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First record of the catfish genus *Amblyceps* Blyth, 1858 from China with the description of a new species (Osteichthyes: Amblycipitidae)

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Abstract. *Amblyceps yunnanensis*, a new species, is described here based on the specimens collected from a tributary of the upper Irrawaddy in the western Yunnan Province, China. It differs from all its congeners by the following combination of morphological features: skin smooth with a complete lateral line; adipose-fin originates at vertical level from anterior one quarter of the length of the anal-fin base, in the form of a low and smooth edge; dorsal-fin with one very weak spine; pectoral-fins without spines; caudal-fin truncated without pinnate-like rays.

Key words: *Amblyceps yunnanensis*, new species, Irrawaddy, China

Introduction

The great majority of catfishes live only in freshwater; they can be easily identified by having body covered with thick mucus; barbells extending from each side of the jaws; adipose dorsal-fin usually present, mostly without rays (Chu et al. 1999). The genus *Amblyceps*, proposed by Blyth in 1858, is a group of diminutive freshwater catfishes. Amblycipitidae, which can be found in south and southeast Asia, typically inhabit swift streams or faster-flowing stretches of river drainages. According to Chen & Lundberg (1995), *Amblyceps* species possess the following synapomorphies: the presence of an epiphyseal commissure of the supraorbital sensory canals immediately anterior to, and not passing through the epiphyseal bar; anterior cranial fontanel narrowing abruptly along its posterior end, offering epiphyseal commissure bony support from the frontals; fifth ceratobranchial expended posteromedially; pinnate process present along anterior margin of the procurrent and median caudal-fin rays; transverse ridge along entire posterior margin of roof on supraoccipital and pterotic; lateroposterior process of horizontal lamina of urohyal short or vestigial, shorter than horizontal lamina; anterior nostril situated immediately anterior to base of nasal barbel; both lips with double folds.

Additionally, it can also be differentiated by a distinctive cup-like structure above the pectoral-fin base, where the gill membrane rests when the gill-opening is closed (Hora 1933).

Currently, there are 19 valid species of *Amblyceps*, and four of them (*A. apangi*, *A. murraystuarti*, *A. torrentis* and *A. cerinum*) are characterized by caudal-fins truncate and emarginate. The other 15 species have caudal-fins deeply forked, namely, *A. arunachalensis* Nath & Dey, 1989; *A. mangois* Hamilton, 1822; *A. laticeps* M'Clelland, 1842; *A. caecutiens* Blyth, 1858; *A. foratum* Ng & Kottelat, 2000; *A. mucronatum* Ng & Kottelat, 2000; *A. platycephalus* Ng & Kottelat, 2000; *A. tenuispinis* Blyth, 1860; *A. serratum* Ng & Kottelat, 2000; *A. variegatum* Ng & Kottelat, 2000; *A. macropterus* Ng, 2001; *A. kurzii* Day, 1872; *A. protentum* Ng & Wright, 2009; *A. carinatum* Ng, 2005; *A. tuberculatum* Linthoingambi & Vishwanath, 2008. Among the 19 species, none of them are known to inhabit in China.

In August 2011, some *Amblyceps* specimens with truncate caudal-fins were collected from downstream of the River Mengnai (a tributary of upper Irrawaddy basin), Nabang Township, Yingjiang County, Yunnan Province, China. These specimens are described as a new species in this study, which also reports the first record of the genus *Amblyceps* in China.

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Fig. 1. Lateral, dorsal, and ventral views and drawing of lateral view of holotype of *Amblyceps yunnanensis* sp. nov. (YNU2011082201, 75.98 mm SL), China: Yunnan, upper Irrawaddy.

Material and Methods

The specimens were fixed in 10 % formalin, and then transferred to 70 % ethanol for long-term storage. The specimens were cataloged and deposited in the collections of Yunnan University. Counts and measurements were made on the left side of specimens. Vernier calipers were used in measurements and data corrected to the nearest 0.1 mm following Ng & Lim (1995) except forehead length which follows Ng & Kottelat (1998) and adipose-fin base follows Ng & Kottelat (2000). Subunits of the head are presented as proportions of head length (%HL). Head length and measurements of body parts are presented as proportions of standard length (%SL). Anus to the vertical distance posterior margin of the pelvic-fin and anus to anal-fin origin were also measured (detailed in Fig. 1), and recorded as a percentage of the former to the latter. Teeth band, lateral line and fin rays were viewed under an Olympus MD50 anatomical lens. Photographs were made by Cannon devices 5D II. Drawings were accomplished by manual labour. Abbreviations used in this study are: SL (standard length), HL (head length), YNU (Yunnan University). Because no comparative specimens could be obtained, we quote and summarize the illustrations and data

from the related literature: *A. apangi*, Vishwanath & Linthoingambi (2007) and Humtsoe & Bordoloi (2009); *A. murraystuarti*, Ng & Kottelat (2000); *A. torrentis*, Linthoingambi & Vishwanath (2008); *A. cerinum*, Ng & Wright (2010).

