

# Ontogeny and morphologic variability of the foraminiferid *Lacustrinella lacustris* (Haman and Marolt)

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**ABSTRACT:** The morphologic variability of *Lacustrinella lacustris* (Haman and Marolt) provides a more comprehensive understanding of the ontogeny of this taxon. *Lacustrinella lacustris* is a unilocular, not multilocular, organism. Multilocular representatives of this species simply represent agglomerations of the unilocular chambers. The number of chambers comprising the test at any time is the most significant variable morphological feature of the taxon, along with concomitant test size variation. The chamber number ranges from 1 to 14. The genus is emended based on these new observations.

## INTRODUCTION

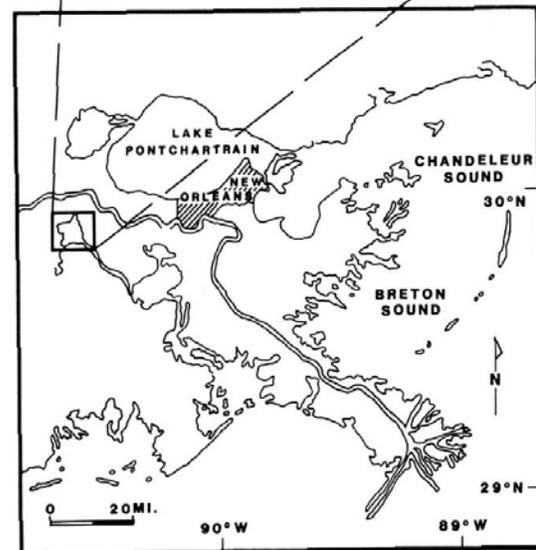
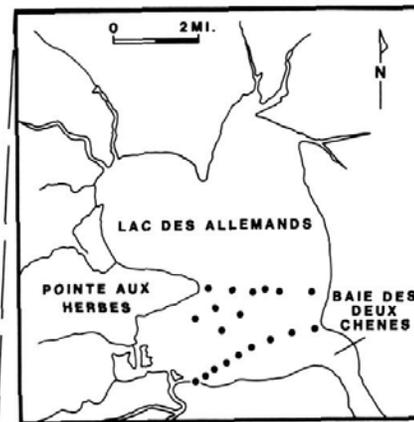
Haman and Marolt (1985) proposed the new species *Ammopemphix lacustris* to accommodate hemisphaeramminid textularaceans retrieved from Lac des Allemands, a shallow, fresh-to-brackish water lake located on the upper deltaic plain of the Mississippi Delta, Louisiana. Haman and Marolt (1985) stressed the difference in wall composition between the new species and other *Ammopemphix* species and indicated that this might be the result of ecophenotypic variation. They also suggested that *Ammopemphix*, as a result of their new observations, may have a more cosmopolitan distribution than previously believed.

Loeblich and Tappan (1987) did not concur with Haman and Marolt (1985) concerning the ecologic variation of the species but adopted a classical typological approach to the new species by selecting it as the type species for their new genus *Lacustrinella*. Loeblich and Tappan (1987) placed their new genus in the subfamily Hemisphaerammininae, the same subfamily in which they kept *Ammopemphix*. Wall composition and ecologic occurrence were utilized as evidence to differentiate the two taxa on a generic basis.

## DISCUSSION

Thirty four specimens of *Lacustrinella lacustris* (Haman and Marolt) were obtained from 11 bottom samples taken in Lac des Allemands, Louisiana. The range of measured environmental parameters associated with these samples at the time of collection were: Depth 1.52-2.28 meters (1.83 meters average); Salinity 0.27-1.62ppt (0.98ppt average); Temperature 27-28°C (27° average); Eh - 190/-120mv (-161 mv average); pH 7.70-6.70 (7.24 average). The living or dead nature of the tests was not determined.

Haman and Marolt (1985) described *Lacustrinella lacustris* as having four chambers; Loeblich and Tappan (1987, p. 36) stated it had "few". Since the original description of *Lacustrinella lacustris*, representatives of this taxon have been retrieved with tests frequently composed of a single chamber, consistently with up to four, rarely with five or six and in one case with 14 chambers.



TEXT-FIGURE 1

Location of Lac Des Allemands, with sample localities, on the upper deltaic plain of the Mississippi River Delta system.

The single chambers are of two types. The first are complete in themselves and do not represent disaggregated elements of multichambered larger forms. They are subglobular and regularly inflated, and are not as abundant as the second type of unilocular chamber. The second kind represent disaggregated larger forms, which can be identified by evidence of the test wall having been appressed to another chamber (Pl. 1, figs. 1,2).

