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Cruciglanis, a new genus of Pseudopimelodid catfish (Ostariophysi: Siluriformes) with description of a new species from the Colombian Pacific coast

Armando Ortega-Lara* and Pablo Lehmann A.**

Cruciglanis pacifici, *gen. et sp. nov*., is described from the Dagua and Anchicaya Rivers on the Pacific slope of Colombia. The new genus is differentiated from the other genera in the family by the presence of an ossified crucifix-shaped second basibranchial; ectopterygoid bone shaped as an inverted comma, with its distal end narrow and directed medially towards the mesopterygoid; anterior fontanel elongated, reaching a transverse line at sensory canal opening of the sphenotic bone; caudal fin emarginated with rounded edges and ventral lobe more developed than the dorsal lobe; caudal fin with a dark spot from its base and fused with the peduncular spot, covering the anterior three quarters of its length, distal rim totally hyaline. Coloration of the species is described *in vivo*, and the shared diagnostic characters with the other genera within the Pseudopimelodidae are discussed. The phylogenetic position of the new genus is proposed and new insights in the family interrelationships are presented.

Cruciglanis pacifici, um novo gênero e espécie de Pseudopimelodídeo, é descrito para a bacia dos rios Dagua e Anchicaya na vertente do Pacífico colombiano. O novo gênero é diferenciado dos outros gêneros da família pela presença do segundo basibranquial ossificado em forma de cruz, osso ectocterigoide em forma de vírgula invertida, com o extremo posterior estreito e dirigido medialmente ao mesopterigóide; fontanela anterior alongada alcançando a altura da sua linha na horizontal a abertura do canal sensorial do osso esfenótico; nadadeira caudal emarginada com as suas bordas arredondadas e o lóbulo inferior mais desenvolvido do que o superior, nadadeira caudal com uma mancha escura desde sua base e fusionada à mancha peduncular, abrangendo as três primeiras quartas partes do seu comprimento, borda posterior hialina. Descreve-se a coloração da espécie *in vivo*, e os caracteres diagnósticos compartilhados com os demais gêneros da família Pseudopimelodidae são discutidos. A posição filogenética do novo gênero é proposta e, adicionalmente, uma nova hipótese de interrelações filogenéticas da família é apresentada.

Key words: *Cruciglanis pacifici*, Pseudopimelodidae, Taxonomy, Systematic, Neotropical, Catfishes, Dagua River, Anchicaya River, Colombia.

Introduction

The Neotropical catfish family Pseudopimelodidae (*sensu* Shibatta, 2003a: 401) is found from the Atrato River in Colombia to Argentina in the Río de la Plata. The wide distribution and the scarcity of specimens in collections in part due to the size of some species have contributed to a delayed phylogenetic study of this family. In the first revision of the group three genera were proposed as valid: *Pseudopimelodus*, *Microglanis* y *Lophiosilurus* (Mees, 1974). Later, the genera *Cephalosilurus*, *Zungaro* and probably *Zungaropsis* were included (Lundberg *et al*., 1991: 204).

Shibatta (1998: 87) carried out a phylogenetic analysis of the Pseudopimelodidae family based on 55 morphologic characters, considering the genus *Pseudopimelodus* as polyphyletic and a basal group in his analysis. This supports the Lundberg *et al*. (1991) hypothesis where this genus (called *Zungaro* by the authors) is presented as closely related to the other Pseudopimelodidae (Shibatta, 2003b: fig. 13.4). Additionally, *Batrochoglanis* was added as valid genus and

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Zungaro and *Zungaropsis* are invalidated because they share synapomorphies proposed for the Pimelodidae (de Pinna, 1998; Shibatta, 2003b: 394). Currently, *Zungaropsis* is considered as a *genus inquirendum* of the Pimelodidae (Lundberg & Littmann, 2003: 443) thus confirming the incipient knowledge about this family.

Lundberg *et al*. (1991: 204) proposed the following synapomorphies for the Pseudopimelodidae: (1) Lateral ethmoid projecting beyond the condyle of the palatine, with the tip-shaped wing of membranous bone lost. This structure is projected beyond the condilo of the palatine (Lundberg *et al*., 1991: 194, figs. 2c-d); (2) Very short metapterygoid, dorsally curved towards the inner part and generally supported by a crest or rim (Lundberg *et al*., 1991: 200, fig. 9c); (3) Endopterygoid (=mesopterygoid in Shibatta, 1998) and ectopterygoid wide, with a distinct shape (where in the former, the antero-lateral process has a sharp tip and the latter has a comma shape) and being loosely linked between the neurocranium from the proximity of the orbitsphenoid suture and the lateral ethmoid to the autopalatine (Lundberg *et al*., 1991: 194, fig. 2c-d); (4) Third to the seventh (last) proximal radials of the dorsal fin wide with adjacent rays in close contact for all their length (large pseudopimelodines, see Lundberg *et al*., 1991: 196, fig. 5d), and a bit separated in *Microglanis*; (5) Absence of hypohyal dorsal bones.

Diogo *et al*. (2004: 273) confirmed the synapomorphies supporting the monophyly of the group. Additionally, they proposed two new potentially diagnostic characters for Pseudopimelodidae, based on a phylogenetic analysis that included 440 characters and 87 terminal taxa representing all existing catfish families: (1) mesethmoid markedly bifurcated and (2) spoon-like autopalatine with a roundish, dorso-ventrally expanded posterior tip.

Batrochoglanis transmontanus (Regan 1913) has been the only representative of the family described or mentioned in the Pacific basin of Colombia. The present work makes a diagnosis of *Cruciglanis*, collected in the Dagua and Anchicayá River basins, as a new genus grouped in the family Pseudopimelodidae, according to the synapomorphies suggested by Lundberg *et al*. (1991), and confirmed by Shibatta (1998, 2003a, b).

