

Minimum legal size- A study on pomfrets in fish markets of Kochi, Kerala, India

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ABSTRACT

A decline in the fish catch has led to fishermen overexploiting their catch by violating the Minimum Legal Size (MLS) of fish. Several fishes reaching the local markets and fish meal production plants are juvenile fishes which have not reached the size at first maturity. The Department of Fisheries has set a minimum legal size (MLS) for 14 species of finfish in 2015, based on the recommendation of CMFRI for Kerala Marine Fisheries Regulation. A study was conducted to determine the undersized pomfrets – *Pampus argenteus* and *Parastromateus niger* available in fish markets of Kochi. The study was conducted for six months. Random sub samples of the catch (25 numbers) were measured and it was determined if the catch violated the MLS. The results of the study showed that there was irregular compliance with the MLS. In comparison, more of *Pampus argenteus* was seen to be sold below the MLS than *P. niger*. This could be due to the greater demand for *P. argenteus* among the consumers. Even small sized fishes of *P. argenteus* were sold out fast. Lack of knowledge among the fishermen, especially those who go in groups of 3-4 people in a boat or those using thermocol boats singly could lead to non-compliance with MLS. This has far reaching effects as the juveniles cannot reach reproductive age and the fish production during successive years declines. Recommendations for implementing MLS are also discussed in this paper.

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1. Introduction

With its vast coastline, Kerala is a state with rich potential for the fishery. The opportunities provided by the extensive coast, inland and backwaters have made fishing lucrative employment and industry in the state (Shyam *et al.*, 2011). Fisheries are a renewable resource, provided there is sustainable management of fisheries. The rich fishery resources have declined over the years, as evident from the catch statistics. Responsible fishing is essential for a sustainable fishery (Nair and Mohamed, 2015). This is necessary to recoup the dwindling fishery resources along our coastline. The Kerala state has adopted the Marine Fishing Regulation Act (1980) to enforce regulatory measures toward sustainable fisheries (Xavier, 2014). It restricts the number of fishing crafts and mesh size of nets. Ban on fisheries using trawls during the monsoon season has been implemented successfully in the past years (Mohamed *et al.*, 2014).

The minimum legal size (MLS) is the smallest legal size at which a particular species in a catch can be legally retained if caught (Mohammed *et al.*, 2014). The Department of Fisheries set a minimum legal size (MLS) for 14 finfish species in 2015, based on the recommendation of CMFRI for the Kerala Marine Fisheries Regulation. Recruitment overfishing and growth overfishing (fishing of juveniles) have led to dwindling fish stock (Takar and Gurjar, 2020). Sustainable fisheries management allows fish to spawn at least once before being fished. It protects juvenile fish by controlling the sizes of fish caught. It ensures that enough fish survive to grow and spawn.

Dwindling fish resources has led to fishermen overexploiting fish stock by violating the Minimum Legal Size (MLS) of fish. Many species of fish available in the local markets are juvenile fish. They cannot contribute to the fishery next season because they have not reached the size at first maturity. This causes economic loss for the fishermen in the long run. Temporary monetary benefits may be obtained

from selling undersized fish for fish meal or fertilizer. There is little field study on the minimum legal size violations in fish catches.

The objective of the study was to study violations of the Minimum Legal Size of pomfret species- *Pampus argenteus* and *Parastromateus niger* in two fish markets in Kochi.

2. Materials and Methods

The study was conducted for six months, from May to October 2020, in two fish markets in Kochi (M1 and M2). Random subsamples of each fish species (25 numbers) of *Pampus argenteus* and *Parastromateus niger* were measured for total length. Total length is the straight line measurement taken from the tip of the snout to the end of the caudal fin (Jayaram, 2002).

In cases where more than 50% of the sample consisted of fishes at or below the MLS designated for that species, it was considered a violation (Mohamed *et al.*, 2014)

3. Results and Discussion

The study results indicate a violation of MLS in the two pomfret species - *Pampus argenteus* and *Parastromateus niger* available in the two fish markets in Kochi. Tables 1 and 2 show the percentage of *P. argenteus* and *P. niger* below MLS obtained in the study. Fig. 1 represents the mean percentage of *P. argenteus* and *P. niger* below MLS during the study period.

