

## ABSTRACTS OF MEMOIRS

### RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

DAVIES, A. G., 1967. Studies of the accumulation of radio-iron by a marine diatom. In *Radioecological Concentration Processes*, being *Proc. Int. Symp. Stockholm*, 25–29 April, 1966 (Bertil Aberg and Frank P. Hungate, eds), pp. 983–91. Oxford and New York: Pergamon Press.

A method is described for measuring the adhesion of hydrous ferric oxide to the surfaces of phytoplankton. The quantities of both newly precipitated and aged oxide accumulated by the surface of the diatom *Phaeodactylum tricornerutum* Bohlin have been determined for a range of iron concentrations and diatom populations. The results were found to accord with the Freundlich adsorption isotherm, the newly precipitated oxide proving to be much more adhesive than the aged oxide. Extrapolation of the results to natural conditions has provided an estimate of the degree of contamination of a diatom population which would result from the influx of radioactive hydrous ferric oxide.

A. G. D.

HOLME, N. A., 1967. Pollution par le mazout des côtes de Cornouailles anglaise à la suite du naufrage du 'Torrey Canyon'. *Penn Bed.*, Vol. 6, No. 50, pp. 88–94.

An account, in French, of the biological effects of 'Torrey Canyon' oil pollution on the coast of Cornwall. It forms one of a series of papers on oil pollution which make up the 50th number of this Breton journal of nature conservation.

N. A. H.

HOLME, N. A. & SPOONER, G. M., 1968. Oil pollution at Bovisand—an interim report. *J. Devon Trust Nat. Conserv.*, No. 16, pp. 665–7, March 1968.

In October 1967 a Belgian oil tanker accidentally released a quantity of oil, estimated at 50 tons, into Plymouth Sound. This drifted on to the eastern shores of the sound between Bovisand and Renney Point, where it caused heavy pollution of the rocks. Following advice from the Marine Biological Association, no detergents were sprayed at first, some manual clearing of oil was carried out, and the remainder left to weather on the rocks. In February 1968 detergent spraying of beaches frequented by the public was commenced, but a stretch of rocky coast about half a mile in length was left unsprayed to see the sequence of events under such conditions.

N. A. H.

RUDY, P. P., JR., 1967. Water permeability in selected decapod crustacea. *Comp. Biochem. Physiol.*, Vol. 22, pp. 581–9.

Water influx constants for four decapods were calculated:

(a) <i>Macropipus depurator</i> :	sea water	$2.39 \pm 0.71 \text{ h}^{-1}$
(b) <i>Carcinus maenas</i> :	sea water	$0.79 \pm 0.17 \text{ h}^{-1}$
	70 % sea water	$0.78 \pm 0.14 \text{ h}^{-1}$
	40 % sea water	$0.72 \pm 0.08 \text{ h}^{-1}$
(c) <i>Palaemonetes varians</i> :	120 % sea water	$0.64 \pm 0.25 \text{ h}^{-1}$
	70 % sea water	$0.64 \pm 0.12 \text{ h}^{-1}$
	10 % sea water	$0.55 \pm 0.16 \text{ h}^{-1}$
(d) <i>Astacus fluviatilis</i>	fresh water	$0.20 \pm 0.03 \text{ h}^{-1}$

The brackish water species *Carcinus maenas* and *Palaemonetes varians* cannot significantly alter their integumental water permeability.

Urine volumes, predicted on a water diffusion basis, are two to four times lower than measured urine volumes.

Internal water of *Carcinus maenas* and *Macropipus depurator* exchanges with the external medium as a two-pool system.

P. P. R.

SOUTHWARD, A. J., 1967. On the ecology and cirral behaviour of a new barnacle from the Red Sea and Indian Ocean. *J. Zool.*, Vol. 153, pp. 437-44.

*Tetrachthamalus oblitteratus* is a small chthamalid found high up in the intertidal zone in the Gulf of Aqaba, Red Sea and at Mauritius, Seychelles and Aldabra Island, Indian Ocean. The general behaviour and rate of cirral activity are described and shown not to differ greatly from those of other chthamalids. The species appear well-adapted to the life in the tropics, and the present restricted distribution is presumed to be the result of competition with larger chthamalids of Indo-Pacific distribution. The absence of the larger chthamalids from places where *Tetrachthamalus* is found may be due to geographical isolation reinforced by the effects of a small tidal range and other extreme environmental conditions.

A. J. S.

SOUTHWARD, E. C., 1968. On a new genus of pogonophore from the western Atlantic Ocean, with descriptions of two new species. *Bull. mar. Sci.*, Vol. 18, pp. 182-90.

A new genus of Pogonophora, *Crassibrachia*, is described, with two new species. *C. sandersi* occurs in depths of 2435-5000 m between N. America and Bermuda. *C. brasiliensis* occurs at a depth of about 800 m off the coast of Brazil. Both species have two tentacles and inhabit black tubes. The genus *Crassibrachia* is placed, tentatively, in the family Polybrachiidae.

E. C. S.

SKUTSCH, G. M., D. C. WATTS & E. BALDWIN, 1966. The synthesis of acetyl phosphate by homogenates of elasmobranch liver. *Comp. Biochem. Physiol.*, Vol. 17, pp. 799-803.

It has been suggested that carbamyl phosphate synthetase from the rat and frog liver and from bacteria will also synthesize acetyl phosphate from acetate and ATP.

It was thought that this might also occur with carbamoyl phosphate synthetase from elasmobranch liver. It was found that sucrose homogenates of elasmobranch liver do exhibit quite marked acetyl kinase activity but only if the homogenates are treated with cetyl trimethyl ammonium bromide. In these conditions no carbamoyl phosphate synthetase activity can be demonstrated.

Homogenizing the liver with ammonium sulphate solution instead of sucrose increased the acetyl kinase activity (in the presence of cetyltrimethyl ammonium bromide) while the carbamoyl phosphate synthetase activity was completely inhibited.

Acetyl kinase activity was reduced by only 30% if N-acetyl glutamate was omitted from the assay mixture, whereas carbamoyl phosphate synthetase activity ceased completely.

Finally the stability of the acetyl kinase activity was shown to be considerably greater than that of carbamoyl phosphate synthetase activity.

The condition for the two types of activity are therefore very different. It is not, however, ruled out that the two activities are due to different active sites on the same enzyme.

Progress curves suggesting that a time-dependent activation process may be involved in the synthesis of acetyl phosphate in the case of aged and frozen extracts were obtained.

D. C. W.

WATTS, D. C. & WATTS, R. L., 1966. Carbamoyl phosphate synthetase in the elasmobranchii. Osmoregulatory function and evolutionary implications. *Comp. Biochem. Physiol.*, Vol. 17, pp. 785-98.

Carbamoyl phosphate synthetase activity is demonstrated in sucrose homogenates of elasmobranch livers in the presence of ATP, ammonium bicarbonate, *N*-acetyl glutamate and ornithine with  $Mg^{2+}$  as the activating metal ion. With *Scylliorhinus canicula* and *S. stellaris* livers ammonia and glutamine act equally well as substrates but with *Raia circularis* only glutamine acted as substrate. If the fish is first adapted to diluted sea water (80-90%) carbamoyl phosphate synthetase activity is found to be enhanced. This finding is contrary to the idea of urea acting solely as an osmoregulator in elasmobranchs and an alternative hypothesis involving chemical homeostasis is advanced. The evolution of the urea cycle is discussed in the light of these findings.

D. C. W.