Material and Methods

Morphometric data are straight line distances, between defined landmark points based on the methodology proposed by Bookstein *et al*. (1985). The measurements are adapted from Littmann *et al*. (2000). The following measurements were taken using a dissecting microscope and a digital caliper with a precision of 0.05 mm: head length, measured from the tip of the snout to posterodorsal angle of the opercle; snout length, from the tip of the snout to the anterior rim of the eye orbit; interorbital length measured between the inner rims of the eyes; mouth width, measured from one commissure to the other; barbel distance using the center of the barbel's base as the landmark point. Predorsal, prepectoral and preventral distances were taken from the tip of the snout to the base (origin) of the first ray or bony element in the corresponding fin; the cleithral width was taken between the insertion of the pectoral spines. The distances between fins were taken from the landmark points using the term "origin" as the first ray or bony element and insertion as the most distal point of the last ray. The center of the hypural was defined as the medial point in vertical direction from the end of the hypural complex. The depth of the caudal peduncle is the minimum height in vertical direction at the end of the adipose fin.

The external anatomic descriptions and comparisons are based on alcohol preserved museum specimens. Osteological descriptions and comparisons were done using dried skeletons (dpo) prepared with the help of Dermestids colonies. Cleared and counter-stained (c&s) specimens with alizarin and alcian blue, were prepared using the modifided technique proposed by Dingerkus & Uhler (1977), Estrada (1977) and Taylor & Van Dyke (1985). The number of gill rakers, vertebrae, fin rays, branchiostegal rays and ribs were obtained using only cleared and stained specimens. The vertebral counts included the five vertebrae of the Weberian complex. The bone complex of the caudal fin is counted as a single vertebra.

The phylogenetic placement of the new genus was proposed by including it in the data matrix of Shibatta (Table 1, 1998) with the addition of corresponding data and autapomorphies proposed for *Cruciglanis*. The matrix was reanalyzed using the computer programs NONA (Goloboff, P., 1999) & WINCLADA (Nixon, 2002), all characters [61] were treated unordered.

The specimens examined during this study are deposited in the Natural Sciences Museum Federico Carlos Lehmann V. - INCIVA (IMCN), Cali (Valle del Cauca - Colombia); Natural Sciences Museum, Universidad del Cauca (MHNUC), Popayán (Cauca - Colombia); Ichthyological Unit, Natural Sciences Museum, Universidad Nacional de Colombia (ICNMHN), Bogotá (Cundinamarca - Colombia); Ichthyological reference collection, Biology Department, Universidad del Valle (CIRUV), Cali (Valle del Cauca - Colombia); Biology Museum, Instituto de Zoología Tropical, Universidad Central de Venezuela (MBUCV-V), Caracas (Venezuela); Pontifícia Universidade Católica do Rio Grande do Sul (MCP), Porto Alegre (Brazil); Zoological Collection, Universidad del Tolima (CZUT - IC), Ibagué (Tolima - Colombia); Freshwater Fish Collection, Instituto Alexander von Humboldt (IAvH-P), Villa de Leiva (Boyacá - Colombia).

The following abbreviations are used in the text and figures: **acf**: anterior cranial fontanelle; **ap**: autopalatine; **bb**$_{2-4}$: basibranchials 2 to 4; **bra**: gill raker; **cb**$_{1-5}$: ceratobranchial 1 and 5; **dpo**: dry osteological preparation; **eb**$_{1-4}$: epibranchials 1 and 4; **ec**: ectopterygoid; **en**: endopterygoid [=mesoptergoid en Shibatta, 1998]; **ex**: extrascapular; **fr**: frontal; **hb**$_{1-2}$: hypobranchial 1 and 2; **le**: lateral ethmoid; **me**: mesethmoid; **pm**: premaxilla; **pt**: pterotic; **sn**: supraneural; **sop**: supraoccipital process; **sph**: sphenotic; **v**: vomer; **tpl**: tooth plate.

Fig. 1. *Cruciglanis pacifici*, holotype, IMCN 2359, 95.5 mm SL; Colombia, Valle del Cauca Department, near Buenaventura city, San Cipriano River, near San Cipriano village, Dagua River basin, Pacific drainage, Colombia.

Results

Cruciglanis, new genus

Type species: *Cruciglanis pacifici*, new species.

Diagnosis. The new genus *Cruciglanis*, is distinguished from all other pseudopimelodid genera by the following characters: the subdorsal and the subadipose spots are joined forming an oval-shaped clear spot (Fig. 1, Character 56); the second basibranchial ossified, cross-shaped with lateral processes (Fig. 2, Character 57); ectopterygoid bone with the

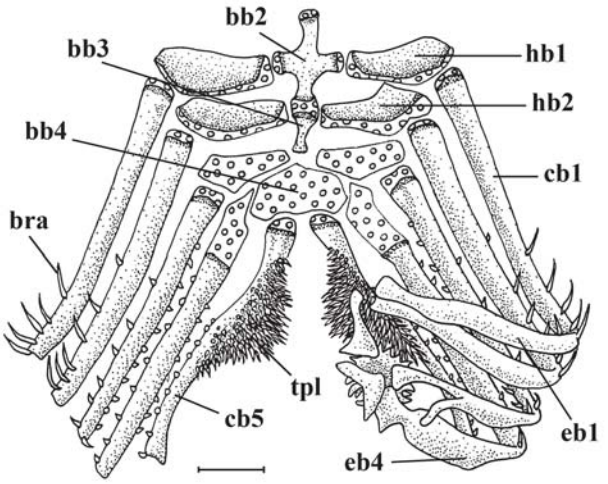

Fig. 2. Branchial skeleton of *Cruciglanis pacifici*, paratype. IMCN 2356 (79 mm SL) in dorsal view. Scale bar: 2 mm.

shape of an inverted comma, its distal end narrow and directed medially towards the endopterygoid (=mesopterygoid) (Fig. 3a, Character 58); anterior fontanel elongated, reaching posteriorly to the level of the infraorbital sensory canal opening of the sphenotic bone (Fig. 4a, Character 59); caudal fin emarginated with rounded edges and ventral lobe larger than the dorsal one (Fig. 5a, Character 60); caudal fin with a dark spot at its base and fused with the peduncular spot, covering the anterior three quarters of its length, and distal rim totally hyaline (Fig. 5a, Character 61).

