

A SUMMARY OF THE BIOSTRATIGRAPHY OF THE NEWARK SUPERGROUP OF EASTERN  
NORTH AMERICA  
WITH COMMENTS ON EARLY MESOZOIC PROVINCIALITY

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ABSTRACT

The Newark Supergroup of Eastern North America consists of rocks judged to range in age from early Middle Triassic through late Early Jurassic. Dating is principally based on the recognition of seven palynological zones correlated with the European standard stages and on correlation of vertebrates and megafossil plants. The basic floristic trends are a decrease in diversity into the Early Jurassic and the rise to strong dominance of the cheirolepidaceous conifers. Based on published radiometric scales, the Newark depositional episode lasted roughly 45 million years and was antecedent to the actual separation of the North American and African Plates. Correlation of other Early Mesozoic continental areas with the Newark allows the conclusions that there was a shift from Late Triassic floral and faunal provinciality to Early Jurassic homogeneity, and that this shift was synchronous with a widening of the equatorial arid zone.

RESUMEN

El Supergrupo Newark, del Oriente de América del Norte, consiste en rocas que a juicio de los autores tienen un margen de edad entre el Triásico Medio temprano y el Jurásico Temprano tardío. La asignación de edad se basa principalmente en el reconocimiento de siete zonas palinológicas que se correlacionan con los pisos estandar europeos y en la correlación mediante vertebrados y megafósiles vegetales. Las tendencias florísticas básicas son un decremento de la diversidad hacia el Jurásico Temprano y el surgimiento a una dominancia fuerte de las coníferas del tipo Cheirolepidiaceae. De acuerdo con escalas radiométricas publicadas, el episodio de depósito Newark duró unos 45 millones de años y precedió la separación de las placas de América del Norte y de África. La correlación de otras áreas continentales del Mesozoico temprano con el Newark permite las conclusiones de que en este lapso sucedió un cambio que a partir de la provincialidad de flora y fauna del Triásico Tardío llevó a la homogeneidad del Jurásico Temprano, y que este cambio fue contemporáneo con el ensanchamiento de la zona árida ecuatorial.

INTRODUCTION AND GEOLOGICAL CONTEXT

The Newark Supergroup (Figure 1) consists of a series of Early Mesozoic deposits of principally red non-marine clastics and minor tholeiitic igneous rocks exposed in a long series of discrete basins from Nova Scotia, Canada to South Carolina, U.S.A. (OLSEN, 1978; VAN HOUTEN, 1977; FROELICH and OLSEN, 1984). The long axes of these basins

parallel the fabric of the Appalachian Orogen and in most cases the basin sequences are preserved as internally faulted and tilted halfgrabens. A long series of closely related basins occur beneath the Atlantic Coastal Plain and on the Continental Shelf (OLSEN, 1978).

Most Newark Supergroup rocks were apparently deposited in asymmetrically subsid-

ing troughs formed along major Paleozoic thrust faults, which were reactivated in the Early Mesozoic as listric normal or normal-oblique faults (LINDHOLM, 1978; PETERSON, et al., 1984). There were at least several kilometers of dip-slip movement during the history of the basins. Whether these basins formed in a simple extensional system acting perpendicular to the axis of the basins or in a wrench system acting oblique to the fabric of the orogene is a matter of ongoing

debate (MANSPEIZER and OLSEN, 1981; MANSPEIZER, 1982); however, it is certain that these basins formed just before the onset of actual separation of the North American and African plates and the oldest formation of Atlantic oceanic crust in the Middle Jurassic (SUTTER and SMITH, 1979).

As much as 10 km of principally fluvial and lacustrine sediments filled these basins. Most sequences show a bulls-eye facies pat-

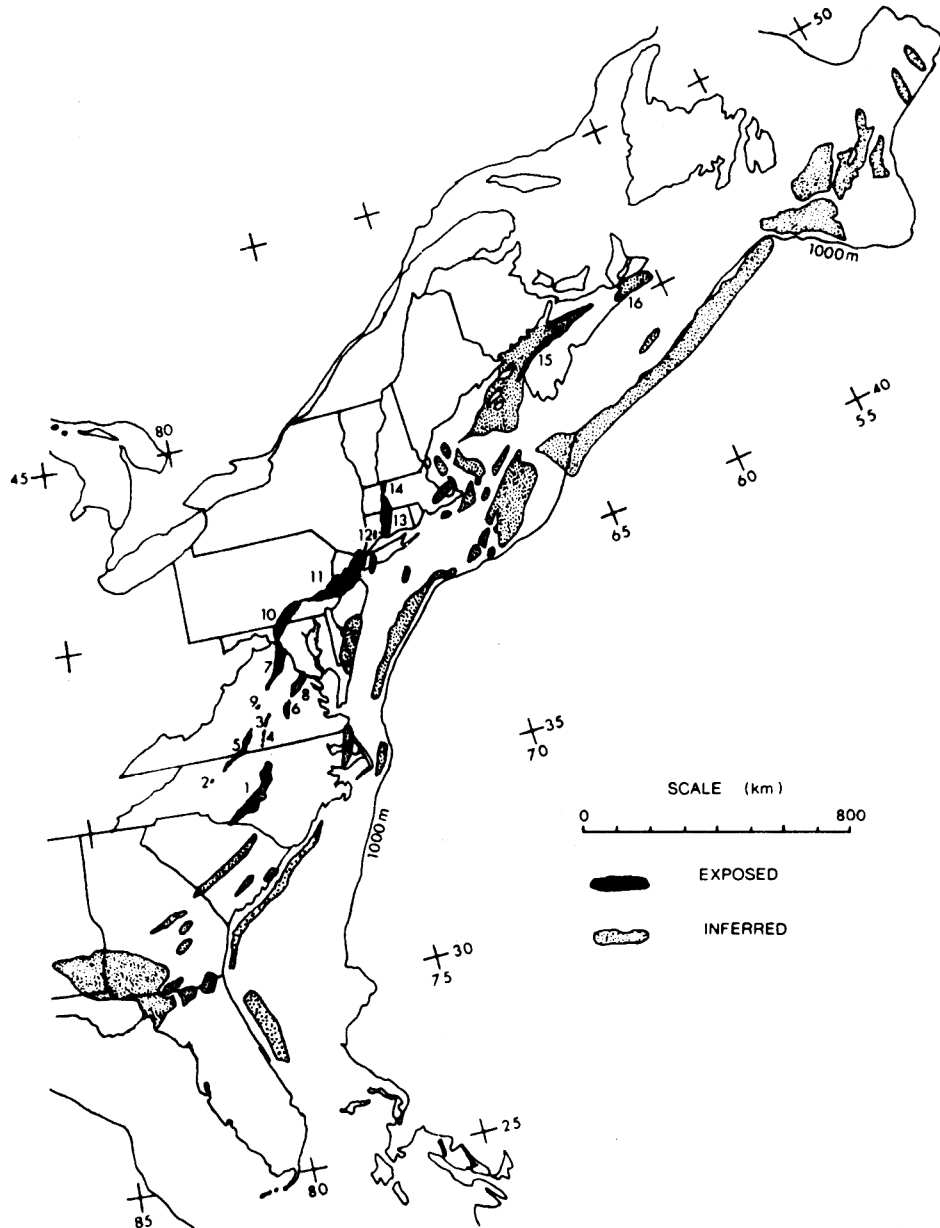


Figure 1: The Newark Supergroup of Eastern North America. Modified from OLSEN (1978). The inferred areas probably overlap the Newark in age but some may not be lithologically similar to the Newark. Key to Figure in Table 1.

