

KEY FOR THE TWO SPECIES

<i>Pueraria garhwalensis</i> sp. nov.	<i>Pueraria ferruginea</i> Kurz
1. Annual glandular-hairy herbs.	Perennial hirsute herbs.
2. Stipules large, ca 7 mm long.	Stipules small, ca 3 mm long
3. Leaflets sparsely hairy.	Leaflets densely hairy.
4. Bracts persistent.	Bracts caducous.
5. Calyx large, ca 5 mm	Calyx small, ca 2.5 mm long.
6. Stamens diadelphous (9+1); anthers not uniform.	Stamens monadelphous; anthers uniform.
7. Pods narrow 3 mm broad, glandular hairy with persistent bracts and stamens.	Pods broader, 5-6 mm, sparsely hairy, without persistent bracts and stamens.

lanceolate, 7 mm long. Inflorescence axillary or terminal, fasciculate, 2- 3 nate, racemes. Flowers emerge with leaves; flowers c 7 mm long, with persistent bracts; bracts lanceolate, c 6 mm long, glandular hairy on both the sides. Pedicel c 4 mm long. Calyx campanulate, c 5 mm long, tube longer than teeth; teeth 5-lobed, unequal, 2 smaller, 3 larger. Corolla bluish-purple; vexillum ovate, 7 mm long; wing shortly narrow, feathery, c 7 mm long; keel shortly feathery, c 7 mm long. Stamens diadelphous (9+1), vexillary one fused at the base of column; anthers unequal. Carpel c 7 mm long; ovary minutely hairy, stipitate; style short, curved; stigma capitate. Pods linear, adpressed glandular hairy, ca 3.0 x 0.3 cm, with persistent bracts and stamens. Seeds 1 - 4 in a pod, c 2 mm long as well

as broad.

Flowering and Fruiting: August - November.

Ecology: In moist and shady places along roadsides on slopes, associated with *Carrisa opaca*, *Berberis* and *Rubus* species.

Etymology: The species is named after the locality of Garhwal Himalaya, in Uttar Pradesh, India.

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2. *GARRA SURENDRANATHANII* - A NEW CYPRINID FISH FROM THE SOUTHERN WESTERN GHATS, INDIA¹

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(With one text-figure)

INTRODUCTION

Nineteen species of *Garra* have been described from the Indian subcontinent. Of these, five are distributed in the state of Kerala. These are *Garra mullya* (Sykes), *G. gotyla stenorhynchus* (Jerdon), *G. McClellandi* (Jerdon), *G. hughi* Silas and *G. menoni* Remadevi and Indra (Jayaram, 1981; Talwar and Jhingran, 1991). *G. menoni* (Remadevi and

Indra, 1986) described from the Kunthi river of Silent Valley, Kerala was later synonymised with *G. mullya* by Talwar and Jhingran (1991) without any discussion. But Menon (pers. comm.) considers it as a valid species. A new species of *Garra*, collected recently from three river systems of Kerala originating from Western Ghats is described

STUDY AREAS

(i) Chalakkudy river flows through the central portion of Kerala. The collection location of the stream (76° 41' E and 10° 22' N) is narrow (15m),

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MORPHOMETRIC MEASUREMENTS OF *Garra surendranathanii* SP. NOV.

	Holotype	Paratypes		
		Range	Mean	SD
% Standard Length				
Total length	117.27	116.66-119.87	118.14	1.61
Head length	19.87	18.25-21.98	20.20	1.52
Snout length	8.42	9.12-11.18	9.85	0.94
Eye diameter	5.55	4.93-5.59	5.35	0.30
Inter orbital width	7.93	7.45-8.37	7.84	0.38
Depth of body at dorsal origin	15.87	12.65-16.23	14.80	1.57
Depth of body at anal origin	12.56	12.11-12.69	12.38	0.23
Pre-dorsal distance	40.83	38.49-42.87	40.89	1.80
Pre-pectoral distance	20.94	15.27-20.94	18.03	2.31
Pre-anal distance	72.25	72.22-73.14	72.57	0.36
Pre-ventral distance	46.27	44.44-47.64	46.33	1.36
Length of dorsal fin	21.98	17.50-22.36	20.48	2.13
Length of ventral fin	17.39	17.27-18.25	17.90	0.45
Length of anal fin	17.27	16.04-17.39	16.69	0.55
Length of pectoral fin	19.84	18.63-22.51	20.29	1.63
Basal width of dorsal fin	14.28	13.36-14.31	13.72	0.41
Basal width of ventral fin	5.55	4.96-5.55	5.35	0.27
Basal width of anal fin	7.14	6.28-7.41	6.92	0.47
Basal width of pectoral fin	6.83	6.28-7.09	6.70	0.33
Depth of caudal peduncle	9.92	9.31-10.49	9.01	0.48
Length of caudal peduncle	21.42	17.80-22.04	20.07	1.74
% Head Length				
Eye diameter	28.12	22.72-30.43	25.65	3.40
Snout length	42.85	42.87-50.00	46.10	2.74
Inter-orbital width	38.09	37.50-43.47	39.61	2.73
Width of mental disc	28.57	28.57-36.66	33.33	3.45

