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Latitudinal gradients and poleward expansion of mangrove ecosystems in South Africa: 50 years after Macnae's first assessment

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Abstract

Mangroves occur in South African estuaries at their poleward distribution limits, extending into temperate habitats. In 1963, William Macnae published the first comprehensive assessment of mangrove swamps in South Africa and made firsthand observations of these mangrove ecosystems. This article reassesses South African mangrove habitats, highlighting changes since Macnae's assessment, through a literature review of research done in the past 50 years and using the results of a dedicated mangrove survey spanning 2012–2017. Until now, changes have been recorded mostly for mangrove vegetation, including a change in mangrove cover and a poleward shift of mangrove species. While some mangrove-associated fauna have disappeared from most sites (e.g. the gastropod Terebralia palustris), others, such as fiddler crabs, have spread farther south. The effects of decreasing diversity with an increase in latitude were not observed along the South African coast. Instead, habitat quality and estuarine mouth state seem to exert greater influence on species diversity in the mangroves, and a poleward shift in species distribution is now evident not just for the mangrove flora but for the fauna as well. South African mangrove research needs to include a continuous monitoring plan, especially if we are to contribute to global knowledge on blue carbon, the effects of sea-level rise, and the resilience of the mangrove ecosystem.