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ON SOME GROWTH STAGES AND FOOD OF *AROTHRON STELLATUS* (BLOCH) (TETRAODONTIDAE:PISCES)

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The controversial characters in the colour pattern in the different growth stages of the species *Arothron stellatus* (Bloch) have been examined. The present study confirms that the continuous bands reported on the dorsal surface in fish of 26 mm length start breaking up at about 45 mm length and this is completed at even as early as 110 mm length, and that the continuous bands in the under surface of the medium sized fish disappear in the adult fish. Food of the species at the different growth stages has also been outlined.

The species *stellatus* was originally described by Bloch in 1801 under genus *Tetraodon* Linnaeus. But later it was assigned to *Arothron* Muller 1839. The present account attempts to provide a confirmation on the variations in the colour pattern of the species in the different growth stages (45 mm, 110 mm and 380 mm in total length) and provide information on the difference in the body proportions in these stages together with an account of the food of the species. The descriptions are based on specimens collected at Vizhinjam from shore seines and preserved in 5% formalin.

Colour — 45 mm size (Fig. 1. A and B): Body pale brown with dark brown bands on the upper side, radiating from a point mid-dorsally, midway between pectoral tip and dorsal fin origin; the bands, extending to all over

the body, are continuous along the ventral region. The bands are much broken over the anterior half of the dorsal surface, sides of head, snout and caudal peduncle. Anus in a black patch. Dorsal and anal fins pale yellow without pigment spots. Pectoral pale yellow with four small blotches in a row over the base only. Caudal pale yellow with dark brown spots in three vertical rows.

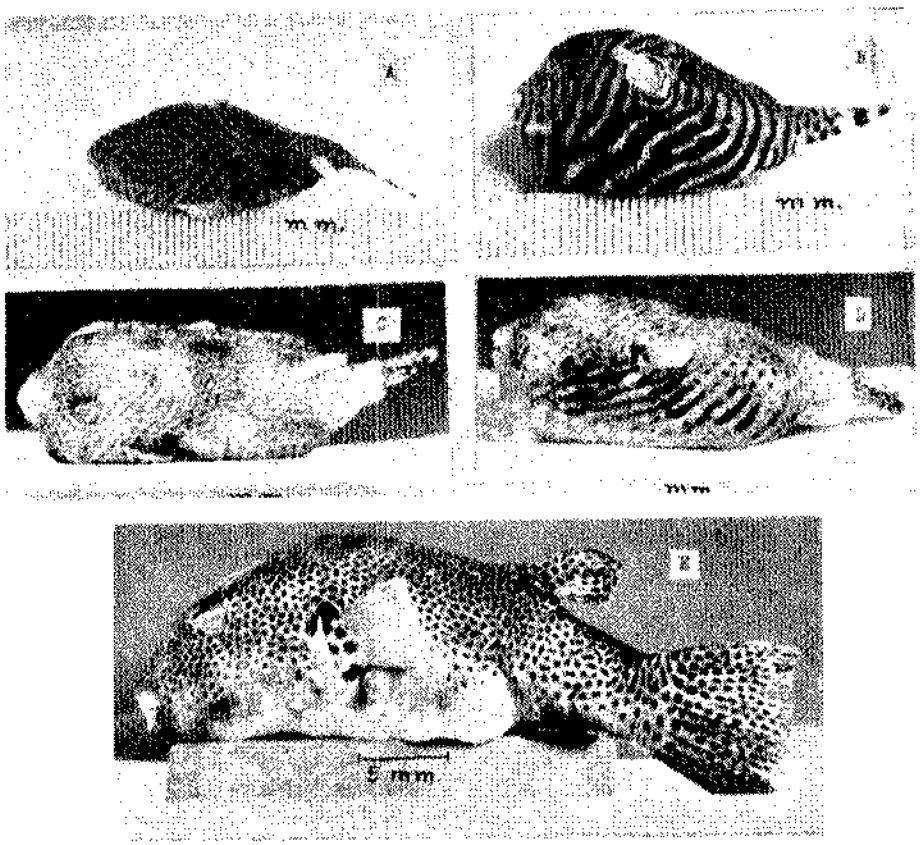

FIG. 1. Variations in the colour pattern in the different growth stages of *Arothron stellatus* (Bloch). A and B:45 mm total length, dorsal and lateral views.
C and D:110 mm total length, dorsal and lateral views.
E:380 mm total length, lateral view.

