

HEXAPTEROSPERMUM DELEVORYII FROM THE MIDDLE PENNSYLVANIAN OF SOUTHERN ILLINOIS

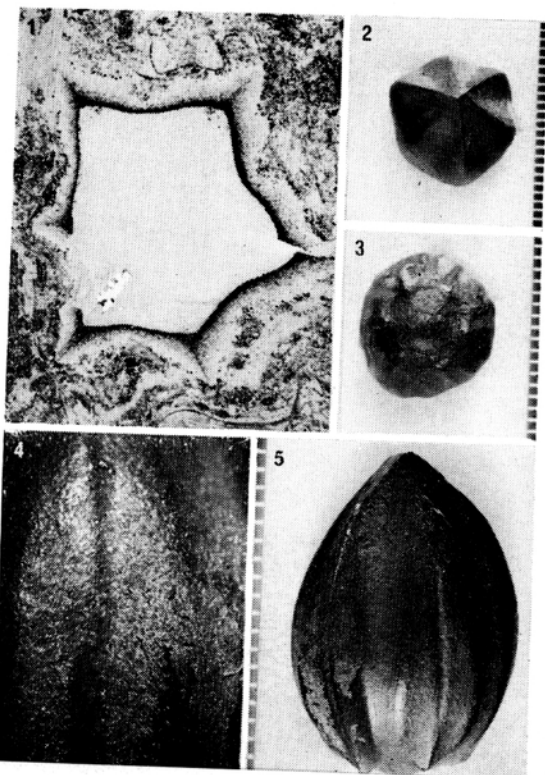
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ABSTRACT.—Several specimens of *Hexapterospermum delevoryii* Taylor, collected near Carrier Mills, Illinois, are described. "Seeds" freed from the rock matrix represent casts of the inner part of the integument and are illustrated.

The seed genus *Hexapterospermum* was described over 90 years ago from a locality of Carboniferous age near Saint-Étienne, France (Brongniart, 1874). The seeds are characterized as being hexagonal in cross section with six commissured wings (one at each angle) elongated into keels at their base (chalaza). Although all of Brongniart's specimens were incomplete, he was able to differentiate two species (*H. stenopterum* and *H. pachypterum*) on the basis of differences in the tissue organization of the integument.

Recently Taylor (1966) described a new species, *H. delevoryii*, from the Middle Pennsylvanian coal ball horizon above the Herrin no. 6 coal, Carbondale formation, Kewanee group at the Sahara Coal Company Mine near Carrier Mills, Illinois. In addition to illustrating the first nearly complete specimens of this genus, Taylor described the nucellus and its apical differentiation into a pollen receiving device. He was able to show, also, that the integument and nucellus were vascularized and free from each other except at their base. Although these latter features are characteristic of

portion of the integument, however, remained entombed within the rock. Cross sections through two seeds still embedded within the matrix showed anatomy identical to that described by Taylor for *H. delevoryii* (FIG. 1). The integument exhibits the three-layered pat-



ern with an outer layer including a marginal row of secretory canals, a well developed middle layer, and an inner layer composed of thin-walled cells. The commissure is visible in each angle of the seed as a plate of cells. The nucellus and the vascularization were not seen.

Sections of the freed "seeds" indicated that only the innermost portion of the integument separated from the rock matrix. Though the outermost part of the freed "seed" is petrification, the remainder represents a cast of the inside of the seed integument. A description of such "casts" may aid in identification of this genus when it is found preserved in this state only.

Externally, the "casts" are ovate with a broad, slightly curved base (chalaza) and a tapering apex (FIG. 5). The length of the "casts" ranged from 16 to 18 mm and at their widest point they were 13 to 15.5 mm. The six ribs are represented at the chalazal end (FIG. 3) by Keels which expand rapidly towards the micropylar end (about 1/6 the length of the "cast") to a diameter of about 5 mm. The ribs then taper into narrow ridges (FIG. 2). In at least one specimen three of the ribs appear to be more prominent at the micropylar end (FIG. 2) thus giving a superficial resemblance to the genus *Archytaster*. The commissure forms a

definite groove along the center of each rib becoming a raised ridge in the region of the keels on the chalazal end.

When examined under reflected light, the surface pattern of cells on the ribs appear to be contoured to the groove of the commissure (FIG. 4). The cells are elongated and appear to represent the compact part of the middle layer of the integument as described by Taylor.

The seeds ("casts" and petrifications) described in this paper bear the numbers 100-106 in the Southern Illinois University Paleontological Collection.

ACKNOWLEDGMENTS

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