

CREAGRUTUS MELASMA, A NEW SPECIES OF
CHARACID FISH (TELEOSTEI: CHARACIFORMES)
FROM UPLAND STREAMS OF
NORTHERN VENEZUELA

Richard P. Vari, Antony S. Harold, and Donald C. Taphorn

Abstract.—*Creagrutus melasma*, new species, occurs in a band across the northern headwaters of the Río Orinoco from Táchira state in the west to Monagas in the east. The species is also known from several Caribbean versant drainages, including the Ríos Tuy and Neverí. This small-bodied species, which barely exceeds 40 mm SL, is distinguished from congeners by its dorsal-fin and humeral pigmentation as well as a combination of meristic characters.

Resumen.—Se describe una nueva especie de *Creagrutus* que habita una franja en el piedemonte norte de las cuencas altas afluentes del Río Orinoco desde el estado Táchira en el oeste hasta Monagas en el este. La especie es también conocida desde varias cuencas del Mar Caribe, incluyendo los ríos Tuy y Neverí. Esta especie tiene un cuerpo pequeño que raramente excede los 40 mm de longitud estándar. Se distingue de sus congéneres por la pigmentación en la aleta dorsal, la forma de la mancha humeral, y la combinación de varias caracteres merísticas.

The presence of *Creagrutus* Günther in Lago de Valencia and adjoining drainages of northern Venezuela was first noted by Eigenmann (1920:12). Eigenmann, followed by Pearse (1920:11), identified these populations as *C. beni*, a species described by Eigenmann (1911:172) from the Río Beni, northeastern Bolivia. Although Eigenmann (1920:12) noted the darkly pigmented dorsal fin in material from Lago de Valencia and the Río Bue, a feature absent in *C. beni*, he considered the pigmentation a juvenile condition. The absence of such pigmentation in juveniles from elsewhere in the range of *C. beni* (see Eigenmann 1927:421–423) was not discussed.

The Lago de Valencia *Creagrutus* populations with dark dorsal-fin pigmentation, described herein as *C. melasma*, were independently recognized as distinct from all congeners by two of the authors (RPV & ASH) during their revisionary study of the genus and by the third author (DCT) in the

course of research on fishes of the Río Apure basin (Taphorn 1992:173–175). The ongoing review of *Creagrutus* by the first two authors indicates that the new species has distinctive derived pigmentation patterns of the dorsal fin and humeral mark and is further separable from congeners on the basis of a combination of various meristic and morphometric characters. It is broadly distributed in northern headwaters of the Río Orinoco and several Caribbean drainage basins, being particularly common in the Lago de Valencia basin and northern headwaters of the Río Apure. It is described herein to make its name available for an ongoing phylogenetic study (RPV & ASH) of *Creagrutus* and putatively related taxa.

Materials and methods.—Specimens are deposited in the following collections: Academy of Natural Sciences of Philadelphia (ANSP); California Academy of Sciences (CAS), including former Indiana University collections (IU); Illinois Natural

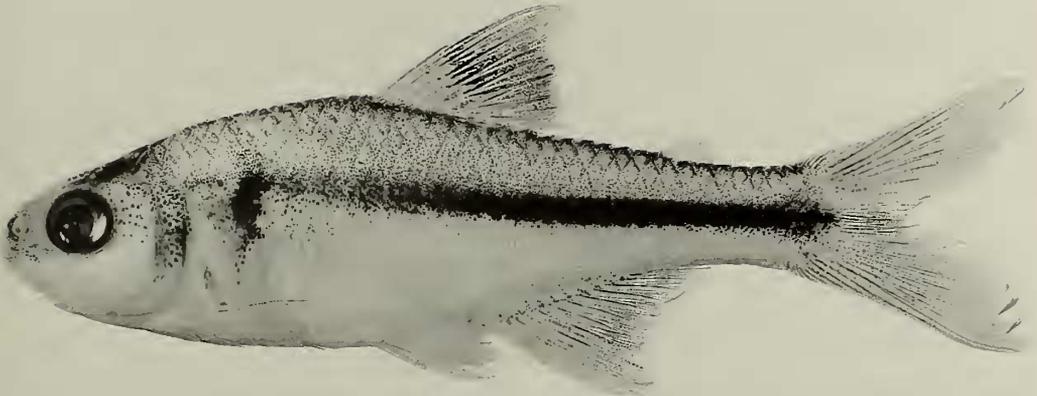


Fig. 1. *Creagrutus melasma*, new species, holotype, MBUCV V-22198, 32.4 mm; Venezuela, Estado Guarico, Parque Nacional Guatopo, Río Orituco, first bridge along road from Santa Teresa to Altigracia.

