Three new species of *Bryconamericus* (Characiformes, Characidae), with keys for species from Ecuador and a discussion on the validity of the genus *Knodus*

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Abstract

Three new species of Bryconamericus *(Characiformes, Characidae), with keys for species from Ecuador and a discussion on the validity of the genus* Knodus.— Three new species of characid fishes of the genus *Bryconamericus* are described from the Pacific coast and Amazon Basin in Ecuador, based on pigmentation and morphometric, meristic and osteological characters. *B. bucayensis* (n = 48) is distinguished by the number of scales between the lateral line and the pelvic–fin insertions (7–8 *vs.* 2–7, except *B. terraben*sis with 7–8 and *B. arilepis* with 9–10), the number of branched anal–fin rays (33–38 *vs.* 31 or fewer), the number of anterior anal–fin rays covered by a row of scales at their bases (28–31 *vs.* 4–26), and its wide anterior maxillary tooth being at least twice the width of the posterior tooth, both of which are pentacuspid (*vs.* maxillary teeth of same size). *B. zamorensis* (n = 126) is distinguished from congeners by having five teeth on the maxilla (*vs.* 1 or 2 teeth on maxilla), except *B. rubropictus* and *B. thomasi*, from which it differs in a reticulated pattern over the lateral stripe, generated by the concentration of melanophores, the scale margins, all along the sides of the body, the high number of branched anal–fin rays and vertebras, and the low branched dorsal–fin rays. The dorsal expansion of the rhinosphenoid forms a bony wall between olfactory nerves (*vs.* dorsal expansion of rhinosphenoid between olfactory nerves absent). Lateral process of palatine surpasses anterolateral margin of ectopterygoid (*vs.* palatine without lateral processes that laterally surpass the ectopterygoid), and the distal tip of sphenotic spine is laterally wide and undulated (*vs.* narrow). *B. oroensis* n. sp. (n = 124) is distinguished by having a dark lateral stripe overlaid with a peduncular spot and a reticulated pattern on the sides of the body (*vs.* peduncular spot and other body pigments not superimposed over a dark lateral stripe). It has three simple dorsal–fin rays, the first only visible in cleared and stained material and articulated, along with the second simple ray, with the first dorsal pterygiophores. The third simple ray is longer, and articulated with second dorsal pterygiophores (*vs*. only two simple dorsal–fin rays, both articulated with first dorsal pterygiophores). The anterior frontal is separated and so the fontanel front parietal is continued on the mesethmoids (*vs.* anterior tips of frontals united, and not separated by mesethmoids). Keys for identification of the species of *Bryconamericus* known to occur in Ecuador are included and the validity of the genus *Knodus* (vide *Knodus carlosi*) is discussed for cis Andean species.

Key words: *Bryconamericus* n. sp., Taxonomy, Characid Fish, South America, Freshwater.

Resumen

Tres nuevas especies de Bryconamericus *(Characiforme, Characidae), con claves de identificación para las especies de Ecuador y discusión sobre la validez del género* Knodus.— Se describen tres especies nuevas de peces carácidos pertenecientes al género *Bryconamericus* en la costa del Pacifico y la cuenca del Amazonas en Ecuador que se basan en la pigmentación y caracteres morfométricos, merísticos y osteológicos. *B. bucayensis* (n = 48) se distingue por el número de escamas existentes entre la línea lateral y el origen de las aletas pélvicas (7–8 en lugar de 2–7, excepto *B. terrabensis* con 7–8 y *B. arilepis* con 9–10); por el número de radios ramificados de la aleta anal (33–38 en lugar de 31 o menos); por el número de radios anteriores de la aleta anal cuya base está cubierta por una hilera de escamas (28–31 en lugar de 4–26), por presentar un diente anterior del maxilar superior, al menos el doble de ancho que el diente posterior, ambos pentacúspides (en lugar de que los dientes del maxilar superior sean de igual tamaño). *B. zamorensis* (n = 126) se

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distingue de sus congéneres por presentar cinco dientes en el maxilar superior (en lugar de 1 o 2), excepto de *B. rubropictus* y *B. thomasi*, de los que se distingue por el diseño reticulado de la parte lateral del cuerpo, generado por la concentración de melanóforos, por los bordes de las escamas, a los lados del cuerpo, por el mayor número de radios ramificados en la aleta anal y de vertebras, así como por el menor número de radios ramificados en la aleta dorsal. La extensión dorsal del rinosfenoide forma una pared entre los nervios olfatorios (en lugar de que la extensión dorsal del rinosfenoide entre los nervios olfatorios esté ausente). El proceso lateral del palatino sobrepasa el borde anterolateral del ectopterigoide (en lugar de que el palatino no tenga un proceso lateral y el extremo distal de la espina del esfenótico en vista lateral es ancha y ondulada (en lugar de ser estrecha). *B. oroensis* (n = 124) se distingue por presentar una banda lateral oscura que se solapa con la mancha del pedúnculo caudal y un diseño reticulado en los laterales del cuerpo (en lugar de que la mancha del pedúnculo caudal y otros pigmentos corporales no se solapen con una banda lateral). Tiene tres radios simples en la aleta dorsal el primero de los cuales sólo es visible cuando el material se ha limpiado y teñido, y se articula, junto con el segundo radio simple, con el primer pterigióforo dorsal. El tercer radio simple es más largo y se articula con el segundo pterigióforo dorsal (en lugar de tener solo dos radios simples en la aleta dorsal, ambos articulados con el primer pterigióforo dorsal). El frontal anterior está separado de manera que la fontanela frontoparietal se prolonga sobre el mesetmoides (en lugar de que los extremos anteriores del frontal estén unidos y no separados por el mesetmoides). Se incluyen las claves para identificar a las especies conocidas de *Bryconamericus* en Ecuador y se debate sobre la validez del género *Knodus* (véase *Knodus carlosi*) para las especies de la parte cisandina de Sudamérica.

Palabras clave: *Bryconamericus* n. sp., Taxonomía, Pez carácido, Sudamérica, Agua dulce.

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Introduction

Systematically, *Bryconamericus* species from Central America have now been clearly resolved (Román–Valencia, 2002a; Román–Valencia & Vanegas–Rios, 2009) but South American species in most countries are still poorly understood, as is the case for both Pacific and Amazon drainages from Ecuador, Perú and Bolivia (Eigenmann, 1927; Böhlke, 1958; Vari & Siebert, 1990; Malabarba & Kindel, 1995; Silva, 2004; Langeani et al., 2005; Román–Valencia, 2005; Serra & Langeani, 2006; Román–Valencia et al., 2008a, 2008b, 2011). Available keys and species descriptions (Eigenmann, 1927; Böhlke, 1958; Gery, 1977) for these countries are of little use to identify the nominal species reported. We consider five species as valid from Ecuador: *B. brevirostris* (Günther), *B. dahli* Román–Valencia, *B. pachacuti* Eigenmann, *B. phoenicopterus* (Cope) and *B. simus* (Boulenger), in addition to the three new species described herein. *B. peruanus* is not a valid record from Colombia or Ecuador (Reis et al., 2003; Román–Valencia, 2011). These descriptions of new species of *Bryconamericus* from Ecuador stem from the authors ongoing revision of the genus *Bryconamericus* and are further proof of the as yet undocumented biodiversity of the genus. We provide keys to help identify species from Ecuador and separate them into the following regions: western coastal zone, eastern zone, Rio Napo drainage, Morona and Santiago River drainages, and the Conambo and Marañon River drainages in the Amazon River Basin.

Material and methods

Measurements were taken with digital calipers, recorded to hundredths of millimeters and usually expressed as percentages of standard (SL) or head length (HL) (table 1). Counts were made using a stereoscope with a dissection needle to extend the fins. Counts and measurements were taken from the left side of specimens when possible and were taken according to guidelines in Vari & Siebert (1990) and Armbruster (2012). Counts for the holotype are indicated with an asterisk (*). In the lists of types, the number of individuals is given immediately after the catalog number, which is followed by the range of standard length in mm (SL) for that lot; for example: MEPN 59236 (6), 48.5–72.9 mm SL indicates six individuals in lot MEPN 59236, with the smallest fish 48.5 mm SL and the largest 72.9 mm SL. All collections were from Ecuador. Acronyms used follow Sabaj–Pérez (2010). Meters above sea level is abbreviated as m a.s.l. *Municipio* is translated as county. Observations of bones and cartilage were made on cleared and stained specimens (C&S) prepared according to techniques outlined in Taylor & Van Dyke (1985) and Song & Parenti (1995). Bone nomenclature follows Weitzman (1962), Vari (1995), and Ruiz–C. & Román–Valencia (2006).

Comparative material

In addition to the specimens listed below, see also those listed in Román–Valencia (1998, 2000, 2001, 2002a, 2002b, 2003a, 2003b, 2003c, 2003d, 2003e, 2005), Román–Valencia et al. (2008a, 2008b, 2009a, 2009b, 2011).

Bryconamericus bolivianus: all from Bolivia: CAS 39506 (1), syntypes, La Paz, R. Amazon Basin, R. Colorado, tributary to lower Rio Bopi 10 miles above Huachi (= San Miguel de Huachi), 1 Sep 1921. CAS 39508 (2), paratype, El Beni, Rio Amazon Basin. Upper Rio Beni, Pena Colorado, four miles below Huachi, 1 IX 1921. CBF 06027 (3), Santa Cruz. Ichilo county, PN–AMI Amboro, Santa Rosa, 20 V 1996. CBF 06934 (3), la Paz, San Pedro county, Rio San Pedro. Coroico, Kaka, Beni. Madera, 12 XI 1996. CBF 08042 (10), Santa Cruz. Ichilo county, PN–AMI Amboro, Serrania Volcanes, 15 V 1996. CBF 07178 (10), Santa Cruz, Ichilo county, Parque National and integrated management area Amboro, 16 V 1996. CBF 08832 (50), Amazon. Madera, Beni. Cotacajes, afluente del Cotacajes, San Miguel de Huachi, 20 X 2008. CBF 06015 (10), Santa Cruz. Ichilo county, PN–AMI Ambooro, Tambo, 2 V 1996. CBF 07212 (5), Santa Cruz. Ichilo county, PN–AMI Amboro, Mairana, 19 V 1996. CBF 07239 (5), Santa Cruz. Ichilo municipality, PN–Ami Amboro, 10 Km Río debajo de Mairana, 19 V 1996. CBF 0021 (10). Cochabamba. Chapare county, Villa Tunari, 20 VI 1983. CBF 06023 (10), Santa Cruz. Ichilo county, PN–AMI Amboro, San Juan del Potrero, 23 V 1996. CBF 07879 (1), La Paz, F. Tamayo county, Rio Eslabòn, 21 VIII 1998. CBF 06695 (2), La Paz, Sudyungas county. Covendo, 16 XI 1996. UMSS 09850 (50), Amazon. Madera, Beni, Bopi, Rio Irpa Chuqui, San Pablo. UMSS 10002 (11), Amazon, Beni. Madera. Cotacajes, afluente del Cotacajes, San Miguel de Huachi, 1 V 2009. UMSS 05944 (38), Amazon. Madera. Mamore, Blanco, Rio San Joaquin, 10 XII 2004. UMSS (6), Amazon. Madera, Beni, Bopi, Rio Carrasco. Carrasco, 15 X 2009. UMSS 09900 (50), Amazon, Beni. Madera, Cotacajes, afluente del Cotacajes, San Miguel de Huachi, 5 XI 2009. UMSS10080 (50), Amazon. Madera, Beni, Kaka, Rio Tajilihui, 16 X 2009. UMSS 10093 (50), Amazon. Madera, Beni, Kaka, Rio Naranjakata, San José, 16 X 009. UMSS 10078 (4), Amazon. Madera, Beni, Kaka, Rio Tajilihui Alcoch, 16 X 2009. UMSS 01227 (50), Amazon. Itenez. Izozog, parapeti, Rio Parapeti, arriba de Camiri, 22 X 2005. UMSS 08831 (59), Amazon. Madera, Beni. Cotacajes, afluente del Cotacajes, San Miguel de Huachi 20 X 2008. UMSS 08921(50), Amazon. Madera, Alto Beni. Cuartel Tohomonoco, 9 XII 2008. UMSS 09827 (3), Amazon. Madera, Beni, Bopi, Río Yanamayu, Yanamayu, 23 X 2009. UMSS 05691 (8), Amazon. Madera. Mamore, Grande, Rio Mina Asientos, 6 IX 1998.

