

GARRA BISPINOSA, A NEW SPECIES OF CYPRINID FISH (TELEOSTEI: CYPRINIFORMES) FROM YUNNAN, SOUTHWEST CHINA

E Zhang

Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430072, Hubei, Peoples' Republic of China
Fax: 86-27-87875132; Email: zhange@ihb.ac.cn

ABSTRACT. – *Garra bispinosa*, a new species of cyprinid fish from the Irrawaddy River basin in Yunnan, Southwest China is described here. It has a conspicuous, quadrate and forwards pointed proboscis reflected downwards against the snout and anteriorly bilobed with one large, uniscupid and acanthoid tubercle on the distal end of each lobe, a character unique among all other congeners in Southeast Asia and China, and further differs from them in having the following combination of characters: snout with a deep groove across its tip to form a transverse lobe, 16 circumpeduncular scales, 34-35 lateral line scales, a smaller mental disc (length 38.1-43.8 % of head length), a forwards situated anus (anus to anal distance 25.9-30.6 % of pelvic to anal distance), and a slightly pointed snout.

KEY WORDS. – *Garra*, Cyprinidae, new species, China.

INTRODUCTION

Four nominal species of the cyprinid genus *Garra* Hamilton have presently been reported from the Yiluowadi Jiang (Irrawaddy River) basin in Yunnan, Southwest China. Wu et al. (1977) described a new species *G. qiaojiensis* based only on a single specimen from the Longchuan Jiang, a tributary of the Yiluowadi Jiang (Irrawaddy River) basin in Qiaojie, Yunnan. A detailed description of this species was provided by Chu & Cui (1989) based on specimens from the type locality. It is so far treated as valid by Chinese authors (Zhu, 1995; Chen, 1998; Zhang et al., 2000). Chu & Cui (1987) presented a review of the Chinese species of *Garra*, in which four species were identified from the Yiluowadi Jiang (Irrawaddy River) basin, i.e. *G. gravelyi*, *G. kempfi*, *G. orientalis* and *G. qiaojiensis*. Recently, Zhang et al. (2000) followed Chu & Cui (1987) to record these species from the same basin again. However, two species (viz. *G. kempfi* and *G. orientalis*) of these authors are not better understood taxonomically.

Since its original description by Hora (1921), *G. kempfi* has long been recognized as a valid species with the known distribution in both India and China. It was reported from the Siyom River (Brahmaputra River basin), Abor Hills, Assam (presently Arunachal Pradesh) and the Tuival River (Chindwinn River basin), Manipur, India (Menon, 1964; Talwar & Jhingran, 1991; Vishwanath, 1993). In China, *G. kempfi* was recorded from the Yaluzangbu Jiang (the main Brahmaputra River before it enters into India) basin in Tibet (Wu et al., 1977; Wu & Wu, 1992; Zhang et al., 1995) and

the Yiluowadi Jiang (Irrawaddy River) basin in Yunnan (Chu & Cui, 1989). However, Zhang & Chen (2002) showed that the Yaluzangbu Jiang (Brahmaputra River) basin material is conspecific with *G. kempfi* and that the Yiluowadi Jiang (Irrawaddy River) basin material previously identified by Chu & Cui (1989) as *G. kempfi* represents an undescribed species, thus named as *G. tengchongensis*.

Garra orientalis, originally described by Nichols (1925) from Yenping (=Nanping), Fukien (=Fujian), China, is currently recognized by Chinese authors as a valid species widely distributed in the Yiluowadi Jiang (Irrawaddy River), Nu Jiang (Salween River), Lancang Jiang (Mekong River), Yuan Jiang (Red River), Zhu Jiang (Pearl River), Chang Jiang (Yangtze River) and Min Jiang basins as well as Hainan Island (Wu et al., 1977; Chu & Cui, 1989; Zhu, 1995; Zhang et al., 2000). It is well known for a strange rostral modification, a conspicuous and heavily tuberculated proboscis on the snout. *Garra orientalis*, together with other species with this structure from Southeast Asia and China, such as *Discognathus bourreti* (Pellegrin, 1928: 340) (Rivière Claire, Tonkin [Song Lo, Vietnam]), *Discolabeo fisheri* Fowler (1937: 211) (Tachin basin, Thailand), *G. salweenica* Hora & Mukerji (1934: 365) (Salween at Takaw, Kengtung, Burma [Myanmar]) and *G. fuliginosa* Fowler (1934: 139) (Metang [Mae Taeng], Chao Phraya basin, Thailand), was formerly treated by Menon (1964: 239) as synonyms of *G. nasuta*, a widely distributed species with its range extending from Assam of India to North Vietnam and South China. Kottelat (2000) showed that the materials from the Salween, Mekong, Chao Phraya and Red River basin are distinct from those from

