

3

abstracts from scientific papers

1. Behavioural Adaptations of Intertidal Molluscs from a Tropical Sandy Beach
2. Ultrabasite and Gabbro from the Rift Zones of the Arabian-Indian and Western Indian Underwater Ridges
3. Suspended Organic Matters in the Waters of the Arabian Sea
4. Littoral Fauna of the Red Sea : The Population of non-Scleractinian Anthozoans of Shallow Waters of the Red Sea
5. Studies on the Transport of Sugars in the Holothurian, *Holothuria scabra*
6. Observations on the Ecology of some Sandy Beaches of the South West Coast of India
7. Using Natural Radon for Delineating Monsoon Circulation
8. Antibacterial Activity of the Marine Blue-Green Alga, *Trichodesmium erythraeum* in the Gastro-Intestinal Contents of the Sea Gull, *Larus brunicephalus*
9. On the Occurrence of Oxygen Maxima and Minima in the Upper 500 Meters of the North-Western Indian Ocean
10. Middle Eocene Planktonic Foraminifera from Lakhpat, Cutch, Western India
11. Water Structure of the Equatorial Indian Ocean

ANSELL D. ALAN and ANN TREVAL-LION. 1969. Behavioural Adaptations of Intertidal Molluscs from a Tropical Sandy Beach. *J. exp. mar. Biol. Ecol.*, 4 (1) : 9-35.

Observations were made on the movements of the bivalves *Macra olo-*

rina and *Donax incarnatus*, and of the gastropod *Bullia melanoides*, collected from an exposed sandy beach near Shertallai in southwest India.

The burrowing movements were remarkable for the speed at which they occurred. In *Macra olorina*, the foot probed with a frequency of at first 8-9 probes per sec. later reduced to 5 probes per sec. The events associated with the establishment of the pedal anchorage and of active downward movement occupied 0.35 sec only and those of establishment of the shell anchorage and of probing occupied 1.15 sec. The complete digging cycle occupied 1.5 sec. These movements are compared with those of *M. corallina* from the Mediterranean and from the Clyde. The movements responsible for recovery from deep burial were also examined. Rapid burrowing and active upward movement through the sand, as appropriate, enable the animal to maintain its position in disturbed sediments.

Similar observations were made on *Donax incarnatus*, which was compared with the north temperate species *D. vittatus*. In *D. incarnatus* rapid burrowing and active emergence from part of a complex of movements which lead to tidal migration of the population on the beach. Tidal migration was also a feature of the behaviour of *Bullia melanoides*, and in this species too, rapid burrowing and active emergence from the substratum at appropriate times are elements in the complex of movements by which this tidal migration is performed.

CHERNYSHEVA, A. I. 1969. Ultrabasite and Gabbro from the Rift Zones of the Arabian-Indian and Western Indian Underwater Ridges. *Oceanology* 9 (4) : 519.

The results of petrographic studies of ultrabasite and gabbro from the rift zone of the Indian Ocean bottom ridges are discussed using the materials of the 36th Vityaz cruise. Rocks sampled from two sites 2,700 km apart are close

to each other in their composition. Petrographically, ultrabasic rocks are divided into four subgroups: I. dunite; II. harzburgite, serpentinite; III. plagioclase-lherzolite; and IV. metamorphically changed rocks. The petrographic description and chemical composition of the basic rock varieties are presented as well as the description of rocks forming minerals and their optical properties. The formation of pyroxene and plagioclase is shown to be related to autometasomatism, which concludes the magmatic phase proper in the rock mass formation, accompanied by the activity of residual intragranular liquid. The formation of ultrabasic in the rift zone is related to complicated processes among which the intrusion of ultrabasic rock by faults is of no small importance.

FINENKO, Z. Z. and ZAIKA, V. Ye. 1969. Suspended Organic Matters in the waters of the Arabian Sea. *Oceanology* 9 (4) : 504.