History Survey, Champaign (INHS); Museo de Biología, Universidad Central de Venezuela, Caracas (MBUCV); Museo de Ciencias Naturales, Universidad Nacional Experimental de los Llanos Occidentales Ezequiel Zamora, Guanare, Venezuela (MCNG); Museo de Historia Natural La Salle, Caracas (MHNLS), and National Museum of Natural History, Smithsonian Institution (USNM). Counts and measurements were taken following methods outlined in Harold & Vari (1994). Range of standard lengths (in mm) of specimens measured for meristic and morphometric data are cited, followed by the number of specimens measured.

Creagrutus melasma, new species

Fig. 1

Creagrutus beni (not of Eigenmann 1911).—Eigenmann 1920:12 (Venezuela, Lago de Valencia and adjoining rivers; specimens from Maracay, IU 15133, and Isla del Buro (=Isla El Burro), IU 15134).—Pearse 1920:12, 24, 25, 43 (Venezuela, Lago de Valencia; food items and parasites; specimens served as basis for Eigenmann 1920 and 1927 citations).—Eigenmann 1927: 422 (in part; specimens from Venezuela,

Maracay, IU 15133, and Isla del Buro (=Isla El Burro), IU 15134).

Holotype.—MBUCV V-22198, 32.4 mm, Venezuela, Estado Guarico, Parque Nacional Guatopo, Río Orituco, first bridge along road from Santa Teresa to Altigracia; collected by H. Moreno and A. Machado-Allison, 20 May 1992.

Paratypes.—All collected in Venezuela:

Estado Aragua: MBUCV-V21257, 56 specimens; 34.2–40.7 mm (3), CAS 79622, 10 specimens; Río Tuy basin, mouth of Río Cagua, ~10 km from Guayes, collected by R. Royero et al., 6 Apr 1991.

Estado Carabobo: ANSP 134171, 48 specimens; 33.5–34.2 mm (3), Río Guacara basin, Río Vigirima, ~10 km NNW of Guacara (~10°24'N, 67°55'W), collected by N. R. Foster et al., 30 Nov 1966. INHS 60021, 10 specimens; 33.2–36.0 mm (3), Lago de Valencia basin, Vigirima, Río Las Penitas (~10°20'N, 67°52'W), collected by D. C. Taphorn et al., 29 Nov 1990. MHNLS 503, 6 specimens; Lago de Valencia, at Guataparó dike, W of Valencia. MCNG 15354, 56 specimens; Río Manuare, collected by D. C. Taphorn, 19 Oct 1985. MCNG 15354, 56 specimens; Río Manuare, about 16 km along river from Manuare (09°59'N,

67°45'10"W), collected by C. Olds et al., 19 Oct 1985. MCNG 24622, 34 specimens; Caño La Camarca, N of San Diego, collected by D. C. Taphorn, 29 Dec 1990.

Estado Guarico: MBUCV V-24020, 2 specimens; 32.0–33.9 mm (2), collected with holotype.

Estado Yaracuy: USNM 219615, 3 specimens; 22.8–36.3 mm (3), USNM 219616, 1 specimen; 31.8 mm, Río Cojedas basin, Quebrada Grande, between Nirqua and Chivacoa, collected by F. Mago-Leccia, 19 May 1978.

Non-type specimens examined.—(all collected in Venezuela):

Estado Anzoátegui: MBUCV V-15444, 1 specimen; Quebrada Las Minas, tributary of Río Querecual.

Estado Apure: MCNG 10302, 19 specimens; Caño Naporal, tributary of Río Portuguesa. ANSP 165139, 1 specimen; Río Capanaparo, ~5.0 km downstream from crossing of highway between San Fernando de Apure and Puerto Paez (7°02'N, 67°25'W).

Estado Aragua: CAS 69297 (formerly IU 15133), 75 specimens; Río Bue at Maracay. MBUCV V-3045, Lago de Valencia basin, Río Limon, east of I.N.A. (Agricultural Research Institute). MCNG 14201, 3 specimens; Río Pao, near La Candelaria.

Estado Barinas: MCNG 5271, 402 specimens; MCNG 5401, 9 specimens; caño at entrance to Boconó dam. MCNG 8877, 8 specimens; Río Boconó at dam site. MCNG 5648, 12 specimens; Río Tucupido at Las Cañas. MCNG 6347, 2 specimens; Caño Musao. MCNG 11944, 4 specimens; Caño Las Maravillas. MCNG 6546, 2 specimens; caño at Estero Chiguira.