The percentage of undersized *P. argenteus* (below MLS) available in the fish markets was higher during July (41 %) and October (42.5 %) months. Undersized *P. niger* was seen in September (43 %). This could be related to the spawning season of the fish and juveniles obtained in the fish catch. Local fishermen who go in small boats or singly in thermocol boats and use drift/gill nets often ignore or violate the MLS.

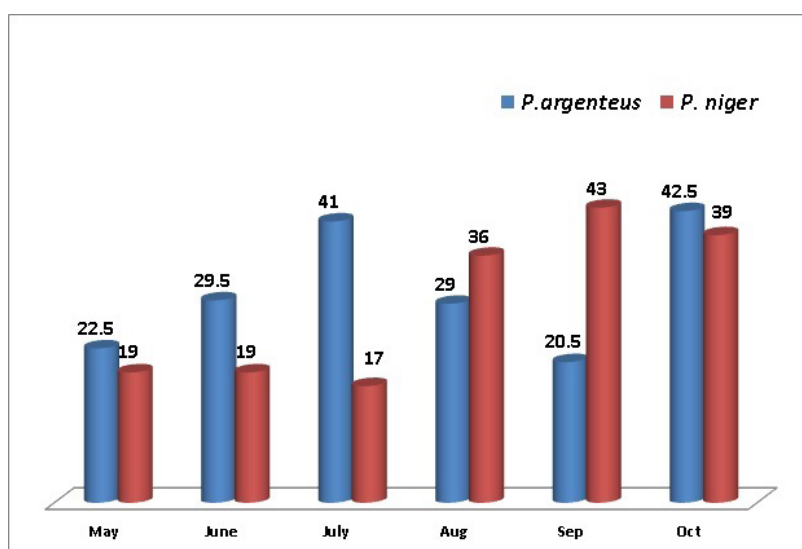
Irregular compliance with the MLS for both pomfret species was seen in the two markets of Kochi. In comparison, more of *P. argenteus* was seen to be sold below the MLS than

Table 1 Percentage of *P. argenteus* below MLS

Month	Market 1(%)	Market 2(%)	Mean (%)
May	23	22	22.5
June	30	29	29.5
July	40	42	41
August	30	28	29
September	23	18	20.5
October	40	45	42.5

Table 2 Percentage of *P. niger* below MLS

Month	Market 1(%)	Market 2(%)	Mean (%)
May	19	19	19
June	23	15	19
July	18	16	17
August	30	42	36
September	42	44	43
October	38	40	39

Fig. 1. Mean percentage of *P. argenteus* and *P. niger* below MLS

P. niger. This could be due to the greater demand for *P. argenteus* (silver pomfret) among consumers. Even small sized fishes of *P. argenteus* were sold out fast.

Studies by ICAR-Central Marine Fisheries Research Institute, revealed that overfishing and juvenile fishing were the prime reasons for decline in fish stock and catches. (Najmudeen and Sathiadhas, 2008; Sathiadhas and Shyam, 2012; Gopalakrishna and Satheeshkumar, 2012). The concept of minimum legal size is simple to analyse and comprehend (Hill, 1992). MLS can ensure enough fish survive to spawn, control the numbers and sizes of fish landed, and maintain fishery sustainably (Winstanley, 1992). Compliance with the minimum legal size helps to control growth overfishing as well as recruitment overfishing (Sivadas *et al.*, 2017). A review of the need for imposing legal sizes in Australia revealed two main reasons - the protection of immature fish and allowing them to spawn at least once (Hancock, 1992). MLS for 58 species of commercially important fishes occurring in Maharashtra was estimated for marine fisheries management (Anulekshmi *et al.*, 2018). They also suggested random

checking of unsorted samples for violation of MLS at sea or in the landing centre.

The study recommends raising awareness among fishermen about MLS and the need for sustainable fisheries. Higher income from big sized fish species could be stressed in awareness programs as an added economic benefit to fishermen. The mesh size regulations for each species of fish should be strictly complied. Species-specific closed season for vulnerable fish species may help reduce the catch below the minimum legal size. KMFR Act should be amended to include unregulated and illegal fishing provisions. It is also necessary to have a similar minimum legal size regulations for fishing in neighbouring states like Tamil Nadu and Karnataka. This is because a size legal in one state may be illegal in another (Sivadas *et al.*, 2017), which can lead to illicit fishing and transport to other states bypassing the laws.

MLS violations should be appropriately fined to avoid future recurrences. Random checks by authorities in the local fish markets and tracing the sources of juveniles and fish below MLS would help curb this practice.

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