The organic matters of seston was determined during the summer monsoon mainly in coastal areas of the Arabian Sea and partly in the Red Sea. The highest organic contents were found in the coastal areas of the Arabian Sea. (200-600 mg of C/m³) and the amount of suspended matter in the open parts of the sea did not exceed 100 mg C in the Red Sea and the Gulf of Aden suspended matter averaged 250 mg C.

FISHELSON, L. 1970. Littoral Fauna of the Red Sea : the population of non-scleractinian anthozoans of shallow waters of the Red Sea. *Mar Biol.* 6 (2) : 106-116.

Approximately 22 species of sea anemones and 20 species of alcyonarians were found on the reef fringing the shallow water at Eilat (Gulf of Aqaba) and other localities along the Red Sea coast of the Sinai Peninsula. Investigations showed that these 2 groups of non-scleractinian coelenterates form (on diff-

erent substrates) well identified colonies part of them inhabiting sandy bottom, other groups growing on the reef surface. Observations lead to the conclusion that several of the sea anemones and alcyonarians can act, under certain conditions, as factors limiting the development of hermatypic corals. In some areas, several species of the 2 groups of animals are found together with their symbiotic partners, such as fishes and crustaceans.

KRISHNAN, S. and KRISHNASWAMY, S. 1970. Studies on the Transport of Sugars in the Holothurian *Holothuria scabra*. *Mar. Biol.* 5 (4) : 303-306.

Experiments using 14C sugars were carried out of the holothurian *Holothuria scabra* JAGER, in order to assess the role of its perivisceral fluid in the translocation and transportation of dissolved organic materials. The results obtained indicate that the perivisceral fluid plays a significant part. Rates of 14C glucose, fructose and sucrose uptake were followed in a major tissues such as the alimentary canal, haemal system, respiratory tree and body wall. The monosaccharides are absorbed more intensively by digestive and haemal systems the disaccharide by respiratory tree and body wall. It is, therefore, presumed that tissues in *H. scabra* selectively absorb sugars depending on their metabolic activity.

PANIKKAR, BHASKARA M. and RAJAN, S. 1970. Observations on the Ecology of some Sandy Beaches of the South West Coast of India. *Proc. Indian Acad. Sci.* LXXI (6) : 247-260.

The seasonal cycles of organic matter and chlorophyll at some beaches of the Kerala Coast were studied in relation to the abundance of the interstitial fauna at one of the beaches. The faunal abundance showed no definite correlation either with organic matter or with

chlorophyll. There was no correlation between organic matter and chlorophyll, which indicates that the occurrence of one is independent of the other. The maximum density of interstitial fauna at the Cochin beach was found to be at the mid-tide level. The most abundant groups on the beach were the ciliates, foraminiferans, nematodes and harpacticoids. Less abundant forms included the gastrotrichs, turbellarians, polychaetes, archiannelids, oligochaetes and isopods.

RAMA, 1970. Using Natural Radon for Delineating Monsoon Circulation. *J. geophys. Res.* 75 (12): 2227-2229.

The presence of a major continental component in the monsoon air mass has been detected from radon observations made over the Arabian Sea and the Indian Ocean. The concentrations of radon in equatorial maritime surface air are found to be low (2-3 dpm/m³): in the monsoon air over the west Arabian Sea they are similar, but values gradually increase (~20 dpm/m) as the monsoon approaches the west coast of India. This result can be interpreted in terms of mixing between the lower maritime air and the continental air above. The usefulness of vertical radon profiles in further delineating some aspects of monsoon circulation is pointed out.

RAMAMURTHY, V.D. 1970. Antibacterial Activity of the Marine Blue-Green Alga *Trichodesmium erythraeum* in the Gastro-Intestinal Contents of the Sea Gull *Larus brunicephalus*. *Mar. Biol.* 6 (1): 74-76.