Estado Bolívar: MHNLS 7240, 2 specimens; Caicara.

Estado Carabobo: CAS 69294 (formerly IU 15134), 266 specimens; Lago de Valencia, Isla El Burro. MHNLS 5882, 1 specimen; Lago de Valencia, Muelle Nuevo, opposite Isla El Burro. INHS 60446, 35 specimens; 32.2–35.0 mm (5), Lago de Va-

lencia basin, Caño la Cumara, 3 km N of San Diego (10°16.55'N, 67°56.21'W). MBUCV uncat., 6 specimens; Lago de Valencia. MBUCV V-9919, 1 specimen; Río Onoto, Puente Onoto, about 40 km from San Carlos. MCNG 15281, 5 specimens; Río Chirigu, tributary of Río Pao. MCNG 15295, 7 specimens; caño near Belen. MCNG 15342, 60 specimens; Caño Guamita. MCNG 24647, Río Las Penitas at Vígirima.

Estado Cojedas: MCNG 6786, 2 specimens; Quebrada Camoruco. MCNG 13780, 6 specimens; Río Chorreron, 10 km from Apartaderos. MHNLS 2502, 1 specimen; Quebrada Guabinas, at highway from San Carlos to Acarigua. MHNLS 499, 6 specimens; Río Portuguesa basin, Río Manrique, 2 km upstream of Manrique. MHNLS 520, 10 specimens; Río Portuguesa basin, Quebrada Tierra Caliente, 5 km W of Manrique.

Estado Miranda: MCNG 14296, 3 specimens; at bridge near Araguaita.

Estado Monagas: MBUCV V-9753, 1 specimen; Río Caripe, Sector Salle, on the Las Parcelas Road, 6 km from Carripito. MCNG 16977, 3 specimens; Río Cocoyal. MHNLS 517, 2 specimens; quebrada N of San Francisco de Maturin. MHNLS 527, 9 specimens; Río Colorado at San Antonio de Maturin. MHNLS 8064, 1 specimen; Río Aragua, at road from Maturin to Quiriquire, about 10 km from Maturin (63°25'W). MHNLS 8879, 1 specimen; Río Aragua, 10 km from Aragua de Maturin, at road from Maturin to Quiriquire. MHNLS 9437, 16 specimens; Distrito Acosta, Río Caripe basin, Embalse El Guamo.

Estado Portuguesa: MCNG 122, 1 specimen; Caño La Lora, tributary of Río Tucupido. MCNG 2443, 9 specimens; tributary of Río Tucupido. MCNG 8835, 3 specimens; Río Tucupido at dam site. MCNG 9215, 2 specimens; Río Tucupido, Los Hierros. MHNLS 6361, 2 specimens; Río Tucupido, Los Hierros, 7 km N of Tucupido. MHNLS 2678, 6 specimens; caño N of Tucupido, 6 km along road to Los Hie-

rros. MCNG 19303, 3 specimens; MCNG 19638, 1 specimen; MCNG 19798, 6 specimens; Embalse Tucupido. MCNG 10666, 6 specimens; caño tributary of Río Boconó, near dam. MCNG 703, 8 specimens; tributary of Río Boconó, upstream from Puerto Paez. MCNG 124, 1 specimen; caño at road from Chabasquen to Barquismeto, tributary of upper Río Guanare. MCNG 10858, 5 specimens; Caño Buchi, between Acarigua and Guanare. MCNG 11261, 1 specimen; Río Las Marias, bridge on Highway 5. MCNG 13314, 1 specimen; MCNG 19769, 1 specimen; Río Las Marias. MCNG 11616, 5 specimens; Río Are, at bridge on Highway 5 between km 227 and 228. MCNG 11842, 1 specimen; Caño Bombicito, near Aparición. MCNG 15380, 14 specimens; Caño Volcan. MCNG 16727, 1 specimen; Caño San Rafael, at km 247 on Highway 5. MCNG 18737, 5 specimens; Río Saguas.

Estado Sucre: MBUCV V-15419, 2 specimens; Río Neverí, at road to Turimiquire, near Cambural. MBUCV V-15423, 3 specimens; Río Neverí, at road to Turimiquire, near Paraparo. MBUCV V-15428, 4 specimens; Río Neverí, near Paraparo. MBUCV V-15405, 2 specimens; Río Neverí, Quebrada Carrasposo. MBUCV V-15451, 3 specimens; Caño Cruz de Agua. MCNG 17051, 1 specimen; Caño Juan Antonio.

