Species records of the river prawn *Macrobrachium* (Decapoda: Natantia: Palaemonidae) from lake Cubhu, Zululand, Natal

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Abstract

Five species of river prawn belonging to the genus *Macrobrachium* were collected from lake Cubhu in Zululand, Natal. Of these, *M. australe* was recorded for the first time in Africa. A brief description is given of the lake, its water quality conditions at the time of the survey, and of the major vegetation types fringing or occurring in the littoral zone of the lake. The taxonomic status and fisheries status of some of the species are discussed.

Introduction

A number of *Macrobrachium* species have thus far been recorded from coastal lakes and rivers flowing into the Indian Ocean along the South African coast. To date, records have indicated that there is an increase in *Macrobrachium* species diversity and incidence towards the northern, more subtropical coastal belt of Natal (Barnard, 1950; Kensley 1981; Forbes and Bickerton 1977; Read, 1983; Coetzee, 1988). During three visits to Zululand in the summer months of 1982 and 1983, prawns belonging to this genus were collected from Lake Cubhu near Empangeni (Fig. 1). Collections were made using electro-fishing techniques, with a Moore type shocker (Moore, 1968), in the littoral zone along the shore of the lake. Species were identified with the aid of the keys of Barnard (1950), Kensley (1972) and Holthuis (1950). A representative collection of the material obtained was also provided to Professor LB Holthuis of the Natural History Museum, Leiden, Netherlands, for confirmation of the species.

Description of Lake Cubhu

In geologically recent times, Lake Cubhu was part of a larger Richard's Bay lagoon, from which it is separated today by a land strip which is approximately 2 km wide (Worthington, 1978). The total surface area of the lake, when full, is approximately 464 ha, with a maximum and mean depth of just under 4 m and 2,5 m respectively (Geustyn, Forsyth and Joubert, Inc., 1976).

According to analyses of water samples taken by the authors, and by Hemens (1980) on the water quality conditions of the lake system, both the river tributaries and main stream of the Mzingwenya River which feeds the lake, as well as the lake itself, contain mainly soft, usually alkaline water, with a pH which may fluctuate between 6,7 and 7,5. The lake water appears to be poor in nutrient loads, with low phosphate concentrations (Hemens, 1980) being an important, possibly limiting, factor which may prevent undue algal development in the lake itself. Dense swamp vegetation, which occurs at the points of inflow of surrounding streams, may act as a filter in the removal of nitrogen and phosphate from waters entering the lake from the Mzingwenya River catchment.

The vegetation of the lake consists of a swamp forest which is largely confined to two areas along the south-western and southern parts of the lake (Fig. 1) and covers approximately 25 ha (Visser and Boshoff, 1977; Hemens, 1980). Here the freshwater mangrove *Barringtonia racemosa* dominates the littoral zone of the lake. Other associated plant species include the water berry or umdoni, *Syzygium cordatum*, swamp fig tree, *Ficus trichopoda*, climbing fern, *Stenochlaena tenuifolia*, thorny creeper, *Asparagus falcatus*, toothed fern, *Thelypteris dentata*, wild date palm, *Phoenix reclinata*, and white pear, *Apodytes dimidiata*. In the swamp, the papyrus, *Cyperus papyrus*, and the water hyacinth, *Eichhornia crassipes*, also occur densely in isolated spots. *Papyrus* swamps also fringe larger areas of the lake (Fig. 1), covering an approximate area of 50 ha. The water hyacinth, which floats freely in the lake, is usually largely restricted to regions where the water enters and leaves the lake (Fig. 1).

Macrobrachium species in Lake Cubhu

The following *Macrobrachium* species (as identified by Professor LB Holthuis, 1982) were found in the lake.
Macrobrachium lepidactylus (Hilgendorf): Scaly-armed river prawn
Macrobrachium rude (Heller): Hairy (furry-armed) river prawn
Macrobrachium petersii (Hilgendorf): No established common name.
Macrobrachium scabriculum (Heller): Strong-arm river prawn
Macrobrachium australe (Guérin): Koua river prawn.

With the exception of *M. australe* and *M. lepidactylus*, all the other species collected in Lake Cubhu were captured mainly in the marginal vegetation and amongst the roots of the freshwater mangrove *B. racemosa*, where the lake has a fine sandy bottom. It appears that the root system of the water hyacinth *E. crassipes*, which occurs in dense clusters in parts of the lake, could provide shelter and possibly also a feeding substrate for *Macrobrachium* species, especially for the juvenile stages of some of these species which were collected there. *M. australe* occurred largely amongst the stones used in the construction of a wall at the outlet along the north-eastern perimeter of the lake. Of the other *Macrobrachium* species collected at this site, only *M. lepidactylus* predominated in the same habitat as *M. australe*. *M. lepidactylus* was also collected from stony bottom substrates in the Limpopo River near Messina in the Transvaal (Cort, 1983), suggesting some preference of this species for this kind of habitat.

