

Some important features of the East coast Spiny Lobster fishery after implementation of co- management mechanism

U.S.P.K. Liyanage* and J.S. Jayanatha

National Aquatic Resources Research and Development Agency (NARA), Regional Research Centre, Kapparatota, Weligama

Abstract

Spiny lobster fishery in the east coastal region of Sri Lanka has been developing among small scale fishes as a lucrative income source. High exploitation rate followed by the demand in the foreign market accelerate the depletion of the resource. Current information of the fishery resources are essential requirement for formulation of the future management. Spiny lobster biology and economic data collected from Okanda to Wakarai in monthly basis. Eighty nine percent of the catch consisted with the Scalloped Spiny Lobster (*Panulirus homarus*) while other species including *P. versicolor*, *P. ornatus* and *P. longipes* represented in small quantities (all together 11 %). Annual length frequency distribution charts of the *P. homarus* revealed that the mature lobsters are heavily exploited and the small lobsters fulfil the gaps in the catch. Small lobsters below the minimum legal size are not in the catch, but berried females (Females having egg mass) are present throughout the year. Peak breeding season of the *P. homarus* is July to January of the forthcoming year. There is no significance difference between the variance of males and females of the population ($F = 1.63$, F Critical one tail 2.97, $\alpha = 0.05$).

Keywords: Spiny lobster, *P. homarus*, Fisheries management, East coast

*Corresponding author: upulliyanaage@hotmail.com

Introduction

Spiny lobster fishery in South (Tangalle to Patanangala) and Eastern (Okanda to Oluvil) coastal regions of Sri Lanka play very important role in the small scale fishes economy. (Liyanage and Long 2009; Jayakody, 1993). The fishery in the east coast appears to have grown most rapidly during past decade, that could adversely affect on sustainability of the stock and on livelihood. Preliminary Spiny Lobster research on stock assessment studies including biology, Ecology, distribution have been completed for the South coastal region (Jayakody 1993,1997; Liyanage and Long, 2009; Long et al. 2009;) but rare in east coast. This is the first fisheries dependent survey completed for management of the Spiny Lobster resources in the East coast of Sri Lanka.

Materials and Methods

Spiny Lobster collecting centers in the east coastal region from Panama to Walachchena were visited once a month during year 2014. Those centers are collecting the lobster catch from the Okanda in Kumana National Park to Vakarei. Biological data required for management of the fishery such as species composition, sex, Presence of external eggs or Tar spot (Spermatophore) were recorded. Carapace length (CL) and Total length (TL) of the individuals were also measured to nearest millimeter using a venire caliper. F-test was performed to analysis of variance among the number males and females in the catch.

H0; Monthly variations of the males and females in the catch are similar

H1: Monthly variations of the males and females in the catch are significantly different

Results

Species composition of the catch: Species composition of the commercial catch provide valuable information on the level of abundance of different species. Six Spiny Lobster species were recorded from Sri Lankan coastal waters (De Bruin, 1995). Scalloped spiny lobster *Panulirus homarus* is contributing to the 88.8 percent of the catch in survey area. Other species contributed to the catch as *P. versicolor* 6.9 %, *P. ornatus* 0.7%, *P. longipes* 3.3%. Likewise *P. polyphagus* is absent and the *P. penicillatus* represent 0.5 % of the catch.

Length frequency: Length frequencies of the individuals represent in the catch is a good indicator reflecting the status of the stock.

