CONOPHYTON MISRAI, A NEW STROMATOLITE FORM FROM THE GANGOLIHAT DOLOMITES, KATHPURIA CHHINA AREA, ALMORA DISTRICT, U.P.

A NEW stromatolite form *Conophyton misrai* is recorded from the Gangolihat Dolomites, Kathpuria Chhina area, Almora district, U.P. There are several horizons showing development of this form on the mule track between Kathpuria Chhina and Dhuraphat.

The *Conophyton* has been defined as the stromatolite having conical laminations in which apices point upwards and the axial zone may or may not be present (Donaldson, 1976)[1]. Before the discovery of *Conophyton* from the hot springs of the Yellowstone Park, it was thought to be an extinct group after Precambrian times (Walter *et al.*, 1976)[5]. Now the study of morphogenesis of the *Conophyton* of Yellowstone Park is quite helpful in the better evaluation of this characteristic group in the Precambrian carbonate sequences.

The Gangolihat Dolomites of Middle Riphean age is considered as the youngest formation of the Calc Zone of Pithoragarh, which attains a thickness of about 500 to 700 metres in Almora-Pithoragarh districts, U.P. Valdiya (1969)[4] has, however, considered the entire Calc Zone of Pithoragarh as inverted. Kumar and Tewari (1977)[2] have discussed this aspect. In the present work, the Calc Zone is considered as normal. The stratigraphic succession is given in Table I (after Valdiya, 1969)[4].

TABLE I

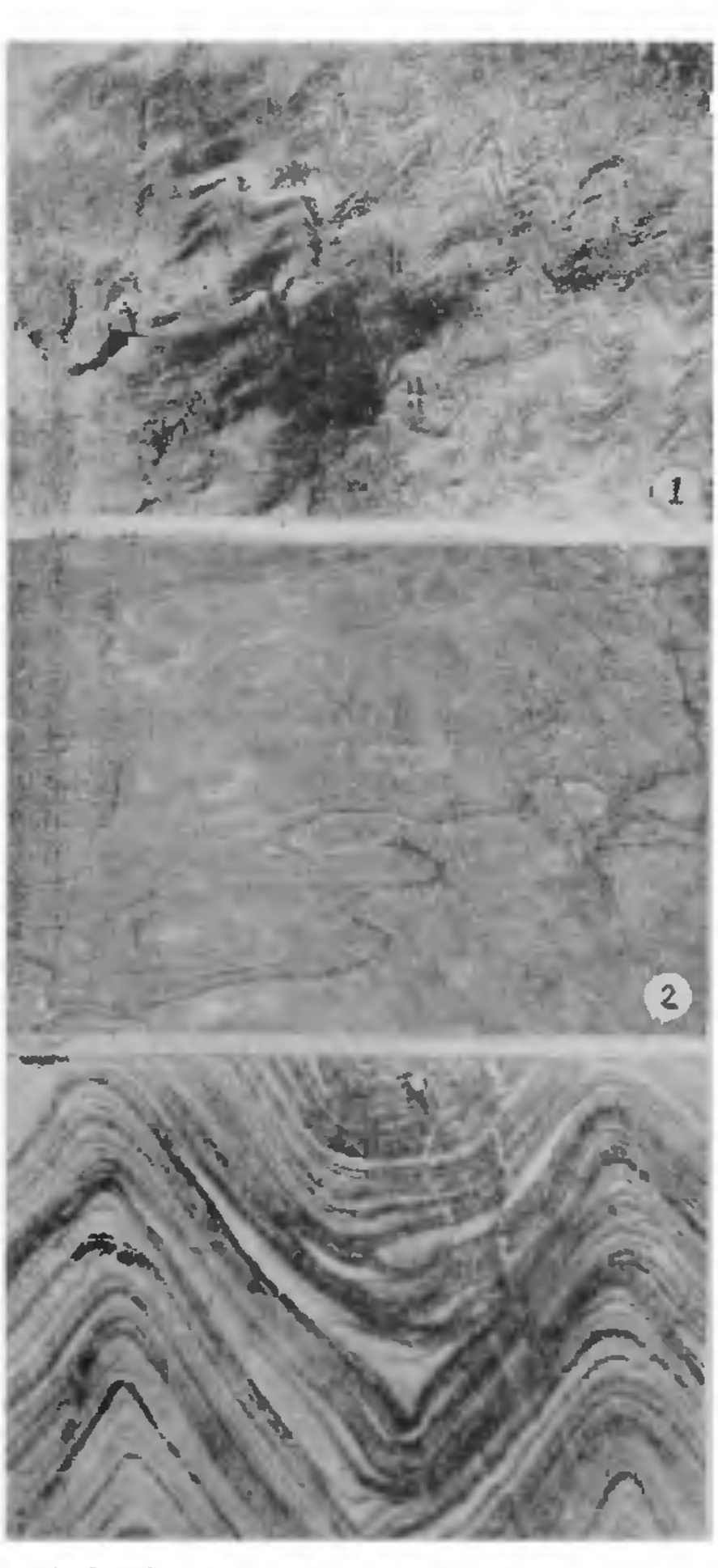
Berinag Quartzites	Orthoquartzites and amphibolites
Calc Zone of Pithoragarh	Gangolihat Dolomites Sor Slates Thalkedar Limestone Rautgara Quartzites
---------- North Almora Thrust --------	
Crystalline Zone of Almora	
-------- Schists and gneisses. --------	

Systematic Description

Supergroup	CONOPHYTONIDA	Raaben, 1969
Group	*Conophyton*	Maslov, 1937
Form	*Conophyton misrai*	new form.