Estado Táchira: MCNG 6484, 4 specimens; tributary of Río Quinimari. MCNG 6626, 3 specimens; caño tributary to Río Chururu. MCNG 11661, 21 specimens; Caño Toronduy, at bridge on San Cristobal road. MCNG 11790, 1 specimen; Río San Agaton.

Diagnosis.—*Creagrutus melasma* has the unique jaw structure and premaxillary dentition typical of *Creagrutus*. Form of the humeral mark in this species is unique within *Creagrutus* (see “Remarks” below), darkest immediately dorsal to lateral line, vertically elongate, and oriented vertically to obliquely from anteroventral to posterodorsal. Distinctive large, dark spot on anterior portion of dorsal fin. Other characters

Table 1.—Morphometric and meristic features of holotype and ranges of values for 20 paratypes of *Creagrutus melasma*, new species. Standard length is expressed in mm; measurements 1 to 14 are percentages of standard length; 15 to 17 are percentages of head length.

	Holo- type	Paratypes
Morphometrics		
Standard length	32.4	22.8–40.7
1. Snout to anal-fin origin	61.4	61.9–66.7
2. Snout to pelvic-fin origin	47.7	46.8–51.2
3. Snout to pectoral-fin origin	26.5	24.3–27.2
4. Snout to dorsal-fin origin	49.8	48.4–53.8
5. Dorsal-fin origin to hypural joint	56.9	53.3–57.7
6. Dorsal-fin origin to anal-fin origin	31.3	30.7–36.8
7. Dorsal-fin origin to pelvic-fin origin	30.2	29.0–35.2
8. Dorsal-fin origin to pectoral-fin origin	34.5	32.5–39.0
9. Caudal peduncle depth	11.9	11.5–13.1
10. Pectoral-fin length	21.3	18.7–21.5
11. Pelvic-fin length	15.9	14.8–16.7
12. Dorsal-fin length	25.7	21.4–28.5
13. Anal-fin length	21.3	18.6–21.6
14. Head length	26.4	24.5–26.9
15. Postorbital head length	43.8	42.4–47.8
16. Snout length	28.3	24.0–29.0
17. Bony orbital diameter	32.8	30.9–36.2
18. Interorbital width	31.9	29.3–34.7
Meristics		
Lateral line scales	35	34–36
Scale rows between dorsal-fin origin and lateral line	5	5–6
Scale rows between anal-fin origin and lateral line	4	4–5
Predorsal median scales	10	10–11
Branched dorsal-fin rays	8	7–8
Branched anal-fin rays	11	10–12
Branched pelvic-fin rays	7	7
Pectoral-fin rays	10	10–12
Vertebrae	35	34–36

which, in combination, serve to distinguish the species are small body size; short, stout gill-rakers, those of ceratobranchial and epi-branchial about equal in length; and 5 teeth in main premaxillary row, with anterior tooth slightly displaced anteriorly and medially.

Description.—Morphometric and meristic data for holotype and paratypes presented in Table 1. Body size relatively small, maximum observed standard length about 41 mm. Maximum body depth at pelvic-fin origin. Anterior profile of snout and dorsal profile of head meeting in rounded obtuse angle near vertical line immediately anterior to nares. Dorsal profile of head posterior to that line inclined and slightly convex. Predorsal profile of body slightly arched between supraoccipital and dorsal-fin origin. Dorsal profile of body straight to slightly concave between dorsal-fin origin and adipose fin. Dorsal profile from adipose fin to caudal-fin base straight. Ventral profile of head and body smoothly convex from margin of lower lip to pelvic-fin origin or with indistinct rounded obtuse angle delimiting anteroventral angle of dentary.

Upper jaw longer than, and overhanging, lower jaw. Anterior surface of snout fleshy, as in other *Creagrutus*, with minute papillae over surface. Greatest concentration of papillae on upper lip, margin of upper jaw, and in mouth on fleshy, plicate flaps between premaxillary teeth. Lower jaw with thick, fleshy anterior region and numerous papillae on lip. Infraorbitals poorly developed compared to many *Creagrutus* species, covering less than one half of cheek, with ventral and posterior margins of series broadly separated from preopercle. Posteroventral margins of infraorbitals three and four rounded, with indentation or concavity at their juncture. Curvature of posteroventral margin of third infraorbital approximately concentric with margin of orbit.

