

# ECHINODERM FAUNAS OF THE DECATUR LIMESTONE AND ROSS FORMATION (UPPER SILURIAN TO LOWER DEVONIAN) OF WEST-CENTRAL TENNESSEE

CRAIG R. CLEMENT

248 Best Drive, Berea, Ohio 44017, U. S. A., scypho@sbcglobal.net

AND

CARLTON E. BRETT

Department of Geology, University of Cincinnati, Cincinnati, Ohio 45221-0013, U. S. A., brettce@ucmail.uc.edu

## ABSTRACT

The Decatur Limestone (Pridolian) and Ross Formation (Lochkovian), which crop out in the western valley of the Tennessee River, are a series of fossiliferous bioclastic limestones and fine-grained terrigenous clastic rocks that span the Silurian–Devonian boundary. These formations were deposited at a paleolatitude of 20–30°S on a shallow shelf bounded by the Illinois Basin to the north, the Black Warrior Basin to the south, the Nashville Dome to the east, and the Ozark Uplift and New Madrid Rift Zone to the west.

The Decatur and Ross formations contain diverse assemblages of echinoderms with a total of 38 genera and 69 species in 7 classes, with the crinoids comprising the greatest number of taxa. Of the crinoids, camerates are most diverse (16 genera, 33 species) followed by disparids (8 genera, 11 species), flexibles (4 genera, 13 species), and cladids (2 genera, 4 species). Among the other echinoderm classes, blastoids are represented by 3 genera and 3 species; rhombiferans, edrioasteroids, cyclocystoids, stylophorans, and echinoids are each represented by a single genus and species.

Preservation of the echinoderms ranges from nearly complete specimens to completely disarticulated debris. Several genera, particularly among the flexibles, are known from nearly complete crowns, whereas the cyclocystoid *Sievertsia* sp. and the disparid crinoid *Pygmaeocrinus* sp. are recognized only from isolated ossicles. This style of preservation is interpreted to have been produced by episodic storms. The complete crowns represent living individuals, and the cups represent forms that were somewhat resistant to disarticulation, buried by storm-entrained sediment. The calyces of some of the crinoids, particularly among the camerates, were sufficiently resistant to disarticulation to serve as sites of epibiont colonization. The most abundant identifiable echinoderms occur in several beds of coarse debris within the Decatur Limestone and in the lower Rockhouse Limestone and the upper Birdsong Shale (Bryozoan Zone) members of the Ross Formation.

The echinoderm faunas preserved in the Decatur and Ross formations compare most favorably with those in Oklahoma (17/32 genera in common), Bohemia (13/29), and the Armorican Massif (7/22). These comparisons indicate a greater degree of interchange among the echinoderm faunas of these regions than has been previously reported. Representatives of the genus *Pygmaeocrinus* are noted for the first time outside of Bohemia. Within the Decatur–Ross interval, *Scyphocrinites* and *Marsupiocrinus* (*Amarsupiocrinus*) made their last appearance.

Seven new genera and 13 new species of echinoderms are described herein, including *Probalocrinus dignis* (Strimple, 1963) n. comb., *Eudimerocrinus hlabsei* n. sp., *Dimerocrinites* (*Dimerocrinites*) *cheilobathron* n. sp., *Macrostylocrinus tertibrachialis* n. sp., *Marsupiocrinus* (*Amarsupiocrinus*) *devonicus* n. sp., *Paramarsupiocrinus broadheadi* n. gen. et n. sp., *Paramarsupiocrinus* n. gen. et n. sp., *Eodolotocrinus hlabsei* n. gen. et n. sp., *Eohalysiocrinus broweri* n. sp., *E. gibsoni* n. sp., *Ichthyocrinus erugatus* n. sp., *Parahormocrinus decaturensis* n. gen. et n. sp., *Eohadroblastus inexpectatus* n. gen. et n. sp., and *Eodevonocystis marilynny* n. gen. et n. sp. In addition, the blastoid *Leptoschisma lorae* (Dunbar, 1920) is referred to *Decaschisma*, and the disparid crinoid *Phimocrinus americanus* Springer, 1923, is referred to *Theloreus*. Most previously described taxa have been rediagnosed to emphasize those characters that serve to distinguish them.