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Wrapped in flames: *Corydoras hephaestus*, a new remarkably colored species from the Rio Madeira basin (Teleostei: Callichthyidae)

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Abstract

A new species of *Corydoras* is described from the upper Rio Machado, Rio Madeira basin, Rondônia State, Brazil. The new species can be distinguished from its congeners by the absence of contact between the posterior process of the parieto-supraoccipital and the nuchal plate; a ventral laminar expansion of the infraorbital 1 conspicuously developed; and the posterior margin of the pectoral-fin spine with serrations along almost of its entire length, only lacking in the distal portion. Additionally, *Corydoras hephaestus* possesses dorsal and pectoral spines short, and exhibits an unusual color pattern in life. The conservation status of the new species and other endemic species are briefly commented.

Key words: Amazon, Corydoradinae, Fish, Endemism, Conservation

Resumo

Uma espécie nova de *Corydoras* é descrita do alto Rio Machado, afluente da bacia do Rio Madeira, Rondônia, Brasil. A espécie nova pode ser distinguida de suas congêneres pela ausência de contato entre o processo do parieto-supraocciptal e a placa nucal; expansão laminar ventral do infraorbital 1 conspicuamente desenvolvida, e margem posterior do espinho da nadadeira peitoral com serras ao longo de quase todo o seu comprimento, ausente apenas na porção distal. Adicionalmente, *Corydoras hephaestus* possui espinhos da nadadeira dorsal e peitoral curtos, e exibe um padrão de colorido em vida incomum. O estado de conservação da espécie nova e de outras espécies endêmicas são brevemente comentados.

Palavras chave: Amazônia, Corydoradinae, Peixe, Endemismo, Conservação

Introduction

Corydoras Lacépède, 1803 is a species-rich genus of small siluriform fishes, comprising about 170 valid species (Tencatt & Pavanelli, 2015; Tencatt & Ohara, 2016), usually with a standard length between 30 and 50 mm SL, rarely greater than 70 mm SL. The genus is widely distributed in cis-andean South America, and its greatest diversity can be found in the Amazon basin, which has more than the half of the described species (Tencatt & Ohara, 2016). The species can be captured in many types of environment, from lakes and streams to large rivers. Often found in shallow depths or in marginal regions, usually associated with sandy or muddy bottoms (Tencatt & Britto, 2016).

With recent collecting efforts during the development of the project "Monitoramento e Conservação da Ictiofauna do Rio Madeira" (Assessment and conservation of the ichthyofauna of the Madeira River) from 2009 to 2013, many species of Callichthyidae were collected. Britto (2013) recorded 14 species of *Corydoras* from the Rio Madeira basin in the Brazilian territory, but mentioned the occurrence of twenty species. During a recent field expedition to the upper Rio Machado drainage, Rio Madeira basin, a new species was found, which is described herein.

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Material and methods

Morphometric and meristic data were taken following Reis (1997), with modifications of Tencatt *et al.* (2013), except for least internareal distance, measured between the posterior nares. Measurements were obtained with 0.1 mm precision calipers. Teeth and vertebral counts were taken only from cleared-and-stained (CS) specimens, prepared according to Taylor & Van Dyke (1985). Vertebral counts include only free centra, with the compound caudal centrum (preural 1 + ural 1) counted as a single element. Lateral plate counts include all dorsolateral and ventrolateral plates, except for a pair of small, irregular platelets on the caudal-fin base. In the description, numbers assigned with an asterisk represent counts from the holotype. Nomenclature of latero-sensory canals follows Schaefer & Aquino (2000), and that of preopercular pores follows Schaefer (1988). Osteological terminology follows Reis (1998), except for parieto-supraoccipital instead of supraoccipital (Arratia & Gayet, 1995), compound pterotic instead of pterotic-supracleithrum (Aquino & Schaefer, 2002), and scapulocoracoid instead of coracoid (Lundberg, 1970). Homology of barbels follows Britto & Lima (2003). Comparative data of *Corydoras concolor* Weitzman, 1961, *C. gladysae* Calviño & Alonso, 2010, *C. gracilis* Nijssen & Isbrücker, 1976, *C. latus* Pearson 1924, *C. micracanthus* Regan, 1912, *C. nanus* Nijssen & Isbrücker, 1967, and *C. petracinii* Calviño & Alonso, 2010 were obtained through their original descriptions and/or high resolution photographs of type specimens hosted in the Natural History Museum, London. Photographs of other pertinent type specimens were available to examination through the All Catfish Inventory website (Morris *et al.* 2006) and the California Academy of Sciences Ichthyology Primary Types Imagebase (available from http://www.calacademy.org/scientists/ichthyology-primary-types-imagebase). Institutional abbreviations are according to Reis *et al.* (2003), except UFRO-I (Universidade Federal de Rondônia, Porto Velho, Rondônia).

Corydoras hephaestus, new species

(Figs. 1, 5, 6)

Holotype. MZUSP 119087, 22.6 mm SL. Brazil, Rondônia, Vilhena, Rio Madeira basin, upper Rio Machado, tributary of Igarapé Piracolina, near the road BR-364, 12°48'56"S 60°06'37"W; W. M. Ohara, F. C. P. Dagosta & V. Giovannetti, 12 Nov 2014.

