

## ***Gonserellus*: A New Genus of Leptophlebiidae (Ephemeroptera) from Southern South America**

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*Gonserellus atopus* from Chile, a new genus and species, is described based on the mature nymph. The nymph of *Gonserellus* is distinguished from that of other leptophlebiid genera by having a well-developed galea-lacinal tusk on the maxilla and prominent bipectinate spines on the tibiae. *Gonserellus* appears to be a member of the *Nousia* lineage based on a number of shared derived nymphal characters.

Keywords: Insecta, Ephemeroptera, Leptophlebiidae, *Gonserellus atopus*, South America.

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### INTRODUCTION

A new taxon of the family Leptophlebiidae (Ephemeroptera) was collected by Dr. Tom Gonser while conducting a two-year comprehensive study of the biology of mayflies in Central Chile (Gonser, 1990). The leptophlebiid fauna of southern South America has been relatively well-studied by Pescador and Peters (1980a, b, 1982, 1985, 1987, 1990, 1991). Both workers have described new genera and have revised several genera as well, but none of the known genera from the region have the unique nymphal characters that the genus described herein possesses.

This paper represents an on-going research effort to systematically document the leptophlebiid fauna, the most dominant mayfly group, of southern South America. The techniques of Pescador and Peters (1980a) were followed to prepare structures for taxonomic description of the nymph.

### *Gonserellus*, new genus

**Mature Nymph:** Head prognathous (Fig. 13). Antennae  $1\frac{1}{2}$  times as long as head, variable apical groupings of fine hair on flagellum (Fig. 16). Mouthparts (Figs. 1-8): Clypeus slightly narrower than labrum, lateral margins parallel (Fig. 3). Length of labrum approximately  $\frac{1}{2}$  times maximum width; smoothly curved laterally (Fig. 3); dorsal hair unbranched; anteromedian emargination broad, U-shaped with well-developed denticles (Fig. 4). Outer margin of mandibles smoothly

