**Tucanoichthys tucano** gen. n. sp. n., a new miniature characid fish
(Teleostei: Characiformes: Characidae) from the Rio Uaupés basin in Brazil

by J. Géry * & U. Römer **

* Chemin du Plantier, 24200 Sarlat, France  
** Bielefeld University, Department of Biology, PO Box 100131, 33501 Bielefeld, Germany

Accepted: 1.12.97

Keywords: Ichthyology, Systematics, New genus and species, Characidae, South America, Miniaturization in fishes.

**Abstract**

A new dwarf genus and species, *Tucanoichthys tucano*, less than 17 mm in maximal standard length, is described. It comes from a brook tributary of the Rio Uaupés, upper Rio Negro basin, in Brazil. Its affinities are discussed. It belongs to the Characidae in the broad sense, but could not as yet be attached to a particular subfamily. Its ecology and behaviour are also described, following observations in the field as well as in the aquarium.

**Zusammenfassung**


**Résumé**

*Tucanoichthys tucano* gen. gen. n. sp. n., un nouveau poisson characidé miniature (Teleostei, Characiformes, Characidae) du bassin du Rio Uaupés au Brésil.

Un nouveau genre et espèce de poisson nain (moins de 17 mm de longueur standard maximale) est décrit. Il provient d'un ruisseau tributaire du Rio Uaupés, bassin du haut Rio Négro, au Brésil. Ses affinités sont discutées. Il appartient aux Characidae au sens large, mais ne peut actuellement être relié à une sous-famille particulière. Son écologie et son comportement sont également décrits, d'après des observations sur le terrain ainsi qu'en aquarium.

**Sumário**

Um novo gênero e espécie de peixe-anão, *Tucanoichthys tucano*, com menos de 17 mm de comprimento padrão máximo standard, é encontrado em um riacho tributário do Rio Uaupés, na bacia do alto Rio Negro, no Brasil. As suas afinidades são discutidas. Ele pertence aos carácidos, no sentido amplo, mas não pode ser relacionado a uma subfamília especial, até o momento. A sua ecologia e o seu comportamento também são descritos, a partir de observações no campo bem como em aquário.

**Introduction**

Miniaturization is one of the most interesting adaptations in fish. Thanks to their reduced size, they occupy particular specialised niches (in the broad sense), such as, in fresh water, the roots of trees on the river bank, dense submerged vegetation, and layers of dead leaves. Most of these so-called pigmy or miniature fishes (Weitzman & Vari 1988), at least the truly dwarfs ones (somewhat arbitrarily: 13 to 18 mm in standard length (SL), see Discussion), are
protected by their milieu and rarely quits leave it to swim in free water. The peculiar miniature characid described below, found in an unexplored tributary of the Rio Uaupés (basin of the upper Rio Negro, Brazil) by the junior author during his ethological studies of cichlids, departs from this seemingly general behaviour. Thanks to its vivacity, and probably to the rarity of predators, this dwarf is able to swim in shallow water, where its brilliant colours make it clearly visible, as was observed in the field, and probably hides in Ficus roots only in the event of danger or for spawning. Moreover, the male was observed to guard the eggs during the first 24 hours after spawning, highly evolved behaviour which is extremely rare among characids.

Because the new taxon, like most of the other miniature fishes, has several so-called regressive morphological features which are unsuitable for evaluation of its genealogy, phylogenetic analysis must be postponed until more data are available. In the present paper, no attempt will be made to place it in a particular clade (except in the family Characidae in the broad sense), although some leads will be suggested.

Material and methods
Specimens preserved in 75% ethanol in the field and measured with a micrometric ocular. Two specimens cleared and stained, using Dinkercus & Uhler (1977) method, as modified by Plösch (1991).

**Tucanoichthys** gen. n.
Type species Tucanoichthys tucano sp. n.

A miniature fish of the family Characidae, the adults measuring less than 17 mm (maximum SL), with a conspicuous dark lateral band, well coloured and apparently not homochromic, characterized by narrow, thin jaws set with a single series, in each jaw, of small, acute, slightly recurved conical teeth, and a number of morphological reductions: lateral line very short, with usually only the 3rd and 4th scales pored; canal very reduced, without parietal branch; postorbital region naked; fronto-parieto-occipital fontanel very large, epiophysal bar thick and strong, with a nucleus of cartilage. Adipose fin present.

