

A NEW GENUS OF SCHIZOTHORACINE FISHES FROM TRAVANCORE, SOUTH INDIA.

By B. SUNDARA RAJ, *Diwan Bahadur, M.A., Ph.D.* (Liverpool).

(Plate VII)

In this paper a new genus of the Schizothoracine fishes is described from the Periyar Lake, which is an immense irrigation reservoir formed by the damming of the Periyar River, the largest and most important of the rivers of Travancore. It lies at an elevation of 2,709 feet above mean sea level. The Periyar rises in the Shivagiri Forest, on the Cardamom Hills, which form the north-eastern slope of the Western Ghats in Travancore, approximately in Lat. $9^{\circ} 10' N.$ and Long. $77^{\circ} 17' E.$ After a course of 10 miles in a northerly direction to Lat. $9^{\circ} 31' N.$ the river turns due west and flows over a sandy bed for a few miles to Peermade (Pirmed). It then resumes a northerly direction gradually trending westwards, and eventually crossing the Ghats reaches the sea near Cochin. The Periyar Dam is situated in its short east to west reach about 8 miles east of Peermade. The Lake at full supply level has a water spread of 232.80 square miles and a maximum depth of 176 feet. The discharge at the Dam is stated to be equal to half the average flow of Niagara. The Lake is surrounded by an impenetrable, evergreen tropical forest. The average rainfall in Peermade is 198.4 inches annually; it is the highest in all Travancore.

This is the first record¹ of a species of Schizothoracinae from the Tropics. The absence of this subfamily south of the Himalayas and the striking differences between the new genus and all the other known genera of Schizothoracinae might lead one to suspect that the South Indian fish is probably not a member of that subfamily. But the sheath of enlarged scales covering the vent and the base of the anal fin, which is the characteristic feature of that subfamily, and the serrated dorsal spine, the short anal fin and the general form of the fish prove that it is a true Schizothoracine species. The opinion of two leading ichthyologists, Professors L. F. de Beaufort and L. S. Berg, who were consulted, is quite definite. The latter, who is a specialist in the group and who examined a specimen, states :

“The Cyprinoid, as you correctly state, belongs undoubtedly to the Schizothoracinae as is demonstrated by the presence of a scaly sheath at the base of the anal fin and at the anal opening, by its serrated dorsal spine and short anal fin; but it differs from all the known Schizothoracinae in its peculiar scaling and from a lateral line forming a curve on the peduncle. The intestine is rather short and the peritoneum brown (not black). As far as I can judge this genus has affinity neither with *Cyprinon* nor with *Scaphiodon*, both those genera having no scaly sheath at the anal base. It is remotely allied to *Schizopygopsis*.”

¹ Dr. Hora has called my attention to a record in 1935 of an unidentified specimen of *Ptychobarbus* from Hyderabad State (Deccan) in the *Journ. Osmania University* III, p. 37. The occurrence of *Ptychobarbus* in plains is so improbable that the identification is open to serious doubt. Several enquiries made have not succeeded in either tracing the specimen or verifying the identification up to the time going to press.

Lepidopygopsis, gen. nov.

The new genus *Lepidopygopsis* is created to receive the South Indian form which differs from the rest of the Schizothoracinae in having a decurved lateral line on the caudal peduncle and in the arrangement and character of its scales and their number along the lateral line. It bears some resemblance to the genus *Schizopygopsis* Steindachner, from which it is readily distinguished by the presence of scales on the caudal portion of the body, a coarsely denticulated dorsal spine, four barbels and triserial pharyngeal teeth.

Genotype.—*Lepidopygopsis typus*, gen. et sp. nov.

Lepidopygopsis typus, gen. et sp. nov.

(Plate VII, figs. 1-4.)

Local name: “Brahmana Kendai” (Tamil).

B. iii; D. 4/7; A. 3/5; V 2/8; P. 1/14 (1/13)¹; C. 19; L. 1. 54-58 (54-60)+2; gill rakers 12 (10-12); Vert. 38.

The body is elongate and compressed. Its greatest depth, which is below the commencement of the dorsal fin, is contained 4.25 (4.1-4.65) times in the standard length. The dorsal profile ascends obliquely from the snout to the base of the dorsal fin almost in a straight line, whence it descends more gently also in a straight line to the base of the caudal fin. The ventral profile is curved up to the base of the anal fin but runs more or less straight along the caudal peduncle. The caudal peduncle is more than twice as long as broad at its narrowest part. The head is conical, moderately large and somewhat compressed; its length is contained 9.4 (4.4-4.9) times in the standard length; its width 1.7 (1.8-2) times and its height 1.4 times in its own length.