Results

Amblyceps yunnanensis sp. nov. (Fig. 1)

Holotype: YNU2011082201, 75.98 mm SL; China: Yunnan Province, Yingjiang County, Nabang Township, downstream of the River Mengnai (a tributary of the upper Irrawaddy), 24°42'54.54" N, 97°34'06.44" E, 247 m, 22 August 2011, Ziming Chen.

Paratype: YNU2011082202, 61.01 mm SL; China: Yunnan Province, Yingjiang County, Nabang Township, downstream of the River Mengnai (a tributary of the upper Irrawaddy), 24°42'54.54" N, 97°34'06.44" E, 247 m, 22 August 2011, Ziming Chen.

Diagnosis: *A. yunnanensis* is distinguished from congeners in having the following combination of characters: skin smooth with complete lateral line, laterosensory pores haphazardly distributed in pairs; mouth sub-terminal with upper jaw slightly longer than the lower one; lips with papillae, adipose-fin short, with a low and smooth outer edge, posterior end of which rounded and separated from dorsal procurent rays of caudal-fin by a remarkable notch; no pinnate like rays on caudal-fin rays; body depth at anus 14.1-14.6 % SL; head length 19.9-20.4 % SL; head depth 9.9-10.1 % SL; eye to nasal barbel 9.3-10.2 % SL; caudal peduncle length 19.6-19.9 % SL; caudal peduncle depth 13.5-13.6 % SL.

There were five species of *Amblyceps* with caudal-fins truncate and emarginate, namely, *A. yunnansis*, *A. apangi*, *A. murraystuarti*, *A. torrentis* (caudal-fin emarginated according to Linthoingambi & Vishwanath 2008) and *A. cerinum* with a truncate caudal-fin (*vs.* deeply forked and emarginated). Compared with those species, a shorter adipose-fin base (19.6-21.5 % SL) and a unique tooth band can set *A. yunnansis* apart immediately. It further differs from *A. apangi* in having a more slender caudal peduncle (caudal peduncle depth 13.5-13.6 % SL *vs.* 15.0-16.8 % SL); a shorter space between the eye and nasal barbel (eye to nasal barbel 9.3 -10.2 % HL *vs.* 13.0-16.0 % HL); a less developed rictal fold (*vs.* large and very well developed); teeth in upper jaw with no gap (*vs.* with a narrow gap), from *A. murraystuarti* in having upper jaw slightly longer than the lower (*vs.* lower longer); a distinct boundary between adipose-

Table 1. Morphometric data of *Amblyceps yunnanensis* sp. nov. (n = 2).

	YNU2011082201	YNU2011082202	Mean
Standard length (SL) (mm)	75.98	61.01	68.50
Head length (HL) (mm)	15.14	12.47	13.81
Percentage of standard length (%SL)			
Body depth at anus	14.1	14.6	14.4
Body depth at dorsal-fin origin	11.6	13.0	12.3
Predorsal length	24.9	24.3	24.6
Preanal length	63.3	66.6	65.0
Prepelvic length	49.7	47.5	48.6
Prepectoral length	17.2	17.8	17.5
Dorsal-fin base length	6.9	6.4	6.7
Anal-fin base length	14.6	14.7	14.7
Adipose-fin base length	21.5	19.6	20.6
Dorsal to adipose-fin distance	37.3	40.4	38.9
Pectoral-fin length	13.7	13.7	13.7
Pelvic-fin length	11.2	11.6	11.4
Caudal-fin length	18.1	18.1	18.1
Caudal peduncle length	19.6	19.9	19.8
Caudal peduncle depth	13.6	13.5	13.6
Head length	19.9	20.4	20.2
Percentage of head length (%HL)			
Head depth	49.9	49.3	49.6
Head width	78.0	75.5	76.8
Snout length	29.4	30.2	29.8
Interorbital distance	24.0	24.5	24.3
Eye diameter	6.7	7.5	7.1
Eye to nasal barbel	10.2	9.3	9.8
Nasal barbel length	63.1	53.7	58.4
Maxillary barbel length	95.0	84.2	89.6
Inner mandibular barbel length	33.2	41.9	37.6
Outer mandibular barbel length	68.7	80.3	74.5
Percentage of anus to anal-fin origin length (%)			
Anus to pelvic-fin ends	7.5	5.3	6.4