Pectoral not ossified but developed (not post-larval), the rays probably not branched. Interneurals and interhaemals relatively numerous, but not protruding.

No pseudotympanum visible by transparency; no sexual hooks on pelvic, anal or caudal fins rays; no caudal gland; no frontal organ (as in the Crenichidae); no papillos or pit-lines on head; no external teeth.

**Derivatio nominis**
Im honour of the Tucano Indians living in the upper Rio Negro and Rio Uaupés area. The Tucanos are an intere-sting people who are in great danger, owing to the avid-ty greed of so-called “civilized” men. Less than 5000 members of their tribes survive nowadays along the banks of the Rio Uaupés, and their future is in doubt.

**Description**

**Tucanoichthys tucano** sp. n. (Fig. 1)
Derivatio nominis: see genus-name. The species name is a substantive in apposition, treated as Latin.

Holotype: MZUSP N°51321, 16.55 mm in SL (specimen N° 2 of the table 1), collected in a brook empty-

![Figure 1: Tucanoichthys tucano sp. n. (SMF 28202); adult female in prespawning-coloration, photographed about ten month after capture immediately before preservation. Photo: U. Römer](image-url)
ing into Igapó Yavuari, a tributary of Rio Uaupés, upper Rio Negro Basin, Amazonas, Brazil, 0°14′31″ N and 68°03′48″ W., by Uwe Römer, 22 February 1994.

**Paratypes:** (25 ex. collected with the holotype):
10 ex. MZUSP N° 51322 (spec. 1, 3-7 and unnumbered)
5 ex. ZFMK N° 18585 (spec. 8-10 + 1 unnumbered)
3 ex. MHNG N° 2588:41
3 ex. MTD F N° 18 469 - 18 471
1 ex., SMF N° 28202, preserved after 18 months in aquarium 3 ex. Coll. J. GERY N° 1003

**Not paratypes:** 2 small, distorted specimens collected with the type (alizarined).

**Type locality**
A small forest brook emptying into Igapó Yavuari, the first left-hand tributary of the Rio Uaupés downstream of the Tucano settlement of Açaí, Amazonas, Brazil. The locality is approximately 300 m above the mouth of the brook, approximately 300 m SW from the camp site called locally “Yavuary”, on the right bank ca. 20 km above the mouth of the Igapó Yavuari (see Römer 1994b).

Despite intense collecting in the area, *Tucanoichthys tucano* gen. n. sp. n. was found only along 200 m of the brook, and nowhere else. If the area is someday popuated and polluted, the species might be greatly endangered.

**Diagnosis**
Very small size: 10.5 mm SL (apparently mature) to 16.55 mm SL (holotype); habitus of a small tetra such as a *Hyphessobrycon* (s.l.) or a *Hemigrammus*. Jaws relatively large, narrow, set with a single row of conical teeth; premaxilla with a double curve, forming an “S”. Lateral line almost non-existent; predorsal line broadly naked; postorbitals lacking. Colour pattern reminiscent of that of *Hyphessobrycon loretoensis* Ladiges or *Moenkhausia phaeonota* Fink, for example, i.e. tetras with a broad, very conspicuous band along the body.

Fig. 3: Type locality of *Tucanoichthys tucano* sp. n.

Fig. 2: Type locality of *Tucanoichthys tucano* sp. n.; a small clearwater brook in the rain forest, photographed on 22nd. of February, 1994. Photo: U. Römer

Fig. 4: Type locality of *Tucanoichthys tucano* sp. n.; small clearwater brook in the rain forest, photographed on 22nd. of February, 1994. Photo: U. Römer
Tucanoichthys tucano gen. n. sp. n.

