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Distribution pattern, reproductive biology, and fishery of the wedge sole *Dicologlossa cuneata* in the Gulf of Cadiz, south-west Spain

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Abstract The wedge sole *Dicologlossa cuneata* (Moreau, 1881) is a coastal species that lives along the inner shelf waters of the Gulf of Cadiz down to a depth of 115 m. Its fishery, the size composition of the exploited population, and its reproduction have been studied on the basis of data acquired from commercial statistics from 1984 to 1994 and from sampling carried out during 1993 and 1994. The relative abundance of the species and its geographic and bathymetric distribution have been examined by analysis of four trawl surveys carried out from 1992 to 1994. *D. cuneata* is captured mainly by the trawl fleet, and to a lesser extent by gillnet gears. Wedge sole fishery has a marked seasonality. Size-frequency distributions from commercial samples and from bottom-trawl surveys are very similar, ranging from 12 to 26 cm total body length (TL). *D. cuneata* is a “repeat-spawner”. Peak spawning is from January to May. Females attain sexual maturity at 18 cm TL, while sexually mature males have been observed at 15 cm TL. The flexibility of the spawning strategy of *D. cuneata* throughout its distribution range is discussed. The scarcity of small specimens in the monthly samples and sequential spawning throughout the year prevented the estimation of growth parameters by means of length-frequency analysis. *D. cuneata* is present in greatest abundances in the sandy–muddy bottoms of the Guadalquivir River mouth at 15 to 30 m depth. Its optimum habitat coincides with the principal commercial fishing grounds. The possibility of reproductive vertical migration is discussed, but more precise data are needed before a viable hypothesis can be made.

Introduction

The wedge sole *Dicologlossa cuneata* is a coastal demersal soleid living at depths of 10 to 150 m, and occasionally down to 430 m on the Mauritanian continental slope. *D. cuneata* inhabits sandy or sandy-muddy bottoms in temperate-warm waters from the Bay of Biscay to South Africa and southwestern Mediterranean coasts (see recent reviews by: Quéro 1981; Hemstra and Gon 1986; Quéro et al. 1986; Bauchot 1987).

Research on the life cycle of this species has included exhaustive studies of the early developmental stages (embryo, egg, larval, pre-recruit stages) and during recruitment (reproduction, growth, feeding, migration), but these have all been restricted to the northernmost limit of its geographical range; i.e. Bay of Biscay (Forest 1975; Lagardère 1975, 1980, 1982; Lagardère and Aboussouan 1981). Other recent studies have concerned the distribution of its eggs and larvae (Aboussouan 1972; O’Toole 1974, 1976), aspects of reproduction and growth (Marinaro et al. 1979b; Rousset 1979; Rousset and Marinaro 1983; Dinis 1986; Belghyti 1990), feeding (Belghyti et al. 1993), and parasites hosted by this species (Belghyti et al. 1994) in other areas of its distributional range.

Wedge sole is one of the main target-species and is of high commercial interest in the demersal fisheries of the Spanish waters of the Gulf of Cádiz (Anonymous 1993a; Sobrino et al. 1994). However, despite its economic importance in this region, data on its biology and fishery is very rare, the literature being restricted to comments on the occurrence of its larvae and juveniles in the river mouths of the region (Arias 1976; Fernández-Delgado 1987; Arias and Drake 1990).

The present study examines aspects of the distribution, relative abundance and size composition of the exploited population, and the reproductive biology and fishery of *Dicologlossa cuneata* in the Gulf of Cádiz, and compares the results with those obtained in other areas of this species’ range.

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