Bryconamericus brevirostris: MUSM 3393 (3), Perú, Tumbes, San Jacinto, La Peña, Rio Tumbes, canal de Boca toma, 6 VII 1992. MUSM 3306 (3), Perú, Tumbes, Rio Tumbes to 500 m del puente, 5 II 1992. MUSM 6889 (50), Ecuador, Guayas, Rio Guayas basin. Cotimes, Rio Daule. MUSM 5732 (7), Perú, Tumbes, San Jacinto Bocatoma, Rio Tumbes, 16 VIII 1994. MUSM 3394 (9), Perú, Tumbes, Rio Tumbes en caudal

de Riego, 6 II 1992. MUSM 3058 (1), Perú, Tumbes, Zarumilla. Matapalo, Rio Zarumilla, 11 XII 1990. MUSM 5765 (26), Perú, Tumbes, Zarumilla, Lepanga, Rio Zarumilla, 15 VIII 1994. MUSM 2582 (20), Tumbes, Rio Tumbes. Ca. La irrigación bocatoma, 10 VIII 1986. MUSM 1983 (20); Tumbes, Rio Zarumilla and pozo bajos, 12 VIII 1986.

Bryconamericus dahli: all from Ecuador: MEPN 4023 (15), Esmeraldas, estero Sabalero to 600 m del campamento P. Chiquira, 22 X 1985. IUQ 3138 (1C&S.), Esmeraldas, Rio Matajita afl. Rio Mataje media hora centro comunal Mataje to Rio Mira and estero pensamiento to 800 m aguas sitio Pan, 22 X 1985. MEPN 4129 (83). Carchi, bahía pequeña de la quebrada Negra. MEPN 16–3979 (15), Esmeraldas, estero Boca del Onsole margen derecha del Río Guayllabamba River to 450 m Golondrina. MEPN 11150 (90), Esmeraldas, Estero Guavina, km 12, road orilla Río Esmeraldas, Valle de Sade, 8 III 1985. MEPN 11151 (19), Esmeraldas, Estero Pospi a 2 km de la desembocadura del Chimbogal river, on the Bravo river, 11 VIII 1985. MEPN 4309 (4) 55.1–68.5 mm SL, Esmeraldas, Río Mataje to 2 km del centro comunal Mataje, 8 II1988. MEPN 4022 (29), Esmeraldas, estero Claro 5 km antes de la caída del Río Bravo to 10 minutos del Río Chimbagol, 10 VIII 1985. IUQ 3140 (1C&S), Esmeraldas, estero Pistolosa media hora aguas debajo de Vargas Torres, IV 1984.

Bryconamericvus cristiani: (Román–Valencia, 1998).

Bryconamericus diaphanus: all from Perú: MUSM 17760 (50), Ucayali, Coronel, Portillo, cuenca Río Sheshe, RioTahuayo, 8º 06' 21" S & 73º 55' 33,7" W, 225 m a.s.l. MUSM 33585 (1), San Martin. Moyobamba, Rio Negro. MUSM 33475 (40), San Martin. Moyobamba, Rio Indeche, 826 m a.s.l. MUSM 17855 (50), Ucayali, Coronel Portillo, Rio Shesha, 8º 05' 46" S, 73º 51' 36.4" W, 230 m a.s.l., 12 II 2001. MUSM 10248 (1), Amazon, Bagua, Río Chiriaco, Nazareth, 15 II 1978. MUSM 32567 (5), San Martin. Caceres, Huicunga, Río Abiseo, Quebrada Machaco, 358 m a.s.l., 21 V 2005.

Bryconamericus grosvenori: all from Perú: MUSM 32229 (3), Cusco, La Convencion, Echarate, Urubambva, Río Napitoniari, Monte carreto, 11 XI 2007. MUSM 12227 (10), Junin, Satipo, Quebrada La Florida, 11º 17' 06.36" S, 74º 40' 45" W, 23 IX 1995. MUSM 32340 (50), Cusco, La Convencion, Echarate. CCA Urubamba, Rio Shimaa, 21 XI 2007. MUSM 31314 (4), Cusco, La Convencion, Echarate, CCA, Alto Urubamba, Monte Camelo, quebrada Igorotoshiari. MUSM 36033 (8), Cusco, La Convencion, Echarate, Urubamba, Rio Piroton, quebrada Parotori, 21 V 2009. MUSM 32348 (10), Cusco, La Convencion, Echarate, Urubamba, 12 XI 2007. MUSM 12163 (1), Cusco, La Convencion, Río Urubamba, Río Picha, Pto. Huallana, 29 V 1997. MUSM 12115(2), Cusco, La Convencion, Rio Urubamba, Rio Picha. Mayapo, Rio Mayapo, 25 V 1997. MUSM 12072 (3). Cusco, La Convencion. Urubamba, 23 V 1997.

Bryconamericus pachacuti: CAS 40829 (22), paratype, Perú. Cuzco, Rio Amazon, Rio Urubamba. IUQ 3155 (1C&S), Ecuador. Morona–Santiago, Rio Yapapa afl. Santiago River, 9 V 1991. MUSM 12268 (5), Perú, Junin, Chanchan, Riachuelo entre Rio Colorado, 7 XII 1987. MUSM 34001 (17), Perú, Ucayali, P. abajo, Rio Aguaytia entre Meihuga, Rio Tahuayo, 8 X 1986. MUSM 26975 (100), Perú, Junin, Satipo em Poyeni, Rio Tambo, Margen izquierda, 254 m a.s.l., 27 X 2005. MUSM 30529 (19), Perú, Cusco, Echarate, bajo Urubamba, Rio Camisea, Playa Paisita, 370 m a.s.l., 30 IV 2005. MUSM 32466 (4), Perú, Cusco, La Convencion, Echarate, quebrada Iherimpituari, Río Paratori, 16 III 2008. MUSM 11120 (24), Perú, Puno, Sandia, Rio Candamo, 358 m a.s.l., 2 IV 1997. MUSM 11061(9), Perú, Puno, Sandia, quebrada Candamo. MUSM 30199 (3), Perú, Pasco, Oxapampa, Pto. Bera afluente Río Apunmacayali, 26 V 2004. MUSM 35771 (9), Perú. Ucayali, Atalaya, Sepahua,quebrada Huayashi, 26 VII 2007. MUSM 12329 (1), Junin, Rio Perené via a Satipo, 21 IX 1995. MUSM 27058 (13), Perú, Junin, Satipo ccnn cheni, quebrada Pijireni, 269 m a.s.l., 26 X 2005. MUSM 37348 (22), Perú. Ucayali, Padre Abad, Rio Aguaytia, Rio Shamabo, 8º 50' 03" S, 75º 34' 10" W, 258 m a.s.l., 26 V 2009. MUSM 16144 (30), Perú. Ucayali, Padre Abad, Rio Aguaytia, quebrada Huiango km 18 via Curimana, 14 V 1997. MUSM 30363 (50), Perú, Pasco, Oxampa, Villa Rica. Caserío San Pedro de Pichanos, quebrada Pichanos, 3 VI 2004. MUSM 9155 (1), Perú, Puno. Carabajo, Rio Inambari, Sangaban, Rio Elcamayo, 24 VI 1994. MUSM 15866 (30), Perú. Ucayali, Padre Abad, Aguaytia, Rio Aguaytia, Rio Negro, 9º 02' 4.2" S, 75º 30' 45.5" W, 2 XI 1199. MUSM 3693 (11), Perú, Puno, Sandia, Rio Tambopata, quebrada a 500 m del campamento, 26 VIII 1992. MUSM 16720 (20), Perú, Junin. Chanchamayo, Rio Perené cerca al Rio Pancartambo, 1 V 1199. MUSM 26592 (8), Perú, Pasco, Oxampa, Pozazo, río Huancabamba, 21 X 2005. MUSM 37818 (30), Perú, Junin, Satipo. Mashira,quebrada Marado, 6 VI 2009. MUSM 18017 (50); Perú, Huanuco. CCA, Rio Pachitea, Honoris. Islãs Sargento Lores, 4 VII 2005. MUSM 33969 (34), Perú. Ucayali, Padre Abad, Aguaytia Rio Aguaytia, 19 X 2000. MUSM 20562 (50), Perú, Pasco, Oxapampa Pto. Bermudez, quebrada Ataz, 9 VIII 2002. MUSM 34324 (27), Perú. Cusco. Convencion, Echarate. CCNN Camaná, Alto Urubamba, 29 IX 2008. MUSM 32582 (24), Perú, Loreto, Andeas, Rio Pastaza, quebrada Thiyacil, 26 VIII 2007. MUSM 26590 (23), Perú, Pasco, Oxampa, Rio Huancabamba puente, 21 X 2005. MUSM 29125 (1), Perú. Madre de Dios, Tambopata, Rio Tambopata, playa Botafogo, 13 VI 2006. MUSM 25433 (2). Madre de Dios, Tambopata Mazuko, Rio Inambari, Quenque Creek, 8 IX 2009.

Bryconamericus osgoodi: all from Perú: MUSM 14966 (5), Huanuco, Trigo Maria, Rio Huallaga, Rio Cueva de las Lechuzas, 13 VII 1998.

Bryconamericus pectinatus: all from Perú: MUSM 3821 (1). Madre de Dios, seto, quebrada de Calli, 5 IX 1988. MUSM 3809 (1). Madre de Dios. Manú National Park, Rio Manu playa cerca de Cucha, 8 IX 1988. MUSM 3815 (1). Madre de Dios. Manú National Park, Rio Manu, 8 IX 1988. MUSM 29947 (3), Pasco, Okapampa. Icozacia, Rio Mayo, 20 V 2004.

