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AULOCYSTOID AND SYRINGOPOROID CORALS FROM THE MIDDLE DEVONIAN CEDAR VALLEY LIMESTONE OF CENTRAL MISSOURI

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ABSTRACT

A number of genera of colonial corals are common to the Cedar Valley Limestone (Middle Devonian-Hamilton/Tully) of central Missouri and to the Lingle Limestone (Middle Devonian-Hamilton) and St. Laurent Limestone (Middle Devonian-Hamilton/Tully) of southern Illinois and southeastern Missouri. However, no colonial coral species were common among these units. Two new genera and species of colonial corals in the Cedar Valley Limestone are identified in this study. They are common to both the St. Laurent and Lingle formations and provide further indication of the similar composition of the coral fauna. This similarity may prove to be useful in more closely correlating the Middle Devonian units of central Missouri with those in southern Illinois and southeastern Missouri. The newly-identified forms present in the Cedar Valley in central Missouri are *Aulocystis jacksoni* (Grabau), *Syringopora* aff. *S. hisingeri* Billings, and *Syringopora neoperelegans* Fraunfelter. *S.* aff. *S. hisingeri*, however, has been found only in the Cedar Valley.

INTRODUCTION

This study is part of an on-going study of the Middle Devonian megafaunas of central and southeastern Missouri, as well as those of southern Illinois. The purpose of this study is to identify, describe, and compare these megafaunas, and to determine the stratigraphic relationships of the containing beds. We have zoned the Cedar Valley in central Missouri using megafossils. Two of the zones were defined on the basis of diagnostic colonial coral species. We have zoned the stratigraphically equivalent Lingle and St. Laurent Limestones in southeastern Missouri and southern Illinois. One of those zones was defined on the presence of a diagnostic colonial coral species. The colonial corals described here are the first documented occurrences from the Cedar Valley in central Missouri. Two of these latter species also occur in the St.

Laurent and Lingle Limestones (Fraunfelter, 1970). This study then is an attempt to correlate the zones of the Cedar Valley Limestone in central Missouri with the zones of the St. Laurent and Lingle Limestones in southeastern Missouri and southern Illinois, by means of common species, in this situation colonial coral species. Such correlations must be established in order to determine the regional paleoecology, environments of deposition, and paleogeography of the involved stratigraphic units in the future. Collecting localities are shown in Figure 1. A generalized columnar section is illustrated in Figure 2, and a columnar section for Mineola Hill is shown in Figure 3. The latter two sections indicate the pertinent stratigraphy.

Figure 1. Locality Map.

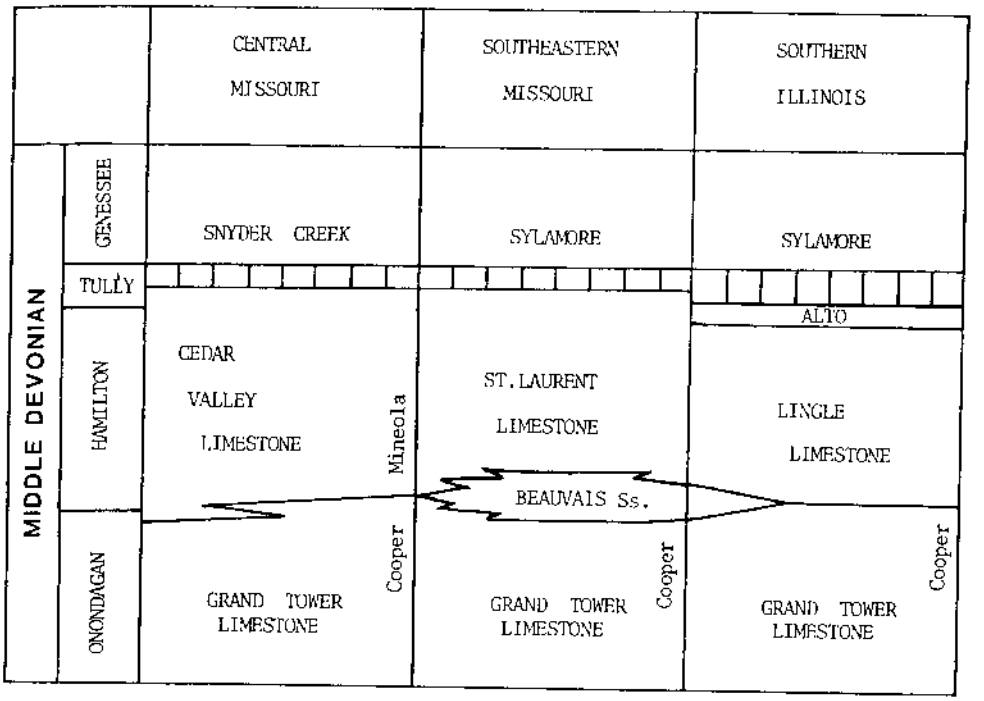


Figure 2. Correlation Chart.