Premaxillary dentition with three major components: 1) undulating main row of five, rounded unicuspid to tricuspid teeth; anterior tooth slightly displaced anteromedially; 2) triangular cluster of three larger tricuspidate teeth, crowded together on medial portion of premaxilla; and 3) single tooth, similar in morphology to those of main premaxillary row, occurring lateral to third or fourth tooth of that row. Maxilla with two

or three, rarely four, unicuspid to tricuspid teeth. Dentary teeth six, anterior three largest and tricuspid followed by three unicuspid teeth becoming successively shorter posteriorly.

Unpaired fins relatively large compared with most *Creagrutus*; similar to that of *C. lepidus* Vari et al. (1993). Dorsal-fin origin slightly posterior to vertical through pelvic-fin origin. Dorsal fin ii,8, rarely ii,7; distal margin nearly straight, with slight elongation of anterior rays. Anal fin ii or iii,10-12; distal margin slightly concave with anterior rays more elongate. Single, paired hooks present on 3 to 6 anterior branched anal-fin rays in males; hooks restricted to posterolateral surface of main shaft and posterior, secondary branch of each ray. Pectoral fin i,10-12; fin reaching posteriorly almost to pelvic-fin base. Pelvic fin i,7; approaching or, especially in sexually mature males, reaching anal-fin origin; with distal portion turned medially in some individuals giving fin slightly cupped appearance. Pelvic-fin hooks, when present, on all but smallest, distal branches of all branched rays.

Gill-rakers short and stout, those of ceratobranchial and epibranchial about equal in length; 3-6+8-10 = 11-16 ($n = 21$).

Color in alcohol.—Dorsal surface of head with dark, shallow and deep chromatophores. Large, stellate deep-lying chromatophores lining interior surface of frontal, except in region of anterior fontanel. Shallow chromatophores punctate, present over most dorsal surfaces; most concentrated on snout and on ventral of upper lip, with small crescent of dark pigmentation immediately anterior of nares. Three patches of chromatophores extending posteriorly from portion of main field immediately dorsal to anterior margin of orbit; one over each orbit and one along midline over fontanel. Band of scattered dark chromatophores extending from pigmentation on snout posteriorly to anteroventral margin of orbit and then around ventral and posterior margin of orbit. Scattered stellate dark chromatophores overly-

ing dorsal portions of infraorbitals and opercle. Dorsal portion of body with small dark chromatophores concentrated on and below posterior portion of scales; overall pattern reticulate. Anterior one-half of predorsal surface with longitudinal concentration of large stellate chromatophores. Small dark chromatophores along dorsal-fin base. Humeral mark darkest immediately dorsal to lateral line, vertically elongate with orientation ranging from vertical to somewhat posterodorsally oblique. Dark midlateral stripe extending from pectoral girdle to caudal-fin base (Fig. 1). Stripe diffuse anteriorly; most sharply defined ventrally and posteriorly; expanded into diffuse triangle extending slightly ventral to lateral line on caudal peduncle. Region of body between midlateral stripe and anal-fin base unpigmented or with very small dark chromatophores delineating myosepta. Dorsally tapered concentrations of dark pigment located between bundles of fin-ray musculature at base of anal fin.

Small dark chromatophores on caudal-fin membranes; greatest concentrations along central and outer branched rays and dorsal and ventral procurrent rays. Small dark chromatophores on anal-fin membranes mainly restricted to narrow bands along anterior and posterior margins of fin rays. Slightly larger, darker chromatophores forming diffuse longitudinal band on distal one-third of anal fin; some specimens with greatly enlarged chromatophores, giving appearance of dark spot on fin anteriorly. Small dark chromatophores present across dorsal-fin membranes; large, very dark chromatophores concentrated in central portion of anterior one-half of fin, giving appearance of large dark spot (spot well developed across observed size range; present in 14.8 mm SL juvenile, MBUCV V-21257). Pectoral fins with series of dark chromatophores associated with most rays, most numerous laterally. Pelvic fins unpigmented.

Color in life.—Dorsal and anal fins with bright red anteriorly, and black centrally (see

color plate in Roman 1992:169). Dorsal lobe of caudal fin red. Dorsal surface of eye with red patch overlying reflective guanine.

Distribution.—Northern Venezuela east of the Andes from Estado Táchira in the west to Sucre in the east. Occurs in many upland tributaries of the Río Orinoco basin and the Ríos Tuy and Neverí of the Caribbean versant.

