REGENERATION OF TAIL IN THE EEL *MURAENESOX TALABONOIDES* (BLEEKER)

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Regeneration of caudal fins among fishes of the Indian region has been reported (Menon 1951, Jones and Menon 1952, and Bensam 1965). In the eel, *Muraenesox talabonoides* studied here, regeneration beyond the base of caudal fin is common and hence, morphological and anatomical details and the proportion of length of tail to that of trunk are effected.

Standard alizarin preparation of normal and regenerated caudal fins made the anatomical features visible. Fig 1. shows the isocercal nature of the normal caudal fin. It has, in addition to the unbranched dorsal and ventral fin rays (Fig. 1C), eight branched fin rays attached to the hypurals (Fig. 1B). All these rays appear to be many jointed.

As the regenerated tail portion is ill-formed and distorted, the caudal fin loses its isocercal nature, particularly when the zone of truncation involves regions anterior to the base of the caudal fin (Fig. 2). The number of fin rays in the regenerated fin is more than that of the normal ones. In the specimens studied, it varied from 15 to 60. These rays are unequal in length and are not branched, except for a few rays. The unbranched nature of most of the regenerated rays in the caudal fin and all of the original rays in the dorsal and ventral fin may indicate that all these rays have a common origin.

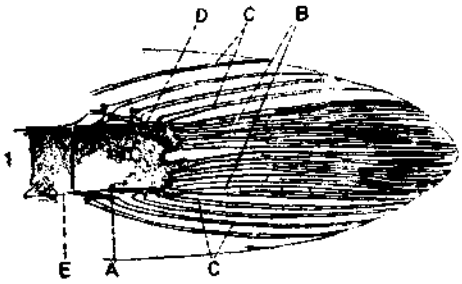

FIG. 1. Details of the normal caudal region of *M. talabonoides*. A. hypurals; B.caudal fin rays; C. rays of dorsal and ventral; D. radials; E. vertebrae.

Although regenerated rays usually increase in number as the area of truncation is located further anterior wards from the base of caudal fin (Jones and Menon 1952, and Bensam and Mahadevan Pillai 1968), the capacity to regenerate lost rays was found to be totally lacking when the length of tail lost was more than 58% in *Muraenesox talabonoides*.

Normally, the length of tail in *Muraenesox talabonoides* is found to be more than that of the trunk, the average trunk: tail length ratio being 1:1.09. However, truncation and subsequent regeneration of tail changes the above proportion. Variations in the proportion, and hence the percentage (P) of tail-

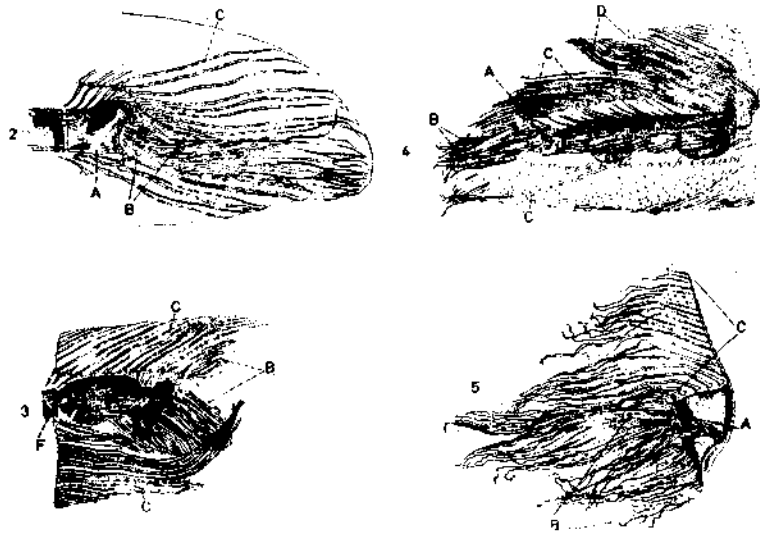

FIG. 2. Re-generated caudal region. A. hypurals; B. caudal fin rays; C. rays of dorsal and ventral; D. regenerated rays of dorsal fin; E. vertebrae.

length that might have been lost due to the process of regeneration was calculated from the expected (E) and observed (O) length of tail of each specimen, using the formula, $P = \frac{E-O}{E} \times 100$. The expeoted length of tail (E) was calculated from the formula, E = T x A, where, T = observed length of trunk of a specimen and A = the average proportion of length of tail to that of trunk of 37 normal specimens, which was found to be 1.09. That is, for every 1 cm of the trunk, the tail would measure 1.09 cm. Table 1 shows that the proportion of tail length has been reduced to less than 1 in all the specimen except one. The percentage of caudal length apparently lost in these examples, therefore, varied from 6 to 79, some of which are statistically significant (Table 1).

TABLE 1. *Calculated percentage of tail length lost due to truncation in wam specimen with regenerated tail.*

Length of trunk	Observed length of tail in cm	Observed trunk/tail proportion	Expected length of tail	% of tail length lost	X^2 Value 1 d.f.
63***	66	1:1.05	——	——	——
58.2**	63.3	1:1.09	——	——	——
75	77	1:1.02	81.75	5.8	2.76
85	74	1:0.87	92.65	20.1	3.75
69	59	1:0.85	75.21	21.5	3.49
83	66.5	1:0.80	90.3	26.4	6.35
93	70	1:0.75	101.37	30.9	9.7*
61	35	1:0.57	66.49	47.3	14.9*
64	33	1:0.51	69.76	52.6	19.3*
80	36	1:0.45	87.20	58.7	30.1*
75	33.5	1:0.44	81.75	59	28.5*
98	22	1:0.22	106.82	79.4	67.3*

*** Normal specimen studied.
** Average for normal specimens.
* Significant at 1% level.

The process of regeneration of caudal fin in *Sardinella longiceps* was attributed to the spawning behaviour (Bensam 1965). In *Muraenesox talabonoides*, it appears to be independent of size, sex, maturity and seasons. However, the observation of young eels in the food items of *M. talabonoides*

(Kagwade 1969 and Suseelan and Somasekharan Nair 1972) may suggest that the truncation of its tail may also be caused by the cannibalistic habit of this species itself.

As tail regeneration is common in *M. talabonoides*, and in some cases the percentage of length of tail lost being at statistically significant level, age and growth determination based on (total) length-frequency studies will not be advisable, unless precautions to avoid affected specimens are taken. For the same reason, caudal region of *M. talabonoides* may be avoided in tagging, meristic and non-meristic studies.

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