10.8 % of SL (M=9.9, s=.5), 1.2-1.6 in its length (M=1.4, s=.2); dorsal fin approximately in the middle of the body, the post-dorsal distance .96 to 1.05 in the predorsal distance (M=1.0, s=.03), the predorsal distance 49-54 % of SL; head length (without membrane) 23.1-27.2 % of SL (M=25.6, s=1.2); horizontal diameter of eye 40.7-51.1 % of head length (M=44.5, s=2.8); apparent length of maxilla 40.0-45.8 % of head length (M=42.3, s=2.0); length of snout (in projection) 16.7-20.0 % of head length (M=18.5, s=1.1).

Scales numbering 31 or 32 along the mid-body, with usually only 2 scales of the lateral line pored; there is usually a depression, corresponding to normal pore position, on the first 2 scales, which are apparently without pores (but no pseudotynampanum, strictly speaking); then a pore visible on the 3rd and 4th scales; transverse scales numbering usually 10 or $\sqrt{2}$-9-7-5, i.e. with a half scale below the first dorsal ray and a half scale above the pelvic insertion root and 9 scales between; ca 11 predorsal scales in a lateral row, and ca 11 around caudal peduncle; predorsal region with a naked triangle, the naked base corresponding to about 5 scales missing in the post-occipital region, and the tip, with one scale missing, reaching the 3rd scale before the dorsal fin; scale oval with the vertical axis slightly longer than the horizontal one, ca 5-10 mm deep, with a simplified structure: only 8 or 9 circuli, strictly basad, and no radii, nucleus or notch on the basal border.

Dorsal fin almost exactly at mid-body, ii,9 (last ray unbranched), once possibly ii,8; the first rays prolonged, reaching the level of the rather small adipose fin; anal fin iii,16-18, last ray divided at its base, the 2 first unbranched rays separated from the others, the third unbranched and the first branched rays prolonged, forming an anterior lobe originating under the middle of the dorsal fin, sometimes the posterior rays also a little prolonged, seemingly in males; no sexual hooks; pectorals short, not reaching pelvic base, about 8 weak rays, probably all unbranched; pelvic fins short, well in advance of the dorsal fin level, not reaching the first anal ray, probably with i,6 weak rays; formula of the caudal rays typically characoid, i,9/8i; interneurals and interhaemals scarcely distinguishable from the accessory caudal rays, 6 to 8 or 9 above and below, not protruding.

Head moderate, the mouth oblique (slightly superior), the gape rather big relative to the size of the species, the mandible in front of the premaxilla, the maxilla long, reaching the level of the pupil when the mouth is closed. Nostrils close together, not tubuliform; bony interorbital about 23-25 % of the head length; fontanel broad, beginning at level of anterior border of eye to the very short supraoccipital; profile of the head slightly convex and very slightly ascending, with a characteristic step, the predorsal line abruptly ascending and then slightly ascending to the dorsal fin with a feeble convexity; this step-like structure, sometimes attenu-

---

**Fig. 5:** Cranium of *Tucanoichthys tucano* gen. n. sp. n. Photo: U. Römer

**Fig. 6:** Jaws of *Tucanoichthys tucano* gen. n. sp. n., semischematic. Above: superior view of right premaxilla and maxilla; below: lateral view of right jaws.

**Description**

Body tetra-like (cf. small fishes of the genus *Hemigrammus* et al.), moderately elongate, with the habitus of *Hyphessobrycon loretoensis* or *H. peruvianus* for example, to cite species which are well-known to aquarists.

Principal proportions of the 10 largest specimens (see table I; range followed, in parentheses ()), by the mean (M) and the standard deviation (s): Largest depth in front of pelvic fins, 26.6-33.0 % of the SL (M=28.7 %, s=1.7); depth of caudal peduncle 9.2-
ated, resembles that of the "flag tetras" of the genera *Hyphessobrycon* and *Paracheirodon*, but does not seem to be homologous, not being formed by the supraccipital. Opercle with a posterior, feeble notch.

