Trichomycterus yuska, a new species from high elevations of Argentina (Siluriformes: Trichomycteridae)

Luis Fernández* and Scott A. Schaefer**

Trichomycterus yuska, new species, is described from a stream at 4,000 m elevation in the Andean Cordillera of Catamarca, Argentina. The new species shares the synapomorphies diagnosing the trichomycterid clade comprised of the Trichomycterinae, Scleronema, Ituglanis, plus the TSVSG clade (subfamilies Tridentinae, Stegophilinae, Vandelliinae, Sarcoglanidinae, and Glanapteryginae), but lacks the diagnostic synapomorphies for the clade comprised of Scleronema, Ituglanis, and TSVSG. Trichomycterus yuska is assigned to the patently non-monophyletic subfamily Trichomycterinae and, because it lacks characters which place it within any other trichomycterine genus, it is assigned to the genus Trichomycterus by default. The new species is excluded from membership in other genera of the subfamily Trichomycterinae by the combination: presence of pelvic fins and girdle, 6-7 principal dorsal-fin rays, 18-19 ribs, transversely flattened caudal peduncle, lack of a very thick layer of fatty tissue on the body and head, presence of a portion of the laterosensory canal system in the sphenotic, and first dorsal fin pterygiophore inserting on vertebra 21. The following combination serves to further distinguish T. yuska from other species of the genus Trichomycterus, include the well-developed head musculature, first pectoral fin ray prolonged as a short filament, tip of pelvic fin not reaching to anus, no bands or spots on the body, premaxilla rectangular with outer row teeth incisiform and not spatulate or bifid.

Trichomycterus yuska, nueva especie, es descripta de un arroyo a 4.000 m de altura en la Cordillera de los Andes de Catamarca, Argentina. La nueva especie comparte las sinapomorfías que diagnostica al clado tricomictérido comprendido por Trichomycterinae, Scleronema, Ituglanis más el clado TSVSG (subfamilias Tridentinae, Stegophilinae, Vandelliinae, Sarcoglanidinae y Glanapteryginae), pero carece de las sinapomorfías que diagnostican al clado formado por Scleronema, Ituglanis y TSVSG. Trichomycterus yuska es en consecuencia asignada a la subfamilia Trichomycterinae claramente no monofilética y debido a que carece de los caracteres que la ubican dentro de cualquier otro género de tricomicterinae, es asignada por defecto al género Trichomycterus. La nueva especie se diferencia de los otros géneros de la subfamilia Trichomycterinae por la combinación: presencia de aletas pélvicas y cintura pélvica, 6 o 7 radios principales en la aleta dorsal, 18 a 19 costillas, pedúnculo caudal comprimido transversalmente, ausencia de una muy delgada capa de tejido graso sobre el cuerpo y cabeza, presencia de una porción del sistema canal laterosensorial en el esfenótico y el primer pterigióforo de la aleta dorsal inserta en la vértebra 21. La siguiente combinación sirve para diferenciar T. yuska de las otras especies del género Trichomycterus: musculatura de la cabeza bien desarrollada, primer radio de la aleta pectoral prolongada como un corto filamento, extremo de la aleta ventral no extendido sobre el ano, sin bandas o manchas sobre el cuerpo, premaxila rectangular con hilera externa de dientes incisiformes y no spatulados o bifidos.

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Introduction

The siluriform family Trichomycteridae is a highly diverse monophyletic group of approximately 200 species of neotropical catfishes, including the translucent sand dwelling and the torrent-dwelling species of the genus *Trichomycterus* (de Pinna, 1992, 1998). The family includes eight subfamilies, the members of which possess some of the most remarkable feeding specializations observed among fishes, including lepidophagy, hematophagy, omnivory and parasitism. Species of the family are distributed in freshwaters throughout South America and part of Central America, from Costa Rica in the north to Patagonia in the south, and from lowland Atlantic rainforest in the east to Andean streams in the west (Campanario & de Pinna, 2000).

