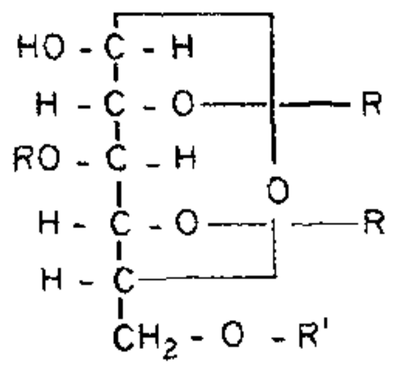
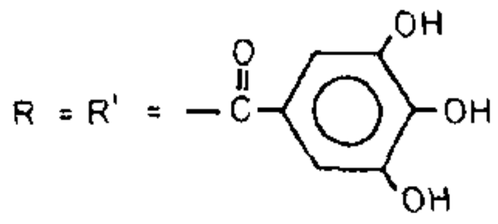
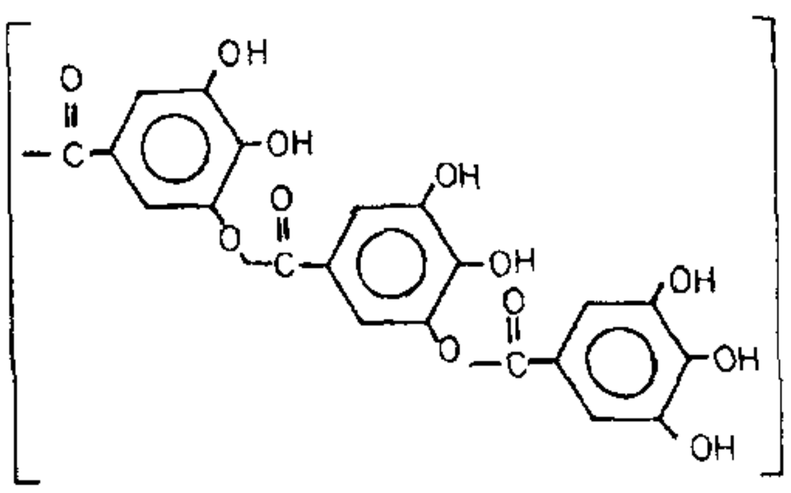


Tannin I R = R' = 

Tannin II - R' = 

The presence of four ester linkages in the molecule of tannin would mean that one hydroxyl of glucose moiety is free. Positive test with AHP reagent indicated the presence of free aldehyde group. Therefore, the ester linkages must be present at 2,3,4 and 6-positions provided glucose moiety has pyranose ring structure.

The position of the two depside linkages was decided by methanolysis of the tannin which gave traces of gallic acid, methyl-*m*-digallate and another tannin, which compared on paper chromatography and TLC with one obtained from the ethanolic extract of the roots (tannin I). This tannin on hydrolysis gave gallic acid and glucose. Gallic acid estimation (86.28%) and glucose (22.29%) suggested that there might be four gallic acid units per mole of glucose. This suggested that the remaining two gallic acid units must be linked with depside links.

From the above discussion it could be concluded that in tannin II four galloyl units are linked through ester linkages at 2,3,4, and 6 positions of glucose molecule and at any one of these positions a trigalloyl chain is present having two gallic acid units linked through depside linkages. Although the exact position of the trigalloyl chain could not be decided, the stereochemistry of the molecules as well as biogenesis of this class of compounds favour position-6. In all the naturally occurring gallatannins so far reported, the longest chain of gallic acid residues is always attached at position-6.

The low optical rotation $[\alpha]_D^{20} + 9.8$ (in Me_2CO) of the gallotannin II, suggested that probably glucose was present here in β-form.

From the above discussion, it could be concluded that tannin II is the genuine tannin and tannin I is its artefact obtained by alcoholysis of the depside linkages during extraction with ethanol.

7 March 1984

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OCCURRENCE OF BAGH BED (UPPER CRETACEOUS) IN HARDASPUR-UMRI AREA, JHABUA DISTRICT, MADHYA PRADESH.

