

A new species of *Australoheros* (Teleostei: Perciformes: Cichlidae) from the río Iguazú basin, Argentina

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Abstract. *Australoheros kaaygua* sp. n. is described from the río Iguazú basin above Iguazú falls. *Australoheros kaaygua* sp. n. is distinguished from its congeners by the following combination of characters: 5–6 anal-fin spines; 6–7 branched anal-fin rays; caudal-peduncle length 8.9–11.8 % of SL; lips not thickened; lateral band formed by two series of scales, each of them with a dark spot in its centrum. Between both scales there is a narrow light area; dorsal, anal, caudal fins and opercle without dark spots.

Resumen. Una nueva especie de *Australoheros* de la cuenca del río Iguazú en Argentina. En este trabajo se describe *Australoheros kaaygua* sp. n. de arroyos afluentes del río Iguazú por encima de las cataratas del Iguazú. *Australoheros kaaygua* sp. n. se distingue de todos sus congéneres por la siguiente combinación de caracteres: 5 a 6 espinas en la aleta anal; 6 a 7 radios anales ramificados; longitud del pedúnculo caudal 8.9–11.8 en % de la longitud estándar; labios no engrosados; banda lateral formada por dos series longitudinales de escamas, cada escama con una mancha oscura en el centro dejando una angosta línea clara entre ellas; aletas dorsal, anal y caudal y opérculo sin manchas oscuras.

Kurzfassung. *Australoheros kaaygua* sp. n. wird beschrieben aus dem Einzugsgebiet des río Iguazú oberhalb der Wasserfälle, Argentinien. *Australoheros kaaygua* sp. n. unterscheidet sich von den anderen Vertretern der Gattung durch folgende Kombination von Merkmalen: 5–6 Hartstahlen in der Anale; 6–7 geteilte Analstrahlen; Schwanzstielhöhe 8,9–11,8 % der Standardlänge; Lippen nicht verdickt; das Längsband wird von zwei Schuppenreihen gebildet, jede Schuppe besitzt im Zentrum einen dunklen Fleck, zwischen beiden Schuppen eine helle, schmale Zone; Dorsale, Anale, Caudale und Operculum ohne dunkle Flecken.

Key words. Perciformes, Cichlidae, systematics, *Australoheros*, new species, Argentina, río Iguazú basin.

Introduction

The genus *Cichlasoma* SWAINSON was restricted to small group of species by KULLANDER (1983). This genus excludes about 90 species mostly from Central America. The genus *Australoheros* RÍCAN & KULLANDER, 2006 was established for the ‘*Cichlasoma*’-*facetum*-group and includes *A. facetus* (JENYNS, 1842), *A. scitulus* (RÍCAN & KULLANDER, 2003), and *A. tembe* (CASCIOTTA *et al.*, 1995) (JENYNS, 1842; RÍCAN & KULLANDER, 2003; CASCIOTTA *et al.*, 1995). *Australoheros facetus*, has a widespread distribution, inhabiting the basins of the ríos Paraná, Uruguay and in the Río de la Plata (CASCIOTTA, 1998). *Australoheros scitulus* is found in the tributaries of the río Uruguay and Río de la Plata basin. Finally, *Australoheros tembe* inhabits streams flowing in the ríos Paraná and Uruguay.

The aim of this paper is to describe a new species of the genus *Australoheros* from the río Iguazú basin above Iguazú falls in Argentina.

Materials and methods

The specimens examined in this study were cleared and counterstained (C&S) following TAYLOR & VAN DYKE (1985). Measurements were taken as straight line distances in mm, using digital callipers to the nearest 0.1 mm, all measurements are expressed as percentages of SL. Vertebral count includes the vertebrae corresponding to the complex centrum. Values of holotype are indicated by an asterisk.

Material is deposited in the Asociación Ictiológica, La Plata, Argentina (AI); Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina (MLP); and Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Argentina (MACN-ict).

Australoheros kaaygua sp. n. (Figs 1–4, Tab. 1)

Material. Holotype. MACN-ict 8917, 94.0 mm SL, female, Argentina, Misiones, río Iguazú basin, arroyo Ñandú, coll. D. Somay, January, 1983.

