



<http://dx.doi.org/10.11646/zootaxa.4007.4.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:D6811FE9-DCA3-4ABF-BC88-16129036BCF4>

Metazoan parasites of fishes from the Celestun coastal lagoon, Yucatan, Mexico

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Summary

The aims of this study were to produce a checklist of the metazoan parasites of fishes from the Celestun coastal lagoon and to determine the degree of faunal similarity among the fishes based on the metazoan parasites they share. A checklist was prepared including all available records (1996–2014) of parasites of marine, brackish water and freshwater fishes of the area. All of these data were included in a presence/absence database and used to determine similarity via Jaccard's index. The results indicate the presence of 62 metazoan parasite species infecting 22 fish species. The number of metazoan parasite species found in the fishes from the Celestun lagoon is apparently the highest reported worldwide for a tropical coastal lagoon. The parasites included 12 species of adult digeneans, 27 digeneans in the metacercarial stage, 6 monogeneans, 3 metacestodes, 9 nematodes, 2 acanthocephalans, 2 crustaceans and 1 annelid. Forty parasite species were autogenic and 23 were allogenic and 1 unknown. The overall similarity among all of the species of fish with respect to the metazoan parasites they share was low (0.08 ± 0.12), with few similarity values above 0.4 being obtained. This low similarity was due primarily to the presence of suites of parasites exclusive to specific species of fish. The autogenic component of the parasite fauna (40 species) dominated the allogenic component (21 species). The most likely explanation for the large number of fish parasites found at Celestun is the good environmental condition of the lagoon, which allows the completion of parasite life cycles and free circulation of euryhaline fishes from the marine environment bringing marine parasites into the lagoon.

Key words: Coastal lagoon, metazoan parasites, brackish water fishes, marine fishes, Yucatán, México

Introduction

The Celestun coastal lagoon (from now on Celestun) is an indispensable site in the flyways of migratory birds, and an important shelter and feeding ground for marine organisms (e.g., shrimps, fishes), supporting regional fisheries (Vega-Cendejas *et al.* 2004) and the coral reef species of the Mesoamerican Reef System, the largest barrier reef in the Western Hemisphere. The main productive activities in the lagoon area are fisheries, ecotourism and mineral extraction (Herrera-Silveira and Morales-Ojeda, 2009). For these reasons, Celestun is a RAMSAR site recognized by the Convention on Wetlands of International Importance (Herrera-Silveira 2006; RAMSAR, 2014). As in many other tropical coastal lagoons of the Yucatan Peninsula, there is constant mixture of freshwater, provided by the subterranean flows typical of karstic environments, and saltwater from the sea. Based on its hydrological characteristics, Celestun can be divided into an inner zone with freshwater discharges from groundwater currents and low salinity, a middle zone with high ammonium and chlorophyll concentrations, and a brackish outer zone, influenced by seawater and with low nutrient concentrations (Herrera-Silveira 1994a; Tapia-González *et al.* 2008; Herrera-Silveira and Morales-Ojeda, 2009).

Celestun provides shelter for approximately 157 species of fish representing four ichthyological categories: marine and euryhaline (49%), stenohaline (40%), resident (8%) and freshwater fishes (3%) (Vega-Cendejas *et al.* 2004). The most numerically important fish family in Celestun is Sciaenidae (14 species), followed by Sparidae (9 species) and Carangidae (8 species). The most frequent and abundant fish species are marine and euryhaline, among which the most representative species are *Archosargus rhomboidalis*, *Lagodon rhomboides*, *Anchoa mitchilli*, *A. hepsetus* and *Lutjanus griseus* (Vega-Cendejas *et al.* 2004). Some of these species are considered