# The plant-louse *Leuronota calycophylli* sp. n. (Homoptera, Psylloidea), a pest on the timber species *Calycophyllum spruceanum* (Rubiaceae) in Peru

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## Abstract

*Leuronota calycophylli* sp. n. attacks experimental plantations of the high-quality timber *Calycophyllum spruceanum* in Peru. Adults, larvae and the damage on the host are described and illustrated. Adults differ from other congeners in the absence of genal processes and in the structure of the genitalia. The host of *L. calycophylli* is unusual for psylloids: rubiacious hosts are otherwise known only from the four members of the Palaearctic *Trioza galii* Förster group and the Taiwanese *Synpsylla wendlandiae* Yang.

## Introduction

Several species of the small rubiaceous genus *Calycophyllum*, which occurs in tropical America, are exploited for high-quality timber (Record & Hess, 1943; Uphof, 1968; Mabberley, 1987). The Instituto de Investigaciones de la Amazonia peruana (IIAP) has experimental plantations of *Calycophyllum spruceanum*, locally known as capirona, which are situated on the bank of the Ucayalli river near Iquitos. In the region capirona is much used for poles, boards, timber, firewood, etc. Young plants are attacked by a species of the homopterous jumping plant-lice (Psylloidea), causing considerable damage. It is a hitherto unknown species of *Leuronota* (Triozidae) which is described below.

Psylloid species exhibit a high degree of specificity towards their mostly dicotyledonous hosts. Restricted host ranges are found also at higher systematic level where related psylloid taxa tend to develop on related plant taxa. This is well-exemplified by the small families Homotomidae (on *Ficus* spp.), Carsidaridae (on Malvales), Phacopteronidae (on Rutales) and the ill-defined Calophyidae (on Rutales). In the large family Psyllidae, again, many subfamilies, tribes or generea exhibit narrow host ranges (White & Hodkinson, 1985; Hollis, 1987a, 1987b; Burckhardt & Lauterer, 1989; Hollis & Broomfield, 1989; Burckhardt, 1991). In the speciose Triozidae, these patterns seem less strict, though they may be obscured by the current artificial classification (Hollis, 1984).

Some plant families are particularly well-represented among psylloid hosts such as the Fabaceae, Myrtaceae and Asteraceae. The Rubiaceae are, with about 650 genera and 10,700 species, the fourth largest family of angiosperms (Robbrecht, 1988) but host surprisingly few psylloids. Several published records are dubious: *Cinchona* was erroneously recorded as host of *Euceropsylla cayeyensis* (Caldwell) and *E. russoi* Boselli, which both develop on the fabaceous *Inga* (Hodkinson & White, 1981); the record of *Anthocephalus indicus* as host of *Pauropsylla reticulata* Mathur may concern a misidentified *Ficus* sp. (Moraceae) (Hollis, 1984, pers. comm.); and *Conciata laevipes* listed by Gegechkori & Loginova (1990) is an unlikely host of *Trioza schrankii* Flor, which develops on *Astrantia* spp. (Apiaceae). Rubiaceous hosts are likely or confirmed only for the following taxa: the Taiwanese *Synpsylla wendlandiae* Yang (Psyllidae) on *Wendlandia formosana* (Cinchonoideae, Rondeletieae) and the palaearctic *Trioza galii* Förster group on several genera of Rubioidea, Rubieae. The *Trioza galii* Förster

