

Reproductive Season of the Caribbean Spiny Lobster *Panulirus argus* in the Coastal Waters of Northern Brazil

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Abstract

The spawning season of the Caribbean spiny lobster *Panulirus argus* (Latreille) was identified based on adult specimens collected monthly off northeastern Brazil, from August 1982 to July 1988. The maturity indices used were relative abundance of females with full spermatheca, eggs or rests of spermatheca, female gonad weight and relative abundance of stage four females. The main spawning activity occurs in February to May, with an occasional second peak in September/October.

Introduction

Because of the need to identify clearly the period of greater reproductive activity of the spiny lobster *Panulirus argus* (Latreille) in the coastal waters off northeastern Brazil, and because results obtained so far by different researchers in various institutions of the country were contradictory, the IBAMA (Brazilian Institute for the Environment and Natural Renewable Resources), which is responsible for the administration of this important resource, started in August 1982 a research program to identify the spawning season of this lobster, based on the approach suggested by Cavalcante Soares and Cavalcante (1988).

Materials and Methods

From August 1982 to July 1988, a total of 61,981 spiny lobsters were sampled on board medium-sized (10 to 15 m) commercial lobster fishing vessels (Costa 1966), operating at depths varying from 10 to 80 m along the coasts of the States of Ceará and Rio Grande do Norte, an area which accounts for about 90% of total Brazilian lobster production. The samples were taken by two collectors operating on different boats, averaging nearly two trips per month.

For the determination of the reproductive period, 60 lobsters were sampled per day from the catch. The sex and the length of the cephalothorax were recorded for each individual. For the females, the stage of the reproductive process was also recorded, taking into account external characteristics such as presence of a

full (CE) or residual (CR) spermatheca or the presence of eggs (OV).

The cephalothorax length was taken as the distance between the posterior edge of the cephalothorax and the gap between the two rostral spines. This was chosen because of the rigidity of this part of the body which makes measurements less prone to errors.

For the determination of the sex, only external characteristics needed to be taken into account, since spiny lobsters display sexual dimorphisms when adult.

Previous experience suggested that full spermathecae and the presence of eggs are the best indicators of reproductive activity. Females with only rests of spermathecae are usually in the fifth gonadal stage which, according to Buesa Más and Mota Alves (1970), characterizes the end of the reproductive process. The gonads of the females were classified into five maturation stages, using a color scale devised by Buesa Más and Mota Alves (1970). Nearly all females with gonads in the fourth stage of development have full spermathecae. The period with major occurrence of this development stage was therefore considered as indicative of the greatest reproductive activity. The gonads were weighed on an analytical balance and their average monthly weight was also taken as indicative of reproductive activity.

Results and Discussion

Fig. 1 shows that:

- the period of major occurrence of females with spermathecae was from January to April;