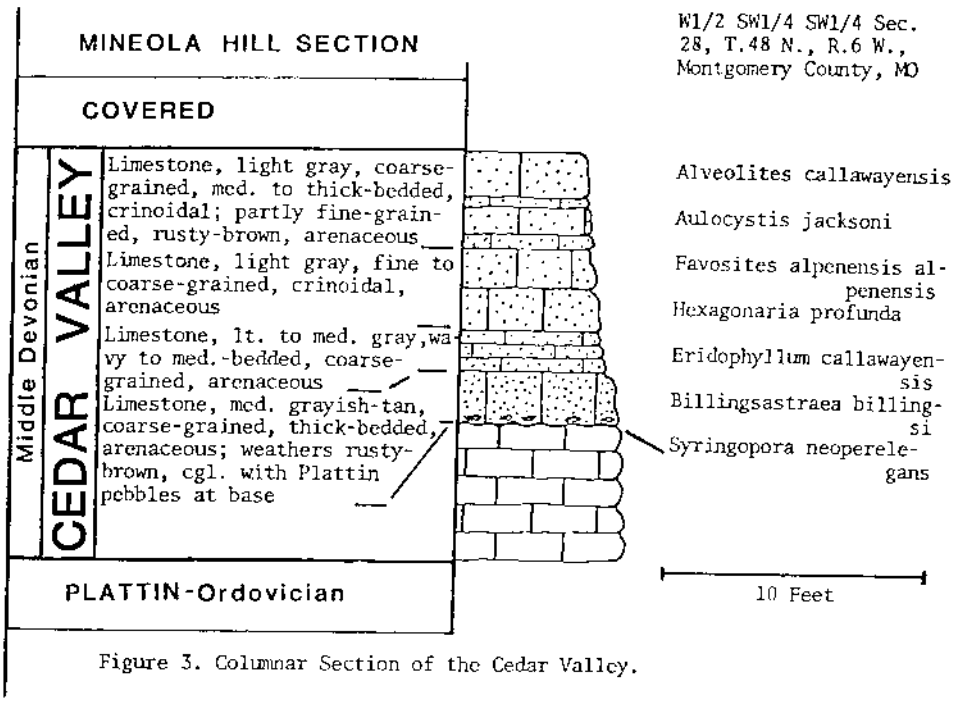
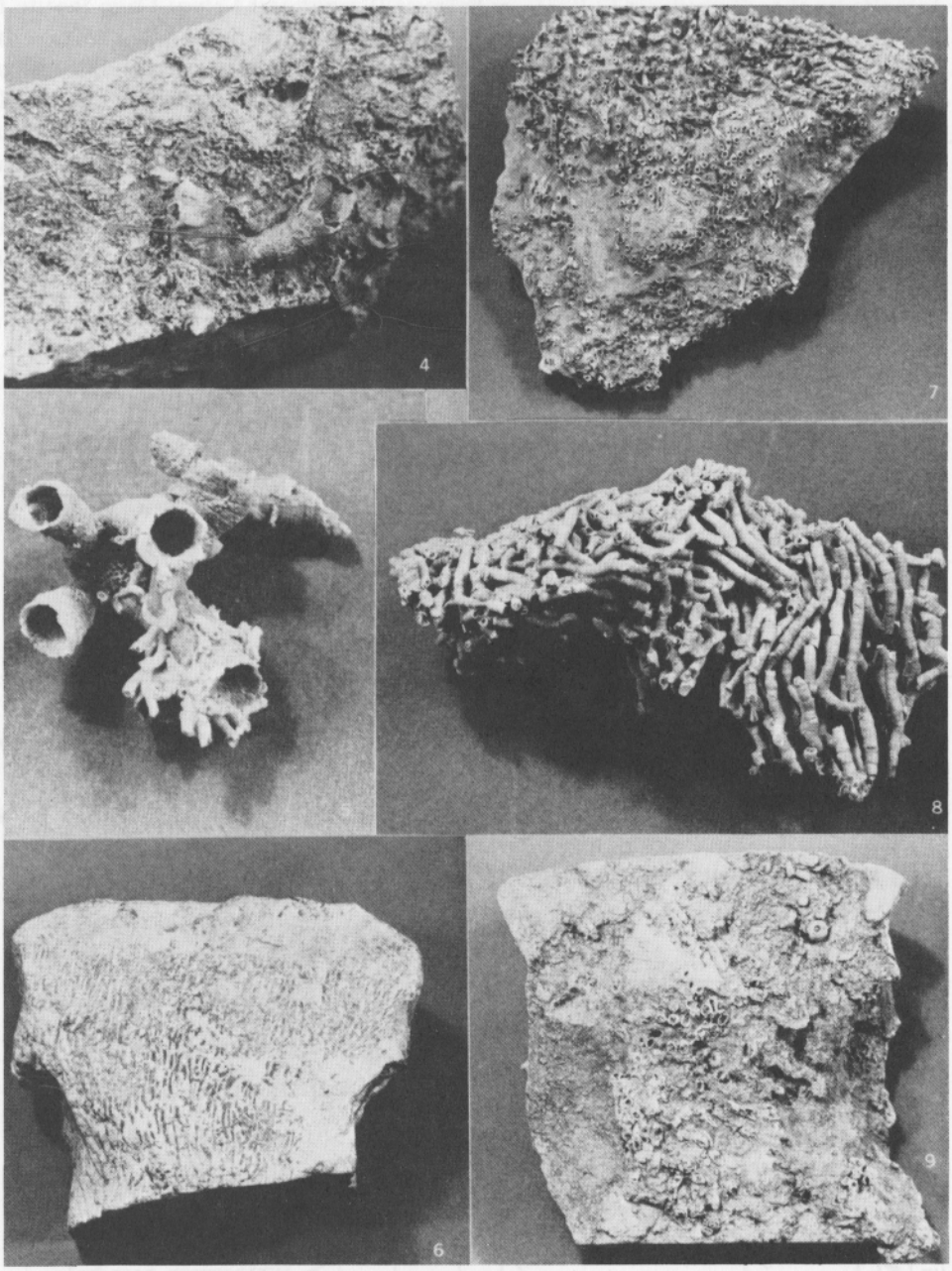