Assam figured by Menon (1964: pl.13 figs.11-12) and at least three or four species are involved. The material of the Mekong River basin was described by him as a new species *G. cyrano*, while the Salween and Chao Phraya River basin material were referred respectively to as *G. salweenica* and *G. fuliginosa*, with which *Discolabeo fisheri* was synonymized. The Red River basin material was provisionally recognized by Kottelat (2001a) based on comparison with the illustration by Chu (1984: 354) as distinct from *G. orientalis* s. str.. Whether this material is conspecific with *G. bourreti* from the Lo River in Vietnam or *G. rhynchota* Koller, 1926 from Hainan Island in China remained undetermined, however. To facilitate comparison, we still recognize it as *G. orientalis* here, with which *G. bourreti* and *G. rhynchota* are tentatively synonymized, as it was done in the known Chinese literatures (Wu et al., 1977; Chu & Cui, 1989).

As for the materials previously reported by Chu & Cui (1989) as *G. orientalis* from the Yiluowadi Jiang (Irrawaddy River), Nu jiang (Salween River) and Lancang Jiang (Mekong River) basins, Kottelat (2000, 2001a) made no comments about their assignments perhaps due to inaccessibility to them. But Kottelat (2000:42) referred the material from the Salween River basin in Thailand to *G. salweenica*. Apparently, the Chu & Cui's (1989) material from the Nu Jiang (Salween River in China) basin should be assigned to the species. Our observation proved that the Nu Jiang (Salween River) basin material is conspecific with *G. salweenica* and the Lancang Jiang (Mekong River) basin material is identical to *G. orientalis*. And the Yiluowadi Jiang (Irrawaddy River) basin material involves two species. One is not quite distinct from *G. salweenica*. The other is not identifiable with any of the species of *Garra* recognized in China and Southeast Asia to date, thus representing an undescribed species, which is here named as *Garra bispinosa*.

MATERIALS AND METHODS

Counts and measurements were made on the left side of individual whenever possible. All measurements were taken point to point with digital readout calipers input directly into a computer database to 0.1mm precision. Counts and measurements follow those of Kottelat (2001b) with the exception of the lateral line scales. Their counts include scales on the caudal-fin base. The additional measurements are: disc length is measured from the anterior-mid point of the anterior margin to the most point of the posterior margin of the mental disc; disc width is taken between the bases of two maxillary barbels; anus to anal distance is taken from the anus to the anal-fin origin; pelvic to anal distance is taken from the pelvic-fin origin to the anal-fin origin; head depth is taken from the midline at occiput vertically downwards to the ventral contour of the breast; head width is the greatest dimension when opercles are forced into a reasonably normal position. Other additional measurements, i.e. predorsal, prepectoral, prepelvic and preanal length, are taken separately from the snout tip to the dorsal-, pectoral-, pelvic- and anal-fin origin. Subunits of the head are presented as percentages of the head length and the anus to anal distance is given as a proportion of the pelvic

to anal distance. Head length itself and other measurements of body parts are expressed as proportions of the standard length.

The local Chinese toponymy is used for the distribution data. The international English toponymy, if available, is also given in the bracket next to the local Chinese river name whenever it appears in the present paper. The Chinese portion of four Asian rivers, namely the Irrawaddy, Salween, Mekong and Red River, is known locally as the Yiluowadi Jiang, Nu Jiang, Lancang Jiang and Yuan Jiang, respectively. The Pearl River is the English name of the Zhu Jiang in Chinese.

The specimens examined for the present study are deposited in the Institute of Hydrobiology (IHB) and Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences, Academy of Natural Sciences of Philadelphia (ANSP), Pennsylvania and Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore. Abbreviations herein used are: HL, head length and SL, standard length.

TAXONOMY

Garra bispinosa, new species (Figs. 1, 2A)

Material examined. – Holotype -IHB 78IV1537, 121.0 mm SL; Daying Jiang, a tributary flowing to the Yiluowadi Jiang (Irrawaddy River) basin in Yingjiang, Yunnan, China; coll. J. X. Chen & W. X. Li, Apr.1978.

