NOTES ON FISHES OF THE GENUS *GLYPTOTHORAX* BLYTH.

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INTRODUCTION.

Hora[1] in 1921 created the genus *Laguvia* to accommodate two small species of Sisorid fishes, *L. shawi* and *L. riberoi* obtained from the rivers of the Darjeeling District, W Bengal. Discussing the affinities of the genus he remarked,

> " It closely resembles *Erethistes* Mull. and Trosch., from which it can be distinguished by the nature of its gill-openings which are wide. From the genus *Glyptothorax* it differs in the possession of scapular processes, the presence of bony tubercles on the sides of the body and in the absence of a well-marked adhesive apparatus on the chest. In most respects the genus is intermediate between *Eresthistes* and *Glyptothorax*."

Besides, he described the first pectoral ray of *Laguvia* as a strong spine which is denticulated internally.

In the generic key to Glyptosternoid fishes Hora[2] distinguished the genus *Glyptothorax* thus,

> " Gill-openings wide, almost meeting each other on under surface; pectoral provided with a strong spine which is denticulated internally ".

It is thus seen from a close comparison of the generic characters of *Laguvia* and *Glyptothorax*, that a strong, internally deticulated pectoral spine and wide gill-openings are salient features shared commonly by both the genera, *Laguvia*, according to Hora (*op. cit.*) differing from *Glyptothorax* only in the possession of humero-cubital and scapular processes, the presence of bony tubercles on the sides of the body and in the absence of a well-marked adhesive, thoracic apparatus. On an examination of the entire Glyptothoracid fishes in the collections of the Zoological Survey of India, it has been found that these minor characters as have been attributed only to the genus *Laguvia*, are so clearly discernible in some of the Glyptothoracid species like *G. tuberculatus* that it is proposed to merge *Laguvia* Hora into the synonymy of *Glypothorax* Blyth. A revised key to the valid Indian and Burmese species, based mainly on the nature of the skin, relative length of the occipital spine, peculiarity of the thoracic adhesive apparatus etc.,is provided along with a list of the Glyptothoracid fishes in the collections of the Zoological Survey of India. Besides, *G. madraspatanum*, *G. platypogonoides*, *G. trilineatus* and *G. horai* have been redescribed as the available descriptions of these species are rather meagre.

Hora's[3] statement regarding the specific diagnosis of the members of the genus *Glyptothorax* are also worthy of consideration in this context. He remarks,

> " The members of the genus Glyptothorax are still in a process of adaption to life in hill-streams and the specific characters in them are not yet properly fixed. The taxonomy of the genus is in a state of confusion and I agree with Day that some of the species may ultimately prove to be mere varieties."

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[1] Hora, S. L., *Rec. Ind. Mus.* XXII, pp. 739-43 (1921).
[2] Hora, S. L., *Rec. Ind. Mus.* XXV, p. 8 (1923).
[3] Hora, S. L., *Rec. Ind. Mus.* XXV, p. 27 (1923).

Thus while he expressed doubts with regard to the specific validity of Hamiltons' *Pimelodus botia*, *P. telchitta* and *P. cavia*, obliged as he was " to employ characters which in the case of most other Silurid genera would not be regarded as specific ", adopted the plaited condition of the paired fins as the main character for grouping the different species of *Glyptothorax*.

In the group with plaited paired fins he included six species, *viz.*, *G. annandalei**, *G. brevipinnis**, *G. stoliczkae*, *G. pectinopterus*, *G. saisii** and *G. striatus*; while eleven others, *G. kashmirensis**, *G. dekkanensis*, *G. gracilis*, *G. botia*, *G. telchitta*, *G. dorsalis*, *G. conirostre*, *G. minutus*, *G. lonah*, *G. trilineatus** and *G. madraspatanus** were referred to a group with non-plaited paired fins. *G. lineatus** was not, however, included in either category of his key.

Prashad and Mukerji[1] later described two more new species, *G. burmanicus** and *G. tuberculatus** and Mukerji[2] another new species *G. prashadi** from Burma.

Hora[3] in his account of the Glyptothoracid fishes of the Deccan cleared up the systematic position of *G. lonah* and found *G. dekkanensis* conspecific with it. He also recorded a new variety, *G. conirostre poonaensis** from Poona and a new species *G. trewavasae** from Mysore, and invented a key for distinguishing them.

Since then Shaw and Shebbeare[4] added a new species *G. horai** from N. Bengal and Herre[5] another new species *G. housei* from Malabar, S. India.

Later Hora and Menon[6] discussing the systematic position of Hamilton's *P. botia P. telchitta* and *P. cavia* brought forward reasons for relegating *P. botia* to the synonmy of the valid species *G. telchitta*, and *G. burmanicus* and *G. lineatus* to *G cavia*. The Indian and Burmese species have thus been reduced to 24 and these may be distinguished by means of the following key :—

Key to the Indian and Burmese Species of the genus **Glyptothorax** Blyth

1. Skin smooth, devoid of granulations or tuberculations 3

2. Skin rough, with granulations or tuberculations .19

3. Adhesive apparatus on chest distinctly longer than broad 5

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* Type of the species is in the Zoological Survey of India.

[1] Prashad, B. and Mukerji, D. D., *Rec. Ind. Mus.* XXXI, pp. 182 ; 184 (1929).

[2] Mukerji, D. D., *Rec. Ind. Mus.* XXXIV, p. 281 (1932).

[3] Hora, S. L., *Rec. Ind. Mus.* XL, pp. 363-375 (1938).

[4] Shaw, G. E. and Shebbeare, E. O., *Journ. Bombay Nat. Hist. Soc.* XXXIX, p. 188 (1937-38).

[5] Herre, A. W. C. T., *Stanford Ichthyol. Bull.* II, p. 117 (1942).

[6] Hora, S. L. and Menon, M. A. S., *Rec. Ind. Mus.* XLVI, pp. 55-62 (1948-49).

4. Adhesive apparatus on chest as long as or broader than long ..17

5. Occipital process touching basal bone of dorsal .. 7

6. Occipital process distinctly separated from basal bone of dorsal .. 9

7. Dorsal spine smooth; ventral surface of paired fins plaited .. .. .*G. stoliczkae* (Steind.)

8. Dorsal spine serrated along both edges; ventral surface of paired fins non-plaited .*G. madraspatanum* (Day)

9. Dorsal spine strong; adhesive apparatus on chest with a distinct central pit .*G. cavia* (Ham.)

10. Dorsal spine weak; adhesive apparatus on chest without a central pit 11

11. Dorsal spine serrated along inner border ..*G. sinense* Regan

12. Dorsal spine non-serrated .13

13. Origin of dorsal fin equidistant from base of adipose dorsal and tip of snout .*G. conirostre* (Steind.)

14. Origin of dorsal fin distinctly nearer tip of snout than base of adipose dorsal 15

15. Maxillary and nasal barbels long; adhesive apparatus on chest well developed .*G. housei*[1] Herre

16. Maxillary and nasal barbels short; adhesive apparatus on chest poorly developed .*G. conirostre poonaensis* Hora

17. Occipital process touching basal bone of dorsal; ventral surface of paired fins plaited; adhesive apparatus on chest as broad as long ..*G. brevipinnis* Hora

18. Occipital process distinctly separated from basal bone of dorsal; ventral surface of paired fins non-plaited; adhesive apparatus on chest broader than long .*G. horai* Shaw & Shebbeare

19. Skin coarsely tuberculated or denticulated .. 21

20. Skin granulated .. 33

21. Adhesive apparatus on chest prominent 25

22. Adhesive apparatus on chest faintly marked or absent 23

23. Dorsal spine serrated along both the borders .. .*G. ribeiroi* (Hora)

24. Dorsal spine smooth along both the borders .. .*G. shawi* (Hora)

25. Pectoral fins distinclty shorter than head; nasal barbels nearly equal to eye diameter 27

26. Pectoral fins as long as head; nasal barbels much longer than eye diameter 31

27. Adhesive apparatus on chest with a distinct central pit .*G. tuberculatus* Prashad & Mukerji

28. Adhesive apparatus on chest without a central pit .29

29. Occipital process touching basal bone of dorsal .*G. prashadi* Mukerji

[1] Not represented in the collections of the Zoological Survey of India and so not examined.

30. Occipital process distinctly separated from basal bone of dorsal ... *G. telchitta* (Ham.)

31. Dorsal fin distinctly higher than depth of body; dorsal spine serrated ... ... *G. paltypogonoides* (Blkr.)

32. Dorsal fin as high as depth of body; dorsal spine smooth ... *G. trewavasae* Hora

33. Occipital process touching basal bone of dorsal ... 35

34. Occipital process distinctly separated from basal bone of dorsal 43

35. Adhesive apparatus on chest longer than broad ... 37

36. Adhesive apparatus on chest small and as long as broad ... *G. pectinopterus* (McClell.)

37. Pectoral fins distinctly longer than head; dorsal spine strong and serrated ... *G. gracilis* (Gthr.)

38. Pectoral fins as long as, or shorter than head; dorsal spine weak and smooth ... 39

39. Head distinctly longer than broad ... .41

40. Head as long as broad ... .*G. lonah* (Sykes)

41. Base of adipose dorsal distinctly longer than snout; ventral surface of paired fins non-plaited ... ... *G. trilineatus* Blyth

42. Base of adipose dorsal as long as snout; ventral surface of paired fins plaited *G. annandalei* Hora

43. Dorsal spine strong; ventral surface of paired fins non-plaited ... *G. kashmirensis* Hora

44. Dorsal spine weak; ventral surface of paired fins plaited ... 45

45. Base of adipose dorsal distinctly longer than snout ... *G. striatus* (McClell.)

46. Base of adipose dorsal equal to or shorter than snout ... *G. saisii* (Jenkins)

Systematic Account

Genus **Glyptothorax** Blyth

1860. *Glyptothorax*, Blyth, *Journ. As. Soc. Bengal* XXIX, p. 154.

