

portion was free from the opaque yolk mass having numerous tiny and irregular oil globules. The eyes were fairly well developed and already black in colour. The heart was also fully formed and beating rhythmically. The otocysts were clearly visible. Pigment spots could be seen all over the cephalic region and at a few places on the trunk and tail.

*Newly hatched larva*: The larva hatched out in the afternoon of 9-2-'59 and measured 8.1 mm. (fig. 2). It had already attained the characteristic shape of the adult pipe-fish except that the pipe-shaped snout was extremely short and the yolk mass was still present though very much reduced in size. The dorsal and pectoral fins were well developed with rudiments of rays visible. The whole body (including the fins) was pigmented, with a heavier concentration of spots in the cephalic region. In *Ichthyocampus carce* (Jones & Menon 1953-embryo, stage II) the chromatophores are concentrated more on the trunk than on the head. Rudiments of abdominal and caudal annuli were discernible with seven of the latter under the dorsal fin. The larva, however, did not survive for more than a few hours.

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#### REFERENCES

- DUNCKER, G. 1910. *Spol. Zeyl.* 7, pp. 25-34.  
 GUDGER, E. W. 1906. *Proc. U.S. Nat. Mus.*, 29 : 447-500.  
 JONES, S. AND MENON, P. M. G. 1953. *J. zool. Soc. India* 5, pp. 255-267.  
 PADMANABHAN, K. G. 1961. *Bull. Central Res. Inst. Univ. Kerala, Ser. C. Nat. Sci.* 8 : 1-13.  
 TAKAI, T. AND MIZOKAMI, A. 1959. *J. Shimonoseki Coll. Fish.* 8 : 85-89.

#### A NOTE ON THE OCCURRENCE OF LARGE SCALE FISH MORTALITY ALONG THE CHALIYAR RIVER NEAR BEYPORE

An unusual phenomenon of large scale fish mortality was noticed at Chaliyar river in Beypore on the morning of 3rd May 1966. The fishermen noticed hundreds of fish struggling and coming up on the surface of water in a dazed and dead condition and showing signs of suffocation. They caught the dead and dying fish and sold them immediately in the market. No adverse effect as a result of eating these fish was noticed. The fishermen reported that at the time fish were seen struggling for life, large quantities of black, viscous liquid were flowing in the river evidently being the effluents discharged by the Gwalior Rayons Silk factory situated at Mavoor about 8 km. away from Beypore. This factory which is located near the banks of the Chaliyar river usually discharges its effluents into the above mentioned river which joins the sea at Beypore.

Beypore was visited by us the next day i.e. on 4th May. We saw large quantities of dead fish strewn all along on either side of the Chaliyar river and for about two miles on the sea shore to the north and south of Beypore sea. They were found to be in a decomposed state.

A representative sample of the fish was collected and it was found to consist of the following species :

<i>Trypauchen vagina</i> (Bl. Schn.)	<i>Cynoglossus dubius</i> (Day)
<i>Etroplus suratensis</i> (Bloch)	<i>Platycephalus indicus</i> (L.)
<i>Tachysurus dussumieri</i> (C. & V.)	<i>Platycephalus crocodilus</i> Tilesius
<i>Tachysurus thalassinus</i> (Rupp.)	<i>Triacanthus brevirostris</i> (Temm. & Schl.)
<i>Batrachus grunniens</i> (Bloch)	<i>Pomadasys hasta</i> (Bl.)
<i>Platax teira</i> (Forsk.)	<i>Leiognathus blochi</i> (C. & V.) and
<i>Scatophagus argus</i> (Bl.)	Eels & Mulletts
<i>Brachirus orientalis</i> (Bloch)	<i>Scylla serrata</i> (Forsk.)
<i>Sillago sihama</i> (Forsk.)	

Nearly seventy per cent of the dead fish comprised of the first four species listed above.

On the same day water sample was collected from Chaliyar river at Mavoor near the factory and a sample of effluent discharged from the factory was also collected. Both these samples were analysed for oxygen, pH, phosphates and silicates, and the values are given in the Table below :

	Effluent	Chaliyar river
Oxygen	3.6 ml./l	4.7 ml./l
pH	8.2	8.0
Phosphates	0.15 $\mu$ g at./l	0.1 $\mu$ g at./l
Silicate	17.5 $\mu$ g at./l	9.0 $\mu$ g at./l

From the above it is seen that the phosphate and silicate values were low as compared with the values observed in Korapuzha estuary (Rao & George 1959). But it is unlikely that the low phosphate and silicate values affected fish life. pH though alkaline could not have endangered fish life. But the oxygen content was found to be low in the effluent. This low oxygen can be attributed to the oxidation of the chemicals found in the effluent and this reduced oxygen with the products of oxidation can create an unfavourable environment (Banerjea *et al.* 1956). It can be deduced that the discharge of oxygen deficient effluent into the Chaliyar river in abundant quantities coupled with the decomposition of organic matter creating near anaerobic conditions has caused the large scale fish mortality in Chaliyar river. As a further evidence the dead fish showed signs of asphyxiation with extended gills and swollen bodies.

The devastating effect of the effluent matter more or less caused the complete destruction of fish and aquatic fauna along its course in the river and especially at the fish rich Beypore estuary. Steps have to be taken to see that the effluent water is so purified that it does not cause destruction of fish and aquatic life when discharged into the river even in large quantities.

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## REFERENCES

- SURYANARAYANA RAO S. V. AND GEORGE P. C. 1959. *J. Mar. biol. Ass. India*, 1(2): 212-223.
- SANTIMONY BANERJEA, MOTWANI, M. P. AND KARAM CHANDANI, S. J. 1956. *Ind. J. Fish.*, 3(1): 186-196.