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Juvenile Fish Associated with Pondweed and Charophyte Habitat: A Case Study Using Upgraded Pop-up Net in the Estuarine Part of the Curonian Lagoon

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Abstract : Submerged vegetation enhances heterogeneity of sublittoral habitats; therefore, macrophyte stands are essential elements of aquatic ecosystems to maintain a diverse fish fauna. Fish-habitat relations have been extensively studied in streams and coastal waters, but in lakes and estuaries are still underestimated. The aim of this study is to assess temporal (diurnal and seasonal) patterns of fish juvenile assemblages associated with common submerged macrophyte habitats, which have significantly spread during the recent decade in the upper littoral part of the Curonian Lagoon. The assessment was performed by means of an upgraded pop-up net approach resulting in much precise sampling versus other techniques. The optimal number of samples (i.e., pop-up nets) required to cover>80% of the total number of fish species depended on the time of the day in both study sites: at least 7and 9 nets in the evening (18-24 pm) in the Southern and Northern study sites, respectively. In total, 14 fish species were recorded, where perch and roach dominated (respectively 48% and 24%). From multivariate analysis, water salinity and seasonality (temperature or sampling month) were primary factors determining fish assemblage composition. The southern littoral area, less affected by brackish water conditions, hosted a higher number of species (13) than in the Northern site (8). In the latter site, brackish water tolerant species (three-spined and nine-spined sticklebacks, spiny loach, roach, and round goby) were more abundant than in the Southern site. Perch and ruffe dominated in the Southern site. Spiny loach and nine-spined stickleback were more frequent in September, while ruffe, perch, and roach occurred more in July. The diel dynamics of the common species such as perch, roach, and ruffe followed the general pattern, but it was species specific and depended on the study site, habitat, and month. The species composition between macrophyte habitats did not significantly differ; however, it differed from the results obtained in 2005 at both study sites indicating the importance of expanded charophyte stands during the last decade in the littoral zone.

Keywords : diel dynamics, charophytes, pondweeds, herbivorous and benthivorous fishes, littoral, nursery habitat, shelter
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