1860. *Exostoma*, Blyth (in part: only the type-sepcies of *C. berdmorei*), *Journ As. Soc. Bengal* XXIX, p. 155.

1864. *Glyptosternum*, Gunther, *Cat. Brit. Mus.* V, p. 185.

1878. *Glyptosternum*, Day, *Fish. India*, p. 496.

1878. *Euglyptosternum*, Day (*nec Aclyptosternum* Blkr. and *Euclyptosternum* Gthr.), *Fish. India*, p. 499.

1889. *Glyptosternum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 195.

1889. *Euglyptosternum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 202.

1913. *Glyptosternum*, Weber and Beaufort, *Fish. Indo-Austral. Archipel.* II. p. 263.

1921. *Laguvia*, Hora, *Rec. Ind. Mus.* XXII, p. 739.

1923. *Glyptothorax*, Hora, *Rec. Ind. Mus.* VXX, p. 27.

1931. *Glyptothorax*, Myers, *Lingnan Sci. Journ.* X, p. 260.

1943. *Glyptosternon*, Nichols, *Natural History of Central Asia* IX, p. 52.

1945. *Glyptothorax*, Smith, *U. S. Nat. Mus. Bull.* No. 188, p. 396.

The reasons for synonymising *Laguvia* Hora with *Glyptothorax* Blyth have already been discussed (*vide supra*), and Hora[1] has so clearly defined the genus *Glyptothorax* that there is no need to add anything more by way of comment.

Glyptothorax stoliczkae (Steind.)

1867. *Glyptosternum Stolikczkae*, Steindachner, *Sitzungsb. K. Acad. Wiss. Wie* LV, pt. 1, p. 533, pl. v. fig. 1 ; pl. vi, fig. 1.

1878. *Glyptosternum pectinopterum*, Day, *Fish. India*, p. 499, pl. cxvi, fig. C.

1889. *Glyptosternum pectinopterum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 201.

1923. *Glyptothorax stoliczkae*, Hora, *Rec. Ind. Mus.* XXV, p. 17.

Hora (*loc. cit.* p. 17) has already shown that the two specimens described by Day as "*Glyptosternum pectinopterum*" are to be referred to this species.

G. stoliczkae can be easily recognised from its congener *G. pectinopterus* by its smooth skin, strong dorsal spine, well developed thoracic adhesive apparatus and the long maxillary barbels. Besides, in *G. stoliczkae* the pelvic origin is entirely behind the vertical from the post-end of the dorsal and the occipital spine is apposed to the basal bone of the dorsal.

Distribution.—Simla, W Himalayas.

G. stoliczkae is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality*	*Donor or Collector.*	*Remarks.*
1231	Simla.	Purchased from F. Day.	1 specimen : in bad state of preservation.
1311	Simla.	Ditto.	1 specimen : Original of Day's pl. cxvi, fig. 7 : in bad state of preservation.

Glyptothorax madraspatanum (Day)

1867. *Glyptosternum lonah*, Day (*nec* Sykes), *Proc. Zool. Soc. London*, p. 285.

1873. *Glyptosternum madraspatanum*, Day, *Journ. Linn. Soc. London.* XI.

1878. *Glyptosternum madraspatamum*, Day, *Fish. India*, p. 49,

1889. *Glyptosternum madraspatanum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 200.

1923. *Glyptothorax madraspatanus*, Hora, *Rec. Ind. Mus.* XXV, p. 29.

1938. *Glyptothorax madraspatanus*, Hora, *Rec. Ind. Mus.* XL, p. 370,

1941. *Glyptothorax madraspatanus*, Hora and Law, *Rec. Ind. Mus.* XLIII p. 255.

? 1951. *Glyptothorax* prox. *madraspatanus*, Silas, *Journ. Bombay. Nat. Hist., Soc.* XLIX, p.676, figs. 1, 2, 3.

D.1/6 ; A. 1/9-10 ; P. 1/9-10 ; V 1/5 ; C. 16-18+

G. madraspatanum is a well-built, medium sized fish in which the dorsal profile rises gently to the commencement of the dorsal fin beyond which it slopes down gradually to the base of the caudal fin. The ventral

[1] Hora, S. L., *Rec. Ind. Mus.* XXV, p. 8 (1923).

profile is almost horizontal as far as the base of the pelvic fins, thereafter ascending smoothly to the caudal region. The fish is laterally compressed in the postrior half while in the anterior half its body is somewhat sub-cylindrical.

The head is broadly pointed in front and flattened ventrally; its length is contained from 4·1 to 4·3 times in the standard length; its height at the occiput is contained from 1·3 to 1·5 and its width 1·1 to 1·2 times in its length. The eyes are moderately prominent and dorso-lateral in position; their diameter is contained from 5·8 to 7·0 times in the length of the head. The length of the snout is contained from 2·0 to 2·2 times in the length of the head. The interorbital width is contained from 3·0 to 3·9 times in the width of the head. The mouth is inferior and horizontal; the width of its gape is about two times the interorbital width; the lips are papillated and reflected round the corner. The teeth in the jaws are villiform; those in the upper jaw form a narrow, crescentic, continuous band while in the lower jaw the band is interrupted in the middle. The nasal openings are placed about half an eye diameter away from the tip of the snout. The nasal barbels are almost one-and-a-half eye diameter long; the maxillaries are as long as the head behind the nasal openings, and extend upto the base of the pectoral fins; the outer mandibulars are nearly equal in length to the snout while the inner pairs are of the same length as the gape of the mouth. The gill-openings form channelled, spout-like structures on the ventral surface in front of the bases of the pectoral fins. The gill-membrane is flap-like at the upper angle of the opening.

The depth of the body is contained from 4·8 to 5·8 times in the standard length. The caudal peduncle is 1·9 to 2·7 times as long as high. The origin of the dorsal fin is slightly nearer to the base of the adipose dorsal than to the tip of the snout. The dorsal is about 1·0 to 1·3 times higher than the depth of the body below it. The basal bone of the dorsal as seen or felt through the skin is gently apposed to the occipital process which is nearly 4·0 times as long as wide. The dorsal spine is naked, often serrated on both the edges; its length is nearly equal to the greatest depth of the body. The pectoral spine is moderately broad; it is denticulated internally. The pectoral fins reach beyond the middle of the dorsal fin and are separated from the pelvic fins by a distance equal to two eye diameters; they are usually longer than the head and the caudal peduncle. The pelvic fins are almost as long as the dorsal spine; they extend beyond the vent almost touching the anal fin. There is a small anal papilla. The anal fin is situated slightly behind the adipose dorsal; its longest ray is longer than the dorsal spine. The caudal fin is deeply forked and the lobes are sub-euqal.

The thoracic adhesive apparatus is longer than broad and vignitted posteriorly; there is no central pit. The paired fins are devoid of any adhesive mechanism.

In the preserved specimens the colour is grayish-yellow becoming dirty-white below. The paired and unpaired fins bear well-marked, dark-gray bands at their bases. The skin is smooth.

In the Day's specimens, as well as in all the rest of the specimens examined by me, the skin is quite smooth as observed by Day (*op. cit.*). I refer here *Glyptothorax* prox. *madraspatanus* of Silas (*op. cit.*) as a doubtful synonym of *G. madraspatanum* Day ; in these specimens which he obtained from the Anamalai Hills, W. Ghats, S. India, the skin is stated to be tuberculated. Besides, the paired fins while described as being plaited shows no sign of the adhesive plaits in the drawings. In body proportions also Silas's specimens differ from *G. madraspatanum*. Unfortunately, these specimens registered as (Nos. F 629/2 ; F630/2) " *Glyptothorax anamalaiensis* Silas " in the Accession Register, could not be traced in the reserve collections and so were not examined. From the description and figures provided by Silas, their resemblance to *Glytopthorax housei* Herre, a smooth skinned species described from the same locality—Anamalai Hills—can be easily noted.

Distribution.—Western Ghats, S. India.

G. madraspatanum is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*		*Remarks.*
1235	Bhavani R., Nilgiris, Madras State.	Purchased from F. Day.	1	specimen : *Type* : Original of Day's pl. cxvi, fig. 4 : in fairly good state of preservation.
1313	Ditto.	Ditto.	1	specimen : in bad state of preservation.
F 10272/1	Nierololay stream, Bhavani R., Nilgris, Madras State.	N. Annandale.	2	specimens : in fairly good state of preservation.
F 10273/1	Mettupalayam, Coimbatore, Madras State.	N. Annandale.	2	specimens : in fairly good state of preservation.
F 12409/1	Cauvery R., Coorg State S. India.	C. R. Narayana Rao.	1	specimen : in bad state of preservation.
F 13590/1	Pampadampara, W. Ghats, Travancore.	S. Jones.	2	specimens : in good state of preservation.

TABLE I.—*Measurements in millimetres of* Glyptothorax madraspatanum *(Day)*

	Nilgiris.		Coimbatore.		Coorg.	W. Ghats.	
	1235	1313	F 10272/1	F 10273/1	F 10273/1	F 12409/1	F 13590/1	F 13590/1
Standard length	97·0	70·5	84·0	73·5	86·5	121·2	88·3	54·9
Length of head	23·0	17·0	20·5	17·5	20·5	28·2	20·5	10·8
Height of head at occiput	14·5	10·5	13·0	12·5	D*	19 9	13·5	9·2

* Destroyed.

TABLE I.—*Measurements in millimetres of* Glyptothorax madraspatanum (*Day*)—contd.

