

**Evaluation of the amount of undersized Sand sole *Solea lascaris*  
(Risso, 1810) caught in the Portuguese fisheries.**

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KEYWORDS: Undersized, *Solea lascaris*, Portuguese fisheries

**ABSTRACT**

The Sand sole, *Solea lascaris*, has recently become an important resource for the traditional fishing activity. Its captures have increased from less than 1% in 1994 to 25% of the flatfish landings only in the North region and about 15% of the total Portuguese landings in 1998.

Although there is a minimum landing length, settled 24 cm for this species, this limit is not always observed either by fisherman or the landing authorities. To access the magnitude of this occurrence, we analysed the catches in two main Portuguese harbours, Matosinhos in the North coast and Olhão, in the South coast of Portugal.

A total of 1888 fish were measured to the nearest millimetre, from April 1998 till March 1999.

This analysis revealed a high number of fish caught under the 24 cm minimum landing length limit. In the South we found 25.6% of undersized fish while in the North a difference concerning male and female occurs as we found 52.5% for the former and 15.1% for the later, caught under 24 cm total length.

Furthermore, the amount of undersized fish caught shows several irregularities along the year.

It is recommended a new approach to the relationship between the biological data and the selectivity data, in order to set new landing parameters.

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## INTRODUCTION

*Solea lascaris* is a common species on the eastern Atlantic (southern part of the North Sea and southward from Scotland) and in the Mediterranean (western part, including the Adriatic) (Quéro, Desoutter & Lagardère, 1986). Although not very abundant, this flatfish is highly appreciated in the market reaching high prices at auction (20 EUR). Landings of this species have increased considerably in the last years thus sand sole became an important resource for the traditional fishing activity. Its captures have increased from less than 1% in 1994 to 25% of the flatfish landings only in the North region and about 15% of the total Portuguese landings in 1998 (DGPA, 1994;1995;1996;1997;1998). Sand sole reported landings in the Northern of Portugal, during 1998, accounted for 74% of total national landings on this species (DGPA, 1998).

Although there is a minimum landing length, settled at 24 cm for all the Soleidae species in Portugal, this limit is not always observed either by fisherman or the landing harbour authorities. This value was stated by the DGPA and has been enforced since January 1999. This value is in accordance with the length at first maturation (22.5cm) described afterwards by Andrade (1990). According to Crowder & Murawsky (1998) undersized catch is specially observed in flatfish fisheries, being

most of the individuals involved aged 0 or 1 year old, and representing this catch a significant percentage of flatfish fisheries world-wide.

The objective of the present work is to evaluate the magnitude of the undersized catches in the commercial fisheries and derived from a broader research project (DG XIV 97/0083) "Collection of biological data of 5 flatfish species from Iberian waters (Portuguese coast and Gulf of Cadiz)".

## **MATERIAL AND METHODS**

While sampling for the EU project above mentioned, a total of 1888 fishes were sampled from commercial fishing vessels at Matosinhos (in the North coast) and Olhão (in the South Coast) fishing harbours between April 1998 and March 1999. The sampling was performed monthly or twice a month and, in each sampling day, at least half of the fish boxes were analysed. All individuals were measured (total length) and sub-samples were sexed.

Data from regional and national landings was obtained from Direcção Geral das Pescas.

National landings and also the landings in the two concerned regions in the last years were plotted to evaluate their evolution in time.

A simple length analysis was performed in order to evaluate the proportion of undersized fish in the landings, discriminating sexes for the North region of Portugal.

## RESULTS AND DISCUSSION

The evolution of total national landings of *Solea lascaris* since 1993 is shown figure 1. The numbers provided, show the increasing importance of this species since 1996, despite the decrease of total national landings in the last decade.

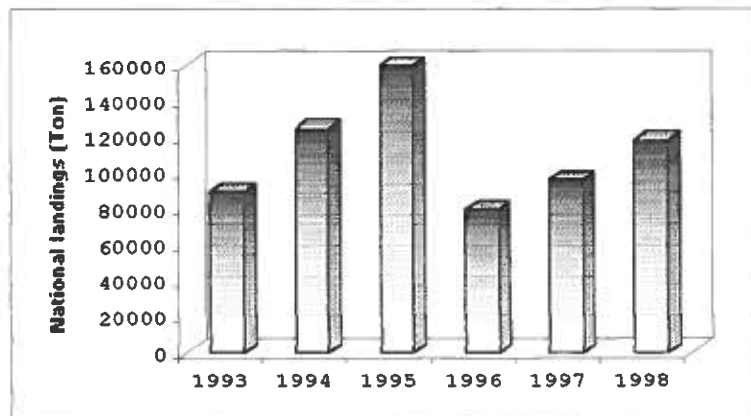


Figure 1: Evolution of total national landings of *Solea lascaris* since 1993 to 1998.