Paratypes. MTD F 28765–28766, 2 ex. 42.5–55.3 mm SL, Argentina, Misiones, río Iguazú basin, arroyo Lobo (25°42'57"S–54°05'59"W), coll. M. Moreno, February, 2001. AI 194, 9 ex., 1 (C&S) 28.0–75.7 mm SL, Argentina, Misiones, río Iguazú basin, arroyo Lobo (25°42'57"S–54°05'59"W), coll. M. Moreno, February, 2001. AI 195, 1 ex., 89.2 mm SL, Argentina, Misiones, río Iguazú basin, arroyo Yacuí at road 101 (25°36'00.37"S–54°08'24.61"W), coll. D. Somay, 1983. AI 196, 1 ex., 32.8 mm SL, Argentina, Misiones, río Iguazú basin, arroyo Deseado at road 101 (25°47'08.1"S–54°02'21.1"W), coll. M. Moreno, February, 2002.

Comparative material. *Australoheros facetus* (JENYNS, 1842): MACN-ict 2554, 10 ex., 33.0–79.3 mm SL, Argentina, Salta, río Las Conchas. MLP 8568, 1 ex., 26.6 mm SL Argentina, Corrientes, arroyo Las Piedritas. MLP 8569, 12 ex., 18.3–37.2 mm SL, Argentina, Corrientes, creek about 1 km from Tres Bocas. MLP 8570, 1 ex., 40.2 mm SL, Argentina, Corrientes, arroyo Payubre, close to Ita-Corá. MLP 2220, 7 ex., 19.1–58.6 mm SL, Argentina, Córdoba, flood water in Barreto. MLP 2218, 1 ex., 47.9 mm SL, Argentina, Córdoba, Barreto. MLP 2600, 3 ex., 57.8–100.2 mm SL, Argentina, Córdoba, Río III from Almafuerde to Río III city. MLP 2211, 4 ex., 21.2–48.4 mm SL, Argentina, Córdoba. MLP 2233, 11 ex., 22.3–51.8 mm SL, Argentina, Córdoba, Barreto. MLP 2502, 4 ex., 28.1–59.0 mm SL, Argentina, Córdoba, flood water in Barreto. MLP 8571, 22 ex., 28.9–102.5 mm SL, Argentina, Córdoba, arroyo El Durazno, close to Tanti. MLP 8572, 1 ex., 102.6 mm SL, Argentina, Córdoba, río Mina Clavero. MLP 8575, 2 ex., 100.8–104.7 mm SL, Argentina, Buenos Aires, Laguna de Lobos. MLP 8576, 2 ex., 56.8–63.1 mm SL, Argentina, Buenos Aires, Tandil City. MLP 6202, 1 ex., 66.5 mm SL, Argentina, Buenos Aires, Laguna de Monte. MLP 4748, 5 ex., 53.0–102.1 mm SL, Argentina, Buenos Aires, arroyo Pereyra. MLP 5633, 2 ex., 43.1–115.8 mm SL, Argentina, Buenos Aires, Magdalena. MLP 1775, 4 ex., 82.3–150.5 mm SL, Argentina, Buenos Aires, Mercedes. MLP 6594, 18 ex., 48.5–138.2 mm SL, Argentina, Buenos Aires, arroyo Zapata, close to La Plata city. MLP 1756, 12 ex., 33.9–88.4 mm SL, Argentina, Buenos Aires, Isla Martín García. MLP 6162, 1 ex., 101.7 mm SL, Argentina, Buenos Aires, río Quequén. MLP 6115, 4 ex., 124.2–151.4 mm SL, Argentina, Buenos Aires, San Nicolás. MLP 6290, 5 ex., 181.0–202.1 mm SL, Argentina, Buenos Aires, Laguna Vitel. MLP 8577, 2 ex., 26.2–30.3 mm SL, Argentina, Buenos Aires, arroyo Castelli, Punta Indio. MLP 8578, 3 ex., 31.9–53.6 mm SL, Argentina, Buenos Aires, arroyo Villoldo, Punta Indio. MLP 1219, 13 ex., 51.4–80.0 mm SL, Argentina, Buenos Aires, Mercedes. MLP 1421, 14 ex., 27.5–87.0 mm SL, Argentina, Buenos Aires, La Plata neighborhood. MLP 7700, 1 ex., 36.6 mm SL, Argentina, Buenos Aires, Delta del Paraná. MLP 7735, 2 ex., 36.1–38.3 mm SL, Argentina, Buenos Aires, arroyo Gallo Fiambre, Delta del Paraná. MLP 7808, 1 ex., 29.8 mm SL, Argentina, Buenos Aires, río Matanza. MLP 6147, 38 ex., 30.3–100.6 mm SL, Argentina, Buenos Aires, Los Talas ponds, Berisso. MLP 7699, 13 ex., 27.4–47.9 mm SL, Argentina, Buenos Aires, Plátanos. MLP 7680, 4 ex., 23.5–34.5 mm SL, Argentina, Buenos Aires, arroyo Caraguatá, Delta del Paraná. MLP