Premaxilla very narrow, S-like, with 8 tiny, acute conical teeth in one scarcely irregular row, the anteriormost one the largest; maxilla long and narrow, slightly curved (the concavity anterior), entirely toothed with 12 conical, acute teeth, the superiormost ones about the same size as the pmx largest premaxillary tooth; mandible long and narrow, the tooth-bearing part (dentary) concave (the concavity superior), with 14 conical teeth arranged in a slightly irregular single row, the acute tip slightly recurved, the anteriormost ones larger as in the other jaws; anterior and posterior part of the mandible slightly elevated; no pterygoid teeth. Gill-rakers about 7-9 + 10-11. Hyo-mandibular series and neuro-cranium feebly ossified, apparently not departing from the basic characid acid structure. 4+28 vertebrae. Post-cleithrum 3 and 2 visible, post-cleithrum 2 not observed.

**Colour Pattern**

In life, no difference in coloration between sexes. Fins translucent, sometimes milk-cloudy. Ground colour of body pale yellowish, translucent, the yellow tint more intense during sexual display and spawning. Mouth region and iris citrus yellow with intense metallic blue sheen on the upper part of iris; red gills very conspicuous, visible through the translucent opercle and membrane, the intense red in the opercle region and the blue of the upper part of eye very characteristic of the species. A broad black lateral band, sometimes with dark bluish hue; dominant individuals often with many small brownish or reddish spots on the caudal fin base. The middle of the lower jaw and the upper jaw up to the distal part of dorsal fin are sprinkled with brownish or blackish chromatophores. Spinal column sometimes covered by the black band mostly in the caudal region, but usually clearly visible by transparency, with the upper part iridescent silver or golden-yellow, and the lower part brownish to reddish-brown. Abdominal region whitish with a silvery hue.

The black pattern is very variable, depending on the social status of the individual. It may vanish completely in dominated fishes. In subdominant or frightened individuals (for example after confrontation with pike cichlids of the genus *Crenicichla*), the lateral band is represented by just a few dots, with persistence of the bluish eye.

**After preservation**, first dorsal and anal rays dark chestnut to black, pelvics very dark, including membranes, as well as distal parts of caudal membranes, chiefly the tips of the lobes; adipose fin hyaline, pectoral fins scarcely coloured. Maxilla, mandible, and back chiefly at dorsal base, chestnut coloured. A broad lateral band, always clearly visible, in contrast to the live state, from just behind the head to the root of the caudal fin, and vertically from the axis of the body to the abdomen, leaving only a third of the abdomen uncoloured, and tapering backwards; under the binocular microscope, the chromatophores, dark chestnut coloured, are arranged in vertical lines up to dorsal level, and then progressively take the form of chevrons up to the caudal peduncle, without extension onto the caudal fin.

**Discussion**

Weitzman & Vari (1988) list 50 or so "miniature" Neotropical Characiformes (ca 10% of their respective group), i.e. species maturing at less than 20 mm in SL and not growing to longer than 26 mm in SL.

---

Table I. Proportions of the 10 largest *Tucanoichthys tucano* gen. n. sp. n. (rounded figures, specimens sorted by size, with their original N° in front; the holotype is the N° 2)