fin and caudal procurrent rays; a longer pelvic-fin length (11.2-11.6 % SL vs. 7.4-8.8 % SL); a longer caudal-fin (length 18.1 % SL vs. 13.7-16.6 % SL), from *A. torrentis* in having a sub-terminal jaws (vs. equal jaws); no separation in the premaxillary teeth (vs. a narrow gap); a slightly compressed body (body depth 14.1-14.6 % SL vs. 15.3-17.3 % SL); a greater head length (19.9-20.4 % SL vs. 16.8-18.9 % SL); a shorter interorbital space (24.0-24.5 % HL vs. 29.0-37.0 % HL); a longer predorsal length (24.3-24.9 % SL vs. 20.6-22.7 % SL); a shorter caudal peduncle (caudal peduncle length 19.6-19.9 % SL vs. 21.0-24.3 % SL), from *A. cerinum* in having skin smooth (vs.

in small granular papillae) and lateral line completed (vs. incomplete); a less depressed head (head depth 9.9-10.1 % SL vs. 7.0-9.2 % SL); a less slender tail (caudal peduncle length 19.6-19.9 % SL vs. 21.9-24.5 % SL; caudal peduncle depth 13.5-13.6 % SL vs. 9.2-11.2 % SL).

Description: Morphometric data shown in Table 1. Body elongate, covered with thick semitransparent mucus, anterior region of pelvic-fin subcylindrical, posterior region of pelvic-fin compressed gradually. Skin smooth with uniform colouration, lateral line midlateral and complete. Remarkable cup-like skin flap above the origin of the pectoral-fin, posterior to

the gill-openings. Dorsal profile from lateral view, cephalic area gently convex; dorsal-fin region straight; postdorsal part from end of dorsal-fin base to end of adipose-fin base convex. Ventral profile concave from pectoral-fin to caudal-fin base; preanal area of ventral profile presenting two convexs: one from the tip of snout to the start of pelvic-fin, and the other from end of pelvic-fin to the anal-fin origin. Anus and urogenital openings located very close to depressed pelvic-fin (distance of anus to posterior margin of pelvic-fin 5.3-7.5 % of the distance to anal-fin origin) (Fig. 2).

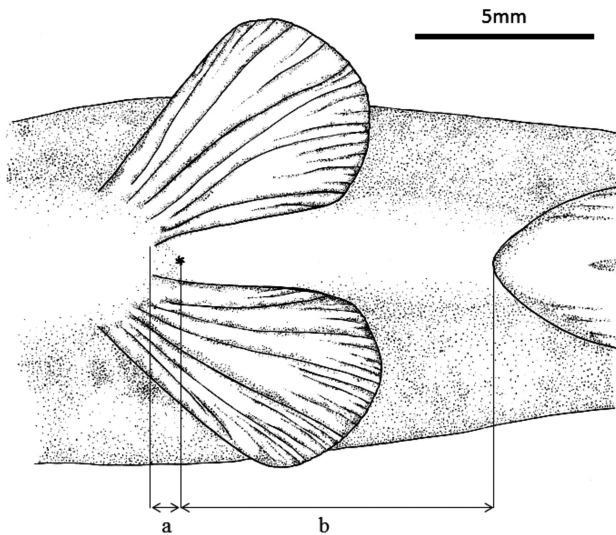


Fig. 2. Relative location of anus: (a) pelvic-fin insertion to anus distance, (b) anus to anal-fin origin distance.