In the northern region the increase of *Solea lascaris* landings is even stronger, attaining as much as 87.740 ton. in 1998, about 74% of total national landings for this species, as shown in figure 2.

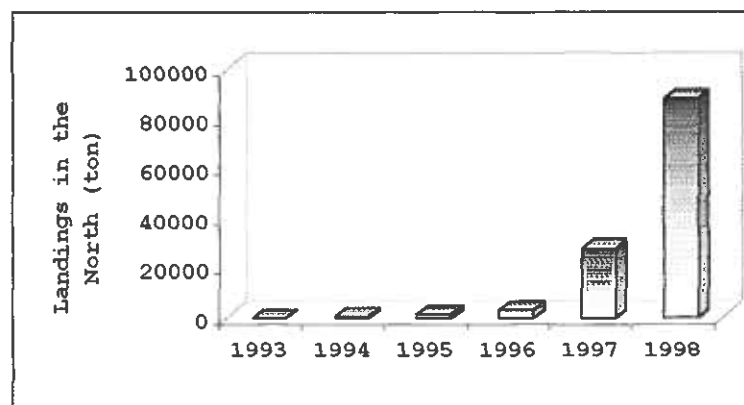


Figure 2: Evolution of *Solea lascaris* Northern landings since 1993.

Length frequency in North and South landings, for both sexes together, is presented in Fig. 3. The size range obtained is similar in both sampling sites.

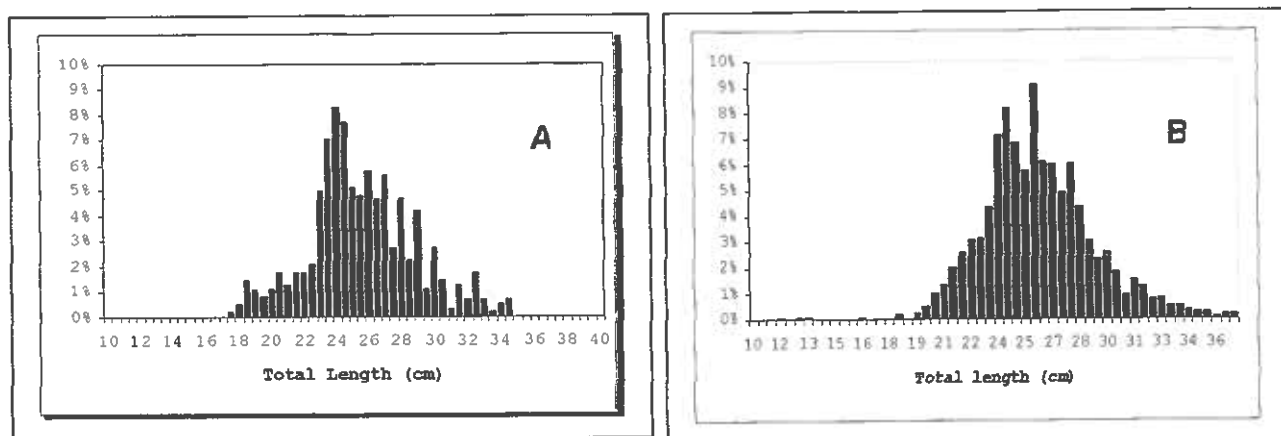


Figure 3: *S. lascaris* length frequencies in North (A) and South (B) landings.

The amount of undersized *S. lascaris* present in landings (fig. 4) either in the North or in the South of Portugal is, according to our estimation, higher than 25% of total landings of this species.