Bryconamericus phoenicopterus: MEPN 2120 (200), Ecuador, Zamora Chinchipe, playa frente al destaca-

mento militar. Mayaicu bajo, 3° 58' 15" S, 78° 41' 15" W, 18 VIII 1993. MEPN 44 (11), Ecuador, Zamora Chinchipe, Nangantza Río, playa frente al destacamento militar. Mayaicu, 18 VII 1993. IUQ 3135 and 3153 (2C&S), Ecuador. Morona Santiago, Rio Gualaquiza, 22 IX 1978. MUSM 20722 (4), Perú, San Martin, Tarapota. Morales, San Antonio, Rio Cuerabraza, 18 IX 1998.

B. simus: all from Ecuador: BMNH 1898.11.4.71–7 (3), syntype. Carchi, Valle de Chotá, Norte de Ecuador. MEPN 4128 (83), Carchi, Bahía pequeña de la Quebrada Negra que rodea al sitio San Marcos, 8 XI 1987.

Bryconamericus rubropictus (Braga, 2000).

Bryconamericus terrabensis: Meek (Román–Valencia et al., 2008b).

Bryconamericus turiuba (Román–Valencia et al., 2008b).

Bryconamericus stramineus: MUSM 17039 (15), Brazil, n.s. Rio Formozinho a 17 km de R. Bonito, 21° 5' 14.6" S, 56° 33' 35.7" W, 6 IX 1998.

Bryconamericus thomasi (Miquelarena & Aquino, 1995): all from Bolivia: CBF 01228 (10), Tarija, Gran Chaco county, 1.5 km. En linea recta al SO de Villamontes, 2 X 1988. UMSS 00806 (2), La Plata, Pilcomayo, Rio Pilaya, 12 VII 2005. UMSS 00740 (12), La Plata, Bermejo, Rio Emborozu, 12 VII 2005. UMSS (35), La Plata, Bermejo, Rio Orosas, 12 VIII 2005. UMSS 03131 (14), La Plata, Bermejo, Rio Guadalquivir, 10 VII 2006. UMSS 04945 (1), La Plata, Bermejo, Gran de Tarija, Rio Tarija, 21 XI 2006. UMSS 04530 (3), La Plata, Bermejo, Grande de Tarija, Tarija, Rio Salinas, 5 X 2004. UMSS 5106 (11), La Plata, Bermejo, Arroyo Toro, 1 VII 2006. UMSS 00719 (1), Amazon, Mamoré, Rio Salado, 11 VII 2005. UMSS 00891 (8), Amazon, Itenez, San Pablo, Parapeti, Rio Heredia, 23 X 2005. UMSS 04968 (3), La Plata, Bermejo, Grande de Tarija, Rio Tarija, Rio Saycan, 6 X 2004.

Bryconamericus sp. 1: CBF 05923 (2), Bolivia, Potosi, Linares municipality, Rio Mata, 11 X 1996.

Bryconamericus sp. 2: MUSM 31598 (24), Perú, Lambayeque, Tenerife, Pacifico, Kañanis, Rio Huancdocinibe, Río Cañariaco, 19 IX 2007

Bryconamericus sp. 3: MUSM 19564 (65), Perú, Ayacucho, Huamanga, Rio Yucay, 20 VIII 2004.

Bryconamericus sp. 4: MUSM 0832 (15), Perú. Ucayali, Rio Neshuya, 6 VII 1981.

Knodus carlosi: all from Ecuador: MEPN 11149 (6), Orellana, Rio Jivino ca. 1,600 m del pozo Chontayacu. IUQ 3137 (1C&S), Ecuador, Sucumbios, Tipotini River, sector Mondaña 1 km aguas abajo, 28 I 1998. MUSM 21106 (40), Perú, Amazon. Condorcanqui. Cenepa, Rio Alto Cenepa, quebrada Capitan, 12 XI 2003. MUSM 8332 (70), Perú, Madre de Dios, Tambopata, Rio Tambopata, quebrada Garza, (13º 10' 21" S, 69º 37' 41" W), 2 X 1985. MUSM 16088 (30), Perú. Ucayali, Padre Abad, Rio Aguaytio, quebrada Moronal km 23.5 via Curimaná, 14 V 1997. MUSM 19013 (15), Perú, Pasco, Oxampa. Constitucion, Rìo El Dorado, 22 VII 2001. MUSM 33546 (2), Perú, San Martin, Moyomba, Rìo Alto Mayo, 810 m a.s.l., 24 VI 2006. MUSM 21284 (100), Perú, Amazon. Condorcanqui. Cenepa, quebrada Capitan, 75 m a.s.l., 13 XI 2005. MUSM 38111 (5), Perú, Loreto. cuenca del Marañon, Andoas, 201 m a.s.l., 27 IX 2008. MUSM 13590 (30), Perú. Cusco, La Convencion, Echarate, Rio Camisea quebrada Yopucuriari, 11 X 1998. MUSM 37638 (80), Perú, Loreto, Rio Corrientes, to 35 km de Jobano, 170 m a.s.l., 29 VI 2008. MUSM 35753 (50), Perú. Ucayali, Atalaya, Sepahua,quebrada Las Piedras, 25 VII 2009. MUSM 10601 (20), Perú, Amazon, Bagua. Imazita. Marañon, 11 XI 1996. MUSM 37696 (40), Perú, Loreto, Rio Corrientes, quebrada a 1 km de Río Corrientes, 30 VI 2008. MUSM 15654 (31), Perú, San Martin, Tarapota, Ahuashiyacu, Parte alta, 29 XI 1997. MUSM 32645 (4), Perú, San Martin. M. Caceres, Huicuago, Rio Huallabamba, 340 m a.s.l., 25 VI 2008. MUSM 31390 (13), Perú, Cusco, La Convencion, bajo Urubamba, 8 VI 2004. MUSM 30912 (30), Perú, Cusco, La Convencion, Echarate cca. Bajo Urubamba, 28 I 2005. MUSM 32564 (19), Perú, San Martin. M. Caceres, Huicungo, PNRA, abisco, 358 m a.s.l., 21 V 2008. MUSM29963 (50), Perú, Huanuco, Pto. Inca. Codo del Pozas o Ca Paliazu, quebrada Charepa, 22 V 2004. MUSM 26075 (90), Perú, Cusco, La Convencion, Echarate, Rio Camisea, 30 IX 2005. MUSM 30127 (10), Perú, Huanuco, pto. Inca. Codo de Rozuzo, 22 V 2004. MUSM 30677 (20), Perú. Cusco, La Convencion, Echarate, bajo Urubamba, 28 IV 2005. MUSM 30055 (20), Huanuco, pto. Inca. Codo de Pozuso, Pucacurga, Pucacurgacreek, 22 V 2004. MUSM 31647 (26), Perú. Cusco, La Convencion, Echarate, bajo Urubamba, 9 X 2007. MUSM 31463(24), Cusco, La Convencion, Echarate. Ca. del bajo Urubamba to Katshingari, 478 m a.s.l., 21 I 200. MUSM 30089 (25), Perú, Huanuco, pto. Inca codo del pozuzo, Huanpumayo, 290 m a.s.l., 22 V 2005. MUSM 33455 (50), Perú, San Martin, Moyobamba, Rio Negro, 21 X 2001. MUSM 32822 (50), Perú, Huanuco, Aucayacu, Jose Crespoy Castillo, CP Consuelo, Rios Huallaga and Aucayacu, 26 I 2008. MUSM 34323 (100), Perú. Cusco, La Convencion, Echarate, Alto Urubamba, boca Quebrada Kcishingar, 29 IX 2008. MUSM 29441 (40), Perú, Pasco, Oxapampa, Iscozacin, Rio Chuchurras, quebrada Helgo, 20 VI 2000. MUSM 32106 (50); Perú, Loreto, Andaces, CCA, Rio Corrientes, R. Macusari, 7 VII 2006. MUSM 31366 (29); Perú. Cusco, La Convencion, Echarate, bajo Urubamba, 22 VI 2004.

Knodus delta: (Román–Valencia, 2003a, 2003b), all from Ecuador: MEPN 28 (11), Sucumbios, Rio Tiputini. Mondaña sector, 1 km downstream. MEPN 29 (50), Napo, Rio Huataracu. MEPN 35 (40), Sucumbios, Dugunо River, 2 km from comuna Cofan. IUQ 3139 (2C&S), Sucumbios, Dugunom Rio 2 km de la comuna Cofan.

Knodus heteresthes: IUQ 1166 (1C&S), 49.94 mm SL, Colombia, Guaviare, Retorno county, Amazon, Caño el Tigre en la vía a San José del Guaviare municipality. IUQ 1170 (1C&S), 40.82 mm SL, Colombia, Vaupés, Amazon, bajo Río Apoporis, pequeño drenaje del lago Taraira. IUQ 400 (3), Colombia, Vaupes, Amazon, drenaje del lago Taraira, bajo Río Apaporis.

Knodus hypopterus: IUQ 1650 (1C&S), 35.34 mm SL, Colombia, cuenca Río Caqueta, Quebrada Manigua en el puente via Florencia–Belen. IUQ 395 (2C&S), 40.54–49.55 mm SL, Colombia, cuenca Río Caqueta, Quebrada Manigua en el puente via Florencia–Belen. IUQ 398 (9), Colombia. Caquetá, Amazon,

Table 1. Morphometric and meristic data of *Bryconamericus zamorensis* n. sp., *B. oroensis* n. sp. and *B. bucayensis* n. sp. (standard and total lengths in mm, mean values in parenthesis).

Tabla 1. Datos morfométricos y merísticos de Bryconamericus zamorensis *sp. n.,* B. oroensis *sp. n. y* B. bucayensis *sp. n. (longitudes estándar y total en mm, medias entre paréntesis).*

	B. zamorensis n. sp.		*B. oroensis* n. sp.		*B. bucayensis* n. sp.	
	Paratype	Holotype	Paratype	Holotype	Paratype	Holotype
Standard length	35.09–64.76 (45.65)	52.61	34.91–74.51 (49.82)	74.51	49.48–72.88 (59.15)	87.05
Total length	43.96–82.02 (56.80)	64.38	42.37–88.92 (60.33)	88.82	63.72–90.41 (74.70)	108.49
Percentages of SL						
Body depth	31.97–39.76 (35.25)	31.97	27.84–33.37 (30.64)	30.48	31.73–38.31 (34.59)	38.11
Snout–dorsal fin distance	52.41–57.70 (55.60)	53.79	50.09–53.66 (51.60)	51.03	51.55–53.05 (52.24)	52.69
Snout–pectoral fin distance	23.71–27.92 (25.65)	26.29	23.07–26.87 (24.89)	24.56	23.89–26.27 (25.04)	23.89
Snout–pelvic fin distance	42.84–50.12 (46.89)	45.18	43.70–47.82 (45.83)	43.7	44.63–47.04 (45.61)	45.03
Snout–anal fin distance	57.54–65.14 (61.66)	57.93	58.85–63.74 (61.11)	58.95	59.73–64.64 (61.86)	63.35
Dorsal fin–hypural distance	45.20–52.87 (49.00)	50.83	47.94–52.73 (49.96)	52.09	49.72–52.65 (51.05)	51.87
Dorsal–fin length	30.0–37.55 (33.92)	31.51	28.04–33.60 (30.87)	29.23	20.91–37.19 (25.54)	22.4
Pectoral–fin length	39.16–44.83 (42.34)	42.41	32.03–39.32 (37.91)	38.38	20.35–34.54 (23.59)	21.56
Pelvic–fin length	18.45–26.45 (22.64)	24.33	22.04–25.92 (23.76)	22.04	12.53–28.67 (16.03)	14.53
Caudal peduncle depth	18.10–24.95 (21.27)	20.49	16.70–23.82 (19.71)	18.47	9.35–11.69 (10.71)	11.43
Caudal peduncle length	11.77–16.24 (14.34)	14.41	12.11–14.86 (13.66)	12.74	7.85–10.68 (10.68)	7.85
Head length	13.26–20.23 (16.78)	16.84	16.47–21.02 (18.01)	17.8	22.35–25.86 (24.15)	22.8
Dorsal–anal fin distance	9.81–13.74 (11.59)	11.88	10.83–12.98 (11.85)	12.98	32.16–46.37 (37.06)	38.51
Dorsal–pectoral distance	8.12–13.82 (11.29)	10.04	9.37–13.45 (11.13)	10.67	37.22–52.11 (41.75)	42.97
Anal–fin length	22.45–28.08 (25.09)	23.97	23.43–27.75 (25.25)	23.43	13.77–18.09 (16.15)	13.77

Table 1. (Cont.)