A linear relationship exists between the number of chambers comprising the test in relation to the diameter of the test. Single-chambered forms range in diameter from 0.30-0.90 mm (Pl. 1, figs. 1,2); two-chambered forms from 0.80-1.20 mm (Pl. 1, figs. 3); three-chambered forms from 1.10-1.65 mm (Pl. 1, figs. 4,5); four-chambered forms from 1.00-1.80 mm (Pl. 1, figs. 6-8) to the largest form with 14 chambers and a diameter of 2.75 mm (Pl. 1, figs. 9-11). Such a linear relationship is only to be expected where "pseudomultilocular" forms are composed of conglomerations of relatively equal-sized single chambered tests.

*Lacustrinella* exhibits morphological variation only in chamber number and corresponding test size. This is, however, simply a reflection of the aggregation of unilocular tests into larger "pseudomultilocular" forms. All other morphological characters, test wall construction and composition, aperture number, etc, remain constant. The discovery of unilocular representatives of this species requires that the description of the genus be emended.

#### SYSTEMATIC DESCRIPTION

Order FORAMINIFERIDA Eichwald 1830

Suborder TEXTULARIINA Delage and Hérouard 1896

Superfamily ASTORRHIZACEA Brady 1881

Family HEMISPHAERAMMINIDAE Loeblich and Tappan 1961

Subfamily HEMISPHAERAMMININAE Loeblich and Tappan 1961

Genus *Lacustrinella* Loeblich and Tappan, **emend.** Haman  
*Description:* Test free, formerly attached, unilocular, single chamber subglobular, plano-convex in side view, circular to sub-circular in outline junction between dorsal and ventral sides angular; dorsal surface finely agglutinated with randomly arranged siliceous spicules with minor fine-grained sand, ventral surface with thin, easily ruptured, translucent membrane; aperture a single circular to slightly irregular opening, at dorsal summit of chamber, raised slightly above chamber surface; multilocular tests represented by agglomeration of single chambers, not arranged in any fixed pattern and without intercameral connection.

#### *Lacustrinella lacustris* (Haman and Marolt)

As genus is monotypic, type species diagnosis is same as for genus.