Paratypes – IHB 78IV1460, 78IV1462-4, 78IV1466-7, 78IV1524-9, 78IV1543-5, 78IV1534-6, 78IV1532, 78IV1548-9, 78IV1459, 78IV1538, 78IV1547, 25 ex., 75.7-127.8 mm SL; -ZRC 78IV1542, 1 ex., 104.0 mm SL; other data same as holotype.

Diagnosis. – *Garra bispinosa* can be distinguished from all other congeners in Southeast Asia and China by having a conspicuous, quadrate and forwards pointed proboscis reflected downwards against the snout and anteriorly bilobed with one large, uniscupid and acanthoid tubercle on the distal end of each lobe, and a combination of the following characters: snout with a deep groove across its tip to form a transverse lobe; 34-35 lateral line scales; 16 circumpeduncular scales; a small mental disc (length 38.1-43.8 % HL); an anterior position of anus (anus to anal distance 25.9-30.6 % of pelvic to anal distance); a slightly pointed snout.



Fig. 1. *Garra bispinosa*, IHB 78IV1537, holotype, 121.0 mm SL; China: Yunnan: Yingjiang. Lateral view.

Description. – Measurements and counts from 27 specimens of 75.7–127.8 mm SL are given in Table 1. The photography of the holotype is shown in Fig. 1 and the morphology of the snout and mental adhesive disc are illustrated in Fig. 2, respectively.

Body elongate, somewhat cylindrical anteriorly and compressed posteriorly, dorsal profile slightly convex and ventral surface flattened from head to anal-fin origin. Caudal peduncle stout, length as 1.2–1.4 times as long as width. Head moderately large, more or less depressed with a slight convex interorbital space; depth less than head length; width greater than height. Eye small, dorso-laterally located, closer to posterior margin of opercle than to snout tip. Snout slightly pointed, with a deep groove across its tip in front of anterior margin of lachrymal to form a transverse lobe and a conspicuous, quadrate (1.3–1.6 times wider than long) and anteriorly bilobed proboscis above lachrymal, pointed forwards and reflected downwards against snout. Proboscis in small specimens (75.7–90.9 mm SL) not as conspicuous as in large specimens (99.3–127.8 mm SL). Two pairs of minute barbels; rostral pair anteroventrally positioned, shorter than eye diameter; maxillary pair rooted at corner of mouth and shorter than rostral pair.

Mental disc elliptical, shorter than wide; anterior edge modified into a transverse, crescentic and fleshy fold of skin superficially covered with numerous papillae, anteriorly separated from lower jaw by a shallow and transverse groove and posteriorly bordered in a deep groove with central callous

pad; anterior margin of central callous pad somewhat papillose; lateral and posterior margins free and papillose, surrounding central callous pad; posterior margin not reaching vertical of posterior margin of eye.

Dorsal fin with 4 simple and 7–8 branched rays, last one split to base; last simple ray shorter than HL; distal margin slightly concave; origin closer to snout tip than to caudal-fin base. Pectoral fin with 1 simple ray and 13–14 branched rays, reaching slightly beyond midway to pelvic-fin insertion, shorter than HL. Pelvic fin falcate, with 1 simple ray and 7–8 branched rays, slightly shorter than HL, inserted vertically below base of 2nd or 3rd branched dorsal-fin ray and in halfway between pectoral-fin insertion and anal-fin origin, reaching somewhat beyond halfway to anal-fin origin; axillary scales long, reaching beyond base of last ray. Anal fin with 3 simple and 5 branched rays, distal margin concave, origin closer to caudal-fin base than to pelvic-fin insertion. Anus located closer to anal-fin origin than to pelvic-fin insertion. Caudal fin forked, longest rays about 1.5–2.0 times as long as shortest rays.

Lateral line complete, with 34–35 perforated scales. 4 scale rows above lateral line and $2\frac{1}{2}$ –3 below. 16 circumpeduncular scales. 9–11 predorsal midline scales, slightly smaller than flank scales. Anus separated from anal-fin origin by 3–4 scales. Both belly and breast scaled. Pharyngeal teeth 3 in rows, with slightly compressed and pointed tips. Air bladder bipartite, anterior chamber elliptical and posterior chamber slender, twice as long as anterior chamber.