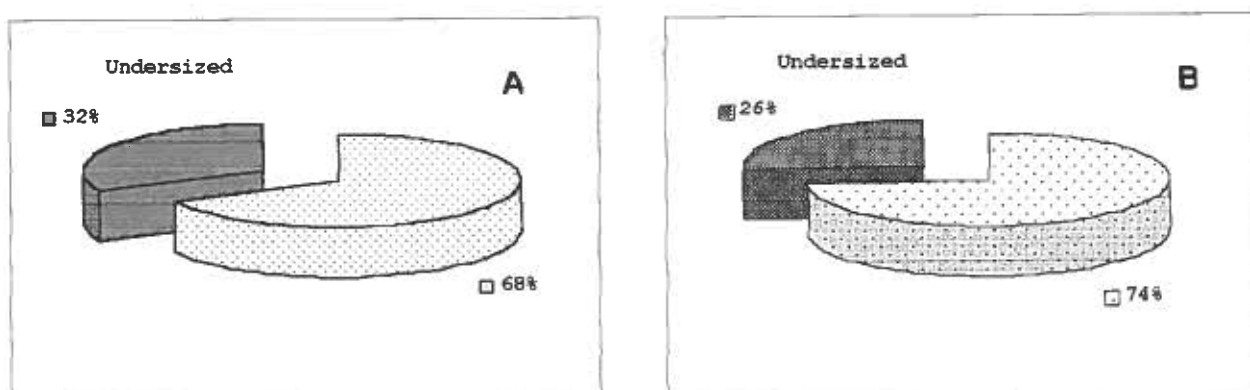


Figure 4: Percentage of undersized *S. lascaris* in the landings: North (A) and South (B).

Fig. 5 indicates that the amount of undersized fish caught both in the North and South of Portugal shows several irregularities along the year, and seems to raise in the winter, when reproduction occurs.

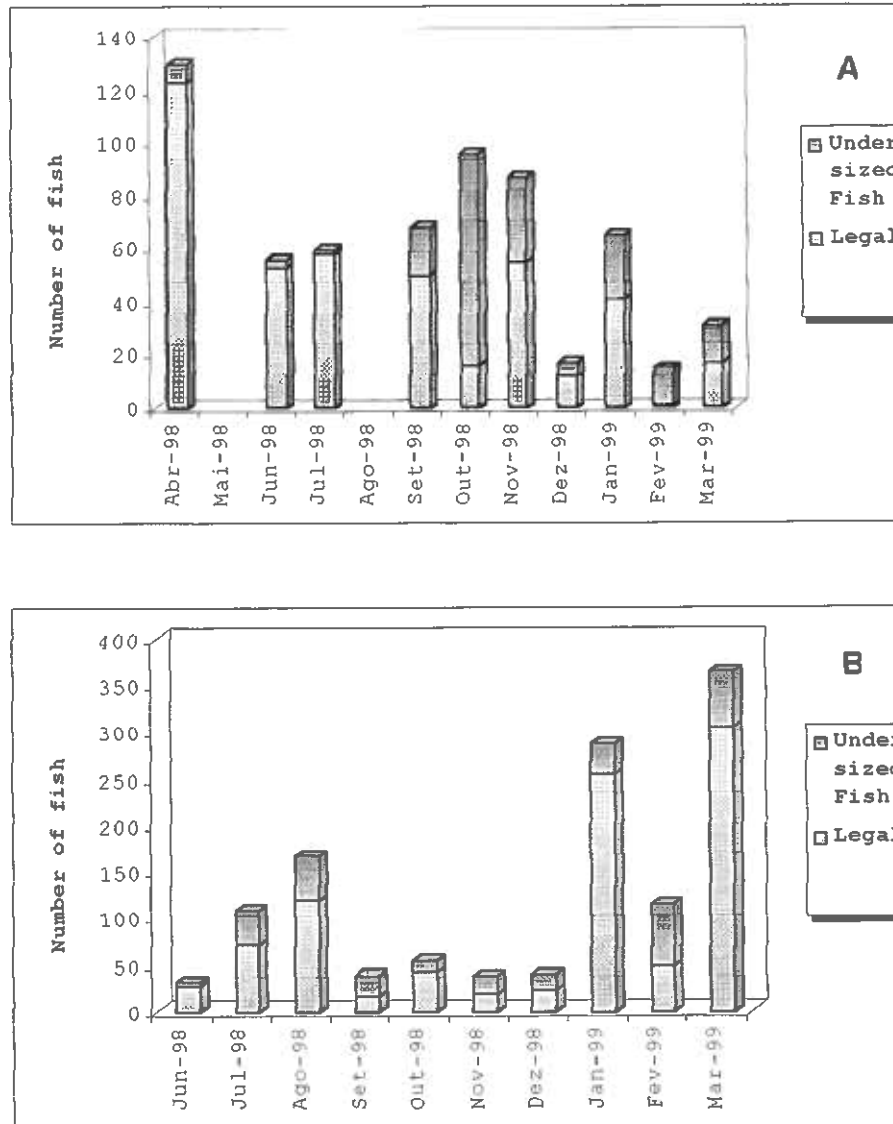


Figure 5: Percentage of undersized fish in the landings both sexes together, North and South along the year

