

COMPOSITION OF JUVENILE FISH POPULATIONS IN THE DONJI MOLUNAT BAY, SOUTHERN ADRIATIC (SUMMER ASPECT)

J. Dulcic^{1*}, M. Kraljevic¹, V. Kozul² and B. Skaramuca²

¹ Institute of Oceanography and Fisheries, P.O.B. 500, 21000 Split, Croatia

² Institute of Oceanography and Fisheries-Split, Biological Station Dubrovnik, P.O.B. 39, 20000 Dubrovnik, Croatia

Abstract

A total of 1172 fishes belonging to 27 species were caught in July (283) and August (883) 1996, in the Donji Molunat Bay in the southern Adriatic, using a 50 m long beach seine. *Chromis chromis* (48.29%), *Spicara smaris* (13.40%), *Oblada melanura* (8.11%) and *Mullus barbatus* (6.57%) comprised 76.37% of the total. *O. melanura* was dominant in July (83) and *Ch. chromis* in August (566). The remaining species comprised from 5.03% to 0.09% of the catch. The overall value of richness D was 3.68, ranging from 2.65 in July to 2.95 in August. Diversity H values were 1.71 in July and 1.33 in August, with an overall value of 1.94. The annual value of evenness J was 0.59, fluctuating from 0.44 in August to 0.62 in July. Preliminary results of the present study provide a basis for future studies to elucidate what additional aspects may influence the distribution and abundance of juveniles during different seasons in the Donji Molunat Bay.

Key-words: Biodiversity, fishes, coastal waters, Adriatic Sea

Introduction

Numerous studies have been published on fish populations in lagoons, estuaries and coastal regions (bays and coves) in many parts of the world (1) indicating that such concentrations are due to their higher productivity and that many species utilize these areas as nursery and feeding grounds. The composition of juvenile fish communities in inshore areas of the Eastern Adriatic is poorly known, although it is a very important biogeographical area that joins the Mediterranean fauna. There are only few papers on juvenile fish populations of the Eastern Adriatic. Some researchers dealt with the temporal distribution of young mugilids in the coastal area of the Eastern middle Adriatic (2, 3), some with feeding of striped seabream *Lithognathus mormyrus* (4), and annular bream *Diplodus annularis* (5). Composition and temporal fluctuations of inshore juvenile fish populations in the Kornati Archipelago were presented elsewhere (6).

The present study provides the preliminary data on juvenile fish composition in the Donji Molunat Bay in July and August 1996.

Material and methods

The Donji Molunat Bay is located in the southern part of the Eastern Adriatic coast between City of Dubrovnik and Boka Kotorska Bay (Fig. 1). It is a traditional area of fishing, especially of yellow-tail *Seriola dumerilli*. The maximum depth of the entrance of the bay is 29 m. The sampling area was characteristically sandy and sandy-mud overgrown by meadows of *Posidonia oceanica* and *Cymodocea nodosa*. Sampling was conducted in July and August of 1996 in Donji Molunat Bay in the Southern eastern Adriatic. Fish samples were collected using a 50 m long beach seine. Net depth was 30 cm and 250 cm at the central part together with the sac. The mesh size was 8 mm at the outer wing and 4 mm at the central sac. Collected specimens were sorted and preserved in 4% formalin (pH from 8.5 to 9.0). Fish species were identified using (7) and (8). The juveniles of the species were taken as specimens with already formed scales after metamorphosis, and were taken as such until the moment of first sexual maturity (9). Total lengths were measured to the nearest 0.1 cm. The weight of specimens was determined to the nearest 0.01 g. The community structure was specified by species richness (D), diversity (H) and evenness (J), using the equations proposed by Margalef (10), Shannon (11) and Pielou (12) respectively

Results

Twenty-seven species were caught in July and August 1996. (Table 1). Sixteen species were caught in July and twenty-one in August. A total of 1,172 fishes were collected, 289 in July and 883 in August. *Chromis chromis* (48.29%), *Spicara smaris* (13.40%), *Oblada melanura* (8.11%) and *Mullus barbatus* (6.57%) comprised 76.37% of the total. *O. melanura* was dominant in July (83) and *Ch. chromis* in August (566). The remaining species comprised from 5.03% to 0.09% of the total catch.

