

SHORT SCIENTIFIC NOTES

Notes on Aggregation Observed in a Few Species of the Freshwater Ostracods in Madurai Area, Tamil Nadu

Homotypical association among animals is not an uncommon phenomenon and is usually referred to as 'aggregation' (Allee, 1931). During the studies carried out on the freshwater Ostracoda of Madurai area in South India, aggregation in *Stenocypris malcolmsonii* Brady and *Cyprinotus* sp. was observed in some of the astatic pools, particularly during the period of drying. It is thought that this association is likely to be due to the receding water level and evaporation of the system resulting in low oxygen levels and high temperature.

In another species of Ostracod *Cypridopsis* sp. when maintained under laboratory conditions, aggregation of the animals was observed. These organisms were kept in an open tray without food and the aggregation was in the air/water boundary at the margins. The pattern of aggregation was highly irregular, although it collapsed when disturbed mechanically. But when the stimulus was withdrawn the animals once again aggregated. These observations were similar to that reported by Nuttall and Fernando (1970) in an allied species, *Cypridopsis vidua* Müller.

In order to find whether these aggregations are associated with feeding, the present forms *Cypridopsis* sp. were tested under experimental conditions. These animals were provided with different kinds of food materials like dead conchostracans, Noto-nectids, Chironomids and filamentous algae obtained from their natural habitats. The results of these experiments were always negative with regard to aggregation, though feeding was observed in these animals. However Klie (1926) reported larger sized Ostracods belonging to family Cyprinae gathering in masses to feed on the bodies of dead animals. More recently Nuttall and Fernando (1970) recorded feeding aggregations in the case of the freshwater Ostracod *Cyprinotus incongruens* Ramdohr.

The present observations show that the feeding response in this tropical species does not evoke the phenomenon of aggregation though the opposite seems to be the case for other Ostracods (Klie, 1926; Nuttall and Fernando, 1970). Hutchinson (1967) reviewed the various factors which induce zooplankton microaggregations. Among these factors, reproductive activities could also be one

of the causative agents. However, limited observations of the present study does not warrant any definite conclusions and suggests more detailed study.

The author is grateful to Professor S. Krishnaswamy, Head, Department of Biological Sciences, Madurai University, Madurai-21, for his keen interest shown during this work and to Dr. R. George Michael of the same department for his help in the preparation of this paper. My thanks are also due to Professor J. C. B. Abraham, American College, Madurai-2, for the facilities provided.

Department of Zoology, REGINALD VICTOR,
American College,
Madurai-2, August 1, 1973.

1. Allee, N. C., *Animal Aggregation—Study in General Sociology*, University of Chicago Press, 1931.
2. Hutchinson, G. E., *A Treatise on Limnology II. Introduction to Lake Biology and the Limnoplankton*, John Wiley & Sons, New York, 1967, p. 1115.
3. Klie, N., "Ostracoda," *Bio. Tiera. Deut.*, 1926, 22, 1.
4. Nuttall, P. M. and Fernando, C. H., "Notes on aggregation observed in two species of freshwater Ostracods," *Can. J. Zool.*, 1970, 48, 391.

Middle Triassic Conodonts from Malla Johar, Tethys Himalaya

Middle Triassic conodonts were discovered from samples brought by one of us (S. Kumar, member, Wadia Institute Himalayan Geology Expedition 1972) from the Kalapani Limestone about 5 km east of Sumna towards Lapthal in the Kiogar valley, 40 metres above the mule track in the Northern Kumaun District of Uttar Pradesh. The assemblage shows affinities with European forms and consists of seven species which are fairly abundant in Alpine region and are very rare or absent in Germanic or North American facies (Mosher, 1968)¹. The following are species characteristic of Alpine region: *Cratognathodus posterognathus* Mosher, *C. kochi* (Huckriede), *Hindeodella multihamata* Huckriede, *Prioniodina libita* Mosher, *P. petrae-viridis* (Huckriede), *Gladigondolella tethydis* (Huckriede) and *Paragondolella navicula* (Huckriede).