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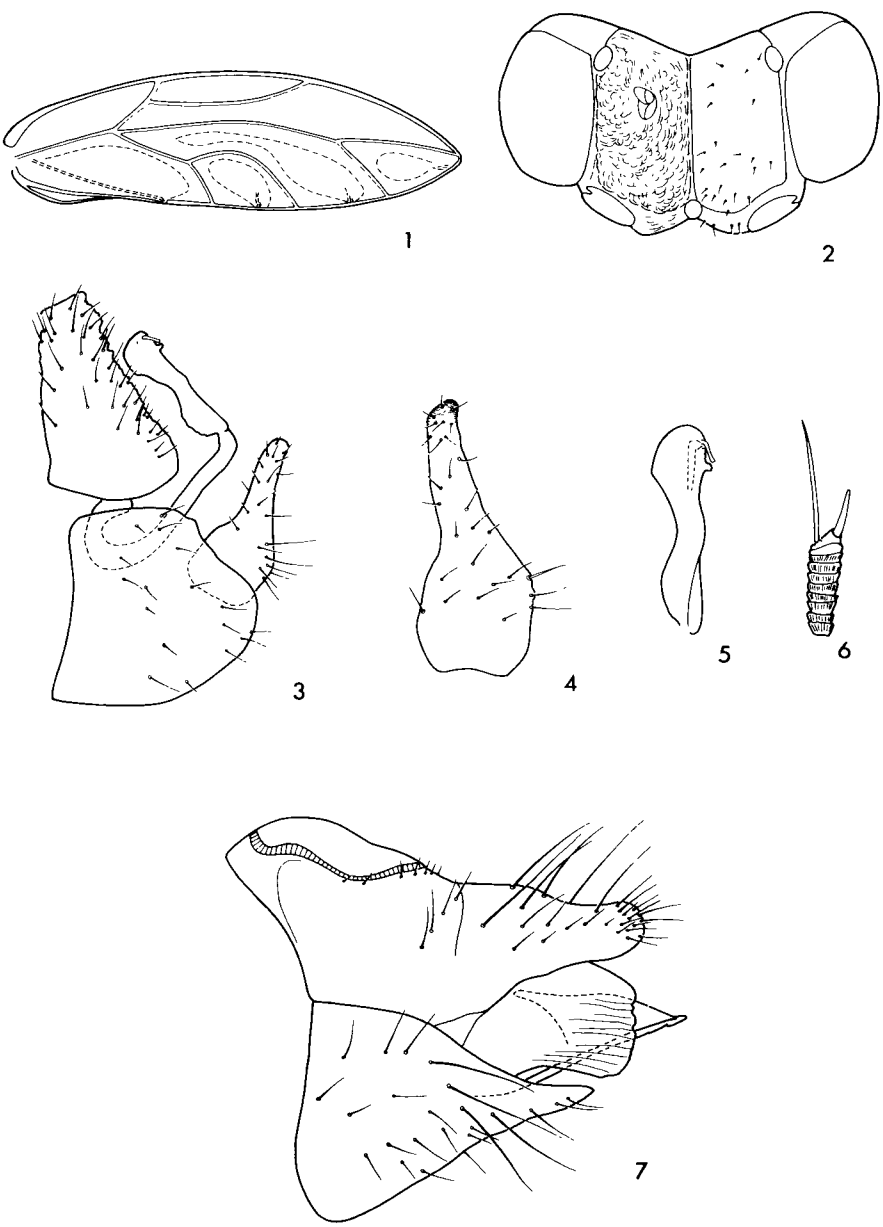
group was placed by Conci (1992), who defined and revised the group, in *Spanioza* Enderlein with the following species: *S. galii* (Förster) on *Galium* spp., *Asperula* spp., *Sherardia arvensis* and *Rubia peregrina* (all Rubiaceae); *S. rubiae* (Baeva) on *Rubia rubiflorae*; *S. rubicunda* (Loginova) on *Galium* sp.; and *S. tamaninii* Conci possibly on *Galium anisophyllum*. In the absence of phylogenetically convincing arguments this narrow generic concept is not followed here and the group is referred to the large, artificial genus *Trioza*. Another record concerns *Chomelia asiatica* (Cinchonoideae, Cinchoneae) from India which was assigned to an unidentified psylloid (Mani, 1973; Hodkinson, 1986).

### *Leuronota calycophylli* sp. n.

(figs 1-8)

*Description. Adult.* Coloration Head and thorax ochreous dorsally with slightly darker longitudinal stripes, and straw-coloured laterally and ventrally. Compound eyes dark reddish-brown. Antennae yellow, segments 3-8 black-tipped, 9 and 10 entirely black. Abdomen dark brown above, pale-yellow beneath. Legs yellow. Fore wings transparent with yellow veins, sometimes with yellowish tint at radular areas; hind wings transparent. Younger specimens lighter with less expanded dark coloration.




Figs. 1–7. *Leuronota calycophylli* **sp. n.**: 1, fore wing; 2, head, dorsal view; 3, male terminalia, lateral view; 4, paramere, inner surface; 5, distal segment of aedeagus; 6, antennal segment 10, 7, female terminalia, lateral view.