	Nilgiris.			Coimbatore.		Coorg.	W. Ghats.	
	1235	1313 F	10272/1 F	10273/1 F	10273/1 F	12409/1 F	13590/1 F	13590/1
Width of head	19·5	13·5	16·5	14·5	16·5	24·8	17·0	11·0
Length of snout	11·0	7·5	10·0	8·0	10·2	14·0	9·2	6·0
Diameter of eye	3·5	2·5	3·0	2·5	3·5	4·0	3·0	1·6
Interorbital width	5·0	4·0	4·5	4·5	5·0	6·9	5·4	4·1
Depth of body	17·0	12·0	15·0	12·5	15·4	22·5	15·5	10·0
Length of caudal poduncle	175·	13·0	17·5	15·0	18·0	22·9	17·2	10·4
Least height of caudal peduncle	8·5	5·5	7·0	5·5	7·1	11·6	6·5	5·0
Longest ray of dorsal	19·5	16·5	19·0	15·5	20·0	22·6	19·0	11·3
Length of dorsal spine	D*	13·0	14·0	13·0	16·1	19·2	12·6	6·8
Length of pectoral	24·5	20·0	20·5	18·5	D*	29·5	21·6	13·2
Length of pectoral spine	D*	15·0	15·5	14·5	D*	24·1	15·6	7·0
Length of pelvic	17·5	13·0	13·5	13·0	13·0	14·5	15·2	9·0
Longest ray of anal	19·5	15·0	15·5	14·5	17·0	26·8	16·0	10·3
Length of base of anal	13·5	9·5	10·0	9·0	10·4	16·5	11·1	7·5
Length of base of adipose dorsal	14·5	10·5	13·0	11·5	13·6	21·0	12·0	7·8

Glyptothorax cavia (Ham.)

1822. *Pimelodus cavia*, Hamilton, *Gangetic Fishes*, pp. 188, 378.

1877. *Euglypiosternum lineatum*, Day, *Fish. India*, p. 500, pl. cxvi. fig. 7.

1889. *Euglyptosternum lineatum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 202, fig. 73.

1923. *Glyptothorax lineatus*, Hora, *Rec. Ind. Mus.* XXV, pp. 9, 10, fig. 1*a*.

1929. *Glyptothorax burmanicus*, Prashad and Mukerji, *Rec. Ind. Mus.* XXXI, p. 184, fig. 5, pl. vii, fig. 3.

1937. *Glyptothorax lineatus*, Shaw and Shebbeare, *Journ. Roy. As. Soc. Bengaly Sci.* III, p. 102, text-fig. 104.

1948. *Glyptothorax cavia*, Hora and Menon, *Rec. Ind. Mus.* XLVI, p. 60, 49, pl. ii, figs. 4, 6.

1949-50. *Glyptothorax cavia*, Menon, *Rec. Ind. Mus.* XLVII, p. 235.

* Destroyed.

Hora and Menon (*loc. cit.*, pp. 56, 57) have cleared up the systematic position of this species and re-described it in detail.

G. cavia is easily separated from all the E. Himalayan and Burmese forms of *Glyptothorax* by its characteristic adhesive disc encircling a deep central pit as well as by its broad band of teeth in the upper jaw.

Distribution.—Northern Bengal, Assam, Eastern Himalayas and Burma.

G. cavia is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
1312	Jumna (? Bengal).	Purchased from F. Day.	1 specimen : *Type* of *G. linetus* : Original of Day's pl. cxvi, fig. 7 : in bad state of preservation.
F 10877/1	Sankha R., Myitkiyna Dt., U. Burma.		1 specimen : *Type* of *G. burmanicus* : in fairly good state of preservation.
F 11375/1	Rivers below Darjeeling, W. Bengal.	G. E. Shaw & E. O. Shebbeare.	1 specimen : in good state of preservation.
F 217/2	Kosi R., Nepal.	Kosi Survey.	3 specimens : in very good state of preservation.
F 218/2	Ditto.	Ditto.	Ditto.
F 219/2	Ditto.	Ditto.	4 specimens : in very good state of preservation.
F 220/2	Kosi R., Nepal.	Kosi Survey.	1 specimen : in very good state of preservation.

Glyptothorax sinense (Regan)

1908. *Glyptosternum sinense*, Regan, *Ann. Mag. Nat. Hist.* (8), I, p. 110.

1931. *Glyptosternon sinense*, Chu, *Biol. Bull. St. John's Univ.* No. 1, p. 82.

1943. *Glyptosternon sinense*, Nichols, *Natural History of Central Asia* IX, p. 53.

G. sinense can be dintinguished from *G. cavia* by its thoracic adhesive disc which is devoid of a central pit. While its resemblance to *G. conirostre* is noteworthy *G. sinense* may be separated from the latter by its serrated dorsal spine.

Distribution.—Burma and China.

G. sinense is represented in the collection of Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 11444/1	Phungin Hka, tributary of Mali Hka R., Myitkiyina Dt., U. Burma.	R. W. Burton.	1 specimen : in fairly good state of preservation.
F 12209/1	No locality.	Fan Memorial Institute of Biology, Peiping, China.	1 specimen : in fairly good state of preservation.

Glyptothorax conirostre (Steind.)

1867. *Glyptosternum conirostre*, Steindachner, *Sitzungsb. K. Acad. Wiss. Wien.* LV, pt. 1, p. 532, pl. v, fig. 2 ; pl. vi, fig. 2.

1871. *Glyptosternum modestum*, Day, *Proc. Zool. Soc. London*, p. 714.

1878. *Glyptosternum lonah*, Day (in part), *Fish. India*, p. 496.

1878. *Glyptosternum conirostre*, Day, *Fish. India*, p. 497, pl. cxvi, fig. 5.

1889. *Glyptosternum lonah*, Day, *Faun. Brit. Ind.*, Fish I, p. 196.

1889. *Glyptosternum conirostre*, Day, *Faun. Brit. Ind.*, Fish. I, p. 198.

1923. *Clyptothorax conirostris*, Hora, *Rec. Ind. Mus.* XXV, p. 28.

1931. *Glyptosternon conirostre*, Chu, *Biol. Bull. St. John's Univ.* No. 1, p. 81.

1943. *Glyptosternon conirostre*, Nichols, *Natural History of Central Asia* IX,p. 5.

In *G. conirostre* the head is much longer than broad. The dorsal fin is higher than the body ; the dorsal spine is weak and smooth. The pectorals are of the same length as the head. The pelvic origin is below the vertical from the last ray of the dorsal. The paired fins are nonplaited. The skin is smooth. The occipital spine is separated from the basal bone of the dorsal.

This species differs from its W Himalayan congener *G. pectinopterus* mainly in its longer head, larger thoracic adhesive disc, nonplaited paired fins and smooth skin.

Distribution.—Simla, W. Himalayas and Mahanadi river at Siliguri, E. Himalayas, China.

G. conirostre is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
1315 or F 10382/1	Simla.	Purchased from F. Day.	1 specimen : Original of Day's pl. cxvi, fig. 5 : in bad state of preservation.
F 11378/1	Mahanadi R., Siliguri, W. Bengal.	G. E. Shaw and E. O. Shebbeare.	1 specimen : in fairly good state of preservation.

Glyptothorax conirostre poonaensis Hora

1877. *Glyptosternum lonah*, Day (in part, *nec.* Sykes), *Fish. India*, p. 496, pl. cxiii, fig. 5.

1938. *Glyptothorax conirostre* var. *poonaensis*, Hora, *Rec. Ind. Mus.* XL, p. 368, pl. vii, figs. 5, 6.

Hora (*loc. cit.*, p. 366) has already shown that in *G. conirostre poonaensis* the head is proportionately broader and the dorsal fin shorter than in *G. conirostre*. Besides, the pelvic origin is distinctly behind the vertical from the last ray of the dorsal.

This species can be separated from *G. lonah*, *G. annandalei* and *G. trewavasae* by its smooth skin and from *G. madraspatanum* by its smooth, dorsal spine and shorter pectorals.

Distribution.—Poona, Peninsular India.

G. conirostre poonaensis is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 12126/1	Moola-Mutha R., Poona, Bombay State.	Dept. of Fisheries, Bombay.	1 specimen : *Holotype* : in good state of preservation.

Glyptothorax brevipinnis Hora.

1923. *Glyptothorax brevipinnis*, Hora, *Rec. Ind. Mus.* XXV, p. 16, pl. i, fig. 4.

In *G. brevipinnis* the thoracic adhesive disc is characteristically broader than long and not so well developed. The dorsal origin is nearer to the tip of the snout than to the base of the adipose dorsal. The pelvic is considerably behind the vertical from the last ray of the dorsal. The paired fins are plaited. The occipital process is apposed to the basal bone of the dorsal. The skin is smooth.

This species may be readily distinguished from *G. pectinopterus* by its smooth skin, its pectoral being shorter than head, the dorsal spine being shorter than depth of body and the dorsal origin being much nearer to the snout tip than to the base of the adipose dorsal.

The type-locality of the species is unknown.

Distribution.—Unknown.

G. brevipinnis is represented in the collection of the Zoological Survey of India from the following locality :—

Regd. No.	*Locality.*	*Donour or Collector.*	*Remarks.*
F 10134/1	Unknown.	No history.	4 specimens : *Type* : in fairly good state of preservation.

Glyptothorax horai Shaw & Shebbeare.

1937. *Glyptothorax horai*, Shaw and Shebbeare, *Journ. Bombay Nat. Hist. Soc.* XXXIX, p. 188.

1937. *Glyptothorax horai*, Shaw and Shebbeare, *Journ. Roy. As. Soc. Bengal, Sci.* III, p. 101.

1949. *Glyptothorax horai*, Hora, *Journ. Zool. Soc. India* I, p. 2.

1949-50. *Glyptothorax horai*, Menon, *Rec. Ind. Mus.* XLVII, p. 235.