The eyes, which are moderately large, round and almost lateral in position, are situated more or less in the anterior half of the head. The diameter of the eye is contained 4.4 (2.8-4.4) times in the length of the head. The eyes are proportionately large in the young. The inter-orbital space is curved and is 1.8 (1.1-1.8) times the diameter of the eye.

The anterior and posterior nasal apertures are close together and are situated dorsally on either side of the snout midway between the tip of the snout and the anterior margin of the eye.

The snout, which is 1.25 (1.2-1.25) times as broad as long, is swollen, bluntly rounded, and overhangs the mouth. Its anterior border is sharp and entire and forms a deep rostral fold with small lateral lobes (Pl. VII, fig. 3). The large preorbitals extend on either side of the snout and end anteriorly in rounded, vertical borders concealing the lateral lobes of the snout. In one of the paratypes there are pearl organs on the snout. Two small rostral and two maxillary barbels are present; these are subequal, each measuring hardly 1.25 (1.12-1.25) of the diameter of the eye. The rostral barbels arise from the lateral lobes of the snout and the maxillary barbels are at the corners of the mouth.

¹ In the description the scale counts and measurements of the holotype, which is the largest complete specimen collected, are given; these are followed within brackets by the range of variation, if any, shown by the paratypes.

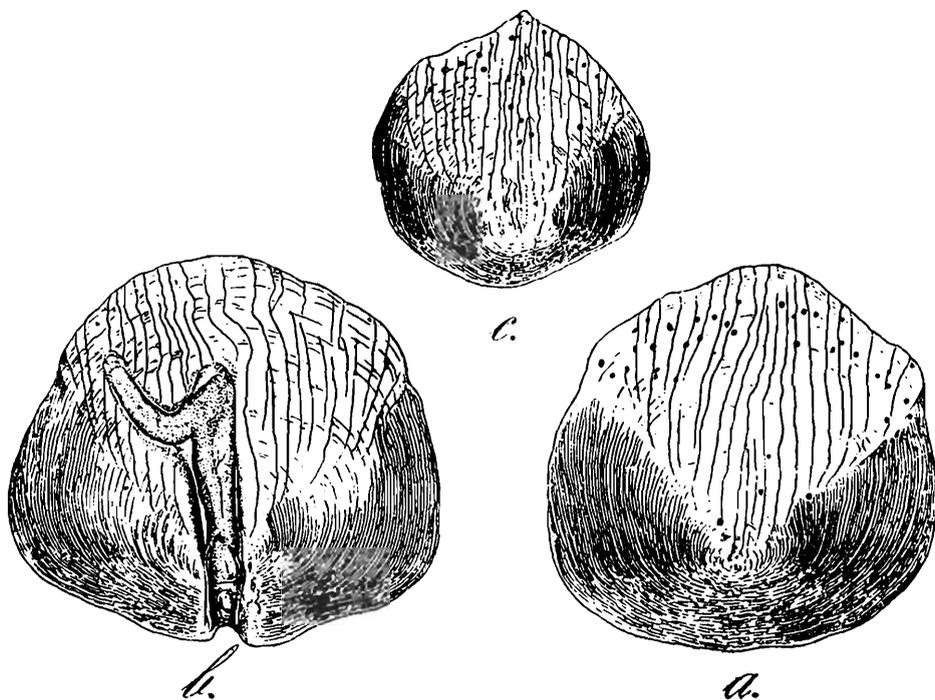
The mouth is inferior, moderately broad and transverse, but curved at the angles. Its cleft is shallow and nearly horizontal. The jaws are feebly protractile. The concealed maxillary does not reach below the anterior border of the eye (it does so in the young). The upper lip, which is thin and loosely invests the upper jaw, is continuous with the lower lip, which is developed only laterally at the curved corners of the mouth. The postlabial groove is broadly interrupted medially. The lower jaw is covered internally by the thin deciduous horny covering with a sharp anterior edge.

The gill opening is wide. It starts dorsally on a level with the upper border of the eye and extends forward ventrally to below the posterior margin of the preopercle. The gill membranes are confluent with the skin of the isthmus. The 10 to 12 short and pointed gill rakers are often curved and are hardly $\frac{1}{5}$ as long as the gill filaments which measure half the diameter of the eye. The pseudobranchiae are well developed and are provided with filaments.

