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Comparison of Recent and sub-fossil sponge communities of West Antarctica

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Sponges comprise a diverse and important benthic invertebrate group in many ecoregions, being a dominating component in the Antarctic communities. Based on two piston cores from the Admiralty Bay, West Antarctica, we isolated the sponge spicules from the sediments and compared the sub-fossil sublittoral sponge assemblage with the Recent sponge fauna of this area. In addition, we performed statistical analysis to compare the species composition from and within each core. While no significant shifts in the composition of sponge assemblages along the cores were noticed, our study revealed a noteworthy distinction between the documented sponge species in the area and those identified based on loose spicules within the sediment. The sedimentological record appeared to capture more sponge species than identified in contemporary faunistic studies. Out of the 27 sponge taxa recognized in the sediment, merely seven were confirmed as presently inhabiting the area. Of the remaining 20 taxa, several were documented in nearby regions such as Maxwell Bay or South Shetland Islands in general, but 12 species had not been previously recorded in this locality or its adjacent areas. Conversely, the sediments did not indicate the presence of nine modern species previously reported in this area. We attribute these discrepancies to various factors, including the potential oversights in recognizing sponges characterized by small size, fragility, or encrusting habits during faunistic studies. In cases where the certain taxa lack a fossil record, we suggest that the simplicity of their spicule types made the recognition in sediments challenging. In summary, our findings underscore that Admiralty Bay remains substantially understudied in terms of sponge species inhabiting this area, highlighting the need for further comprehensive studies in this region.

Key words: Porifera, sediment spicules, sponge taxonomy, Admiralty Bay, Antarctica, Holocene.

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