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New record of bagrid catfish *Chandramara chandramara* (Hamilton, 1822) from Singen River of east Siang district, Arunachal Pradesh (a biodiversity hotspot)

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Abstracts

The bagrid catfish Chandramara chandramara (Hamilton) was originally described from North Bengal province, India and has now been recorded from Arunachal Pradesh, for the first time. The specimens were collected by the authors using cast net from the Singen river of East Siang District, Arunachal Pradesh. The specimens were preserved in 10 % formalin and deposited in Rajiv Gandhi University Museum of Fishery (RGUMF), Rajiv Gandhi University, Itanagar, Arunachal Pradesh, India. The detailed description, diagnostic, and comparison of the specimens agreed with the original description of Chandramara chandramara (Hamilton) and thereby it extends the geographical distribution of the species chandramara chandramara (Hamilton) up to the water bodies of Arunachal Pradesh, exhibiting its wide range of habitat adaptability.

Key words- First record, catfish, *Chandramara chandramara*, Singen river, Arunachal Pradesh.

Introduction

Arunachal Pradesh (AP) is one of the largest and hilly states in entire northeastern India with a geographical area of about 83,743 sq km and situated at the easternmost part of union of India. The state is drained by a number of river and rivulets including Singen river which traverse mountainous topography of the area with gradient heterogeneity. Singen river originated near the Piri-Sago area of West Siang District and enters into East Siang district near Rina village and passes through forested areas and villages viz. Koyu, Rami, Rotte, Saku(Kadu), New Seren, etc. and finally drained off in Brahmaputra river in Assam as one of its tributaries (Fig.1). While working on the various groups, many contributions have been made by different workers (Hamilton, 1822; Blyth, 1860; Day, 1877; Jayaram, 1981, 1996, 2006; Tilak, 1987; Rahman, 1989; Ng and Kottelat, 2001 and Ferraris, 2007, regarding exploration and documentation of ichthyofaunal diversity of diverse habitats of various places. Considering the studies related to fish diversity in rivers of Arunachal Pradesh, it is very scarce and fragmentary with only a few literatures available. Hamilton (1822); Chaudhury (1978, 1980, and 1981) initially made significant contributions which later on extended by Sen (1985), Nath and Dey (2000) and Tamang *et al*. (2006). Further, Bagra *et al.* (2009) have made an effort of exhaustive survey of ichthyological diversity of Arunachal Pradesh; but however, *Chandramara chandramara* (Hamilton) left unreported, by the entire earlier worker. The present paper deals with a new record of little known Bagrid catfish, the

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Chandramara chandramara (Hamilton), from the Singen river of East Siang district, Arunachal Pradesh, India.

Materials and Methods

Small sized bagrid catfishes of genus *Chandramara* were collected from the Singen river using cast net during 2008 to 2009. The specimens were preserved in 10% formalin solution and subsequently deposited and registered in Rajiv Gandhi University Museum of Fishery (RGUMF), Rajiv Gandhi University, Arunachal Pradesh, India.