The conodont fauna is associated with ammonites, gastropods, pelecypods, ostracodes, foraminifera and fish remains. The ostracodes are badly damaged

in the etching extraction process and have been tentatively identified as *Bairadia*, *Cavellina* and *Healdia*. The assemblage consists of thirteen genera and forty species of which eight are new. The following previously known species are present: *Cratognathodus kochi* (Huckriede), *C. posterognathus* Mosher, *Cypridodella mülleri* (Tatge), *C. conflexa* Mosher, *C. spengleri* (Huckriede), *C. mediocris* (Tatge), *Diplododella lautissima* (Huckriede), *D. magnidentata* (Tatge), *Enantiognathus ziegleri* (Diebel), *Hindeodella multihamata* Huckriede, *H. triassica* Müller, *H. cf. H. nevadensis* Müller, *H. suevica* (Tatge), *Ozarkodina tortalis* Tatge, *Prioniodella decrescence* Tatge,

Neospathodus cristagalli (Huckriede), *Prioniodina latidentata* Tatge, *P. libita* Mosher, *P. petrae-viridis* (Huckriede), *chirodella* sp., *Paragondolella navicula* (Huckriede), *Neogondolella constricta* (Mosher and Clark), *N. mombergensis* (Tatge) and *Gladigondolella tethydis* (Huckriede).

Geology Department,
Lucknow University,
Lucknow, September 1, 1973.

N. L. CHHABRA.
A. SAHNI.
S. KUMAR.

1. Mosher, L. C., "Triassic condonts from western North America and Europe and their correlation," *Jour. Palaeontol.*, 1968, 42, 895.

REVIEWS AND NOTICES OF BOOKS

Practical Fluorescence, Theory, Methods and Techniques. By George G. Guilbault. (Marcel Dekker, Inc., 95, Madison Avenue, New York, N.Y. 10016), 1973. Pp. xi + 664. Price \$29.50.

This book deals with a subject that has been of long-standing interest. From the title of the book one expects to find here a discussion on the theory of fluorescence in addition to that on the techniques and applications. However, the theory of fluorescence is given a minimal treatment here. After an introductory chapter on the basic concepts of luminescence processes, the author deals with the instrumentation and techniques used in the study of fluorescence. Though the conventional methods are discussed adequately, the considerable advantages of using tunable lasers, CW as well as pulsed, for exciting photoluminescence have not even been mentioned in the book.

Other forms of luminescence, such as phosphorescence, electrogenerated luminescence, chemiluminescence, atomic flame fluorescence and bioluminescence are treated in later chapters. The use of fluorescence for the assay of chemical compounds and in the study of biological materials is extensively illustrated with the results obtained in a large variety of materials. Finally, the author deals with the practical applications of fluorescence as indicator in chemical reactions, in the study of solid surfaces and in forensic and environmental analysis. Researchers and students interested in fluorescence spectroscopy as a tool in chemistry and biology would find the present book very useful in view of the large number of references and examples contained here.

S. V.

Petrology of the Igneous Rocks. By F. H. Hatch, A. K. Wells and M. K. Wells, Thirteenth Edition, Thomas Murby and Co., London, 1972. Pp. 551. Price £7.40.

This latest edition of the authors is extensively rewritten to take account of new developments. In the first part of the book, particular attention is paid to the structure of essential minerals of igneous rocks which controls variation arising from atomic substitution within each family of minerals. This is necessary for proper understanding of igneous rocks in relation to their composition. The treatment of secondary and accessory minerals is selective. The significance of petrology of modern concepts in global geophysics and geology is recognised by the inclusion of a new chapter on the geological setting of igneous activity. The mode of occurrence of igneous rocks and consolidation of magma are included in the second and third chapters of Part II. The scheme of classification of igneous rocks given by the authors is designed to meet the needs of field geologists and students of geology. It is based on mineral as distinct from chemical composition because the former is tangible. A complete revision has been made of the chapters dealing with the distribution and origin of some of the more important rock groups notably andesites, trachytes and rhyolites and the magmas from which they derived.

The fundamental objective of the book is to demonstrate the principles of petrology through the evidence of the rocks themselves and present the essentials necessary for a student to observe and interpret for himself; a foundation is laid on which petrogenetic theories can be developed. In the last