	B. zamorensis n. sp.		*B. oroensis* n. sp.		*B. bucayensis* n. sp.	
	Paratype	Holotype	Paratype	Holotype	Paratype	Holotype
Percentages of HL						
Snout length	21.01–32.19 (26.32)	24.98	20.0–29.90 (26.32)	29.9	16.63–22.92 (21.14)	22.72
Orbital diameter	28.32–39.35 (34.41)	38.14	26.12–38.10 (32.72)	26.11	30.82–40.00 (34.91)	32.29
Postorbital distance	41.33–53.04 (46.93)	47.51	40.02–51.55 (43.98)	51.55	37.35–47.88 (41.84)	45.94
Maxilla length	26.31–36.99 (31.31)	34.5	22.26–36.18 (29.23)	27.32	24.57–27.42 (26.02)	27.3
Interorbital distance	29.16–39.08 (32.87)	31.4	32.76–39.84 (36.99)	36.2	29.79–35.10 (31.83)	32.1
Meristics						
Lateral–line scales	33–37	37	38–40	41	41–49	44
Scale row between dorsal–fin origin and lateral line	6–8	6	6	6	6–9	8
Scale rows between anal–fin origin and lateral line	4–7	5	6–8	6	6–10	10
Scale rows between pelvic–fin and lateral line	5–6	6	6–8	6	7–9	8
Dorsal–fin rays	ii, 7, i	ii, 7, i	iii, 9	iii, 9	ii, 9	ii, 9
Anal–fin rays	iii, 22–25	iii, 25	iii–iv, 24–28	iv, 24	iv–v, 33–38	v, 35
Pelvic–fin rays	ii, 6–7	ii, 6	ii, 6	ii, 6	i, 7	i, 7
Pectoral–fin rays	ii, 9–10	ii, 10	ii, 10	ii, 10	ii, 9–12	ii, 12

Quebrada Pompella sobre el puente via Florencia–Belem, 14 XII 1998. IUQ 405 (23), Colombia, Florencia, Amazon, Río Caquetá basin, Quebrada Manigua en el puente via Florencia–Belem.

Knodus meridae: all from Venezuela: AUM 44950 (5), Zulia, Lago Maracaibo basin, Rio Chama, slightly E of bridge on Hwy 7 SW of Lagunillas. IUQ 391 (30), Zulia, Lago Maracaibo basin, Río Aguas Calientes. IUQ 39 (9), Portuguesa, Portuguesa system, Rio Las Marias, cerca de Guanare. IUQ 393 (15). Mérida, Rio Chama, puente No. 4 a 20 km N–O de Mérida. IUQ 1207 (2C&S), 45.84–47.11 mm SL, Mérida, Rio Chama, puente # 4 a 20 km N–O de Mérida. IUQ 1164 (1C&S), 28.96 mm SL, Zulia, Rio Aguas Calientes. IUQ 2196 (1C&S), 36.81 mm SL, Portuguesa, Rio Portuguesa system, Rio Las Marias, cerca de Guanare.

Knodus orteguasae: all from Colombia: IUQ 408 (13), Putumayo, Amazon, Rio Orito en el puente via a Caldero. IUQ 1209 (3C&S), 37.33–48.58 mm SL, Putumayo, Oríto county, Amazon Rio Putumayo basin, Rio Orito en el puente vía a Caldero.

Knodus pasco: all from Perú: MUSM 10308(2). Ucayali, Amazon, Pedro Abad, Rio Huacamayo, a 5 km de Aguaytía y 155 km desde Pucallpa,13 IX 1994. MUSM 10030 (4). Ucayali, Amazon, Purús, Esperanza, quebrada o arroyo Esperancillo, 09º 42' S, 70º 40' W, 4 IX 1994. MUSM 13655 (27), Cusco, Amazon, La Convencion, Echorate, San Martin, 11 VII 1998. MUSM 13907(4), Cusco, Amazon, La Convencion. MUSM 13664 (7), Cusco, Amazon, La Convención, Echarate, San Martin, quebrada Natsiringari, 10 X 1998. MUSM 13591 (1). Cusco, Amazon, La Convencion. MUSM 13914 (4), Cusco, Amazon, La Convencion. MUSM 13549 (6). Cusco, Amazon, La Convencion. Cashihari, 9 I 1998. MUSM 13576 (3). Cusco, Amazon, La Convencion, Pagoreni, 2 IX 1998. MUSM 13591 (3). Cusco, Amazonia, La Convención. MUSM 13906 (18), Cusco,

Amazon, La Convencion, Echarate, Pagoreni,quebrada Oshetoato. MUSM 31700 (6). Cusco, Amazon, La Convencion, Echarate, Río Urubamba basin, quebrada Choro, Rio Camisea, 365 m a.s.l., 5 X 2007. MUSM 11081 (29), Puno, Amazon, Sandia, Rio Candano,quebrada Ebcbahuacji, 31 III 1997. MUSM 17379 (26), San Martin, Amazon, Rioja, Rio Trayaca, 3 IV 1998. MUSM 10351 (49), Puno, Amazonas, Sandia. Candamo, 11 XII 1996.

Knodus moenkhausii: CBF07898 (2), Bolivia, La Paz, F. Tamayo, Rio Eslabon, 21 VIII 1998. CBF 3129 (5), Bolivia, Beni, Yacuma, reserva de la Biosfera estación Biológica Beni en la estancia 08, 5 IV 1986. CBF 4793 (8), Bolivia, Pando. Manuripi, Rio Nareuda, arriba del campamento Nareuda en la playa, 4 IX 1996. CBF08067 (8), Bolivia, Beni, J. Ballivian, puente camino San Borja–Santarosa (Achaparina), 8 VIII 1997. MUSM 24668 (32), Perú. Madre de Dios, Amazon, Tahuamanu, RioTahuamanu, Rio Maymanu, 263 m a.s.l., 23 VII 2004. MUSM 26419 (16), Perú. Cusco, Amazon, Quispicanchi, Camananti. Cueva Araza, 1 VIII 2005. MUSM 29882 (149), Perú, Pasco, Oxapampa, Pto. Bermúdez,constitución, plaza 3, R. Palcazu, 254 m a.s.l., 26 IX 2004. MUSM 13691 (111), Perú. Ucayali, Amazon, Atalaya, Sepahua, Rìo Urubamba, Quebrada Comarillo, 4 XI 1998.

Knodus shinahota: all from Perú: MUSM 15576 (20); Amazon. Madre de Dios, Tambopata, Terzdacolpa, Rio Tambopata, 21 VIII 1992. MUSM 25439 (127). Madre de Dios, Tambopata. Mazuka CCA Rio Inambari, Rio Inambari, 311 m a.s.l., 27 VII 2004.

Knodus victoriae: CBF 4834 (3), Bolivia, Pando. Manuripi, Rio Nareuda, arriba del campamento Nareuda en la playa, 4 IX 1996. MUSM 16368 (1), Perú. Madre de Dios, Tambopata, quebrada Jayave km 127, 20 II 1998.

Knodus mizquae: UMSS 00700 (7), Bolivia, Amazon. Mamore río Salado, 11 VII 2005.

Knodus sp. 1: CBF 6736 (2), Bolivia, La Paz, Sudyungas, Amazon, San Juan de Piquendo, 19 Nov. 1996. CBF 7423 (10), Bolivia, La Paz. Iturralde county. Campamento Candelaria (PN AMI Madidi), 24 IV 2001. CBF 07897 (2), Bolivia, La Paz, F. Tamayo county, Rio Eslabon, 21 VIII 1998.

Knodus sp. 2: CBF 06341 (5), Bolivia, alto Paraguay, varias localidades: Rios Paraguay, Negro, Apa and Riacho La Paz, IX 1997. CBF 06368 (8), Bolivia, Alto Paraguay, varias localidades: de los Rios Paraguay, Negro, Apa and riacho La Paz, IX 1997.

Knodus sp. 3: MUSM 17612 (25), Perú, Loreto, Amazon. Ucayali. Contamana, sierra de la Contamana, Río Ucayali, 7º 10' 54.4" W, 74º 57' 10.4" S, 16 XI 2000. MUSM 32466 (4).

Knodus sp. 4: UMSS 00699 (21) Bolivia, Beni, Amazon. Mamore, Rio Salado, 11 VIII 2005. UMSS 04413 (23), Bolivia, Beni, Amazon, Madera. Mamore, Ichilo, Rio Bolivar, 25 VI 2003. UMSS 07345 (17), Bolivia, Amazon. Itenez, Rio Blanco, 12 XII 2004.

Knodus sp. 5: MUSM 10335 (31), Perú, Puno, Sandia, Rio Candamo, quebrada Unión, 7 XII 1996. MUSM 10351 (50), Perú, Puno, Sandia Candamo, 11 XII 1996. MUSM 6158 (25), Perú, Amazon, Condorcanqui, Marañon, Rio Comainas, 19 VII 1994. MUSM 0160 (30), Perú. Ucayali, Pucallpa. Ivita, Pisci granja, 31 V 1983. MUSM 3569 (30), Perú, Junin. Chanchamaya, elcimo, Rio Poncantamanbo. MUSM 10335 (31), Puno, Sandi, Rio Candamo. Union creek, 7 XII 1996; Perú, Cusco, Amazon, subcuenca Rio Paratori, La Convencion, Echarate, quebrada Iherimpituari, 16 III 2008.

