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Eocene foraminiferal biostratigraphy and paleoenvironment of Nagaland, Northeastern India

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Nagaland state in the northeastern India is a part of Assam-Arakan Basin. Geodynamically the basin evolved through the convergence of Indian, Eurasian and Burmese plates. The Naga Schuppen Belt and Kohima-Patkai folded zones are the major geotectonic units of Nagaland. The Naga Schuppen Belt is an imbricate thrust zone, in which Oligocene and younger sediments are mostly exposed, whereas the Kohima-Patkai Range comprises the anticlinal and synclinal reversals involving a huge exposed pile of sedimentary deposits of the Eocene Disang Group along with the Oligocene Barail deposits. Further, the eastern part of the Nagaland state comprises an epi-metamorphosed complex of ophiolite-suite.

The Eocene Disang deposits are fossiliferous and considered to be the basinal equivalents of the Jaintia Group of the Assam Shelf. In the present paper the foraminiferal biostratigraphy of the Disang and Barail Groups exposed in western and south-central parts is discussed along with its paleoenvironmental significance.

In the western part, two assemblage zones, namely the *Cribrohantkenina inflata-Hantkenina alabamensis* Zone and *Nummulites pengaronensis-Pellatispira madaraszi-Discocyclina dispansa* Zone, have been recognized, which are of middle to latest Eocene age (Zone P-16 and early part of Zone P-17 of Blow, 1969). In the south-central part, three biozones have been recognized, namely the *Globigerinatheka semiinvoluta* Zone (Zone P-15), *Cribrohantkenina inflata* Zone (Zone P-16) and *Turborotalia cerroazulensis* Zone (Zone P-17) of Berggren *et al.* (1995) of Priabonian (late Eocene) age.

The foraminiferal assemblages as recorded from the Disang and Barail Groups in the western area indicate deposition in shallow marine environment with oscillations in bathymetry. Inner shelf facies is inferred at Tehai Reu and Lotsu Village sections in the western part-based on reported occurrence of *Pellatispira*, *Nummulites* and *Discocyclina*. Middle to outer shelf setting is inferred by an association of larger benthic and planktonic foraminifera and some uvigerinids (*U. cf. jacksonensis*) from the Heina Reu section.

In the south-central part the foraminiferal assemblage represents a deeper marine setting (lower part of upper bathyal) by the finding of *Uvigerina* facies consisting of *U. cocoaensis*, *U. continuosa*, *U. eocaena*, *U. glabrans*, *U. jacksonensis*, *U. longa*, *U. moravia*, *U. steyeri* and *U. vicksburgensis* from the localities of Pftusero I, II, Chobama and Leshemi. If the foraminifera reported from the western part are not transported by turbidity current, we may infer a shelf-slope setting from the western to south-central part of Nagaland.

Further towards eastern part, the basin seems to be shallower as supported by the findings of scarce miliolids, bivalves, gastropods in the absence of uvigerinids and planktonic foraminifera.

The morphological features of some cosmopolitan 'species' of uvigerinids and their dominance and the presence of chiloguembelinids in south-central Nagaland suggest an anoxic environment. The foraminiferal criteria employed to infer anoxic conditions are based on localized occurrence of thick uvigerinids, presence of pteropods and pyritized tests. The Disang Sea may be termed as a confined turbidite basin, sharing features common to many structurally complex continental slopes, that, in part was connected at times to the main Tethyan Sea.