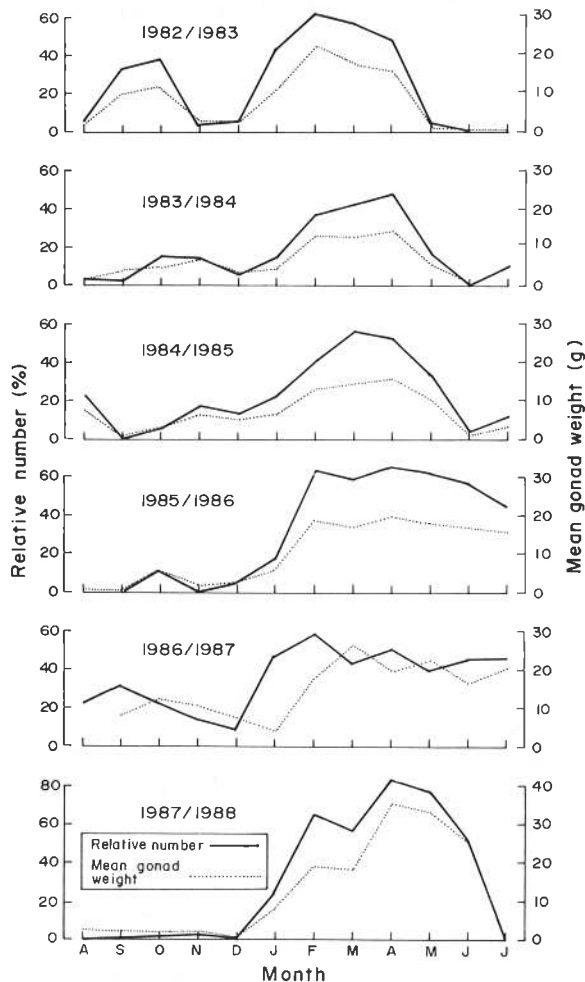


Fig. 1. Relative number (in %) of female spiny lobster *Panulirus argus* with spermathecae (CE), egg-bearing (OV) or egg-bearing and with spermatheca (T), August 1982 to July 1988.

- the months of March and April correspond to the period of major occurrence of egg-bearing females, though in the last years, this period extended to the months of May, June and July.

The identification of the period of major reproductive activity was also done through the analysis of the occurrence of females with gonads in the fourth stage of development since it is in this stage that the females go in search of males. The months of major occurrence of stage four females were from January to April (Fig. 2).

Average gonad weights (Fig. 2) also show the period of major reproductive activity, since higher gonadal weights are associated with the fourth development stage and therefore with females ready for mating or already with full spermathecae. The highest average gonadal weights occur in the months of February to April.

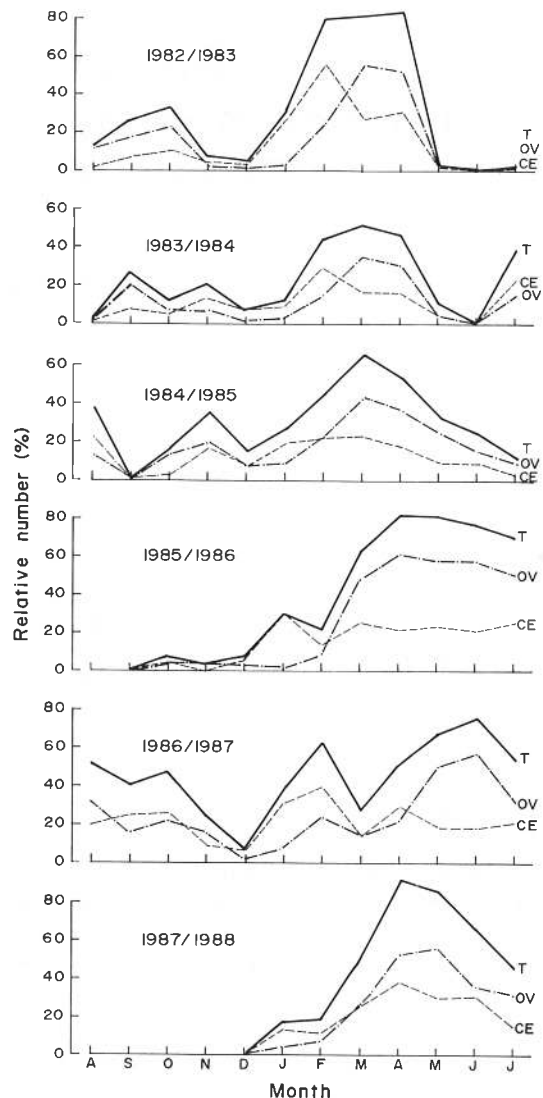


Fig. 2. Seasonality of reproductive activity in spiny lobster *Panulirus argus* as expressed by the relative frequency (in %) of state four females (solid line) and the mean weight of their gonads (dotted line).

Thus, in summary, it appears that in *Panulirus argus* from northeastern Brazil, reproductive activity is highest in the first half of the year, especially in February to May. There is also some indication of the occasional occurrence of a second spawning period, generally in September/October.

References

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