(Figs. 1, 2 and 3)

The form is closely packed laterally linked conical layers arranged one over the other. The maximum height is 16 cm. In transverse section, it is circular to elliptical. The maximum diameter is 4 cm. The axial zone is right angle to the bedding plane. The axial angle varies from 70°–80°. In thin section, the dark laminae is continuous and the thickness is in the range of 0·0450 to 0·150 mm. The thickness of light coloured bands is in the range of 0·03 mm to 0·37 mm. The axial zone is not very well marked. The thickness of the dark bands remains constant but there is a general thickening in the light coloured bands in the axial zone. Invariably the laminae of one column is continuous in the adjoining column.



FIGS. 1–3. Fig. 1. Longitudinal Section of *Conophyton misrai*, Kathpuria Chhina area, Almora District, U.P. Fig. 2. Transverse Section of *Conophyton misrai*, same locality as above, × ½. Fig. 3. Microphotograph of axial zone of *Conophyton misrai*, × 2.

Remarks: The form resembles microstructurally with *Conophytons* described from the Dismal Lakes Group by Donaldson (1976)[1]. Since he has not described the microstructures of the *Conophytons* of Dismal Lakes, it is difficult to compare the present form with

them. The present form also resembles with *Conophyton circulus* described by Raaben (1969)[3] but the axial zone is not as well defined as in *Conophyton circulus*.

Entomology: The form is named in honour of Prof. R. C. Misra, Retired Professor of Geology, Lucknow University, Lucknow.

The other stromatolites recorded from the Gangolihat Dolomites of the Kathpuria Chhina area are *Colonella columnaris*, *Conophyton garganicus* and *Stratifera*.

The laterally linked *Conophyton* has been used for the interpretation of the environment of deposition. The lack of structures indicative of waves, strong currents and of subaerial exposures in association with Dismal Lakes *Conophytons* leads to the suggestion that these stromatolites formed in a subtidal zone (Donaldson, 1976)[1].

The most conspicuous bedding feature associated with *Conophyton misrai* is parallel lamination, indicating absence of strong currents and wave activity. This can be suggested that the *Conophyton misrai* must have formed in the environment in which currents were either absent or were very weak.

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EFFECT OF *AZOLLA* ON THE YIELD OF PADDY WITH AND WITHOUT APPLICATION OF N FERTILIZER

Introduction

Azolla pinnata is commonly found in India in ponds, ditches and channels containing stagnant water[1–4]. The nitrogen fixing blue-green alga *Anabaena azollae* is always found as symbiont in the cavities present at the ventral side of dorsal leaves and nitrogen fixed by the alga is available to the plant[1–5]. This unique property of the plant has drawn the attention of the agriculturists for its utilization in agriculture as organic nitrogen fertilizer for the rice crop[6–9].

The experiments conducted at the Central Rice Research Institute by the author have shown that fern could be multiplied throughout the year when fields are kept under water-logging and fertilized with superphosphate regularly[1–4]. The present study deals with the effect of *Azolla* on the yield of paddy with and without the application of ammonium sulphate.

Experimental

The experiments were conducted at C.R.R.I. farm in replicated plots in Kharif and Rabi to observe the effect of *Azolla pinnata* on the yield of high yielding varieties IR-8, Supriya, CR-1005 and Kalinga-2. The *Azolla* was cultivated separately and applied in the plots before planting of seedlings. (The cost of phosphate fertilizer, pesticide and labour to obtain 10–12 tons of *Azolla* is about Rs. 40.) The freshly harvested *Azolla* contained about 95% water and 4–5% N on dry wt. basis. Incorporation of *Azolla* was done manually by burying in the soil after draining the fields and ammonium sulphate 30 and 50 kg N/ha was applied. Basal doses of 20, 40, 60 and 80 kg N/ha were also tried. The seedlings were transplanted with the spacing of 20 × 15 and 15 × 10 cm in Kharif and Rabi respectively.

Results and Discussion

The increase in grain yield of varieties Supriya and IR-8 was 47% and 25% respectively over control with the application of 10 tons/ha of fresh *Azolla*. Similarly, 47% and 29% respectively were the increase in straw yields of these two varieties. The significant difference in the number and weight of panicle/m², etc., are given in Table I.

TABLE I

Effect of Azolla *on the yield of varieties IR-8 and Supriya during* Rabi 1977

Treatments	No. of panicles/m²		Wt. of panicles in gm/m²		Grain yield in kg/ha		Straw yield in kg/ha	
	IR-8	Supriya	IR-8	Supriya	IR-8	Supriya	IR-8	Supriya
Control	339	434	745	548	4722	3489	3607	2571
Azolla (10 tonnes fresh wt/ha)	430	545	880	825	5918	5125	4643	3786
% increase	27	26	18	51	25	47	29	47