D. 1/5-6 ; A. 1/9-10 ; P. 1/7-9 ; V. 1/5 ; C. 16-18

In *G. horai* the dorsal profile rises gracefully from the tip of the snout to the origin of the dorsal fin and thereafter descends gradually to the tail. The ventral profile, somewhat straight and horizontal as far as the base of the pectoral fins, thereafter arches down gently to the commencement of the pelvic fin, whence ascending smoothly to the caudal region. The fish has a more or less cylindrical, steam-lined body.

The head is moderately depressed, flattened ventrally and broadly pointed in front ; its length is contained from 3·5 to 3·9 times in the standard length ; its height at the occiput is contained from 1·6 to 1·8 and its width 1·2 to 1·4 times in its length. The eyes are small and dorso laterally placed ; their diameter is contained from 9·7 to 11·5

times in the length of the head. The length of the snout is contained from 2·0 to 2·3 times in the length of head. The interorbital width is contained from 3·1 to 3·6 times in the width of the head. The mouth is inferior and horizontal; the width of its gape is nearly equal to the length of the snout and twice the interorbital width; the lips are papillated and continuous at the angles of the mouth. The teeth in the jaws are villiform; those in the upper jaw form a narrow, continuous, crescentic band while in the lower jaw the band is interrupted in the middle. The nasal openings are situated about an eye diameter away from the tip of the snout. The nasal barbels are twice as long as the distance between their bases and reach upto the eyes behind; the maxillaries are usually longer than the head extending considerably beyond the pectoral bases; the outer mandibulars, just reaching up the pectoral bases, are twice as long as, and the inner pairs, of the same length as the gape of the mouth. The gill-openings form well-developed, channelled, spout-like structures on the ventral surface in front of the bases of the pectoral fins, the gill-membrane being flap-like near the upper angle of the opening.

The depth of the body is contained from 4·8 to 5·7 times in the standard length. The caudal peduncle is 1·8 to 2·2 times as long as high. The origin of the dorsal fin is slightly nearer to the base of the adipose dorsal than to the tip of the snout. The dorsal fin is higher than the depth of the body in younger specimens and smaller in older individuals. The basal bone of dorsal as can be felt by a needle from outside, is widely separated from the occipital process which is nearly three times as long as wide. The dorsal spine is strong and enveloped by skin; on dissection it is found to be finely denticulated along its posterior margin. The pectoral spine is moderately broad and as long as the dorsal spine; it is denticulated internally. The pectoral fins are markedly shorter than the head and extend a little beyond the origin of the dorsal fin; they are, however, longer than the caudal peduncle and separated from the pelvic fins by a distance equal to the length of the pectoral spine. The pelvic fins are almost as long as the dorsal spine; they extend upto the vent. There is a small anal papilla. The anal fin is situated more or less opposite to the adipose dorsal; its longest ray is longer than the dorsal spine. The caudal fin is deeply forked, the upper lobe being slightly longer.

The adhesive apparatus is peculiar. It extends from the lip and traverses the gill-membrane to half way down the pectoral bases. In the thoracic region it is rhomboidal in shape anteriorly and vignitted posteriorly. There is no central pit. The paired fins are devoid of any adhesive mechanism.

A small mucus pit is discernible in the shoulder region below the cleithrum.

The preserved specimens are copper-gray with pale, brownish-yellow abdomen. The fins are lightly copper-tinged, the caudal being profusely spotted with gray. The skin is smooth.

G. horai is recognised from its E. Himalayan and Vindhyan congener *G. annandalei* by its smooth skin and its peculiar thoracic adhesive disc which extends from the lip and traverses the gill-membranes half way

down to the pectoral region in a rhomboidal form. In having the adhesive disc devoid of a central pit, this species is at once separated from *G. cavia* of the E. Himalayas and Burma.

Distribution.—Kosi river, Nepal, streams of Terai, E. Himalayas, Rihand river, Vindhyas, Mirzapur District, U. P.

G. horai is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 11376/1	Streams of Terai, W. Bengal.	G. E. Shaw and E. O. Shebbeare.	1 specimen ; *Type* : in fairly good state of preservation.
F 234/2	Rihand R. near Dam site, Mirzapur Dt., U. P.	Rihand Survey.	22 specimens : in very good state of preservation.
F 235/2	Ditto.	Ditto.	4 specimens : in very good state of preservation.
F 236/2	Kosi R. at Chhatra, Nepal.	Kosi Survey.	2 specimens : in very good state of preservation.
F 237/2	Kosi R. at Barahakshetra, Nepal.	Ditto.	1 specimen : in very good state of preservation.

TABLE II.—*Measurements in millimetres of* Glyptothorax horai *Shaw & Shebbeare*

	Bengal. F 11376/1	Rihand R. F 234/2				Rihand R. F 235/2		Nepal. F 236/2		Nepal. F 237/2
Standard length	90·1	77·0	35·0	65·3	71·5	75·1	68·0	98·5	67·2	70·1
Length of head	23·0	22·2	9·5	18·5	19·8	21·0	18·8	27·4	19·2	19·0
Height of head at occiput	14·1	13·0	5·2	11·0	12·0	12·0	10·2	14·5	10·2	11·0
Width of head	17·0	15·5	7·4	14·0	15·1	15·1	13·6	19·3	13·0	14·2
Length of snout	11·0	10·1	4·0	8·0	9·0	9·5	9·0	12·0	9·0	9·8
Diameter of eye	1·8	1·2	0·7	1·5	1·8	1·5	1·5	1·8	1·3	1·1
Interorbital width	6·0	4·5	2·0	4·4	4·5	5·0	4·0	5·2	4·0	4·1
Depth of body	19·5	16·5	8·0	14·0	14·0	14·4	12·3	19·0	13·0	13·7
Length of caudal peduncle	19·0	14·0	6·4	12·0	13·2	13·0	13·0	18·0	13·5	14·5
Least height of caudal peduncle.	8·0	7·0	3·1	6·0	6·8	6·5	7·0	8·5	6·0	7·2
Longest ray of dorsal	15·2	16·0	7·8	13·1	15·0	14·0	13·0	17·5	12·4	13·2
Length of dorsal spine	10·8	10·5	5·1	10·0	11·0	10·0	10·0	13·0	8·7	9·5
Length of pectoral	17·5	14·6	9·0	11·8	15·0	13·5	12·5	19·0	12·0	12·8
Length of pectoral spine	12·3	11·0	5·3	9·0	11·0	12·0	10·2	15·3	9·5	10·0
Length of pelvic	11·2	11·1	5·0	9·2	12·0	11·0	10·3	12·2	9·5	9·0
Longest ray of anal	16·0	15·8	7·4	13·2	15·1	13·0	13·0	9·0	11·2	12·4
Length of base of anal	13·0	10·2	5·0	9·4	10·1	11·0	9·5	16·5	9·1	10·0
Length of base of adipose dorsal	14·0	10·5	4·5	9·0	11·7	10·0	9·0	14·3	8·2	9·0

Glyptothorax ribeiroi (Hora)

1921. *Laguvia ribeiroi*, Hora, *Rec. Ind. Mus.* XXII, p. 741, XXIX, fig. 3.

1937-38. *Laguvia ribeiroi*, Shaw and Shebbeare, *Journ. Roy. As. Soc. Bengal, Sci.* III, p. 104, text-fig. 106.

1938. *Laguvia ribeiroi*, Hora, *Rec. Ind. Mus.* XL, p. 179, text-fig. 5.

1941. *Laguvia ribeiroi*, Hora and Nair, *Rec. Ind. Mus.* XLIII, p. 372.

1949. *Laguvia ribeiroi*, Hora, *Journ. Zool. Soc. India* I, p. 2.

G. ribeiroi has a somewhat stumpy form. The head is short and broad. The thoracic adhesive disc is faintly developed. The dorsal is as high as or less than the depth of body below it. The dorsal spine is strong and serrated. The pectoral spine is strong and denticulated internally. The pectorals do not reach to the pelvic bases. The pelvic origin is distinctly in advance of the vertical from the last ray of the dorsal. The pelvics are separated from the anal by a considerable distance. The gill-openings are wide. The skin is tuberculated.

This species is separated from *G. shawi* by its serrated dorsal spine, shorter head and paired fins and its pelvic origin which is clearly in front of the vertical from the posterior end of the dorsal base.

There are several nicely preserved specimens in the collection and they all agree with the type and description and figures given by Hora (*op. cit.*). There are, however, some examples from the Rihand river, U. P., in which a few uppermost rays of the caudal are noticeably elongated.

Distribution.—Tista drainage, Darjiling Himalayas, Kosi river, Nepal Himalayas, Morel river, Santal Parganas and Kamla river, Dharbhanga District, Bihar, and Rihand river, Vindhyan range.

G. ribeiroi is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 10086/1	Khoila R., tributory of the Tista, Jalpaiguri, W. Bengal.	S. L. Hora.	1 specimen : *Type* : in fairly good state of preservation.
F 12722/1	Mosel R. near Bario, Santal Parganas, Bihar.	H. A. Hafiz.	2 specimens : in fairly good state of preservation.
F 12722/1	Kamla R., Jainagar, Darbhanga Dt., Bihar.	P. N. Mitter.	13 specimens : in good state of preservation.
F 12722/1	Kosi R., Nepal.	Kosi Survey.	24 specimens : in good state of preservation.
F 12722/1	Duars and Terai, N. Himalayas.	S. L. Hora.	Several specimens : in good state of preservation.
F 12722/1	Rihand R., U. P.	K. S. Misra.	Several specimens : in good state of preservation.

Glyptothorax shawi (Hora)

1921. *Laguvia shawi*, Hora, *Rec. Ind. Mus.* XXII, p. 740, pl. xxix, fig. 2.

1937-38. *Laguvia shawi*, Shaw and Shebbeare, *Journ. Roy. As. Soc. Bengal, Sci.* III, p. 104, text-fig. 106.

1940-41. *Laguvia shawi*, Hora and Gupta, *Journ. Roy. As. Soc. Bengal, Sci.* VI, p. 5.