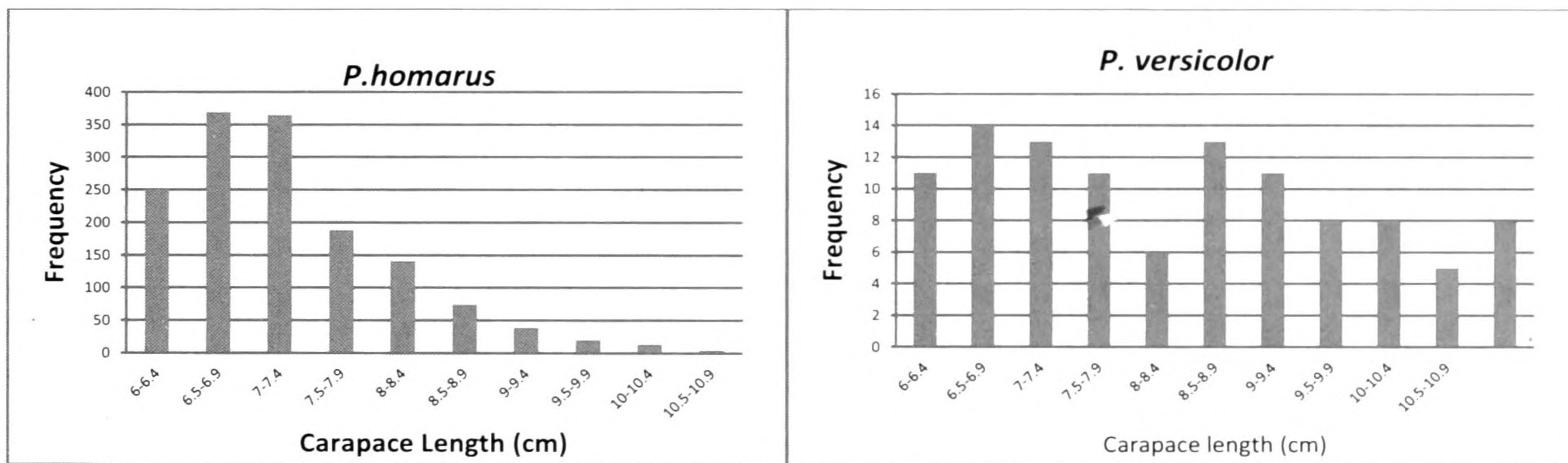


Fig.1: Annual Length frequency distribution of *P. homarus* and *P. versicolor*

Since March to July period, majority of the *P. homarus* catch consist with small carapace length classes ranged 6.0-6.9 cm, hence November to January period majority of the catch consisted with bigger length classes of the carapace length 7 cm to above.

Average annual carapace length frequency distribution chart (1.A) of the *P. homarus* clearly shows that representation of the elder lobsters in the catch are rare while newly recruits are fulfil gaps in the catch. *Panulirus versicolor*, the second most abundant species in the East Coast lobster fishery catch shows more or less similar number of individuals represent in each length class reflect the health of the stock.

Females with Eggs or tar spot: Monthly percentage of female brooders having eggs or spermatopore shows seasonal peak in their breeding cycle lying July to January of the forthcoming year. Fishing impacts on the stock has not effected on male female ratio of the population. F test revealed that no significant difference between the variation among sexes. ($F = 1.63$, F Critical one tail 2.97, $\alpha = 0.05$).