Paratypes. All from Brazil, Rondônia State, Vilhena. MZUSP 117059, 3, 24.2–29.4 mm SL, same as holotype. MZUSP 118570, 6 (1 CS, 25,4 mm SL), 25.4–33.2 mm SL, W. M. Ohara, D. B. Hungria & B. S. Barros, 14 Sep 2013. MZUSP 118571, 1, 18.9 mm SL, same locality as holotype, I. D. Costa 19 Jul 2013. MNRJ 13459, 7 (1 CS, 24.7 mm SL), 12.8–34.0 mm SL, Igarapé Piracolina, tributary of Rio Comemoração, G. W. Nunan & W. D. Bandeira, 18 Jul 1986. INPA 53091, 2, 25.1–26.8 mm SL; MNRJ 46763, 1, 25.9 mm SL; NUP 18142, 1, 27.8 mm SL, same locality as holotype, W. M. Ohara & P. L. Cunha, 3 Sep 2014. MCP 36270, 1, 12.3 mm SL, Rondônia, Vilhena, Igarapé Piracolina, about 6 km to Vilhena on BR-364, 12°43'32"S 60°11'34"W; R. E. Reis, P. A. Buckup, A. R. Cardoso & E. H. L. Pereira, 17 Jul 2004.

Diagnosis. *Corydoras hephaestus* can be distinguished from all its congeners, with exception of *C. difluviatilis* Britto & Castro, 2002, *C. flaveolus* Ihering, 1911, *C. gladysae*, *C. gracilis*, *C. hastatus* Eigenmann & Eigenmann, 1888, *C. latus*, *C. micracanthus*, *C. nanus*, *C. petracinii*, *C. pygmaeus* Knaack, 1966, and *C. undulatus* Regan, 1912, by the absence of contact between the posterior process of the parieto-supraoccipital and the nuchal plate (*vs*. bones in contact). The new species can be distinguished from *C. gladysae*, *C. gracilis*, *C. hastatus*, *C. latus*, *C. micracanthus*, *C. nanus*, *C. petracinii*, *C. pygmaeus* and *C. undulatus* by having a ventral laminar expansion of infraorbital 1 conspicuously well-developed (*vs.* poorly to moderately developed); from *C. difluviatilis* and *C. flaveolus* by having a posterior margin of the pectoral-fin spine with serrations along almost its entire length, only absent on distal portion (*vs.* serrations, when present, restricted to the proximal portion of the spine).

Description. Morphometric data presented in Table 1. Head compressed with convex dorsal profile; triangular in dorsal view. Snout moderately developed and pointed. Head profile slightly convex from tip of snout to anterior nares; ascending slightly convex or nearly straight from this point to posterior tip of parieto-supraoccipital process; slightly convex from that point to dorsal-fin origin; region between eye and posterior tip of parieto-supraoccipital slightly concave in specimens with more than 27.0 mm SL. Profile slightly convex along dorsal-fin base. Dorsal body profile posterior to dorsal fin slightly concave to adipose-fin spine; concave from that point to caudal-fin

base. Ventral profile of body slightly convex from isthmus to pelvic-fin origin; nearly straight from that point to anal-fin origin; concave to caudal-fin base. Body roughly elliptical in cross section at pectoral girdle, gradually becoming more compressed toward caudal fin.

TABLE 1. Morphometric data for holotype and paratypes of *Corydoras hephaestus*. Values for the holotype (included in range, N = 17*),* range and mean ± SD (standard deviation).

Characters	Holotype	Range	Median±SD
Standard length	22.7	18.9–33.41	27.1
Percents of standard length			
Depth of body	37.7	34.9–41.5	37.0±1.5
Predorsal distance	53.8	48.4–54.7	50.6±1.9
Prepelvic distance	52.1	47.1–52.4	48.9±1.6
Preanal distance	81.8	78.4–83.3	81.2±1.4
Preadipose distance	87.9	84.9–91.6	86.9±1.7
Length of dorsal spine	12.8	9.7–15.8	12.5±1.7
Length of pectoral spine	20.3	16.5–22.2	19.3±1.8
Length of adipose-fin spine	8.9	5.9–9.3	7.4±1.1
Depth of caudal peduncle	17.1	14.1–18.3	16.4±1.1
Dorsal to adipose distance	19.1	19.1–25.6	22.6±2.2
Length of dorsal-fin base	22.7	17.9–22.7	20.9±1.2
Maximum cleithral width	11.7	8.2–12.1	10.5±1.3
Head length	44.6	38.9–44.7	41.7±1.8
Length of maxillary barbel	19.6	16.1–22.4	19.1±1.9
Percents of head length			
Head depth	87.2	79.0–91.1	85.1±3.0
Least interorbital distance	40.0	36.5–43.1	40.1±1.6
Horizontal orbit diameter	18.3	14.9–20.1	17.5±1.5
Snout length	37.1	37.1–41.7	39.6±1.6
Least internarial distance	21.5	18.8–29.2	25.0±2.8

Eye rounded, located dorsolaterally on head; orbit delimited dorsally by lateral ethmoid, frontal and sphenotic, ventrally by infraorbitals. Anterior and posterior nares close to each other, only separated by skin flap. Anterior naris tubular. Posterior naris close to anterodorsal margin of orbit, separated from it by distance equal to naris diameter. Mouth small, subterminal, width slightly larger than bony orbit diameter. Maxillary barbel moderate in size, generally not reaching anteroventral limit of gill opening; surpassing it in two specimens. Outer mental barbel slightly larger than maxillary barbel. Inner mental barbel fleshy, with base close to its counterpart. Lower lip moderately developed, forming small rounded fleshy flap. Small rounded papillae covering entire surface of all barbels, upper and lower lips, and isthmus. Area between junction of opercle and compound pterotic and region of lateral ethmoid with small platelets; ventral surface of trunk with scarce small platelets.

Mesethmoid short; anterior tip relatively poorly developed, slightly smaller than half bone length, covered by thick layer of skin; posterior portion wide and externally visible, covered by thin layer of skin. Nasal slender, curved laterally, inner margin with moderately-developed laminar expansion; outer margin with reduced laminar expansion; mesial border contacting only frontal. Nasal and mesethmoid bones not in contact. Frontal elongated, relatively thick, with width slightly larger than half of entire length; anterior projection short, size smaller than nasal length. Frontal fontanel elongate and narrow; posterior tip surpassing anterior margin of parieto-supraoccipital. Parieto-supraoccipital wide, posterior process moderately developed, not contacting nuchal plate (Fig. 2).