In *G. shawi* the body is more or less elongated. The head is long and broad. A faintly developed adhesive disc is present on the chest. The dorsal is as high as the depth of body below it. The dorsal spine is strong and smooth. The pectoral spine is strong and serrated internally. The pectorals nearly reach the pelvic bases. The pelvic origin is behind the vertical from the last ray of the dorsal. The pelvics extend almost to the anal base. The gill-openings are wide. The skin is tuberculated.

This species was first described by Hora (*loc. cit.*, p. 740) with three specimens, two from the Mahanadi river and one from the Sivoke river, Darjiling Himalayas. Since then "hundreds" of the species were collected by Hora (*loc. cit.* p. 179) and others from the same localities. Most of them seem to have been lost in the Varuna floods at Banaras where the Survey was housed during the last war, and the existing ones are in a bad state of preservation. Of the type-series, only the holotype from the Mahanadi river is now to be found in the collection of the Survey and it is in a poor state of preservation.

Distribution.—The Tista drainage of the Darjiling Himalayas.

G. shawi is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 10084/1	Mahanadi R., Darjiling Himalayas.	G. E. Shaw.	1 specimen : *Type* : in poor state of preservation.
F 11381/1	Siliguri, N. Bengal.	G. E. Shaw and E. O. Shebbeare.	1 specimen : in poor state of preservation.
F 13448/1	Kalimpong Duars and Siliguri Terai, Tista R. drainage.	S. L. Hora.	32 specimens : in bad state of preservation.

Glyptothorax tuberculatus Prashad & Mukerji

1929. *Glyptothorax tuberculatus*, Prashad and Mukerji, *Rec. Ind. Mus.* XXXI, p. 182, pl. vii, fig. 2 ; text-fix. 4.

In *G. tuberculatus* the head is slightly longer than broad. The height of the dorsal is equal to the depth of the body. The dorsal spine is weak and serrated along its inner border. The pectorals are shorter than the head. The pelvic origin is below the vertical from the last ray of the dorsal. The thoracic adhesive disc encircles a central pit. The paired fins are not plaited. The humerocubital and scapular processes are prominent. The skin is rough and tuberculated.

This species is readily recognised from *G. shawi* and *G. ribeiroi*, which also possess well developed humero-cubital and scapular processes, by its characteristic, prominent adhesive disc and rough skin.

Distribution.—Burma.

G. tuberculatus is represented in the collection of the Zoological Survey of India from the following locality :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 10876/1	Sankha, a hill-stream midway between Kamaing and Mong-aung, Myitkyina Dt., U. Burma.	B. N. Chopra.	1 specimen : *Type* : in good state of preservation.

Glyptothorax prashadi Mukerji

1932. *Glyptothorax prashadi*, Mukerji, *Rec. Ind. Mus.* XXXIV, p. 281, text-fig. 1.
1945. *Glyptothorax prashadi*, Smith, *U. S. Nat. Mus. Bull.* No. 188, p. 402.

In *G. prashadi* the head is longer than broad and moderately depressed. The height of the dorsal is less than the depth of the body. The dorsal spine is strong and serrated. The pectorals are shorter than the head. The pelvic origin is just below the vertical from the last ray of the dorsal. The paired fins are nonplaited. The thoracic adhesive disc is fairly well developed and without a central pit. The cubito-humeral and scapular processes are not prominent. The occipital spine is apposed to the basal bone of the dorsal. The skin is rough and tuberculated.

Mukerji (*loc. cit.*, p. 281) has already remarked on the close resemblance of this species to *G. platypogonoides* (=*G. dorsalis*) from which it can be distinguished only by its deeper body, shorter pectorals and shorter caudal peduncle.

Distribution.—Burma, Peninsular Siam.

G. prashadi is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 11334/1	Kyenchaung R., Mergui Dt., L. Burma.	K. Biswas.	1 specimen : *Type* : in good state of preservation.
F 10845/1	Nakon, Sritamarat, Siam.	H. M. Smith.	1 specimen : in good state of preservation.
F 11341/1	Ditto.	Ditto.	1 specimen : in good state of preservation.

Glyptothorax telchitta (Ham.)

1822. *Pimelodus telchitta*, Hamilton, *Gangetic Fishes*, pp. 185, 378.
1822. *Pimelodus botius*, Hamilton, *Gangetic Fishes*, pp. 192, 378.
1871. *Glyptosternum telchitta*, Day, *Proc. Zool. Soc. London*, p. 228.
1877. *Glyptosternum telchitta*, Day, *Fish India*, p. 498, pl. cxvi, fig. 2.
1877. *Glyptosternum botia*, Day, *Fish. India*, p. 497, pl. cxii, fig. 4.
1889. *Glyptosternum telchitta*, Day, *Faun. Brit. Ind.*, Fish. I, p. 199.
1889. *Glyptosternum botium*, Day, *Faun. Brit. Ind.*, Fish. I, p. 198.
1923. *Glyptothorax* sp., Hora, *Rec. Ind. Mus.* XXV, p. 26, pl. iv. ag. 2.
1923. *Glyptothorax botia*, Hora, *Rec. Ind. Mus.* XXV, p. 27.
1923. *Glyptothorax telchitta*, Hora, *Rec. Ind. Mus.* XXV, p. 28.
1929. *Pimelodus telchitta*, Hora, *Mem. Ind. Mus.* IX, pl. xxi, fig. 3 (Hamilton's MS drawing published).
1937-38. *Glyptothorax telchitta*, Shaw and Shebbeare, *Jour. Roy. As. Soc. Bengal, Sci.* III, p. 103, text-fix. 105.
1939. *Glyptothorax botia*, Das, *Rec. Ind. Mus.* XLI, p. 448.
1948-49. *Glyptothorax telchitta*, Hora and Menon, *Rec. Ind. Mus.* XLVI, p. 57, pl ii, figs. 1, 2, 3.
1949. *Glyptothorax telchitta*, Hora, *Journ. Zool. Soc. India* I, p. 2.
1949-50 *Glyptothorax telchitta*, Menon, *Rec. Ind. Mus.* XLVII, p. 235.

Hora and Menon (*loc. cit.*, pp. 55, 56) have discussed the taxonomic position of this species and redescribed it in detail.

G. telchitta can be easily separated from its Indian congeners by its more or less spindle-shaped body and the rough tuberculated skin. From *G. platypogonoides* this species may be distinguished by its shorter pectorals, shorter nasal barbels and spindle-shaped body, while from *G. prashadi* it is recognised by its smooth and feeble dorsal spine and the shorter occipital spine not reaching the basal bone of the dorsal.

Distribution.—Uttar Pradesh (Vindhyan Mountains), Bihar, N. Bengal and Nepal, E. Himalayas. Its record from the Punjab needs confirmation.

G. telchitta is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
1314	No. locality.	Purchased from F. Day.	1 specimen : Original of Day's pl. cxvi, fig. 2 (*G. telchitta*) : in very bad state of preservation.
1488	" Jumna ".	Ditto.	1 specimen : Original of Day's pl. cxiii, fig. 4 (*G. botium*) : in fairly good state of preservation.
Cat. 580 or F 9735/1	Birbhum, W. Bengal.	Museum Collector.	8 specimens : in very bad state of preservation.
F 5374/1	Jharahi R., Siripur, Saran Dt., Bihar.	M. Mackenzie.	1 specimen : in fairly good state of preservation.
F 6887/1	Mawai, Bara Banki, U. P.	M. M. Khan.	1 young specimen : in bad state of preservation.
F 6888/1	Ditto.	Ditto.	Ditto.
F 7033/1	Ditto.	Ditto.	Ditto.
F 10268/1	Jharahi R., Siripur, Saran Dt., Bihar.	M. Mackenzie.	2 specimens : in fairly good state of preservation.
F 1027/1	Ditto.	Ditto.	1 specimen : in fairly good state of preservation.
F 11377/1	Rivers of Terai and Duars, N. Bengal.	G. E. Shaw and E. O Shebbeare.	2 specimens : in fairly good state of preservation.
F 13326/1	Damodar R. near Ramgarh, Hazaribagh Dt., Bihar.	H. S. Rao.	4 young specimens : in fairly good state of preservation.
F 81/2	Rihand R. at Dam Site, Mirzapur Dt., U. P.	Rihand Survey.	5 specimens : in good state of preservation.
F 221/2	Mohalpahari, Santal Parganas, Bihar.	R. Bodding.	1 specimen : in fairly good state or preservation.
F 222/2	Kosi R., Nepal.	Kosi Survey.	Ditto.
F 233/2	Rihand R. at Dam Site, Mirzapur Dt., U. P.	Rihand Survey.	7 specimens : in very good state of preservation.

Glyptothorax platypogonoides (Blkr.)

1855. *Pimelodus platypogonoides*, Bleeker, *Nat. Tijd. Ned., Indie* IX, p. 272.

1889. *Glyptothorax dorsalis*, Vinciguerra, *Ann. Mus. Stor. Nat. Genova* XXIX, p. 246, pl. vii, fig. 4.

1921. *Glyptohorax dorsalis*, Hora, *Rec. Ind. Mus.* XXI, p. 180.

1921. *Glyptothorax minutus*, Hora, *Rec. Ind. Mus.* XXII, p. 180, text-fig. 1.

1923. *Glyptothorax minutus*, Hora, *Rec. Ind. Mus.* XXV, p. 27.

1923. *Glyptothorax dorsalis*, Hora, *Rec. Ind. Mus.* XXV, p. 28.

1923. *Glyptothorax siamensis*, Hora, *Journ. Siam Soc., Nat. Hist. Suppl.* VI, p. 168, pl. x, fig. 1.

1945. *Glyptothorax platypogonoides*, Smith, *U. S. Nat. Mus. Bull.* No. 188, p. 397.

