

Microfossils and the age of the Subathu Formation of Dogadda, Garhwal Himalayas

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Introduction

Recently, the geology around Dogadda ($78^{\circ}36'40''\text{E}$: $29^{\circ}48'20''\text{N}$) has received the attention of several geologists, prominent amongst these being Maithani (1972), Ganesan (1972), Shanker, Dhaundial and Kapoor (1973), Shanker and Ganesan (1973) and Kalia (1974). The chief attraction being the new finds of Upper Carboniferous Brachiopods and Bryozoans near Jogira ($78^{\circ}39'04''\text{N}$: $29^{\circ}47'56''$) and the reported occurrence of various groups of fossils from the Tal Formation (Middlemiss, 1865) and their bearing on the age of this key horizon in the Himalayas.

The Subathu Formation from Dogadda has received scant attention and so far no fossils have been recorded from this horizon to enable us to infer the age of these rocks. The note records profuse occurrence *Nummulites* cf. *maumilla* (Fichtel and Moll.), *Operculina patalensis* Davies, a few fragments of *N. atacicus* Leymerie, *Assilina granulosa chhumbiensis* Gill, *Globorotalia*, shells of Molluscs and some oblique sections of *Cocconeis*, from the Subathu Formation which according to Hanna (1929) is a brackish water Tertiary Diatom.

Stratigraphy

Formation	Lithology	Age
Amri	Schistose phyllites with granite	Lower Palaeozoic to Precambrian?
Amri Thrust		
Lower Bijni	Quartzites, boulder slate, gritty quartzites and sandy limestones	Permian to Upper Carboniferous
Garhwal Thrust		
Subathu	Intercalated bands of grey, green and purple shales, grey sandstones, and lenses of grey limestones and brownish shell marls	Lower Eocene to Upper Paleocene
Tal	Interbedded greenish, reddish, shales and compact sandy limestones becoming oolitic and shelly near top	Lower Paleocene to Cretaceous
Krol	Dolomitic grey limestones and grey, green and red shales	Cretaceous? Jurassic to Upper Paleozoic
Krol Thrust		
Siwalik Group	Compact micaceous sandstones and interbedded greenish and reddish shales	Pliocene to Middle miocene

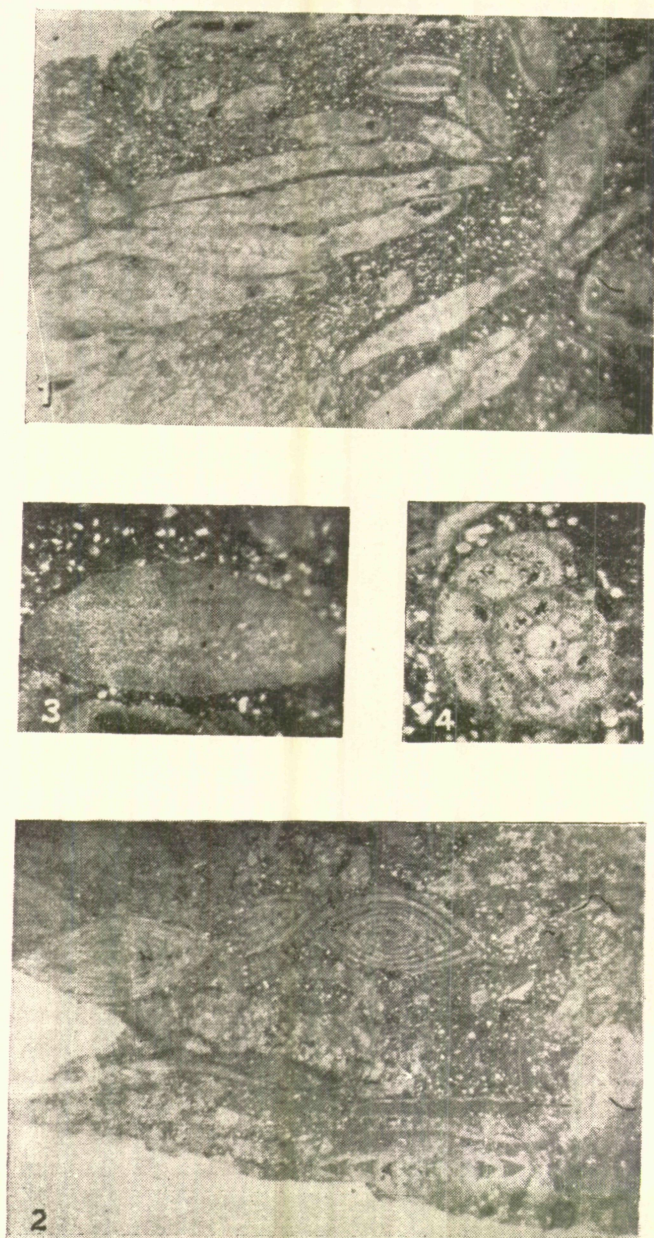


Figure 1. Microfossils from the Subathu of Dogadda.