The gastro-intestinal contents of the sea gull *Larus brunicephalus* JERDON were found to possess antibacterial activity. This activity could be traced to heavy accumulations of the marine blue-green algae *Trichodesmium erythraeum* in the gut. During 1969, a bloom of *T. erythraeum* began in Porto Novo waters about the middle of

February, and attained a peak during the second week of March. It has been reported previously by the author that antibacterial properties are exhibited by *T. erythraeum* maintained in laboratory cultures, as well as in water samples collected from a red tide area. It was also reported (RAMAMURTHY, 1970) that the gut contents in 2 pelagic fishes, *Hilsa Kanagurta* and *Rastrelliger kanagurta*, collected during the same red tide bloom period, possessed antibacterial properties. During this period large numbers of these fishes were consumed by sea gulls *L. brunicephalus*. In view of this finding, experimental procedures were adopted to determine whether extracts of *T. erythraeum* occurring in the gut of the sea gulls might exhibit antibacterial activity. It was found that *T. erythraeum* collected from the gut of *L. brunicephalus* could inhibit both gram positive and gram negative bacterial gastrointestinal extracts from *L. brunicephalus* collected during the non bloom period of *T. erythraeum* showed heavy microbial growth of bacteria and fungi. Evidently, antibacterial or sterile conditions prevail in the gut of these tropical sea gulls in a manner similar to that observed in polar penguins by SEVURTH (1959, 1961).

RAO ; D. PANAKALA and JAYARAMAN, R. 1970. On the Occurrence of Oxygen Maxima and Minima in the Upper 500 Meters of the North-Western Indian Ocean. *Proc. Indian Acad. Sci.* LXXI (6): 230-246.

The depths of occurrence of oxygen maxima and minima have been studied in the upper 500 meters of the north-western Indian Ocean (including Arabian Sea and Laccadive Sea). The data collected by various ships during the International Indian Ocean Expedition were pooled into one degree grids and analysed for getting patterns of distribution seasonally and regionally.

The studies reveal that there is much variation in the depths of occurrence of

oxygen maxima and minima in different areas and different seasons in the north-western Indian Ocean. Along the continental shelf all over the Arabian Sea, biological activity appears to play a predominant role in controlling the oxygen content, while in the open parts of the ocean the depths of occurrence of oxygen maxima and minima mainly appear to be governed by the water movements, circulation and mixing. One of the important observations is the existence of stagnant or near stagnant conditions in the more central part of the Arabian Sea, restricting the exchange of water masses with the adjoining seas.

SAMANTA, BIMAL. K. 1970. Middle Eocene Planktonic Foraminifera from Lakhpat, Cutch, Western India. *Micro-paleontology*. 16 (2) : 185-215.

Thirty-seven species and subspecies of planktonic foraminifera, including one new species, have been identified from the Middle Eocene succession around Lakhpat, Cutch, Western India. They occur associated with abundant larger foraminifera in all of the samples. On the basis of the stratigraphic distribution of the significant planktonic foraminiferal species, two distinct assemblage zones are recognized which correlate with Bolli's *Orbulinoides beckmanni* ("Porti-

culasphaera mexicana") and *Truncorotaloides rohri* Zones respectively.

SHCHERBININ, A.D. 1969. Water Structure of the Equatorial Indian Ocean. *Oceanology*. 9 (4) : 487-495

Three main water mass structures can be distinguished in the equatorial area of the Indian Ocean by maximum horizontal gradients of oceanographic parameters : (1) central Indian, (2) equatorial transitional, (3) north Indian. These are separated by two frontal zones extending quasizoneally along latitudes 15°S and 7°S.

Because of the poor stratification in the region of the transitional structure, special methods must be sought to establish the boundaries between the layers. An attempt was made to calculate the vertical current component by P.S. Lineykin's simplified equation for stationary diffusion on the basis of agreement between maximum vertical stability and minimum vertical transport. By identifying the depth at which the vertical transport changes sign with the water mass boundary (by analogy with E. 10° maxima), it is possible to give a more detailed description of the vertical structure of the equatorial transition zone.