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## Title: Sedimentological and biostratigraphic study to decipher the paleo-environment of Bokabil Formation in Dhansiri valley, Assam.

### Extended Abstract

Dhansiri valley is a part of Assam & Assam Arakan Basin in the south-western part of the Brahmaputra valley, covering approximately an area of 16000sq. kms. The Dhansiri valley represents a classical asymmetric/foreland basin flanked by NE-SW trending mobile Naga Schuppen belt on the east and southeast and Mikir massif in the southwest. It exhibits a sedimentary fill ranging in age from Cretaceous to Recent with varying rate of sedimentation, overlying the Precambrian granitic Basement.

Bokabil Formation constitutes upper division of Surma Group. In Dhansiri valley, it overlies Barail/Pre-Barail sediments unconformably and shows gradational upper contact with overlying Tipam Group. Hansada et.al.,1999, divided Bokabil Formation into three lithounits - The upper arenaceous unit deposited in transitional to marginal marine condition in a proximal delta front and lower delta plain condition. The middle argillaceous unit representing a major transgression over the area followed by regression towards the upper part of the middle unit. The lower arenaceous unit deposited over Pre-Bokabil uneven topography as a barrier bar & associated facies deposited in a transitional to shallow inner shelf conditions in a coastal interdeltaic depositional set up. The discovery of oil in the "Khoraghat" structure is one of the major "oil find" in this region which opened up a big avenue for oil exploration in Bokabil Formation.

This study deals with the megascopy, petrography, foraminiferal and palynofloral biostratigraphy of Bokabil Formation in order to demarcate the North-South extension of Bokabil Formation in Dhansiri valley and distribution of the three Bokabil members- Upper, Middle and Lower in each studied well on the basis of lithological variation and changes in distribution of flora and fauna. The study also includes analysis of paleoenvironment and age during deposition of Bokabil Formation. To fulfill the objectives, cutting samples from nine (09) wells- A, B, C, D, E, F, G, H and I (Fig 1) were selected covering southern to northern extension Dhansiri valley.

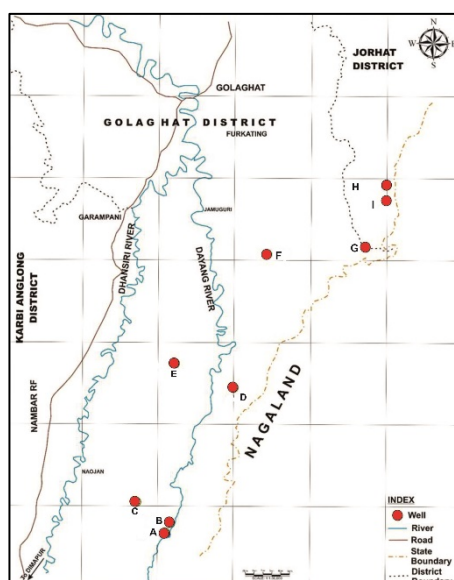


Fig1: Location of the studied wells.

Megascopic description of the cuttings revealed that the Upper Bokabil Member is arenaceous and consists dominantly of sandstone with subordinate siltstone and claystone. Petrographically, the sandstone unit ranges from sublith arenite to quartz arenite. Cement is mostly calcareous with minor

amount of chloritic and ferruginous cement. The porosity is completely destroyed by calcite cementation. The Middle Bokabil Member is dominantly claystone and siltstone with subordinate sandstone. Petrographically, the sandstone unit ranges from sublith arenite to quartz wacke. Cement is mostly calcareous with minor ferruginous cement. Grains have floating contact and porosity is completely destroyed by the cement. The Lower Bokabil Member is dominantly sandstone with subordinate claystone and shale. Petrographically, the sandstone unit ranges from sublith arenite, quartz arenite and lithic wacke. Cement is mostly calcareous with minor amount of chloritic cement. The porosity ranges from poor to moderate.

Based on the variations in lithology, microfaunal and microfloral assemblages, the Bokabil Formation could be traced in all the nine (09) studied wells. However, the three Bokabil members- Upper, Middle and Lower are not equally developed in all the wells. In wells F and H, the Bokabil Formation remains undifferentiated into Lower, Middle and Upper members. While the Upper and Middle Bokabil members are clearly demarcated in wells A, B, C, D, E, G and I respectively, Lower Bokabil is present only in wells A, B and C.

Based on palynological complex and species diversities of foraminifera, Bokabil Formation exhibits irregular and fluctuating environment of deposition from SW-NE. The floral complex in Upper Bokabil is dominant mangrove and coastal palm with very few marine elements, suggesting coastal environment of deposition. The Middle Bokabil Member in well B with increase in planktic foraminifera population is suggested to be deposited in inner shelf environment while in well A and C it is deposited in a shallow marine to marginal marine environment. In wells D, E, G and I, similar type of species distribution of palytaxa as in well A and C with sporadic presence of foraminifera was observed, suggesting marginal marine environment of deposition. Lower Bokabil Member was recorded only in wells A, B and C. Microfossil distribution is dominated by coastal palm, mangrove and very rare foraminifera, indicating coastal environment of deposition.

Top of Middle Miocene was demarcated at 2180m in well A and at 2605m in well D on the basis of presence of palytaxa *Cribroperidinium tenuitabulatum* which marks LAD at 13Ma and *Apteodinium australiense* which marks LAD at 12Ma respectively. There is a general absence of index foraminifera and palynofossils in the remaining wells yielding only common Early to Middle Miocene fauna and flora.