A NEW *GISORTIA* FROM THE CRYSTAL RIVER FORMATION, OCALA GROUP, OF FLORIDA, WITH EXPLANATORY NOTES ON THE TETHYAN INFLUENCE IN THE FLORIDIAN MIDDLE AND UPPER EOCENE

KATHERINE VAN WINKLE PALMER

Palaeontological Research Institution, Ithaca, New York, U.S.A.

ABSTRACT.—A new species of *Gisortia* is described from the Crystal River formation, Ocala group, Upper Eocene of Florida. Brief description of the Avon Park limestone, Middle Eocene and the Upper Eocene formations Inglis, Williston, and Crystal River limestones respectively, is given with a summary of Old World (Tethyan) influence shown by the molluscan fauna.

INTRODUCTION

GENERAL REMARKS

THE Upper Middle Eocene of Florida consists of the Avon Park limestone overlain by the Ocala group (Puri, 1953) of the Upper Eocene age. The Ocala group, currently recognized as three lithologic units, Inglis, Williston and Crystal River, has been formerly and generally called the "Ocala limestone". Although the Middle and Upper Eocene seas covered the Floridian area, the Avon Park limestone which represents the oldest sediments exposed, is buried except in Levy and Citrus counties in west central Florida. Formations of the Ocala group crop out from the central part of the Peninsula to the Gulf of Mexico west and north towards the Alabama line. Fine exposures of the Crystal River formation may be observed in the numerous commercial quarries around Ocala, Marion County and Gainesville, Alachua County. Both Inglis and Williston formations are hard limestones, the Inglis is harder, whereas the Crystal River is soft, compact in places with irregular solution cavities and deposition of large irregular masses of chert. This limestone is a mixture of abundant large Foraminifera, echinoids, and mollusks. The Foraminifera have been described mainly by Cushman (1917, 1920, 1921, 1934), Vaughan (1928), Cole (1941, 1942, 1944), Applin and Jordan (1945), Puri (1957, in press); the echinoids by Cooke (1941, 1942), and a few molluscan species by Dall (1890-1898). The mollusks are abundant, remarkable, and diagnostic. Their study is in process by the writer.

VELATES IN THE EOCENE OF FLORIDA

The announcement in 1946 by Horace G. Richards of the discovery of the Eocene gastropod *Velates* in Citrus County, Florida, revealed the presence of an Indian-European, north African-West Indian (Tethyan) affinity in the Floridian Eocene. This fact presented an important element in the Eocene of the mainland of southeastern United States. Heretofore, *Velates* was known in the Western Hemisphere only from California and the West Indies. It (*V. floridanus* Richards) has been reported with certainty so far in Florida only from the type locality at Inglis, Withlacoochee River(L-135, Vernon, 1951, p. 123). When announced, the age of the beds bearing *Velates* was described as overlying "Avon Park dolomites" and below typical "Ocala limestone" with uncertainty as to whether they were Middle

or Upper Eocene (Fischer in Richards, 1946). Later, Vernon (1951, p. 123) placed the beds in the Inglis member, Moodys Branch formation, Upper Eocene series. Palmer (in Richards and Palmer, 1953, p. 14) further discussed *Velates* from the type locality. Mention was made of a "juvenile *Velates* sp." in the Avon Park limestone (L-73) Middle Eocene by Vernon (1951, p. 103). This is the only specimen of *Velates* reported from other than the Inglis formation in Florida.

Specimens from the Crystal River formation preliminarily identified as *Velates* have been examined by the writer and all are *Calyptraea aperta* (Solander), a widespread species geographically and stratigraphically in the Eocene. The writer has studied extensive collections of Ocala specimens and collected several times from a large number of exposures (quarries) in the "Ocala limestone"; and has not observed *Velates* in the rocks of the Crystal River formation. If it is present, it is rare as it is in the Avon Park limestone below the type formation (Inglis) and in the Williston and Crystal River formations above. *Velates* is, therefore, an important indicator of the Inglis formation in the Floridian Eocene.

TETHYAN FAUNAL RELATIONSHIP IN THE EOCENE OF FLORIDA

An Old World element in the Avon Park limestone and Inglis formation was announced by Palmer and Richards in 1952 (Palmer and Richards, 1954) and the molluscan fauna described by Richards and Palmer (1953). Palmer (1953) identified the following Tethyan Eocene gastropod genera from the formations, *Batillaria*, *Bellatara*, *Pseudoaluca*, *Pseudocrommium*, *Terebellum* (*Seraphs*) and *Eovasum*. Such genera had not been previously reported from the Eocene of Southern or southeastern United States.