Etimology. Genus *Cruciglanis*, from the Latin *crucis*, cross; and *glanis*, meaning catfish, in allusion to the crucifix shape of the second basibranchial in the branchial arch. Gender: Masculine.

Cruciglanis pacifici, new species

Fig. 1

Holotype. IMCN 2359 (1), 95.5 mm SL; Colombia, Valle del Cauca Department, near Buenaventura city, San Cipriano River where it crosses San Cipriano village, confluence of the La Sardina stream, approximately 500 m before the confluence with Dagua River, Dagua River basin, 03º50.543'N 76º54.068'W, 84 m of altitude; 14 Sep 2003, Armando Ortega-Lara, Gian Carlo Sánchez & Amabelly Aguiño. **Paratypes.** IMCN 2354 (2), 37.8-85.8 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, Danubio River, tributary of the Anchicayá River, Alto Anchicayá dam, Anchicayá River basin, 7 Mar 2002, Armando Ortega-Lara; IMCN 2358 (2), 27.1-29.8 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, Anchicayá River, Alto Anchicaya dam, 7 Apr 2002, Armando Ortega-Lara; IMCN 2356 (3, 3c&s), 39.7-99.5 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, Aguaclara River 600 m before its confluence with the Anchicayá River, Anchicayá River basin, 14 Jul 2002, Armando Ortega-Lara; MHNUC 0355 (2, 1c&s), 76.85-91.50 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, San Cipriano River near San Cipriano village, Dagua River basin, aprox. 03º50.188'N 76º53.795'W, 86 m of altitude. 8 Oct 2002, A. Ortega-Lara, G. C. Sanchez & A. Aguiño. IMCN 2350 (2, 1c&s), 89.8-100.47 mm SL, MCP 39666 (1), 110.88 mm SL, and ICNMHN 14919 (1), 100.1 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, San Cipriano River when it crosses San Cipriano village, Dagua River basin, 03º50.188'N 76º53.795'W, 86 m of altitude, 13

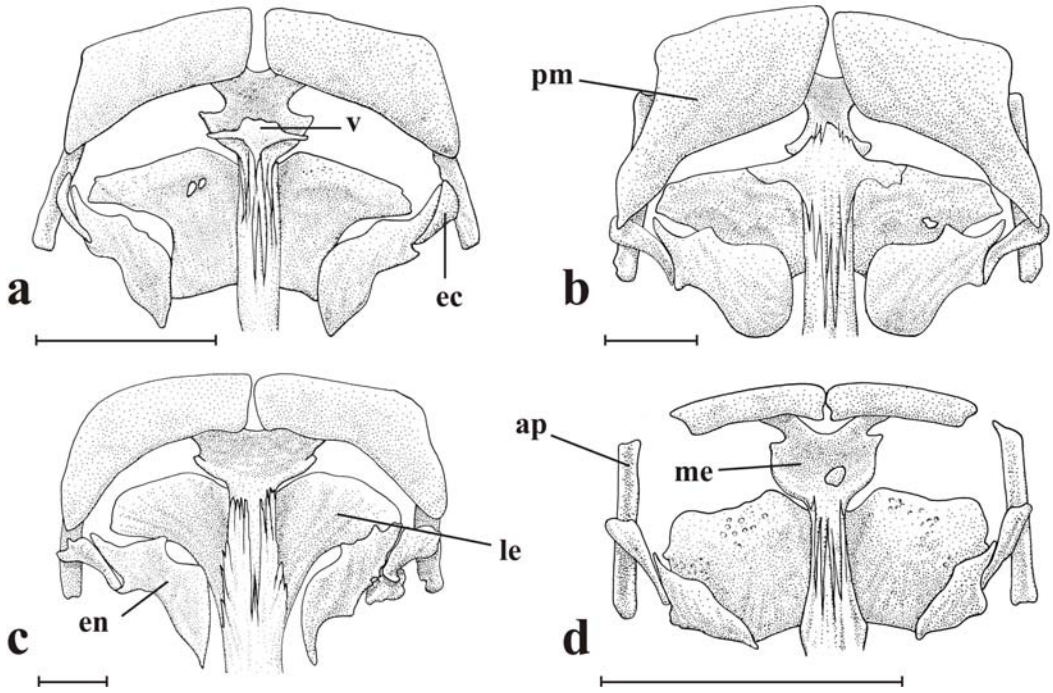

Fig. 3. Ethmo-vomerine region in ventral view. **a**. *Cruciglanis pacifici*, paratype. IMCN 2356, 79 mm SL. **b**. *Pseudopimelodus bufonius*: IMCN 2349, 158 mm SL. **c**. *Batrochoglanis transmontanus* IMCN 2347, 163 mm SL. **d**. *Microglanis iheringi*: ICNMHN 1021, 42 mm SL. Scale bar: 4 mm.