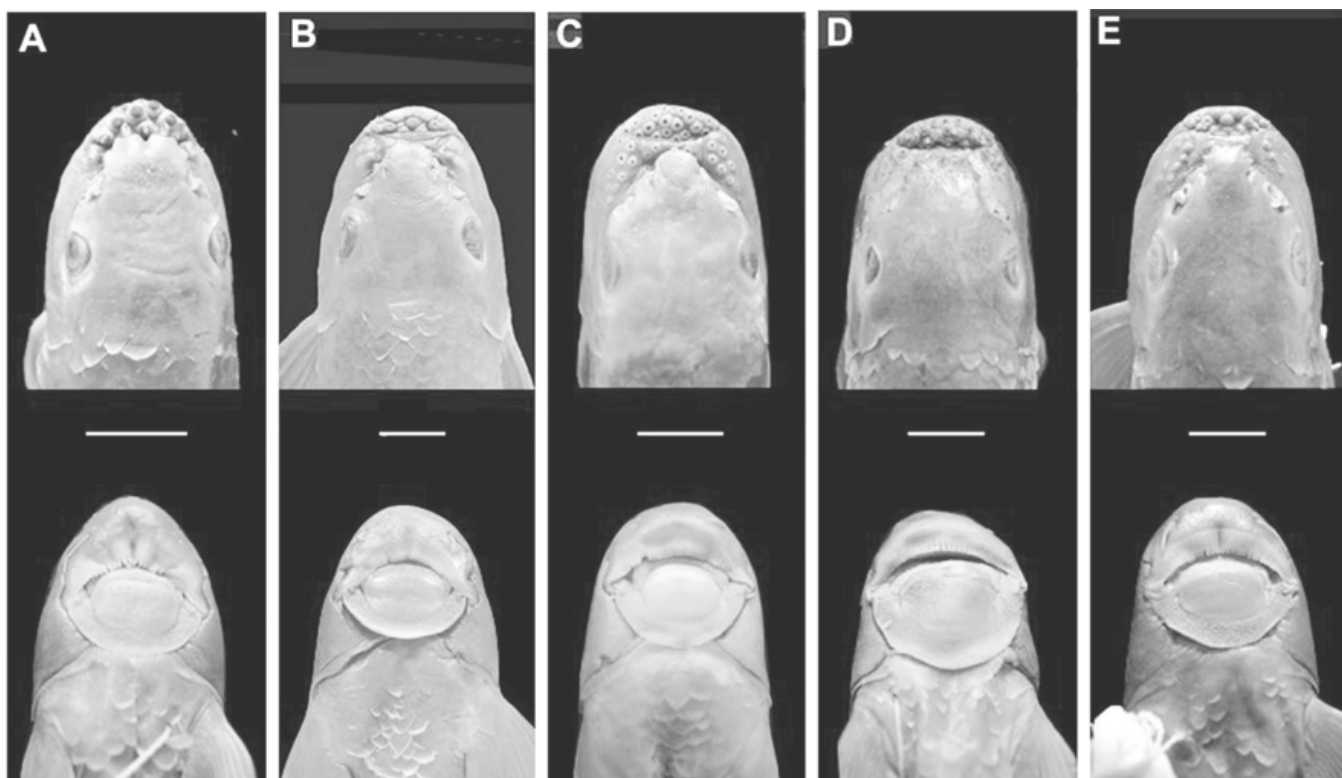


Fig. 2. (A) *Garra bispinosa*, IHB 78 IV1537, holotype, 121.0 mm SL; (B) *G. fuliginosa*, ANSP 58006, holotype, 178.0 mm SL; (C) *G. orientalis*, IHB 90IV0147, 164.8 mm SL; (D) *G. qiaojiensis*, IHB 78IV1051, 146.4 mm SL; (E) *G. salweenica*, IHB 78IV1530, 123.5 mm SL. Top: dorsal view of the snout; bottom: ventral view of the mouth. Scale bar = 1 cm.