The subfamily Trichomycterinae is considered monophyletic by some authors (e.g. Arratia, 1990), while others have questioned its monophyly (e.g. Baskin, 1973; de Pinna, 1989, 1992, 1998). The subfamily has traditionally been recognized by default, in terms of the absence of specializations which characterize other trichomycterid monophyletic subgroups. The genus *Trichomycterus* forms a large non-monophyletic assemblage of approximately 100 species characterized by the absence of specializations found in other members of the subfamily Trichomycterinae, such as *Bullockia*, *Eremophilus*, *Hatcheria*, *Rhizosomichthys* and *Silvinichthys* (de Pinna, 1989, 1992, 1998; Arratia, 1990, 1998).

Arratia (1998) noted that a majority of *Trichomycterus* species had been described based mainly on differences in body proportions, fin ray counts, and coloration; the latter was shown experimentally to vary in response to the substratum by Arratia (1983a-b). Despite the long-standing problem of *Trichomycterus* non-monophyly and the potential that its alpha-level taxonomy is over-split to the extent that it includes numerous forms of questionable validity, a number of highly distinctive species have recently been discovered from poorly known and/or hitherto inaccessible regions of South America. For example, Fernández & Vari (2000) described a *Trichomycterus* species lacking pelvic girdle and fins from high elevations of Argentina. We believe that such distinctive taxa, to the extent that their differences are well characterized, deserve formal taxonomic recognition in consideration of the probability that distinctive taxa from such remote and previously understudied regions are not likely members of widely distributed, lowland species. Consequently, we describe here a new species of *Trichomycterus* from 4,000 m elevation of northwestern Argentina.

Fig. 1. *Trichomycterus yuska*, holotype, FML 2535, 88.5 mm SL.
Materials and methods

Counts and measurements were recorded following the convention established by Tchernavin (1944), Ringuelet et al. (1967), and de Pinna (1992). Measurements were taken on the left side of each specimen with digital calipers under a binocular microscope. Osteological preparations were made according to Taylor & Van Dyke (1985) and terminology follows Baskin (1973) and de Pinna (1989, 1998); that for laterosensory pores of the head follows Arratia (1998). Vertebral counts do not include the vertebrae of the Weberian complex or the compound caudal centrum. Counts of caudal vertebrae include centra having the presence of bony bridge between ventral parapophyses. Institutional abbreviations are as listed in Leviton et al. (1985). In those instances of intraspecific morphological variation, the value for a given count is followed by the number of specimens observed in parenthesis. Of the approximately 114 nominal Trichomycterus species (Eschmeyer, 1998), a total of 45 nominal species occur in, and may have their distributions restricted to regions within, Perú, Bolivia, Chile, and Argentina, geographic regions of direct relevance in the comparison of the new species among congeners from southern Andean South America. Of these 45 species, 10 are synonyms of other nominal species, following Eigenmann (1918), Tchernavin (1944) and Arratia (1983a), bringing to 35 the number of southern Andean congeneric species of direct concern. Consequently, we made direct comparison of the new species with 40 species, including 30 of 35 southern Andean species.

Trichomycterus yuska, new species
(Fig. 1)

Holotype. FML 2535, 88.5 mm SL; Argentina: Provincia de Catamarca, Departamento Tinogasta, Arroyo Aguas Calientes, 4,050 m elevation; 27°14'S 68°16'W; E. Fra, Feb. 1996.

Paratypes. 21 specimens, all from Argentina: Provincia de Catamarca, Departamento Tinogasta: AMNH 232397, 97.3 mm SL; collected with holotype. – FML 1130, 2, 60.5-74.7 mm SL; Arroyo Aguas Calientes, 4,000 m elevation; O. Ladilla, 22 Nov. 1983. – FML 1131, 48.9 mm SL; Aguas Calientes frente al Real o Cueva, 4,000 m elevation; 27 Jan. 1983. – FML 1132, 12, 15.4-61.5 mm SL; Arroyo Aguas Calientes, 4,000 m elevation; 27 Jan. 1983. – FML 1133, 5, 38.1-48.4 mm SL; Arroyo Aguas Calientes, 4,000 m elevation; 12 Nov. 1983.