Bryconamericus bucayensis n. sp. (table 1, figs. 1–2)

Holotype: MEPN 11125, 87.1 mm SL, Ecuador, Guayas, Rio Bucay 3 km. upstream from bride on Naranjal–Machala road, 79º 42' 31" W, 02º 39' 45" S, 80 m a.s.l., 24 IX 1992.

Paratypes: all from Guayas, Ecuador: MEPN 59236 (6), 48.5–72.9 mm SL, Rio Bucay 3 km. upstream from bride on Naranjal–Machala road, 79º 42' 31" W, 02º 39' 45" S, 85 m a.s.l., 24 IX 1992. IUQ 3143 (1C&S), 56.9 mm SL. Collected with holotype. MEPN 11126 (5), 38.2–75.3 mm SL, Guayas, Rio Minas. Cooperativa 23 XI, 9 km south of Naranjal, R. Barriga. 22 IX 1992. MEPN 9847 (18), 24.0–44.3 mm SL, Río Minas, at Cooperativa 23 XI, 9 km south of Naranjal, 79º 39' 16" W, 02º 41' 26" S. MEPN 5980 (14), 64.3–74.3 mm SL, Rio Tenguel, 180 m upstream from eva Esperanza bridge. Machala Road, 79º 43' 56" W, 03º 00' 24" S, 110 m a.s.l., MEPN 6029 (3), 68.5–74.1 mm SL, Rio Tenguel, La Esperanza sector, 79º 44' 22" W, 02º 59' 29" S, 110 m a.s.l., 23 IX 1992.

Diagnosis

Bryconamericus bucayensis n. sp. is distinguished from congeners by: the number of scales between the lateral line and the pelvic–fin insertions (7–8 *vs.* 2–7, except *B. terrabensis* with 7–8 and *B. arilepis* with 9–10); the number of branched anal–fin rays (33–38 *vs.* 31 or fewer);the number of anterior anal–fin rays covered by a row of scales at their bases (28–31 *vs*. 4–26); presence of a wide anterior maxillary tooth, at least twice as wide as the posterior tooth, both of which are pentacuspid (*vs.* maxillary teeth of same size) (fig. 2).

Description

Morphometric data in table 1. Greatest body depth at dorsal–fin origin (mean maximum body depth about 34.6% SL). Area above orbits flat. Dorsal profile of head and body oblique from supraoccipital to dorsal–fin origin and from last dorsal–fin ray to caudal–fin base. Ventral profile of body rounded from snout to anal–fin base. Caudal peduncle laterally compressed. Head and snout short, mandibles equal, mouth terminal, lips soft and flexible and not covering outer row of premaxilla teeth; ventral border of upper mandible curved; posterior edge of maxilla reaching anterior edge of orbit; opening of posterior nostrils vertically ovoid; opening of anterior nostrils with a membranous flap. Distal tip of pectoral fin surpassing pelvic–fin insertions. Distal tip of pelvic fin not reaching anal–fin origin.

Premaxilla with two rows of teeth. Four teeth of outer row pentacuspid, lateral teeth anteriorly displaced in relation to medial teeth, together forming an arc from ventral view, with central cusp larger. Inner premaxilla row with four tetra– or pentacuspid teeth that diminish gradually in size. Maxilla long. More than three–quarters length of second infraorbital, anterior margin with

Fig. 1. *Bryconamericus bucayensis* n. sp., holotype, MEPN 11125, 87.1 mm SL, Guayas state, Bucaya River 3 km, upstream from Camboya Naranjal, Module 2.

Fig. 1. Bryconamericus bucayensis *sp. n., holotipo, MEPN 11125, 87,1 mm de longitud estándar, Estado de Guayas, río Bucaya 3 km, antes de llegar a Camboya Naranjal, Módulo 2.*

notches, with two pentacuspid teeth, dorsal tooth wider than ventral. Dentary with five large front pentacuspid teeth with central cusp largest, followed by four or five small teeth, anterior–most tricuspid and subsequent ones unicuspid.

Foramina on anterior ventral surface of sphenotic channel absent. Cleithrum with pointed dorsal process that surpasses entire supracleithrum, which is joined to postemporal.

Lateral line complete, perforated scales 41–49 (44*, mean = 46.44). Scale rows between dorsal–fin origin and lateral line 6–9 (8*, mean = 6.76); scale rows between lateral line and anal–fin origin 6–10 (10*, mean = 7.76); scale rows between lateral line and pelvic–fin insertion 7–9, (8*, mean = 7.29). Predorsal scales arranged in regular series. Dorsal–fin rays ii, 9 (n = 40); first unbranched ray approximately one–half length of second unbranched ray. Dorsal–fin origin located near middle of body and posterior to vertical through pelvic–fin origin. Anal–fin rays iv–v, 33–38 (v, 35*, n = 48). Anal–fin origin posterior to vertical through base of first dorsal–fin ray. Pectoral–fin rays ii, 9–12 (ii, 12*, n = 40). Pelvic–fin rays i, 7 (n = 48). Pelvic–fin origin anterior to vertical through dorsal–fin origin. Total number of vertebra 37–38.

Secondary sexual dimorphism

Sexually mature males with seven to twelve spines present on anterior branched anal–fin rays. Including longest anal–fin ray; one row of large hooks on 1st to 11th, each with 5–14 hooks. From 11–16 spines present along ventral surface of branched pelvic–fin rays; from 13–19 large hooks, located on both branches of rays, and extending on to anterior most part.

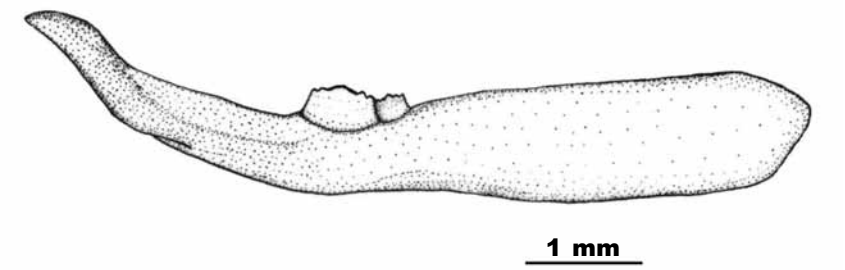

Fig. 2. Lateral view of maxillary bone of *B. bucayensis n. sp.*

Fig. 2. Vista lateral del hueso maxilar de B. bucayensis *sp. n.*

Color in alcohol
Dorsum dark, greenish. Body with silvery lateral band from posterior edge of opercle to base of caudal fin. Humeral spot diffuse, round with faint ventral projection, second humeral spot faint, transverse. Peduncle spot arrow–head shaped, not extending anteriorly beyond caudal peduncle. Continued on to middle caudal–fin rays. Ventral–lateral region of body, from snout tip to caudal peduncle yellow. Fins hyaline.

Distribution
This species is so far known from the Bucaya, Tengui, Tenguel, and Guayas Rivers, Guayas, Pacific basin, Ecuador.

Etymology
Bryconamericus bucayensis is named after the Rio Bucaya, where the type series was collected.

Bryconamericus zamorensis n. sp. (table 1, figs. 3–5)

Holotype: MEPN 11134. Male 51.2 mm SL, Ecuador, Zamora Chinchipe, Rio Nangaritza at confluence with Rio Numpatakaime, 78º 31' 20" W, 04º 20' 31" S, 950 m a.s.l., 21 VII 1993.

Paratypes: all Zamora Chinchipe, Ecuador: MEPN 11135 (37), 32.0–39.8 mm SL, Rio Nangaritza at confluence with Rio Numpatakaime, 78º 31' 20" W, 04º 20' 31" S, 950 m a.s.l., 21 VII 199. IUQ 3144 (2C&S), 48.0–55.1 mm SL collected with holotype. IUQ 3199 (2) 52.5–62.2 mm SL collected with holotype. MEPN 11136 (30), 37.4–72.9 mm SL, Rio Chicaña upper tributary of Rio Zamora, 78º 44' 35" W, 03º 41' 48" S, 1,150 m a.s.l., 29 III 1979. MEPN 7785 (3), 33.9–54.7 mm SL, Rio Salado South of Los Encuentros, tributary of Rio Zamora, 77º 37' 20" W, 03º 45' 30" S, 900 m a.s.l., 29 III 1979. MEPN 11136 (8), 47.4–64.5 mm SL, San Antonio de Guadalupe Creek, 78º 53' 45" W, 03º 50' 8" S, 1,250 m a.s.l., 21 III 1979. MEPN 4612, (40), 36.5–65.0 mm SL, Rio Chicaña. Upper tributary of Río Zamora, (78º 44' 35" W, 03º 41' 8" S), 1,750 m a.s.l., 29 III 1979. MEPN 11139 (3), 33.5–62.0 mm SL, at confluence of Numpatakaime and Nangaritza rivers, 78º 31' 20" W, 04º 20' 31" S, 950 m a.s.l., 21 VII 1999.

Diagnosis
Bryconamericus zamorensis n. sp. is distinguished from congeners by having five teeth on the maxilla (*vs.* 1 or 2 teeth on maxilla), except *B. rubropictus* and *B. thomasi*, from which it differs in a reticulated pattern over the lateral stripe, generated by the concentration of melanophores, the scale margins, all along the sides of the body, by the number high of branched anal fin ray, vertebra, and the low number of branched dorsal fin ray. Dorsal prolongation of rhinosphenoid forming a bony wall between olfactory nerves (*vs.* dorsal prolongation of rhinosphenoid between olfactory nerves absent). Lateral process of palatine over the anterolateral margin of ectopterygoid (vs. palatine without lateral processes that laterally surpass the ectopterygoid) (fig. 4). Distal tip of sphenotic spine, see laterally, wide and undulated (*vs.* narrow) (fig. 5).

Description
Morphometric data in table 1. Maximum body depth at dorsal–fin origin (mean maximum body depth about 35.3% SL). Area above orbits convex. Dorsal profile of head curved from supraoccipital to dorsal origin and oblique from last dorsal–fin ray to base of caudal fin. Ventral profile of body curved from snout to base of anal fin. Caudal peduncle laterally compressed. Head and snout short, mandibles equal, mouth terminal, lips soft and flexible, and not covering outer row of premaxilla teeth; ventral border of upper mandible straight; pos-

Fig. 3. *Bryconamericus* zamorensis n. sp., holotype, MEPN 11134, male 51.2 mm SL, Zamora Chinchipe state, Rio Narigaritza at its confluence with the Numpatakaime River.

Fig. 3. Bryconamericus zamorensis *sp. n., holotipo, MEPN 11134, macho 51,2 mm de longitud estándar, Estado de Zamora Chinchipe, río Narigaritza en su confluencia con el río Numpatakaime.*

terior edge of maxilla reaching anterior edge of orbit; opening of posterior nostrils vertically ovoid; opening of anterior nostrils with membranous flap. Distal tip of pectoral fin not surpassing pelvic–fin insertion. Distal tip of pelvic fin not surpassing anal–fin origin.