Table 1. Morphometric and meristic data for six Chinese species of *Garra*

Species	<i>G. bispinosa</i> (n=27)			<i>G. gravelyi</i> (n=7)			<i>G. orientalis</i> (n=28)			<i>G. qiaojiaensis</i> (n=12)			<i>G. salweenica</i> (n=10)			<i>G. tengchongensis</i> (n=14)										
	Holotype		Paratypes		Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD						
SL (mm)	121.0	75.7	127.8	109.4	14.1	81.2	184.5	134.9	37.0	66.9	139.5	95.4	20.0	92.3	162.4	123.9	24.0	94.0	174.4	131.8	23.2	51.3	87.0	68.1	11.1	
% SL																										
Body depth	23.3	20.8	24.1	22.5	1.0	18.5	21.0	20.3	0.9	19.9	26.8	23.4	1.7	21.6	25.6	23.0	1.5	22.4	25.3	23.6	0.9	20.4	24.6	22.2	1.4	
Head length	23.9	22.6	24.6	23.5	0.7	19.7	21.7	20.7	0.9	20.5	25.7	22.6	1.1	21.8	23.9	22.6	0.8	20.1	24.1	22.8	1.1	20.2	25.3	22.5	1.5	
Head depth	17.9	15.4	17.6	16.6	0.7	12.5	14.4	13.4	0.8	16.5	18.6	17.3	0.5	14.0	17.3	16.0	1.1	15.2	18.6	17.1	1.0	13.8	17.0	15.3	1.0	
Head width	19.3	16.4	18.8	17.7	0.8	15.8	18.5	16.9	1.0	16.4	19.3	17.8	0.8	16.5	18.8	18.3	0.3	17.1	20.2	18.8	1.1	17.0	19.5	18.2	0.9	
Dorsal-fin length	23.3	20.9	23.4	22.5	0.9	21.2	24.2	23.0	1.3	41.1	52.5	46.2	2.7	23.5	25.8	24.1	0.9	23.3	26.6	25.1	1.2	17.6	19.5	18.6	0.7	
Pectoral-fin length	21.7	19.1	21.6	20.1	0.8	18.6	21.1	19.8	1.0	22.2	26.1	24.2	1.1	21.2	23.0	22.1	0.6	20.2	22.9	21.2	0.9	11.8	14.3	13.1	0.8	
Pelvic-fin length	21.0	17.7	21.2	19.3	1.2	16.5	19.9	18.9	1.2	15.1	20.0	17.3	1.2	19.5	21.8	20.5	0.8	19.0	21.9	20.2	1.0	14.0	16.3	14.8	0.7	
Anal-fin length	19.7	17.3	19.6	18.6	0.6	15.9	18.1	17.2	0.9	16.8	21.8	19.2	1.0	17.2	20.7	19.0	0.8	17.3	20.2	19.0	1.0	14.7	19.4	15.9	1.5	
Length of caudal peduncle	16.3	14.7	18.5	16.0	1.2	14.3	16.1	15.4	0.8	11.4	17.8	14.4	1.7	15.5	17.1	16.7	0.6	14.6	17.9	16.0	1.2	14.8	17.1	15.9	0.9	
Depth of caudal peduncle	13.5	12.4	13.6	13.0	0.4	10.8	11.8	11.4	0.3	12.2	14.4	13.4	0.7	11.3	12.6	12.2	0.5	13.5	14.9	14.0	0.4	12.0	13.2	12.6	0.5	
Predorsal length	45.0	44.0	48.0	46.3	1.3	45.5	48.0	46.7	0.9	42.4	48.1	44.7	1.3	47.3	48.3	47.8	0.3	45.2	49.4	47.2	1.5	48.1	51.9	49.6	1.2	
Prepectoral length	22.9	20.9	24.2	22.3	1.1	18.5	21.2	19.8	1.3	20.6	25.9	22.2	1.2	20.0	23.3	21.4	1.2	19.4	23.9	21.5	1.4	18.3	22.6	21.0	1.5	