FIGURE 1. *Corydoras hephaestus*, new species, holotype, MZUSP 119087, 22.6 mm SL, Brazil, Rondônia, Vilhena, upper Rio Machado. Lateral (a), dorsal (b), and ventral (c) views.

Two laminar infraorbitals externally visible, covered by thin layer of skin with minute odontodes. Infraorbital 1 very large, ventral laminar expansion conspicuously well developed, significantly covering lateral portion of snout; anterior portion with well-developed laminar expansion, almost reaching to anterior margin of nasal capsule. Infraorbital 2 small, thickened, with posterior laminar expansion well developed; posteroventral margin contacting posterodorsal ridge of hyomandibula, dorsal tip contacting sphenotic and compound pterotic (Fig. 3). Posterodorsal ridge of hyomandibula close to its articulation with opercle oblong, externally visible, covered by thin layer of

skin, relatively slender. Dorsal ridge of hyomandibula between compound pterotic and opercle covered by posterodorsal laminar expansion of infraorbital 2; exposed areas bearing small odontodes. Interopercle almost entirely exposed, somewhat triangular, anterior projection moderately developed. Preopercle approximately at 45° angle relative to longitudinal body axis. Preopercle relatively thick, elongated, minute odontodes sparse on external surface. Opercle compact in shape, width larger than half of its length; free margin convex; posterodorsal region with smoothly concave area in some specimens. Opercle surface without serrations and covered by small odontodes. Anteroventral portion of cleithrum and posterolateral portion of scapulocoracoid exposed; minute odontodes sparse on exposed areas. Vertebral count 21(2), precaudal and caudal vertebrae 8(2) and 13(2), respectively; ribs 6(2), first pair conspicuously large; complex vertebra slender in shape.

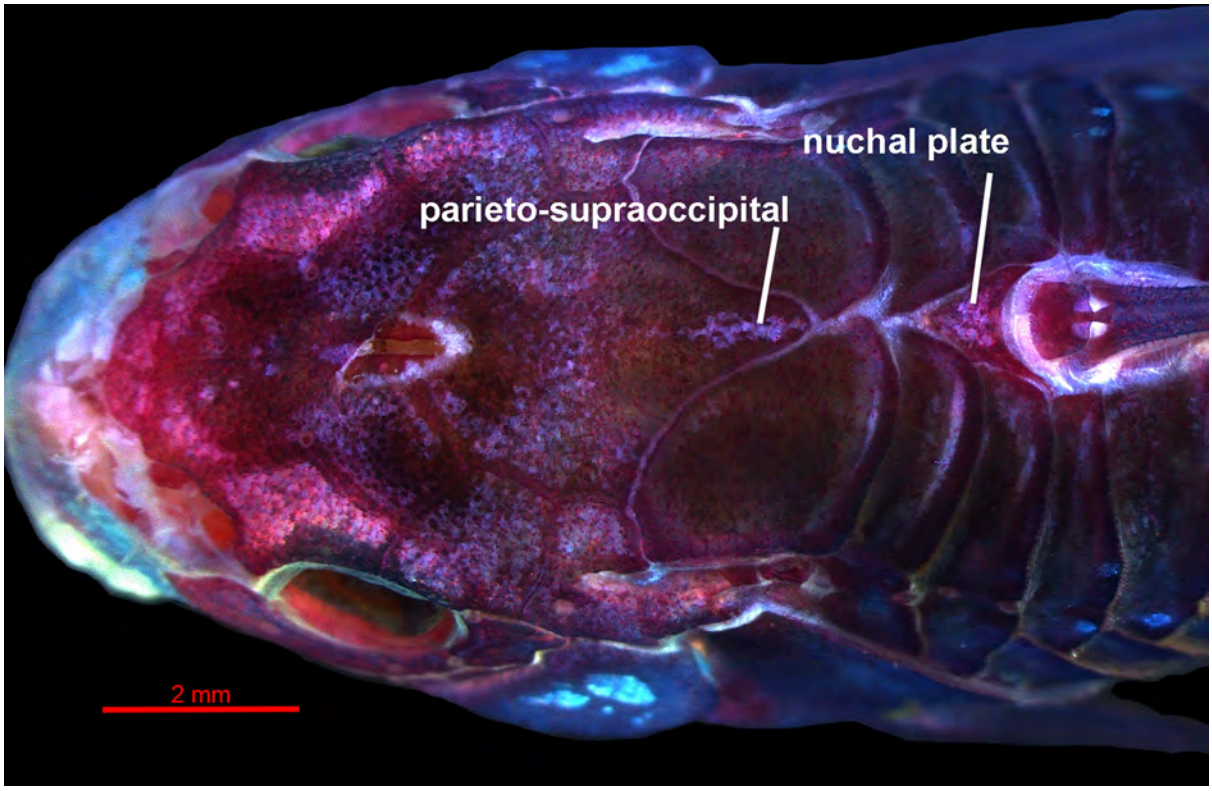

FIGURE 2. Dorsal view of head of a cleared-and-stained specimen of *Corydoras hephaestus*, MZUSP 118570, 25.4 mm SL, showing absence of contact between the posterior process of the parieto-supraoccipital and the nuchal plate.