Research on extensive molluscan fossils of the Crystal River formation substantiates the deduction of the Tethyan influence in the Floridian province. The "Ocala" exposures in Florida cover about 9900 square miles and the molluscan fossils are abundant. Preliminary identifications include such Tethyan genera as *Gisortia* (new species herein described), *Terebellum*, *Seraphs*, *Platyoptera* (rare in the Jackson Eocene of Mississippi), *Pseudocrommium*, *Lithophaga*, and *Exputens* (*Vusella*).

The final identification of all of the "Ocala" material available has not been completed so that additional distinctive genera and species new to the southern Eocene will be found. The description and illustration are in preparation by the writer through a grant (G 1339) from the National Science Foundation. By means of the grant, additional collections were made by the writer and by members of the Florida Geological Survey. The Florida Geological Survey loaned to the writer their molluscan collections from the Ocala group. Acknowledgement is made to the National Science Foundation, to the Florida Geological Survey, and to its Assistant Director, Dr. Robert Vernon, for reading the manuscript. The work on the Ocala mollusks will be published as a Bulletin of American Paleontology.

THE GENUS GISORTIA

One of the conspicuous representatives of the Tethyan influence in the Crystal River formation is a species of the genus *Gisortia*, giant gastropods related to the Cypraeas. Occasion is taken herein to describe a new species.

The genus *Gisortia* was described by Jousseaume (1885, p. 88) with the type species by original designation, *Ovula gisortiana* "Valenciennes" (1843) [Passy, 1859] from the Lutetian of Gisors, N. France and Barto-

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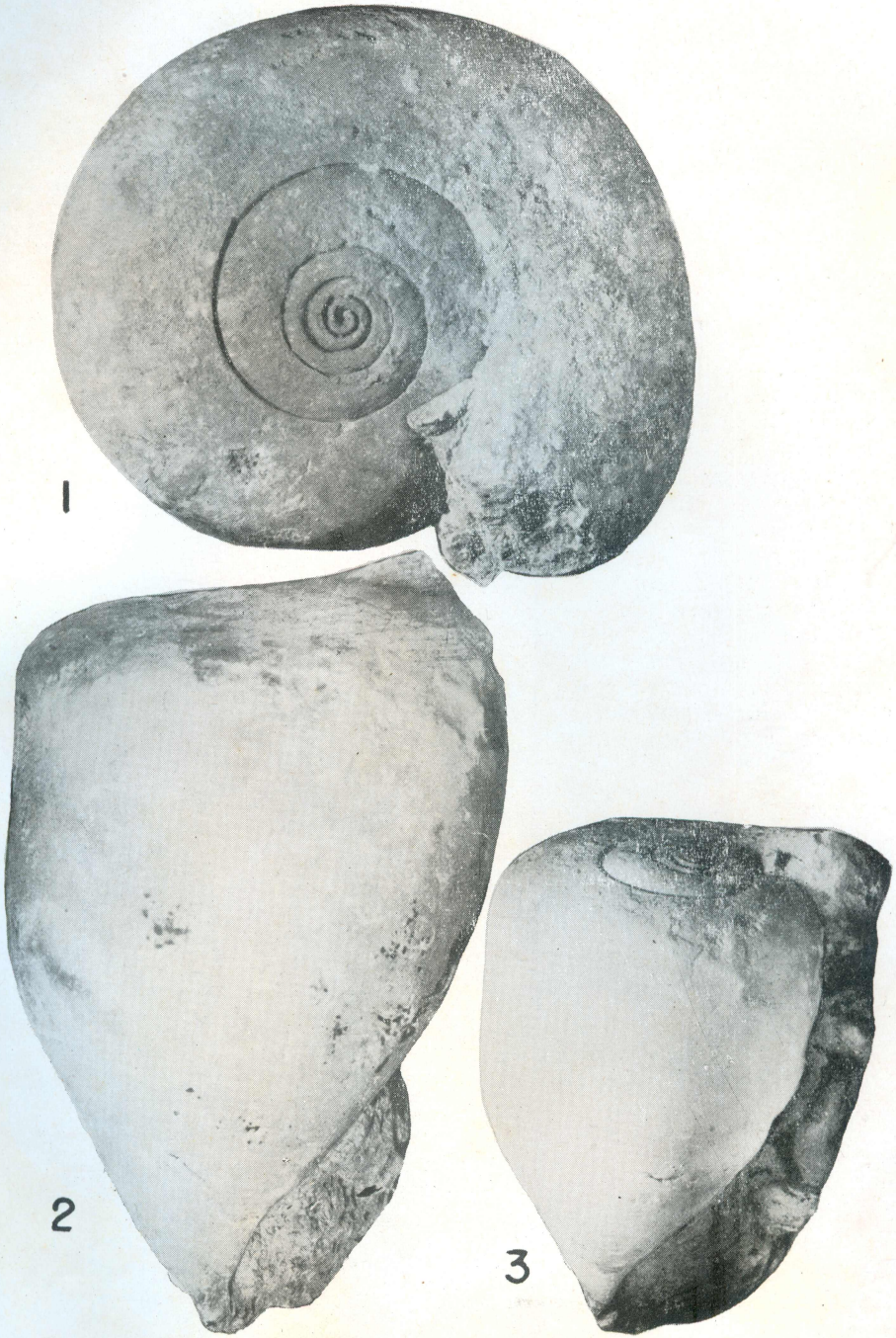
EXPLANATION OF PLATE 9