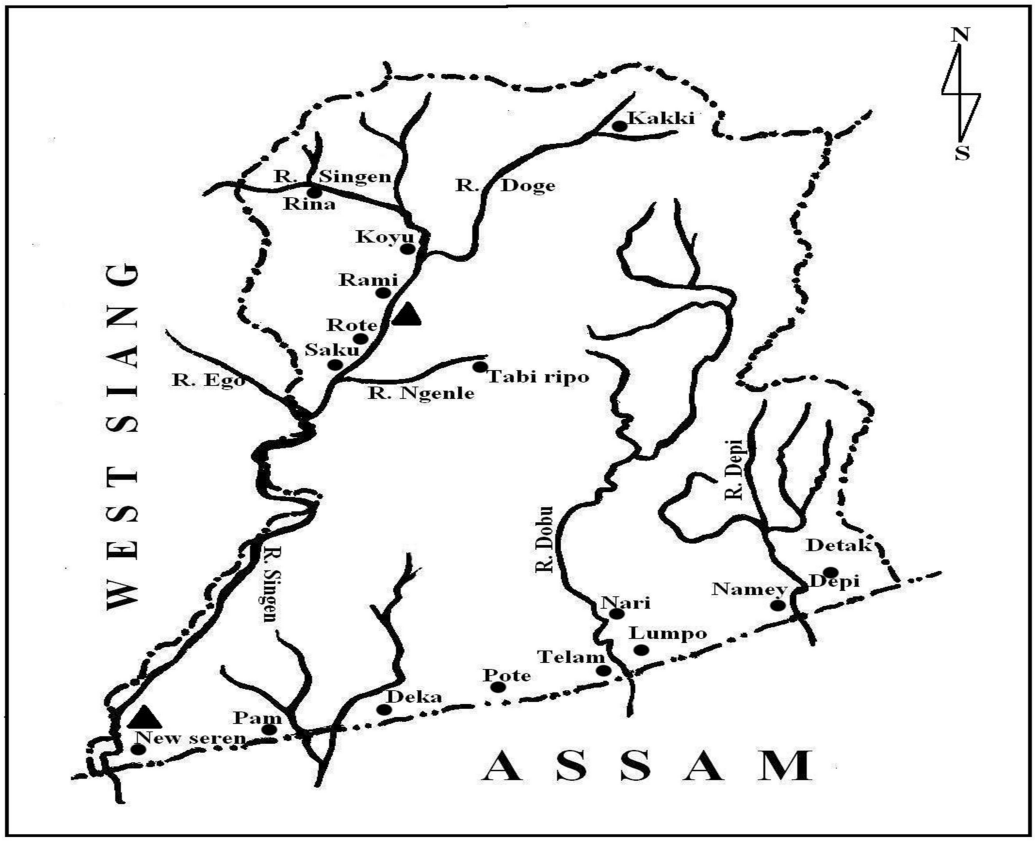

Fig.1. Map showing collection site (Map not in scale)

Morphometric measurements were taken using dial caliper and data were recorded to the tenth of a millimeter. The Counts and measurements were made from the left side of specimen following Ng and Kottelat (2001) and Kottelat (2001). The body proportion was expressed as percentage of standard length (SL) and the units of the head are presented as proportion of head length (HL).

All the morphometric and meristic taxonomic traits also and the diagnostic features generated were compared with original descriptions of Hamilton (1822) followed by validation of genus *Chandramara* as described by Jayaram (1966, 1981 & 2006).

The present valid generic and species name were used according to the internationally accepted valid names as available in the online catalogue of fishes, California Academy of Science, Ichthyology, and World fish base.

Fig. 2. *Chandramara chandramara* Hamilton, 1822), (Lateral view).

Results

1822: *Pimelodus chandramara* Hamilton, *Fish Ganges*, pp.162, 375 (Type locality north Bengal).
1877: *Leiocassis rama* Day, *Fishes of India*. pp.451, pl. CXIV, Fig.2,(Synonym).
1840: *Silundia chandramara* Valenciennes, *Histoire Naturelle des Poissons*.15:49, (river Atrai).
1860: *Batasio chandramara* Blyth, *Journal of Asiatic Society of Bengal*, 29:149.
1966: *Rita chandramara* Jayaram, *International .Rev des Gesum Hydrobiol*. 51: 442.
1971: *Chandramara chandramara*, Jayaram, *International .Rev des Gesum Hydrobiol* 57(5):816, fig.1.
1977: *Chandramara chandramara*, Jayaram, *Records zoological survey of India, Occasional paper* No. 8:19 (diagnosis)
1987: *Chandramara chandramara* Tilak, *Matsya.* No.12-13: 84-92, fig.6,7. pl.1. (Philbhit, U.P).
1989: *Chandramara chandramara* Rahman, *Freshwater fishes of Bangladesh*.
1999: *Rama chandramara* Talwar and Jhingran, *Inland fishes* 2:574, Fig. 191.
2006: *Rama chandramara* Jayaram, *Catfishes of India*. pp.69. Fig 2.
2007: *Chandramara chandramara* Ferrari, *Zootaxa*, 1418: 1-628.

