Temporal and spatial distribution of neritic and mesopelagic fish larvae in the Gulf of Kisamos (NW Cretan Sea, SW Aegean Sea)

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The present study concerns with the assessment of the fish larvae composition and their temporal abundance in the neritic and mesopelagic zone. The study area is the Gulf of Kisamos which is connected to the open SW Aegean Sea. Although the total area of the Gulf of Kisamos is rather a small one, it is lined by a narrow continental shelf and an abrupt continental slope. This kind of geomorphological feature is expected to play an important role on the density of neritic and mesopelagic fish larvae, according to YOUNG *et al.* (1986). Relevant information are reported in our previous study (PAPASISSI and LYKAKIS, 1988). Other studies concerning with fish larvae of the Gulf of Kisamos are non-existing.

Day samples were collected from five sites (S1, S2, S3, S4 and S5 stations) of the Gulf of Kisamos in September and November 1988, and February, April, May and July 1989. Samples were taken by double oblique hauls in the upper 50m using a Bongo net with 500μm mesh size. 88 fish larvae species were identified in our samples. The identification was based on ABOUSSOUAN (1964), PAPASISSI and FROESE (1990), and other sources. Among all identified larval fish, 16 species were recorded in abundant densities.

A peak and minimum density of the total fish larvae group occurred in April 1989 (106.9 n.100m^{-3}) and November 1988 (11.7 n.100m^{-3}) respectively (Anova test, $p<0.05$). Density values of fish larvae in other collecting periods were: 15.3 n.100m^{-3} in September 1988, 42.6 n.100m^{-3} in February 1989, 64.11 n.100^{-3} in May 1989 and 42.3 n.100^{-3} in July 1989. Peak densities of fish larvae group coincided with mean maximum biomass of zooplankton (438.6 mg.100m^{-3}) while their minimum abundance occurred when minimum values of zooplankton biomass were recorded (51.2 mg.100^{-3}) (FRAGOPOULU, personal communication).

Higher mean annual densities of fish larvae were recorded at neritic stations S1 and S5 (53.96 and 95.6 n.100m^{-3} respectively), and station S2 (60.77 n.100m^{-3}) at the edge of the continental shelf (200m depth). Lower densities of fish larvae were found at pelagic stations S3 and S4 (at depth >200m) (13.8 and 10.4 n.100m^{-3} respectively). In addition, the diversity of fish larval species was found higher at neritic stations. To justify differences between neritic and pelagic station groups, Anova tests ($p<0.05$) were applied. It seems, that composition and differences of fish larvae assemblage are determined by temporal and spatial factors.

Among all different fish larval species identified in the Gulf of Kisamos, highest mean density values recorded for *Diplodus annularis, Boops boops, Gobius niger, Cyclothone braueri* and *Hygophum* sp.

Neritic and mesopelagic fish larval species were collected at all sampling stations. The following abundant neritic fish larvae were identified: *Crenilabrus* sp., *Chromis chromis, Anthias anthias, Serranus cabrilla, Crystallogobius linearis* and *Sprattus sprattus*.

Similarly, the following abundant mesopelagic fish larvae were recorded: *Ceratoscopelus maderensis, Lampanyctus pusillus, Lampanyctus crocodilus, Diaphus holti* and *Stomias boa*.

Most of the abundant fish larvae showed a well defined seasonal distribution. For example, the following larval fish are encountered in maximum densities in the indicated collecting periods. a) Neritic species: *Diplodus annularis* in April, *Boops boops* in April, *Gobius gobius* in May, *Anthias anthias* in September, *Chromis chromis* in September, *Crenilabrus* sp. in April, *Crystallogobius linearis* in November, *Serranus cabrilla* in July, and b) Mesopelagic species: *Hygophum* sp. in November, *Cyclothone braueri* in September, *Lampanyctus pusillus* in February, *Lampanyctus crocodilus* in April, *Diaphus holti* in February and *Stomias boa* in February. Larvae of *Sprattus sprattus* were found in very abundant densities in April while they are almost missing in the remaining sampling periods.

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