GISORTIA HARRISI, sp. nov.

FIG. 1—Apical view, greatest width, 135 mm.
2—Partial apertural view, height, 180+, mm.
3—Apertural view showing apex.

All views of the holotype, Pal. Res. Inst., No. 25, 222. Dixie Lime Products Co., Reddick, Sumter Co., Fla., Upper Eocene, Ocala group, Crystal River limestone.



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nian of Egypt (Mokattam series), and Crimea (Kalinowka).

The genus ranges from Paleocene through Eocene. *Gisortia harrisi*, n. sp., Crystal River formation with *G. clarki* Ingram (1940) the Lower Eocene (Capay) of California are the two known forms in North America. The first species discovered in the Western Hemisphere was by Trechmann (1923, p. 355) from Jamaica, B.W.I. Trechmann compared the species to *G. murchisoni* d'-Archiac from the Eocene of India, but Schilder (1930, p. 134) believed it to be distinct and renamed it *G. americana*. Olsson (1930, p. 64) found a representative, "*G.*" *thomasi*, in the upper Eocene of Peru. So far, the four species denote the group in the New World.

"*G.*" *colombiana* Clark (1946, p. 29) from the upper Eocene of Colombia is a gisortid. It is probably a *Megacypraea*, but it is not typical *Gisortia*.

The family, when separated from the Cypraeidae as Gisortiidae, is limited by Schilder (1930) to three genera, *Gisortia*, *Megacypraea*, and *Vicetia*. These genera have been discovered in the Upper Cretaceous and Eocene of Europe, Egypt, India, to Formosa, Jamaica, B. W. I., Peru, California and Florida. Wenz (1941) retained the three genera in the Cypraeidae as did Ingram (1947, p. 14). The family (Gisortiidae) as restricted reached its climax with the greatest number of species in the Lutetian (Middle Eocene). The fossils usually occur as internal casts, hence, generic distinctions of the gisortids may not be distinguishable. The following species represent the last of the clan in the Upper Eocene :

Vicetia roncana (de Gregorio) (Ronca beds, n. Italy) and *V. bellardi* (Deshayes) (Auversian near Nice), *V. hornesi* Hebert et Munier-Chalmas (Italy, Prkabonian), "*G.*" *thomasi* Olsson (Upper Eocene, Peru), cf. *Megacypraea colombiana* (Clark) (Colombia, Upper Eocene), and *Gisortia harrisi*, n.sp. (Florida, Upper Eocene). From such a diagnosis it appears that gisortids arrived in the Western Hemisphere early in the Eocene as represented in California and became extinct in America at the end of that epoch. For further discussion and listing of species with synonymies see Vredenberg (1927) and Schilder (1930). Vredenberg gave a thorough discussion of the literature chronologically up to his time. Schilder analyzed the shell characters from personal examination of most of the specimens described (excluding American forms) and presented a detailed discussion with figures. He excluded the Recent and fossil Australian species which had been identified as *Gisortia*.

DESCRIPTION

GISORTIA HARRISI, sp. nov.

Pl. 9, figs 1–3.

Shell large, (190 mm.+height) apical whorls sunken, spire flat or slightly raised, consists of 4½-5 whorls, posterior lip raised above the spire, anterior extended, body whorl rounded above, left side straight and parallel to the right for about half the distance of the body whorl, then it slopes to the posterior canal. Some specimens have a slight concavity above the body whorl, left side.

