

MICROSTROMATOLITES FROM THE "CALC—ZONE OF PITHORAGARH" KUMAUN HIMALAYA

Microstromatolites, viz. *Renalcis* Vologdin, *Epiphyton* Bornemann and *Sajania* Vologdin are being reported for the first time from the "Calc-Zone of Pithoragarh". VALDIYA (1980) grouped these calcareous sediments under Deoban Formation of Riphean age. JOHNSON (1966) considered the calcareous structures described here, as calcareous algae. However, later PRATT AND NOEL (1982) suggested that these structures should be termed microstromatolites, as they are digenetic calcareous structures formed by algal activities.

Renalcis Vologdin, 1932

Pl. 1, Figs. 1 & 2

Small 35-400 μm , hollow structures, either solitary or in groups; shape variable, circular, subcircular oval or even irregular; composed of grey-black to brown nearly opaque-micro-crystalline calcite.

These structures compare with *Renalcis* Vologdin (JOHNSON, 1966, pl. 9, figs, 1 & 4) due to hollow nature and irregular shape of chambers. These structures have been found in black calcareous phyllites 1.5 km east of Mastamano temple, in slates 3/4 km north of Satsilling in a hillock and in calcareous slates near Nakot bus station.

Epiphyton Bornemann, 1886

Pl. 1, Figs. 3 & 4

Solid rod-like structures, repeatedly branches at 25°-60°, arranged in radial manner, length of individual rods 180-300 μm breadth 3-5 μm at base and 6-10 μm at the point of branching, composed of black opaque micro-crystalline calcite. No micro-texture is discernible.