Prepelvic length	52.6	48.2	53.2	51.1	1.6	50.1	53.9	51.3	1.4	48.7	56.4	52.3	2.0	50.1	59.5	53.9	3.1	46.7	55.1	51.4	2.3	52.5	59.3	54.6	2.0	
Preanal length	78.7	76.4	80.1	78.2	1.2	77.8	81.2	79.5	1.2	74.1	81.7	77.3	2.1	77.5	79.9	78.8	1.0	76.5	81.2	78.3	1.6	75.9	78.7	76.9	1.0	
% HL																										
Snout length	51.8	49.5	56.5	53.2	2.5	47.2	53.6	51.2	2.7	44.6	56.5	51.3	3.3	48.9	54.6	51.8	2.3	49.0	55.9	52.0	2.4	44.4	49.1	45.7	1.4	
Eye diameter	19.9	17.9	21.7	19.8	1.1	14.8	18.6	16.7	1.7	18.2	24.8	21.7	1.8	13.9	19.1	16.5	1.7	16.3	22.0	18.6	1.7	17.0	23.3	19.6	1.9	
Interorbital width	47.2	43.3	51.1	47.2	2.6	46.8	56.9	50.2	3.8	41.1	52.5	49.7	3.7	43.4	53.2	48.7	3.3	41.4	48.6	44.6	2.2	43.6	51.8	48.4	2.9	
Disc length	39.7	38.1	43.8	41.0	1.7	48.2	57.8	52.2	3.4	32.5	43.1	37.4	2.6	48.7	55.9	52.2	2.8	39.2	47.9	41.9	2.6	36.1	42.5	40.1	1.9	
Disc width	58.9	53.9	60.9	56.6	2.9	68.8	74.7	71.0	2.7	47.8	70.7	58.1	5.1	62.5	70.8	67.1	3.1	56.0	62.8	59.2	2.5	43.3	56.0	49.5	3.8	
% Pelvic-anal distance																										
Anus-anal distance	28.6	25.9	30.6	28.4	1.3	32.1	39.2	35.9	2.5	16.8	25.9	22.0	2.9	22.8	28.3	25.7	2.0	19.0	25.4	21.0	2.1	49.5	51.8	50.7	0.8	
Dorsal-fin rays	iv, 8		iv, 7-8			iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		iv, 8		
Anal-fin rays	iii, 5		iii, 5			iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		iii, 5		
Pectoral-fin rays	i, 13		i, 13-14			i, 13-15		i, 13-15		i, 14-15		i, 14-15		i, 13		i, 13		i, 12-13		i, 12-13		i, 12-13		i, 12-14		
Pelvic-fin rays	i, 8		i, 7-8			i, 8		i, 8		i, 8		i, 8		i, 8		i, 8		i, 8		i, 8		i, 8		i, 8		
Lateral line scales	34		34-35			36-37		32-34		32-34		32-34		34		34		33-34		33-34		33-34		37-38		
Scales above lateral line	4		4			3		4		4		4		4		4		4		4		4		3 ^{1/2} -4		
Scales below lateral line	2 ^{1/2}		2 ^{1/2} -3			2 ^{1/2} -3		3		3		2 ^{1/2} -3		2 ^{1/2} -3		2 ^{1/2} -3		3-3 ^{1/2}		3-3 ^{1/2}		3		3		
Predorsal scales	10		9-11			10-11		9-10		9-10		10		10		10		9-11		9-11		12		12-14		
Circumpeduncular scales	16		16			12		16		16		12		12		12		16		16		12		12		
Scales between anus and anal-fin origin	4		3-4			5		3-4		3-4		3-4		3-4		3-4		3-4		3-4		3-4		5-6		