D. 1/6-7 ; A. 1/9-10 ; P. 1/9-10. V 1/5 ; C. 16-18

Glyptothorax platypogonoides is a medium-sized fish with the dorsal profile considerably arched and the ventral profile more or less horizontal. The dorsal profile rises gently from the tip of the snout to the base of the dorsal fin, hereafter descending gradually to the base of the caudal fin. The ventral profile is straight and horizontal as far as the origin of the pelvic fins and thereafter gradiently ascends to the caudal fin. The fish is compressed from side to side in the tail region, while anteriorly it is subcylindrical as far as the basal bone of the dorsal fin.

The head is flattened ventrally and pointed anteriorly ; its length is contained from 4·1 to 5·0 times in the standard length ; its height at the occiput is contained from 1·4 to 1·8, and its width 1·1 to 1·2 times in its length. The eyes are small and dorso-lateral in position ; their diameter is contained from 7·4 to 9·5 times in the length of the head The length of the snout is contained from 2·2 to 2·3 times in the length of the head. The interorbital width is contained from 3·5 to 4·7 times in the width of the head. The mouth is inferior and horizontal ; the width of its gape is about three-fourth the length of the snout ; the lips are profusely papillated and reflected round the corner. The teeth in the upper jaw form a narrow continuous band while in the lower jaw the band is interrupted in the middle. The nasal openings are situated close to the tip of the snout and demarcated from it by a distance nearly equal to the diameter of the eye. The nasal barbels are almost as long as the distance between their bases ; the maxillaries are shorter than the head and extend to the bases of the pectoral fins ; the outer mandibulars are nearly of the same length as the gape of the mouth. The gill-openings form channelled, spout-like structures on the ventral surface in front of the bases of the pectoral fins. The gill-membrane is flap like near the upper angle of the opening.

The depth of the body is contained from 5·0 to 6·7 times in the standard length. The caudal peduncle is 3·0 to 3·6 times as long as high. The dorsal fin commences midway between the tip of the snout and the base of the adipose dorsal ; it is about 1·1 to 1·4 times higher than the depth of the body below it. The basal bone of the dorsal, as seen or felt through the skin, is closely apposed to the occipital process which is nearly four times as long as wide. The dorsal spine is sheathed in skin, strong and serrated internally ; it is almost as long as the greatest depth of the body.

The pectoral spine is strong and broad ; it is denticulated along its inner edge. The pectoral fins extend to the middle of the base of the dorsal fin ; they are nearly equal in length to the head and the caudal peduncle and separated from the pelvic fins by a considerable distance. The pelvic fins are shorter than the dorsal spine and they extend a little beyond the vent. A small anal papilla is present. The anal fin is situated opposite to the adipose dorsal ; its longest ray is usually longer than the dorsal spine. The caudal fin is deeply forked, the lower lobe being somewhat the longer.

The adhesive apparatus on chest is about 1·5 times as long as wide and devoid of any central pit. The outer rays of the paired fins are without any adhesive mechanism on their ventral surfaces.

The colour in the preserved specimens is brownish-olive on the dorsal and lateral regions of the body merging into pale yellow below. The head and sides are speckled with dark, oblong spots. All the fins are marked with spotted bands. The skin is rough with prominent tubercles arranged in regular longitudinal rows.

Smith (*loc. cit.*, p. 398) has already elucidated the reasons for regarding *G. dorsalis* Vinciguerra as a synonym of *G. platypogonoides* (Blkr.). Besides, expressing doubts as to the specific validity of *G. siamensis* Hora, he concluded that this species, formerly credited with being peculiar to Sumatra, may prove to be the same as *G. platypogonoides*. After an examination of the type of *G. siamensis* with the relevant materials, descriptions and figures, Smith's observations and surmises are found to be correct. Also, *G. minutus* Hora, reported from the Chindwin Drainage of Assam seem to be the same as the present species in spite of its small size and meagre description. No specimen of *G. minutus*, either type or collateral, exists for comparison. However, its relationships already indicated by Mukerji (*loc. cit.*, pp. 282, 283) with *G. platypogonoides* (=*G. dorsalis*) and *G. prashadi* are convincing enough to regard it as a synonym of the former.

Distribution.—Assam, Burma, Siam and Sumatra.

G. platypogonoides is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 9941/1	Imphal stream near Thanga, Manipur, Assam.	Manipur Survey.	3 specimens : one in fairly good state of preservation and the remaining two dissected and mutilated.
F 9942/1	Amamlu Turail, near Imphal, Manipur, Assam.	Ditto.	5 specimens : in very bad state of preservation.
F 9943/1	Ditto.	Ditto.	1 specimen : in very bad state of preservation.
F 10275/1	Pegu Yomas, Burma.	J. P. Cook.	1 specimen : in fairly good state of preservation.
F 10548/1	Nakon, Sritaramarat Hills, Siam.	H. M. Smith.	1 specimen : *Type* of *G. siamensis* : in good state of preservation.

Table III.—*Measurements in millimetres of* Glyptothorax platypogonoides (*Blkr.*)

	Manipur. F 9942/1		Imphal, Manipur. F 9941/1		Pegu Yomas. F 10275/1	Sittaung drainage.
Standard length ..	81·0	103·0	95·0	97·0	51·0	85·0
Length of head	19·0	23·7	23·0	23·0	12·1	20·0
Height of head at occiput ..	10·5	15·0	15·7	15·0	7·5	12·0
Width of head ..	15·5	20·0	18·0	18·0	9·9	16·0
Length of snout. ..	8·2	11·0	10·2	10·5	5·2	9·6
Diamter of eye	2·0	3·0	3·0	3·1	1·3	2·3
Interorbital width ..	4·0	4·2	4·5	4·1	2·5	4·0
Depth of body	2·0	16·8	17·4	16·7	8·3	14·2
Length of caudal peduncle ..	18·2	22·0	19·3	19·0	11·0	18·6
Least height of caudal peduncle	5·0	6·5	6·0	6·0	3·0	6·0
Longest ray of dorsal ..	16·0	22·0	21·4	20·0	11·0	18·0
Length of dorsal spine ..	13·0	18·5	17·1	16·0	8·0	14·5
Length of pectoral ..	18·2	22·0	21·0	21·5	10·8	18·7
Length of pectoral spine ..	14·5	17·0	16·0	16·0	8·5	14·5
Length of pelvic ..	11·8	16·0	15·0	14·6	8·0	14·1
Longest ray of anal ..	D*	20·2	19·0	18·3	11·0	17·2
Length of base of anal ..	12·0	16·0	14·0	15·0	8·0	12·3
Length of base of adipose dorsal	9·3	14·5	11·1	12·0	5·8	10·5

Glyptothorax trewavasae Hora

1919. *Euglyptosternum saisii*, Annandale (*nec* Jenkins), *Rec. Ind. Mus.* XVI, p. 126.

1923. *Glyptothorax dekkanensis*, Hora (*nec* Gunther), *Rec. Ind. Mus.* XXV, p. 24, fig. 3.

1937. *Glyptothorax dekkanensis*, Hora (*nec* Gunther), *Rec. Ind. Mus.* XXXIX, p. 14.

1938. *Glyptothorax trewavasae*, Hora, *Rec. Ind. Mus.* XL, p. 373, pl. vii, figs. 3, 4.

In *G. trewavasae* the head is longer than broad and depressed. The dorsal is higher than the body. The dorsal spine is strong and smooth. The pectorals are shorter or equal to the head in length. The pelvic origin is a little behind the vertical from the last ray of the dorsal. The paired fins are not plaited. The occipital spine does not reach the basal bone of the dorsal. The skin is tuberculated.

D* Destroyed.

This species is recognised from the rest of the Glyptothoracid fishes of the Peninsular India, by its shorter maxillary barbels barely reaching the bases of the pectorals, and its shorter pectorals less than the head in length in the adults.

Distribution.—Yenna and Koyna Valleys in the Satara District, Bombay and the Tunga river at Shimoga, Mysore. The waters of both these region drain into the Kistna river.

G. trewavasae is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 9723/1	Yenna Valley, Satara Dt., Bombay State.	N. Annandale.	1 specimen : *Holotype* : in fairly good state of preservation.
F 10269/1	Koyna Valley, Satara Dt., Bombay State.	F. H. Gravely.	1 specimen : in bad state of preservation.
F 12435/1	Thunga R. at Shimoga, Mysore State.	B. S. Bhimachar.	1 specimen : in bad state of preservation.

Glyptothorax pectinopterus (McClell.)

1842. *Glyptosternon pectinopterus*, Mc Clelland, *Cal. Journ. Nat. Hist.* II, p. 587.

1923. *Glyptothorax pectinopterus*, Hora, *Rec. Ind. Mus.* XXV, p. 18, pl. fig. 1 ; pl. iv, fig. 3.

1936. *Glyptothorax pectinopterus*, Hora and Mukerji, *Rec. Ind. Mus.* XXXVIII, p. 137.

In *G. pectinopterus* the head and body in front of the pelvics are greatly depressed. The dorsal fin is higher than the body. The dorsal spine is weak and smooth. The pectorals are longer than the head. The pelvic origin is below the vertical from the last ray of the dorsal. The paired fins are strongly plaited and the thoracic adhesive disc characteristically small. The occipital process almost extends to the basal bone of the dorsal.

This species differ from *G. brevipinnis* in having a more depressed head, longer pectorals and pelvics, higher dorsal and granulated skin.

Distribution.—Punjab and U. P.

G. pectinopterus is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
1254 or F 10284/1	Jumna.	Purchased from F. Day.	1 juvenile specimen : in bad state of preservation.
F 10265/1	Sutle R., Badhmana Khad, Punjab.	Punjab Fisheries.	1 specimen : in good state of preservation.
F 10266/1	Kangra Valley, Punjab.	Ditto.	Several specimens : in good state of preservation.
F 12010/1	Irrigation Channel at Lachiwala, Dehra Dun, U. P.	S. L. Hora.	3 juvenile specimens : in fairly good state of preservation.
F 12011/1	Song R., Dehra Dun, U. P.	Ditto.	Ditto.

