

Charophytes of Pleistocene Age From Delta and Denton Counties, Texas

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Collections of *Chara* oogonia from late Pleistocene alluvium beneath the floodplain of the North Fork of the Sulphur River near Ben Franklin (Delta County), and from the second terrace above Clear Creek (Denton County) were studied. The radiocarbon dates of the Sulphur River deposits are 10,000-11,000 B.P., while those of the Clear Creek deposits are about 28,000 B.P.

A general paleoecological picture of the aquatic environment in which these Pleistocene *Chara* grew can be drawn from the biological investigations of Kiener (1944), Wood (1950, 1952) and Anderson and Lommasson (1958), and from the geological studies of Weissenborn and Stenzel (1948) and Deevey (1949). The streams or pools where the *Chara* grew would probably have had slow-moving water with a sand or gravel substratum and a temperature ranging between 20° and 30° C. They would probably have had a methyl orange alkalinity of 21-51, a pH of 7-9 and a salinity of 0-3. The water or substratum would also have contained rather large amounts of silica, calcium carbonate, and aluminum and magnesium salts (Welch, 1935).

The fossil oogonia from Clear Creek are similar to *C. baueri* Braun, being 633 to 664 μ long and having 8 to 9 convolutions with the corona worn away. A second type found in this deposit was 700 to 820 μ long and had 11 to 12 convolutions without the corona. It was similar to *C. vulgaris* f. Kieneri.

The Sulphur River oogonia range in length from 759 to 1076 μ , without the corona. There are 11 to 13 convolutions, usually 12. They are similar to *C. zeylanica* Willd and *C. vulgaris* f. Kieneri, both extant species described by Wood (1959, 1962).

Thus the two sites differed in their *Chara* populations, but it would be necessary to obtain larger samples to determine the significance of these differences.

Identification of *Chara* species solely on the basis of the oogonia

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is necessarily tentative. The structure of the oogonia varies not only within a given species and also on a single plant at different stages of growth. In the absence of the corona and all vegetative parts, specific identifications are usually not possible. Only one of the 60 Pleistocene oogonia retained a portion of the corona.

REFERENCES CITED

- Anderson, R. G. and Lommasson, R. C., 1958, Some effects of temperature on the growth of *Chara zeylanica* Willd: Butler Univ., Bot. Studies v. 13, no. 2, p. 113-120.
- Deevey, E. S., Jr., 1949, Biogeography of the Pleistocene, I: Europe and North America: Geol. Soc. Am., B., v. 60, p. 1315-1416.
- Kiener, W., 1944, Notes on distribution and bio-ecology of Characeae in Nebraska: Butler Univ., Bot. Studies, v. 6, p. 131-148.
- Weissenborn, A. E. and Stenzel, H. B., 1948, Geological resources of the Trinity River tributary area in Oklahoma and Texas: Univ. of Tex. Pub. 4824, 252 p.
- Welch, P. S. 1935. Limnology: New York, McGraw-Hill, 471 p.
- Wood, R. D., 1950, Stability and zonation of Characeae: Ecology, v. 31, p. 642-647.
- , 1952, An analysis of ecological factors in the occurrence of Characeae of the Woods Hole Region, Massachusetts: Ecology, v. 33, p. 104-119.
- , 1952, The Characeae, 1951: Bot. Review, v. 18, p. 317-353.
- , 1959, Gametangial constants of extant Charophyta for use in micropaleobotany: Jour. Paleont., v. 33, p. 186-194.
- , 1962, New combinations and taxa in the revision of Characeae: Taxon, v. 11, p. 7-25.