Proboscis with one large, unicuspid, acanthoid and forwards pointed tubercle on distal end of each lobe and several tiny tubercles on lateral margin. Anterior part of lachrymal covered by some tiny acanthoid tubercles. Tubercles present on transverse lobe of snout, unicuspid, acanthoid, more or less organized in two rows, slightly smaller than those on proboscis.

Color pattern. – In formalin-preserved specimens, body brown dorsally and laterally, gray ventrally. Three or four longitudinal blackish lateral stripes extending along posterior portion of body, more prominent on caudal peduncle in small specimens. A series of dark spots at base of dorsal-fin rays and sometimes a dark spot at upper extremity of gill opening. Pectoral fin with a dark dorsal surface of outside rays. Caudal fin with black median rays.

Distribution. – *Garra bispinosa* is currently known from the Daying Jiang, a tributary flowing to the Yiluowadi Jiang (Irrawaddy River) basin in Yunnan, South China.

Etymology. – The name *bispinosa* is made from the Latin *bi* (two) and *spinus* (spiny), in allusion to a large, unicuspid, acanthoid and forwards pointed tubercle on the distal end of each lobe of the proboscis on the snout.

Remarks. – Among the species of *Garra* presently recognized from China and Southeast Asia, there are five species closely associated with *G. bispinosa* in having a conspicuous and heavily tuberculated proboscis on the snout, viz. *G. cyrano*, *G. fuliginosa*, *G. orientalis*, *G. qiaojiensis* and *G. salweenica*. These species exhibit distinct variations in the general shape of the proboscis, a character that can be employed with some degree of confidence to distinguish some of them. As illustrated by Kottelat (2000, 41: fig. 6), *G. cyrano* has a long and slender proboscis (slightly longer than its width at basis) covered by large tubercles, pointed forwards and not in contact with the snout along its inferior side. The proboscis of *G. qiaojiensis* is quadrate (1.6-1.8 times wider than long), reflected downwards against the snout and anteriorly heavily tuberculated (Fig. 2D: top). A roughly triangular proboscis is present in *G. orientalis* (Fig. 2C: top), trilobed with two small but well-defined lateral lobes that are more or less anteriorly free and a large median lobe anteriorly heavily tuberculated, and not in contact with the snout along its inferior side; the same proboscis is also shared with *G. fuliginosa* (Fig. 2B: top) and *G. salweenica* (Fig. 2E: top). These three species were formerly synonymized by Menon (1964) with *G. nasuta*. Recently, they were recognized as three distinct species by Kottelat (1998, 2000, 2001a) and Rainboth (1996). Color pattern is considered as one of the most important characters used to distinguish them. *Garra salweenica* has a brown body, a series distinct black spots at the base of the median dorsal fin rays, and a black mark at the tip of the upper (and sometimes the lower) caudal fin lobe, with a black blotch on the caudal-fin base and no distinct black spots at the base of the median dorsal-fin rays in *G. fuliginosa* (Kottelat, 2000; Rainboth, 1996). In contrast, *G. orientalis* has no black spots at the base of the median dorsal-fin rays and no black blotch on the caudal-fin base.

Nevertheless, in-depth study based on fresh material from all known localities is needed for the identification of these three species and their distributions.

From five aforementioned species, *G. bispinosa* can be distinguished by having a quadrate (roughly 1.3-1.6 times wider than long) proboscis anteriorly bilobed with one large, unicuspid, acanthoid, and forwards pointed tubercle on the distal end of each lobe (Fig. 2A: top). *Garra bispinosa* is further distinct from *G. qiaojiensis* in having more circumpeduncular scales (16 vs. 12), a smaller mental adhesive disc (length 38.1-43.8 % HL vs. 48.7-55.9) (Fig. 2A, 2D: bottom) and a slightly pointed snout (vs. round), and from *G. orientalis* by the possession of a series of black spots at the base of the dorsal-fin rays (vs. absent), an anterior position of the anus (anus to anal distance 25.9-30.6 % of pelvic to anal distance vs. 6.8-25.9) and a somewhat pointed snout (vs. blunt) (Fig. 2A, 2C: bottom). *Garra bispinosa* is further distinguished from *G. cyrano* in having a brown body with 3 or 4 faint stripes on posterior part (vs. a dark brown to black body with 6 faint stripes on the posterior portion). *Garra bispinosa* is distinct from *G. fuliginosa* in having no large dark blotch on the caudal peduncle (vs. present) and a series of black spots at the base of the dorsal-fin rays (vs. absent), and from *G. salweenica* in having a more forwards situated anus (anus to anal distance 25.9-30.6 % of pelvic to anal distance vs. 19.4-25.4) and a slightly pointed snout (vs. blunt) (Fig. 2A, 2E: bottom).

There are other three species with a conspicuous proboscis currently known from the Manipur River (Chindwin River basin) in India (Vishwanath, 1993). They are: *G. gotyla stenorrhynchus*, *G. litanensis* and *G. nasuta*. Among them, *G. nasuta* maybe is misidentified. Despite Vishwanath (1993) followed Menon (1964) to consider *G. nasuta* as valid, Kottelat (2000) showed that the Southeast and East Asian material identified by Menon (1964) as *G. nasuta* is not identical to his 1964 (pl. 13 figs. 11-12) material from Assam in India and that Menon's material from Assam is actually the misidentified specimens of *Gonorrhynchus caudatus*, a species originally described by McClelland (1839) from the 'Mishmee mountains' (not Kasya mountains as reported by Menon, 1964: 239). The identification of Vishwanath's (1993) material is no doubt beyond the scope of the present paper. Therefore, it is tentatively recognized as *G. cf caudata*.

