PALAEOCARCHARODON ORIENTALIS (SINZOW) (NEOSELACHII: CRETOXYRHINIDAE), FROM THE PALEOCENE OF MARYLAND, U.S.A.

by

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ABSTRACT

Recent collecting of fossil vertebrate remains from the lowermost member of the Aquia Formation (Paleocene), has enabled me to report here for the very first time, the earliest occurrence for the teeth of *Palaeocarcharodon* in the fossil record of the New World.

This report represents only one species of neoselachian from this locality, the remaining fauna of which will subsequently be described.

RESUME

La récolte récente de restes de vertébrés fossiles dans le membre le plus inférieur de la Formation Aquia (Paléocène) me permet de signaler ici pour la toute première fois la plus ancienne occurrence de dents attribuées à *Palaeocarcharodon* dans le registre fossile du Nouveau Monde.

Cette note se rapporte à une seule espèce de néosélaciens de cette localité, le reste de la faune sera décrit ultérieurement.

GEOLOGY

The Aquia Formation (Clark & Martin, 1901; Vokes & Edwards, 1957; Glaser, 1968; Hansen, 1974) is comprised of two units (the Piscataway and the Paspotansa) that range in geological age from the Paleocene (Thanetian Stage) to the Early Eocene (Ypresian Stage).

The uppermost unit of the Aquia Formation is equivalent to the Ypresian Stage (the "London Clay" of England, Casier, 1966). This latter unit and its fauna, in North America, is situated along the Potomac River, on either side, in outcroppings situated between Quantico, Virginia (the United States Marine Training Complex) and Dahlgren, Virginia. Various collecting sites of the uppermost member of the Aquia Formation are located at Marlborough Point, Belvedere and Fairview beaches on the southern side of the Potomac River (Virginia) this also includes Aquia Creek, situated near to Belvedere beach, and at Liverpool Point, Smith's Point, and Blue Beach on the northern side of the river (Maryland). There are also outcroppings inland in Maryland at Tinker's Creek, and Suitland. I have published a rather short note on the collecting of uppermost Aquia Formation fossils (including the teeth of sharks) at Belvedere and Fairview beaches (Case, 1967), and I am presently planning a more complete scientific paper regarding these localities and their faunal assemblages.

The material of this present report comes from the lowermost member of the Aquia Formation at a locality just outside of the Capitol of the United States of America, at Washington, the District of Columbia (D.C.). The site is actually situated just off Central Avenue (Also known as Route 214) (cf. text-fig. 1) at the Hampton Mall shopping plaza, near the Capitol Beltway exit at Largo (Seat Pleasant), Prince Georges County, Maryland.