Figure 3. Columnar Section of the Cedar Valley.



EXPLANATION OF FIGURES OF FOSSILS

Fig. 4. *Aulocystis jacksoni*, lateral view X1.4, S.I.U.M. 4264.
Fig. 5. *Aulocystis jacksoni*, top view X2.25, S.I.U.M. 2171.
Fig. 6. *Syringopora* aff. *hisingeri*, lateral view X0.75, S.I.U.M. 4265.
Fig. 7. *Syringopora neoperelegans*, top view X0.7, S.I.U.M. 631.
Fig. 8. *Syringopora neoperelegans*, lateral view X1.2, S.I.U.M. 2115.
Fig. 9. *Syringopora neoperelegans*, top view X1.0, S.I.U.M. 4268.

SYSTEMATIC PALEONTOLOGY

Phylum Coelenterata Frey and Leuckhart, 1847
Subphylum Cnidaria Hatschek, 1888
Class Anthozoa Ehrenberg, 1834
Subclass Tabulata Milne-Edwards and Haime, 1850
Order Auloporida Sokolov, 1947
Superfamily Auloporicae Milne-Edwards and Haime, 1851
Family Aulocystidae Sokolov, 1950
Genus *Aulocystis* Schluter, 1885
Aulocystis jacksoni (Grabau)

Figs. 4-5

Ceratopora jacksoni Grabau, 1899, p. 415, pl. 1, fig. 1; pl. 2, figs. 6-10.
Ceratopora jacksoni Stewart, 1927, pp. 20-21, pl. 1, fig. 6.
Ceratopora jacksoni Stewart, 1938, pp. 81-82.
Aulocystis jacksoni Watkins, 1959, p. 796, pl. 108, figs. 14-15; pl. 109, figs. 1-3.
Aulocystis jacksoni Stumm, 1967, p. 96, pl. 2, figs. 4-7.
Aulocystis jacksoni Stumm, 1967, p. 126.
Aulocystis jacksoni Kesling and Chilman, 1975, pl. 45, fig. 16, pl. 46, figs. 3-8; pl. 49, fig. 5.