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 12012/1	Junction of Song R. and Ray Naid, Lachiwala, Dehra Dun, U. P.	S. L. Hora.	7 juvenile specimens: in fairly good state of preservation.
F 12148/1	Nandhaur R., Naini-Tal Dt., U. P.	Bhola.	2 specimens: in fairly good state of preservation.
F 215/2	Kangra Valley, Punjab	S. L. Hora.	Several specimens: in good state of preservation.
F 216/2	Ditto.	Ditto.	11 specimens: in very good state of preservation.

Glyptothorax gracile (Gthr.)

1864. *Glyptosternon gracile*, Gunther, *Cat. Brit. Mus. Fish.* V, p. 186.
1923. *Glyptothorax gracilis*, Hora, *Rec. Ind. Mus.* XXV, p. 25, text-fig. 4.

In *G. gracile* the skin is granulated. The thoracic adhesive disc is longer than broad. The occipital spine is apposed to the basal bone of dorsal. The dorsal origin is equidistant from the tip of the snout and the base of the adipose dorsal. The dorsal spine is strong and serrated. The pelvic origin is just below the vertical from the post-end of the dorsal.

Hora (*loc. cit.*, p. 25) has already shown the differences which separate this species from *G. trilineatus* such as longer pectorals and pelvics as well as longer maxillary barbels.

Distribution.—Nepal and Sikkim.

G. gracile is represented in the collection of the Zoological Survey of India from the following locality:—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 8293/1	Rangit R., Manjhitar, Sikkim.	B. L. Chaudhuri	1 specimen: in good state of preservation.

Glyptothorax lonah (Sykes)

1841. *Bagurs lonah*, Sykes, *Trans. Zool. Soc. London* II, p. 371.
1864. *Glyptosternum lonah*, Gunther, *Cat. Brit. Mus. Fish.* V, p. 187.
1864. *Glyptosternum dekkanensis*, Gunther, *Cat. Brit. Mus. Fish.* V, p. 187.
1878. *Glyptosternum lonah*, Day (in part), *Fish. India*, p. 496, pl. cxiii, fig. 5.
1889. *Glyptosternum lonah*, Day (in part), *Faun. Brit. Ind.*, Fish. I, p. 196, fig. 72.
1923. *Glyptothorax dekkanensis*, Hora, *Rec. Ind. Mus.* XXV, p. 24, fig. 3.
1923. *Glyptothorax lonah*, Hora, *Rec. Ind. Mus.* XXV, p. 30.
1937. *Glyptothorax lonah*, Hora and Misra, *Journ. Bombay Nat. Hist. Soc.* XXXIX, p. 513.
1938. *Glyptothorax annandalei*, Hora and Misra (*nec* Hora), *Journ. Bombay Nat. Hist. Soc.* XL, p. 36, pl. iii, figs. 3, 3*a*.
1938. *Glyptothorax dekkanensis*, Hora, *Rec. Ind. Mus.* XL, p. 241.
1938. *Glyptothorax lonah*, Hora, *Rec. Ind. Mus.* XL, p. 371; pl. vii, figs. 1, 2.
1947—49. *Glyptothorax lonah*, Chauhan, *Rec. Ind. Mus.* XLV, p. 274.

Hora (*loc. cit.*, pp. 363-367) has elucidated the systematic position of *G. lonah* in detail.

In this species the skin is granulated. The adhesive apparatus on chest and on the ventral surface of the outer rays of the paired fins, is well developed. The dorsal origin is nearer to the tip of the snout than to the base of the adipose dorsal. The dorsal spine is weak and smooth. The occipital process is long and narrow touching the basal bone of the dorsal. The pelvic origin is considerably behind the vertical from the post-end of the dorsal.

Hora (*loc. cit.*, p. 373) has already remarked on the resemblance of *G. lonah* to *G. annandalei* which can be differentiated from the former by the depressed form of its body and the longer pectorals and caudal peduncle.

Distribution.—Orissa, M. P. and Bombay States.

G. lonah is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 12676/1	Godaveri R. near Indore Road bridge, Nasik, Bombay State.	A. G. L. Fraser.	1 specimen : in good state of preservation.
F 12951/1	Gulli nullah at the foot of Baidila range, Bastar State, M. P.	H. Crooksbank.	6 specimens : in fairly good state of preservation.
F 12953/1	Darna R. below Fitzgerald bridge, Poona, Bombay State.	A. G. L. Fraser.	1 specimen : in good state of preservation.
F 212/2	Mutha R. at Nanderi, Poona, Bombay State.	M. Suter.	14 specimens : in good state of preservation.
F 213/2	Ditto.	Ditto.	11 specimens : in good state of preservation.
F 214/2	Suktel R. up Harishanker Rest House, Patna State, Orissa.	Patna State Survey.	2 juvenile specimens : in fairly good state of preservation.

Glyptothorax trilineatus Blyth

1860. *Glyptothorax trilineatus*, Blyth, *Journ. As. Soc. Bengal* XXIX, p. 154.
1864. *Glyptosternum trilineatum*, Gunther, *Cat. Brit. Mus. Fish* V, p. 185.
1878. *Glyptosternum trilineatum*, Day, *Fish. India*, p. 497, pl. cxvi, fig. 3.
1889. *Glyptosternum trilineatum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 197.
1889. *Glyptothorax trilineatus*, Vinciguerra, *Ann. Mus. Stor. Nat. Genova* XXIX, p. 252.
1923. *Glyptothorax trilineatus*, Hora, *Rec. Ind. Mus.* XXV, p. 29.
1934. *Glyptothorax laosensis*, Fowler, *Proc. Acad. Nat. Sci. Philadelphia* LXXXVI, p. 88, figs. 28, 29, 30.
1937. *Glyptothorax trilineatus*, Hora, *Rec. Ind. Mus.* XXXIX, p. 338.
1945. *Glyptothorax trilineatus*, Smith, *U. S. Nat. Mus. Bull.* No. 188, p. 399.

D.1/6-7 ; A.1/9-10 ; P.1/10-11 ; V.1/5 ; 16-18

Glyptothorax trilineatus is a subcylindrical, elongated species in which the dorsal profile is considerably arched from the tip of the snout to the origin of the dorsal fin whence it slopes down gradually to the base of the caudal fin. The ventral profile is somewhat straight up to the origin of the pelvic fins, thence arching gently to the caudal peduncle where it is horizontal.

The head is broadly pointed, depressed and flattened ventrally ; its length is contained from 3·8 to 4·3 times in the standard length ; its height at the occiput is contained from 1·3 to 1·9 and its width 1·0 to 1·2 times in its length. The eyes are small and dorsolateral in position ; their diameter is contained from 7·5 to 9·7 times in the length of the head. The mouth is inferior and horizontal ; the width of its gape is almost equal to the length of the snout. The lips are profusely papillated and continuous at the angles of the mouth. The teeth in the jaws are villiform ; those in the upper jaw form a narrow, continuous band while in the lower jaw the band is interrupted in the middle. The nasal openings are situated an eye diameter away from the extremity of the snout. The nasal barbels, nearly as long as the distance between their bases, reach just midway up to the eyes posteriorly ; the maxillaries are as long as or longer than the head, and extend beyond the pectoral bases or even to the middle of the pectoral fins ; the outer mandibulars are half as long as the maxillaries and almost reach the pectoral bases while the inner mandibulars are equal in length to the distance between the eyes and the nasal openings. The gill-openings form channelled, spout-like structures on the ventral surface in front of the bases of the pectoral fins. The gill-membrane is flap-like near the upper angle of the opening.

The depth of the body is contained from 5·2 to 6·5 times in the standard length. The caudal peduncle is 2·1 to 2·9 times as long as high. The dorsal fin rises midway between the tip of the snout and the base of the adipose dorsal ; it is nearly 1·1 to 1·5 times higher than the depth of the body below it. The basal bone of the dorsal is gently apposed to the occipital spine which is 3·0 to 4·0 times as long a wide. The dorsal spine is sheathed in skin ; it is rather weak and smooth ; it is usually equal to or a little less than the greatest depth of the body. The pectoral spine is strong and broad ; it is denticulated along its inner margin. The pectoral fins are shorter or as long as the head ; they are longer than the caudal peduncle ; they are separated from the pelvics by a considerable distance. The pelvic fins are longer than the dorsal spine and they extend beyond the vent being separated from the anal fin by only a short distance equal to an eye-diameter. The anal papilla is prominent. The anal fin is situated opposite to the adipose dorsal ; its longest ray is longer than the pelvic rays. The caudal fin is deeply forked and the lobes are usually equal.

The adhesive apparatus on the chest is longer than broad and without any central depression. The paired fins are not plaited.

The preserved specimens are chest-nut brown in colour with pale yellow abdomen. There is a well-marked dirtywhite, longitudinal

streak along the back extending from the occiput to the base of the caudal fin. A similar one runs along the lateral line on each side. There is also a third faint line along the abdominal margin. The fins are tinged with dirty, brownish yellow. The skin is granulated.

This species can be separated from *G. gracile* by its smooth and rather weak dorsal spine, shorter pectorals and by its dorsal origin which is nearer to the snout end than to the adipose base. From *G. cavia* it may be recognised by its granulated skin and the thoracic adhesive disc which is without a central pit and from *G. sinense* by its granulated skin and smooth spine.

Distribution.—India, Nepal, Burma and Siam.