shallow (20cm) and slow flowing, at an altitude of 483 m above msl. The major substrates were pebbles and boulders. The stream is surrounded by moist deciduous forests.

(ii) Periyar is one of the major river systems in Kerala. The collection was made from a site in a regulated stream between two dam reaches (Mullaperiyar and Idukki) at Ayyppankovil (77° 02' E and 9° 43' N) at an altitude of 720 m above msl. The stream is a slow flowing perennial system and has large boulders and bedrocks. The area is highly disturbed by human activities and agricultural plantations.

(iii) Pamba river at Mookkampetty is a

relatively fast flowing tributary in Azhutha (76° 56' E and 9° 26' N), at 160 m above msl. The substrates were mainly bedrock and sand.

Description: D = 2/8; P = 1/11-12; V=1/6; A=2/5; L = 35-36.

The morphometric measurements are presented in Table 1.

The body is very elongated and depth of the body at dorsal origin is 12.5-16.23% in SL (mean = 15.87). Head with moderate length and is 18.25-21.95% in SL (mean=20.03). Snout about 50% in HL and with many tubercles. No deep transverse groove at the tip of the snout as in *G. mcClellandi* (Jerdon) (Fig. 1). Inter orbital region flat. Barbels

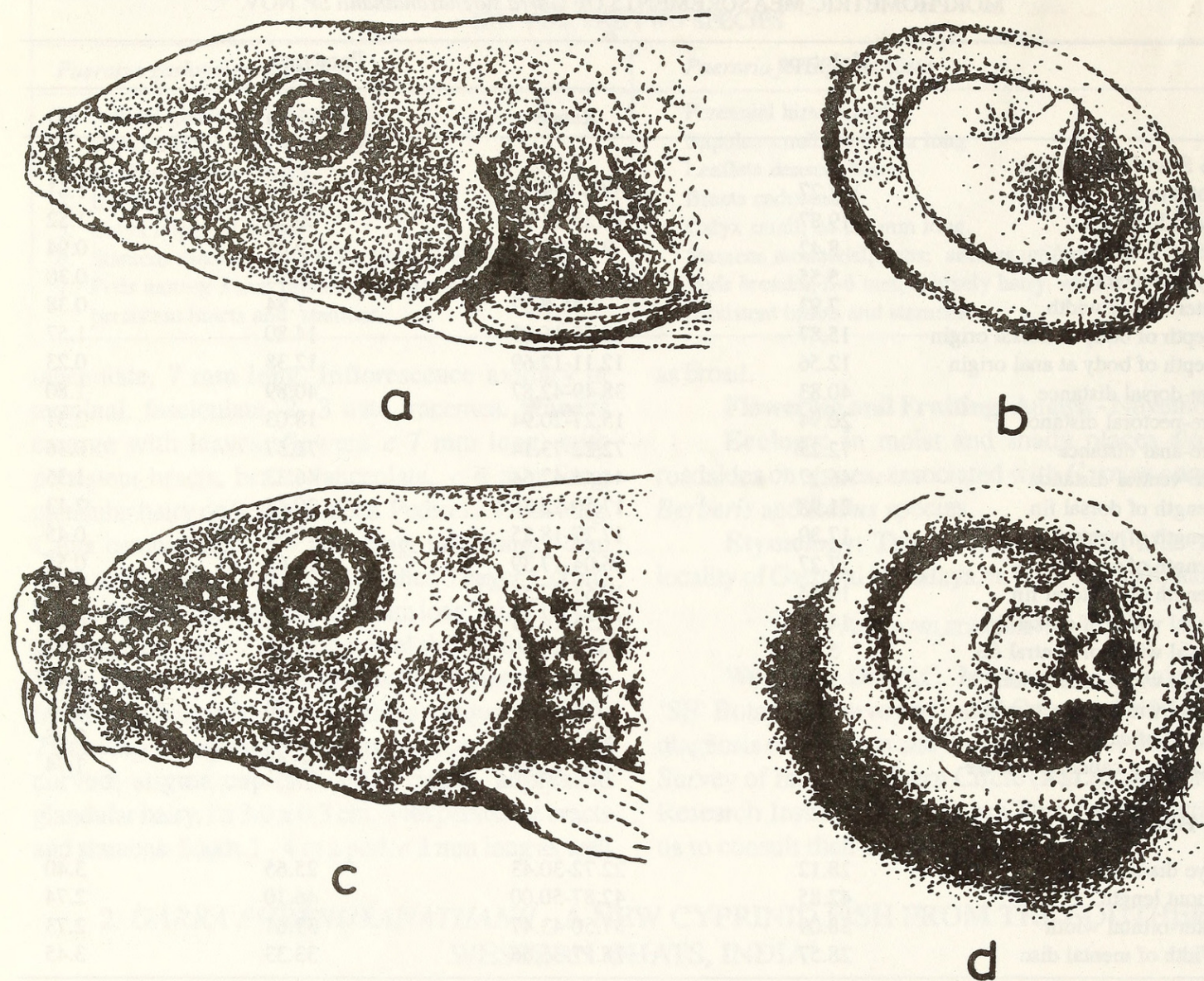


Fig. 1. a. *Garra surendranathinii* - A view of the head region; b. A spinate tubercle - enlarged; c. *Garra mcClellandi* - A view of the head region; d. Rosette-shaped tubercle

two pairs, rostral and maxillaries. Rostral longer than the maxillaries, the latter being placed in the labial groove and not so conspicuous. Mental disc well developed and its width 6.28-7.14% in SL (mean = 6.94). Dorsal fin inserted nearer to the tip of the snout than the base of the caudal fin and anterior to the pelvic fin. The branched rays of the dorsal fin have a series of dark spots which are not easily distinguishable. Vent situated nearer to anal fin origin, the distance from vent to anal fin is 43.93-46.06% (mean = 45.33) in the interdistance between ventral fin and anal fin origin. The anterior portion

of the breast is devoid of scales; belly with cutaneous scales.