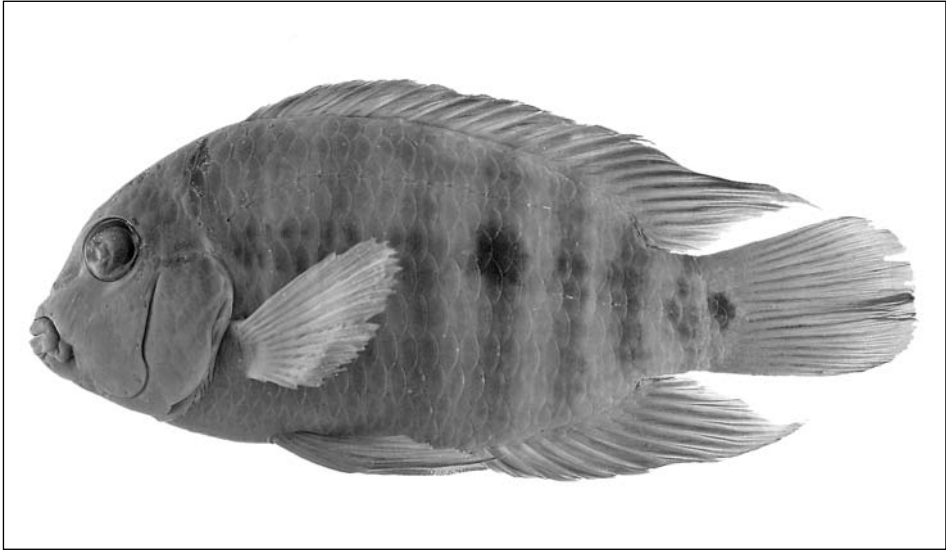


Fig. 1. *Australoheros kaaygua* sp. n., holotype: MACN-ict 8917, 94.0 mm SL, Argentina, Misiones, río Iguazú basin, arroyo Nandú.

6306, 13 ex., 31.3–90.9 mm SL, Argentina, Buenos Aires, Los Talas ponds, Berisso. MLP 7697, 18 ex., 20.4–34.4 mm SL, Argentina, Buenos Aires, Delta del Paraná. MLP 4521, 45 ex., 36.3–189.9 mm SL, Argentina, Buenos Aires, Los Talas ponds, Berisso. MACN-ict 5202, 1 ex., 61.0 mm SL, Argentina, Buenos Aires, arroyo Frías, Mercedes. MACN-ict 3270, 2 ex., 116–129.8 mm SL, Argentina, Buenos Aires, arroyo Manzanares. MACN-ict 6524, 1 ex., 37.5 mm SL, Argentina, Buenos Aires, La Plata city. MLP 5534, 6 ex., 136.6–194.7 mm SL, Argentina, Buenos Aires, Laguna Chascomús. MLP 6262, 15 ex., 33.3–196.6 mm SL, Argentina, Buenos Aires, Laguna de Monte. MLP 6016, 14 ex., 76.3–142.9 mm SL, Argentina, Buenos Aires, arroyo Correa. MLP 2512, 8 ex., 79.8–198.0 mm SL, Argentina, Buenos Aires, Tandil city. MLP 8606, 1 ex., 102.7 mm SL, Argentina, Buenos Aires, río Quequén. AI 197, 2 ex., 93.0–109.1 mm SL, Uruguay, Maldonado, Laguna del Diario. AI 198, 2 ex., 107.4–111.2 mm SL, Uruguay, Maldonado, Arroyo Potrero, Laguna del Sauce. *Australoheros tembe* (CASCIOTTA *et al.*, 1995): MLP 9059, (holotype) 118.3 mm SL, Argentina, Misiones, arroyo Uruguay-í, above Salto del Uruguay-í, at “Alto Paraná” company fields.