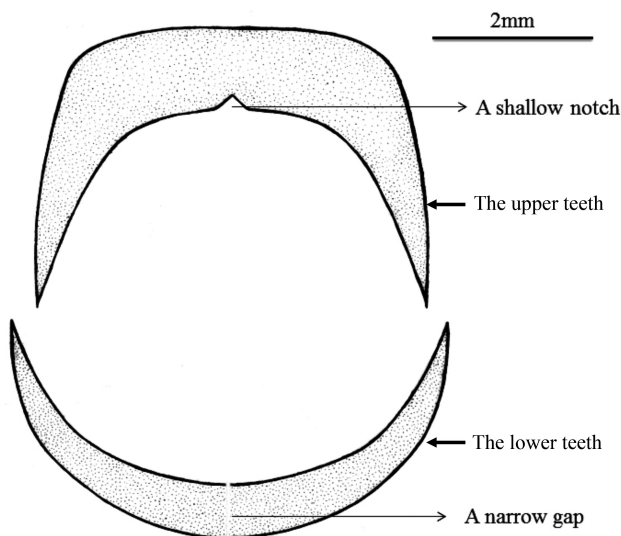


Fig. 3. Upper and lower teeth bands.

Head depressed with cheek muscles being a little swollen residing at each side of the middle groove on the roof of head. Eyes subcutaneous, small and sub-

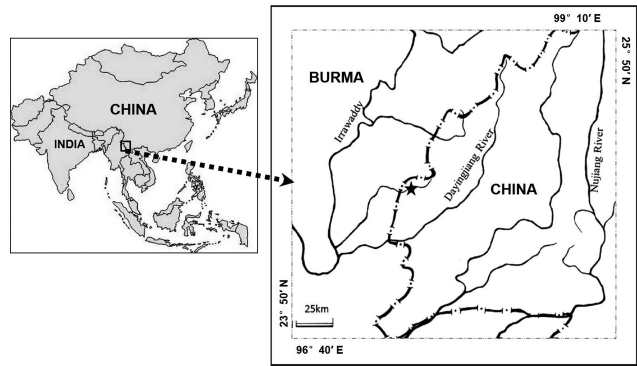


Fig. 4. The sampling site of *Amblyceps yunnanensis*, marked with a star ★.



Fig. 5. Habitat where *Amblyceps yunnanensis* was collected, photo by Ziming Chen, August, 2011.

ovoid (eye diameter 13.4-15.2 % HL). Nostrils close together, separated by a nasal barbel, the anterior naris being a complete tube-like membrane, while posterior naris being an incomplete tube whose anterior edge basally connects to nasal barbel; posterior rim of posterior narial membrane with notch. Gill openings broad, gill membranes united to each other, but free from isthmus, with 10 branchiostegal rays in each side. Oblate barbels in four pairs, extending from each side of jaws. Maxillary barbel longest, originating from end of upper and lower rictal fold of lips, extending to posterior margin of pectoral-fin base; nasal barbel extending almost to opercle; outer mandibular barbel extending to middle of pectoral-fin base; inner mandibular barbel offset from midventral line into two and outer mandibular barbel, extending to middle of pectoral-fin base.

Mouth sub-terminal, with upper jaw a little longer than the lower one, anterior rim of lower jaw not visible dorsally. Lips fleshy and slightly fimbriated, the less developed rictal fold extending to the bases of maxillary barbel on both sides; oral teeth small and villiform, premaxillary teeth in a single broad band,

Table 2. Comparison of major characters between the five related species including the new species, *Amblyceps yunnanensis* sp. nov., *A. apangi*, *A. murraystuarti*, *A. torrentis* and *A. cerinum*.

	<i>A. yunnanensis</i>	<i>A. apangi</i> ⁽¹⁾	<i>A. murraystuarti</i> ⁽²⁾	<i>A. torrentis</i> ⁽³⁾	<i>A. cerinum</i> ⁽⁴⁾
Dorsal fin rays	4	5-6	4	5	5-6
Adipose-fin	Adipose-fin not confluent with the caudal-fin	Adipose-fin not confluent with the caudal-fin	Adipose-fin confluent with the caudal-fin	Adipose-fin confluent with the caudal-fin	Adipose-fin not confluent with the caudal-fin
Anal-fin rays	10	7	7-8	6-8	8-9
Pectoral-fin rays	7	16	5	7	7-8
Pelvic-fin rays	7	5	5-6	5	5
Jaws	Upper jaw slightly longer than the lower one	Upper jaw slightly longer than the lower one	Upper jaw slightly shorter than the lower one	Jaws equal	Upper jaw longer than the lower one
Teeth on upper jaws	No separation gap in the midline	Separated by a very narrow gap in the midline	No separation gap in the midline	Separated by a very narrow gap in the midline	No separation gap in the midline
Lateral line	Complete	Complete	Incomplete	Complete	Incomplete

(1) *A. apangi*: data from Humtsoe & Bordoloi (2009), (2) *A. murraystuarti*: data from Ng & Kottelat (2000), (3) *A. torrentis*: data from Linthoingambi & Vishwanath (2008), (4) *A. cerinum*: data from Ng & Wright (2010).

with a very shallow incision in the middle of the posterior edge, but no separation gap in the midline, dentary teeth in one narrow crescent band with a very narrow gap in the midline (Fig. 3).