The original description of *Aulocystis jacksoni* by Grabau states: "Corallum erect, frequently and irregularly branching; corallites cylindrical, or slightly trumpet-shaped. Surface formed by a coarsely wrinkled epitheca, and showing longitudinal ridges or costae. Cavity of the calyx funnel-shaped, continued as a cylindrical central tube, which seldom occupies more than one third of the diameter of the corallite. Cysts coarse, irregular, arranged semi-concentrically, with frequent spine-like processes or trabeculae projecting from the lamellae of the wall.

The branching of this species is such as to produce an irregular arborescent form, indicating that the corallum grew upright. The corallites seldom grew perfectly cylindrical and erect, almost always having a more of less sinuous or irregular outline. The new buds were usually given off at an oblique angle." (see E.C. Stumm, 1964, p. 82).

Remarks. The material studied from the Cedar Valley Limestone of central Missouri consists of one well-preserved specimen and parts of other specimens. The rock in which these specimens were found is a crinoid coral-lime wackestone. The specimen from the St. Laurent Limestone near Lithium, Missouri, was found in a coral crinoid lime wackestone.

Occurrence. Mineola facies of the Cedar Valley Limestone (Callaway) along the south side, east-bound lane, of I-70 on Mineola Hill, northwest of Mineola, Montgomery County, Missouri (W 1/2, SW1/4 SW1/4 Sec. 28, T.48N., R.6W., Montgomery City Quadrangle); middle clastic, coralline facies, lower Walnut Grove Member of the Lingle Limestone equivalent, of the St. Laurent Limestone near Lithium, Perry County, Missouri (North Center Sec. 11, T.36 N., R.10 E., Chester Quadrangle); and from the same stratigraphic interval at Union School in Perry County, Missouri (Center E1/2 Sec. 29, T.35 N., R.13 E., Chester Quadrangle); as well as from the Rendleman Oolite Bed, lower Walnut Grove Member of the Lingle Limestone at the Lingle Type Section in Union County, Illinois (North Center SE1/4 SW1/4 SW1/4 Sec. 26, T.13 S., R. 2 W., Jonesboro Quadrangle).

Types. Southern Illinois University Museum, Hypotypes 4264 and 2171.

Superfamily Syringoporicae de Fromentel, 1861
Family Syringoporidae de Fromentel, 1861
Genus *Syringopora* Goldfuss, 1826
Syringopora aff. *S. hisingeri* Billings

Fig. 6

The original description of *Syringopora hisingeri* by Billings is as follows: "This species forms large masses of very long, nearly parallel or slightly varying slender corallites, which are closely aggregated, and present a rugged or knobby appearance from the great number of the connecting tubes. The diameter of the corallites is one-third of a line, or a little more. The tubes of connexion are distant from two-thirds of a line, or a little more. The tubes of connexion are distant from two-thirds of a line to one line and a-half. The distance between the corallites is for the greater part less than their diameter. The young corallites branch from the sides of the adult individuals, and immediately become parallel with the parent, and connected with it again by the usual tubes of connexion." (see C.L. and M.A. Fenton, 1947, Card 103).

Remarks. In our specimen the corallites are slightly larger in diameter and the connecting stolons are slightly farther apart. In addition, the corallites are slightly more widely-spaced. Our specimen is enclosed in a matrix of mudstone containing floating quartz grains and a few disassociated brachiopod valves.

Occurrence. Mineola facies of the Cedar Valley Limestone in Adrian Brothers quarry in Southern Boone County, Missouri (NW1/4 NE 1/4 Sec. 24, T.45 N., R.12 W., Jefferson City Quadrangle).

Types. Southern Illinois University Museum, Hypotype 4265.

Syringopora neoperelegans Fraunfelter

Figs. 7-9

Syringopora neoperelegans Fraunfelter, 1970, p. 38, pl. 7, fig. 1.

"Corallum similar to that of *S. perelegans* Billings, but differs from that species in that the corallites are more irregularly-spaced and in that the rounded connecting stolons are, consequently, more widely and irregularly-spaced. Internal structure similar to that of *S. perelegans*. Coralla up to one foot in diameter have been observed.

Remarks. The specimens from the Cedar Valley Limestone in central Missouri are not well-preserved, but the corallites are of about the same size and have internal structure similar to that of *S. neoperelagans*. The specimens from the Cedar Valley on Mineola Hill and Near Wittenberg are enclosed in wackestone.