Premaxilla with two rows of teeth. Four or five teeth of outer row tricuspid and arranged in zigzag. Inner premaxilla row with four tetra or pentacuspid teeth that diminish gradually in size. Maxilla large, reaching posterior margin of second infraorbital; with five tricuspid teeth, the central cusp widest. Dentary with five large front pentacuspid teeth with central cusp largest, followed by eight to 12 small teeth, anterior–most tricuspid and subsequent ones unicuspid. Foramina on anterior dorsal surface of sphenotic channel absent. Pectoral girdle with pointed dorsal process above cleithrum whose end dorsal surpasses transversally supracleithrum.

Lateral line complete, perforated scales 33–37 (37*, mean = 36.44). Scale rows between dorsal–fin origin and lateral line 6–8 (8*, mean = 6.76); scale rows between lateral line and anal–fin origin 4–7 (5*, mean = 6.76); scale rows between lateral line and pelvic–fin insertion5–6 (6*, mean = 5.29). Predorsal area with scales arranged in regular series only in anterior half; posterior half with six medial scales that alternate with lateral scales that extend up onto predorsal midline with scales. Dorsal–fin rays ii 7. I (n = 40); first unbranched ray approximately one–half length of unbranched second ray; dorsal–fin origin located near middle length of body and posterior to vertical through pelvic–fin origin.

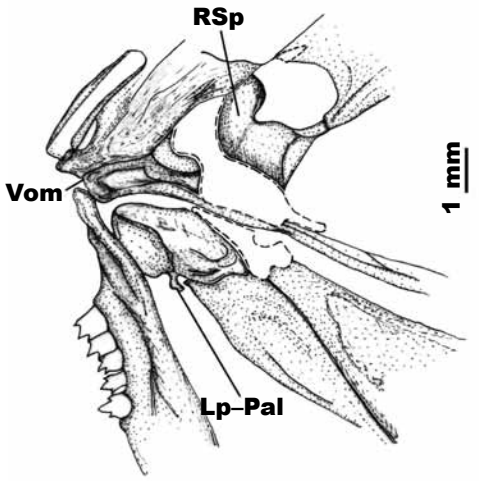

Fig. 4. Lateral view of grave nasal in *B. zamorensis* (see that the lateral process of palatine surpass the anterolateral margin of ectopterigoid): Rsp. Rhinosphenoid; Vom. Vomer; Lp–Pal. Lateral process of palatine.

Fig. 4. Vista lateral de la fosa nasal en B. zamorensis *(se ve que el proceso lateral del palatino cubre el borde anterolateral del ectopterigoide): Rsp. Rinosfenoide; Vom. Vómero; Lp–Pal. Proceso lateral del palatino.*

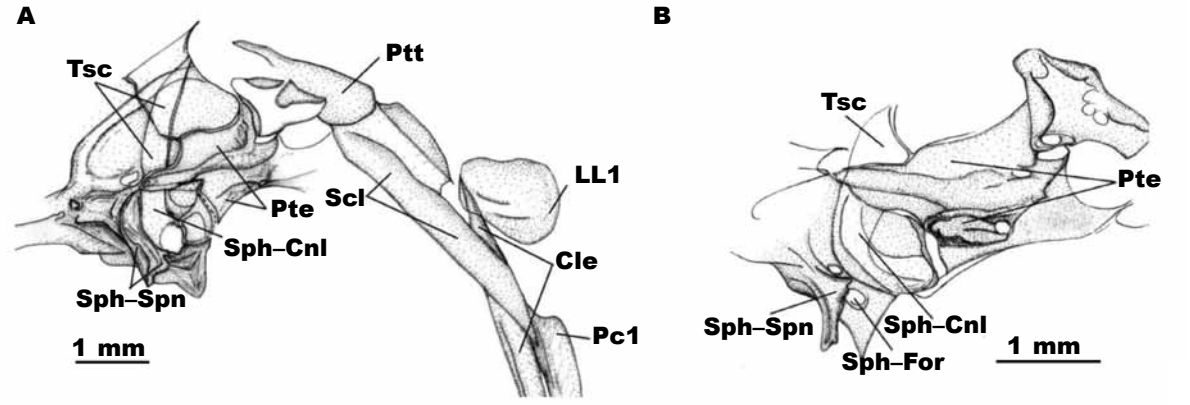

Fig. 5. A. See lateral of canal and spine of sphenotic; dorsal end of cleitrum transversally surpasses the supracleitrum in *B. zamorensis*. B. Lateral view of canal, spine and foramen on sphenotic in *B. phoenicopterus*: Sph–Spn. Spine of sphenotic; Sph–Cnl. Canal of sphenotic; Sph–For. Foramen of sphenotic; Pte. Pterotic; Tsc. Canal semicircular; Ptt. Pos temporal; Scl. Supracleitrum; Cle. Cleitrum; LL1. First scale with pore of canal later sensorial; Pc1. Postcleitrum 1.

Fig. 5. A. Vista lateral del canal y la espina del esfenótico; el extremo dorsal del cleitro sobrepasa transversalmente el supracleitro en B. zamorensis. *B. Vista lateral del canal, la espina y el foramen del esfenótico en* B. phoenicopterus: *Sph–Spn. Espina del esfenótico; Sph–Cnl. Canal del esfenótico; Sph–For. Foramen del esfenótico; Pte. Pterótico; Tsc. Canal semicircular; Ptt. Postemporal; Scl. Supracleitro; Cle. Cleitro; LL1. Primera escama con poro del canal laterosensorial; Pc1. Poscleitro 1.*

Anal–fin rays iii, 22–25 (iii, 25*, n = 126); anal–fin origin posterior to vertical through base of first dorsal–fin ray. Pectoral–fin rays ii, 9–10 (ii, 10*, n = 40). Pelvic–fin rays ii, 6 (n = 126); pelvic–fin origin anterior to vertical through dorsal–fin origin. Caudal fin not scaled, forked with short pointed lobes, principal caudal rays 1/17/1 with 11/11 procurrents. Total number of vertebra 36–37.

Secondary sexual dimorphism
Sexually mature males have no spines on simple rays; one row of large spines is present on 1st to 14th branched anal–fin rays, each ray with 6–13 hooks, located on most medial branch. From 12–18 large spines on branched rays of pelvic fin, located on both branches of rays, and extending on to anterior–most part.

Color in alcohol
Dorsum dark brown. Body without dark lateral stripe from posterior edge of opercle to base of caudal fin. Humeral spot dark, round with a vertical elongate on ventral margin, second spot humeral absent; lateral band with a reticulated pattern, which extends from the humeral region to the caudal region. Fins hyaline except anal fin, which has dark band. Ventral–lateral region of body between snout tip and caudal peduncle yellow.

Distribution
This species is so far known from the Narigaritza River at its confluence with the Numpatakaime River, Zamora River drainage, Zamora Chinchipe, Amazon Basin, Ecuador.

Etymology
Bryconamericus zamorensis is named for the Zamora Chinchipe state, where the type series was collected.

Bryconamericus oroensis n. sp. (table 1, figs. 6–7)

Holotype: MEPN 11140, 74.5 mm SL, male, Ecuador, El Oro, pond in Ortega, 1.5 km NE of Zaruma, 79º 34' 05" W, 03º 39' 46" S, 930 m a.s.l., 14 V 2004.

Paratypes: MEPN 11141 (8), 34.9–74.5 SL, El Oro, pond in Ortega, 1.5 km NE of Zaruma, 79º 34' 05" W, 03º 39' 46" S, 930 m a.s.l., 14 V 2004.IUQ 3145 (1C&S), 66.1 mm SL collected with holotype. MEPN 5445 (42), 38.8–69.8 mm SL, El Oro, Quebrada Digitamo, 120 m south of Trapiche, 18 km from Portovelo, 79º 40' 29" W, 03º 36' 49" S, 980 m a.s.l., 24 VIII 1994. MEPN 2886 (11), 55.6–88.7 mm SL, El Oro, Rio Playón en Santa Rosa, 79º 55' 20" W, 03º 35' 00" S, 100 m a.s.l., 13 IV 1979. IUQ 3651 (4), 55.3–70.1 mm SL, El Oro, Rio Playón en Santa Rosa, 79° 55' 20" W, 03º 35' 00" S, 100 m a.s.l., 13 IV 1979. MEPN 2871 (9), 40.1–87.7 mm SL, El Oro, Ortega, 15 km NE of Zaruma, 79º 36' 41" W, 03º 42' 51" S, 950 m a.s.l., 14 V 2004. IUQ 3150 (1C&S), 45.9 mm SL, El Oro, Río Negro, tributary of Amarillo River near Portobello. IUQ 3148 (1C&S), 60.6 mm SL, El Oro, Huertas at Jubones. MEPN 11144 (1), 55.3 mm SL, El Oro, Rio Calera at Huertas, 79º 40' 20" W, 03º 5' 40" S, 1,450 m a.s.l., 12 VIII 1978. MEPN 11145 (10), 41.2–68.9 mm SL, Loja, Rio Macará near international highway bridge and the city of Macará, 79º 57' 05" W 04º 24' 30" S), 800 m a.s.l., 20 VII 1978. MEPN 11146 (2), 43.8–63.8 mm SL, El Oro, Rio Negro, tributary of Amarillo River near Portobelo, (79º 43' 24" W, 03º 45' 18" S), 1,180 m a.s.l., 24 VIII 1994. MEPN 11147 (9), 39.4–96.6 mm SL, El Oro, artificial pond NE of Zaruma in Huertas parish, (79º 22' 40" W, 04º 03' 50" S), 1,500 m a.s.l., 16 VIII 1978. MEPN 2877 (29), 41,9–65.6 mm SL, Loja, Rio Catamayo at Arenal bridge, (79º 22' 40" W, 04º 03' 50" S), 1,500 m a.s.l., 18 VIII 1978.

Diagnosis
Bryconamericus oroensis n. sp. is distinguished from congeners by having a dark lateral stripe overlaid with a peduncular spot and a reticulated pattern on the sides of the body (*vs*. peduncular spot and other body pigments not superimposed over a dark lateral stripe). It has three simple dorsal–fin rays, the first only visible in cleared and stained material and articulated, along with the second simple ray, with the first dorsal pterygiophores; third simple ray longer, and articulated with second dorsal pterygiophores (*vs.* only two simple dorsal–fin rays, both articulated with first dorsal pterygiophores); anterior frontals both separated and so the fontanel front parietal continues on the mesethmoid (*vs.* anterior tips of frontals united and fontanel front parietal no continued on the mesethmoids).

Description
Table 1 shows morphometric data. Body depth on dorsal–fin origin (mean maximum body depth about 30.6% SL). Area above orbits convex. Dorsal profile of head presents variation, curved from snout to dorsal–fin origin or straight, oblique from last dorsal–fin ray to base of caudal fin. Ventral profile of body curved from snout to base of anal fin. Caudal peduncle laterally compressed. Head and snout short, mandibles equal, mouth terminal, lips soft and flexible, and not covering outer row of premaxilla teeth; posterior edge of maxilla reaching anterior edge of orbit; opening of posterior nostrils vertically ovoid; opening of anterior nostrils with membranous flap. Distal tip of pectoral fin may or may not surpass pelvic–fin insertion; distal tip of pelvic fin reaching anal–fin origin.