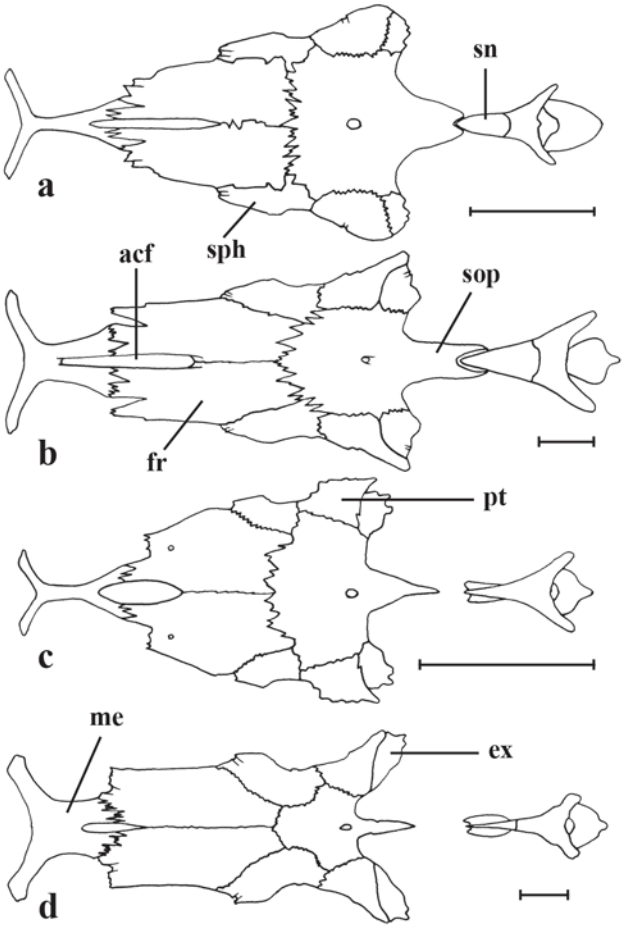

Fig. 4. Neurocranium in dorsal view. **a**. *Cruciglanis pacifici*, paratype. IMCN 2356, 79 mm SL. **b**. *Pseudo-pimelodus bufonius* IMCN 2349, 158 mm SL. **c**. *Microglanis iheringi* ICNMHN 1021, 42 mm SL. **d**. *Batrochoglanis transmontanus* IMCN 2347, 163 mm SL. Scale bar: 5 mm.

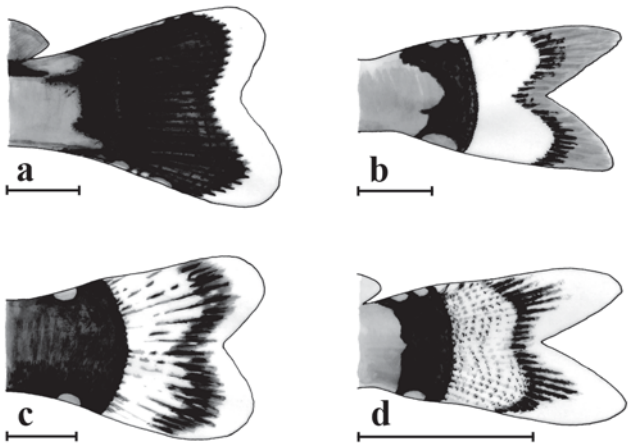

Fig. 5. Forms and pattern of coloration of the caudal fin. **a**. *Cruciglanis pacifici*, paratype. IMCN 2350, 101 mm SL. **b**. *Pseudo-pimelodus bufonius* IMCN 1142, 97 mm SL. **c**. *Batrochoglanis transmontanus* IMCN 2086, 102 mm SL. **d**. *Microglanis iheringi* ICNMHN 1021, 31 mm SL. Scale bar: 10 mm.

Apr 2003, Gian Carlo Sánchez. IMCN 2351 (1), 123.6 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, San Cipriano River when it crosses San Cipriano village, Dagua River basin, 03º50.188'N 76º53.795'W, 86 m of altitude, 13 Sep 2003, Gian Carlo Sánchez; IMCN 2352 (2), 103.2-107.5 mm SL, CZUT-IC 1895 (1), 101.7 mm SL, IAvH 7505 (1), 95.8 mm SL and MCP 39667 (1), 106.5 SL, Colombia, Valle del Cauca Department, Buenaventura municipality, San Cipriano River when it crosses San Cipriano village, Dagua River basin, 03º50.188'N 76º53.795'W, 86 m of altitude, 14 Sep 2003, Armando Ortega-Lara, Gian Carlo Sanchez y Amabelly Aguiño. IMCN 2353 (1), 87.4 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, La Conferencia stream tributary of San Cipriano River, Dagua River basin, 7 Jan 2004, Gian Carlo Sánchez; CIRUV 87007 (4), 73.8-131.2 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, Anchicayá River in the confluence with the Sabaletas River, Anchicayá River basin, 1987, Claudia Eugenia Ospina y Camilo Alberto Restrepo.

Diagnosis. As for the genus.

Description. Morphometric characters of holotype and nine paratypes given in Table 1, meristic characters given in Table 2. Body cylindric, relatively elongated, 26.2-28.8% of SL; head moderately depressed, bones covered by skin; supraoccipital process wider at base than posteriorly with bifurcated tip contacting supraneural, blunt tipped and convexly sided (Fig. 4a); fontanels not visible through skin, anterior fontanel elongated reaching transverse line through opening of infraorbital sensory channel in sphenotics (Fig. 4a); posterior fontanel small and oval-shaped, located in center of supraoccipital. Eye small, covered by skin, in latero-dorsal position; anterior nostril tubular and separated from lip rim; posterior nostril closer to eye than to anterior nostril (Fig. 1); mouth wide (56.3-64.6% of HL), upper jaw projecting slightly beyond lower; upper and lower lip subdivided in two fleshy rims parallel to snout margin. Teeth small, villiform; premaxilae laterally projected backwards (Fig. 3a), dentary symphysis straight. Maxillary barbel inserted on upper lip anterior to anterior nostril, reaching base of pectoral spine. External mental barbel inserted at same level of gular fossa apex reaching branchial opening ventrally. Internal mental barbel inserted anterior to gular fossa apex, reaching symphysis of branchiostegal membrane; branchiostegal membrane free from isthmus; gular fossa V-shaped, with sharply pointed but inconspicuous apex (Fig. 1). Anterior mesial margin of mesethmoid anterior to premaxillary posterior mesial margin (Fig. 3a); vomer present, T-shaped and contacting parasphenoid and mesethmoid but not lateral ethmoid, without interdigitating joints with mesethmoid and parasphenoid (Fig. 3a). Autopalatine posteriorly expanded dorso-ventrally; metapterygoid with antero-lateral upper projection more developed than lower; levator crest palatine arch moderately developed.