Gill membranes united to isthmus. Four branchiostegal rays decreasing in size posteriorly. Hypobranchial 2 somewhat triangular, tip ossified and directed towards anterior portion, posterior margin cartilaginous; ossified portion well developed, about twice size of cartilaginous portion. Five ceratobranchials with expansions increasing posteriorly; ceratobranchial 1 with small process on anterior margin of mesial portion; ceratobranchial 3 notched on posterolateral margin; ceratobranchial 5 toothed on posterodorsal surface, 32(1) or 34(1) teeth aligned in one row. Four epibranchials with similar size; epibranchial 2 slightly larger than others, with small pointed process on laminar expansion of posterior margin; epibranchial 3 with triangular uncinate process on laminar expansion of posterior margin. Two wide pharyngobranchials (3 and 4), pharyngobranchial 3 with triangular laminar expansion on posterior margin. Upper tooth plate oval; 29(1) or 33(1) teeth aligned in two rows on posteroventral surface.

Lateral-line canal entering neurocranium through compound pterotic, branching twice before entering sphenotic: pterotic branch with single pore; preoperculomandibular branch conspicuously reduced, with single pore opening close to postotic main canal. Sensory canal continuing through compound pterotic, entering sphenotic as temporal canal, which splits into two branches: one branch giving rise to infraorbital canal, other branch entering frontal through supraorbital canal, both with single pore. Supraorbital canal branched, running through nasal bone. Epiphyseal branch of supraorbital canal reduced, pore opening close to supraorbital main canal. Nasal canal with three openings, first on posterior edge, second on posterolateral portion, fused with first pore, and third on anterior edge. Infraorbital canal running through entire second infraorbital, extending to infraorbital 1 and opening into two

pores. Preoperculo-mandibular branch giving rise to preoperculo-mandibular canal, which runs through entire preopercle with three openings, leading to pores 3, 4, and 5, respectively.

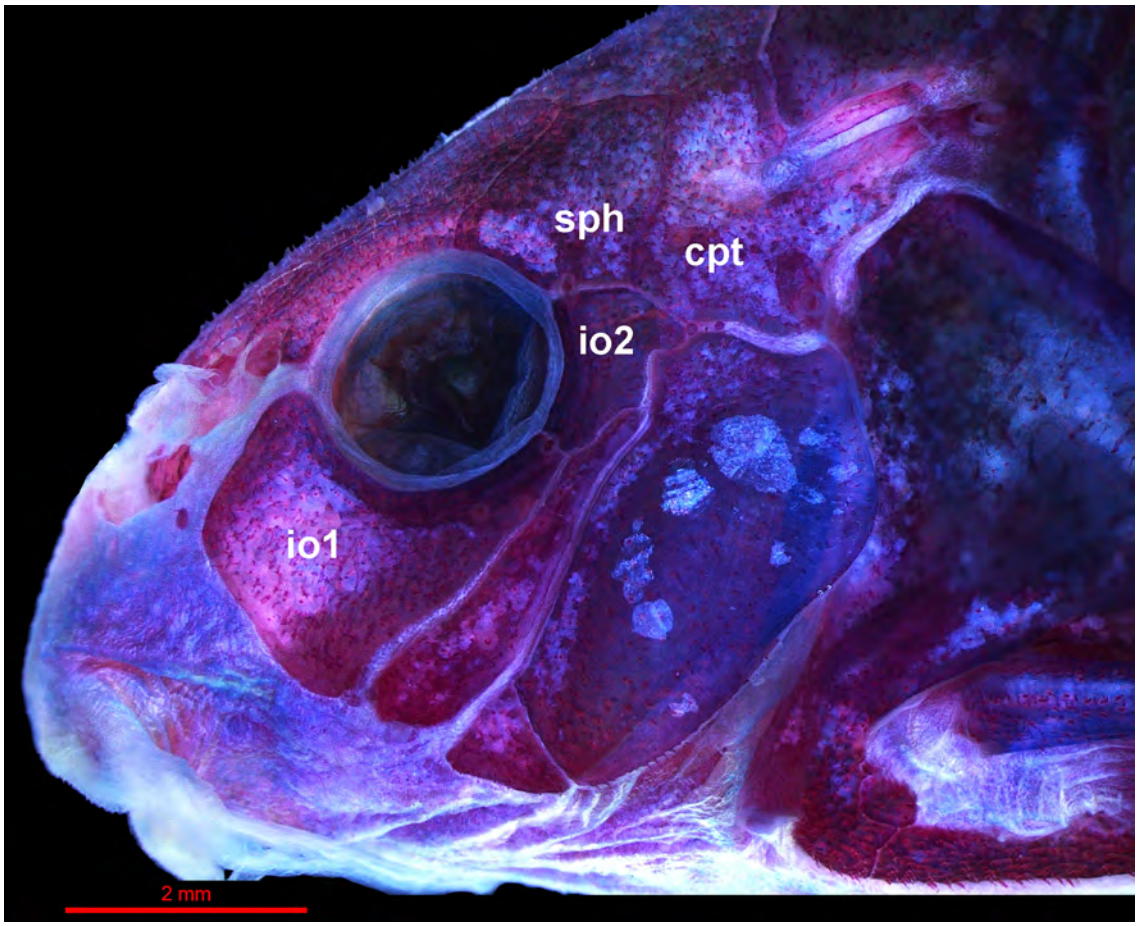

FIGURE 3. Lateral view of the head of a cleared-and-stained specimen of *Corydoras hephaestus*, MZUSP 118570, 25.4 mm SL. Abbreviations: io1: infraorbital 1, io2: infraorbital 2, sph: sphenotic, cpt: compound pterotic.

