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REFERENCES

DAY, F. (1878): Fishes of India, Burma and Ceylon. William Dawson & Sons, London: 607.

HORA, S. L. (1932): Notes on fishes in the Indian Museum XIX. On a new loach of the genus *Botia*, with remarks on *B. dario* (Ham.-Buch.). *Rec. Indian Mus. Calcutta 34*:571-573.

———— (1944): On the Malayan affinities of the Freshwater Fish-fauna of peninsular India, and its bearing on the probable age of the Garo-Rajmahal gap. *Proc. Nat. Inst. Sci. India 10*:423-439.

———— (1949): Satpura hypothesis of the distribution of the Malayan Fauna and Flora to Peninsular India. ibid. *15*:309-314.

MENON, A. G. K. (1951): Further studies regarding Hora's Satpura hypothesis I. The role of the eastern Ghats in the distribution of the Malayan fauna and flora to peninsular India. ibid. *17*:475-497.

———— (1973): Origin of the freshwater fish fauna of India. *Curr. Sci. 42*:553-556.

21. HERMAPHRODITISM IN THE MURREL, *CHANNA PUNCTATA* (BLOCH 1793)

Hermaphroditism has been reported in several teleostean fishes (Dawson 1964, 1966, 1971). In addition to the several examples of hermaphroditism in Indian marine fishes (published in different issues of the Journal of the Marine Biological Association of India), mention may also be made of the following freshwater fishes exhibiting hermaphroditism—*Macrones vittatus* (Singh & Sathyanesan 1961), *Puntius stigma* (Sathyanesan 1958), *Cirrhina reba* (Sathyanesan & Rangarajah 1953), and *Hilsa ilisha* (an anadromous fish) (Chacko & Krishnamurthi 1949)—but in chronological sequence. However, this is the first report on hermaphroditism in the family Channidae.

During our studies on *Channa punctata* (Bloch 1793) from Guntur, South India, we came across a 202 mm long (TL) hermaphrodite. Though Dehadrai *et al.* (1973) reported some colour difference between males and females of this species, we do not find it to be a reliable secondary sexual character in the large number of specimens (2400) examined from Guntur. On dissection, it is easy to identify the sex of even juveniles measuring 70 mm TL, because both ovaries extend behind the vent, whereas the testes do not. In the present hermaphrodite, the gonad looks like a testis externally and does not extend behind vent. However, when examined microscopically, both gonads are observed to be ovotestes. The ovarian and testicular tissues are mixed, without any particular position for each. All the ova are immature; yolk deposi-

tion has started in a few of the larger ova. The diameter of the ova ranges from 0.023 mm to 0.23 mm. The spermatocytes are clear only under high magnification (X 1000).

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REFERENCES

DAWSON, C. E., (1964): A bibliography of anomalies of fishes. *Gulf Research Reports, 1*(6):308-399.

———— (1966): A bibliography of anomalies of fishes, Supplement 1. ibid. *2*(2):169-176.

———— (1971): A bibliography of anomalies of fishes, Supplement 2. ibid. *3*(2):215-239.

CHACKO, P. I. & KRISHNAMURTHI, B. (1949): A preliminary note on the *Hilsa* fishery investigations in South India. *Proc. of the 35th Indian Sci. Cong.*: 209 (Abstract).

DEHADRAI, P. V., BANERJI, S. R., THAKUR, N. K. & DAS, N. K. (1973): Sexual dimorphism in certain air breathing fishes. *J. Inland Fish. Soc. India 5*:71-77.

SATHYANESAN, A. G. & RANGARAJAH, K. (1953): Hermaphroditism in *Cirrhina reba. Proc. of the 40th Indian Sci. Cong.*: 208 (Abstract).

SATHYANESAN, A. G. (1958): Occurrence of oocyte in adult testis of the fish *Barbus stigma* (Cuv. & Val.). *Sci. & Cult. 23*:203.

SINGH, T. P. & SATHYANESAN, A. G. (1961): An instance of hermaphroditism in the catfish *Mystus vittatus* (Bloch). *Curr. Sci. 30*:302-303.

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22. THE LIFE-HISTORY OF A CAVERNICOLOUS ORTHOPTERA *KEMPIOLA SHANKARI* SINHA & AGARWAL (ORTHOPTERA: PHALANGOPSIDAE)

(*With two text-figures*)

INTRODUCTION

The Cavernicolous Orthoptera *Kempiola shankari* Sinha & Agarwal was collected from a subterranean cave at Kotumsar, about 35 miles south of Jagdalpur (Bastar district). The shaft leading to the interior is vertical and about 17 metres deep. The interior has numerous stalagmites and stalactite formations and has several small pools fed by seepage water. The temperature in the interior varies between 24° and 29°C.

POPULATION ANALYSIS

The population of *K. shankari* was studied during March, April, May, November and December 1970 and December 1971 (Table 1). During June to October the cave was not accessible due to heavy rains. The population, during the period of study was divided into three morphological types, (a) nymphs without wing bud, (b) nymphs with wing bud and (c) adults (males and females) (Table 2). The data indicate that in December the adults