

Distribution patterns of fishes in a freshwater deprived Eastern Cape estuary, with particular emphasis on the geographical headwater region

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Abstract

Small seine net fish assemblages in the headwater region of the Kariega Estuary are described and compared to the catch composition in other parts of the system. The geographical headwaters of the freshwater 'deprived' Kariega Estuary were utilised by a range of fish species but, in contrast to the nearby freshwater 'rich' Great Fish Estuary, few important angling species (e.g. spotted grunter *Pomadasys commersonnii* and dusky kob *Argyrosomus japonicus*) were recorded. The reduced riverine flow into the Kariega Estuary resulted in an extremely restricted river-estuary interface (REI) zone being made available to resident and migrant fish species. Despite the low freshwater input recorded, the catadromous freshwater mullet *Myxus capensis* was abundant within the REI zone and headwater reach, probably due to reduced access to riverine habitat above the estuary. Although salinity has been shown to be an important structuring force influencing ichthyofaunal assemblages in many South African estuaries, it is not the primary factor governing the distribution of fish in a freshwater-deprived, marine-dominated system such as the Kariega.

Introduction

Biological research in South African estuaries has been concentrated on the lower and middle reaches of systems, with little information being available from the geographic headwaters or upper reaches. Research on fish communities in South African estuaries has followed a similar pattern, with few studies examining the entire length of an estuary, the notable exception being a recent study on the Great Fish River Estuary (Ter Morshuizen et al., 1996; 1997). This lack of information on the longitudinal distribution of fish within estuaries is compounded by the paucity of studies that rigorously examine the factors, both abiotic and biotic, which structure these communities. Advances in multivariate statistics have enhanced numerical ecology, but the majority of studies examining spatial and temporal variation in fish communities have been analysed using conventional univariate statistics (Ter Morshuizen and Whitfield, 1994). Research into the forces that structure fish communities has also focused on the relationship between fishes and a single abiotic variable (e.g. Cyrus and Blaber, 1987a; 1987b), with only a few using multivariate techniques to link fish species to a range of environmental parameters (Morin et al., 1992; Thiel et al., 1995; Marshall and Elliott, 1998). This study aims to use multivariate techniques to examine the longitudinal variation in Kariega Estuary fish assemblages and the factors that influence them.

Study area

The permanently open Kariega Estuary is situated on the east coast of South Africa (33° 41' S, 26° 42' E) and is approximately 18 km long (Fig. 1). The channel in the upper reaches is narrow (40 to 60 m) while in the lower reaches the estuary widens (100 m) and is bordered by sand flats and salt marshes (Grange, 1992). The

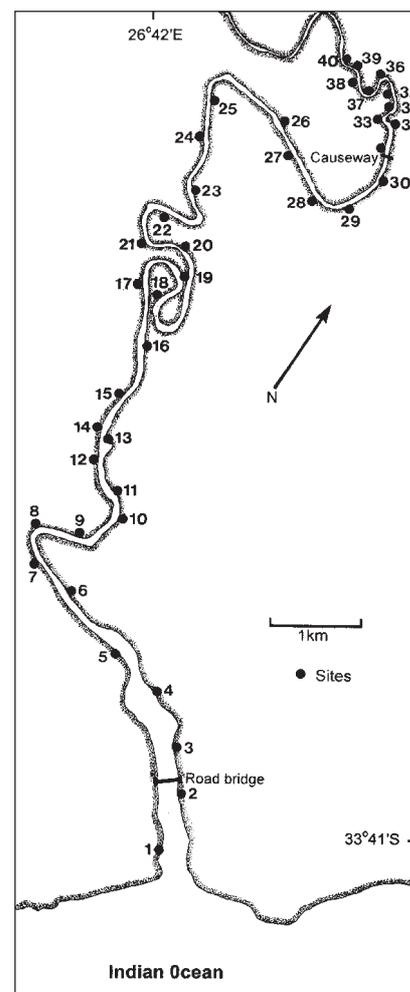


Figure 1
Map of the Kariega Estuary indicating sampling sites used in this study

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