G. trilineatus is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
Cat. 581 or F 10380/1	Tenaserim, Burma.	Berdmore.	2 specimens : *Type* : in bad state of preservation.
Cat. 579 or F 10381/1	Rangoon, Burma.	A. Ball.	1 specimen : in bad state of preservation.
F 11117/1	Thagata juva, Burma.	Genova Museum.	1 specimen : in very bad state of preservation.
F 12460/1	Namya R. at Kongan Thana, Upper Chindwin Drainage, Assam-Burma border.	S. T. Duncan.	3 specimens : in good state of preservation.
F 13206/1	Doi Angka, N. Siam.	H. M. Smith.	1 specimen : in fairly good state of preservation.
F 238/2	Paunglaung Chaung, main tributary of the Sittaung R., Taloktwin, Burma.	V. P. Sondhi.	5 specimens : in very good state of preservation.

TABLE IV.—*Measurements in millimetres of* Glyptothorax trilineatus *Blyth*

	Tenasserim.	Rangoon.	Sittaung drainage.				U. Chindwin drainage.		
	Cat. 581	Cat. 579	F 238/2				F 12460/1		
Standard length . .	59·2	79·5	109·5	120·0	63·0	90·2	61·8	66·8	73·0
Length of head	14·5	19·4	26·5	28·6	15·0	21·0	15·2	16·0	16·6
Height of head at occiput	8·5	10·0	14·6	20·2	11·0	13·0	10·0	10·7	11·0
Width of head	12·7	17·0	22·7	25·1	12·0	18·5	14·1	14·5	15·8
Length of snout .	7·0	8·7	12·0	13·8	6·4	9·0	6·8	7·3	8·0
Diameter of Eye	1·5	2·0	3·0	3·0	2·0	2·6	1·8	2·0	2·2
Interorbital width	4·0	5·0	7·1	7·8	3·2	5·7	4·0	4·3	5·0
Depth of body	9·0	12·3	17·1	22·0	12·0	15·3	11·1	11·5	12·0
Length of caudal peduncle	11·0	16·0	22·0	24·3	14·8	18·5	12·1	15·3	15·0
Least height of caudal peduncle	4·5	7·0	10·0	11·0	5·2	8·3	6·0	6·0	6·0
Longest ray of dorsal	12·3	18·6	22·1	24·0	13·0	18·0	13·5	15·2	15·6
Length of dorsal spine	8·1	13·3	17·0	17·0	11·0	14·0	9·0	10·5	10·2
Length of pectoral	14·0	18·8	23·8	26·0	15·0	19·0	14·2	16·8	15·1
Length of pectoral spine	9·2	12·5	16·0	17·5	11·5	14·2	10·0	12·5	11·2
Length of pelvic .	10·7	15·0	18·6	21·0	11·2	16·3	11·0	12·2	12·0
Longest ray of anal	12·8	16·0	20·3	20·0	13·8	19·3	13·2	15·0	14·5
Length of base of anal	9·2	11·3	15·8	19·0	9·9	14·0	10·0	10·0	10·8
Length of base of adipose dorsal	8·0	10·5	14·0	18·5	9·5	11·3	6·4	8·2	8·1

Glyptothorax annandalei Hora

1923. *Glyptothorax annandalei*, Hora, *Rec. Ind. Mus.* XXV, p.14; pl.i, fig. 3.
1938. *Glyptothorax annandalei*, Hora, *Rec. Ind. Mus.* XL, p. 372, text-fig. 3.
1949. *Glyptothorax annandalei*, Hora, *Journ. Zool. Soc. India* I, p. 2.
1949-50. *Glyptothorax annandalei*, Menon, *Rec. Ind. Mus.* XLVII, p. 237.

In *G. annandalei* the head and the part of the body in front of the pelvics are depressed. The dorsal origin is nearer to the tip of the snout than to the commencement of the adipose dorsal. The dorsal spine is weak and smooth. The pectorals are shorter than the head. The ventral origin is nearly below the vertical from the last ray of the dorsal. The occipital spine is apposed to the basal bone of the dorsal. The skin is granulated.

This species can be easily distinguished from *G. madraspatanum* by its plaited paired fins, smooth dorsal spine and granulated skin, while from *G. housei*, the third species found in the W. Ghats, it is readily separated by its granulated skin and greatly depressed head.

Distribution.—Western Ghats, Peninsular India, the Vindhyas and Nepal Himalayas.

G. annandalei is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 10135/1	Nierolay stream, Bhavani R., Nilgiris, Madras State.	N. Annandale.	3 specimens : *Type* : in good state of preservation.
F 226/2	Kosi R. at its confluence with the Arun R., Tribeni, Nepal.	Kosi Survey.	6 specimens : in good state of preservation.
F 227/2	Kosi R. down Barahakshetra, Nepal.	Do.	3 specimens : in good state of preservation.
F228/2	Kosi R. down Chhatra, Nepal.	Do.	1 specimen : in good state of preservation.
F 229/2	Kosi R., Nepal	Do.	30 juvenile specimens : in good state of preservation.
F 230/2	Rihand at Dam. Site, Mirzapur Dt., U. P.	Rihand Survey.	2 specimens : in good state of preservation.
F 231/2	Do.	Do.	16 specimens : in good state of preservation.
F 232/2	Do.	Do.	3 specimens : in good state of preservation.

Glyptothorax kashmirensis Hora.

1923. *Glyptothorax kashmirensis*, Hora, *Rec. Ind. Mus.* XXV, p. 22, text-fig. 2.
1930. *Glyptothorax kashmirensis*, Mukerji, *Mem. Connect. Acad. Arts and Sci.* X, p. 326.

G. kashmirensis is at once recognised by its characteristic thoracic adhesive disc which is slightly longer than broad with its pinits encircling

a central depression. The paired fins are not plaited. The dorsal spine is strong and smooth. The pelvic origin is behind the vertical from the last ray of the dorsal. The occipital process is distinctly separated from the basal bone of the dorsal. The skin is profusely granulated.

Hora (*loc. cit.*, p. 22) has already remarked about the sexual differences noted in this species with regard to the depth of the body and the length of the pectorals.

Distribution.—Kashmir and Punjab, W Himalayas.

G. kashmirensis is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 10270/1	Kashmir Valley	T. H. Pearse.	2 specimens : *Type* : in good state of preservation.
F 10271/1	Streams round Ichabal, Kashmir.	B. Prashad and B. N. Chopra.	4 specimens : in good state of preservation.
F 223/2	Hill streams of Chamba State, Punjab.	H. Crookshank.	1 specimen : in good state of preservation.
F 224/2	Jhelum R., Shadipur, Kashmir.	Yale North India Expedition.	1 specimen : in good state of preservation.

Glyptothorax striatus (Mc Clell.)

1842. *Glyptosternon striatus*, Mc Clelland, *Cal. Journ. Nat. Hist.* II, p. 587, pl. vi, figs. 1, 2.
1860. *Glyptothorax striatus*, Blyth, *Journ. As. Soc. Bengal* XXIX, p. 154.
1864. *Glyptosternum striatum*, Gunther, *Cat. Brit. Mus. Fish.* V, p. 188.
1878. *Glyptosternum striatum*, Day, *Fish. India*, p. 498.
1889. *Glyptosternum striatum*, Day, *Faun. Brit. Ind.*, Fish. I, p. 200.
1923. *Glyptothorax striatus*, Hora, *Rec. Ind. Mus.* XXV, p. 20.

In *G. striatus* the head and the anterior part of the body in front of the pelvics are greatly depressed. The dorsal fin is higher than the body and the dorsal spine weak and smooth. The pelvic origin is considerably behind the vertical from the last ray of the dorsal. The occipital spine does not extend to the basal bone of the dorsal. The thoracic adhesive disc is large and the paired fins strongly plaited. The skin is granulated.

The species is separated from *G. platypogonoides* by its weak and smooth dorsal spine, plaited paired fins and the occipital process not reaching the basal bone of the dorsal.

Distribution. Sikkim and Assam.

G. striatus is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
Cat. 578 or F 10379/1	Cherrapunji, Assam.	Bourne.	5 specimens : in bad state of preservation.
F 2689/1	Nong Priay R., Cherrapunji, Assam.	Museum Collector.	1 specimen : in fairly good state of preservation.
F 2690/1	Nong Priay R., Cherrapunji, Assam.	Do.	1 specimen : in fairly good state of preservation.
F 10238/1	Do.	S. L. Hora.	2 specimens : in good state of preservation.
F 10263/1	Below Gangtok, Sikkim.	F. M. Bailey.	1 specimen : in good state of preservation.
F 10264/1	Someswary R., Bagmara, Assam.	S. W. Kemp and B. N. Chopra.	1 specimen : in good state of preservation.

Glyptothorax saisii (Jenkins)

1910. *Glyptosternum saisii*, Jenkins, *Rec. Ind. Mus.* V, p. 128, pl. vi, fig. 6, text-fig. 1.

1923. *Glyptothorax saisii*, Hora, *Rec. Ind. Mus.* XXV, p. 20.

In *G. saisii* the head is longer than broad and depressed. The dorsal is higher than the body ; its origin is nearer to the snout end than to the base of the adipose dorsal. The dorsal spine is weak and smooth. The paired fins are plaited. The thoracic adhesive disc is longer than broad. The occipital spine extends to the basal bone of the dorsal. The skin is granulted.

This species differ from *G. pectinopterus* in the head being longer than broad and the thoracic adhesive disc being much longer than wide. It can be separated from *G. brevipinnis* by its higher dorsal, weaker dorsal spine and the well-developed thoracic adhesive disc which is longer than broad.

Distribution.—Paresnath hills, Bihar.

G. saisii is represented in the collection of the Zoological Survey of India from the following localities :—

Regd. No.	*Locality.*	*Donor or Collector.*	*Remarks.*
F 2583/1	Sita nullah, Paresnath hills, Bihar.	N. Annandale .	1 specimen : *Type* : in fairly good state of preservation.
F 3260/1 F 3261/1	Do.	Do.	Do.