CENTRAL MARINE FISHERIES
RESEARCH INSTITUTE

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R & D SERIES FOR MARINE FISHERY RESOURCES MANAGEMENT

16. SPAWNING BIOLOGY OF PRAWNS IN RELATION TO CONSERVATION OF PRAWN RESOURCES

The stagnation in prawn catch from the sea in recent years has raised anxious enquiries about the possibility of depletion of prawn stocks, and the remedial measures, if any, needed to increase marine prawn production. The frequent capture of large quantities of mature prawns with ripe ovaries by the trawlers has been alleged to be one of the possible causes of depletion of the prawn resources. The data collected by the CMFRI over the years were examined to throw light on the spawning habits of prawns and their management implications.

Spawning Seasons

The studies show that all our commercially important species spawn throughout the year. In the marine catch mature prawns occur in all the months of the year in varying numbers. However, there are peak periods of spawning activity for each species, which are given in the following table.

Species	North-west region	South-west region	South-east region	North-east region
Penaeus indicus (Naran or white prawn)	—	Oct-Dec May-Jun	Feb-May Oct-Nov	Feb-Mar May-Jun Sep
P. semisulcatus (Flower Naran)	—	—	Jun-Sep Jan-Feb	—
P. merguiensis (Banana prawn)	—	Oct-Apr	—	Jul-Aug Nov
P. monodon (Tiger prawn)	—	—	Nov-Jan	Dec-Jan Mar-Apr
M. dobsoni (Poovalan)	—	Apr-Jun Oct-Dec	July-Aug Aug-May Oct	—
M. affinis (Kazhandan)	Apr-Jun& Sept	Oct-Dec Jan-Apr	—	March
M. monoceros (Kazhandan or brown prawn)	Feb-Apr	Jul-Aug Nov-Dec	Jan May-July Aug-Oct	Apr-May Sep-Oct
M. brevicornis (Yellow prawn)	Nov Feb-Apr	—	—	Mar-Apr July-Aug
M. kutchensis (Brown prawn)	Feb-Sep	—	—	—
Parapenaeopsis stylifera (Karikkadi)	Sep-Nov Mar-May	Oct-Dec Apr	Nov-Dec	—
P. sculptilis	Jan-Mar	June-Aug	—	Dec-May
P. hardwickii	Sep-Nov Jan-Feb	Oct-July	—	—
Solenocera crassicornis	Dec Mar-Apr	—	—	—

It is evident from the table that each species has spawning peaks which vary from region to region along the Indian coast. It has also been observed that the peak spawning occurs in different months in different years even in the same region.

Fecundity

The fecundity (number of eggs laid by a female at one spawning) estimated for some important species of prawns is given below.

	Total lengfh of Female	No. of eggs per spawning
P. indicus	140-200 mm	68,000-730,000
M. affinis	95-160 mm	88,000 to 363,000
M. dobsoni	70-120 mm	34,500 to 160,000
P. stylifera	70-120 mm	39,500 to 236,000
M. monoceros	145-175 mm	155,000 to 338,000
P. monodon	200-260 mm	200,000 to 1,900,000
P. semisulcatus	(26-46 mm C.L)	52000 to 660,000
Solenocera crassicornis	(61-102 mm)	28,200 to 101,000

The fecundity generally increases with increase in size of the female. The high fecundity of prawns is evident. Further, it is estimated that each female spawns 4-5 times during its lifespan. So the number of eggs laid by a female prawn during its life is enormous.

Management implications

From the conservation point of view the prolonged spawnig period and the high fecundity are significant. The extensive spawning period is a natural safeguard against mass destruction of spawners. The large number of eggs laid by each female ensures quick replenishment of stock from even

a relatively small population of breeding females. So there is no need to impose restrictions on the capture of spawners. Further, it is impracticable. Only if the spawning season is short and well defined can we think of effectively imposing a short closed season to protect the spawners during that critical period. But in the case of the Indian prawns the prolonged spawning season militates against adoption of a closed season. The multispecies nature of the fishery and the differences in the breeding periods of the various species of prawns present on the same fishing ground also render enforcement of a closed season for protection of the spawners impossible.

The short lifespan of the prawns and the early age at which they attain maturity are also factors in favour of rapid recuperation of prawn stocks from the effects of fishing. The prawns live for about 18-24 months and start spawning when they are 6-9 months old. So biologically the prawns are well insured against population damage due to fishing, provided, of course, the fishing effort does not exceed the effort at which the maximum sustainable yield could be obtained. In other words, the spawners do not need to be specially protected. Rather, the entire population has to be exploited judiciously.

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