

# Comparatives studies for age and growth of two sparidae, *Pagrus pagrus* (Linnaeus, 1758) and *Dentex gibbosus* (Rafinesque, 1810), caught in Madeira archipelago

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## Introduction

The red porgy (*Pagrus pagrus*) and pink dentex (*Dentex gibbosus*) are a bottom dwelling marine fish associated with a variety of temperate to subtropical habitats.

In Madeira, these species are caught with handlines and bottom longlines at depths ranging from 20 to 200 m. In 2007 the landings were 19 tons for red porgy and 3 tons for pink dentex. Red porgy has been the most important species in the demersal fishery landings, both in weight and value. The importance of determining the biological aspects of this species is enhanced because its catches are now decreasing.

The main purpose of this study is to compare the von Bertalanffy growth curves for both species.

## Results

Sampled individuals of red porgy were divided in thirteen age groups from 1 to 13, with amplitude of lengths between 14.7 and 58.6 cm furcal length, FL (14.7-58.1 cm FL for females; 15.3-58.6 cm FL for males and 17.6-37.5 cm FL for undetermined). For pink dentex, sampled individuals were divided in eleven age groups from 1 to 11, with amplitude of lengths between 17.0 and 80.3 cm furcal length, FL (20.1-80.3 cm FL for females; 19.8-71.2 cm FL for males and 17.0-24.9 cm FL for undetermined). The von Bertalanffy model was fitted to the mean length at age estimated for females, males and all individuals of red porgy (Table 1) and pink dentex (Table 2). The growth curves estimated for each sex and for both species are presented in Figures 1 and 2. The F-test (F-test,  $p < 0.05$ ) (Zar, 1996) detected significant differences in the growth curves between sexes in both species.

Table 1- Von Bertalanffy growth parameters estimated for females, males and all individuals of *P. pagrus* off Madeira island.

	n	$L_{\infty}$ (cm)	k (year <sup>-1</sup> )	$t_0$ (year)	$r^2$
Females	1173	66.3	0.106	-0.984	0.99
Males	583	57.9	0.154	-0.235	0.99
Total	1784	62.3	0.124	-0.671	0.99

Table 2- Von Bertalanffy growth parameters estimated for females, males and all individuals of *D. gibbosus* off Madeira island.

	n	$L_{\infty}$ (cm)	k (year <sup>-1</sup> )	$t_0$ (year)	$r^2$
Females	71	125.8	0.083	-0.429	0.99
Males	79	104.9	0.101	-0.397	0.99
Total	153	122.5	0.083	-0.464	0.99

## Discussion

For red porgy, the theoretical maximum growth ( $L_{\infty}$ ) was close to the size of the largest fish sampled, and the growth coefficient (k) indicated a relatively slow growth. In relation to pink dentex the theoretical maximum length was too high regarding to the size of the largest fish sampled and the growth coefficient was very low. The lack of small fish in the present study lead to an overestimation of the  $L_{\infty}$  and consequently an underestimation of k.

The results should be considered with some caution, mainly because the lack of 0 age class and undersampling in older age classes (over 8 years) for pink dentex. Setting up a continuous biological sampling programme is strongly recommended in order to obtain data for adequate comparison of growth between both species.

An interesting study in this line of work would be the growth of young specimen in captivity, since their capture in the fishery is limited, caused by the selectivity of the fishing gear.

### Acknowledgements

We would like to thank Ana Sofia Faria for photographic processing in Photoshop, Fernando Vieira and all the staff of DSIP Laboratory for their assistance in sampling and management of fish.

### References

Zar, J.H., 1996. Biostatistical Analysis. Prentice-Hall International, third edition, pp. 123-161.

## Material and Methods

Monthly samples of red porgy (1173 females, 583 males and 28 undertermined) and pink dentex (71 females, 79 males and 3 undertermined) were collected from commercial landings and from the scientific cruises conducted by the R/V "Arquipélago", between 1997-2007 and 2004-2007, respectively.

Each fish was measured, sexed and *sagitta* otoliths were removed. Ages were assigned by counting growth marks on whole otoliths, assumed to be annual. The von Bertalanffy parameters obtained were estimated using the non-linear methods for both sexes.