<table>
<thead>
<tr>
<th>N°</th>
<th>SL</th>
<th>D</th>
<th>H</th>
<th>PED</th>
<th>PED2</th>
<th>PD</th>
<th>PD2</th>
<th>EYE</th>
<th>MAX</th>
<th>SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>15.9</td>
<td>33.0</td>
<td>27.2</td>
<td>9.7</td>
<td>1.50</td>
<td>54.4</td>
<td>1.05</td>
<td>44.6</td>
<td>42.9</td>
<td>17.9</td>
</tr>
<tr>
<td>2)</td>
<td>16.55</td>
<td>28.8</td>
<td>25.1</td>
<td>10.2</td>
<td>1.55</td>
<td>50.2</td>
<td>0.95</td>
<td>40.7</td>
<td>40.7</td>
<td>18.5</td>
</tr>
<tr>
<td>4)</td>
<td>16.05</td>
<td>28.4</td>
<td>23.1</td>
<td>9.6</td>
<td>1.30</td>
<td>51.0</td>
<td>1.00</td>
<td>45.8</td>
<td>45.8</td>
<td>16.7</td>
</tr>
<tr>
<td>5)</td>
<td>15.40</td>
<td>27.5</td>
<td>26.0</td>
<td>9.5</td>
<td>1.65</td>
<td>51.0</td>
<td>1.00</td>
<td>44.2</td>
<td>40.4</td>
<td>17.3</td>
</tr>
<tr>
<td>3)</td>
<td>15.30</td>
<td>28.8</td>
<td>26.3</td>
<td>10.1</td>
<td>1.20</td>
<td>52.5</td>
<td>1.00</td>
<td>42.3</td>
<td>40.4</td>
<td>19.2</td>
</tr>
<tr>
<td>6)</td>
<td>15.30</td>
<td>28.3</td>
<td>26.3</td>
<td>10.1</td>
<td>1.30</td>
<td>52.5</td>
<td>1.05</td>
<td>44.2</td>
<td>42.3</td>
<td>17.3</td>
</tr>
<tr>
<td>7)</td>
<td>14.95</td>
<td>28.9</td>
<td>25.8</td>
<td>10.8</td>
<td>1.50</td>
<td>52.6</td>
<td>1.00</td>
<td>44.0</td>
<td>40.0</td>
<td>20.0</td>
</tr>
<tr>
<td>10)</td>
<td>14.65</td>
<td>28.9</td>
<td>24.7</td>
<td>9.5</td>
<td>1.20</td>
<td>51.0</td>
<td>1.00</td>
<td>51.1</td>
<td>42.5</td>
<td>19.1</td>
</tr>
<tr>
<td>8)</td>
<td>14.50</td>
<td>27.7</td>
<td>25.0</td>
<td>10.1</td>
<td>1.40</td>
<td>53.2</td>
<td>1.05</td>
<td>42.5</td>
<td>44.7</td>
<td>19.1</td>
</tr>
<tr>
<td>9)</td>
<td>13.30</td>
<td>26.6</td>
<td>26.6</td>
<td>9.2</td>
<td>1.65</td>
<td>49.1</td>
<td>0.95</td>
<td>45.6</td>
<td>43.5</td>
<td>19.6</td>
</tr>
</tbody>
</table>

SL= in mm
D= Greatest depth in % SL
H= Head length in % SL
PED= Depth of caudal peduncle in % SL
PED2= Depth of caudal peduncle in its length
PD= Predorsal length in % SL
PD2= Predorsal length in postdorsal length
EYE= Horizontal diameter of eye in % head length
MAX= Apparent length of maxilla in % head length
SN= Snout length in % head length (projection)
However a number of the listed species, such as several *Hyphessobrycon* and other well-known aquarium species, though very reduced in size, differ by less than 2 standard deviations from the average size of their respective group: they cannot be qualified as exceptional dwarfs. As admitted by the authors, “size criterion for miniatures is not completely satisfactory” (...when applied to species with elongate body...).

We think that a range of 13 mm (*Xenurobycon polyaniscistrus*, the smallest dwarf species known) to 18 mm maximal SL would be more appropriate for true miniature fishes, characterized by a considerable reduction in size relative to the average size of the group (more than 3 standard deviations from the average standard length of the respective group, and including 1-2% of its species), accompanied by a number of morphological reductions which are generally considered as paedomorphic. This convention concerns the growth under natural conditions, excluding specimens kept in aquaria, where they might grow to larger sizes.

The following restricted list (data from Weitzman & Vari, 1988) comprises only 15 spp, excluding those with incomplete data such as *Cheirodon luehingii* Géry, 1964 and *Tyttocharax madeirensis* Fowler, 1914, but including the recently described *Microcharacidium weitzmani* Buckup, 1993 and *Tucanoichthys tucano* gen. sp. n.

### Characidae Tetragonopterinae

*Axelrodia riesei* Géry, 1966, from upper Rio Meta in Colombia (max. 16.7 mm SL).

*Hyphessobrycon elachys* M. Weitzman, 1985, from Rio Paraguay basin (max. 17.9 mm SL).

*Hyphessobrycon georgettae* Géry, 1961, from Sipaliwini River, Surinam (max. 16.7 mm SL).


*Tyttobrycon hamatus* Géry, 1973, from Peruvian Amazon (max. 16.9 mm SL).

