

## An insight on gurnard fisheries in North of Portugal

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### Abstract

This work was intended as a contribution to the current knowledge about gurnard (Triglidae) catches in the north of Portugal and was done in IPIMAR (Fish and Sea Research Institute) and at Matosinhos Fish Auction Market.

Gurnard landings obtained in the Artisanal fleet were sampled between March and July of 2007. Scientific name and size of each individual as well as total weight of each species was recorded from 3 vessels each week. The correspondence between the common designation given at the auction market (*Ruivo* and *Cabra-Cabaço*) and the scientific name of the various species was evaluated. The proportion, in which the various gurnard species occurred in a landing, was calculated and these results compared with the official data and available bibliography.

The most abundant species were *Chelidonichthys lucernus* (L., 1758) *Aspitrigla cuculus* (L., 1758) and *Chelidonichthys obscurus* (Bloch & Schneider, 1801). The landings for the other three species were residual. Also the common designation of these species were given at the auction market reflects the mean size of the individuals in the box sampled rather than the scientific names. Therefore, data based on the official classification does not seem to be of any scientific or statistic use for fishery management of these species.

Boxes designated as *Ruivo* consistently attained higher values on the auction market, even though their content in *C. lucernus*, the species widely considered as the most valuable gurnard, was less than 60% on average. *Cabra-Cabaço* is a common name traditionally given only to *C. lucernus*, but the boxes sampled had a mixture of all species. The average size

of the animals that were given this designation was considerably smaller than their *Ruivo* counterparts.

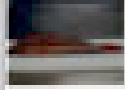
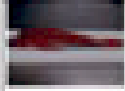
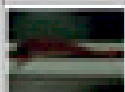
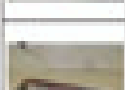

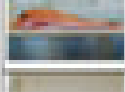
## Introduction

Gurnards are fishes belonging to the Triglidae family (order: Scorpaeniformes). There are over 100 species (FISHBASE, 2007), 8 occurring in portuguese waters (Borges & Olim, 2006). They occur in all temperate and tropical seas, in depths up to 700 m (FISHBASE, 2007). They are benthonic, in rocky, muddy or sandy bottoms and their diet consists of small fish, crustaceans, gastropods and molluscs (Fischer, 1981; Bauchot, 1987; Campos, 1982). Their heads are bony and casquelike. The pectoral fins have their lower 2 or 3 rays enlarged for food detection and locomotion (Fischer, 1981).

Gurnards are considered by-catch in bottom trawl and beam trawl fisheries (Borges & Olim, 2006), although due to decrease of traditionally targeted species their interest and value has increased (Fischer, 1981; Boudaya *et al.*, 2007). This study was carried out once IPIMAR has the responsibility for fish stock assessment and there is lack of studies concerning gurnards in Portugal. The various gurnard species are classified in the official portuguese statistics only under one designation (*Ruivo*). However, in a fish auction market, they can receive various other designations (being, in Matosinhos, *Ruivo*, *Cabra-Cabaço* and, in the bottom trawl landings, “Cabra” as well). Therefore, total gurnard captures are not accounted in the official statistics and there is no information on each species’ captures.

Table I is a brief description of the six gurnard species landed by the fishing fleet in the Portugal. There are two species belonging to the genus *Lepidotrigla* in the Portuguese waters (*L. cavillone* (Lacepède, 1801) and *L. dieuzeidei* Blanc & Hureau, 1973), but they are too small to be of any commercial value and are discarded. It should be noted that the designation *Ruivo* is shared by 4 species, each one of them species having its own distinctive variant of the “Cabra” designation.

