EPIBENTHIC ALGAL PRODUCTION IN THE SWARTKOPS ESTUARY.

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Benthic metabolism was measured at two stations in the Swartkops estuary as part of a study on the ecology of meiofauna. To the author's knowledge no work has been published on benthic primary production in South African estuaries, the only primary production works being those of Christie (1976) in Langebaan Lagoon and Robarts (1976) in Swartvlei. The present studies were carried out in spring (September) and autumn (April) 1976 at a mean temperature of 18°C. The areas studied were a sandy beach near the mouth (Station A) and a muddy beach in the upper reaches (Station B). Dark and light bottle respirometers were used and a complete description of the method is given in Dye *et al.* (In press). Four tidal levels were studied at each station, viz. high water (HW), mid water (MW), low water (LW) and under water (UW), the last being permanently covered by water to a depth of at least 0,30 m. Oxygen production results are expressed in terms of g C/m²/y assuming an average photoperiod of 12 h/day and an RQ of 0,85 (Hargrave 1969).

Table 1 gives the results of the primary production determinations which are the means of duplicate measurements. The mean spring production at Station A was 58,5 g C/m²/y and at B the production was 123,0 g C/m²/y. The autumn production at A was 47,0 g C/m²/y and at B it was 109,5 g C/m²/y. This gives an annual mean of 53 g C/m²/y for sandy areas and 116,5 g C/m²/y for muddy areas. As far as intertidal differences in primary production are concerned, it can be seen from Table

TABLE I

Epibenthic algal production at two stations in the Swartkops estuary during spring and autumn 1976, including Standard Deviation.

Station		Spring production g C/m²/y	Autumn production g C/m²/y	Mean
A (sand)	HW	33,4 ± 3,2	29,1 ± 3,5	31,25
	MW	47,1 ± 3,6	40,9 ± 2,8	44,0
	LW	75,6 ± 5,9	55,8 ± 3,8	65,7
	UW	78,0 ± 6,2	64,4 ± 4,1	71,2
B (mud)	HW	52,4 ± 4,2	47,2 ± 2,9	50,7
	MW	118,0 ± 9,8	109,1 ± 3,9	113,5
	LW	255,6 ± 11,2	238,6 ± 10,2	247,1
	UW	66,3 ± 4,4	43,1 ± 3,1	54,7

1 that, in sandy areas, primary production increases from HW to UW. In muddy areas, however, highest primary production occurred at LW with a considerable decrease towards UW, probably due to turbidity.

There is little data on primary production of estuarine sand or, indeed, of sandy beaches in general. Steele & Baird (1968) estimated a production of 6,5 g $C/m^2/y$ at an ambient temperature of 10°C in a Scottish beach. This is approximately a tenth of the production measured in the present study and this may be partly due to the low temperature and the fact that the measurements were made on an exposed beach and not in an estuary. As far as the muddy stations are concerned, more comprehensive data are available. Hargrave (1969) estimated production to be 40,4 g $C/m^2/y$, Biggs & Flemmer (1972) obtained a value of 72,0 g $C/m^2/y$ and Riznyk & Phinney (1972) found production rates of 80 to 300 g $C/m^2/y$ in estuarine mud flats. The present findings compare well with these published data.

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YELLOWFISH AND TIGERFISH HAEMATOLOGY

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No previous physiological studies have been made on the large-mouth yellowfish and the tigerfish in South Africa. Difficulties were originally encountered in obtaining healthy specimens, and high mortality rates occurred during and after transportation, problems which have now been overcome (Hattingh *et al.* 1975). It is known that the environment plays an important role in the physiology of a fish and haematological ranges will give an indication of the blood physiological state (Blaxhall & Daisley 1973; Bouck & Ball 1966). The present report concerns basic haematological values for these two species.

Barbus kimberleyensis (yellowfish) was obtained from Scandinaviadrif near Potchefstroom with the

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