Dorsal-fin origin on first third of body, posterior edge convex; dorsal spine strongly ossified, shorter than following branched ray, posterior edge of dorsal spine with two distal serrae. Pectoral-fin spine serrated, covered by skin, anterior margin with 11-15 serrae of similar size and posterior

Fig. 6. Live specimen of *Cruciglanis pacifici*, IMCN 2353, paratype (87.4 mm SL), collected in La Conferencia stream, tributary of San Cipriano River, in the Dagua River basin, Pacific vertent, near to Buenaventura city in theValle del Cauca Department, Colombia.

margin with 8-11 serrae larger than on anterior side, increasing progressively in size and curvature from base distally; posterior edge of pectoral fin convex; mesocoracoid arch elongated, stick-shaped in 90º angle; posterior cleithral process thin, sharp and long, longer than half of adducted pectoral spine; axillary pore absent. Pelvic fin rounded inserted behind end of dorsal-fin base. Anal fin with rounded posterior edge and inserted below 15th or 16th vertebra. Caudal fin emarginated, with rounded lobes and inferior lobe slightly more developed and longer than dorsal (Fig. 5a). Adipose fin 12.3-14.2% of SL, originating at level of anal-fin origin, posteriorly rounded and free from caudal peduncle (Fig. 1).

Distance between end of dorsal-fin base and origin of adipose fin 26.2-28.9% of SL. Nine or ten pairs of pleural ribs associated with vertebrae 6th to 14th-15th, first hemal spine complete on vertebrae 14th-15th; total number of vertebrae 36(2), 37(4), or 39(1). Head sensory canals unbranched, ending in single pore; lateral line incomplete surpassing posterior end of adipose fin by more then half of its length. Epidermal papillae well developed, concentrated mainly on barbels, head, and base of caudal fin. Dorsal-fin rays I,6; pectoral-fin rays I,7; pelvic-fin rays i,5; anal-fin rays iv-v,6-7; caudal-fin rays i,14,i; dorsal procurrent rays 13-18 (unsegmented) and 3-5 (segmented); ventral procurrent rays 11-15 (unsegmented) and 3-4 (segmented). Free vertebrae 37, ribs 9-10.

Color in life. Dorsal region of head, lateral surface of body, and adipose fin brown, ventral region cream (beige) with some brown spots. Four dark brown vertical marks on sides, first on occipital region; second completely crossing base of dorsal fin, joining first just behind posterior cleithral process and reaching anterior portion of belly; third mark crosses through base of adipose fin and extends onto middle anal-fin rays, third mark also joining dorsal portion of second mark by two bands that flank back of body between dorsal and adipose fins, forming clear oval-shaped spot that extends dorsally from insertion of dorsal fin to origin of adipose fin (Fig. 6); fourth mark covers first three fourths of caudal fin; posterior quarter of caudal fin hyaline (Figs. 5-6). Pectoral, dorsal, anal, and adipose fins dark, except for completely hyaline or semitransparent posterior rims (variable clear area on adipose); pelvic fins generally clear except at their base where some dark pigmentation occurs. Pattern above shows very little variation among specimens observed (Fig. 6).

Color in alcohol. Body coloration pattern conserved in alcohol, but some general changes occur in color tones. Dorsal region of head and dorso-lateral area of body with dark grayish brown tone, body lateral surface turns gray-purple, and cream (beige) color intensified on ventral region of body and head. Brown spots present in life turn maroon, and semitransparent areas observed *in vivo* turn white (Fig. 1).

Etymology. The specific name, *pacifici*, is treated as a noun in apposition, in allusion to the endemic distribution of this species in the coastal rivers draining the western slope of the Cordillera Occidental of Colombia.

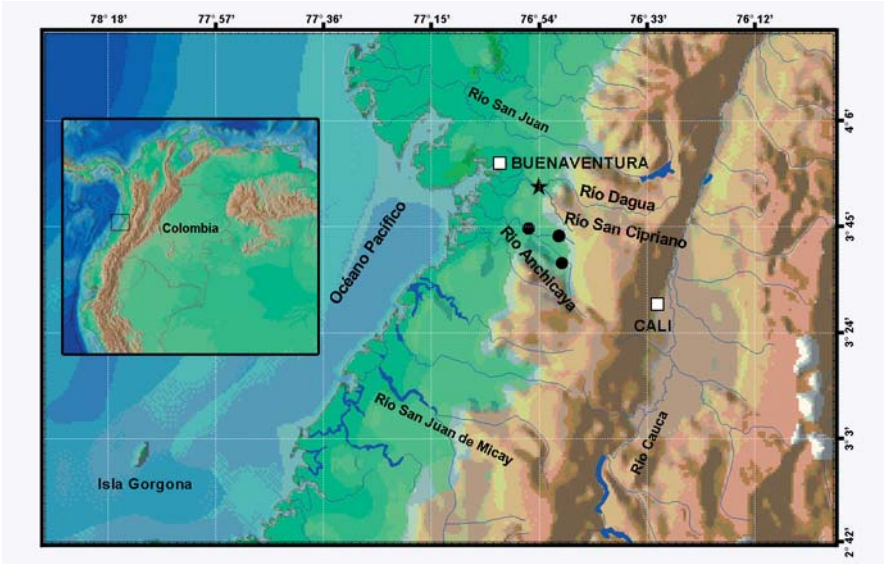

Fig. 7. Geographic distribution of *Cruciglanis pacifici*. Type locality (star); additional collection localities (dots).

Distribution. San Cipriano River, Dagua River basin; Anchicayá, Aguaclara and Danubio Rivers, Anchicayá River basin, western slope of the Pacific versant, Valle del Cauca Department, Colombia (Fig. 7).