Diagnosis. Trichomycterus yuska is diagnosed among congeners by the unique combination of the following features: (1) head and cheek musculature hypertrophied, head shape square in dorsal view; (2) first pectoral fin ray prolonged as a thin, short filament; (3) tip of pelvic fin when depressed not reaching the anus. In T. yuska the adductor mandibulae muscle is hypertrophied, resulting in a head that is notably square in dorsal view (Fig. 2a). In all other Trichomycterus species, with the exception of T. nigromaculatus from Colombia, the muscles of the head are not similarly hypertrophied and the shape of the head is generally ovoid or triangular in dorsal view (Fig. 2b). Trichomycterus yuska can be distinguished from T. nigromaculatus by the presence of 7-8 (vs. 9) pectoral fin rays, the pelvic fin short, not
extending posteriorly to reach the anus (vs. extending posteriorly to reach the anus), premaxilla with outer row teeth incisiform, not spatulate (vs. teeth conical). *Trichomycterus yuska* is readily distinguished from congeners from western and southern South America by having the first pectoral fin ray prolonged as a short filament (Fig. 2a), versus first pectoral fin ray terminating at the fin margin (Fig. 2b). The first pectoral fin ray in *T. catamarcensis*, which is known from 3,500 m elevation in northwestern Argentina, is prolonged as a short filament in 2 of 8 paratype specimens and not prolonged in the holotype and remaining paratypes (Fernández and Vari, 2000). The new species can be distinguished from *T. catamarcensis* by the presence of a pelvic fin and girdle (vs. fin and girdle absent), and 6-7 (vs. 8-9) dorsal fin rays.

**Description.** Descriptive morphometric features for the holotype and paratypes are provided in Table 1. Body elongate, roughly cylindrical, compressed transversely in trunk region; gradually and progressively becoming more compressed transversely towards caudal fin. Dorsal and ventral profiles of trunk region ranging from nearly straight to slightly convex or concave. Caudal peduncle smoothly confluent with trunk profile.

Table 1. Morphometric data for holotype and 19 paratypes of *Trichomycterus yuska*. H: holotype.

<table>
<thead>
<tr>
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<th>H paratypes mean SD</th>
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<tr>
<td>Standard length (mm)</td>
<td>88.6 32.2-96.4 49.6 15.9</td>
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<tr>
<td>Total length (mm)</td>
<td>101.9 38.4-107.2 57.2 17.4</td>
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<tr>
<td>In percentage of SL</td>
<td></td>
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<tr>
<td>Body depth</td>
<td>16.7 12.3-16.5 14.9 1.1</td>
</tr>
<tr>
<td>Caudal peduncle length</td>
<td>19.3 19.6-23.3 21.8 1.1</td>
</tr>
<tr>
<td>Caudal peduncle depth</td>
<td>11.6 8.9-12.1 10.3 0.8</td>
</tr>
<tr>
<td>Predorsal length</td>
<td>65.0 60.1-69.4 66.1 2.3</td>
</tr>
<tr>
<td>Preanal length</td>
<td>73.0 66.6-75.1 70.0 2.1</td>
</tr>
<tr>
<td>Prepelvic length</td>
<td>56.4 50.8-58.6 55.6 2.0</td>
</tr>
<tr>
<td>Dorsal-fin base length</td>
<td>11.4 10.4-13.2 11.8 0.7</td>
</tr>
<tr>
<td>Anal-fin base length</td>
<td>9.6 7.7-10.9 9.0 0.9</td>
</tr>
<tr>
<td>Head length</td>
<td>17.7 16.4-19.3 17.7 0.8</td>
</tr>
<tr>
<td>Head width</td>
<td>16.0 12.5-14.8 13.8 0.6</td>
</tr>
<tr>
<td>Head depth</td>
<td>9.6 8.1-11.4 9.6 0.9</td>
</tr>
<tr>
<td>In percentage of HL</td>
<td></td>
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<tr>
<td>Nasal barbel length</td>
<td>57.9 41.2-72.1 57.1 8.3</td>
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<tr>
<td>Maxillary barbel length</td>
<td>45.9 38.1-93.3 71.5 14.1</td>
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<tr>
<td>Submaxillary barbel length</td>
<td>31.4 31.4-61.2 49.2 6.1</td>
</tr>
<tr>
<td>Mouth width</td>
<td>50.9 39.2-53.2 45.2 4.1</td>
</tr>
<tr>
<td>Interorbital width</td>
<td>43.4 23.3-48.6 41.9 8.1</td>
</tr>
<tr>
<td>Snout length</td>
<td>49.7 21.2-49.7 28.7 9.2</td>
</tr>
</tbody>
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Dorsal-fin origin at or slightly in advance of vertical through anus. Anal-fin origin approximately at vertical through second third of dorsal-fin base length.

