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Hypolophid Teeth from the Woodbine Formation, Tarrant County, Texas

By **Charles L. McNulty, Jr.**

With 1 plate (I)

INTRODUCTION

The hypolophid teeth of this note occur sparingly but consistently in lenses of phosphatic sandstone in the uppermost Woodbine Formation (*vide*, STEPHENSON, 1952, p. 13) in the environs of Southwest International Airport, Tarrant County, Texas. Beds of similar lithology occur elsewhere in the upper Woodbine of Tarrant and Denton Counties. Such teeth have not been found there, but are to be expected upon careful examination. Most teeth were recovered by disaggregation of the rock and study of the sediment under a stereoscopic microscope, for they are too small and uncommon for casual examination of weathered exposure.

Certain fossil sting ray teeth are characterised by a thick, flat-topped, typically hexagonal crown and a similarly polygonal, but somewhat smaller root that is cut by a prominent basal groove. About a dozen species have been proposed under genera such as *Hypolophus* MÜLLER & HENLE, *Myledaphus* COPE, *Rhombodus* DAMES, which is somewhat different in its prevailingly quadralateral outline of crown, *Hypolophites* STROMER and *Parapaleobates* WEILER. They have been grouped under the *Hypolophinae* STROMER, the *Hypolophidae* LERICHE and divided between the *Hypolophitinae* and *Trygoninae* (WHITE, 1934, p. 38). Most species are found in very late Cretaceous or early Tertiary strata.

The teeth are unusually early for a hypolophid. Externally they are virtually identical to *H. sylvestris* WHITE (see Plate I, figures 1 and 2). But they are strikingly different internally, raising questions of hypolophid relations. Consequently, description of them and their histology appears worthwhile.

I am indebted to Dr. ERROL I. WHITE of the British Museum for specimens of *Hypolophus sylvestris* WHITE and for the loan of jaws of *H. sephan* FORSKÅL, to Dr. WANN LANGSTON, of the Texas Memorial Museum and Dr. BOBB SCHAEFFER, of the American Museum of Natural History, for specimens of *M. bipartitus* and for helpful suggestions.

DESCRIPTION

Plate I, figs. 1–4

Description. Isolated, tritural teeth of polygonal outline; grinding surface smooth and slightly convex; crown sides steeply inclined and projecting beyond the smaller root on all sides; crown slightly higher than root, shape typically distorted hexagonal, rarely rhombic; root shape like crown, sides vertical and ir-

regularly punctate from openings for connective and vascular tissue, bottom flat and cut by a transverse (actually anteroposterior) groove that extends well into the root. Crown composed of dense columnar, dentine which radiates from a sparse net of coarse vascular canals, lying in a horizontal plane located just below the crown boundaries (see Plate I, fig. 1d–f), dentinal tubules appear to enter the enameloid cover; root composed of coarsely porous, osteodentinal tissue, containing irregularly branching canals.

Horizon and *Locality.* Uppermost Woodbine (Cenomanian-Turonian) Formation; exposed in low cuts along road to Central Airlines Operation's Hangar, Southwest International Airport, Tarrant County, Texas.

Repository. Arlington State College Paleontological Collection. Specimens have also been sent to the British Museum and the French National Museum.

DISCUSSION

I could not find in thin sections or external form any indication of a central foramen (*vide*, CASIER, 1947, p. 3, 6, etc.). The same is true of *H. sylvestris* material discussed below.

The external differences between this Woodbine form and *H. sylvestris* are very slight. The latter is somewhat more variable in shape, but this may be more apparent than real for I have less than 50 teeth from the Woodbine. *H. sylvestris* teeth often display considerable abrasion of the crown, and this may be a reflection of the more coarsely porous and consequently less resistant crown, but the question of crown histology and physical resistance is presently controversial (*vide*, SCHAEFFER 1963, p. 16).

However, thin sections show that the Woodbine teeth possess a heavy, presumably resistant, orthodentinal crown; whereas those of *H. sylvestris* show osteodentine continuing from root into most of the crown (Plate I).

This difference kindled a desire to see the histology of *Myledaphus bipartitus*, a relevant American form, and *H. sephan*, the genotypic species. Thin sections of them are shown also in Plate 1. In its possession of a heavy orthodentinal crown *Myledaphus bipartitus* shows basic histologic similarity to the Woodbine material, although there are obvious differences in the details of the structure of the two. In its osteodentinal crown, *H. sephan* shows basically the same structure as *H. sylvestris*, although there are again differences in detail. In this regard, it might be noted that the tooth of *H. sephan* shows a central cavity. Although the specimen sectioned and illustrated here was the only one available to me and open to question on that score, it was a mature tooth from the right lateral margin of the lower jaw. Such a central cavity may be unusual in a hypolophid (*vide*, CASIER, 1947).

It might be added, somewhat parenthetically, that the markedly corrugate crown of *M. bipartitus* is due to variations in thickness of the enameloid material. The thickness variation produces undulations in the summit surface of the columnar dentine, particularly along the transverse axis that divides the grinding surface and its corrugations into anterior and posterior halves.

The scanty histological information presented here suggests the hypolophids to be polyphyletic. The situation resembles that emerging in the ganopristid sawfishes

(SCHAEFFER, 1963). But there is yet insufficient data to perceive, much less propose the relations between the various hypolophids. And I cannot presently imagine how to assign the Woodbine teeth, although it seems that they are a distinct taxon.