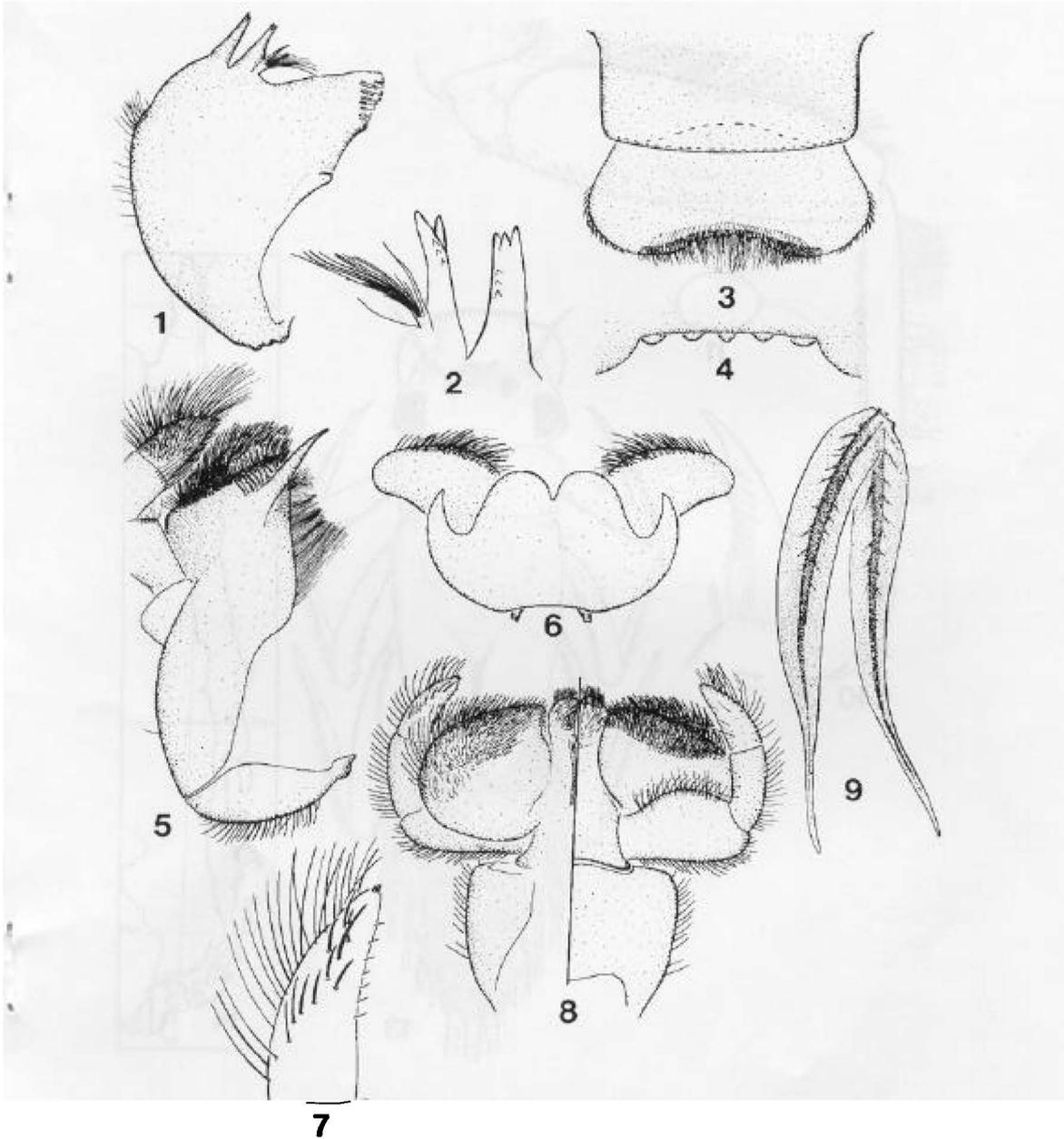
curved; few fine hairs and a submedian hair tuft (Fig. 1); incisors with subapical denticles (Fig. 2). Galea-lacinia of maxillae slightly broadened apically with sharp subapical tusk and 8–11 subapical pectinate setae (Fig. 5); segments of maxillary palpi subequal in length, segment 3 with long thick hair (Fig. 5). Hypopharyngeal lingua with well developed lateral processes (Fig. 6), anterior margin deeply cleft; superlingua with thick hair along anterior margin (Fig. 6), lateral margin rounded. Segments 2 and 3 of labial palpi subequal in length, either segment distinctly shorter than segment 1; segment 3 with long, thick dorsal setae (Fig. 7); glossae straight and bulbous, paraglossae ventral to glossae (Fig. 8); lateral margins of submentum with long setae (Fig. 8). Pronotum with short anterolateral spines. Legs (Figs. 10–13): maximal width of tibiae approximately two times maximal width of tarsi; tibiae of prothoracic legs in cross section oval (Fig. 11); posterior margin of femora with fine, long hair (Fig. 10, 13), dorsal surface with spatulate setae (Fig. 18); tibiae with bipectinate setae (Fig. 15), posterior margin with fine long hair (Fig. 13); tarsal claws with small equal-sized basal denticles, remaining denticles progressively larger apically with apical denticle enlarged (Fig. 12). Gills (Fig. 9): gills on abdominal segments I–VII alike; dorsal and ventral lamellae slender, tapered apically (Fig. 9), gills progressively smaller posteriorly; main trachea along median line with weakly developed branches (Fig. 9). Posterolateral spines on abdominal segments VI–IX, progressively larger posteriorly; abdominal terga with fine hairs; lateral margins glabrous, posterior margins with sharpened-pointed spines (Figs. 19–20). Caudal filaments: terminal filament longer than cerci; segments of caudal filaments scaly with evenly-spaced apical spines and groups of fine apical hairs (Fig. 17). Male and Female Adults unknown.

*Etymology:* Genus named for Dr. Tom Gonser, Kastanienbaum, Switzerland for collecting the specimens.

*Type species:* *Gonserellus atopus*, new species.

