

GLOBAL DECLINE OF PRE-EDIACARAN (RIPHEAN) STROMATOLITES AND THE EMERGENCE OF EDIACARAN BIOTA: PALAEOBIOLOGICAL AND STABLE ISOTOPIC EVIDENCES FROM THE LESSER HIMALAYA

(Gist of a talk by Prof. V. C. Tewari, Geology Department, Kumaun University, Nainital, delivered at Bangalore on 27th December, 1991).

The possible link between the decrease in microbial carbonate sedimentation, and decline of large subtidal conical and columnar stromatolites like *Conophyton*, *Kussiella*, and *Baicalia* of Riphean (Pre-Ediacaran) Deoban cycle and the first appearance of complex acruarchs in Blaini-Infra Krol and emergence of Ediacaran biota like impressions of soft bodied metazoans (*Charniodiscus* sp., (Figs. d and f) *Sekwia* sp., *Kimberella* sp., *Beltanelliformis* sp.); metaphytes (*Vendotaenia* sp., *Vendotaenia antiqua*, (Fig. b) *Krolotaenia*, Tewari, (Fig. a) *Krolotaenia gnilovskayi* tewari, *Tyrasotaenia* sp., (Fig. c) and trace fossils (*Gordia* sp., *Gordia marina*-*Gordia meansdri* (Fig. e) from Krol succession of the outer Lesser Himalaya is perhaps related with the evolutionary stages of the metazoan and metaphytes in the terminal Proterozoic history of evolution of life on Earth. These palaeobiological events are of global nature and have been documented from Africa, Australia, Canada, China, and U.S.S.R.

The carbon isotope stratigraphy of the Deoban-Blaini-Krol succession suggests that the positive $\delta^{13}\text{C}$ signature obtained in the Deoban stromatolitic carbonates is followed by a negative $\delta^{13}\text{C}$ shift in Blaini microbial limestone and again a positive $\delta^{13}\text{C}$ shift in the Upper Krol carbonates suggests that possibly there has been an extinction (decrease of biomass prior to the evolution of the Ediacaran biota (metazoans and metaphytes). The metazoans and metaphytes mark the first appearance of multicellular soft-bodied organisms and macroscopic plants on earth.

The Ediacaran (=Krolian) Period (Terminal Proterozoic System) is recently recognized in the Krol Belt of the outer Lesser Himalaya based on the Pre-Ediacaran and Ediacaran biota. The *Ediacaran System* is represented by Krol Formation which overlies the Blaini Formation (=Varanger) and underlies the Lower Tal Formation (=Tommotian/Meischucunian).

The end of Krol stromatolitic carbonate cycle, development of commercial phosphorite, stromatolites and the diversification of small shelly fossils (SSF's) of Tommotian/Meischucunian Zone 1 age in Lower Tal Formation is a global phenomenon at the Precambrian/Cambrian boundary. The negative $\delta^{13}\text{C}$ values of the Lower Tal carbonates indicate a negative shift in isotopic signature which is also consistent with the global data available from Morocco, Siberia, Iran, and China.

