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枸杞岛潮下带沙地生境鱼类群落结构和季节变化

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Fish community structure and its seasonal change in subtidal sandy beach habitat off southern Gouqi Island.

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摘要

为了解岛礁水域沙地生境的鱼类群落结构特征，评估该生境对鱼类资源养护的潜在作用，于2009年采用多网目组合刺网对枸杞岛潮下带沙质区域进行了逐月采样，同步设置岩礁为对照生境.应用α和β多样性指数结合相对重要性指数、相对渔获率、ABC曲线和聚类排序方法对两种生境中的鱼类组成、多样性变化和群落格局与变化进行了全面探讨.全年在沙地和岩礁生境共采集鱼类63种，隶属11目38科56属，2种生境各自出现的鱼类皆为46种.受暖水种频繁出现在沙地生境的影响，潮下带沙质区域鱼类区系比岩礁生境略显丰富，且春夏季的渔获量普遍高于岩礁生境；由于种类组成均匀度较低，沙地生境各季节的α多样性普遍较低，夏季显著低于岩礁生境.日本须鳎是沙地生境的指示种，为早春、夏末和秋冬季沙地底层优势鱼种.5—7月鳀、多数月份鳁和10月份鳗鲡等种类对沙地生境的阶段性利用，使其形成了区别于以趋礁性鱼类为优势类群的岩礁生境的群落格局和季节动态.沙地是多种鱼类幼鱼阶段的庇护所和饵料场，是鲆鲽类的良好栖息地.沙地生境在维持鱼类区系和养护鱼类资源方面具有重要作用.

关键词： 沙地 岩礁 鱼类群落结构 ABC曲线 枸杞岛

Abstract:

To understand the characteristics of fish community structure in sandy beach habitats of island reef water areas, and to evaluate the potential capacity of these habitats in local fish stock maintenance, fishes were monthly collected with multi-mesh trammel nets in 2009 from the subtidal sandy beach habitat off southern Gouqi Island, taking the adjacent rocky reef habitat as the control. α and β species diversity indices, index of relative importance (*IRI*), relative catch rate, and dominance curve for abundance and biomass (ABC curve) were adopted to compare the fish species composition, diversity, and community pattern between the two habitats, and multivariate statistical analyses such as non-metric multidimensional scaling (nMDS) and cluster were conducted to discuss the fish assemblage patterns. A total of 63 fish species belonging to 11 orders, 38 families, and 56 genera were collected, of which, 46 fish species were appeared in the two habitats. Due to the appearance of more warm water species in sandy bottom, the fishes in subtidal sandy beach habitat showed much higher richness, and the abundance catch rate (ACR) from May to July was higher than that in rocky reef habitat. In most rest months, the ACR in subtidal sandy beach habitat also showed the similar trend. However, the species richness and diversity in spring and summer were significantly lower in subtidal sandy beach habitat than in rocky reef habitat, because of the high species dominance and low evenness in the sandy beach habitat. Japanese tonguefish (*Paraplagusia japonica*) was the indicator species in the sandy beach habitat, and dominated in early spring, later summer, autumn, and winter when the fishing pressure was not strong. In sandy bottom, a unique community structure was formed and kept in dynamic, due to the nursery use of sandy beach by Japanese anchovy (*Engraulis japonicus*) from May to July, the gathering of gray mullet (*Mugil cephalus*) in most months for feeding, and the large quantity appearance of plotosid catfish (*Plotosus anguillaris*) in early Autumn, which was quite different from the community structure pattern dominated by reef fishes in rocky-algae habitat. The subtidal sandy bottom off Gouqi Island was serving as both nursery and feeding grounds for many fish species, being a suitable habitat for flatfishes. It was concluded that the sandy beaches around Gouqi Island could be a very important habitat for economic fish species, especially as a nursery ground for juvenile fishes, contributing to the fish stock maintenance in specific area.

Key words: sandy beach rocky reef fish community structure ABC curve Gouqi Island

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