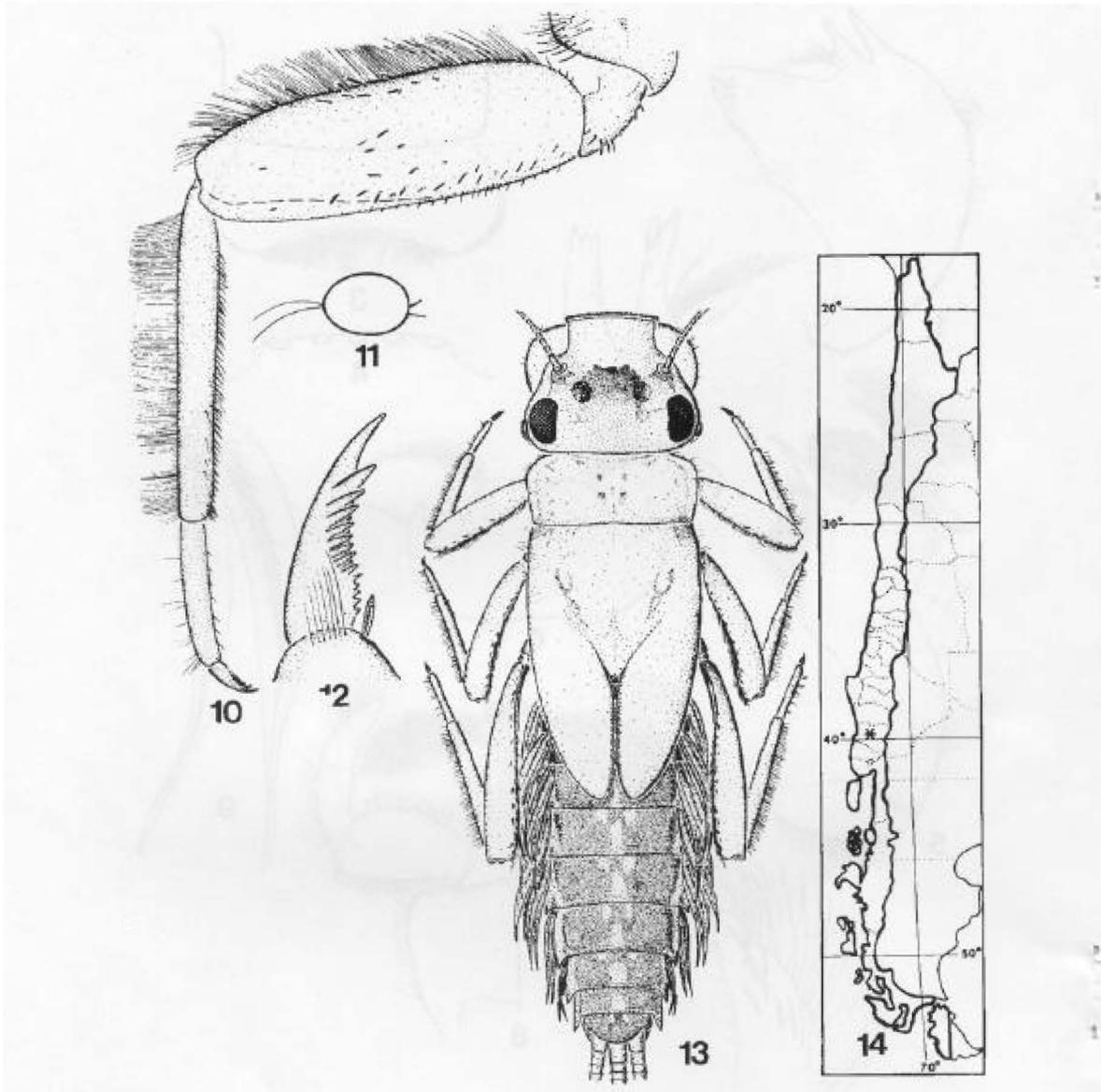
*Discussion:* The nymphs of *Gonserellus* can be distinguished from all the other genera of Leptophlebiidae by the following combination of characters: (1) clypeus is slightly narrower than labrum and the lateral margins are parallel (Fig. 3); (2) length of labrum is slightly more than  $1/2$  maximum width and lateral margins are smoothly curved (Fig. 3); (3) outer margin of mandibles is smoothly curved with fine hair and a submedian hair tuft (Fig. 1); (4) galea-lacinia of maxillae has a sharp subapical tusk (Fig. 5); (5) lateral margins of submentum have long hair (Fig. 8); (6) tibiae have bipectinate setae (Fig. 15); (7) tarsal claws have small equal-sized basal denticles, remainder of denticles progressively larger apically with the apical denticle enlarged (Fig. 12); (8) posterolateral spines occur on abdominal segments VI–IX; (9) abdominal gills I–VII are alike, both dorsal and ventral lamellae are tapered apically (Fig. 9), and (10) caudal filaments are scaly with evenly-spaced apical spines (Fig. 17).

In the absence of adults, definitive sister group relationships are difficult to establish at this time. *Gonserellus*, however, appears to be a member of the Southern Hemisphere *Nousia* [= *Atalonella* (Pescador and Peters, 1980b)] lineage based on the following shared derived nymphal characters: margins of clypeus



Figs. 1-9. *Gonserellus atopus*, mature nymph: 1, left mandible; 2, right mandibular incisor; 3, clypeus and labrum; 4, enlarged anteromedian emargination of labrum; 5, right maxilla, ventral; 6, labial palpi, dorsal view; 8, labium, dorsal (left), ventral (right); 9, gill IV.

parallel (Fig. 3); margins of labrum smoothly curved (Fig. 3); anteromedian emargination of labrum broad with well-developed denticles (Fig. 4); glossae



Figs. 10–14. *Gonserellus atopus*, mature nymph: 10, fore leg; 11, cross section of tibiae of fore leg; 12, fore claw; 13, nymph; 14, geographical distribution of *G. atopus*.

straight and bulbous; and paraglossae ventral to glossae (Fig. 8). The *Nousia*-lineage currently includes the genus *Nousia* which is represented by the subgenera *Australonousia* Campbell and Suter from Australia and *Nousia* s.s. from southern South America, and the Australian genera *Koornonga* Campbell and

Suter and Nyungara Dean (Campbell and Suter, 1988; Dean, 1987). *Gonserellus* can easily be distinguished from these genera by the presence of a well-developed subapical tusk on the galea-lacinia (Fig. 5) and bipectinate setae on the tibiae (Fig. 15). The genus *Neboissophlebia* Dean from Australia does have a small tusk on the margin of the maxilla quite similar to *Gonserellus* but both genera are not closely related, and are easily distinguished by their tarsal claws, labial glossae, and labrum. According to Dean (1988) *Neboissophlebia* is most closely related to *Jappa* and *Atalomicria*.