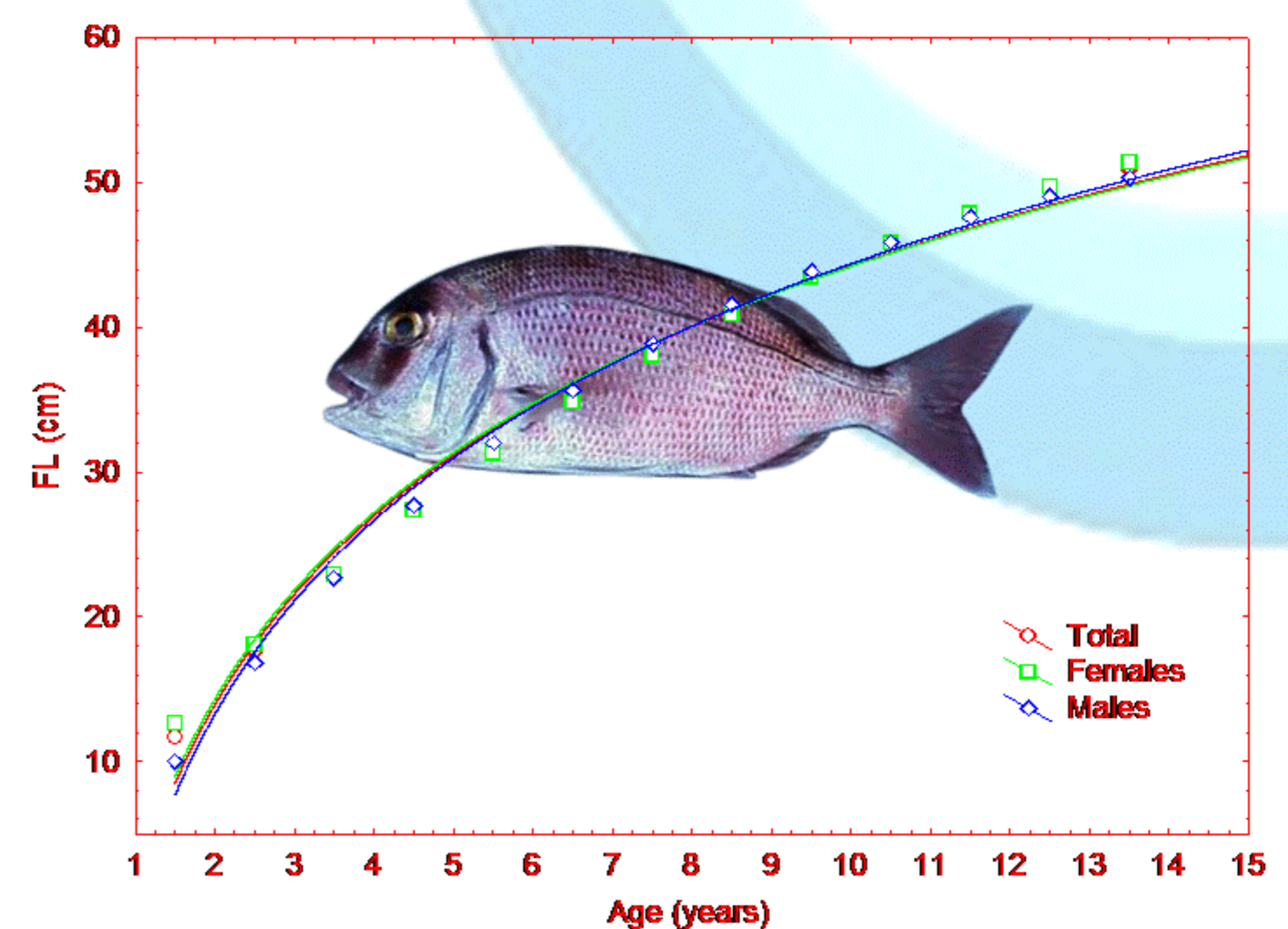


Figure 1- Von Bertalanffy growth curve fitted for females, males and all individuals of *P. pagrus* off Madeira Island.