Material examined

11 examples (SL: 42-47mm). RGUMF- 00220; Collection date: 16.09.2009. Collection site: Singen river: Rami (Koyu) and near new Seren Village, East Siang Districts, A.P. Collected by Kento Kadu.

Diagnosis

The present specimen, C*handramara chandramara* (Hamilton) can easily be distinguished from its nearest congener *Rama rama* (Hamilton) in various distinguishing characters viz. in having shorter first dorsal fin spine (shorter than head length) vs. longer dorsal spine (equal or some times longer than head length); pelvic fin not reaching base of anal fin vs. pelvic reaching the base of anal fin and the dorsal spine with weak serration vs. without serration in *R.rama*.

Description

D:I, 6-7 ; P:I,iii,5; V:i,5; A: i-iii, 12-13; C:16-17.

All the morphometric measurements are given in table: 1. Body short and compressed laterally towards caudal base. While dorsal profile of the body showed rising appearances from tip of snout up to dorsal fin origin and sloping gently towards the caudal fin base; its ventral profile exhibited rise from the tip of snout up to the origin of pectoral fin and thereafter gentle slope dorsally towards the base of caudal fin. Abdomen rounded, without any adhesive apparatus. Head of moderate size, compressed, snout obtusely rounded. Mouth sub-terminal with upper jaw slightly longer than lower. Median longitudinal groove on head long, extending up to the base of occipital process, which is more in length than width, reaching to basal bone of dorsal fin. Eyes moderately large, dorso-lateral in position, placed almost in the middle of the lateral head length, and is slightly visible from ventral surface. Barbels four pairs, one maxillary and a nasal pair each, of which maxillary pair slightly longer reaching the posterior margin of orbit. Mandibular barbels two pairs (inner and outer) which is shorter than maxillary and nasal.

Rayed dorsal fin with moderately strong spine and with weakly anterose serration on the anterior portion of spine and is inserted above the posterior half the pectoral fin length. When add pressed, the longest dorsal ray did not reached to the origin point of adipose dorsal fin. When observed vertically, adipose dorsal fin was found to be low and did not reach to the caudal fin base and originated just behind the insertion point of anal fin. Pectoral fins with strong spine, having 12-13 anterose serration on anterior portion of spine, pectoral did not reach the pelvic fin origin when add pressed. Pelvic fin with pointed end inserted in between the origin of rayed dorsal and adipose dorsal fin and did not reach anal fin origin when laid flat. Anal fin slightly long, originated just ahead of adipose dorsal when observed vertically; and when laid flat, it did not reach caudal base. Caudal fin forked both lobes almost of equal length. Lateral line present, complete, almost straight except slightly curved upward near the shoulder spot. Vertebrae 15+18(19) = 33-34.

Body colour whitish yellow with irregularly distributed black spot on the lateral and dorsal surface of the body, while ventral portion are white. A prominent semi-translucent shoulder spot is always present.

Sexual dimorphism is very prominent in *Chandramara chandramara* (Hamilton) species. Male having prominent genital papilla just behind the vent, while female counterpart devoid of such papilla.

Discussion

Earlier, the systematic position of the genus *Chandramara* had been confused as different authors placed the same species under different genera. Hamilton, (1822) while describing two species *Pimelodus rama* and *Pimelodus chandramara*, kept them under the genus *Pimelodus*. It was Bleeker (1862) who first provisionally erected the genus *Rama* and included it under the family Ritae along with *Rita*. Later on, after thorough study of the original drawing and illustration of these two, the former was found sufficiently distinct to warrant a new generic status. Day (1877) wrongly placed the species under the genus *Leiocasius* while describing *Leiocasius rama* from Assam. Tilak (1987) while working on the extension range of distribution of *Conta conta* (Hamilton) and *Chandramara chandramara* (Hamliton), kept the species under different genera as *Chandramara*. Rahman (1989) kept the same species under the genera *Chandramara*, while doing his taxonomic study on the freshwater fishes of Bangladesh, and supported the work of Tilak (1987). Mo (1991) clearly mentioned in his work as it was the synonym to *Batasio* Blyth. Talwar and Jhingran (1991) again adjusted the species under the genus *Rama*. It was Ng and Kottelat (2001) who distinguished it from *Batasio* with the following characters such as short adipose dorsal fin base vs. moderately long in *Batasio* and conspicuously visible vs. slightly (or not) visible orbital margin from ventral surface; and segregated *Rama* as a distinct genus from both genera *Chandramara* and *Batasio*. Jayaram (2006) again placed the same species under the genus *Rama* along with the other species *Rama rama* (Hamilton). However, Ferrari (2007) while compiling the checklist of