Diagnosis. *Australoheros kaaygua* sp. n. is distinguished from its congeners by the following combination of characters: 5–6 anal-fin spines; 6–7 branched anal-fin rays; caudal-peduncle length 8.9–11.8 % of SL; lips not thickened; in preserved specimens lateral band formed by two series of scales, each scale bears a dark spot in the centrum, between both scales there is a light narrow area; dorsal, anal and caudal fins, and opercle without dark spots.

Description. Morphometrics of holotype and 12 paratypes are presented in table 1. Body moderately deep and laterally compressed (Fig. 1). Head profile between tip of snout and orbit straight, slightly concave in front of orbit. Above orbits, profile coming up until dorsal-fin origin. Dorsal-fin base slightly curved, progressively descending from origin to end. Ventral profile slightly curved. Orbit placed below dorsal head profile. Nostrils closer to anterior margin of orbit than tip of snout.

Mouth terminal, distal tip of maxilla not reaching vertical tangent to anterior margin of orbits. Lips not thickened, without fleshy folds.

Dorsal-fin origin placed before level of posterior margin of opercle.

Table 1. Proportional measurements in percents of standard length of holotype and 12 paratypes of *Australoheros kaaygua* sp. n. SD= standard deviation. The holotype is included in calculated values.

	Holotype	Range	Mean	SD
Standard length (mm)	94.0	28.0–48.1		
Head length	36.1	35.2–38.4	37.0	1.02
Snout length	12.6	8.9–13.0	10.9	1.16
Body depth	46.7	40.7–46.7	43.8	1.71
Orbital diameter	9.9	9.8–12.9	11.2	1.19
Head width	21.1	17.9–23.4	19.6	1.40
Interorbital width	15.1	10.1–15.1	11.7	1.42
Preorbital depth	11.0	7.3–11.0	8.9	1.25
Caudal peduncle depth	17.6	13.9–17.6	16.2	1.00
Caudal peduncle length	11.6	8.9–11.0	10.4	0.79
Pectoral-fin length	29.3	27.3–31.7	29.0	1.38
Pelvic-fin length	35.3	26.4–35.3	28.8	2.81

Twenty five (8*) or 26 (6) scales in lateral row. Scales on head and chest ctenoid, smaller than those of flanks. Posterior prepelvic scales cycloid and ctenoid. Cheek scales cycloid and smaller than those of flanks. Cheek scales forming 3 (1), 4 (7), 5 (1) oblique series. Scales on the opercular, subopercular, and interopercular cycloid. Upper lateral line 13 (1), 14 (1), 15 (1), 16 (6*), 17 (3), 18 (2). Lower lateral line 7 (2), 8 (2), 9 (2), 10 (2), 11 (6*); scales continuing onto caudal fin 1 (3), 2 (2).

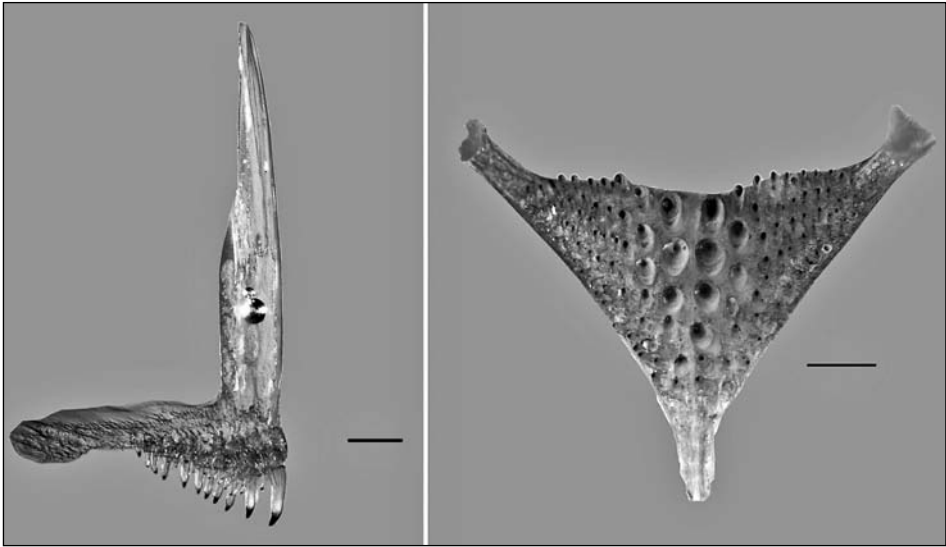
Dorsal-fin rays XV,8 (1); XV,9 (2); XVI,7 (1); XVI,8 (8); XVI,9 (1*); XVII,9 (1). Dorsal and anal fins with ctenoid scales on basal third. Dorsal fin scaled from 13th–15th spine to 5th–9th branched ray. Caudal-fin scales ctenoid, covering about 50 % of fin length. First anal-fin spine placed opposite to 13th dorsal spine. Anal-fin rays V,7 (2); VI,6 (7); VI,7 (5*). Anal fin scaled from 5th or 6th spine to the end of the fin. Caudal fin with distal margin curved. Pectoral fin reaching vertical of anus. Pectoral-fin rays 12 (9) or 13 (5*). Distal tip of pelvic fin reaching or surpass anal-fin origin.