Natural history. This species is found in undisturbed clear and shallow rivers in strong current and on gravel to small stone substrates (riffles or runs). *Cruciglanis pacifici* generally shares its microhabitat with other species of fishes like *Gobiesox* sp., *Chaetostoma marginatum*, *Cordilancistrus daguae*, *Astroblepus trifasciatus*, *Trichomycterus taenia*; as well as shrimps (*Atya*). The stomach contents of five specimens caught in the Aguaclara River, showed immature aquatic insects belonging to Trichoptera, Diptera, Ephemeroptera and Odonata, and terrestrial insects of the orders Hymenoptera and Coleoptera.

Discussion

The new genus presents the five synapomorphies proposed for the family Pseudopimelodidae defined by Lundberg *et al*. (1991) and Shibatta (1998). The mesethmoid markedly bifurcated anteriorly, described as: anterior bifurcation of this bone is even more pronounced, with its antero-mesial surface being situated behind to the postero-mesial surface of the premaxillae (Diogo *et al*., 2004: 273), here, we refute this character as one of the new synapomorphies proposed for the family (*op. cit*), this character has a different configuration, *id est*, the mesethmoid is moderately bifurcated anteriorly on the material examined of *Pseudopimelodus buffonius* (Figs. 3b, 4b), *Batrochoglanis transmontanus* (Fig. 4d), *Lophiosilurus alexandri* (Shibatta, 1998: 81, fig. 12e) same as in the specimen *Pseudopimelodus* examined by Lundberg *et al*. (1991: 194, fig. 2d). In contrast this character was observed as markedly bifurcated only in *C. pacifici* (Fig. 4a), *Microglanis iheringi* (Fig. 4c) and *Cephalosilurus fowleri* (Shibatta, 1998: 81, fig. 12d). Therefore, the character: "mesethmoid markedly bifurcated anteriorly" does not suport the monophyly of the subfamily Pseudopimelodinae (*sensu* Shibatta, 2003b; & Shibatta & Pavanelli, 2005: 27). However, the bifurcation (markedly or moderately) and the broad (posteriorly to bifurcation, in dorsal view) of the mesethmoid could be informative to estimate the phylogenetic relationships among the genera.

The other synapomorphy described as spoon-like autopalatine with a roundish, dorso-ventrally expanded posterior tip, is corroborated as observed in all the available ma-

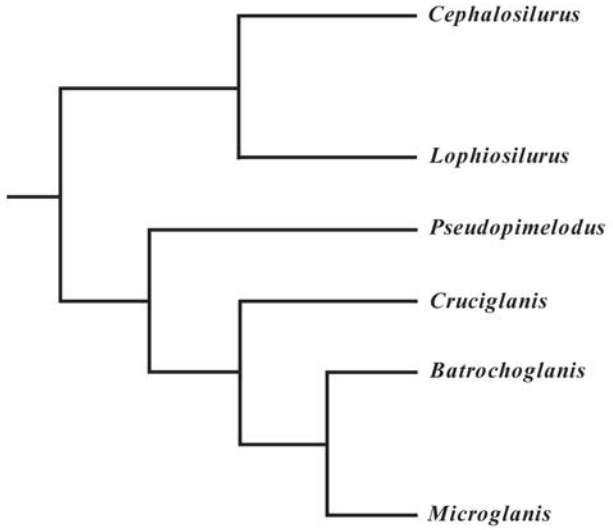

Fig. 8. Strict consensus tree of relationships among genera of Pseudopimelodidae. Tree length 114 steps, CI = 0.66, and RI = 0.77.

Table 1. Descriptive morphometry of *Cruciglanis pacifici* (Hol. - Holotype; n = 9).

	Hol.	Range	Media	SD
Standard length (SL)	95.5	94.7-111.6	103.3	5.1
Percent of the standard length				
Head length (HL)	26.4	26.2-28.8	27.1	0.9
Predorsal distance	31.9	31.3-36.3	33.6	1.8
Prepectoral distance	24.5	22.9-27.2	24.3	1.4
Prepelvic distance	48.5	47.6-48.8	48.3	0.3
Pectoral origin to pelvic origin	28.4	24.0-29.3	27.6	1.8
Base of dorsal fin	13.1	10.0-12.3	11.2	1.0
Pelvic origin to anal origin	23.6	22.8-25.5	24.4	0.8
Dorsal insertion to adipose origin	28.2	26.2-28.9	27.7	1.0
Base of adipose fin	13.0	12.3-14.2	13.6	0.6
Base of anal fin	12.0	9.6-12.2	10.9	0.8
Adipose insertion to hypural center	14.6	13.6-15.7	14.7	0.7
Anal insertion to hypural center	18.8	17.4-21.0	18.9	1.1
Cleithral width	23.8	22.9-25.2	24.2	0.8
Depth of caudal peduncle	13.4	12.4-14.8	13.3	0.8
Percent of the head length				
Head length	49.5	44.6-53.5	49.5	2.4
Snout length	37.6	34.0-42.2	38.6	2.4
Width between maxillary barbels	46.7	48.8-56.7	54.4	2.5
Fleshy interorbital	38.0	38.8-44.2	40.7	1.9
Eye horizontal diameter	7.5	7.0-8.9	7.9	0.7
Mouth gape	61.0	56.3-64.6	60.0	3.0