### Characidae Glaudulaucaudinae

*Xenurobycon polyaniscistrus* Weitzman, 1987, from Rio Mamoré basin (max. 13.1 mm SL).

*Xenurobycon peropus* Weitzman & Fink, 1985, from Fonte Boa, Amazon (max. 13.8 mm SL).

### Characidae inc. sed.

*Prioccharax ariel* Weitzman & Vari, 1987, from Rio Casiquiare (max. 17.1 mm LS).

*Prioccharax pygmaeus* Weitzman & Vari, 1987, from the Rio Marañón basin near Leticia (max. 16.4 mm SL).

*Tucanoichthys tucano* gen. sp. n. from Rio Uaupés (max. 16.5 mm SL).

### Characidae  

*Elachocharax geryi* Weitzman, 1986, from Rio Negro basin (max. 13.9 mm SL).

*Elachocharax mitopterus* Weitzman, 1986, from Rio Casiquiare (max. 16.5 mm SL).


*Odontocharacidium aphanes* Weitzman & Kanazawa, 1977, from middle Rio Negro (max. 16.5 mm SL).

### Lebiasinidae

*Nannostomus anduzei* Fernandez & Weitzman, 1987, from Rio Orinoco (max. 16.2 mm SL).

*Tucanoichthys tucano* gen. sp. n. should be compared with the dwarf species with uniserial, conical teeth, belonging to the Characidae, its form and structure being clearly very different from that of the Lebiasinidae Nannostomini and of the Characidiidae, which have small jaws, as well as other different features.

The Glandulocaudinae are excluded from the comparison owing to the absence, in *Tucanoichthys tucano* gen. sp. n., of an elaborate caudal structure; likewise, most of the Tetragonopterinae need not be discussed, owing to their very different structures. However, some taxa belonging to a peculiar group, the Aphyoideina (cf. Géry 1973), usually classified within the Tetragonopterinae for convenience, share with *Tucanoichthys tucano* gen. sp. n. certain characters such as uniserial conical teeth, incomplete lateral line, small size etc.

*Brittanichthys* has the maxilla not toothed and the caudal fin scaled, that of the male with an ornamented hook; *Oxybrycon*, an enigmatic species of extremely small size, has two mandible rows and a very short anl, and *Macropsobrycon*, *Thrissobrycon* and *Leptobrycon* have a clupeoid, feebly toothed maxilla which is unmistakable. The three other genera, *Microschobrycon*, *Axelrodia* and *Tyttobrycon*, differ from *Tucanoichthys tucano* gen. sp. n., by among other features (sexual hooks etc.), the jaws structure: the taxa with conical, sometimes acute teeth (in *Axelrodia lindiae* for example), have stronger jaws (for their small size), the premaxilla rather deep with usually a well formed ascending apophysis, never narrow and S-shaped without apophysis, the maxilla rounded and rather short, never narrow and elongate, and the mandible rather high, never narrow and elongate.

Lastly the two *Prioccharax* spp. recently described by Weitzman & Vari (1987) share with *Tucanoichthys tucano* gen. sp. n. the presence of uniserial conical teeth and a number of regressive characters, but differ strongly from it in having different jaw structure with much more numerous teeth (28-56 on the upper jaw, 45-90 on the lower one), i.e. pelvic rays, no
adipose fin, presence of sexual hooks, unconspicuous colour pattern, and chiefly an unique feature, the persistence of a larval pectoral girdle and fin in the adult.

To sum up the discussion, *Tucanoichthys tucano* gen. n. sp. n. has an unique set of characters, notably the structure of the jaws, the peculiar predorsal naked area and the pores of the lateral line, which is not shared by any other small or extremely small characid. For the time being its status is *incertae sedis*, together with certain enigmatic, for the most part monotypic, genera, such as *Acanthocharax*, *Gnathocharax*, *Heterocharax*, *Hoplocharax*, *Loncho- genys*, excluded by Uj (1990) from the Characinae (restricted to *Asiphonichthys*, *Charax*, *Eucynoptomus*, *Phenacogaster* and *Roedoide*) and *Priocharax*.

