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Effects of urbanisation on macroalgae and sessile invertebrates in southeast Australian estuaries

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Abstract

The influence of anthropogenic and environmental factors on the composition, cover and dominance of macroalgae and sessile invertebrates was assessed in three capital city estuaries in south-eastern Australia. Heavy metals and proximity to ports showed the strongest relationships to the distribution of sessile reef biota after accounting for natural environmental gradients. The densities of laminarian, furoid, brown and red foliose algae were negatively correlated with heavy metals, both in Port Phillip Bay (Melbourne) and the Derwent (Hobart), while turf, filamentous algae and some invertebrates were favoured. Sydney Harbour possessed a different pattern, with the laminarian kelp *Ecklonia radiata* most abundant near the main shipping port, probably because of biotic interactions involving urchin grazing in the lower estuary. Identifying drivers of benthic community pattern represents a key challenge for effective conservation management, particularly for estuaries affected by multiple anthropogenic impacts.

Keywords: *Ecklonia radiata*; estuarine ecology; heavy metal pollution; kelp; multiple stressors

Highlights

- Impacts of urban contaminants on sessile reef biota were detectable above the natural variability of estuarine systems in three Australian capital cities

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