The pharyngeal teeth (Pl. VII, fig. 4) are pointed and hooked and are in three rows 4-5.3.2—2.3.4-5. The anterior edentulous process of the pharyngeal is about $\frac{2}{3}$ as long as the posterior, and the pitted surface is moderately broad.

The alimentary canal is short, about 2.3 times as long as the standard length of the fish. The stomach contents in the specimen dissected consisted of insects, crustacea, diatoms and vegetable matter. The air bladder is of the usual Cyprinoid type and occupies almost the whole length of the body cavity. The peritoneum is brown in colour.

The scales are thin, cycloid, imbricate, and firmly adherent; their greatest diameter being that of the eye. There are no scales on the head, and only a few on the anterior part of the body consisting of a



Scales of *Lepidopygopsis typus*, gen. et sp. nov.

a. From scapular region; $\times 10\frac{1}{2}$; b. From lateral line; $\times 10\frac{1}{4}$; c. From caudal peduncle; $\times 10\frac{1}{2}$.

patch on the scapular region extending as far as the 6th scale on the lateral line, a few scattered scales on the base of the dorsal spine, a continuous row of enlarged scales along the lateral line and another along the midventral line starting from the base of the ventral fins. This latter at the end of the ventral fins constitutes a row of elongated tile-like scales forming a sheath to the vent and the base of the anal fin. The caudal portion of the body behind the dorsal and ventral fins is completely covered by an even, longitudinal series of scales. There are 26 rows of scales round the caudal peduncle and 54-58 on the lateral line, with two more on the base of the caudal fin. The scales are oval, broader than long in the scapular region, more or less rounded on the caudal peduncle and elongate in the anal sheath. A typical scale from the scapular region is oval and has a broad gently convex base, rounded sides with obsolescent basilateral angles and an obtusely pointed apex. The focus is basal in position. Numerous fine circuli cover the whole scale. They are circular and are packed closely at the base, and more distinctly spaced and somewhat indistinct on the apical field. Unlike other Schizothoracinae only apical radii, about 28 in number, are present. They are fine, weak, and more or less parallel lines running up and causing the apical margin to be crenulate. Only a few radii reach the nucleus.

The lateral line is complete and decurved. It runs concurrently with the ventral profile as far as the middle of the caudal peduncle and thence in a straight line along the midlateral line of the body to the base of the caudal fin. The curvature of the lateral line on the caudal peduncle is a feature peculiar to this genus.

The dorsal fin is short and is situated opposite the ventral fin. The length of its base equals the length of the head without the snout. Its origin is closer to the tip of the snout than to the base of the caudal fin. Its free margin is concave. The last undivided dorsal ray, which is almost as high as the body, is osseous, stout, and strongly denticulated along the two sides of its posterior margin. When depressed the first branched ray, which is the longest, reaches well beyond the tips of the last ray and almost half way to the base of the caudal fin. The anal fin is also short; its base is only 0.75 as long as that of the dorsal fin, and has an obtusely straight free margin. It is inserted about midway between the bases of the ventral and caudal fins. The anal fin is shorter in young specimens. The pectoral fin is roughly falciform, nearly as long as the head (shorter in the young), and when depressed reaches three-quarters of the way to the base of the ventral fin which originates about midway between the bases of the pectoral and anal fins. The ventral fin has a slightly concave free margin and is shorter than the pectoral fin. When depressed it reaches about three-fourths of the way to the anal fin. The caudal fin is as long as the distance between the bases of the ventral and anal fins, and is deeply forked with subequal pointed lobes.

The anus is situated on a short papilla.

In fresh specimens the back is olive brown and the sides and ventral surface of the head and body silvery, the dorsal, the caudal, and the distal half of the anal fin olive green. The terminal half of the dorsal

fin has a broad, indistinct dusky band. The caudal lobes and the anterior margin of the anal fin are dusky. The pectoral and ventral fins are hyaline. The iris is silvery.

Relationships.—The exact position of the new genus among the known genera of the subfamily Schizothoracinae is somewhat obscure. It differs from the rest of the subfamily and approaches the Cyprininae more closely than any other genus of the Schizothoracinae in the absence of the basal radii on the scales, and in having fewer scales along the lateral line, which is decurved on the caudal peduncle. While in the character and number of rows of its pharyngeal teeth and in having the caudal portion of its body completely covered by imbricate scales it shows primitive characters; in the loss of scales on the anterior portion of its body it is specialised. Thus it seems to occupy an intermediate position between the primitive genera *Paratylognathus* and *Schizothorax* and the specialised genera *Schizopygopsis*, *Gymnocypris*, etc.