Dorsal fin triangular; posterior margin slightly rounded; located just posterior to third dorsolateral body plate, when adpressed tip not reaching to preadipose platelets in specimens longer than 25.1 mm SL. Dorsal-fin rays II,7*(17). Dorsal-fin spine short, approximately half-length of first branched ray, when adpressed tip reaching to middle portion of dorsal-fin base; anterior margin with small odontodes; posterior margin smooth and with medial sulcus. Nuchal plate moderately developed, not reaching to posterior process of parieto-supraoccipital, and almost entirely exposed. Dorsal spinelet short, almost entirely exposed; exposed areas with small odontodes. Pectoral fin triangular, its origin just posterior to gill opening. Pectoral-fin rays I,7(2), I,8*(14), or I,9(1). Tip of adpressed pectoral fin reaching to fourth ventrolateral plate. Pectoral-fin spine reaching to second ventrolateral plate when adpressed. Posterior margin of pectoral spine with 9 to 14 poorly-developed serrations along its entire length; absent on distal portion of spine in some specimens. Pectoral-spine serrations generally simple and directed distally; some serrations perpendicularly directed; presence of bifid serrations in some specimens (Fig. 4). Small, sharp odontodes on dorsal surface of pectoral spine just adjacent to fin membrane in males. Pelvic fin ellipsoid, located just below second ventrolateral body plate, and at vertical through first or second branched dorsal-fin ray. Pelvic-fin rays i,5*(17). Adipose fin roughly triangular, separated from base of last dorsal-fin ray by 8*(12) dorsolateral body plates. Anal fin somewhat triangular, located just posterior to 12^{th*}(10) or 13th(2) ventrolateral body plates, and at vertical through region of preadipose platelets. Anal-fin rays i,4(1) or ii,6*(16). Caudal-fin rays i,12,i*(16), generally four dorsal and ventral procurrent rays. Caudal fin bilobed, dorsal and ventral lobes with similar size.

Two (5) or three (2)* laterosensory canals on trunk; first ossicle tubular, second ossicle laminar, third lateral-line canal, when present, encased in third dorsolateral body plate. Body plates with minute odontodes scattered

over exposed area, conspicuous line of odontodes confined on posterior margins. Dorsolateral body plates 23*(17); ventrolateral body plates 20(11) or 21(6)*; dorsolateral body plates along dorsal-fin base 6(9) or 7*(8); dorsolateral body plates between adipose- and caudal-fin 7(3), 8*(10), or 9(5); preadipose platelets 3(4), 4*(9), 5(2), or 6(1). Small platelets covering base of caudal-fin rays, and disposed dorsally and ventrally between junctions of lateral plates on posterior portion of caudal peduncle.

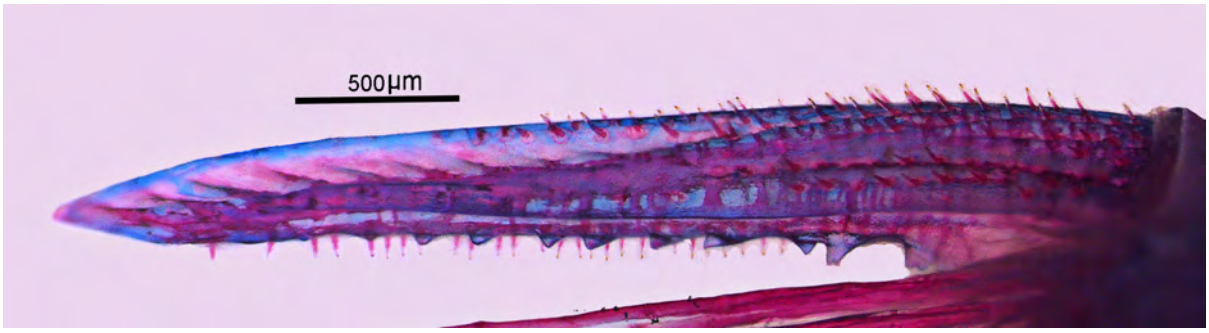

FIGURE 4. Ventral view of left pectoral-fin spine of *Corydoras hephaestus*, MZUSP 118570, 25.4 mm SL, showing the small conical serrations on inner margin of the right spine.

Juveniles description. Based on two paratypes of 12.8 mm SL (MNRJ 13459) and 12.3 mm SL (MCP 36270) in postflexion stage (Fig. 5). Body elongate. Barbels with well-developed papillae; tip not reaching anteroventral limit of gill opening. Dorso- and ventrolateral plates absent. All fins completely formed, except adipose fin. Skin membrane from base of last dorsal-fin ray to caudal-fin base, with adipose-fin spine contained within it. Pectoral-fin spine formed. Dorsal-fin spine (partially damaged) possibly formed. All rays segmented. Ground color of body yellowish white. Proximal area of dorsal fin, dorsal surface of caudal peduncle and caudal-fin base reddish-brown. Body with few small dark, sparsely distributed chromatophores. All fins and barbels without dark chromatophores.

Color in alcohol. Overall color of body in Fig. 1. Head entirely covered by black chromatophores, including ventral surface; chromatophores less concentrated on lateral and ventral portions of head. Region of parieto-supraoccipital process reddish brown. Barbels covered by black chromatophores, more concentrated on their distal portions. Body almost entirely covered by black chromatophores, including ventral surface. Dorsolateral-body plates just posterior to dorsal-fin base with reddish brown dorsal portion, increasing in size towards caudal peduncle; remaining areas of dorsolateral plates densely covered by black chromatophores. Ventrolateral body plates on caudal peduncle reddish brown; remaining areas of ventrolateral plates with less concentrated black chromatophores. Ventral surface of trunk covered by sparse, black chromatophores. Pectoral-, pelvic- and anal-fin rays covered by black chromatophores; anal-fin base with reddish brown chromatophores, becoming sparse distally. Dorsal fin with reddish-brown chromatophores more concentrated on ventral portion, becoming sparse distally. Caudal-fin rays with reddish-brown chromatophores more concentrated ventrally, becoming sparse distally.

