

# LARVAL FISH ASSOCIATIONS IN PELAGIC FISHES TRACE INTER-ANNUAL ENVIRONMENTAL VARIABILITY IN THE NE AEGEAN SEA

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The timing and intensity of spawning in fishes is believed to be adaptive, reflecting the phase of the mean seasonal cycle of the environment favorable for offspring survival. The present study was directed towards an understanding of the factors that influence the timing and intensity of spawning of the eastern Mediterranean pelagic fishes during early summer (May-June), which is a transitional period for both the physical environment and spawning of fishes. It is also the period of maximum abundance and species diversity for fish larvae in the plankton.

The analysis of satellite images taken on a weekly basis from 1981 to 2000 revealed that sea surface temperature (SST) in the NE Aegean Sea (eastern Mediterranean) exhibited an intense peak in 1994 and 1995. We examined inter-annual variability in larval abundance of pelagic fishes during June 1993, 1994, 1995 and 1996, in an effort to identify multispecies ichthyoplankton responses to the observed SST variability.

Ichthyoplankton, hydrological and zooplankton displacement volume data were available from four surveys carried out in 7-11 June 1993, 19-23 June 1994, 15-22 June

1995 and 6-14 June 1996 in the NE Aegean Sea. There were significant ( $P < 0.05$ ) among-year differences in the mean larval abundance of pelagic species, which were associated with differences in the environmental conditions. The NE Aegean Sea was cooler, fresher and richer in zooplankton during June 1993 and June 1996. Mean larval abundance of small-sized pelagic species (anchovy and most meso-pelagic species) was higher in 1993 and 1996, whereas that of the middle-sized pelagic species (i.e., *Sardinella aurita*, *Trachurus mediterraneus*, *Scomber japonicus* and *Auxis rochei*) was higher more abundant and/or frequent in June 1994 and June 1995. Such differences, which indicate differences in reproductive strategies among pelagic fishes, are discussed in terms of 'income' versus 'capital' breeding as well as in terms of inter-specific differences in the larval performance abilities. The observed multispecies ichthyoplankton associations of small-sized and middle-sized pelagic fishes might be adaptive and result from similar responses among species to the pelagic environment, especially to prey fields of zooplanktivorous adults.

Inter-annual variability in ichthyoplankton during the transitional period of spring - early summer may trace variability in meteorological and physical processes and be particularly useful in highlighting shared or contrasting reproductive adaptations and their response to inter-annual climatic variability.

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51

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