Ecology.—This species inhabits small, shallow, shady streams of the Andean piedmont where the water is usually clear and substrate ranges from sand to gravel (Taphorn 1992:174). The diet of adults consists of small seeds, ostracods, gastropods, and aquatic insects, especially chironomid larvae (Pearse 1920:24, 25; Winemiller, pers. comm. in Taphorn 1992:174). Spawning occurs throughout the wet season, with individuals probably spawning more than once a season (Taphorn 1992:174).

Etymology.—A noun in apposition from the Greek *melasma*, meaning a black spot, in reference to the distinctive pigmentation of the dorsal fin.

Remarks.—Material herein referred to *Creagrutus melasma* was identified as *C. beni* by Eigenmann (1920:12; 1927:422). This is puzzling, given the distinctiveness of the new species and the fact that Eigenmann described *C. beni*. We have examined the holotype of *C. beni* and other material from near the type locality. *Creagrutus melasma* and *C. beni* are readily distinguished by number of vertebrae (34 or 35, 1 specimen out of 60 had 36, in *C. melasma* versus 38 in the holotype of *C. beni*), and relative size of the infraorbital bones (poorly developed, with posteroventral margin of the series distinctly separated from the preopercle in *C. melasma* compared to well developed, with the posteroventral margin approaching or contacting the preopercle in *C. beni*).

Creagrutus melasma appears most similar to *C. lepidus* in body and fin form, premaxillary dentition and gill-raker shape. The two species differ, however, in their humeral

spots (distinctly vertically elongate in *melasma* versus incorporated into midlateral stripe in *lepidus*), midlateral stripe (diffuse and tapering anteriorly in *melasma* versus broad and well developed anteriorly in *lepidus*), and dorsal-fin pigmentation (patch of dark pigmentation present in *melasma* versus absent in *lepidus*; compare Fig. 1 with Vari et al. 1993:fig. 1).

Acknowledgments

We thank the following individuals and institutions for making material available: S. A. Schaefer and W. G. Saul (ANSP), T. Iwamoto (CAS), L. M. Page, K. S. Cummings, M. R. Retzer (INHS), F. Mago-Lecchia, A. Machado-Allison, and F. Provenzano (MBUCV), C. Lasso (MHNLS), L. F. Palmer and S. J. Raredon (USNM). We also thank S. J. Raredon for technical assistance, G. C. Steyskal for his advice on the specific name, and W. C. Starnes and S. A. Schaefer for their careful reviews of the manuscript. Figure 1 was prepared by T. B. Griswold. Museum and field studies associated with this study in Venezuela were supported by the Neotropical Lowland Research Program of the Smithsonian Institution. During this study A. S. Harold received support in the form of a Natural Sciences and Engineering Research Council of Canada Postdoctoral Fellowship and a Tilton Postdoctoral Fellowship, California Academy of Sciences.

Literature Cited

Eigenmann, C. H. 1911. New characins in the collection of the Carnegie Museum. — *Annals of the Carnegie Museum* 8(1):164–181.

- . 1920. The fishes of Lake Valencia, Caracas, and of the Río Tuy at El Concejo, Venezuela. — *Indiana University Studies* 7(44):1–13.
- . 1927. The American Characidae. — *Memoirs of the Museum of Comparative Zoology, at Harvard College* 43(4):311–428.
- Harold, A. S., & R. P. Vari. 1994. Systematics of the trans-Andean species of *Creagrutus* (Ostariophysi, Characiformes, Characidae). *Smithsonian Contributions to Zoology*, 551:1–31.
- Pearse, A. S. 1920. The fishes of Lake Valencia, Venezuela. *University of Wisconsin Studies in Science* 1:1–51.
- Roman, B. 1992. *Peces ornamentales de Venezuela*. Fundación La Salle de Ciencias Naturales, Caracas, 223 pp.
- Taphorn, D. C. 1992. The characiform fishes of the Apure River drainage, Venezuela. *Biollania, Edición Especial*, 537 pp.
- Vari, R. P., A. S. Harold, C. A. Lasso, & A. Machado-Allison. 1993. *Creagrutus lepidus*, a new species from the Río Aroa basin, Yaracuy State, Venezuela (Teleostei: Characiformes: Characidae). *Ichthyological Exploration of Freshwaters* 4(4):351–355.

(RPV) Division of Fishes, Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560, U.S.A.; (ASH) Department of Ichthyology, California Academy of Sciences, Golden Gate Park, San Francisco, California 94118, U.S.A; and (DCT) Museo de Ciencias Naturales—Guanare, UNELLEZ, Guanare, Estado Portuguesa, 3310 Venezuela.