External gill-rakers on first ceratobranchial 6. Microbranchiospines present on external sides from second to fourth ceratobranchials.

Teeth of jaws caniniform, with recurved tips; those of outer series stronger than those of inner ones (Fig. 2). Teeth in outer hemiseries of upper/lower jaw 11/14–15; 3 inner series symphysially. Lower pharyngeal tooth-plate stout, with molariform teeth close to sagittal axis (Fig. 3). Frayed zone in upper pharyngeal tooth-plate with several concavities (more than 3). Each fourth ceratobranchial bears only one toothed patch. Vertebrae 13+13 (1). Twelve pterygiophores in anal fin.

Color in alcohol. Ground color of body brownish or grayish, yellowish ventrally. Flanks with seven vertical bars of two scales width between dorsal-fin origin and base of caudal fin. First vertical bar at dorsal-fin origin, last one on caudal peduncle. Head dark brownish, with two inconspicuous bands, on nape and interorbital. Lateral band two scales wide, formed by two series of scales, the lower of them corresponds to lower lateral line and the other series is placed just above it. Each scale bears a dark spot in the centrum; between both series of scales there is a light narrow area.

Intersections of lateral band with transverse bars sometimes with lateral spot, that at intersection of 4th vertical bar and lateral band larger and occupying five or six scales. Caudal spot at base on caudal fin elongated dorsad-ventrad, in the holotype rather subcircular. All fins except pectorals dusky.



Figs. 2–3. 2. *Australoheros kaaygua* sp. n., upper jaw in medial view. Scale= 1 mm. 3. *Australoheros kaaygua* sp. n., Lower pharyngeal tooth plate and teeth in occlusal view. Scale = 1 mm.

Etymology. The specific epithet *kaaygua* is in honor of the Ka'aýgua people (Guaraní group) who, in the 16th Century, refused the domination of Jesuit Missions.

Distribution. *Australoheros kaaygua* sp. n. is known from streams flowing in the río Iguazú basin above the Iguazú falls (Fig. 4).

Remarks. The following species of *Australoheros* from the Río de la Plata basin are considered valid: *A. facetus* (JENYNS, 1842), *A. scitulus* (RÍCAN & KULLANDER, 2003), and *A. tembe* (CASCIOтта *et al.*, 1995). *Australoheros facetus* is a widespread species inhabiting the basins of río Paraná, río Uruguay, and Río de la Plata. *Australoheros scitulus* is distributed in the río Uruguay and Río de la Plata basins. *Australoheros tembe* is known from streams flowing into the río Paraná and río Uruguay (CASCIOтта *et al.*, 2003) in the Province of Misiones. The new species described herein comes from the río Iguazú basin above Iguazú falls and represents the first *Australoheros* species from that basin.

Australoheros kaaygua differs from the other species of *Australoheros* in having a lateral band formed by two rows of scales leaving a narrow light line between them. In addition *A. kaaygua* differs from *A. facetus* in having 6–7 vs. 8–9 branched anal-fin rays, longer head (35.2–38.4 vs. 34.2–35.4 % SL), shallower body (40.7–46.7 vs. 49.5–53.5 % SL), greater eye diameter (9.8–12.9 vs. 8.2–8.7 % SL), shallower and longer caudal peduncle (13.9–17.6 vs. 18.9–20.9 and 8.9–11.8 vs. 6.9–9.1 % SL respectively) and 6 vs. 8 gill rakers on first ceratobranchial.

A. kaaygua is distinguished from *A. scitulus* in having 5–6 vs. 8–9 anal-fin spines, 12 vs. 13–14 pterygiophores in the anal fin, longer caudal peduncle (8.9–11.8 vs. 5.6–8.8 % SL), and the absence of dark spots on odd fins and opercle. Finally *A. kaaygua* differs from *A. tembe* in the absence of thickened lips.