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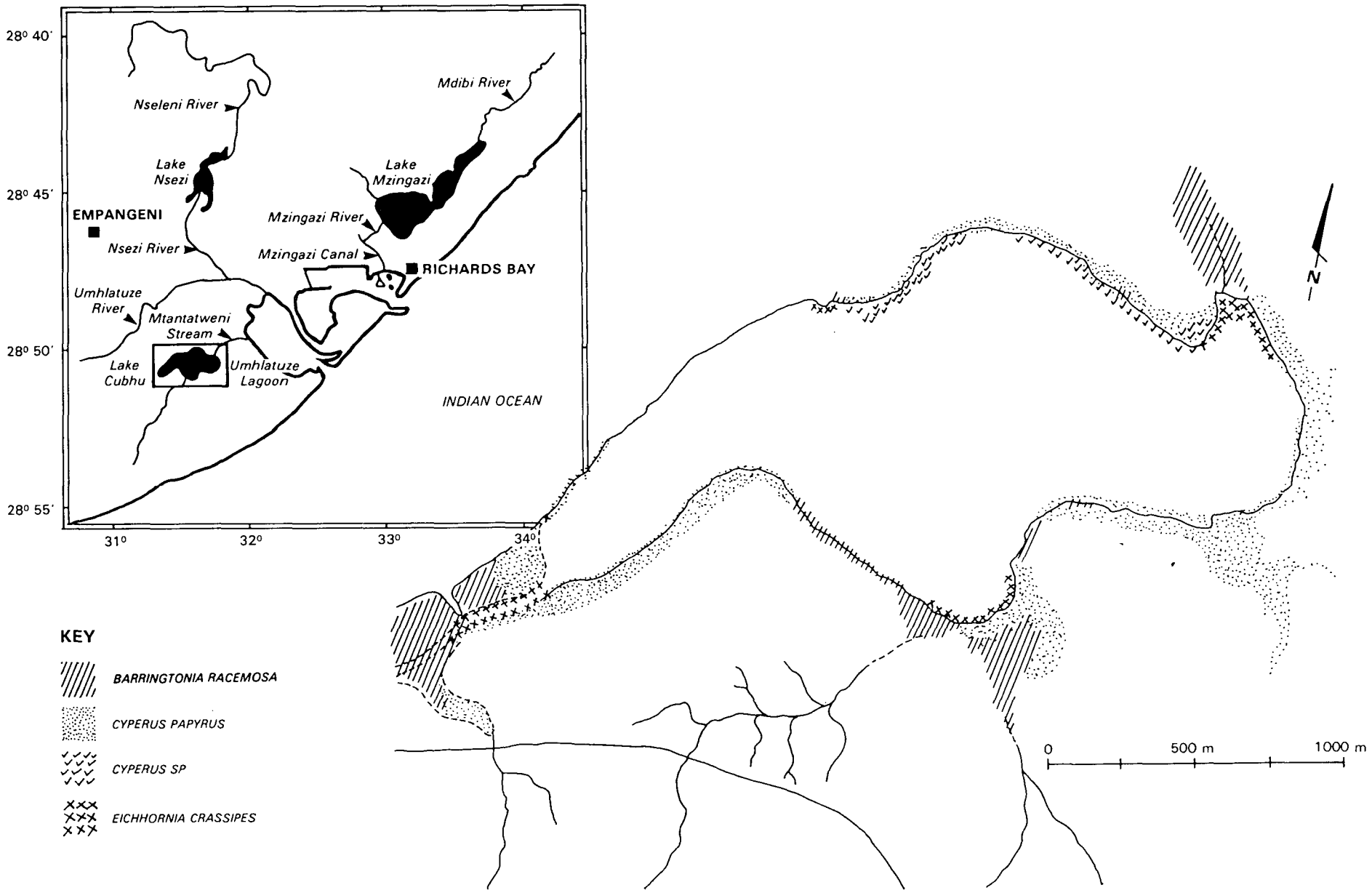

Figure 1
Lake Cubhu showing dominant vegetation types.

Discussion

Holthuis (1982) is of the opinion that the taxonomy of a number of the east African species of *Macrobrachium* has not been described conclusively, and he mentioned that Johnson (1973) intimated that both Barnard's (1950) *Palaemon "sundaicus"* and *P. "idae"* probably are synonyms of *Macrobrachium rude*. Only a direct comparison of the South African material of *M. rude* with material of this species from India will throw more light on the taxonomic status of the *M. rude* complex. Holthuis (1982) also indicated that *Palaemon dolichodactylus* Hilgendorf has been synonymised with *Macrobrachium scabriculum* and that *M. petersii* still remains a valid species.

The presence of *M. australe* in Lake Cubhu is a new record of this species on the African continent (Holthuis, 1982) with previous recordings of its distribution being the Indo-West Pacific Region, including Madagascar and the Seychelles, and as far as Polynesia (Holthuis, 1980). Longhurst (1970), mentions that this species forms an important component in subsistence fisheries of Fiji. *M. australe*, with other prawn species, is also exploited by the local inhabitants of the Marquesas Islands (Adamson, 1935) and Madagascar (Louvel, 1930).

Macrobrachium lepidactylus (= *Palaemon hilgendorfii*: Louvel, 1930), which occurs with *M. australe* in rivers of Madagascar, is also exploited by fishermen there (Holthuis, 1980). According to Bailey and Crichton (1971), this species is also caught on a small scale in Kenya and Tanzania.

Macrobrachium rude, although of apparently minor economic importance, is also utilised by fisheries in Kenya and Tanzania (Holthuis, 1980). However, a number of authors mention the importance of *M. rude* in fisheries in India (Chopra, 1943; Jones, 1967; Kurian and Sebastian, 1976) and in Thailand (Ling and Costello, 1976).

Because of its relatively small size, *M. scabriculum*, although utilised as food when caught, appears to be of minor significance in the fisheries of Kenya (Bailey and Crichton, 1971), India (Kurian and Sebastian, 1976) and Bangladesh (Ahmad, 1957).

Macrobrachium petersii is a river prawn, endemic to southern Africa. It occurs as far north as Tete on the Zambezi River (Read, 1983) and was also found by this author to occur much further south than the Umtata and Illovo River localities where this species was previously recorded by Barnard (1950). Read (1982) found *M. petersii* to occur in the Great Fish and Kowie Rivers. Coetzee (1988) extended its known southward distribution even further by recording it from the Sundays, Swartkops and Gamtoos Rivers in the eastern Cape.

Because of the size it can attain, it may be worthwile investigating the aquaculture potential of *M. petersii* under local environmental conditions.

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