Consequently, it can only be suggested that those with access to additional hypolophids examine and report upon their histology. Dual nature of the hypolophid group has been suggested by Dr. WHITE (1934) and implied by the assignment to the dasyatids at one time and the myliobatids at another.

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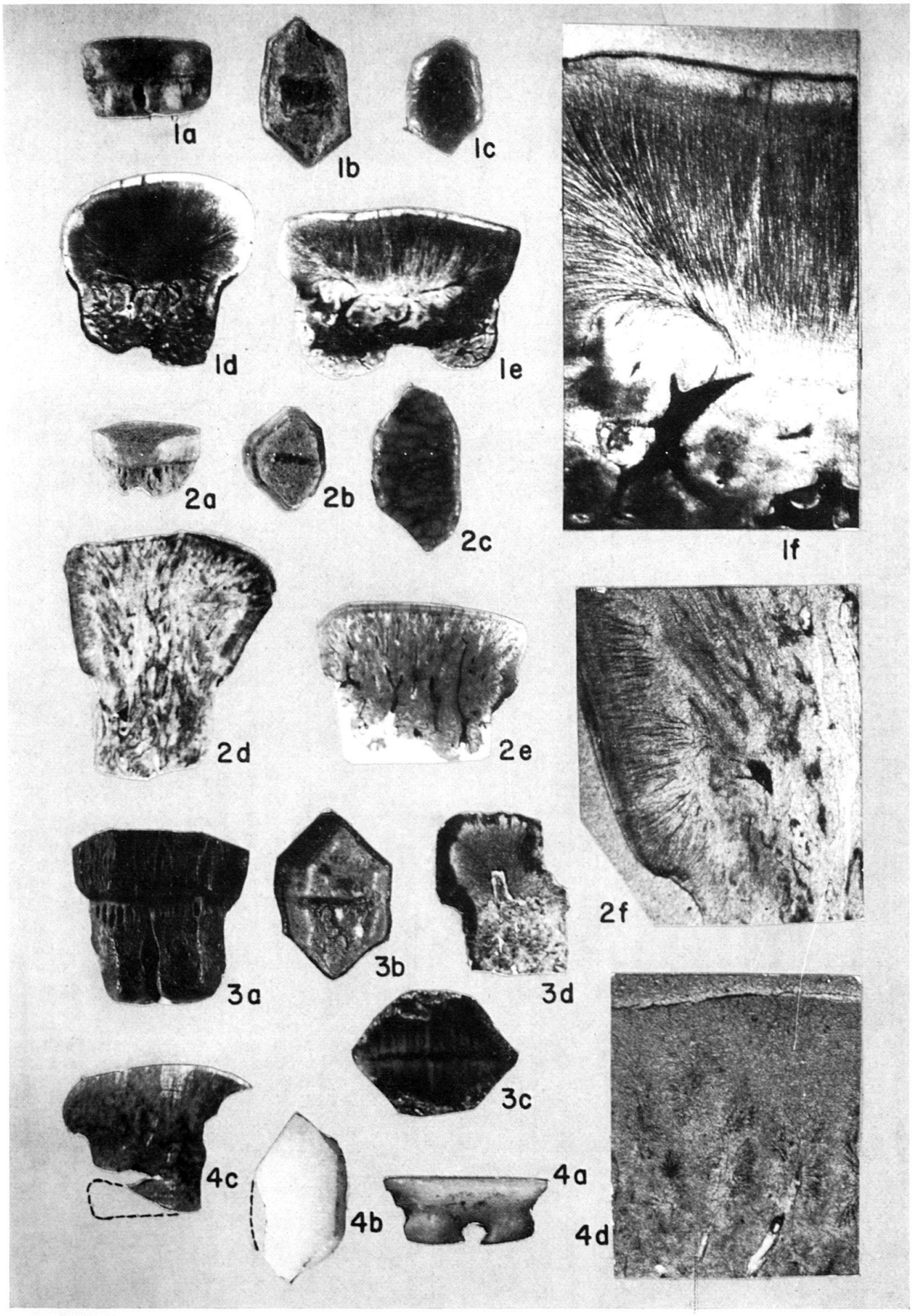
Plate I

Fig. 1a–f. Hypolophid teeth, uppermost Woodbine Formation, Tarrant County, Texas, U.S.A.; a–c × 4, d–e longitudinal and transverse thin sections respectively × 10, f same as e but × 28; ASC Paleontological Collection T-12000 through T-12004.

Fig. 2a–f. *Hypolophus sylvestris* WHITE, Blackheath Beds, Abbey Wood, England; a–c × 4, d–e longitudinal and transverse thin sections respectively × 10, f same as e but × 28; ASC Paleontological Collection T-12005 through T-12009.

Fig. 3a–e. *Myledaphus bipartitus* COPE, Oldman Formation, Steverville, Alberta, Canada; a–c × 4, d longitudinal thin section × 6; ASC Paleontological Collection T-12010 through T-12013.

Fig. 4a–d. *Hypolophus sylvestris* FORSKÅL, specimen from jaws loaned by Dr. E. I. WHITE of the British Museum of Natural History; a–b × 4, c longitudinal section × 10, d the same × 28.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