Fins wrapped in thin skin, base of which somewhat swollen; dorsal-fin originating vertically at the middle length of pectoral-fin, with one very weak spine wrapped in very thin skin and four rays. Adipose-fin base short, in the form of low and smooth edge, originating approximately at vertical point of anterior one quarter of the length of the anal-fin base, the boundary to the caudal-fin presented by a distinct groove (Fig. 1). Anal-fin with a straight anterior margin and convex posterior rim, with 10 rays; pectoral-fin without spine, posterior margin convex, extending nearly to the level of middle of dorsal-fin, with seven rays. Pelvic-fin depressed, tip of which far for reaching the anal-fin origin, with rays seven; caudal-fin truncated without pinnate rays, dorsal procurrent rays of which extending quite anterior to its base.

Colour in living specimens: In fresh specimens: body brownish grey, dorsal and flank region of anterior 2/3 of body gray white, shade into light brown grey posterior. Area of swollen cheek muscles on dorsal surface of the head light brown, abdominal region white anteriorly and orange posteriorly. Fins with margins whitish to light yellow, dorsal-fin dark grey; anal-fin slate grey; pelvic and pectoral-fins covered by translucent light yellow membrane; adipose-fin light brown; middle of caudal-fin dark grey, and fading dorsally and ventrally. Nasal and maxillary barbels

light grey to yellow. Mandibular barbel light yellow with lighter abaxial margin.

Colour in formalin: Presence of a darker colouration, shown by grey dorsal surfaces, grey-brown profiles and yellow ventral regions. Light yellow orange laterally.

Distribution and habitat: Currently only from the River Mengnai (24°42'54.54" N, 97°34'06.44" E, 247 m), which is located near Nabang Township, Yingjiang County, in the west of Yunnan Province, China (Fig. 4). *A. yunnanensis* was found hiding under boulders in groups in shallow rapids of hill streams. The River Mengnai is a fast-flowing hill streams which twists its way through dense forest. The river bed has large boulders, cobbles, gravel, and sand. The wet rocks are covered with many diatoms (Fig. 5). Water temperature was 22.8 °C (at 12:40 p.m., 22 August 2011), water pH 7.0, and transparency 45 cm.

Etymology: From Yunnan Province and the latin suffix “ensis”, meaning from a place.

Discussion

Currently, there are 19 valid species of *Amblyceps*, four of them (*A. apangi*, *A. murraystuarti*, *A. torrentis* and *A. cerinum*) have truncate and emarginated caudal-fins (Ng 2001, 2005, Linthoingambi & Vishwanath 2008, Ng & Wright 2010). The new species *A. yunnanensis* can be easily distinguished from the other species as follows. *A. murraystuarti* can be easily separated by having an indistinguishable posterior rim of the adipose-fin and an incomplete or absent lateral line, *A. torrentis* can be distinguished by its equal jaws, and

a unique yellow skin in life can tell *A. cerinum* apart. According to Linthoingambi & Vishwanath (2008), the laterosensory pores are at the tips of short tube-like prolongations aranged longitudinally in pairs of *A. torrentis*, but in *A. yunnanensis*, the laterosensory pores are aranged irregularly (in the mixed form below: single pores anterior, long tube-like structure median, paired short tube-like structure posterior). Other comparisons of major characters between the five related species including the new species, *A. yunnanensis* sp. nov., *A. apangi*, *A. murraystuarti*, *A. torrentis* and *A. cerinum* are summarized in Table 2. A simple identification key is summarized below mainly on the basis of external characters of *Amblyceps* fishes with truncate caudal-fin.

- Key to *Amblyceps* species with truncate caudal-fins:
1. Jaws equal *A. torrentis*
 - Upper jaws longer or lower longe..... 2
 2. Adipose-fin largely confluent with the caudal-fin ...
..... *A. murraystuarti*

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- Adipose-fin distinct from caudal-fin with a notch between them 3
3. Lateral line complete..... 4
- Lateral line incomplete *A. cerinum*
4. Teeth on upper jaws separated into two halves by a gap at the midline..... *A. apangi*
- Teeth on upper jaws continuous with no gap at the midline *A. yunnanensis*

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