**Table I.-**Taxonomic distinction of gurnards. Common names are expressed in English (En) and Portuguese (Pt)

	Scientific Name	Common names	Depth (m)	Max. Length (cm)	Description
	<i>Chelidonichthys lineata</i>	Flat gurnard (En), Cabra-Cabaço (Pt), Barru (Pt)	20-100 (POTIRAGAL, 2007)	75 (Bassford, 1987)	It's the most typical of gurnard. It's brown in Portugal, blue or green-purplish blue
	<i>Apristigaster ruber</i>	Red gurnard (En), Cabra vermelha (Pt), Barru (Pt)	up to 400 (POTIRAGAL, 2007)	30 (Bassford, 1987)	Red colour, vertically enlarged scales in the lateral line and curved snout
	<i>Chelidonichthys obscura</i>	Longfin gurnard (En), Cabra de-Bassford (Pt), Barru (Pt)	up to 170 (Pachon, 1981)	30 (Bassford, 1987)	Strongly curved and enlarged curved ray on the first dorsal fin
	<i>Eurostichus gurnardus</i>	Grey gurnard (En), Cabra-Morreu (Pt), Cabra (Pt), Barru (Pt)	up to 170 (Pachon, 1981)	30 (Bassford, 1987)	Brown colour and the spiny scales in lateral line
	<i>Diplus pipe</i>	Pipe gurnard (En), Cabra (Pt), Cabra-Lisa (Pt)	100-700 (POTIRAGAL, 2007)	60 (Bassford, 1987)	Presence of 3 spines in the upper part, elongated (vertical spine) (more than 17% of Total Length)
	<i>Chelidonichthys barbata</i>	Bearded gurnard (En), Cabra-Barbada (Pt)	20-200 (Bassford, 1987)	30 (Papaemiliou, 1988)	Lateral line scales large and hooked, distinct transverse ridges of skin

## Methods

Sampling took place in Matosinhos fish auction market where each gurnard box is given a size category from T1 (the largest individuals) to T4 (the smaller ones). Each week, 3 vessels from the Artisanal Fleet were chosen. Among their landings, boxes identified as *Ruivo* or *Cabra-Cabaço* were selected and their content separated by species. Each individual was measured to the nearest lowest cm (TL), and the total weight per species (precision=10g) on the sampled box was registered. Species identification was done with IPIMAR keys (Campos, 2002; Martins *et al.*, 2005).

## Results

98 boxes of *Ruivo* (W=331,6 kg) and 22 boxes of *Cabra-Cabaço* (W = 109,6 kg) were sampled, in a total of 1962 individuals. *C. lucernus*, *C. obscurus* and *A. cuculus* were the most abundant species. *Eutrigla gurnardus* (L., 1758), *Chelidonichthys lastoviza* (Bonnaterre, 1788) and *Trigla lyra* L., 1758 were also present, in residual quantities.

**Table II.** - Designation given and length data of the most frequently landed species in Matosinhos. R, *Ruivo*; CC, *Cabra-Cabaço*; N, number of individuals; W, total weight/specie (kg);  $L_{min}$ , minimum length;  $L_{max}$ , maximum length;  $L_{med}$ , average length;  $L_{mod}$ , modal length; all values in cm).

	R	CC	N	W	$L_{min}$	$L_{max}$	$L_{med}$	$L_{mod}$
<i>C.lucernus</i>	86,82	13,18	774	288,00	14	81	30,94	27
<i>A. cuculus</i>	10,42	89,58	576	79,85	17	35	22,90	22
<i>C. obscurus</i>	66,55	33,45	586	70,10	18	32	24,31	26
<i>E.gurnardus</i>	0,00%	100,00%	23	2,35	20	29	22,09	21
<i>C.lastoviza</i>	0,00%	100,00%	2	0,60	29	31	30,00	n/a
<i>T.lyra</i>	0,00%	100,00%	1	0,25	31	31	31	

We observed *C. lucernus* and *C. obscurus* mostly as *Ruivo*. They were the largest species. *A. cuculus* was smaller and mostly classified as “*Cabra-Cabaço*”.

On *Ruivo* boxes T1 and T2, *C. lucernus* as the only specie present, and the average size difference between these two categories was 16,93 cm, the largest difference observed between contiguous categories. Boxes of *Ruivo* T3 contained a mixture of *C. lucernus* (43,59%), *A. cuculus* (11,47%) and *C. obscurus* (44,93%), the later species being the most abundant on sizes T4 (79,08%).

*Cabra-Cabaço* boxes of the larger sizes (T1 and T2) were rare, and therefore, only a T2 box was sampled, containing *A. cuculus* (95,65%) and *C. lucernus* (4,35%). On sizes T3 and T4, *A. cuculus* was the most abundant species (around 60% in both sizes), followed by *C. lucernus* (T3 = 10,78%; T4 = 15,94%) and *C. obscurus* (T3 = 24,03%; T4 = 23,90%). Other species, *E. gurnardus*, *T. lyra* and *C. lastoviza* occurred in *Cabra-Cabaço* boxes, in residual amounts.



**Figure 1 and 2:** Composición of the boxes of each designation, *Ruivo* and *Cabra-Cabaço* according to the size (T1 for bigger to T4 for smaller fish)

**Table III.** - Average lengths (cm) in each designation, per size categories and per species for Triglidae sold in the Matosinhos auction market.