Further analysis of the Northern samples (Fig. 6) revealed a noticeable difference between the amount of the undersized males and females caught. This fact could be related to the different reproductive migratory behaviour displayed by most flatfish males and females (Gibson, 1997).

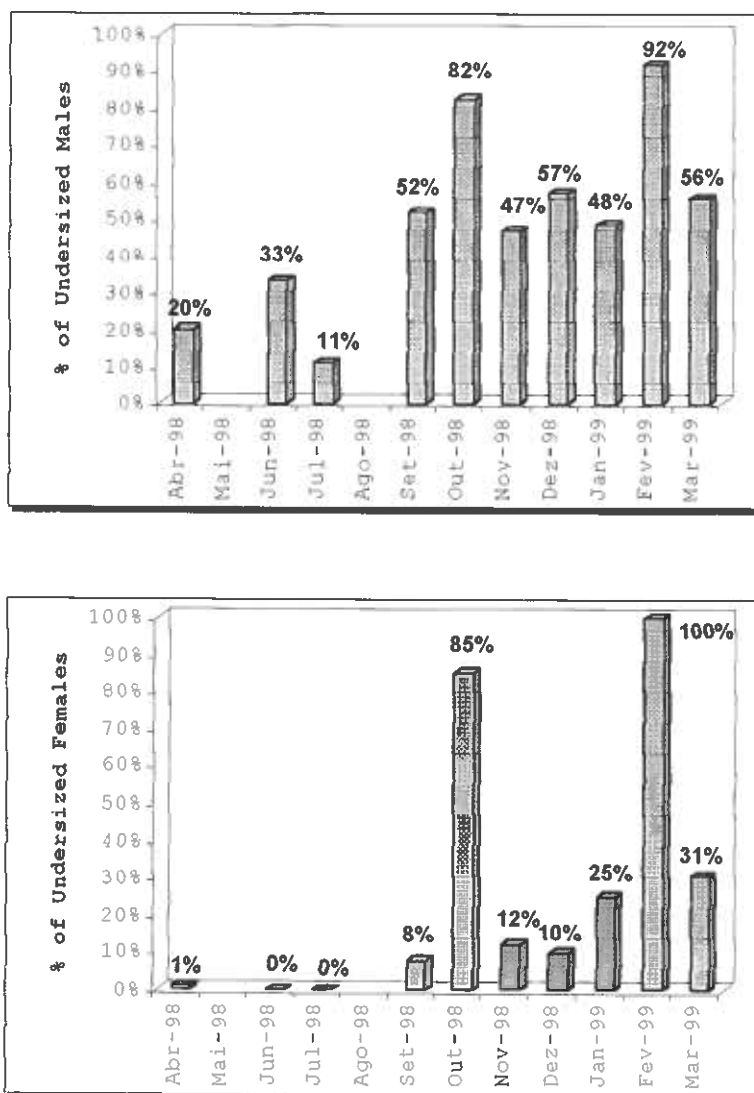


Figure 6: Percentage of undersized males and females *S. lascaris* in the landings, in the North region along the year.

From the values presented, the figures relative to February 99 should be considered with caution not being representative of the catch, since the total amount of individuals sampled was very reduced.

## CONCLUSIONS

The following conclusions can be extracted from this work:

- undersized sand sole is being caught in considerable numbers both in Northern and Southern Portuguese coast.

- this situation occurs even though there has been an enforcement of the 24 cm minimum landing size restriction.
- the amount of undersized fish caught shows several irregularities along the year and among sexes.
- it seems that there are more undersized fish caught, mainly males, during the reproductive period.

We suggest a stronger control of fishing activities, a major research effort on gear design and mesh size, as well as the development of a more representative sampling program, since the aim of the undergoing project wasn't to specifically study this subject.

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