Head roughly rectangular in dorsal view, adductor musculature of cheek well developed. Head dorsoventrally flattened, eyes positioned dorsally, not visible in lateral view, ovoid and slightly elongate anteroposteriorly. Skin covering eye thin and transparent, separate from surface of eyeball, eyes readily visible. Skin of trunk with numerous, minute thread-like papillae. Anterior nostril smaller than posterior nostril, surrounded by fleshy integument flap medially and by nasal barbel laterally. Posterior nostril partially surrounded anteriorly by flap of thin skin.

Infraorbital canal incomplete, anterior segment short, bearing infraorbital pores 1 and 3, separated from posterior segment behind eye, branching from temporal canal in sphenotic and partially involving the frontal bone, bearing infraorbital pores 10 and 11. Supraorbital canal incomplete, short anterior nasal canal separated from canal in frontal by approximate length of lateral ethmoid, with three pores (pore 3 absent). Postotic canal with pterotic branch (sensu Schaefer & Aquino, 2000) at junction of pterotic and posttemporo-supracleithrum (see Schaefer & Aquino, 2000: fig. 3a for *T. tiraquae*). Laterosensory canal of trunk reduced, without ossified tubules, one or two pores present at anterior-most portion of trunk lateral line.

Mouth distinctly subterminal, rictus directed posteriorly. Premaxillae rectangular, wider than greatest palatine width, with 3 rows of teeth. Outer tooth row with 9-10 distally narrowing, incisiform teeth. Lower lip with prominent fleshy lobes laterally, medial to rictal barbel base. Lower lip fleshy anteriorly, anterior surface and to lesser degree anteroventral surface covered with papillae. Upper lip fleshy, with numerous papillae.


Branchiostegal rays 7. Distal margin of pectoral fin straight. First pectoral-fin ray extending slightly beyond fin margin as short filament in holotype and in 12 of 19 paratypes. Pectoral-fin
rays 7 (8) or 8 (12). Distal margin of dorsal fin rounded, semicircular when fin erected. Dorsal fin with 10 or 12 total rays: 6 (5) or 7 (15) principal rays, 4 or 5 procurrent rays in 2 cleared and stained specimens. Dorsal fin base fleshy. Anal fin size equal to or slightly smaller than dorsal fin, elongate, distal margin slightly rounded. Anal-fin total rays 9-11: 5 (17) or 6 (3) principal rays, 4 or 5 procurrent rays in 2 cleared and stained specimens. Tip of pelvic fin not reaching anus. Pelvic-fin rays 5, small splint present anterior to first unbranched ray, second and third rays longest. Caudal fin margin nearly straight, outer fin rays shorter than median rays. Caudal fin with 13 principals rays: 6+7 in 1 specimen cleared and stained (4 rays on hypurals 4+5, 2 on hypural 3, and 7 on hypurals 1+2+parahypural in 1 specimen), dorsal procurrent rays 8-15, ventral procurrent rays 12-13 in 2 cleared and stained specimens. Hypural 3 totally or partially fused to hypurals 4 and 5. Vertebrae 38 (11 precaudal, 27 caudal) to 39 (9 precaudal, 30 caudal); ribs 18-19 in 2 cleared and stained specimens.

Interopercular odontode patch elongate anteroposteriorly; 25-29 odontodes imbedded in fleshy pad over interopercle. Opercular odontode patch small and rounded, 6-10 odontodes imbedded in fleshy covering of opercle (interopercle and opercle odontode counts in 2 cleared and stained specimens).