catfishes, recent and fossils, kept the species under the genus *Chandramara* in the catalogue of siluriform fishes.

All the species of the genus *Chandramara* are characterized by the presence of prominent dark translucent shoulder spot; short adipose dorsal fin base; sparsely distributed dark irregular spot on the body. The valid species *Chandramara chandramara* (Hamilton) therefore, can be distinguished from its nearest congener *Rama rama* (Hamilton) in having shorter dorsal spine vs. longer dorsal spine and pelvic fin not reaching the anal fin base vs. reaching anal fin origin. The type specimens collected from Singen river of Arunachal Pradesh, agreed with all morphological and meristic counts with that of *Chandramara chandramara* (Hamilton). Recently, Bagra *et al.* (2009) while compiling the checklist of the fishes of Arunachal Pradesh did not mention about the availability of the species *Chandramara chandramara* (Hamilton) from the any

Table No. 1. Morphometric measurement of *Chandramara chandramara* (Hamilton) in % of Standard Length (SL) and Head Length (HL) in mm (n=11)

Characters	Type specimen	Range (N=15)	Mean ± SD
In % of SL (mm)			
1. Standard length	45.0	42.0-47.0	44.3±1.9
2. Head Length	12.5	25.6-29.7	27.6±1.5
3. Body width	6.0	11.6-13.9	12.7±1.0
4. Body depth	13.0	27.7-30.9	28.9±1.3
5. Pre dorsal length	18.5	40.4-41.7	41.0±0.5
6. Pre pectoral length	11.5	25.5-27.8	26.6±1.1
7. Pre pelvic length	24.0	48.8-53.3	51.4±1.7
8. Pre anal length	32.0	67.5-71.1	69.8±1.4
9. Pre adipose length	35.0	14.5-81.4	78.1±2.5
10. Dorsal fin Height	9.0	17.0-20.0	18.7±1.1
11. Dorsal fin base length	6.0	11.9-13.3	12.7±0.5
12. Pectoral fin Height	10.0	20.9-22.2	21.5±0.5
13. Pectoral fin base length	1.5	2.1-3.3	2.5±0.5
14. Pelvic fin Height	7.0	12.8-16.7	14.8±1.5
15. Pelvic fin base length	1.0	2.1-1.4	2.3±0.1
16. Anal fin height	9.0	20.0-21.3	20.6±0.5
17. Anal fin base length	8.0	16.0-18.6	17.3±1.0
18. Caudal fin lobe height	11.5	23.3-28.6	25.2±2.0
19. Caudal peduncle length	4.0	8.9-9.6	9.3±0.3
In % of HL (mm)			
1.Snout length	4.0	28.0-33.3	30.6±2.1
2. Eye diameter	3.5	28.0-33.5	30.7±2.0
3. Head height at eye	7.0	48.0-56.0	53.1±3.0
4. Head width at eye	5.5	37.5-45.8	42.8±3.1
5. Median longitudinal groove length	10.0	8.0-10.0	11.3±0.8

water bodies of the state. Being, recorded only up to the state of Assam (Sen, 1985), the present paper concluded the extension of geographical distribution of this present species *Chandramara chandramara* (Hamilton) up to Arunachal Pradesh (a Biodiversity hotspot) the easternmost states of Indian union.

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