SCAVENGING OR PREDATION: MISSISSIPPIAN GONIATITE ACCUMULATIONS IN CARBONATE CONCRETION HALOS AROUND *RAYONNOCERAS* (ACTINOCERIDA) BODY CHAMBERS FROM ARKANSAS

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Zangerl et al. (1968) and Quinn (1977) described from the Mississippian (Fayetteville Formation – Chesterian) of Northern Arkansas the occurrence of large numbers of goniatites in carbonate concretion halos surrounding collapsed body chambers of the actinocerid nautiloid *Rayonnoceras*. Both Zangerl et al. and Quinn speculated these accumulations are the stomach contents of the *Rayonnoceras*. An alternate accumulation hypothesis is that the goniatites died while scavenging because of the lack of oxygen and/or the concentration of poisonous gasses produced by bacterial decomposition of the *Rayonnoceras* carcass. To test which hypothesis is more correct; five concretion halos were cut into 2 to 4 cm thick slabs. All reasonably complete goniatite specimens (n = 743) on the slabs were measured for their maximum apparent diameter with the presence or absence of the body chamber and the angular relationship of the conch to the bedding being noted. Crushed ammonoids on the concretion surface which could have been introduced at a later time were eliminated from the data. The data were then compared to carbonate concretions containing numerous ammonoids from the Triassic of Canada and the Middle Carboniferous of England and Ireland.

The *Rayonnoceras* halo concretions have a great variation in the apparent diameters of the goniatites (min. 1.0 mm to a max. of 34.0 mm) with the mean average apparent diameter being 11.3 mm. Almost all the specimens are missing part or all of their body chambers, and ammonitella are almost completely absent. Overall, the cephalopod diversity is low. Most of the goniatites are randomly oriented to the bedding. In the comparative concretions, the ammonoids are mostly aligned parallel to the bedding, have low to high diversity, and most ammonoids retain most of their body chambers with the goniatite apparent diameter distribution conforming to reasonable survivorship curves.

Based on the number of specimens with missing body chambers, the significant deviation from a reasonable survivorship curve, the limited diversity, and the random conch orientation to bedding, we conclude that the goniatites around the body chambers are the last meal of the *Rayonnoceras*. Thus, these goniatite accumulations represent the only known occurrence where there is evidence that nautiloids have preyed on ammonoids.

Quinn, J. H., 1977. Sedimentary processes in *Rayonnoceras* burial. Fieldiana Geol., 33, 511-519.

Zangerl, R., Woodland, B. G., Richardson, E. S. Jr., and Zachry, D. L. Jr., 1969. Early diagenetic phenomena in the Fayetteville black shale (Mississippian) of Arkansas. Sed. Geol., 3, 87-119.