Premaxilla with two rows of teeth. Fourth to five teeth of outer row tricuspid, and arranged in zigzag. Internal row with four heptacuspid teeth. Maxilla long, reaching posterior margin of second infraorbital, anterior margin of maxilla with notches, with two–three teeth. Most anterior pentacuspid and two following tricuspid with central cusps widest; teeth internally inclined. Dentary with five large front heptacuspid teeth with central cusp largest, followed by seven to nine small teeth, anterior–most tricuspid and subsequent teeth unicuspid. Foramina on anterior ventral surface of sphenotic channel absent. Cleithrum with pointed dorsal process that surpasses transversally supracleithrum.

Lateral line complete, perforated scales 38–41 (41*, mean = 38.75). Scale rows between dorsal–fin origin and lateral line 6; scale rows between lateral line and anal–fin origin 6–8 (6* mean = 6.25); scale rows between lateral line and pelvic–fin insertion 6–8, (6*, mean = 7.29). Predorsal scales arranged in regular series. Dorsal–fin rays iii, 9; second unbranched ray approximately one–half length of third unbranched ray.

Fig. 6. *Bryconamericus oroensis* n. sp., holotype, MEPN 11140, male 74.51 mm SL, El Oro state, Ortega, 1.5 km NE of Zamora.

Fig. 6. Bryconamericus oroensis *sp. n., holotipo, MEPN 11140, macho 74,51 mm de longitud estándar, Estado de El Oro, Ortega, a 1,5 km al NE de Zamora.*

Fig. 7. Sexual dimorphism of *Bryconamericus oroensis* n. sp., paratypes: A. Male; B. Female.

Fig. 7. Dimorfismo sexual de Bryconamericus oroensis *sp. n., paratipos: A. Macho; B. Hembra.*

Dorsal–fin origin located near middle of body and posterior to vertical through pelvic–fin origin. Anal–fin rays iii–iv, 24–28 (iv, 24* n = 124). Anal–fin origin posterior to vertical through base of first dorsal–fin ray. Pectoral–fin rays ii, 10 (n = 124). Pelvic–fin rays ii, 6 (n = 124). Pelvic–fin origin anterior to vertical through dorsal–fin origin. Pelvic fin short, not reaching origin of the anal fin. Caudal fin not scaled, forked with short pointed lobes, principal caudal rays 1/17/1 with 12/11 procurrents. Total number of vertebra 38–39.

Secondary sexual dimorphism
Sexually mature males have row of spines on first to tenth branched anal–fin rays, no spines on simple rays, each ray with 5–11 spines, located on basal. Middle and posterior–most branches,11–23 large spines on all branched rays of pelvic fin, located on both branches of rays extending on to anterior–most part. Males with lateral stripe darker and more prominent than females. Males with caudal peduncle more swollen and caudal–fin rays thicker than females (fig. 5). *B. oroensis* shows sexual dichromatism, in males, related to higher concentration of melanophores along posterior margins of scales that, strongly concentrated along the lateral band and also along infraorbital, opercular and lateral surface of the cranium, whereas females have a lighter pigmentation pattern, with the humeral and peduncular regions pigmented.

Color in alcohol
Dorsum dark brown. Body with dark lateral stripe from posterior edge of opercle to base of caudal fin on male. More diffuse in females, especially anterior to level of dorsal fin. Humeral spot dark, round with faint ventral projection and followed by second transverse humeral spot; dark lateral band continued onto middle caudal–fin rays. Pectoral, pelvic and anal fins hyaline, but dorsal and caudal fin rays with dark bands. Ventro lateral region of body between snout tip and caudal peduncle yellow.

Distribution
This species is so far known from the Negro, Amarillo. Catamayo and Macará Rivers, Amazon basin; in the states of Loja, El Oro and Azuay, Ecuador.

Etymology
Bryconamericus oroensis is named after the El Oro province, where the type series was collected.

Discussion

The taxonomic validity of *Bryconamericus* and *Knodus* has been under discussion since Schultz (1944), who proposed *Knodus* was a modern synonym of *Bryconamericus*. Román–Valencia (2000, 2003a, 2005), Román–Valencia et al. (2008b) as part of a revision of the genus *Bryconamericus*, and Taphorn (1992) maintained the proposal of Schultz (1944) largely because the traditional character used to separate the two genera (caudal fin scaled or not) is not reliable. However, others authors Géry (1977), Lima et al. (2004), Weitzman et al. (2005), Ferreira & Lima (2006), Zarske & Géry (2006), Zarske (2008), Ferreira & Carvajal (2007), and Ferreira & Netto–Ferreira (2010) did not accept the position of Schultz (1944), Román–Valencia (2000, 2003a, 2005) or Taphorn (1992). Instead, they treated *Knodus* as valid as diagnosed by Eigenmann (1927), but they did not providea solution to the taxonomic problems this causes. Weitzman et al. (2005) ascertained that a large part of the phylogenetic relationships of clade A of Characidae depends upon a better phylogenetic knowledge of these two genera. Our recent observations confirm that the caudal scalation of *Knodus* species is an informative character of taxonomic and phylogenetic usefulness. This was already observed by several other authors (Ferreira & Carvajal, 2007; Ferreira & Netto–Ferreira, 2010).We therefore recognize the genus *Knodus* as valid, and relocate species we treated previously as *Bryconamericus* (see comparative material). As we now understand it, *Knodus* differs in the type of caudal scalation. In *Bryconamericus,* there are one or two larger, rounded scales located at the base of the caudal lobes. Furthermore, scalation does not extend beyond one–third of the length of the caudal–fin rays, and when well preserved, scales do not cover the procurrent caudal–fin rays. In *Knodus,* the caudal scales are smaller and sometimes horizontally elongated, and they cover at least two–thirds of the length of the caudal–fin rays as well as the procurrent caudal–fin rays. In addition, males of *Knodus* do not have a thickening of the interradial tissue of the anterior portion of the anal fin, as is observed in males of *Bryconamericus*.

The monophyly of *Bryconamericus* has been discussed by Vari & Siebert (1990). Malabarba & Malabarba (1994), Silva & Malabarba (1996). Malabarba & Weitzman (2003) and Silva (2004). Calcagnotto et al. (2005) hypothesized that *Bryconamericus* should be classified within clade A (Malabarba & Weitzman, 2003), but they later concluded that the relationships between *Bryconamericus* and *Knodus* within clade A are not resolved and that neither genus is part of Stevardiinae: 'genera considered to be non–inseminating Clade A characids' (Menezes & Weitzman, 2009). Although Mirande (2010) suggests characters and proposes that Glandulocaudinae and Stevardiinae are members of one same clade, characters described by Mirande (2010) were not found in the species of *Bryconamericus* described herein: the epiphyseal branch of the epiphyseal bar opens just lateral to the cranial fontanel in *B. oroensis* n. sp. (*vs.* in most members of the Stevardiinae and some other species this branch of the canal system is instead completely absent), nine branched dorsal–fin rays in *B. oroensis* n. sp. and *B. bucayensis* n. sp. (*vs.* eight branched dorsal–fin rays); ten pterygiophores in the dorsal fin of *B. oroensis* n. sp. and *B. bucayensis* n. sp. (*vs.* nine dorsal–fin pterygiophores),three simple anterior dorsal–fin rays, the first two articulated with the first dorsal–fin pterygiophores in *B. oroensis* n. sp. (*vs.* two simple dorsal–fin rays, each articulated respectively with the first two dorsal–fin pterygiophores. (except in *B. dahli*: observation personal); folds present along the posterior margin of the pterosphenoid in *B. oroensis* n. sp. and *B. zamorensis* n. sp. (*vs.* foramina present in posterior margin of pterosphenoid); this last character

Identification key to the species of *Bryconamericus* from Ecuador Coastal region (Pacific Basin).

Clave de identificación de las especies de Bryconamericus *de la región costera de Ecuador (cuenca del Pacífico).*

1	Humeral spot absent	*B. brevirostris*
	Humeral spot present	2
2	41–49 lateral–line scales; 33–38 branched anal–fin rays	*B. bucayensis* n. sp.
	27–40 lateral–line scales; 22–32 branched anal–fin rays	3
3	Dark caudal peduncle spot absent	*B. simus*
	Dark caudal peduncle spot present	*B. dahli*

Identification key to the species of *Bryconamericus* from Rios Morona–Santiago, Napo and Conambo Marañon (Amazon Basin).

Clave de identificación de las especies de Bryconamericus *de los ríos Morona–Santiago, Napo Conambo Marañon (cuenca del Amazonas).*

1	Small scales present on both caudal–fin lobes for at least one third of their length. Caudal peduncle spot not conspicuous, that is, not distinguishable from band through middle caudal–fin rays; first procurrent caudal–fin rays visible	*B. pachacuti*
	Caudal–fin lobes without small scales, or present only near base, not covering one third of their length. Caudal peduncle spot conspicuous as separate from band through middle caudal–fin rays; first procurrent caudal–fin rays not visible	2
2	Lateral line with 37–41 pored scales. Male's pelvic–fin rays with long, thin spines	3
	Lateral line with 33–37 pored scales. Male's pelvic–fin rays without long thin spines	*B. zamorensis* n. sp.
3	Dark, arrowhead shaped caudal peduncle spot present, sometimes with anterior portion slightly widened; dark pigment of caudal peduncle spot extending anterior along sides of body only as diffuse melanophores. Males with intense dark lateral stripe extending from posterior margin of humeral spot to caudal peduncle and extending onto middle caudal–fin rays	*B. oroensis* n. sp.
	No arrowhead shaped caudal peduncle spot. Males without intense dark lateral stripe	*B. phoenicopterus*

belongs to alternative state 43 (0) Mirande (2010, in fig. 10) and relationships with the developed laminar on the area half of pterosfenoids. However, although they do not have all the characters proposed as diagnostic of Stevardiinae, males of the species of *Bryconamericus* examined in this study showed notable thickening of the interradial membrane tissue of the anterior part of the anal fin. This coincides with observations for other members of clade A such as *Bryconadenos,* that 'have glandular club cells at the surface of the epidermis on the anterior part of the anal fin' (Weitzman et al., 2005). The relationship of *Bryconamericus* with other members of clade clado A is evident (Malabarba & Weitzman, 2003) but its relationship with *Knodus* is not yet resolved. Although the dorsal–fin formula of ii, 8 is not present in *B. bucayensis* and *B. oroensis* these two species do share a synapomorphy: the dorsal tip of the cleithrum surpasses the supracleithrum and contacts the pore

of the first scale of the lateral line (vs. cleithrum not surpassing supracleithrum) (fig. 5), perhaps indicating that a separate lineage has developed in transandean Ecuador.

Genus *Bryconamericus* is shown to have high species diversity in both trans and cis–andean drainages, whereas *Knodus* is only known from cis–andean river systems, and none of its species are reported from interior Andean drainages such as the Magdalena–Cauca Basin, the Pacific coastal drainages of Colombia, Ecuador and Perú. We note that no other Trans Andean characid species has the caudal and anal scalation pattern observed in *Knodus*, which is common in many Cisandean species of the genera *Moenkhausia, Hemigrammus* and *Tetragonopterus*.