R. CHAUBEY*
School of Studies in Geology, Vikram University, Ujjain 456 010
**Present address: c/o A. S. Bisen, Near Saibaba Mandir (Vivekanand Nagar), Wardha Road, Nagpur 440 015, India.*

THE present note records the occurrence of richly fossiliferous strata of sandstone and limestone belonging to Bagh Beds in the area near the village of Hardaspur (74° 38′: 22° 25′) Umri (74° 37′: 22° 23′), in Jobat (74° 34′: 22° 25′), Jhabua district, M.P. These have earlier been reported as Lameta[1] (figure 1).

Near the villages of Hardaspur and Umri, ridges of limestones underlying the sandstone are exposed. The sandstone is nearly horizontal and unconformably rests over the Archean basement (granite gneiss). It is hard and friable at places, showing various shades of yellowish brown, reddish brown, and grey colours. This sandstone unit is identical with the Nimar

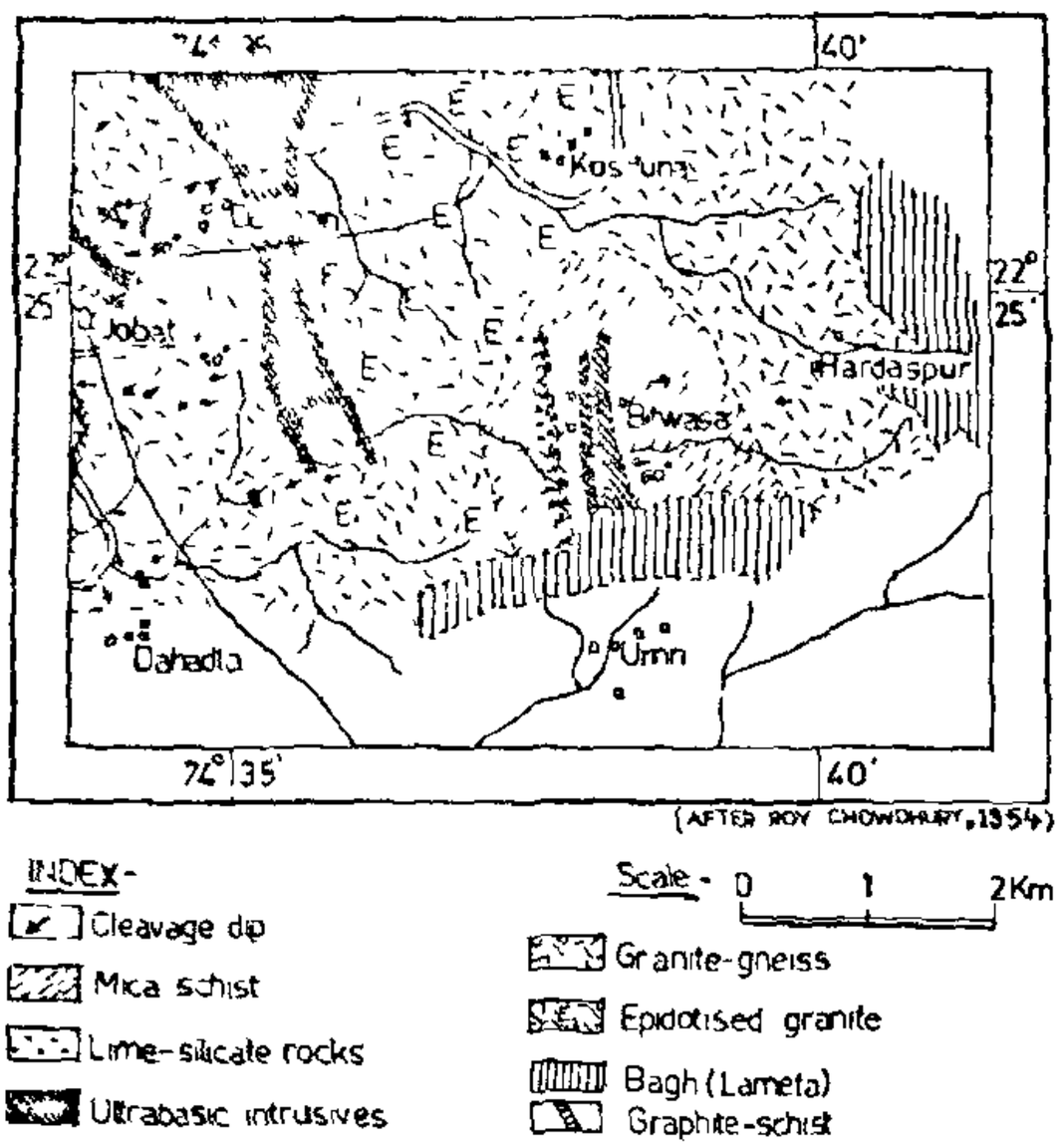

Figure 1. Geological map of the Hardaspur-Umri Area, Jobat, Jhabua district, M.P.

sandstone of Bagh beds described from several areas. This is overlain by yellowish brown fossiliferous limestone containing nodules and is equivalent to nodular limestone of Bagh Beds. This is followed by a compact, massive and fine-grained creamy white limestone, which is characterized by abundance of silicious matter. This resembles the typical coralline limestone found in Bagh beds.

Thus the three lithostratigraphic units described above appear to be equivalent to the three units of Bagh bed, namely Nimar sandstone, nodular limestone, and coralline limestone. The above classification is further substantiated by the occurrence of typical Bagh genera such as *Inoceramus (Indoceramus) concentricus, park; Inoceramus (Cataceramus) goldfussinus d'Orbigny*, *Astarte Sp.*, *Cardium Sp.*, *Nucula Sp.*, *Turritella Sp.*, *Modiolus Sp.*, and *Ostrea Sp.* Thus on the basis of lithological characteristics and mega-fossils assemblage, the exposure of sandstone and limestones in Hardaspur-Umri area of Jobat is inferred to correspond to Bagh beds and not Lameta as recorded earlier[1].