The species is known from casts only but the size and characters revealed are typical of a gisortid. *G. harrisi* differs from described species in the straight and parallel left side of the body whorl. The species is closest to the form discovered in Jamaica, B.W.I. The outline of the Jamaican specimen as illustrated is more eroded than the "Ocala" individuals.

Gisortia was fairly common in the Upper Eocene seas of Florida as indicated by the collection of nine shells. Other specimens have been seen in collections of quarrymen.

The species is named in honor of the late Emeritus Prof. G. D. Harris, authority on American Eocene paleontology and stratigraphy, founder of the Bulletins of American Paleontology, Palaeontographica Americana, and the Paleontological Research Institution.

Measurements—(Cast), maximum : 190 mm. +height ; greatest diameter, 135 mm.

Types—Holotype, No. 22891, Paleontological Research Institution ; paratype, 12306, Florida Geological Survey.

Occurrence—Upper Eocene, Ocala group, Crystal River formation, Florida. Localities :

Dixie Lime Products Co. quarry, Reddick, Marion Co., Fla. (type) ; Florida Lime Co., No. 1, Ocala, Fla. (paratype), Sumter Co., Rock Co., near Sumterville, Fla. limestone pit near Williston, Fla., Connell & Shultz mine, Williston, Fla. ; 1.9 mi. s. of Suwannee River bridge on Florida Highway 49, Gilchrist Co., Fla. ; Newberry Corp. pits SW ½, SE ¼, Sec. 13, TGS, R17E, Florida Geol. Survey.

REFERENCES

CLARK, B. L., 1946, *In* Clark and Durham, Eocene faunas from the Department of Bolivar, Colombia, *Mem.* 16. *Geol. Soc. America*, 126 pp., 27 pls.

COOKE, C. W., 1945, Geology of Florida. *Florida Geol. Sur.*, Geol. Bull. 29, 339 pp., illus.

INGRAM, W. M., 1940, A new *Gisortia*. *Jour., Washington Acad. Sci.*, Vol. 30, no. 9, p. 376, 377.

———, 1947, Check list of the Cypraeidae occurring in the Western Hemisphere. *Bull. Amer. Paleont.*, Vol. 31, no. 112, 25 pp.

JOUSSEAUME, F., 1885, Étude sur la famille des Cypraeidae. *Bull. Soc. Zool. France*, 1884, Vol. 9, pp. 81–100.

OLSSON, A., 1930, Contributions to the Tertiary paleontology of northern Peru : Part 3, Eocene Mollusca. *Bull Amer. Paleont.*, Vol. 17, no. 62, 96 p., 12 pls.

PALMER, K. V. W., and RICHARDS, H. G., 1954, Old World affinities of some Eocene mollusks from Florida. *Union Pal. Inter., Congress Geol. Inter.*, Comptes Rend. 19th sess., 1952, fasc. XIX, p. 35–38.

PURI, H. S., 1953, Zonation of the Ocala group in Peninsular Florida. *Jour. Sec. Petrol.*, vol. 23, p. 130.

———, 1957, Stratigraphy and Zonation of the Ocala group. *Florida Geol. Surv.*, Geol. Bull. 38 (in press).

RICHARDS, H. G., 1946, A gastropod of the genus Velates from the Florida Eocene. *Not. Nat.*, no. 177, 6 pp., 2 pls.

RICHARDS, H. G., AND PALMER, K. V. W., 1953, Eocene mollusks from Citrus and Levy counties, Florida. *Florida Geol. Sur.*, Geol. Bull. 35, 95 pp., 13 pls.

SCHILDER, F. A., 1930, The Gisortiida of the world. *Proc., Malacol. Soc.* London, pt. III, pp. 118–138, pl. 11, 12.

TRECHMANN, C. T., 1923, The Yellow limestone of Jamaica and its Mollusca. *Geol. Mag.*, Vol. 60, no. 710, pp. 337–367, pls. XIV–XVIII.

VERNON, ROBERT O., 1951, The Geology of Citrus and Levy counties, Florida. *Florida Geol. Sur.*, Geol. Bull. 33, 256 pp., 40 figs., 2 pls.

VREDENBERG, E., 1927, A review of the genus *Gisortia* with descriptions of several species. *Mem., Pal. Indica, Geol. Sur. India*, n. ser., Vol. 7, Mem. no. 3, 124 pp., XXXII pls.

WENZ, W., 1941, Gastropoda. Teil 5 : Prosbranchia. Handbuch der Paläozoologie, Bd. 6 (Gisortiae), pp. 967–969.

For references of authors mentioned in the text but not included in the following, see bibliography in Cooke (1945) Richards and Palmer, (1953) and Vernon (1951).