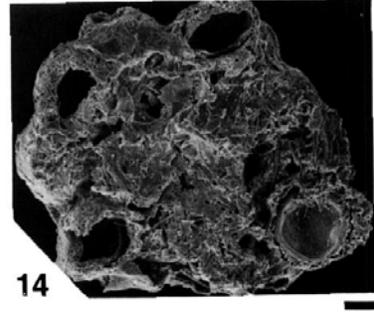
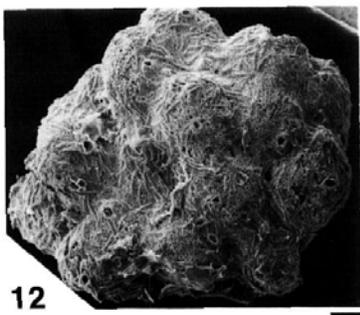
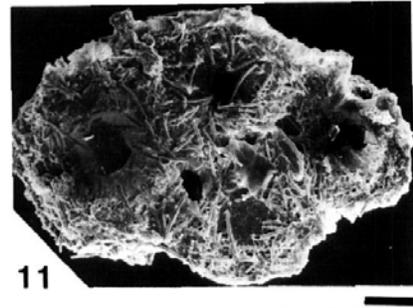
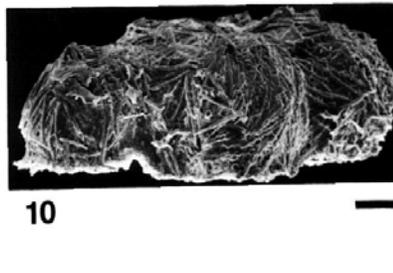
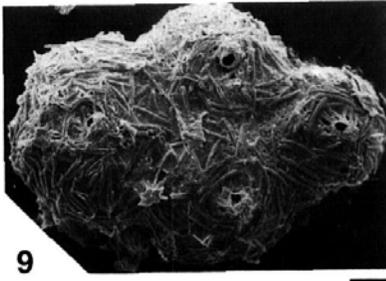
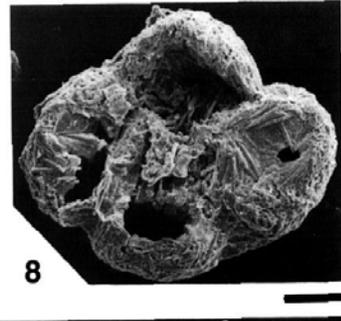
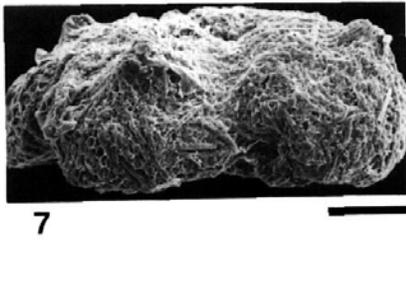
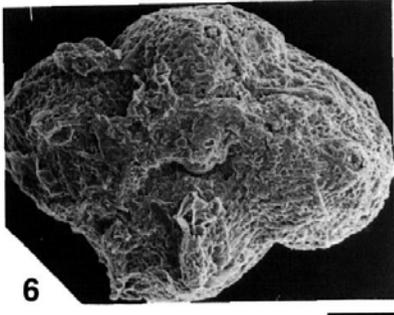
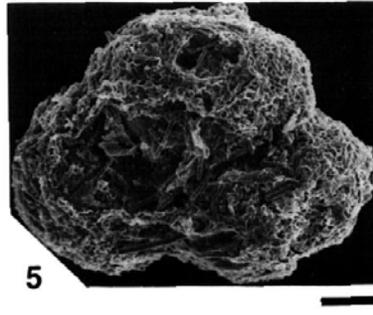
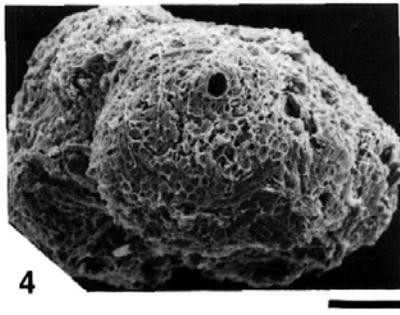
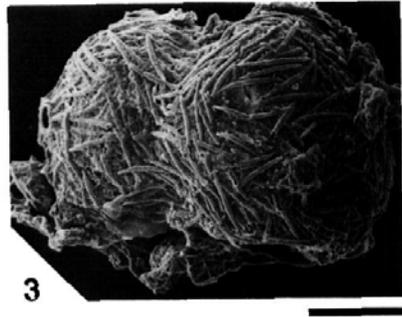
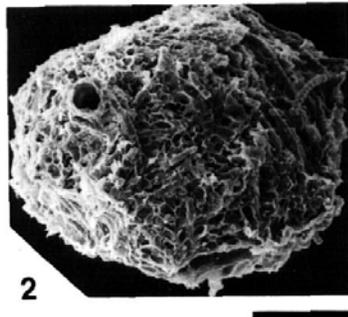
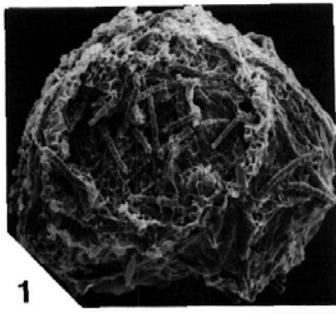
#### SUMMARY

New observations on the morphologic variability of *Lacustrinella lacustris* provide a more definitive understanding of the ontogenetic development of this taxon. This, in turn, indicates that the morphologic variability and ontogeny of allied taxa, such as *Ammopemphix*, should be regarded from more of a biological aspect instead of from a purely typological viewpoint. With an improved understanding of the ontogeny of the *Lacustrinella* and allied forms, more refined paleoecologic interpretations become possible. This is of importance when the occurrence of Paleozoic homeomorphs and pseudomorphs such as *Sorostomasphaera* or *Atelikamara* are considered. Finally, as individuals of some unilocular genera may become fortuitously agglomerated with other individuals of the same genus, these "pseudomultilocular" genera need to be critically evaluated. For example, genera such as *Ammopemphix*, *Saccamminis* and *Webbinelloidea* must have been initially represented by a unilocular form prior to later aggregation. This type of growth pattern is clearly evident with other representatives of the Hemisphaeramminidae, and is probably not restricted to this family.

#### PLATE 1

Figures 1-14: *Lacustrinella lacustris* (Haman and Marolt) from Lac des Allemands, Louisiana. Scale bar = 100 $\mu$

- 1 Unilocular chamber, side view.
- 2 Single chamber diagggregated from "pseudomultilocular" test, dorsal view.
- 3 Double-chambered form, side view;
- 4-5 Triple-chambered form; 4, dorsal view; 5, ventral view to attachment surface.
- 6-8 Four-chambered form (holotype); 6, dorsal view; 7, side view; 8, ventral view to attachment surface.
- 9-11 Four-chambered form; 9, dorsal view; 10, side view; 11, ventral view.
- 12-14 Multi-chambered form; 12, dorsal view; 13, side view; 14, ventral view.



Obviously, a morphologic re-evaluation of these taxa would probably result in a more discerning and useful taxonomic synopsis.

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