Table 2. Descriptive meristics of *Cruciglanis pacifici.*

	n	Range	Mode
Branchiostegal rays	4	10-11	11
Gill rakers on first ceratobranchial	4	4-6	5
Gill rakers on first epibranchial	4	1	1
Total number of vertebrae	8	36-39	37
Pleural ribs	4	9-10	10
Anal fin rays	4	10-11	11
Unbranched anal fin rays	5	4-5	4
Branched anal fin rays	5	6-7	6
Branched pectoral fin rays	5	7	7
Branched pelvic fin rays	5	5	5
Branched dorsal fin rays	5	6	6
Total caudal rays	5	49-55	54
Total caudal rays of dorsal lobe	5	25-29	27
Dorsal unsegmented procurrent caudal-fin rays	5	13-18	17
Dorsal segmented procurrent caudal-fin rays	5	3-5	3
Unbranched principal rays of dorsal caudal lobe	5	1	1
Principal branched rays of dorsal caudal lobe	5	6	6
Total rays of ventral caudal lobe	5	24-28	24
Ventral unsegmented procurrent caudal-fin rays	5	11-15	13
Vemtral segmented procurrent caudal-fin rays	5	3-4	4
Principal unsegmented rays of ventral caudal lobe	5	1	1
Principal branched rays of ventral caudal lobe	5	8	8

Table 3. Characters states of *Cruciglanis pacifici*, for 55 characters presented by Shibatta (1998) plus six additional characters included in the reanalysis (56-61). Characters are listed from top to bottom, arranged in separate groups in columns.

Characters	1-10	11-20	21-30	31-40	41-50	51-60	61
States	0	1	1	1	0	0	1
	0	0	0	0	0	0	
	0	0	1	?	1	0	
	?	0	0	2	0	1	
	1	0	1	1	1	0	
	0	1	0	0	1	1	
	?	1	0	0	1	1	
	0	1	0	0	0	1	
	1	1	0	1	?	1	
	1	1	1	0	1	1	

terial, in consequence six of the seven synapomorphies proposed are confirmed for the family Pseudopimelodidae, nevertheless, it is necessary to test these in all the members, including new characters and taxa (*e.g.*, Shibatta, Lehmann & Reis, in progress); in order to establish a "well" supported phylogeny of pseudopimelodid genera.

Additionally, *Cruciglanis* is distinguished from *Cephalosilurus* and *Lophiosilurus*, by the maxillary bone with a rounded border, ramified gill rakers, and depressed body (Shibatta, 2003b: 396), also *Lophiosilurus* has a second cartilaginous basibranchial (see Britto, 2002: fig. 48) which probably represents an autapomorphy for this genus; *Microglanis*, differs from *Cruciglanis* by its small adult size, premaxilla without a markedly developed postero-lateral projection, absence of vomer (Fig. 3d) and pectoral fin with 5 or 6 soft rays; *Batrochoglanis* is distinguished from the new genus by the absent of the vomer (Fig. 3c), supraoccipital process not contacting anterior nuchal plate (Fig. 4d), metapterygoid with ectopterygoideus process highly developed, levator arcus palatini crest slightly developed and caudal fin emarginated or rounded with longer dorsal lobe (Fig. 5c).

Cruciglanis, has a thick skin that covers the serrae of the anterior edge of the pectoral spine, a character proposed as autapomorphic for the genus *Pseudopimelodus* (Shibatta, 2003b); additionally it shares the following characters: supraoccipital in contact with the nuchal plate, posterior region of the supraoccipital process V-shaped (Fig. 4a-b); presence of seven rays in the pectoral fin and anterior nostril placed posterior to the maxillary barbel rim.

When the two genera are contrasted it is evidenced that *Pseudopimelodus* does not have an ectopterygoid process on the metapterygoid; the levator arcus palatini crest is well developed; possesses a conspicuous vomer articulated with the mesethmoid, lateral ethmoid and parasphenoid (Fig. 3b); also it presents an axilary pore and bifurcated caudal fin with equal lobes equal in size (Fig. 5b). Consequently, the presence of a depressed triangular mesocoracoid arch (Shibatta, 2003b: 395), is identified an autapomorphy for *Pseudopimelodus*.

Among the Pseudopimelodidae, *Batrochoglanis* and *Microglanis* share the absence of axillary pore (Shibatta & Pavanelli, 2005), a synapomorphic character proposed for these two genera by Shibatta (2003a), however, this character is also shared by *Cruciglanis*.

Cruciglanis, presents three basibranchial elements; the second and third brasibranchial are ossified, and the fourth basibranchial element is cartilaginous; according to de Pinna (1989, 1993) the first basibranchial element is absent in all the Siluriformes, thus the first bony element present in this new taxon corresponds to the second basibranchial (bb_2) present in the other Otophysi. The second basibranchial reported here is cross shaped, *id est* with two lateral processes. This is not a unique condition among catfishes. De Pinna (1989), used the presence of a cross-shaped basibranchial element as a diagnostic character for *Stauroglanis*, a monotypic genus of trichomycterid. This shape and disposition according to the author *op. cit.*, can be attributed to a marked modification of the second basibranchial (the third basibranchial is absent), or because of the possible fusion of this element with a second primitive basibranchial and a third basibranchial (considering the first basibranchial absent among the catfishes). Nevertheless, *Stauroglanis* (by de Pinna, 1989: 14, fig. 9) presents this unique basibranchial bony element articulating to a cartilaginous area with the first hypobranchial (hb_1), and its lateral processes articulate with the second hipobranchial (hb_2). The same does not occurr in *Cruciglanis*, where the anterior part of the second basibranchial (bb_2) is projected anteriorly in relation to the first hypobranchial, and the lateral processes of the second basibranchial (bb_2) articulates with the first hypobranchial (Fig. 2). In ligh of the above, and not detecting any suture indicating fusion of two basibranchial elements; we consider the similarities between the cruciform basibranchials of *Stauroglanis* and *Cruciglanis*, to be independent derived character states.

