Late Carboniferous agglutinated foraminifera and thecamoebians from Nova Scotian coal-bearing strata: paleogeographic, paleoenvironmental and paleoecological implications

W.G. Wightman[1], D.B. Scott[1], F.S. Medioli[1], M.R. Gibling[1], A.W. Archer[2] and E.P. Kvale[3]
[1]*Centre for Marine Geology, Dalhousie University, Halifax, Nova Scotia, Canada*
[2]*Kansas Geological Survey, Lawrence, Kansas, U.S.A.*
[3]*Indiana Geological Survey, Bloomington, Indiana, U.S.A.*

Agglutinated foraminifera and arcellaceans ("thecamoebians") are documented from Late Westphalian–Stephanian cyclothems in the Sydney Basin of Nova Scotia. Assemblages from the eastern part of the basin are dominated by *Ammobaculites* and *Ammotium*, indicating low marsh/estuarine paleoenvironments. Mixed assemblages dominated by *Trochammina*, *Ammotium* and *Ammobaculites* occur in both the east and western parts of the basin and indicate vegetated substrates, equivalent to modern low marsh environments, flanked the estuarine system. *Trochammina* assemblages found underlying coal seams in the western part of the basin indicate substrates analogous to modern high marsh facies. Alternation of the *Trochammina* assemblages with encysted thecamoebians indicates short lived freshwater paleoenvironments.

Paleoecological interpretations based on comparisons with faunal associations occurring in modern coastal wetlands are supported by sedimentological features. Samples from a shale immediately below a sandstone containing trace fossils and reworked ripples in the Cumberland Basin (Joggins section) contain a foraminiferal assemblage indicative of estuarine conditions. This find represents the first evidence of marine influence during deposition of the Cumberland Basin. Laminated mudstones and sandstones, identified as tidal deposits from the Brazil Formation (Lower Carboniferous) of Indiana, also contain mixed foraminiferal assemblages indicative of estuarine depositional environments.