TOPOGRAPHIC MAP REFERENCE

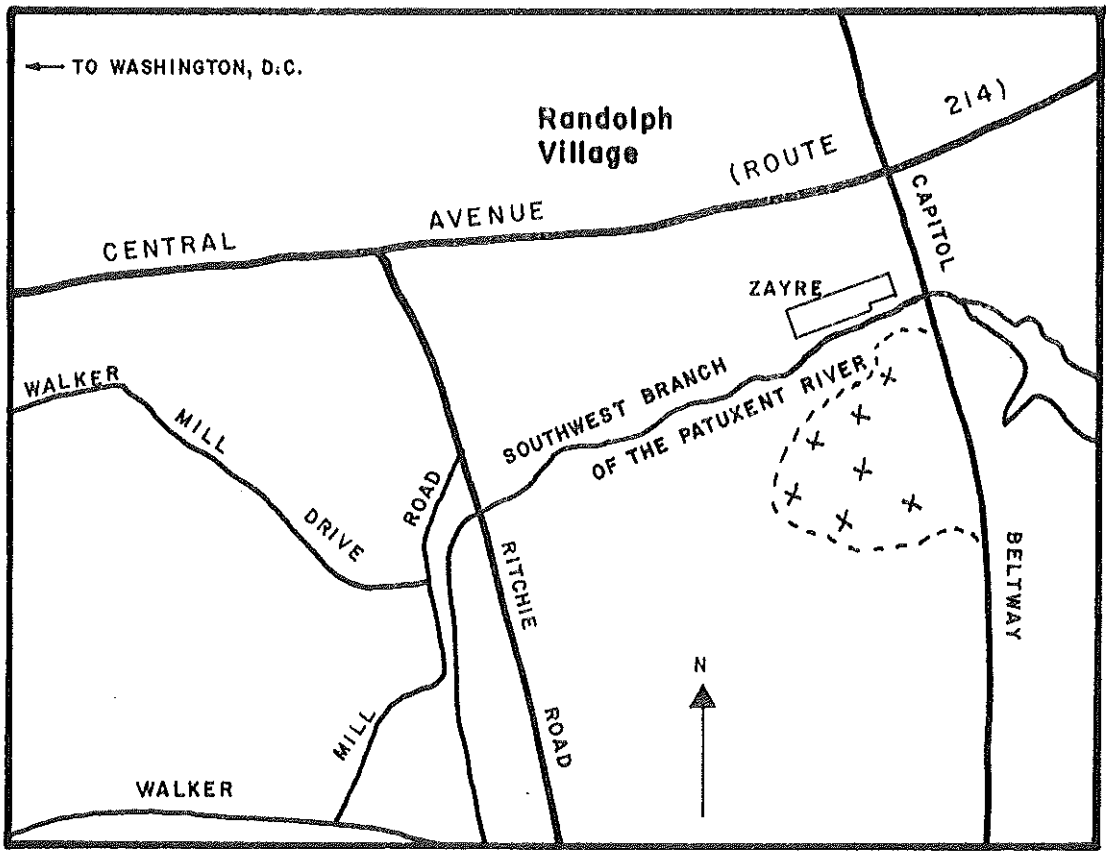
Range 76 degrees, 52 minutes, and 40 seconds; Township 38 degrees, 53 minutes, and 35 seconds, on the Lanham Quadrangle, Prince Georges County, Maryland – 7.5 minute series. The fossil sites are located on a bluff directly behind Zayre's Department store, and just above a tributary and drainage area of the Southwest Branch of the Patuxent River.

INTRODUCTION

Leriche (1919) erected the species *landanensis* for what he thought was a tooth of the genus *Carcharodon*, based upon specimens recovered from the Paleocene of Landana (Cabinda Enclave) in west-central Africa. Leriche (1920) re-established the presence in his fauna of Zaïre (the Congo), of his *Carcharodon landanensis*. It was further discussed and new specimens were illustrated in the work of Dartevelle & Casier (1943: 143-146, and 302-304, and in their Plates numbered: XI, XXVI and XXVIII). Arambourg (1952) described and illustrated *Carcharodon landanensis* from Paleocene (Thanetian) levels in North Africa, in the outcroppings situated at Bou Jniba and Mohammed Chleuh in the Ouled Abdoun Basin, in the Kingdom of Morocco. The latter teeth, though rarer than the ones from Zaïre (the Congo) of Leriche, Dartevelle & Casier's studies, appear to be of the same species.

Casier (1960) erected the new genus *Palaeocarcharodon* and placed Leriche's species *landanensis* in that genus, allowing the older generic name of *Carcharodon* to be used solely for the Pliocene to recent teeth of the modern white shark, *Carcharodon carcharias* (see Case, 1985; Case & Leggett, 1986; Cappetta, 1987). Finally, Cappetta places *Palaeocarcharodon* in the family Cretoxyrhinidae (Cappetta, 1987: 101-102).

The truth of the matter is that Leriche, Arambourg, Dartevelle & Casier failed to thoroughly search the older literature prior to describing the species: *landanensis*, as Sinzow (1899: 101) first erected the species *orientalis* for his *Carcharodon* tooth (an



incomplete specimen, showing a half preserved shark's tooth split vertically and displaying one lateral cusp, in his Plate IV), although he does illustrate two additional specimens in his Plate IV, fig. 35 and 36, which are a bit more complete, and in particular, his fig. 35 compares favorably with Leriche's *landanensis*, as well as those specimens figured by Dartevelle & Casier, and Arambourg.

According to Cappetta (1987: 101) "...it is likely that *Palaeocarcharodon landanensis* and *P. orientalis* are synonyms".