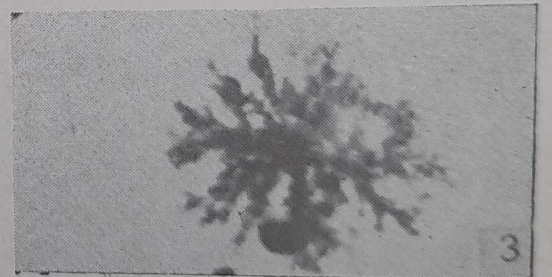
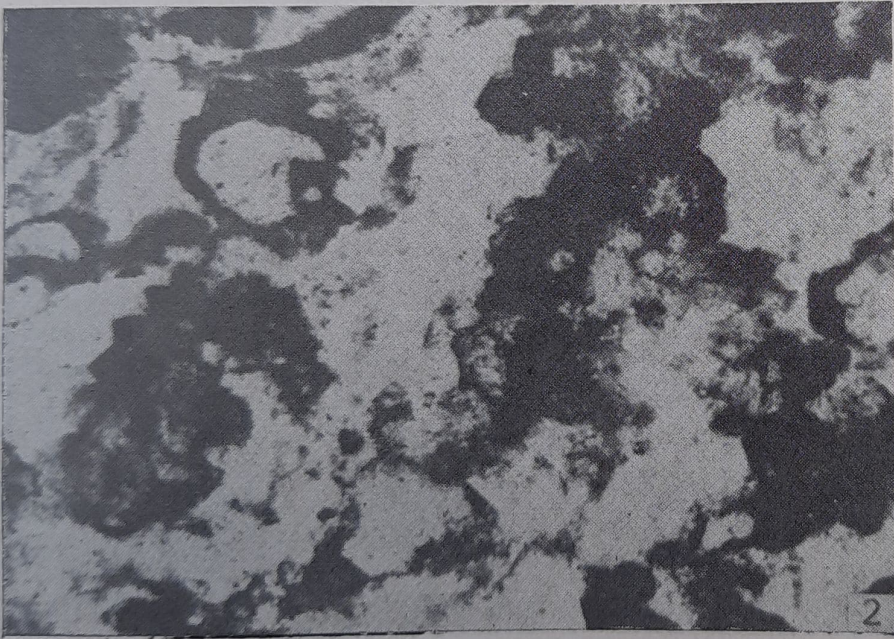
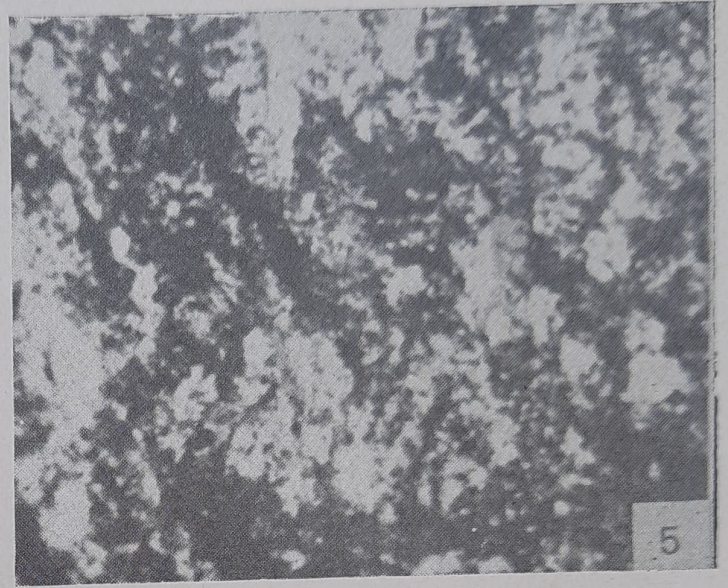
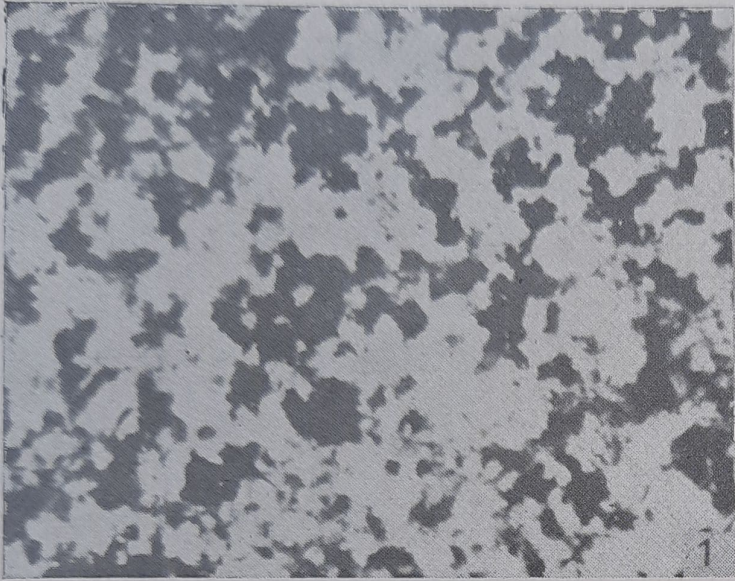
These structures compare with *Epiphyton* Vologdin in branching habit and in being solid rod-like structure. Other members of family Epiphytaceae, viz. *Tubomorphophyton* Korde, differs due to lighter central area, appearing as hollow tubular structure; *Thurme* Wray is larger in size; *Paraepiphyton* Wray and *Gordenophyton* Korde have microtexture. This form has been found in the slates exposed near Mastamano temple on Chandak-Cherra road and dolomites near Dwalihat village bus station.

Sajania Vologdin, 1962

Pl. 1, Fig. 5

Ribbon-shaped structure, 10-100 μm thick, branching irregular, composed of black, opaque, micro-crystalline calcite.

The present form compares with *Sajania* Vologdin in being ribbon-like in shape and having irregular branching. Other two members of family Sajaniaceae are—*Chabakovia* Vologdin and *Angulocellularia* Vologdin; both these forms differ due to chambered appearance. This form has been found 9 km from Ghurna on Ghurna-Pithoragarh Road.



According to ROZANOV (1969) the calcareous structures described here as microstromatolites appear in rocks of late Venedian age. During early cambrian time they increase in number and are associated with Archyococyathids and Hyolithids. Since no animal remains are found in these beds, they are definitely older than Cambrian.

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EXPLANATION OF PLATE—1

- Figs. 1 & 2. *Ranalcis* Vologdin. Note the difference in size of the chambers in two photographs. B. S. I. P. Slide Nos. 8544, 8545; $\times 30$.
- Figs. 3 & 4. *Epiphyton* Bornemann. Fig. 3 showing radially arranged tubes and Fig. 4 showing dichotomous branching. Also variation in the thickness of tubular structure exhibited. B. S. I. P. Slide Nos. 8546, 8547; $\times 30$.
- Fig. 5. *Sajania* Vologdin. Flat-ribboned structure with branchings. B. S. I. P. Slide No. 8548; $\times 30$.

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