110 *mm size* (Fig. 1, C and D): Body light grey. The pattern of the linear distribution of pigmentation over the body generally similar to the one of 45 mm length but the bands are very much broken all over the dorsal surface and sides of body; the bands on the ventral side, however, being continuous. Anus in a black patch. Dorsal and anal fins pale yellow with thin pigment spots along the fin rays. Pectoral pale yellow with thin pigment spots

only over the proximal portion of the fin rays; base of pectoral with three black blotches. Caudal pale yellow with six irregularly vertical rows of black spots.

380 *mm size* (Fig. 1. E): Numerous, closely set, irregular, dark brown spots bordered by narrow light brown lines present on the dorsal and lateral surfaces of body. Pale yellow on the ventral surface excepting for the black patch around the anus. Dorsal fin pale brown, with conspicuous dark brown spots along the fin rays forming 8 curved rows. Pectoral light brown without pigment spots over the fin except on the base, a blotch each at the upper and lower base and three over the mid case. Anal light brown, with a few round dark spots along the fin rays. Caudal with numerous round dark brown spots all over the fin.

Food — Food of the specimen 45 mm size comprised planktonic items. The diet was formed by copepods and they were represented by *Paracalanus, Oithona, Onceaea* and *Pseudodiaptomus*. Amphipods, cumaceans, fish eggs as well as diatoms represented by *Pleurosigma, Coscinodiscus* and *Thalassiothrix* formed the other food items. In specimens 110 mm and 380 mm size broken parts of crabs formed the entire stomach contents.

Body proportions and meristic counts — A few body proportions appear to undergo marked change with the growth in length. Thus the anal fin and the position of anus appear to shift forward. The relative proportions of head length and eye diameter appear to decrease; but the length and the least height of caudal peduncle, and the height of dorsal and anal fins increase. Body proportions are presented here for the three growth stages, separately; the first figure relates to the smallest size of fish and the last figure to the largest size. The meristic counts are also presented similarly.

As per cent of total length: Standard length 82.2, 80.9, 77.4; snout to origin of dorsal 66.7, 64.5, 60.5; snout to origin of anal 73.3, 72.7, 56.8; snout to vent 66.7, 69.1, 48.7; snout to gill opening 35.6, 34.5, 30.5; snout to front border of eye 15.6, 16.4, 15.5; inter-orbital space 17.8, 18.2, 17.4; eye diameter 8.9, 6.4, 4.2; height of body 51.1, 40.0, 34.2; least height of caudal peduncle 8.9, 10.0, 13.2; length of caudal peduncle 11.1, 10.9, 16.3; height of dorsal fin 11.1, 12.7, 17.7; height of anal 11.1, 12.7, 17.1; length of pectoral 13.3, 13.6, 13.4; and length of caudal 20.0, 19.1, 22.6.

D. 10, 10, 11; A. 11, 11, 11; Pect. 19, 19, 18; C. 9, 9, 9.

General Remarks — Gunther (1870) supposes that the bands seen on the back in very young size (26 mm) of the species *stellatus* break up into rows of spots in older specimens. Klunzinger (1871) agrees with this supposition, apparently without having seen such small specimens. De Beaufort and Briggs (1962) state that it is possible that in some individuals the bands on the dorsal surface of fish disappear at size smaller than 150 mm length, at which size according to Gunther (1870) the fish assumes the typical adult colouration.

Annandale and Jenkins (1910) who examined two small specimens of the species could not connect them to species *stellatus* in the absence of intermediate forms.

From the foregoing account, it may be stated that the breaking up of the dark brown bands which started on the dorsal and lateral sides in the 45 mm size is more or less completed even as early as 110 mm size. But the ventral bands although entire show an indication of fading off at this size. In the 380 mm size the broken bands on the dorsal and lateral sides appear to break further and assume a roughly roundish form surrounded by a narrow light brown net work. In all the three growth stages examined the black patch around the anus remains constant. The nasal organ in the three sizes is formed of only two thick tentacles unified basally. All these go to confirm that three growth stages belong to the same species *viz. A. stellatus.*

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