Obruchev (1967) in his editing of the Russian language "Fundamentals of Paleontology", Volume XI, Agnatha, Pisces, (translated that year into the English language, by the Israelis) illustrates two fragmentary examples of the teeth of *Palaeocarcharodon orientalis* (SINZOW). Finally, Case (1973) illustrates both the reverse and obverse of a fine specimen of *P. landanensis* (which is now to become *P. orientalis*) in his figure 105. This same specimen appears in Cappetta (1987: 102) as line drawings A and B of fig. 89.

SYSTEMATIC PALEONTOLOGY

Class **CHONDRICHTHYES**
Subclass **ELASMOBRANCHII**
Cohort **EUSELACHII**
Superorder **GALEOMORPHII**
Order **LAMNIFORMES**
Family **CRETOXYRHINIDAE**

Genus *PALAEOCARCHARODON* CASIER, 1960

Palaeocarcharodon orientalis (SINZOW, 1899)

(Plate 1, Figs. 1-3)

Synonymy

1899 *Carcharodon orientalis* n. sp. — Sinzow, LXXVII, p. 101, pl. IV, figs. 35-37.
1919 *Carcharodon landanensis* — Leriche, CLXIX, p. 480 (name mentioned in text), pl. XXI, fig. ?
1920 *Carcharodon landanensis* n. sp. — Leriche, VIII, p. 84, fig. 6.
1923 *Carcharodon landanensis* LERICHE — Bequaert, XXXIII, I, p. 22.
1927 *Carcharodon landanensis* LERICHE — Leriche, III, p. 60.
1943 *Carcharodon landanensis* LERICHE — Dartevelle & Casier, III, II, p. A/144- A/145, and A/302-A/303, pl. XXVI, fig. 14 (non-serrated); XXVIII, figs. 4-7 (non 9); and XI, figs. 1-6.
1952 *Carcharodon landanensis* LERICHE — Arambourg, p. 118-120, pl. XXI, figs. 7-8.
1960 *Palaeocarcharodon landanensis* (LERICHE) — Casier, III, II, p. B13-B17, pl. 1, figs. 4-5.
1973 *Carcharodon landanensis* LERICHE — Case, p. 30, fig. 105.
1987 *Palaeocarcharodon orientalis* (SINZOW) — Cappetta, 3B, p. 101-102, fig. 89 A-C.

Material: There teeth: a lower anterior tooth (CEN 1), an upper lateral tooth (CEN 2), and an upper posterior tooth (CEN 3).
Locality: Central Avenue Site, outside of Washington, DC, USA.
Age: Late Paleocene (Thanetian Stage).

Description

Anterior, lateral and posterior teeth from the upper and lower jaws, with course, regular and irregular serrations, in general, no robustness, but with generally flat lingual

and labial tooth faces, although a slight concavity exists in some specimens, in the root areas in labial position. With and without lateral cusps.

The anterior tooth (CEN 1, Plate 1, Fig. 1a-b) is erect and rather tall, with one lateral cusp showing, and is probably from the lower jaw. CEN 2, Plate 1, Fig. 2a-b, is a broad, lateral tooth devoid of lateral cusps (side denticles) and is assumed to be from the upper jaw. CEN 3, Plate 1, Fig. 3a-b, is an incomplete upper jaw posterior tooth missing part of its root and the tip of the blade, with a vestigial lateral cusp.

Discussion

Palaeocarcharodon orientalis's origins may be from a branch of the genus *Cretolamna* (Case, 1985; Cappetta, 1987), and possibly represents the earliest representative of this shark in the fossil record.

This paper represents the first occurrence in North America for *P. orientalis*, which had previously only been recovered in the Paleocene of Morocco, Zaïre in West Africa, and in Russia (U.S.S.R.). The specimens of this report now extend the geographical range for *P. orientalis* to three continents.

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The material as described herein will be housed in the collections of the "Laboratoire de Paléontologie", Université de Montpellier II, Montpellier, France. Acronym: CEN.

Photography by Mr. Richard E. Grant, Farmers Branch, Texas, U.S.A.

