ABSTRACT

Paleontological analysis revealed fifty J. bellifalcata fossils occur within a 15 cm horizon. Sizes vary between 4-5 cm in diameter and compared mostly to the borehole, glauconitic sand. These concretions are unique as the nearby footwall strata just above the seafloor bounding the Navesink Fm and the Wenonah Fm. A faunal and sedimentological analysis was conducted. Fifty-five different species were identified, including: Ammonia ficata, Nostoc sp. aggregata, Ophelia panda and zone arctica, commonly associated with the Mount Laurel Fm. The concretions are interpreted as remnants of the Mount Laurel Fm within a lag deposit at the base of the Navesink Formation. Biostratigraphy suggests this is likely related to a late Campanian to early Maastrichtian transgressive event.

INTRODUCTION

The New Jersey Coastal Plain can be characterized by its Upper Cretaceous stratigraphic sequence of the Wenonah, Mount Laurel and Wenonah Formations exposed in Big Brook, northeastern Monmouth County, NJ. This passive margin was evidence of six to eight cycles between 73.3-81.3 Myr (Head, 2006). The stratigraphic sequence extends from New Jersey through Delaware. It is likely stratigraphically equivalent along the Monmouth County and below the Wenonah Fm. Sedimentologically, the Mount Laurel Fm, has been described as a glauconitic (20%), slightly flat, the sand commonly characterized by a well-rounded quartz fabric (Kuehne, 1990) described as a class, moderately sorted quartz sand with an average grain size of 0.14 mm. Interpretations of depositional environment include a subaqueous mouth bar deposit (Owen, 1990), a delta front with comparison to present day Niger delta (oblate) and a barrier island with sediment input from as ongoing Hudson Riverplains and New Jersey Coastal Plain.

The purpose of this study is to investigate the preservation and processes related to sand pods occurring at the base of the Navesink Fm in Monmouth County, NJ, to clarify the Upper Cretaceous stratigraphic sequence.

METHODS

Three successions examined
- Measured using Jacobs staff noting changes in the lithology and fauna
- Bulk samples of pods and sediments were extracted for analysis
- Sediment was disaggregated using kerosene/hydrophobic solution
- Sediment size distribution was determined using a Tyler Ro TESTING Sample model 81-4T with views every half pH
- Pods were broken apart by hand for paleontological analysis
- Mineral points were made to determine mineral composition

CONCLUSIONS

- Paleontological analysis revealed fifty-five species, including: Ophelia pods and Linum succulens, which are restricted to the Mount Laurel Fm (Fig. 7). Ammonia ficata and Anchiss carinata were abundant in the sand pods and are also commonly abundant in the Mount Laurel Fm.
- Sedimentological analysis of the sand pods (Figs. 2 & 3) show a similarity of grain size distribution and mineral composition to the Mount Laurel Fm.
- Relating orientation and morphology of the sand pods suggests weathering.
- We interpret these sand pods to be remnants of the Mount Laurel Fm as a result of erosion and sedimentation during the onset of a transgressive system tract.
- This suggests the unconsolidated boundary line at the base of the Wenonah Fm and in the upper part of the Mount Laurel Fm. The Mount Laurel Fm is not preserved in the Big Brook area except for the sand pods.

REFERENCES


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