	T1	T2	T3	T4	<i>C. lucernus.</i>	<i>A. cuculus</i>	<i>C. obscurus</i>
<i>Ruivo</i>	50.37	33.44	25.22	23.35	32.17	22.83	23.89
<i>Cabra-Cabaço</i>	-	23.36	24.13	22.06	23.20	22.91	25.24

There was little difference in *Ruivo* T3/T4 and *Cabra-Cabaço* T3/T4 as far as sizes were concerned. *C. obscurus* and *A. cuculus* seemed to receive this classification randomly, based on their sizes rather than their scientific name. The only clear pattern found was that the larger individuals of *C. lucernus* were classified as *Ruivo* and the smaller ones as *Cabra-Cabaço*. This is further supported by the fact that *C. obscurus* appeared in larger sizes than *A. cuculus* and was as such often classified as *Ruivo*. *A. cuculus*, the smallest of the 3 most abundant species, was mostly classified as *Cabra-Cabaço*.


## Conclusion

Even though the designations given to gurnards, at the Matosinhos Fish Auction Market, appear to refer to particular species, they reflect mostly the size of the individuals being sold. Species who reach larger sizes, such as *C. lucernus* and *C. obscurus*, are usually classified in the Fish Auction Market as *Ruivo* and the mixture of smaller individuals is tagged as *Cabra-Cabaço*. Also this study proves that, in the fish auction market, there's not only *C. lucernus* (the specie known the most valuable one) but also a mix of 6 species designated all like one – *Ruivo*. However, the official statistics for gurnard captures are based only on the former designation and, therefore, they do not represent the total captures of Gurnards and provide incomplete information on captures for each species. In so, the official data is of very little use for Gurnard fisheries management and further studies are required for these species.


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# An insight on gurnard fisheries in North of Portugal



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## INTRODUCTION


The report will contribute to a contribution to the current knowledge about gurnard fisheries in the north of Portugal and was done in 2019. Fish and Sea Resources Department and all available fish market data. Gurnard catches obtained in the market that were caught between March and July of 2019. Size and sex of each individual as well as total weight of each species was recorded from 2 weeks fish land. The correspondence between the common designation given in the market (‘Barral’ and ‘Galego-Galego’) and the scientific name of the various species was evaluated. The proportion in which the various gurnard species occurred in a landing, was calculated and these results compared with the official data and available bibliography.

## METHODS

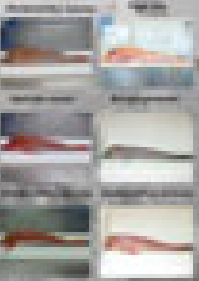
**Sampling in Artisanal ports**



**Separating by species and measuring weight per species**



**Measuring sex of each individual**




## RESULTS

30 tonnes of ‘Barral’ (30 = 300.0 kg) and 30 tonnes of ‘Galego-Galego’ (30 = 300.0 kg) were sampled, in a total of 1760 individuals of ‘Barral’, 2’ females and 2’ males were the most abundant species. 2’ specimens of ‘Barral’ and 2’ fish were also present in market samples.

Each gurnard sex, in the fish market, is given a sex category from 1 (the largest individuals) to 3 (the smaller ones).


**Sexual composition**



**Sex**

Sex	Number	Weight (kg)
Male	1760	300.0
Female	2	0.0
Other	2	0.0

**Sexual composition**



There are differences between the weight of the fish designated ‘Barral’ and ‘Galego-Galego’ and also between the sex and category of each individual. These differences are related to the species and category of each individual.

## CONCLUSION

Even though the proportion given to gurnards, in the Portuguese Fish Market, appear to refer to particular species, they reflect mostly the size of the individual being sold. Gurnards also reach larger sizes, such as ‘Barral’ and ‘Galego-Galego’, and usually classified in the Fish Market as ‘Barral’ and the number of smaller individuals is higher in ‘Galego-Galego’ than in ‘Barral’. In the fish market, ‘Barral’ and ‘Galego-Galego’ are the most abundant species, but also a mix of 2 species designated as ‘Barral’ and ‘Galego-Galego’. However, the official statistics for gurnard catches are based only on the former designation and, therefore, they do not represent the total catches of gurnards and provide incomplete information or confusion for each species. So, the official data is of very little use for gurnard fisheries management and further studies are required for these species.

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