The new species has the majority of tubercles with smooth surface and a few with a horn-shaped spine (Fig. 1 a & b). The other species of *Garra* (*G. gotyla stenorhynchus* and *G. mullya*), have horn-shaped spines. In *G. mcClellandi*, the spines are rosette-shaped (Fig. 1 c & d). *G. hughi* has not been examined for nature of tubercles for want of specimens. *G. menoni*, though synonymised with *G. mullya*, is reported to have no tubercles.

Coloration: Dorsum brownish-black and belly

white. The scales have black edges. Due to this, the body appears to have many bands along the lateral side. Head with many black dots and reticulations. Fins are purple in colour at their bases with tips marked orange. A black dot is present on the upper angle of the gill opening.

Etymology: It is the latinised form of the name Shri. P.K. Surendranathan Asari, Chief Conservator of Forests, Kerala Forest Department, who has been a constant source of encouragement to Wildlife research activities in the state.

Holotype: F/124/KFRI. 147.00 mm SL collected from Orukomban, tributary of Chalakkudy river on 12-03-1996 by the authors. The specimen is presently deposited in Western Ghat Regional Station of the Zoological Survey of India at Calicut (No. WGRS/ZSI/9390).

Paratypes: F/122/KFRI, F/123/KFRI, F/145/KFRI (95.5 - 161.0 mm SL) collected from Orukomban, Chalakkudy river by the authors on 12.iii.96. The specimen, F/123/KFRI is also deposited in Western Ghat Regional Station in the same lot (WGRS/ZSI/9390).

F/269/KFRI 132.0 mm SL was collected from

Ayyppankovil in Periyar river on 21.iii.96 by us.

F/270/KFRI 152.5 mm SL was collected at Mookkampetty of Azhutha tributary of Pamba river on 22.iii.96 by us.

Remarks: The new species comes under the Yunnanensis complex (Menon, 1964) and shows great resemblance to *G. mcClellandi* (Jerdon) in body form, position of the dorsal fin and number of lateral line scales. But it can be distinguished by the nature of the spine in the tubercles and the absence of the deep transverse groove in the snout. It differs from *G. kempfi* Hora by large scales, position of the dorsal fin and less number of lateral line scales. *G. mullya* (Sykes) and *G. menoni* (Remadevi and Indra) differ from it by the number of lateral line scales and *G. gotyla stenorhynchus* (Jerdon) by absence of proboscis. *G. hughi* (Silas) lacks scales in the mid-dorsal region.

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