Color in life. Observations based on field photographs of five live specimens and on field observations by WMO. Overall body coloration black and red (Fig. 6). Greenish metallic hue on opercle and cleithrum. Intense red coloration close to dorsal- and caudal-fin base, adipose fin and on dorsal portion of caudal peduncle; less intense on posterior region of dorsal and caudal fins, anal-fin base, predorsal area, and on dorsolateral portion of head. Pectoral and pelvic fins hyaline. Anal fin hyaline or red. Black on remaining parts of body, except on ventral portions of head and abdomen.

FIGURE 5. Juvenile of *Corydoras hephaestus* in lateral view, MCP 36270, 12.3 mm SL.

FIGURE 6. Color in life of *Corydoras hephaestus*, paratype, MZUSP 117059, immediately after capture.

Sexual dimorphism. Male specimens of *C. hephaestus* can exhibit a lanceolate genital papilla, feature also common to all Corydoradinae (see Nijssen & Isbrücker, 1980; Britto, 2003). In addition, males present small, sharp odontodes on dorsal surface of pectoral spine just adjacent to fin membrane. This feature is observed in some *Scleromystax* Günther, 1864 species (Britto *et al*. in press).

Distribution. The new species is only known from its type locality, Igarapé Piracolina, a tributary of the upper Rio Machado, Rio Madeira basin, about 9 km south of Vilhena, near the border of Rondônia and Mato Grosso States, Brazil (Fig. 7).

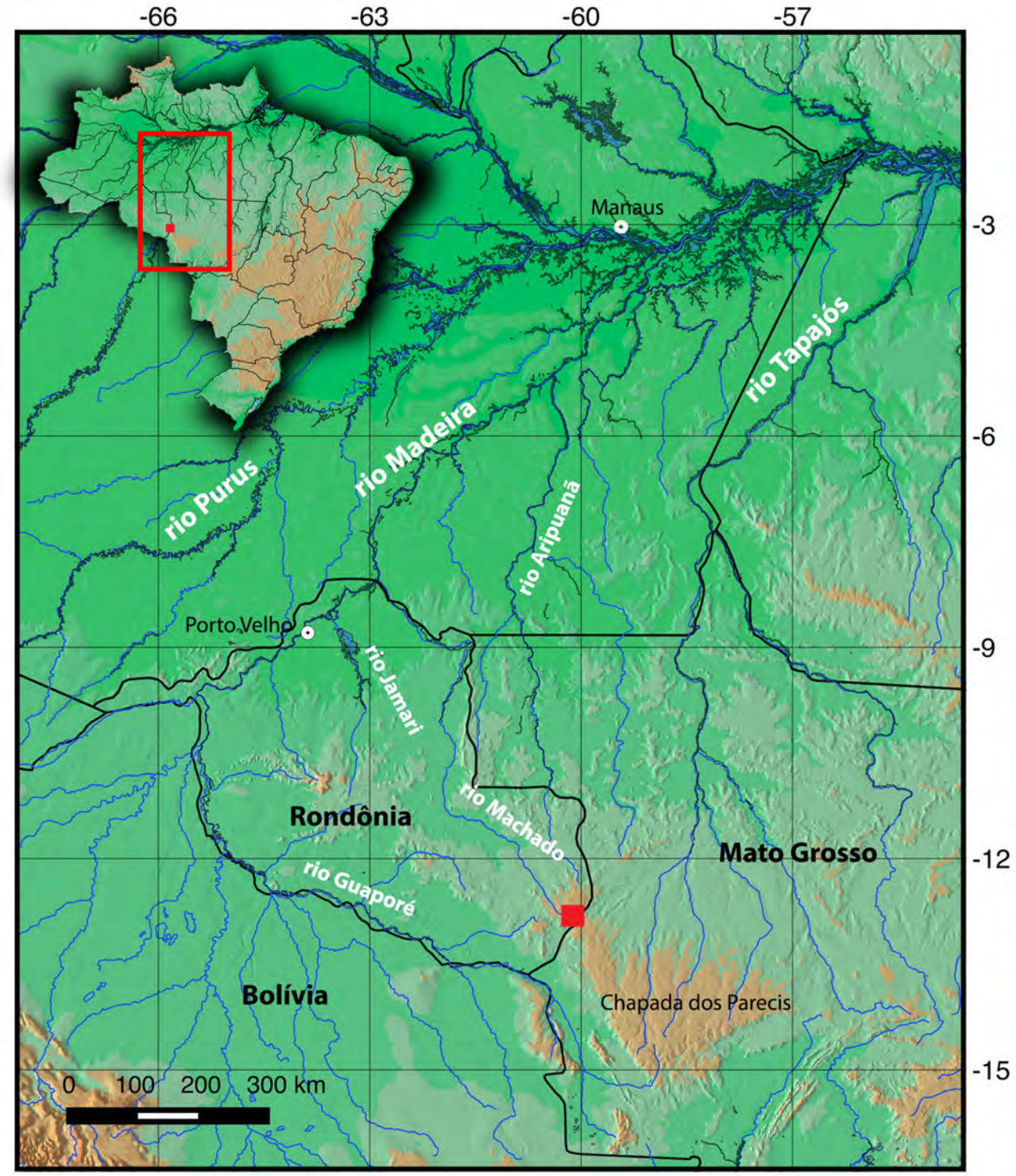

FIGURE 7. Type locality (red square) of *Corydoras hephaestus*, a tributary of the Igarapé Piracolina, upper Rio Machado drainage, Rio Madeira basin, Brazil.

