

THE GROWTH AND REGENERATION OF AN AQUARIUM-HELD
SPINY LOBSTER, *PANULIRUS POLYPHAGUS* (HERBST)
(CRUSTACEA: DECAPODA: PALINURIDAE)

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Growth of a spiny lobster, *Panulirus polyphagus* (Herbst) in captivity is reported. The lobster was maintained in the laboratory aquarium tank for 31 days during which period it moulted twice, the first moult occurring on the day following capture and the second moult after an interval of 29 days. Brief notes on the growth, regeneration of the right antennal flagellum and the effect of regeneration on the growth of the lobster observed during the period are given.

The occurrence of post-larvae and juveniles of the marine spiny lobster, *Panulirus polyphagus* (Herbst) in Cochin backwaters during October to April-May has been reported by Balasubramanyan (1969) and Rao and Kathirvel (1971). While operating a trawl net for juvenile penaeid prawns, on 28th April, 1971, a juvenile specimen (88 mm) of *P. polyphagus* was obtained. The specimen was kept in a bucket containing water from the same area and was brought to the laboratory where it was transferred to an aquarium (100 cm x 50 cm x 61 cm) containing sea water of salinity 34.2‰. The lobster was regularly fed with minced prawn meat twice daily and observations were made on its growth for 31 days after which it died.

During the period of its life in the aquarium, the lobster moulted twice, the first moult occurring on the day following capture and the second moult after an interval of 29 days (Table 1). Ecdysis in both the instances took place in the night and could not be observed. The exuvia was seen in the bottom of the aquarium on the morning following the moulting and the same was in one piece having been broken between cephalothorax and abdomen on the dorsal and the lateral aspect of carapace. This is in agreement with the observation on *P. argus* (Travis, 1954).

Several authors have reported the growth of spiny lobsters in captivity: A mean increase of 8.9 per cent length in *P. argus* of 40-49 mm carapace length and slightly increased growth rate in smaller specimens of the same species have been recorded by Travis (1954). An average increase of 3 mm carapace length per moult in *Jasus lalandii* between 40-49 mm carapace length has been

TABLE 1. Observed growth in *P. polyphagus*

	Date	Intermoult		Growth		Remarks	
		period in days	Size (mm)	Increment (mm)	Increment (mm)		
			T.L.	C.L.	T.L.	C.L.	
Capture	28-4-1971	—	88	33	—	—	Right antennal flagellum broken from the base
1st moult	29-4-1971	—	99	38	11	5	Right antennal flagellum still wanting
Ind moult	28-5-1971	29	110	40	11	2	Right antennal flagellum fully regrown

reported by Fielder (1964). Chittleborough (1967) observed an average increment of 3.7 mm, 6.6 mm and 7.5 mm carapace length for *P. cygnus*, *J. novae hollandiae* and *J. verreauxii* respectively after a single moult. Thomas (1972) found that *P. homarus* grows 4 to 9 mm carapace length per moult in captivity. Mohamed and George (1968) recorded a growth of 140-170 mm in total length at the end of one year in *P. homarus*. The 11 mm growth in a single moult within 29 days is, therefore, quite in agreement with growth pattern observed in other allied species.

The present record of 5 mm and 2 mm increase in carapace length in two succeeding moults of the same lobster shows a divergent growth rate. If the growth increment in the first moult is quite normal that of the second moult appears to be very low. In both these cases total length has shown consistent increase of 11 mm, thereby showing that in the second moult the length attained by carapace length (2 mm) is not commensurate with increase in overall length. Moulting of spiny lobsters resulting in no growth and even with "negative growth" has been reported by several authors (Marshall, 1948; Dawson and Idyll, 1951; Travis, 1954; Fielder, 1964). Emmel (1905 and 1906) demonstrated in the lobster, *Homarus americanus*, that the regeneration of lost appendages at moult markedly affected the growth of the animal as a whole. The reduced growth increment of 2 mm C.L. obtained in the second moult in the present case is possibly the result of the regeneration of the right antennal flagellum. The growth retardation is apparent only in the matter of carapace length and in total length the increase has been consistent. Possibility of retardation of growth restricted to the particular portion of the body where the appendage is regenerated is indicated by the present observations.

The right antennal flagellum of the specimen was broken away when it was captured and brought to the laboratory. Regeneration of this appendage or its premoult growth did not occur in the first moult which happened on the very next day of capture. During the second moult, however, the appendage

was completely regenerated. Such regeneration of antennae during a particular moult was observed in the aquarium held specimens of *P. homarus* and *P. ornatus* (Adolph, 1968). The regeneration of the appendages depends on several factors such as the level at which the amputation occurs, the extent of damage to the tissues remaining within the stump, the stage of the animal in the intermoult cycle and the environmental conditions (Bliss, 1960).

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* Not referred to in the original