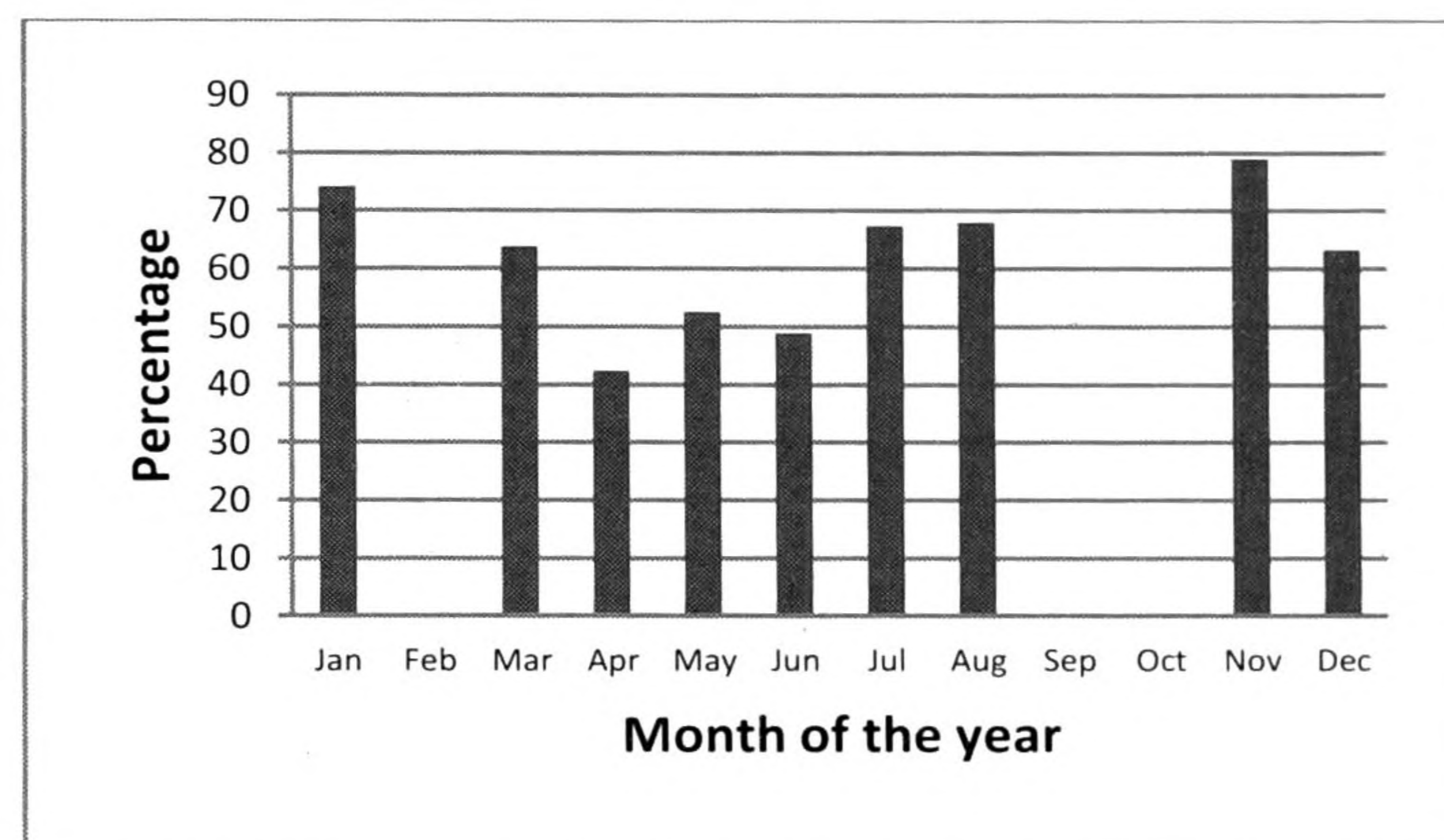


Fig.2: Monthly variation of the percentage of berried females of *P.homarus* (berried females to total female of the respective month).

Discussion

Panulirus homarus is the widely distributed and highly available spiny lobster species in waters of Sri Lanka (De Bruin *et.al.*, 1995; Long *et.al.*, 2011). In East coast, it is contributed to the 88.9 percent of the catch exceeding all other lobster areas. *P. homarus* annual length frequencies results revealed that this species is heavily exploited because of the increasing fishing pressure, removed the matured lobsters and berried females from the stock etc. Further, it revealed that small lobsters are representing the catch in greater extent as (6-7.5 cm in Carapace length) 67 percent and the elder lobsters are found in smaller quantities. Monthly length frequency analysis revealed that the period from November to January is consisted with the bigger size lobsters in the catch while small length classes are dominant during the rest months of the year representing recruitment period. Fishing pressure on the other major species (*P. ornatus* and *P. versicolor*) is negligible and healthy status of the population reflect the equal length class frequency distribution patterns. Further, February, September and October months are declared as closed season to the South coast due to the peak breeding season of the year. The current study revealed that the peak breeding season for the study area extend from July to January of the forthcoming year. Catching of berried female adversely impact on the population growth.

Conclusion

East coast spiny lobster fishery consist with four species and *P. homarus* contribute to 89 percent of the catch. According to the length frequency distribution the stock is overexploited and immediate action must be taken to conservation. Peak breeding season and recruiting seasons of the species are respectively July to January and March to August. Large proportion of the catch consisted with illegal berried females resulted extinction of the stock.

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