Adding *Cruciglanis* to the matrix of Shibatta (Table 1, 1998) and including the six autapomorphic characters proposed for the new genus [characters 56-61, Table 3], the phylogenetic analysis of these 61 characters resulted in eight equally parsimonious trees (length 112 steps, CI = 0.66, and RI = 0.78) . The strict consensus of these trees resulted in a cladogram (Fig. 8) with a length of the 114 steps, CI = 0.66, and RI = 0.77; where *Cruciglanis* form the sister group to *Batrochoglanis* and *Microglanis*. This three-genera clade is supported by seven synapomorphies [4, 9, 38, 44, 45, 46, and 53]. In contrast with Shibatta (1998, 2003b), the genus *Cephalosilurus* and *Lophiosilurus* form the basal clade supported by five synapomorphies [characters 4, 23, 25, 39 and 44] among all other Pseudopimelodines and appears as the sister group to all the others genera. The monophyly of the genus *Pseudopimelodus* is supported by two unreversal characters [14 and 37].

The present cladistic reanalysis did not include two terminal taxa named "new genus" by Shibatta (1998: fig. 17) but, on the other hand, includes six additional characters and one additional terminal taxon. The tree length (114 steps) and the consistency index (0.66) of the present analysis differ from those found by Shibatta [55 characters, 16 terminal taxa] us-

ing Hennig86 computer program (Farris, 1988) and resulting in a strict consensus with 122 steps, CI = 0.58, and RI = 0.77. Therefore, a new arrangement is proposed by the relationships among genera of the Pseudopimelodidae (Fig. 8).

Comparative material. *Pseudopimelodus*: *P. bufonius* IMCN 285 (1), 235.0 mm SL, Colombia, Cauca Department, Suarez municipality, Ovejas River, Alto Cauca basin; *P. bufonius* IMCN 1142 (2), 48.8-96.0 mm SL, Colombia,Valle del Cauca Department, Cartago municipality, La Vieja River airport area in the urban zone of Cartago city, Alto Cauca basin; *P. bufonius* IMCN 2348 (1c&s), 178 mm SL, Colombia,Valle del cauca Department, Cali municipality, Universidad del Valle experimental station; *P. bufonius* IMCN 2349 (2dpo), 160-450 mm SL, Colombia, Valle del cauca depártment, Cali municipality, Cauca River in the Hormiguero area, Alto Cauca basin; *P. bufonius* IMCN 2357 (2c&s), 65.8-85.0 mm SL, Colombia, Valle del Cauca Department, Anserma Nuevo municipality, Chanco River, Alto Cauca River; *P. charus*: MCP 16659, (1c&s), Brazil, Minas Gerais, Montes Claros, Verde Grande River, São Francisco basin, (16°39'01"S 43°42'49"W); *P. schultzi* IMCN 324 (2), 186-141 mm SL, Colombia, Santander Department, Puerto Wilches municipality, Magdalena River, Magdalena basin; *Pseudopimelodus* sp. ex - MBUCV-V 12891: IMCN 2400 (4), 89.2-104.5 mm SL, Venezuela, Portuguesa State , Guanare River in Guanarito town, Apure River basin; *Pseudopimelodus* sp. ICNMNH 798 (1), Colombia, Guajira Department, Quebrada stream, Ranchería River basin; *Batrochoglanis*: *B. raninus* IMCN 212 (1), 156 mm SL, Venezuela, Amazonas Department, Amazonas municipality, Yatuje drain, Amazonas basin, March 1, 1981, Patricia Victoria; *B. raninus*: MCP 35838 (8, 1c&s), Brazil, Amazonas, Canutama, tributary of the rio Ipixuna, Purus basin, (07°55'53"S 063°20'03"W); *B. trasmontanus* IMCN 937 (1), 113.1 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Cuellar stream, San Juan River basin, April 6th, 2002, native community of Puerto Pizario; *B. trasmontanus* IMCN 1447 (1), 148.4 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Equix stream, Bajo río San Juan basin, November 23th, 2002, native community of Tio Silirio; *B. trasmontanus* IMCN 1527 (1), 139.5 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Wequeral stream, Bajo San Juan River basin, December 10th, 2002, native community of Tio Silirio; *B. trasmontanus* IMCN 1565 (2), 116.3-137.2 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Peinemona stream, Bajo San Juan River basin, December 12th, 2002, native community of San Bernardo; *B. trasmontanus* IMCN 1634 (1), 134.4 mm SL, Colombia, límite de los departamentos de Valle del Cauca y Choco, Buenaventura municipality, Checho stream, Bajo San Juan River basin, October 31th, 2002, comunidad indígena de Puerto Pizario; *B. trasmontanus* IMCN 1706 (1), 139.8 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Dopurma stream, Bajo San Juan River basin, April 6th, 2002, native community of Puerto Pizario; *B. trasmontanus* IMCN 1777 (1), 173 mm SL, Colombia, limits between Valle del Cauca and Choco Departments, Buenaventura municipality, Llano stream, Bajo San Juan River basin, August 16th, 2002, native community of Puerto Pizario; *B. trasmontanus* IMCN 2182 (1), 117.2 mm SL, Colombia, limits between de Valle del Cauca and Choco Departments, Buenaventura municipality, Chiquito River, Bajo San Juan River basin, August 24th, 2003, native community of Puerto Pizario; *B. trasmontanus* IMCN 2237 (1), 121 mm SL, San Juan River, Bajo San Juan River basin, July 13th, 2003, native community of Puerto Pizario;límite de los departamentos de Valle del Cauca y Choco, Buenaventura municipality, Puerto Pizario; *B. trasmontanus* IMCN 2347 (1c&s), 167 mm SL, Colombia, Valle del Cauca Department, Buenaventura municipality, Calima River in the experimental station area of Universidad del Tolima, San Juan River basin, February 12th, 2002, Armando Ortega-Lara; *Microglanis*: *M. iheringi* ICNMHN 1021 (12, 3c&s), 29.3-59.3 mm SL, Colombia, Meta Department, Guaitiquía River, Meta River basin. *Microglanis sp.*: MCP 35839 (4, 1c&s), Brazil, Rondônia, rio Crespo, Madeira basin. *Lophiosilurus*: *L. alexandri*: MCP 14110 (1), Brazil, Minas Gerais, Rio São Francisco basin, (18°13'00"S, 45°15'00"W).

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