Occurrences. Mineola facies of the Cedar Valley Limestone on Mineola Hill in Montgomery County, Missouri (W1/2 SW1/4 SW1/4 Sec. 28, T.48 N., R.6W., Montgomery City Quadrangle); middle clastic, coralline facies, lower Walnut Grove Member of the Lingle Limestone equivalent, of the St. Laurent Limestone along an intermittent tributary to Brazeau Creek about one-half mile west of Wittenberg, Perry County, Missouri (NE1/4 NW1/4 NE1/4 SW1/4 Sec. 18, T. 34 N., R.14 E., Altenburg Quadrangle); and middle clastic, coralline facies, lower Walnut Grove Member of the Lingle Limestone equivalent, of the St. Laurent Limestone in the west bluff of the Mississippi River about one-half mile south of Wittenburg, Perry County, Missouri (SE1/4 SE1/4 SE1/4 Sec. 18, T.34 N., R.14 E., Altenburg Quadrangle).

Types. Southern Illinois University Museum, Holotype 2115, and Hypotypes 631 and 4268.

DISCUSSION

Eight genera of colonial corals are common to the Cedar Valley Limestone of central Missouri, to Mineola facies on Mineola Hill and stratigraphically equivalent strata, and to the Lower Walnut Grove Member of the Lingle Limestone in southern Illinois and stratigraphically equivalent strata in southeastern Missouri. Two species, *Syringopora neoperelegans* and *Aulocystis jacksoni* are specifically common to Middle Devonian rocks of the two areas. The colonial coral faunas from these two intervals are listed below:

Cedar Valley
Alveolites callawayensis Fraunfelter
Alveolites subramosus Rominger ?
Aulocystis jacksoni (Grabau)
Aulopora callawayensis Fraunfelter
Billingsastraea billingsi (Calvin)
Cladopora dichotoma Hall
Drymopora callawayensis Fraunfelter
Eridophyllum auxvassensis Fraunfelter
Eridophyllum callawayensis Fraunfelter
Favosites alpenensis alpenensis Winchell
Favorsites romingeri romingeri Swann
Hexagonaria profunda (Hall)
Syringopora aff. S. hisingeri Billings
Syringopora neoperelegans Fraunfelter
Thamnopora limitaris Rominger

Lingle/St. Laurent
Alveolites cf. A. winchellana (Miller)
Aulocystis cf. A. frutectosa (Davis)
Aulocystis cf. A. incrustans (Davis)
Aulocystis jacksoni (Grabau)
Aulopora buccinata Watkins
Aulopora conferta Winchell
Aulopora microbuccinata Watkins

Lingle/St. Laurent continued
Billingsastraea ingens (Davis)
Emmonsia arbuscula (Hall)
Emmonsia? digitatus (Rominger)
Emmonsia eximia (Davis)
Eridophyllum archiaci (Billings)
Favosites alpenensis alpenensis (Winchell)
Favosites clausus Rominger
Favosites hamiltonae Hall
Favosites nitellus Winchell
Favosites placentus Rominger
Favorsites turbinatus (Billings)
Hexagonaria percarinata (Sloss)
Iowaphyllum aplenense (Rominger)
Platytaxum frondosum (Nicholson)
Pleurodictyum (Pleurodictyum) planum Davis
Pleurodictyum (Pleurodictyum) wardi Greene
Striatopora cf. S. cavernosa Rominger
Syringopora neoperelegans Fraunfelter
Trachypora intercedens Fraunfelter
Trachypora vermiculosa (Lesueur)

CONCLUSIONS

The presence of the two newly-identified species of colonial corals from the Cedar Valley Limestone in central Missouri, which also occur in the St. Laurent and Lingle Limestones in southeastern Missouri and southern Illinois, suggests a similar age for the coralline facies of the Cedar Valley Limestone on Mineola Hill and elsewhere in Missouri, and the coralline facies of the St. Laurent and Lingle Limestones in southeastern Missouri and southern Illinois. The generic similarity in composition of the coralline faunas involved, as indicated by the included faunal lists, also suggests a close relationship in time between these coralline faunas. The more detailed correlation made possible by these newly-identified species is significant, because no other diagnostic megafossil species common to the Cedar Valley and St. Laurent/Lingle have been identified from this area. In addition, the Cedar Valley Limestone and the St. Laurent/Lingle Limestones were deposited in different seaways.

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