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References

Armbruster, J. W., 2012. Standardized measurements, landmarks, and meristic counts for cypriniform fishes. *Zootaxa*, 3586: 8–16.

Böhlke, E. J., 1958. Studies of the family Characidae. A report on several extensive recent collections from Ecuador. *Proceeding Philosophy Academy Sciences*, CX: 1–121.

Braga, L., 2000. Redescription of *Bryconamericus rubropictus* (Berg) n. comb. (Ostariophysi, Characidae) and reference to its secondary sexual dimorphism. *Revista Museo Argentino de Ciencias Naturales n.s.*, 2: 145–150.

Calcagnotto, D., Schaefer S. A. & DeSalle, R., 2005. Relationships among characiform fishes inferred from analysis of nuclear and mitochondrial gene sequences. Molecular *Phylogenetics and Evolution*, 36: 135–153.

Eigenmann, C. H., 1927. The American Characidae. *Memoirs of the Museum of Comparative Zoology*, 43: 311–428.

Ferreria, K. M. & Carvajal, F. M., 2007. *Knodus shinahota* (Characiformes: Characidae) a new species from the río Shinahota, río Chapare basin (Mamoré system), Bolivia. *Neotropical Icthyology*, 5: 31–36.

Ferreira, K. M. & Lima, F. C. T., 2006. A new species of *Knodus* (Characiformes: Characidae) from the Rio Tiquié upper Rio Negro system, Brazil. *Copeia*, 4: 630–639.

Ferreira, K. M. & Netto–Ferreira, A. L., 2010. *Knodus dorsomaculatus* (Characiformes: Characidae), a new species from Teles Pires River, Tapajòs River basin, Brazil. *Journal Fish Biology*, 77: 468–478.

Géry, J., 1977. *Characoids of the world*. T. F. H. Publ. Inc., Neptune City, New Jersey, U.S.A.

Langeani, F., De Lucena, Z. M. S., Lima, J. P. & Tarelho–Pereira, F. J., 2005. *Bryconamericus turiuba*, a new species from the upper Rio Paraná system (Ostariophysi: Characiformes). *Copeia*, 2005: 386–392.

Lima, F. C. T., Britski, H. A. & Machado, F. A., 2004. New *Knodus* (Ostariophysi: Characiformes: Characidae) from the upper Rio Para, Brazil. *Copeia*, 2004: 577–582.

Malabarba, L. R. & Kindel, A., 1995. A new species of the genus *Bryconamericus* Eigenmann, 1907 from southern Brazil (Ostariophysi: Characidae). *Proceeding Biology Society Washington*, 8: 679–686.

Malabarba. M. C. S. L. & Malabarba, L. R., 1994. *Hypobrycon maromba*, a new genus and species of characiform fish from the upper rio Uruguay, Brazil (Ostariophysi: Characidae). *Ichthyological Exploration of Freshwaters*, 5: 19–24.

Menezes, N. A. & Weitzman, S. A., 2009. Systematics of the neotropical fish subfamily Glandulocaudinae (Teleostei: Characiformes: Characidae). *Neotropical Ichthyology*, 7(3): 395–370.

Miquelarena, A. M. & Aquino, A. E., 1995. Situación taxonómica y geográfica de *Bryconamericus thomasi* Fowler, 1940 (Teleostei, Characidae). *Revista Brasileira Biologia,* 55: 559–569.

Mirande, M., 2010. Phylogeny of the family Characidae (Teleostei: Characiformes): from characters to taxonomy. *Neotropical Ichthyology*, 8: 385–568.

Reis, R. E., Kullander, S. O. & Ferraris, C. J. (Eds.), 2003. *Checklist of the freshwater fishes of south and Central America*. Porto Alegre, Edipucrs.

Román–Valencia, C., 1998. Descripción de una nueva especie de *Bryconamericus* (Characiformes. Characidae) para la cuenca alta de los Ríos Ariari y Meta. Colombia. *Actualidades Biológicas*, 20: 109–114.

– 2000. Tres nuevas especies de *Bryconamericus* (Ostariophysi. Characidae) de Colombia y diagnóstico del género. *Revista de Biología Tropical*, 48: 449–464.

– 2001. Descripción de una nueva especie de *Bryconamericus* (Ostariophysi. Characidae) del alto río Suárez. Cuenca del Magdalena. Colombia. *Bolletino Museum Regionalli Science Naturali Torino*, 18: 469–476.

– 2002a Revisión sistemática de las especies del género *Bryconamericus* (Teleostei: Characidae) de Centroamérica. *Revista de Biología Tropical,* 50: 173–192.

– 2002b. Description of a new species of *Bryconamericus* (Teleostei, Characidae) from the basin of the Golfo de Paria, northeastern, Venezuela. *Revista Museo Argentino de Ciencias Naturales, n.s.*, 4: 209–214.

– 2003a. Sistemática de las especies Colombianas de *Bryconamericus* (Characiformes, Characidae). *Dahlia (Revista Asoc. Colomb. Ictiól.),* 6: 17–58.

– 2003b. Description of a new species of *Brycona-*

mericus (Teleostei: Characidae) from the Amazon. *Bolletino Museum Regionalli Science Naturali, Torino,* 20: 477–486.

– 2003c. Descripción de tres nuevas especies de *Bryconamericus* (Pisces: Ostariophysi: Characidae) de Colombia. *Memoria Fundación La Salle de Ciencias Naturales*, 155: 31–49.

– 2003d. Una nueva especie de *Bryconamericus* (Pisces: Ostariophysi: Characidae) para el nororiente de Venezuela. *Memoria Fundación La Salle de Ciencias Naturales,* 155: 21–30.

– 2003e. Three new species of the genus *Bryconamericus* (Teleostei: Characidae) from Venezuela. *Dahlia (Revista Asoc. Colomb. Ictiól.),* 6: 7–15.

– 2005. Sinopsis comentada de las especies del género *Bryconamericus* (Teleostei: Characidae) de Venezuela y norte del Ecuador. Con la descripción de una nueva especie para Venezuela. *Memoria Fundación La Salle de Ciencias Naturales*, 163: 27–52.

Román–Valencia, C., García. M. D. & Ortega, H., 2011. Revisión taxonómica y geográfica de *Bryconamericus peruanus* (Teleostei, Characidae). *Revista Mexicana de Biodiversidad,* 82: 844–863.

Román–Valencia, C., Taphorn, D. C. & Ruiz–C., R. I., 2008a. Two new *Bryconamericus*: *B. cinarucoense* n. sp. and *B. singularis* n. sp. (Characiformes, Characidae) from the Cinaruco River, Orinoco Basin, with keys to all Venezuelan Species. *Animal Biodiversity and Conservation,* 31.1: 15–27.

Román–Valencia, C. & Vanegas–Ríos, J. A., 2009. Análisis filogenético y biogeográfico de las especies del género *Bryconamericus* (Characiformes. Characidae) de la baja América Central. *Caldasia*, 31: 393–406.

Román–Valencia, C., Vanegas–Ríos, J. A. & García, M. D., 2009b. Análisis comparado de las especies de *Bryconamericus* (Teleostei: Characidae) en la cuenca de los ríos Cauca–Magdalena y Ranchería. Colombia. *Revista Mexicana de Biodiversidad*, 80: 465–482.

Román–Valencia, C., Vanegas–Ríos, J. A. & Ruiz–C., R. I., 2008b. Una nueva especie de pez del género *Bryconamericus* (Ostariophysi: Characidae) del río Magdalena. Con una clave para las especies de Colombia. *Revista de Biología Tropical,* 56: 1749–1763.

– 2009a. Especie nueva del género *Bryconamericus* (Teleostei: Characidae) del río Fonce, sistema río Magdalena. Colombia. *Revista Mexicana de Biodiversidad*, 80: 455–463.

Ruiz–C., R. I. & Román–Valencia, C., 2006. Osteología de *Astyanax aurocaudatus* Eigenmann, 1913 (Pisces, Characidae), con notas sobre la validez de *Carlastyanax* Géry, 1972. *Animal Biodiversity and Conservation*, 29.1: 49–64.

Sabaj–Pérez, N. H. (Ed.), 2010. Standard symbolic codes institutions resource collections in herpetology and ichthyology: an on line references, version 1.5. *American Society Ichthyologist and herpetologist*, Washington, D. C. http://www.asih.org/

Serra, J. P. & Langeani, F., 2006. Redescrição e osteologia de *Bryconamericus exodon* Eigenmann, C., 1907 (Ostariophysi. Characiformes. Characidae). *Biota Neotropica*, 6: 1–14.

Schultz, L. P., 1944. The fishes of the family Characinidae from Venezuela, with description of seventeen new forms. *Proceeding. United States Natural Museum,* 95: 235–367.

Silva, J. F. P., 2004. Two new species of *Bryconamericus* Eigenmann (Characiformes: Characidae) from southern Brazil. *Neotropical Ichthyology*, 2: 55–60.

Silva, J. F. P. & Malabarba, L. R., 1996. Description of a new species of *Hypobrycon* from the upper río Uruguai, Brazil (Ostariophysi: Characidae). *Comunicações do Museu de Ciências e Tecnologia da PUCRS, Série Zoologia, Porto Alegre*, 9: 45–53.

Song, J. & Parenti, L. R., 1995. Clearing and staining whole fish specimens for simultaneous demonstration of bone. Cartilage and nerves. *Copeia*, 1995: 114–118.

Taphorn, D. C., 1992. *The characiform fishes of the Apure river drainage, Venezuela*. Biollania Ediciòn Especial, No. 4. Guanare: *Monografias Cientìficas del Museo de Ciencias Naturales,* UNELLEZ.

Taylor, W. R. & Van Dyke, G. C., 1985. Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. *Cybium*, 9: 107–119.

Vari, R. P., 1995. The Neotropical fish family Ctenoluciidae (Teleostei: Ostariophysi: Characiformes): supra and intrafamilial phylogenetic relationship, with a revisionary study. *Smithsonian Contribution to Zoology*, 564: 1–96.

Vari, R. P. & Siebert, D. J., 1990. A new unusually sexually dimorphic species of *Bryconamericus* (Pisces: Ostariophysi: Characidae) from the Peruvian Amazon. *Proceeding Biology Society*, 103: 516–524.

Weitzman, S. H., 1962. The osteology of *Brycon meeki*, a generalized characid fish, with an osteological definition of the family. *Stanford Ichthyological Bulletin*, 8: 1–77.

Weitzman, S. H., Menezes, N. A., Evers, H. G. & Burns, J. R., 2005. Putative relationships among inseminating and externally fertilizing characids, with a description of a new genus and species of Brazilian inseminating fish bearing an anal–fin gland in males (Characiformes: Characidae). *Neotropical Ichthyology*, 3: 329–360.

Zarske, A. & Géry, J., 2006. *Knodus longus* sp. n. ein never Salmler (Teleostei: Characiformes: Characidae) aus den bolivianischen Anden, Einzugsge biet des rio Beni. *Zoologische Abhandlunngen (Dresden),* 55: 51–57.