1. *Operculina patalensis* Davies, axial and oblique sections $\times 8$.
2. *Nummulites* cf. *mammilla* (Fichtel and Moll) and *Assilina granulosa chhumbiensis* Gill, axial sections $\times 8$.
3. *Cocconeis* sp. $\times 19$.
4. *Nummulites* cf. *mammilla* (Fichtel and Moll), fragment of equatorial section $\times 32$.

Similar association of *O. patalensis* and *N. mammilla* in abundance is known only from the Khairabad Limestone and Patala Shales of the Ranikot Formation (Paleocene) of Salt Range, Pakistan (Davies and Pinfold, 1937). The Subathu Formation of Dogadda is therefore restricted to Upper Paleocene to Lower Eocene (=Laki). The underlying glauconitic, gritty-oolitic Tal limestones enclosing a varied assemblage of *Archaeolithothamnion*, *Neomeris (Decaisnella)*, *Girvanella*, *Globigerina Globorotalia*, *Textularia*, Miliolids, Cyclostomatous Bryozoa resembling *Leiosoechia*, *Laterocavea*, *Grammanotosoechia* (Tewari and Kumar, 1967) is logically to be restricted to Lower Paleocene-Cretaceous. The bed has often been confused and mixed up (Valdiya, 1975) with the tectonically overlying Upper Palaeozoic grey limestones of the Lower Bijni unit, which can also be distinguished by the absence of the above mentioned assemblage of the Tal Formation.

References

- DAVIES, L. M. and PINFOLD, E. S., (1937) The Eocene beds of the Punjab Salt Range. *Palaeont. Indica*, n.s., v. 24, no. 1, pp. 1-79, pls. 1-7.
- GANESAN, T. M., (1972) Fenestellid Bryozoa from the Boulder Slate sequence of Garhwal. *Him. Geol.* v. 2, pp. 431-451.
- HANNA, G. D., (1929) Brackish-water Pliocene Diatoms from the Etchegoin Formation of Central California. *Jour. Pal.*, v. 3, no. 2, pp. 87-101.
- KALIA, PRABHA, (1974) Upper Permian Fusulinids from Garhwal Himalaya. *Proc. Ind. Coll. Micropal. Strat.* 1972, Lucknow Univ., pp. 107-110.
- MAITHANI, J. B. P., (1972) A study of the Molluscan fauna from the Tal Formation (Garhwal) and its significance in correlation. *Him. Geol.*, v. 2, pp. 239-251.
- MIDDLEMISS, C. S., (1885) A fossiliferous series in the Lower Himalaya, Garhwal. *Rec. Geol. Surv. India*, v. 18, pt. 2, pp. 73-77.
- (1887) Physical Geology of West British Garhwal; with a note on a route traverse through Jaunsar, Bawar and Tiri Garhwal. *Rec. Geol. Surv. India*, v. 20, pt. 1, pp. 26-40.
- SHANKER, R., DHOUNDIAL, J. N. and KAPOOR, H. M., (1973) The age of fossiliferous bed (Boulder Slate Member), Garhwal Syncline, *Jour. Pal. Soc. India*, v. 17, pp. 50-54.
- SHANKER, R. and GANESAN, T. M., (1973) A note on the Garhwal Nappe. *Him. Geol.*, v. 3, pp. 72-82.
- TEWARI, B. S. and KUMAR, R., (1967) Foraminifera from Nummulitic beds of Nilkanth and organic remains from Tal Limestones, Garhwal Himalayas. *Pub. Cent. Adv. Study. Geol. Panjab Univ. Chandigarh*, no. 3, pp. 33-42.
- VALDIYA, K. S., (1975) Lithology and age of the Tal Formation in Garhwal, and implication on stratigraphic scheme of Krol Belt in Kumaon Himalaya. *Jour. Geol. Soc. Ind.*, v. 16, no. 2, pp. 119-134.