

species of fishes for their visceral oil may be economically justifiable.

Inland Fisheries Office,
8, Ormes Road,
Kilpauk, Madras,
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1. Read before the Zoology Section at the 33rd Indian Science Congress, 1946, and communicated by permission of the Director of Industries and Commerce, Madras. 2. Jowett, W. G., and Davies, W., *A Chemical Study of Some Australian Fish*, 1938.

* This analysis was conducted in the Nutrition Research Laboratories, Coonoor, and in the Government Oil Factory, Calicut.

SQUILLA HIEROGLYPHICA KEMP.

MR. KURIYAN'S note on the occurrence of *Squilla hieroglyphica* along the Travancore coast is indeed of considerable interest in view of the fact that the present record extends the range of this rare Indo-Pacific Stomatopod to the west coast of India also. However, his surmise that the species does not appear to have been recorded since Kemp's original description is not quite correct. Kemp² himself collected a second specimen from the Philippines in 1915. It was a female, 48 mm. long. The third record of the species was from the Madras coast. The present writer³ collected an *Alima* in the final pelagic stage from the Madras plankton, reared it in the laboratory through metamorphosis and identified the post-larva as *S. hieroglyphica*. Not only has the species thus been recorded from the Indian waters, but its pelagic larva has also been described and figured. The close resemblance of this Indo-Pacific species to *S. hildebrandi* recently described by Schmitt⁴ from the Panama Canal zone was also pointed out by the writer.

The specimen recorded from Travancore is, therefore, the fourth known so far, and it would appear that the species is not altogether so very rare in the Indo-Pacific region.

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July 10, 1947.

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1. Kuriyan, C. V., *Curr. Sci.*, 1947, **16**, 124. 2. Kemp, S., *Philippine J. Sci.*, (1), 1945, **10**, 3. Alikunhi, K. H., *Curr. Sci.*, 1944, **13**, 18. 4. Schmitt, W. L., *Rept., Allan Hancock Pacific Exped.*, 1940, **5**, 4.

THE MIGRATORY FISHES OF THE INLAND WATERS OF MADRAS

IN accordance with the resolution of the Advisory Board of the Indian Council of Agricultural Research for a survey of the fishery resources of water-ways, a preliminary survey of the migratory fishes of the Madras Province was conducted by me. The following are the salient features of this survey.

The four major rivers in the Madras Presidency, namely, the Godavari, the Kistna, the Tungabhadra and the Cauvery, are generally in floods from June to December, when they are characterised by muddy discolouration,

great velocity of flow and fluctuating depth. By the end of January the river recedes, and these rivers soon dwindle into a few scattered pools which may be interconnected by narrow strips of shallow water until the next year's floods raise the levels again.

It is found that first freshets stimulate the migratory impulse in the various species; and with the rise, swell and discharge of the mingled waters the migration is soon in full swing. The migratory fishes in the rivers of Madras can be grouped into four classes, namely, those (1) entering the rivers from the sea, (2) descending the rivers into the sea, (3) moving up and down the upper reaches, and (4) showing local migrations in the plains.

The Hilsa, *Hilsa ilisha* (Ham.), is one of the most commercially important fishes, ascending the rivers for feeding and breeding. In the Godavari alone this fish yields an annual fishery worth about Rs. 100 lakhs, and in the Kistna and the Cauvery it contributes substantially to the bulk of the riverine crop. Under existing conditions of these South Indian rivers the Hilsa exhibits the longest migration. In the Godavari, it has been observed to go upwards to a distance of 210 miles from the sea, i.e., up to the Dummagudem Anicut. The Bektī, *Lates calcarifer* (Bloch.), the Jew Fish, *Sciæna belangeri* (C. & V.), and the Mullet, *Mugil olivaceus* Day, ascend the rivers, particularly the Godavari and Kistna, in fairly large numbers, to a limit of 80 miles from the sea. Thus, specimens of these species were caught from Polavaram and Bezwada. Stray specimens of the Tarpon, *Megalops cyprinoides* (Broussonet), the marine glass fish, *Ambassis commersonii*, C. & V., and of the Indian Salmon, *Polynemus tetradactylus* Shaw, were observed up to the Godavari Anicut, about 60 miles from the sea. Gonadial examination has not revealed that these species migrate far into the river for spawning. It is presumed that they ascend the rivers only for feeding.

The freshwater eel, *Anguilla bengalensis* (Ham.), which migrates from freshwater to the sea for spawning, is but poorly represented in the rivers and other waters of Madras.

The species which move up and down the upper reaches of the rivers for breeding and feeding are (1) the Carnatic Carp, *Barbus carnaticus*, Jerdon., (2) the Brown Mahseer, *B. hexagonolepis*, McClell., (3) the Mahseer, *B. tor*, (Ham.), and (4) the Goonch, *Bagaris yarrellii* (Ham.). The Mahseer has been observed to breed in the upper reaches of the Cauvery, Bhavani, Tungabhadra and Godavari; and the Carnatic Carp and the Brown Mahseer in the upper reaches of the Cauvery. The Goonch breeds in the Tungabhadra.

The species which show local migrations in the plains are chiefly (1) *Wallago attu* (Bl. Schn.), (2) *Callichrous bimaculatus* (Bl.), (3) *Pangasius pangasius* (Ham.), (4) *Silundia silundia* (Ham.), (5) *Marcones aor* (Ham.), (6) *M. seenghala* (Sykes), (7) *Labeo fimbriatus* (Bloch.), (8) *L. calbasu* (Ham.), (9) *Cirrhina cirrhosa* (Bl.), (10) *C. reba*, Ham., (11) *Catla catla* (Ham.), (12) *Thynnichthys sandkhol* (Sykes), (13) *Barbus sarana* (Ham.), and (14) *B. dubius* (Day).