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### A quantitative study of the trophic relationships within the fish community of the Mhlanga estuary, South Africa

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The importance of benthic floc, zoobenthos, zooplankton and epiphytic flora and fauna as energy sources for the fishes of the Mhlanga estuary was studied between January and December 1978. Benthic floc (detritus and associated microorganisms) was the most important food resource with an annual standing crop of  $161 \text{ kJ m}^{-2}$  ( $9 \cdot 46 \text{ g m}^{-2}$ ). More than 90% of the fish biomass utilized this energy source compared to 1.8% feeding on zoobenthos ( $26 \cdot 4 \text{ kJ m}^{-2}$ ,  $1 \cdot 5 \text{ g m}^{-2}$ ), 1.7% on zooplankton ( $1 \cdot 7 \text{ kJ m}^{-2}$ ,  $0 \cdot 08 \text{ g m}^{-2}$ ) and 3.1% on epiphytic flora and fauna ( $4 \cdot 0 \text{ kJ m}^{-2}$ ,  $0 \cdot 27 \text{ g m}^{-2}$ ). Since much of the detritus entered the Mhlanga estuary from the fringing *Phragmites* swamp, the biological productivity of the estuary was closely linked to that of the reed beds. During the closed phase of the estuary the standing crops of the fish food resources increased due to the relative stability of the physical environment. The highest biomasses of zooplankton, zoobenthos, epiflora and epifauna were recorded after extended periods of closure and decreased significantly when the

were recorded after extended periods of closure and decreased significantly when the estuary opened. This was due to two main factors: firstly prolonged exposure of vast areas of the lagoon and reed swamp, and secondly large scale substrate movement caused by floodwaters leaving the estuary.



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## Keywords

estuaries; bioenergetics; food chains; fish catches; estuarine fauna; estuarine flora; seasonal variation; South Africa

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