The new genus and species are described from 13 specimens collected in 1936 and half a dozen collected in 1939 from the Periyar Lake. The largest specimen measuring 170 millimetres in standard length has been selected as the holotype.

Holotype.—F13510/1, Zoological Survey of India (*Indian Museum*), Calcutta, from the Periyar Lake, Travancore.

Measurements in millimetres.

				Holotype.	Smallest paratype.
Standard length	..	..	..	170	75
Depth of body	..	..	..	40	18
Length of head	..	..	..	35	17
Width of head	..	..	..	21	8
Height of head	..	..	..	25	11
Diameter of eye	..	..	..	8	6
Interorbital space		..	..	15	6
Length of snout	..	..	..	12	5
Width of snout	..	..	..	15	6
Length of caudal peduncle		..	..	37	16
Least height of caudal peduncle		..	..	16	7
Length of dorsal fin	..	..	..	43	19
Length of pectoral fin	..	..	..	34	15
Length of ventral fin	..	..	..	30	14
Length of anal fin		..	..	36	13

Zoogeographical Remarks.—The occurrence so far south in tropical India of a solitary Schizothoracine genus related to *Schizopygopsis* of the Indus and Oxus Rivers to the north-west of India extends the known distribution of the Schizothoracinae very considerably. In the present state of our knowledge of Indian freshwater fish it is also one of the very remarkable instances of discontinuous distribution. A possible explanation for the presence of this trans-Himalayan fish on South Indian Hills is not however far to seek.

According to Jordan¹, while trout and white-fish in Canada and New England travel freely from one river basin to another by descending to

¹ Jordan, D. S., *Fishes*, p. 121 (London: 1925).

the lower reaches or the sea, such a passage of a mountain fish under existing climatic conditions is quite impossible further south, for instance, from the Potomac to the James, in Virginia. The conditions in the north, however, show that such a transfer is possible and will occur, provided climatic conditions favour it at any time. It is generally presumed that the glacial age at the close of the tertiary era in the Northern Hemisphere explains the occurrence of isolated Arctic types in the Lakes of Canada, Sweden, Finland, and in the Gulf of Bothnia, though a direct water communication is postulated. Whether peninsular India was subject to Pleistocene glaciation is doubtful, but geologists consider that sufficient evidence exists in the hilltop flora and fauna of the glacial cold of the north being felt on the plains of India¹.

W. T. Blanford, Medlicott and Oldham² state :

“ On several isolated Hill ranges such as Nilgiris, Anamalai, Shevaroy and other isolated plateaux in Southern India, and on the mountains of Ceylon, there is found a temperate fauna and flora, which does not exist in the low plains of Southern India, but is closely allied to the temperate fauna and flora of the Himalayas, the Assam range (Garó, Khasi and Naga Hills), the Mountains of Malay Peninsula and of Java.....

“ The animals inhabiting the Peninsular and Singalese hills belong, for the most part, to species distinct from those found in the Himalaya and Assam ranges. In some cases even genera are peculiar to the hills of Ceylon, and South India..... There are, however, numerous plants and a few animals inhabiting the hills of Southern India and Ceylon, which are identical with Himalayan and Assamese hill forms, but which are unknown throughout the plains of India.”

After discussing various agencies which might have effected such a distribution, the authors conclude, “ The only remaining theory, to account for the existence of the same species of animals and plants on the Himalayas and the hills of Southern India, is depression of temperature.”

The occurrence, therefore, of this Himalayan and trans-Himalayan subfamily of fish in the Travancore Hills is in line with that of other northern types, such as the Nilgiri wild goat, and is explained by the glacial cold which rendered such a dispersal possible.

I wish to express here my great indebtedness to Dr. Bains Prashad and Dr. S. L. Hora of the Zoological Survey of India for their help in connection with this work. The illustrations were prepared under the supervision of Dr. Hora by Babu B. N. Bagchi.

¹ Wadia, D. N., *Geology of India*, pp. 242-246 (London : 1919).

² Medlicott, M. A. and Blanford, W. T., *A Manual of the Geology of India*, 2nd ed. (Revised by R. D. Oldham), pp. 13-16 (Calcutta : 1893).