The shape difference of the proboscis is a significant character utilized to distinguish among three species mentioned above. *Garra gotyla stenorrhynchus*, as illustrated by Vishwanath (1993), has an unilobed and prolonged proboscis (as long as width at its base), *G. litanensis* has an unilobed and quadrate proboscis (slightly wider than long) and *G. cf caudata* has a trilobed, short and wide proboscis (twice as wide as long). *Garra bispinosa* can be distinguished from them in having a bilobed (vs. unilobed or trilobed) proboscis with one large, unicuspid and acanthoid tubercle on the distal end of each lobe (vs. with many small tubercles on its distal margin) and a slightly pointed (vs. blunt) snout. It is further distinct from *G. gotyla stenorrhynchus* in having a shorter predorsal length (44.0- 48.0 vs. 56.2-75.2), from *G. litanensis* in having a

scaled chest (vs. scaleless) and 34-35 lateral line scales (vs. 32-33), and from *G. cf. caudata* in having a quadrate proboscis with 1.6-1.8 times wider than long (vs. twice as wide as long). Data for *G. gotyla sterrhynchus*, *G. litanensis* and *G. nasuta* were obtained from Vishwanath (1993).

Besides *G. salweenica* and *G. qiaojiensis*, there are other two species currently known from the Yiluowadi Jiang (Irrawaddy River) basin in China: *G. gravelyi* and *G. tengchongensis*. Both can be distinguished from *G. bispinosa* in possessing no conspicuous and heavily tuberculated proboscis on the snout. *Garra gravelyi* is further distinct from *G. bispinosa* in having fewer circumpeduncular scales (12 vs. 16), more lateral line scales (36-37 vs. 34-35), a shorter head (length 19.7-21.7 % SL vs. 22.6-24.6) and a slender caudal peduncle (depth 10.8-11.8 % SL vs. 12.4-13.6). *Garra tengchongensis* further differs from *G. bispinosa* in having fewer circumpeduncular scales (12 vs. 16), more lateral line scales (37-38 vs. 34-35), shorter dorsal fin (length 19.7-19.5 % SL vs. 20.9-23.4), shorter snout (length 44.4-49.1 % HL vs. 49.5-56.5) and an anterior position of the anus (anus to anal distance 49.5-51.8 % of the pelvic to anal distance vs. 25.9-30.6).

Comparative material. – *G. fuliginosa*: ANSP58006, holotype, 178.0 mm SL, Metang River in northern Thailand [photograph examined]. *G. gravelyi*: IHB78IV1162-3, 90IV0137-8; 5 ex., 81.2-184.5 mm SL, Daying Jiang (a tributary flowing to the Yiluowadi Jiang [Irrawaddy River] basin) in Tengchong, Yunnan; IHB 78IV1664-5, 2 ex., 111.0-125.6 mm SL, Daying Jiang in Yingjiang, Yunnan. *G. orientalis*: IHB 75IV1933-5, 81X4594, 81X0148; 5 ex., 66.9-131.7 mm SL, Li Jiang (a tributary to the Zhu Jiang [Pearl River] basin) in Yangsuo, Guangxi; IHB 537811, 537654, 537876, 537607, 537593, 537776, 6 ex., 76.7-88.1 mm SL, Li Jiang in Guiling, Guangxi; IHB 74VI1032-5, 74VI1119, 5 ex., 107.8-139.5 mm SL, Min Jiang in Shanghang, Fujian; IHB 9805001-13, 13 ex., 71.9-103.7 mm SL, Lancang Jiang (Mekong River) basin in Yangbi, Yunnan. *G. qiaojiensis*: IHB 60.542 (holotype), 90IV0998, 90IV0076-8, 90IV1051-2, 90IV0119, 90IV029, 90IV0121, 90IV0288-9, 78IV1051; 12 ex., 92.3-162.4 mm SL, Daying Jiang in Tengchong, Yunnan. *G. salweenica*: KIZ 20007303, 1 ex., 115.1 mm SL, Nu Jiang in Liu Ku, Yunnan; IHB 78IV1546, 78IV1549, 78IV1541, 78IV1536, 78IV1521, 78IV1530, 6 ex., 114.7-174.0 mm SL, Daying Jiang in Yingjiang, Yunnan. CMK 14675, 3 ex., 71.6-88.9 mm SL; Mae Nam Moei, Tak Province, Thailand. *G. tengchongensis*: KIZ 839420, 839439, 8310433, 830406, 839430, 5 ex. 64.2-70.8 mm SL; IHB, 90IV0237-43, 90IV0189-90, 9 ex., 51.3-87.0 mm SL, Daying Jiang in Tengchong Yunnan.

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