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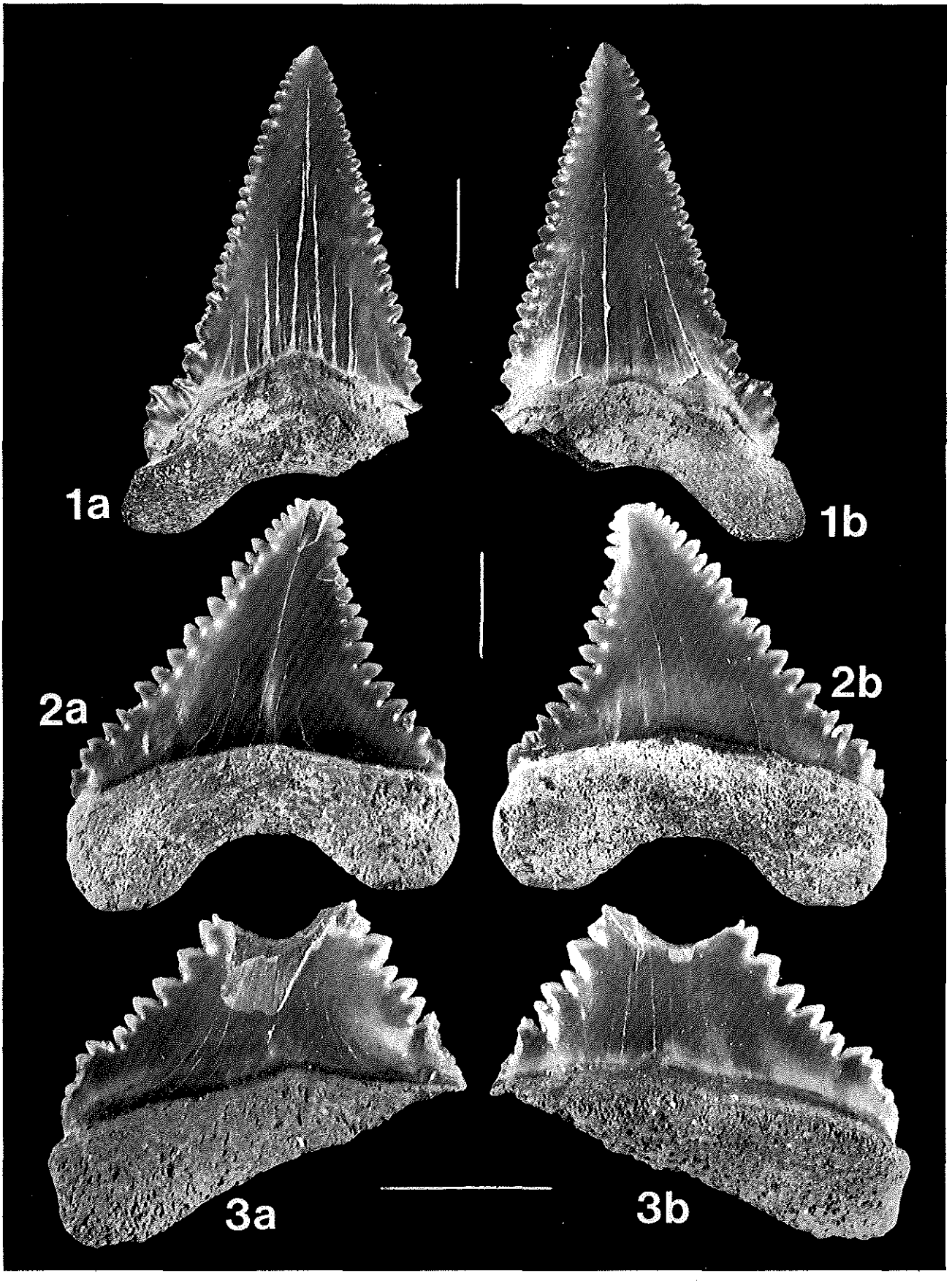
LEGEND OF PLATE

PLATE 1

Fig. 1. – (CEN 1). Anterior tooth, lower jaw. a. Lingual view. b. Labial view. Scale indicates 8 mm.

Fig. 2. – (CEN 2). Lateral tooth, upper jaw. a. Labial view. b. Lingual view. Scale indicates 8 mm.

Fig. 3. – (CEN 3). Posterior tooth, upper jaw. a. Labial view. b. Lingual view. Scale indicates 5 mm.


1a
1b
2a
2b
3a
3b