**Ecology**

The brook, 80-200 cm wide, 50-120 cm deep near the end of the dry season (the level was still dropping at the rate of about 20 cm a day), runs rather swiftly in a through dense forest, with *Ficus* trees and *Leopoldina* palms, lies in the water, as dominant plants. Dead wood, mostly prickly trunks of palms, are lying in the water, usually covered with *Ficus* leaves, which also cover the bottom with a layer 50 to 100 cm thick. No submerse plants. Only the branches and roots of emerse plants provide shelter for aquatic organisms near the surface.

The following data were gathered by the junior author Feb. 21, 1994 at 11.00 a.m.: Clear water with blackwater influence, extremely acid. Current 0.5-1 m/sec. Temp.: air 29°C, water 26°C at the surface (5 cm), 25.5°C at 30 cm depth, 24°C at more than 50 cm depth. Conductivity 24 μS/cm; pH 4.09; oxygen 6.3 mg/l.

The fish-fauna seems quite poor in species. Only 6 species were collected in the brook, including *Tucanoichthys tucano*: two cichlids, *Nannacara adoketa* Kullander & Prada- Pederos, 1993 and *Crenichila* sp.; one catfish, a doradid *Amblydoras* sp.; and an as yet unidentified *Rivulus*, abundant; the only other characid, probably syntopic, was *Poecilocharax weitzmani* Géry, 1965. Owing to the great similarity between the two species, a mimetic association of *T. tucano* with young *P. weitzmani* cannot be excluded.

**Behaviour**

Some observations were possible in the field, the water being relatively clear and the fish easily identifiable (thanks to its iridescent blue eye and despite its minute size). *T. tucano* swims very fast, jerkily and hastily, usually in open water some 20 cm above the bottom, like half-grown *Paracheirodon axelrodi* (Schultz, 1956) observed by the junior author in the Rio Negro basin. By comparison, other small characiforms such as *Odontoccharacidium* sp. or *Poecilocharax weitzmanni* from the same region, usually hide among the between the leaf-litter, *Ficus* roots or submerged terrestrial vegetation.

On two occasions, a single territorial individual was observed watching and defending an immersed root of *Ficus* hanging about 20 cm from the surface in the free water. The fish, probably a male, was chasing every other fish away from an area less than 50 cm across around the root, obviously the centre of its territory. Not only did it attack members of its own species, but was also chasing, with success, some individuals of *Nannacara adoketa* three times bigger. These cichlids frequently sorted from the leaf litter below the territory of *T. tucano* and were attacked as soon as noticed.

On one occasion the territorial fish was observed accompanying a congener instead of chasing it, straight up to the root. After a few seconds, it suddenly began to chase it away. Using aquarium observations for comparison, one may hypothesize that the intruder was a female not far from spawning condition, inspecting the potential spawning substrate.

In the aquarium, a pair of *T. tucano* spawned several times on an immersed root of a *Ficus*, positioned above the tank to reconstruct the natural conditions. The courtship was not observed.

The round eggs, numbering about 49-50, were clear translucent and relatively big, measuring nearly 1 mm in diameter. They were guarded by the male for 24 hours until they hatched, during which time he did not leave the root for more than a few seconds. No direct care of the eggs, such as oxygenation or cleaning, was observed: the brood care by the male, a rather rare behaviour among the Characiforms, seems restricted to protection against predators. No fry could be raised up to now.

**Acknowledgments**

The junior author (UR) is indebted to the Federação das Organizações Indígenas do Rio Negro (FOIRN) and its president Mr. José dos Santos, who represents the Tucano Indians, for permission to travel through their lands, as well as to the capitãos of the indígena settlements along the Uaupés, especially to people from Açaí who invited the party to the tribal rest area “Yavuary”. He cordially thanks his companions, Messrs. von Tscharnhaus and M. Wöhler, and their guide José de Oliveira Netto, for their help in catching the new species.

Both authors are grateful to their colleague T. Plösch (Ganderkesee), who was kind enough to use some of his own research time for the clearing and staining procedure.

The senior author (JG) had the benefit of the experience, in miniature characid osteology, of Dr. Paulo Buckup (Rio de Janeiro, Brazil), who examined the preparations and gave him valuable indications.
REFERENCES