The overall D value was 3.68, ranging from 2.65 in July to 2.95 in August. The H value was 1.71 in July and 1.33 in August, with an overall value of 1.94. The annual value of J was 0.59, ranging from 0.44 in August to 0.62 in July.

Discussion

Adriatic Sea is an oligotrophic area (13). It is relatively rich in ichthyofauna and according to (8) has 407 fish species and subspecies. Occupied either permanently or temporarily by at least 27 species in summer period, the Bay of Donji Molunat is rich in terms of fish spe-

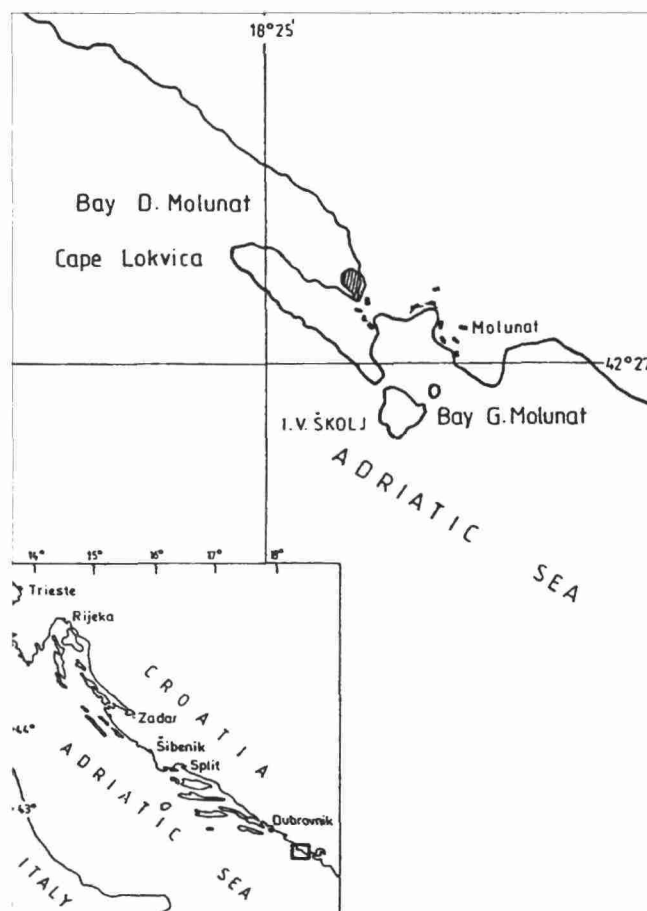


Fig. 1. Study area (The Donji Molunat Bay - southern Adriatic).

cies. Juveniles of four species (*Chromis chromis*, *Spicara smaris*, *Oblada melanura* and *Mullus barbatus*) were dominant forming 76.37% of the total. Grubisic (14) and Jardas (8) indicated that the most common species of the eastern Adriatic spawn in spring and summer. We propose recruitment timing of four mentioned species could be the reason for a high abundance during July and August. Estuaries, coves and bays probably play an important role as nursery grounds for fish in inshore-offshore migration during their early life history. Such areas also provide suitable food, shelter and a reduction in predation. The nursery function of such areas has been well-documented in the world (15, 16, 17, 6). A number of parameters (e.g. temperature, salinity, substrate type, depth, pH) could influence the distribution of juveniles and relative importance their differs from species to species. Perhaps the only common denominator is the preference of juveniles for relatively shallow water. The values of diversity, richness and evenness could be comparable to values obtained for Kornati Archipelago (eastern middle Adriatic), and are lower in the same