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Fish assemblages in three arid mangrove systems of the Gulf of California: comparing observations from 1980 and 2010

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We evaluated the fish community structure in three mangrove systems from la Paz bay, southwestern gulf of California, Mexico, during two annual cycles separated by 30 yrs (1980-1981 and 2009-2010). The three mangrove systems have suffered different degrees of anthropogenic impact that range from relatively pristine (Balandra) to minor impacts from development (Zacatecas), and to highly modified (Enfermería). A robust comparison between periods was attained by field sampling and identification of fishes using a museum collection. Species richness, density, biomass, Shannon diversity, Pielou evenness, and average taxonomic distinctness (ATD) were computed using data collected during each period (12 monthly samples). During both periods, a few species dominated fish abundance in the three systems [*Eucinostomus dowii* (Gill, 1863), *Diapterus brevirostris* (Sauvage, 1879), and *Mugil curema* (Valenciennes, 1836)]. Enfermería showed the most substantial changes in ecological indices; there were significant differences in mean monthly richness, density, and evenness over time. MDS and ANOSIM analyses revealed no differences in assemblage structure; however, SIMPER analysis indicated greater similarity in the assemblage structure overtime in Enfermería (38.06%) compared with Zacatecas (33.49%) and Balandra (9.71%). ATD values were relatively consistent between periods at Balandra and Zacatecas. However, a few samples collected at Enfermería had ATD values that indicated that the dominant species were closely related. This is likely due to the extensive habitat modification the system has suffered. Our study emphasizes the importance of long-term studies for understanding the changes in community structure in mangrove systems that are caused by habitat alteration.

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