**Color in alcohol.** *Trichomycterus yuska* demonstrates considerable range in the intensity of pigmentation on the head and body. The holotype is relatively marmorated (see below), while several paratypes are lightly pigmented on the head and body. Darkly pigmented specimens have marmorated, or marbled arrangement of pigment covering dorsal and dorsolateral surfaces of the head and trunk and all but the ventral-most portion of caudal peduncle. Ventral surfaces of head and all barbels darkly pigmented. Dorsal, anal, pectoral and caudal fins irregularly marmorated; pelvic fin lightly pigmented. Premaxillary teeth, opercular, and interopercular odontodes unpigmented even in darker individuals.

**Ecology.** *Trichomycterus yuska* was collected from a small, clear-water stream with sandy bottom at an elevation of approximately 4,050 m. Only four of 100+ described species of *Trichomycterus* are known to occur at higher elevations (Fernández & Vari, 2000). Also captured at the type locality were tadpoles and adults of *Telmatobius hauthali* and an undescribed *Telmatobius* species (Anura: Leptodactylidae; R. Montero, pers. com.). The stomachs of two specimens contained mainly aquatic insects, such as Trichoptera, Diptera (Chironomidae larvae), and Coleoptera (Elmidae larvae) (H. Fernández, pers. com.).

**Distribution.** The species is known only from the type locality. *Trichomycterus yuska* is the fourth representative of the genus endemic to Argentina (Fernández & Vari, 2000). Of these, we were unable to confirm the validity of *T. riojanus* (Berg, 1897) because the holotype (MACN 5175) is destroyed and the type locality, a “precordilleran stream from the La Rioja” (Fernández, 1999), is ambiguous. Among *Trichomycterus* species, *T. yuska* is the tenth species known to occur at higher elevations; the other species are *T. chungaraensis* Arratia, 1983a, *T. laucaensis* Arratia, 1983a, *T. rivulatus* Valenciennes, 1846 from Bolivia and Peru, *T. duellmani* Arratia & Menu Marque, 1984 from Bolivia, *T. boylei* Nichols, 1956, *T. roigi* Arratia & Menu Marque, 1984, *T. ramosus* Fernández, 2000, *T. catamarcensis* Fernández & Vari, 2000, and *T. belensis* Fernández & Vari, 2002 from Argentina (Fig. 3).
Etymology. The specific name yuska is in reference to yuska, the native name for these catfishes in northwestern Argentina, treated as a noun in apposition.

Discussion

*Trichomycterus yuska* shares the six synapomorphies proposed by de Pinna (1998) for the clade Trichomycterinae plus Scleronemina, Ituglanis and TSVSG (Tridentinae, Stegophilinae, Vandellinae, Sarcoglanidinae, and Glanapteryginae) and the diagnostic characters cited by Arratia (1990, 1998) for the subfamily Trichomycterinae. However, *T. yuska* does not share the three synapomorphies proposed by de Pinna (1998) for the clade Scleronema, Ituglanis and the TSVSG and, consequently, is assigned to the non-monophyletic Trichomycterinae. In addition to Trichomycterus, the Trichomycterinae includes the genera Eremophilus, Hatcheria, Bullockia, Rhizosomichthys, and Silvinichthys (de Pinna, 1989; Arratia, 1990, 1998; Costa & Bockmann, 1993; Fernández & Vari, 2000). *Trichomycterus yuska* can be distinguished from *Eremophilus* by the presence of both the pelvic fins and the associated pelvic girdle (Myers, 1944; Arratia, 1990), from *Hatcheria* by having 6-7 (vs. 15-20) dorsal fin rays (Arratia, 1990), from *Bullockia* by the presence of 18-19 (vs. 6-10) ribs and a transversely flattened caudal peduncle (vs. caudal peduncle round in cross section) (Arratia, 1990), from *Rhizosomichthys* by the absence of a thick layer of fatty tissue on the body and head (vs. presence of a rugose layer of adipose tissue between the skin and muscles and large ‘pillows’ of fatty tissue immediately posterior to the supraoccipital region) (Arratia, 1990), from *Silvinichthys* by the presence of a portion of the postotic laterosensory canal system in the sphenotic (Arratia, 1998) and first dorsal fin pterygiophore inserting on vertebra 21 (vs. postotic canal in sphenotic absent, first dorsal fin pterygiophore inserting on vertebra 23).