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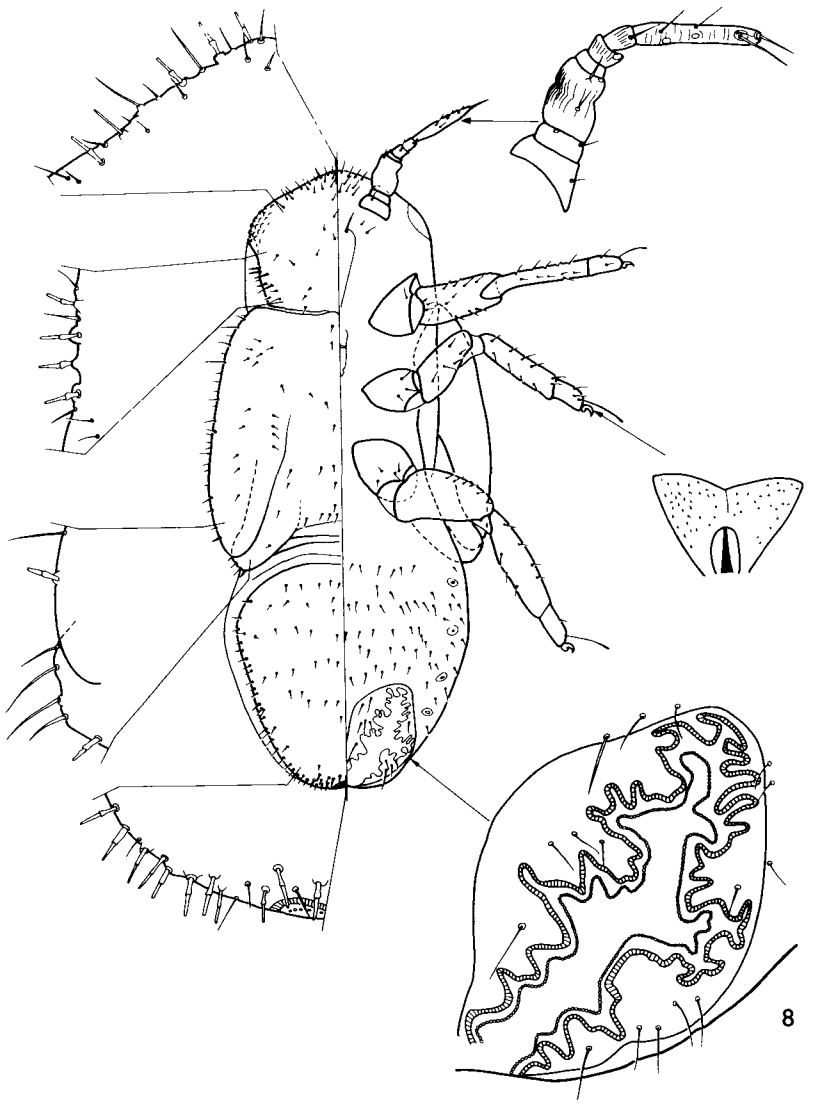


Fig. 8. *Leuronota calycophylli* **sp. n., fifth instar larva; left dorsal view, right ventral view.**

Structure. Head (fig. 2) with sculptured vertex, slightly weaker medially than laterally; genal processes absent, genae forming at most small tubercles. Antennal segment 10 and longer terminal seta subequal in length, about twice as long as shorter seta which is truncate apically (fig. 6). Fore wings (fig. 1) narrowly lanceolate, acute apically; vein Rs short, concave; bifurcation of vein M distinctly distal to line joining the apices of veins Rs and $Cu_{1a}$; cell $M_{1-2}$ and $Cu_{1a}$ subequal. Surface spinules in males present in cells $m_{1-2}$, $m_{3-4}$, $cu_{1a}$ and $cu_{1b}$, denser basally than apically; in females surface spinules present also in other cells, fields larger, in cell c+sc in the center, in $r_1$ a few irregularly spaced spinules, in rs mainly subapically. In both sexes more or less evenly spaced apically, slightly denser and more irregular basally. Radular spinules forming narrowly triangular stripes in cells $m_{1+2}$, $m_{3+4}$ and $cu_{1a}$. Lateral setae present on abdominal tergite 3 in males and 4 in females. Terminalia as in figures 3-5, 7. Male proctiger relatively short, subgenital plate subglobular. Parameres bearing a subquadrangular base with a group of long setae at the hind margin and a slender process sparsely covered in medium long setae; apex strongly sclerotized. Basal portion of aedeagus narrowly bent basally, slender and straight apically; apical portion constricted in the middle, apex irregularly rounded, with rectangular tubercle dorsally; sclerotized end tube of ductus ejaculatorius slender, weakly sinuate. Female terminalia short, dorsal margin of proctiger weakly sinuous, apex blunt; proctiger bearing long setae dorsally forming indistinct longitudinal rows; with weak transverse sclerotization distal to circum-anal ring. Subgenital plate shorter than proctiger, pointed apically. Ventral margin weakly concave in apical half. Valvulae 1 with 2 ventral subapical teeth, valvulae 2 irregularly triangular, valvulae 3 flattened apically.

Measurements in mm and ratios (2♂, 2♀). Head width (HW) 0.43-0.52; antenna length (AL) 1.08-1.19; fore wing length (WL) 2.26-2.85; male proctiger length (MP) 0.15-0.16; paramere length 0.15-0.16; length of distal segment of aedeagus 0.12; female proctiger length (FP) 0.92-0.93.

AL/HW 2.13-2.63; length of apical 2 segments of labium/HW 0.51-0.65; metatibia length/HW 0.94-1.10; WL/HW 5.01-5.61; WL/fore wing width 3.04-3.17; MP/HW 0.33-0.34; FP/HW

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0.92 - 0.93; FP/circum-anal ring length 2.25 - 2.56; female subgenital plate length/FP 0 75 - 0.78.