*Gonserellus atopus*, sp. n. (Figs. 1–20)

*Mature Nymph* (in alcohol): Body length 6.0 – 7.5 mm. Dorsum of head dull yellow, washed with dark brown between ocelli, bases of compound eyes, and antennae. Antennae yellow, progressively paler distally. Eyes of female black; upper portion of eyes of male orange-yellow. Mouthparts: labrum yellow, lateral margins dark brown, darker basally; anteromedian denticles of labrum subequal-sized (Fig. 4). Dorsum of mandibles yellow, venter pale; outer and inner incisors with 3 small subapical denticles (Fig. 2). Maxillae pale yellow, palpi and dorso-lateral surface of stipes darker; subapical tusk and apical crown of galea-lacinia shiny brown. Labium pale yellow, segments 2 and 3 of palpi brownish-yellow. Thorax: nota yellow, with small, irregular dark brown markings near base of wing pads and median of pronotum. Pleura whitish, washed with smoky brown. Sterna pale yellow. Legs pale yellow, subcoxae washed with brown; tarsal claw with 10–13 denticles, enlarged apical denticle with maximum width slightly narrower than maximum width of apex of tarsal claw (Fig. 12). Abdomen: terga dark brown, lateral margins pale yellow; pale yellow markings on terga as in Fig. 13; posterolateral spines on abdominal terga VII–IX slightly incurved (Fig. 20). Sterna pale yellow, faintly washed with brown. Gills: dorsal and ventral lamellae equal in length; main trunk of trachea with weakly developed branches (Fig. 9). Caudal filaments unicolorous pale yellow.

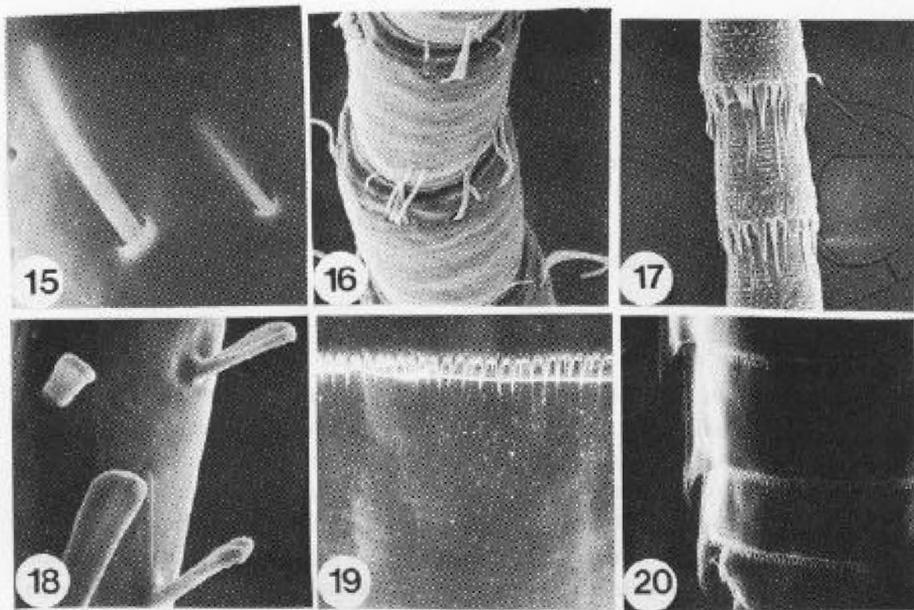
*Geographical Distribution* (Fig. 14): *Gonserellus atopus* has only been collected from south-central Chile (Fig. 14).

*Holotype* mature nymph, CHILE: Los Lagos Prov., Río Quinchila. 17 IV 1986, T. Gonser; paratypes, 3 nymphs, same data as holotype. Holotype and 1 nymphal paratype are deposited in the collection of Florida A&M University; 2 nymphal paratypes are deposited in the collection of EAWAG, Limnological Center, Kastanienbaum, Switzerland.

*Etymology*: adj., atopus, Gr., meaning strange.

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Figs. 15–20. Scanning electron micrographs of mature nymph of *Gonserellus atopus*: 15, tibial setae, dorsal (800×); 16, antenna (1000×); 17, caudal filament (400×); 18, femoral setae, dorsal (1,700×); 19 and 20, abdominal terga (200×, 86×).

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