De Pinna (1989) observed that in larger specimens of *T. boylei* the anteromesial margin of the mesethmoid was convex, as observed in *Scleronema* and the Sarcoglanidinae. He concluded that the convex anterior mesial mesethmoid margin, in comparison to the nearly straight anteromesial margin of other trichomycterids, provides evidence to support monophyly of a group comprised of *T. boylei*, *Scleronema*, and the Sarcoglanidinae (*Sarcoglanis, Malacoglanis, Stauroglanis*). In *T. yuska* the mesethmoid is nearly straight and not concave as in the plesiomorphic condition, but neither is it convex as discussed in de Pinna (1998). An additional character cited by de Pinna (1989) in support of this clade is the presence of an enlarged maxilla. Although de Pinna (1989) mentioned that the condition of the maxilla in *T. boylei* is much less conspicuous than that observed in *Scleroneva* and the Sarcoglanidines, de Pinna & Winemiller (2000) later noted that the enlarged maxilla is more taxonomically widespread than previously supposed, also present in some species of Trichomycterinae and in *Scleroneva*. We concur with this observation and note the presence of an enlarged maxilla in *T. yuska*, similar to that observed in *T. boylei*.

In most trichomycterids the first dorsal fin pterygiophore inserts posterior to vertebra 15, in contrast to other loricarioids and most other siluriforms which have the first pterygiophore associated with vertebra 5 (Royero, 1987; de Pinna, 1992). We observed the location of the first dorsal fin pterygiophore insertion at or posterior to vertebra 21 in *T. yuska*, *T. catamarcensis*, *T. areolatus*, *T. chiltoni*, *T. vittatus*, *Silvinichthys*, *Hatcheria*, and *Ituglanis*; in *T. boylei* between vertebrae 18 and 19. De Pinna (1992) observed the location at vertebrae 14-16 and at 11-12 in *Scleronema* and *Sarcoglanis*, respectively. He considered as the derived state the extreme posterior location of the dorsal fin in all non-copionodontine trichomycterids, versus the more anterior location in Copionodontinae and *Nematogenys* (between vertebrae 9 and 10).

Arratia (1998) stated that *Silvinichthys* is unique among Trichomycterinae in the reduction of the supraorbital canal, reduction of the temporal canal, and complete loss of the infraorbital canal. De Pinna (1992) argued that presence of a complete infraorbital canal in copionodontines represents the plesiomorphic state, as also occurs in *Nematogenys* and almost all other catfishes. The infraorbital canal is present in *T. yuska*; however, a portion of the supraorbital canal is absent between the frontal and nasal bones and involving loss of pores 2 and 4 of other trichomycterids having that canal segment. This condition is similar to that in *T. gracilis*, *T. punctulatus* and *T. rivulatus* (Arratia, 1998: figs. 3b, 4a-b, 5b-c, 14a), but in these taxa the loss involves a segment of canal between supraorbital pores 2 and 3. Arratia (1998) argued that reduction of the sensory canal in *Silvinichthys* is an adaptation to severe environ-
mental conditions in the Andes. However, as noted by Arratia (1998), a complete supraorbital canal is present in *T. areolatus* and *Hatcheria macræi*, both of which live in similar severe conditions. *Hatcheria macræi* occurs syntopically with *Silvinichthys mendozensis* (Fernández, 1999: 121).

We observed a complete cephalic sensory canal system in *T. laucaensis* and *T. chungaraensis*, species which are also found in the Andes above 4,300 m elevation (Arratia, 1983a). Other trichomycterids not known to occur at high elevations Andean that also lack a complete supraorbital canal include *Listrura*, *Glanapteryx*, and *Ituglanis*.

