florida, coleccionado de *Nymphaea odorata*.

Recently I completed the identification of 28 species of Collembola collected by Dr. E. S. Del Fosse from semi-aquatic and aquatic plants. His sample sites were located in Broward, Collier, Glades and Lee Counties, Florida. While sorting through a sample from Lee County, an unusual species of *Pseudachorutes* was detected. Careful analysis showed it to be undescribed. The purpose of this report is to present that new species.

Pseudachorutes (Pseudachorutes) quadrisetosus Snider, New Species

COLOR DESCRIPTION: Dark blue throughout body and appendages; with very narrow intersegmental lines, small pale dots scattered over body segments, and pigment on tarsal complex and mucronal bases.

MORPHOLOGICAL DESCRIPTION: Eyes 8 + 8. Postantennal organ with 5 lobes arranged in a circle (Fig. 1), approximately 2/3 diameter of nearest occllus. Antennal segments in ratio of 1:2.1:1.8:2 (Fig. 2); segment IV with trilobed subapical bulb, 2 apical falciform (Fig. 3) and 4 blunt setae (Fig. 4); segments III and IV with long outstanding setae, longest setae occur on segment III and are 3/4 as long as segment IV. Mouthparts form a pronounced

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