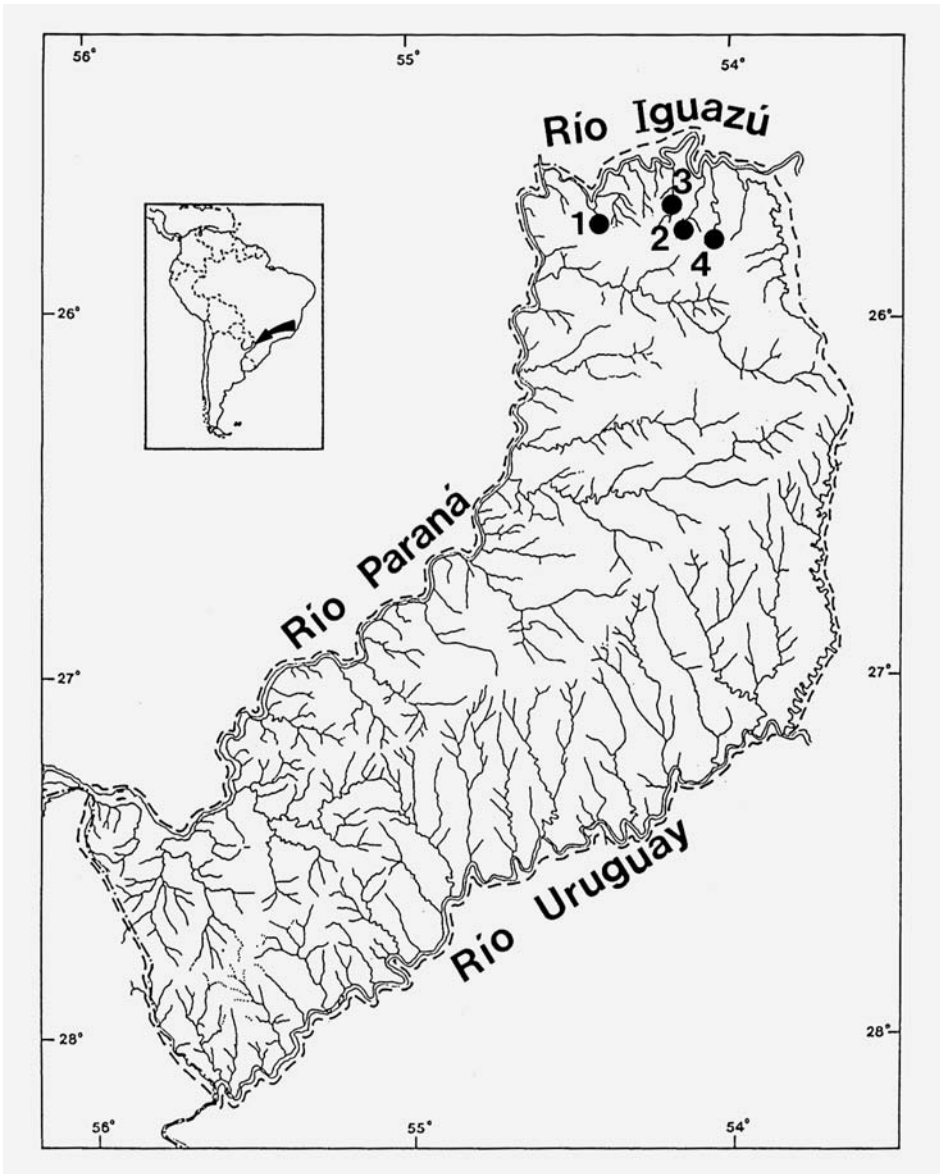


Fig. 4. Geographical distribution of *Australoheros kaaygua* sp. n., 1: arroyo Ñandú (type locality), 2: arroyo Deseado, 3: arroyo Yacuí, and 4: arroyo Lobo.

Key to the species of *Austraheros* in Argentina

1. Eight to nine anal-fin spines *A. scitulus*
- 1a. Five to seven anal-fin spines 2
2. Lips thickened *A. tembe*
- 2a. lips not thickened 3
3. Body depth 40.7–46.7 (% SL), lateral band formed by two rows of scales leaving a narrow light line between them *A. kaaygua*
- 3a. Body depth 49.5–53.5 (% SL), lateral band without a narrow light line in the middle *A. facetus*

Acknowledgments

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