The relatively high number of vertebrae observed in *Trichomycterus yuska* (38-39) is shared by *T. catamarcensis* (37-39), *T. ramosus* (38-39), *T. vitatus* (41), *T. areolatus* (37-39; Arratia & Chang, 1975), *Silvinichthys* (39-41), and *Hatcheria* (41-49; Arratia & Menu Marque, 1981). However *T. ramosus*, *T. areolatus* and *T. vitatus* have 6 to 7 precaudal vertebrae, while *T. yuska*, *T. catamarcensis*, *Silvinichthys*, and *Hatcheria* have 8 or more. Based on this small sampling of derived character states, it appears that *T. yuska* is more closely related to *T. catamarcensis*, *Silvinichthys mendozensis*, and *Hatcheria macræi* than to *T. boylei* and other *Trichomycterus* species. As discussed by de Pinna (1989), such proposals of close relationship between subsets of taxa now included in the patently non-monophyletic genus *Trichomycterus* to other, non-trichomyctereine taxa such as those mentioned above should not necessarily be viewed as unreasonable and, on the contrary, are an expected consequence of an objective taxonomic fragmentation of the Trichomycterinae that will likely follow upon future resolution of phylogenetic relationships within the Trichomycteridae.

Although diagnosed among congeners by a unique combination of features, a number of these features occur more broadly among *Trichomycterus* species from western and southern Andean South America. For example, having the first pectoral fin ray prolonged as a thin, short filament and the tip of pelvic fin when depressed not reaching the anus are characteristics shared by *Trichomycterus yuska*, *T. barbouri*, and *T. punctatus*. The first pectoral fin ray is not prolonged as a short filament in *T. areolatus*, *T. boylei*, *T. borellii*, *T. catamarcensis*, *T. speciﬁetini*, *T. chiriquae*, *T. tenuis*, *T. davisi*, *T. roissi*, *T. duellmani*, *T. atochaes*, *T. oroyae*, *T. quechuorius*, *T. weyrauchi*, *T. laucaensis*, *T. chiltni*, and *T. chungaraensis*. The tip of the pelvic fin reaches the anus in *T. ramosus*, *T. rivojans*, *T. rivulatus*, *T. belensi*, *T. cordwensis*, *T. chuberti*, *T. fassli*, *T. heterodontus*, *T. johnsoni*, *T. vitattus*, *T. dispar*, and *T. alterus*. Also, the first dorsal fin pterygiophore insertion on or posterior to vertebra 21 in *Trichomycterus yuska*, *T. catamarcensis*, *T. areolatus*, *T. chiltoni*, *T. vitattus*, plus *T. chapmani* and *T. romeroi* from Colombia, and *T. gabrieli* from Brazil. In contrast, as far as we are aware, all other *Trichomycterus* species have the first dorsal fin pterygiophore insertion on vertebrae 15 to 20.

**Comparison material.** Material examined included 19 species listed in Fernández & Varí (2000: 995), plus the following: *Trichomycterus catamarcensis*: FML 2509, 13 (2 C&S); *T. belensi*: FML 2533, 5 (2 C&S); *T. boylei*: KU 20188, 1; *T. chuberti*: ANSP 140068, 1; *T. chapmani*: CAS 58128, 1 (+ 6 radiographs); *T. chungaraensis*: KU 19218, 2; KU 19392, 2 (C&S); *T. dispar*: ANSP 21174, 4; *T. fassli*: USNM 302757, 1 (C&S); *T. gabrieli*: CAS 64583, 1 (+4 radiographs); SU 36556, 1; *T. laucaensis*: KU 19403, 2 (C&S); KU 19404, 1 (C&S); *T. maracoibaensis*: AMNH 91133, 1 (C&S); *T. nigromaculatus*: UMNZ 187674, 2; *T. punctatus*: FMNZ 58672, 1; *T. ramosus*: FML 2071, 5 (2 C&S); *T. romeroi*: ANSP 69332, 2 (1 C&S); *T. tiriquae*: UMMZ 204202, 4; AMNH 39740, 2 (2 C&S); *T. vitatus*: ANSP 149683, 3 (1 C&S); *T. weyrauchi*: ANSP 71639, 1; *T. zona- tus*: UMNZ 231757, 4.

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**Literature cited.**


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