

Community structure of coral reef fishes in El Quadim Bay (El Quseir, Egyptian Red Sea coast)

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Abstract. This study investigates the community structure of fishes on the coral reef in El Quadim Bay, in order to obtain baseline data for a regular monitoring programme. A total of 16,683 fishes, representing 111 shallow-water species belonging to 47 genera and 31 families, was counted at 12 transects. Multivariate analysis indicates significant differences between the fish communities of the left side and right side of bay, as well as at different depths. This might be due to different exposure to wave action. The fish community in El Quadim Bay is very similar to those in undisturbed reefs and marine reserves in the Red Sea.

Key words. Multivariate statistics, species composition, ichthyofauna, reef fauna, biodiversity.

Introduction

Coral reefs are under high human pressure in the northern Red Sea, caused by shipping, port activities and pollution as well as tourism (KHALAF & KOCHZIUS 2002a, KOCHZIUS 2002). At the beginning of the 1990s, about 19% of the Egyptian coast, 100% of the Israeli coast and 50% of the Jordanian coast containing coral reefs were affected by tourism (HAWKINS & ROBERTS, 1994). In 1997 approximately 5.7 million tourists visited the Red Sea Riviera (NOAA 1997). Due to the expansion of tourism, it is likely that the percentage of coral reef affected by tourism will continue to increase. SCUBA diving has been identified as a major factor which may influence the underwater fauna of coral reefs.

We investigate here the fish community structure of fishes on the coral reef in El Quadim Bay on the Egyptian Red Sea coast close to El Quseir, in order to obtain baseline data for a regular monitoring programme. This future monitoring programme aims to evaluate whether the current management practice of recreational SCUBA diving is sufficient to prevent a negative impact on El Quadim Bay. The main objectives of the study are to describe the community structure of fishes, and to compare this structure with other fish communities of the Red Sea.

Material and methods

Study area. At El Quadim Bay, fringing reefs are distributed along the coast and are interrupted by bays that are usually located at the mouths of the wadis (dry river valleys). The bay is utilised for SCUBA diving by a single diving centre and for swimming by a hotel that has been built alongside the bay. It is therefore possible for the diving centre to manage the number of recreational SCUBA divers. Following the concept of a carrying capacity of a maximum of 6,000 dives per site and per year (DIXON et al. 1993, HAWKINS & ROBERTS 1997), the number of dives per year is limited to about 20,000 dives at 5 diving sites. There is a gradient in diving pressure, with