Ecological notes. The type locality of *Corydoras hephaestus* is located 585 m above sea level on the Chapada dos Parecis. It is a small terra-firme igarapé (= highland creek) with little preserved riparian vegetation and surrounded by large plantation fields (mostly soy and corn), near Vilhena, Mato Grosso. It is a clear water stream 1.5–2.5 m wide and 0.3–0.8 m deep, with swift currents, and a bottom composed of sand and dead leaves (Fig. 8). The new species are not abundant, and specimens were collected one by one. Shoalling behavior was not observed. Syntopic species included *Ancistrus verecundus* Fisch-Muller, Cardoso, da Silva & Bertaco, 2005, *Bryconops piracolina* Wingert & Malabarba, 2011, *Cetopsorhamdia* sp. 3 (cf. Bockmann & Slobodian, 2013: 25),

Hyphessobrycon lucenorum Ohara & Lima, 2015, *Hyphessobrycon* aff. *melonostichos* Carvalho & Bertaco, 2006, *Moenkhausia parecis* Ohara & Marinho, 2016 and *Pyrrhulina* sp. The analysis of stomach contents of one paratype (MZUSP 118570) revealed the presence of sand, algae and nematodes.

Etymology. The specific epithet *hephaestus* is from the Greek, Ἥφαιστος (or Hēphaistos), the Greek god of fire, metalworking, forges, and blacksmiths. Alluding to the red color of the body and fins. A noun in apposition.

FIGURE 8. Tributary of the Igarapé Piracolina, upper Rio Machado, Rio Madeira basin, Vilhena, Rondônia, Brazil, type locality of *Corydoras hephaestus.*

Discussion

Among *Corydoras*, *C. hephaestus* shares with *C. difluviatilis C. flaveolus*, *C. gladysae*, *C. gracilis*, *C. hastatus*, *C. latus*, *C. micracanthus*, *C. nanus*, *C. petracinii*, *C. pygmaeus*, and *C. undulatus* the posterior process of the parieto-supraocipital not in contact with the nuchal plate. This absence of contact is a feature observed in *Hoplosternum* Gill, 1858, *Callichthys* Scopoli, 1777, *Megalechis* Reis, 1997, in most of *Aspidoras* Ihering, 1907 and *Scleromystax* (Britto & Castro, 2002; Britto, 2003). Nevertheless, there is more than one condition concerning the contact between both elements. The large majority of *Corydoras* species displays a full contact, sometimes a complete suture. In most *Scleromystax* and some *Corydoras*, as cited above, there is a lack of contact or both elements touch one another by just a small point, sometimes covered by a tiny piece of skin. However, the new species shows a different condition, most similar to *Aspidoras* species, in which there is no contact between the posterior process of parieto-supraocipital and the nuchal plate, with the dorsolateral plates touching their counterparts between both bones in some specimens. The nuchal plate is particularly small.

In most cases, *Corydoras* species with different snout morphologies and body size coexist in nature (Nijssen, 1970). These species frequently possess similar color pattern, occurring in pairs or trios that may belong to clearly

different lineages *sensu* Alexandrou *et al*. (2011) (see Britto *et al*. 2009; Tencatt & Pavanelli, 2015; Tencatt & Britto, 2016; Tencatt & Ohara, 2016) or be a shared feature, such as the species close related to *C. paleatus* (Jenyns, 1842) (see Alexandrou *et al*. 2011). The vividly red colored fins (dorsal, adipose and caudal) in life are an unusual feature, which have not been reported in the scientific literature. Three species known in the aquarium hobby and marketed as *Corydoras concolor*, *C. eques* Steindachner, 1876 and *C. venezuelanus* Ihering, 1911[=*C. aeneus* (Gill, 1858)], can exhibit orange fins with variable tones. The three species are scarce in ichthyological collections and, when present, the specimens frequently have uncertain collecting data and come from the ornamental trade. Thus, only comparisons between *C. hephaestus* and four paratypes of *Corydoras eques* (MCZ 8204), three types of *C. venezuelanus* (MZUSP 146, 5359), and the holotype of *C. concolor* (CAS-SU 54131), through photos and by the information provided on its original description, were performed. The new species can be promptly distinguished from *C. concolor*, *C. eques* and *C. venezuelanus* by the absence of contact between the posterior process of the parieto-supraoccipital and the nuchal plate (*vs*. bones in contact). Additionally, *Corydoras hephaestus* can be distinguished from *C. eques* by having a smaller dorsal-fin spine (half the length of the first branched ray *vs*. spine and first branched ray with similar size), and scapulocoracoid moderately expanded towards ventral mesial portion of trunk, not touching its counterpart (*vs*. conspicuously expanded, touching its counterpart); from *C. venezuelanus* by having a smaller pectoral-fin spine (when adpressed reaching to the second ventrolateral plate *vs*. reaching to the fourth ventrolateral plate), and smaller dorsal-fin spine (when adpressed reaching to the seventh dorsolateral plate *vs*. reaching to the ninth dorsolateral plate); and from *C. concolor* by having small and not coalescent platelets on ventral surface of trunk (*vs.* large and coalescent platelets).