The detailed study of fossil assemblage is in progress.

The work has been carried out under the supervision of Dr A. C. Chatterjee. The author is grateful to Dr K. K. Singh, for facilities. Thanks are also due to Drs P. Dev and A. K. Joshi for helpful discussion.

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CYANOSTYLON SINENSIS CHU. FROM SRINAGAR

S. K. GOYAL

Division of Microbiology, Indian Agricultural Research Institute, New Delhi 110 012, India.

CYANOSTYLON Geitler, a rare blue green alga belonging to family Entophysalidaceae, was first described by Geitler[1]. He reported the type *C. microcystoides* from central Europe. Other species described under the genus include *C. cylindrocellulare*[2], *C. ovoideum*[3], *C. sinensis*[4] and *C. banyolensis*[5]. Bourrelly[6] transferred *Hormothece rupestris* Jao[7] and *Stylocapsa sinica* Ley[8] to the genus *Cyanostylon* as *C. rupestris* (Jao) Bourrelly and *C. sinica* (Ley) Bourrelly. The present communication deals with an alga which closely resembles *C. sinensis* Chu. This genus has not been reported from India so far, hence the present record is an addition to our blue green algal flora.

The alga formed hyaline, mucilaginous crust on a wall under dripping water. Thallus was made up of mucilaginous, cylindrical or pyriform stalks (figures 1, 2) with clear lamellations throughout (figure 3). The diameter of the stalks ranged from 17.5 to 20 μm and length from 24.5 to 35 μm. The stalks generally had solitary, rarely 2 to 4 (figures 2, 3), light blue-green homogenous spherical cells at their tips. Cells were surrounded by individual as well as common sheath. Cell diameter was 3.5 to 7 μm without sheath and 11.4 to 23.5 μm with sheath.

Habitat: Formed crustaceous growth on a wall under dripping water at Nishat Garden, Srinagar, in October 1981, 1650 m above m.s.l.

Thanks are due to Prof. P. Bourelly of Laboratorie de Cryptogamie, Paris and Prof. T. V. Desikachary of Department of Botany, University of Madras for guidance.