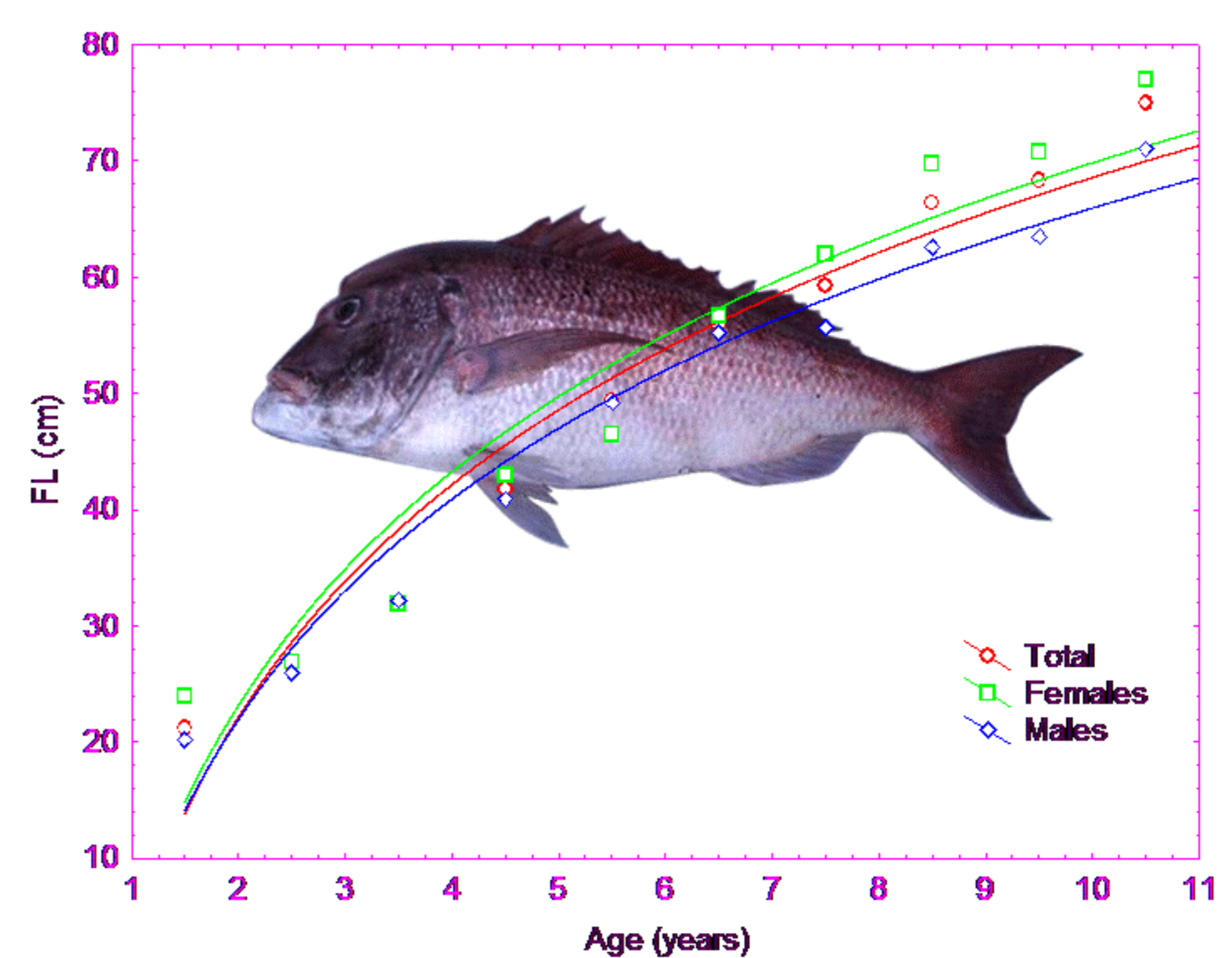


Figure 2- Von Bertalanffy growth curve fitted for females, males and all individuals of *D. gibbosus* off Madeira Island.