Among the rivers of the Amazon basin, the Rio Madeira displays the greatest callichthyid diversity, with 49 species: *Corydoras* (42 spp.), *Dianema* Cope, 1871 (2 spp.), *Megalechis* (2 spp.), *Lepthoplosternum* Reis, 1997 (1), *Hoplosternum* (1) and *Callichthys* (1) (Reis, 1997; Pedroza *et al*. 2012; Britto, 2013; Tencatt & Ohara, 2016). *Aspidoras* and *Scleromystax* are not recorded from the Rio Madeira basin. About 22% of all diversity of *Corydoras* occurs in the Rio Madeira basin, including many species currently known only from this system, which seems to be the case of *Corydoras hephaestus*. Despite intensive and broad collecting efforts in the Rio Madeira basin from 2009 to 2013 (see Queiroz *et al*. 2013) and recent surveys conducted in the southeastern portion of Rondônia State and northwest of Mato Grosso State undertaken in 2010–2011 and 2013–2014, *Corydoras hephaestus* was collected in low abundance and only in the Igarapé Piracolina. Additionally, examination of several fish collections revealed additional specimens (MNRJ 13459 and MCP 36270), but both collected at the same locality. Thus, it is possible that the species is restricted to the upper Rio Machado, at the Chapada dos Parecis. The type locality of *C. hephaestus* is a small forest fragment near Vilhena town that is surrounded by farms. According to the International Union for Conservation of Nature (IUCN) categories and criteria (IUCN Standards and Petitions Subcommittee, 2016), *C. hephaestus* might be considered as 'Vulnerable (D2)', based on its distribution occupation area (AOO) apparently less than 20 km^2 and there is a plausible future threat (agricultural development and expansion of Vilhena town around its very restricted distribution) that could lead the species to being critically endangered (CR) or extinct (EX) in a short period of time. Ohara & Lima (2015) discussed the high number of endemic species of fishes occurring in the headwater tributaries draining the watershed defined by Chapada dos Parecis. This is the case of the Igarapé Piracolina that drains from Chapada dos Parecis, and is locality-type of other species recently described: *Bryconops piracolina*, *Ancistrus verecundus*, *Hyphessobrycon lucenorum*, *Moenkhausia parecis* and now, *Corydoras hephaestus*. The aforementioned species and other undescribed species of *Cetopsorhamdia* (R.E. Reis, pers. obs.), *Hyphessobrycon, Moenkhausia*, and *Pyrrhulina* are also considered as endemic species from Rio Madeira basin (Ohara & Lima, 2015). The presence of a high number of endemic fish species in a small area indicates it as having potential priority for conservation measures, and, currently, habitat loss due to expansions of agriculture and Vilhena town pose a threat to this diversity. This imminent risk demands urgent political efforts to ensure the preservation of this peculiar and unique biological patrimony.

Comparative material examined. In addition to the comparative material examined listed in Tencatt & Ohara (2016) the following species were examined: *Corydoras brittoi*: MNRJ 43316, holotype, 38.1 mm SL; Brazil: Mato Grosso: Rio Aripuanã. *Corydoras difluviatilis*: MZUSP 75268, 1, holotype, 39.8 mm SL; Brazil: São Paulo: Rio Pardo. MZUSP 52909, 1, paratype, 38.1 mm SL; Brazil: Minas Gerais: Rio São Marcos. MZUSP 51496, 5, paratypes, 29.0–34.4 mm SL; Brazil: Minas Gerais: Rio Araguari. MZUSP 75269, 1, paratype, 33.0 mm SL; Brazil: São Paulo: Rio Pardo. MZUSP 52910, 1 paratype, 38.2 mm SL; Brazil: Minas Gerais: Rio Araguari. MZUSP 51485, 2, paratypes, 30.2–34.4 mm SL; Brazil: Minas Gerais: Rio Grande. *Corydoras flaveolus*: MZUSP

424, 1, holotype, 33.4 mm SL; Brazil: São Paulo: tributaries to the Rio Piracicaba. *Corydoras hastatus*: MZUSP 115645, 35, 12.7–21.2 mm SL; Brazil: Mato Grosso: Rio Guaporé. MZUSP 95348, 6, 15.3–18.1 mm SL; Brazil: Mato Grosso: Rio Guaporé. *Corydoras haraldshultzi*: MZUSP 94996, 299, 32.2–55.9 mm SL; Brazil: Mato Grosso: Rio Guaporé. *Corydoras eques*: MCZ 8204, 4 of 12, paratypes, 37.6–44.4 mm SL; Brazil: Amazonas: Rio Amazonas at Codajás. *Corydoras gossei*: MZUSP 38977, 6, paratypes, 48.4–53.4 mm SL; Brazil: Rondônia: tributary to the Rio Mamoré. *Corydoras pavanelliae*: MNRJ 43317, holotype, 45.1 mm SL; Brazil: Mato Grosso: Rio Aripuanã. *Corydoras pinheiroi*: MZUSP 48099, holotype, 55.3 mm SL; Brazil: Rondônia: tributary to the Rio Ribeiro, at Guajará-Mirim. *Corydoras pygmaeus*: MZUSP 23424, 1, 17.9 mm SL; Brazil: Amazonas: Fonte Boa. MZUSP 15301, 2, 17.7–20.9 mm SL; Peru: Iquitos: Rio Nanay. MZUSP 26344, 4, 13.4–21.0 mm SL; Peru: Loreto: Moronacocha, Prov. Maynas. *Corydoras sarareensis*: MZUSP 48100, holotype, 40.9 mm SL; Brazil: Mato Grosso: Rio Sararé. MZUSP 118646, 6, 39.5–52.1 mm SL; Brazil: Mato Grosso: Rio Bugre. *Corydoras sterbai*: MZUSP 94998, 1, 40.8 mm SL; Brazil: Mato Grosso: Rio Guaporé. *Corydoras seussi*: MZUSP 49323, 5, paratypes, 44.3–54.0 mm SL; Brazil: Rondônia: Rio Pacaás Novos, near Guajará-Mirim. MZUSP 49322, 1, paratype, 60.1 mm SL; Brazil: Rondônia: Rio Pacaás Novos. MZUSP 49323, 1, paratype, 48.8–53.4 mm SL; Brazil: Rondônia: Rio Pacaás Novos. *Corydoras undulatus*: MCP 23143, 1 of 25, 28.9 mm SL; Brazil: Rio Grande do Sul: Rio Inhacunda.

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