*Fifth instar larva.* Coloration. Yellow with reddish brown eyes.

Structure. Body (fig. 8) elongate with narrow, long wing buds. Antennae 7-segmented with each a rhinarium on segments 3 and 5, and 2 rhinaria on segment 7; segment 3 large, swollen and constricted in the middle. Tarsal arolium triangular, sessile, with short unguitractor. Anus terminal, outer circum-anal pore ring strongly convoluted, consisting of a single row of oval pores; inner ring similar to outer ring but much fainter. Dorsal body surface and ventral abdominal surface covered with short setae. Margin of body with simple setae, irregular in length and arrangement, and


Figs. 9–10 *Leuronota calycophylli* **sp. n.** galls on *Calycophyllum spruceanum.*

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with very slender, apically truncate sectasetae present in following numbers (on one side only): anterior head margin: 3-5; cephalothorax behind eyes. 3-5; fore wing bud: 1, hind wing bud: 1; caudal plate 14-19 The sectasetae on the margin of the caudal plate are concentrated mainly terminally and sparse laterally

Measurements in mm and ratios (3 larvae). Body length (BL) 1.40-1.66; body breadth (BB) 0 66-0 85; fore wing bud length (WL) 0.58-0 65; antenna length 0.31-0.35.

BL/BB 1 95-2.14; WL/AL 1.86-2,04.

*Egg* Elongate, about 3 times as long as wide; longitudinal axis parallel to substrate surface, pedicel which is incerted in plant tissue thus laterally Apex pointed. Surface longitudinally rugulose

*Material examined* Holotype ♂, PERU: Iquitos 3°45'S 73°15'W, 125 m a.s.l., Departemento Loreto, San Miguel, 1.vi.1992 (G. Couturier), *Calycophyllum spruceanum* (Muséum d'Histoire Naturelle, Genève). Paratypes, PERU 8♂, 13♀, same data as holotype; 23♂, 7♀, 6 adults, same but 17.i.1992 (G Couturier & J. Gonzales T.) (Muséum d'Histoire Naturelle, Genève; Muséum National d'Histoire Naturelle, Paris; The Natural History Museum, London; Departemento de Entomologia, Universidad Agraria La Molina, Lima; Instituto de Investigaciones de la Amazonia, Peruana, Iquitos)

Material excluded from type-series; many larvae of different instars and eggs with the same data and depositories as type-series.

## Affinities

The genus *Leuronota* Crawford currently includes 21 New World and 8 Oriental species. Brown & Hodkinson (1988) and Burckhardt (1988) suggested that, based on a series of autapomorphies, the New World species, together with *L. distincta* (Crawford) from the Philippines, form a monophyletic group congeneric with *Trioza maculata* Crawford, the type-species of *Leuronota*. *Leuronota distincta* is known from a single female only and its provenance in the Philippines may be erroneous (Brown & Hodkinson, 1988).

Within *Leuronota sensu stricto* species are characterized by the shape of genal processes, fore wing shape, pattern and venation, the distribution of the surface spinules and the morphology of the male terminalia, the female terminalia are relatively homogenous The almost complete absence of genal processes separates *L. calycophylli* from all other known congeners. There are no characters suggesting a closer relationship to any of the described species

The larval morphology is very homogenous within the genus. According to Burckhardt & Brown (1992) the last larval instar of *Leuronota trichiliae* Brown & Hodkinson bears 8-segmented antennae, a single circum-anal ring and pointed sectasetae. A reexamination of material showed, however, that in *L. trichiliae* the antennae are 7-segmented, the circum-anal pores are arranged in an inner and an outer ring and the sectasetae are apically truncate similar to *L. calycophylli*. The two species seem to differ in the slightly lower number of marginal sectasetae on the caudal plate in *L. trichiliae*. According to Ferris (1928) the sectasetae are pointed in *Leuronota maculata* (Crawford).

Within *Leuronota sensu stricto*, *L. calycophylli* is distinct in its host association with *Calycophyllum* (Rubiaceae). Other host-plants exploited by *Leuronota* spp. are *Celtis* (Ulmaceae) (by three *Leuronota* spp.), *Esenbeckia* and *Fagara* (Rutaceae) (each by one sp.), *Weinmannia* (Cunoniaceae), *Cordia* (Boraginaceae) and *Trichilia* (Meliaceae) (each by one sp.). *Leuronota leguminicola* Crawford was recorded from a fabaceous host which is erroneous (Hollis, pers. comm.). The hosts of the remaining 13 species are unknown.

## Biology

About six months old capirona plants of 50-60 cm height are heavily attacked by the larvae of *L. calycophylli*. The larval feeding on the young shoots induces marginal rolls on the leaves which are irregularly bulbous and reddish (figs 9-10). The larvae live in the leaf rolls The eggs are laid singly or in small groups along the leaf veins or on the leaf margin.

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