

A preliminary systematic analysis of Cretaceous guitarfishes from Lebanon

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Abstract

The Late Cretaceous Lebanese guitarfishes, previously described from the Cenomanian-age localities of Haqil and Hgula, and the Santonian Sahel Alma, are re-examined cladistically. A phylogenetic analysis considering 28 characters and 21 terminal taxa, including fossil species (e.g., †*Rhinobatos maronita*, †*R. hakelensis*, †*R. whitfieldi*, †*R. tenuirostris*, †*R. intermedius*, †*R. latus*, †*R. primarmatus*, and †*Rhombopterygia rajoides*) and 13 extant taxa, corroborates the polyphyletic condition of the genus *Rhinobatos*. †*Rhinobatos maronita* and †*R. tenuirostris* are here suggested as forming a clade with the extant *Rhynchobatus* species. The more advanced guitarfishes plus the rajids are rooted as the sister group of the torpediniforms, forming a clade largely unresolved. Our results suggest that a thorough revision of the Cretaceous guitarfishes is required.

Introduction

For the last two centuries rhinobatoids (“guitarfishes”) have been the focus of many studies by both zoologists and paleontologists. Despite the attention, the generic interrelationships among extant taxa are still controversial. NISHIDA (1990) demonstrated the polyphyletic condition of the extant guitarfishes, a view supported by SHIRAI (1992), BRITO & SÉRET (1996), and McEACHRAN et al. (1996). The problems are yet more complicated when fossils are considered because, except for a very few articulated forms, the majority of nominal fossil taxa are based on isolated teeth.

Among the better-preserved Mesozoic batoids are the Late Cretaceous guitarfishes from Lebanon. These fossils come from three localities: the Cenomanian Haqil and Hgula, and the Santonian Sahel Alma. †*Rhinobatos maronita*, from Haqil, was described by PICTET & HUMBERT (1866) and was the first known Lebanese guitarfish. A few years later DAVIS (1877), erected two species from Haqil, †*R. grandis* and †*R. expansus*, and three new species from Sahel Alma: †*R. intermedius*, †*R. latus* and †*R. tenuirostris*.

WOODWARD (1889) reviewed the status of fossil rhinobatoids at the end of the 19th century, including the Lebanese taxa. He considered †*R. grandis* to be a junior synonym of †*Rhinobatos maronita*, and †*R. expansus* synonymous with †*Raja expansa*. He also described †*Raja primarmata* from the Santonian Sahel Alma.

In his important work on the Lebanese collection held in the American Museum of Natural History, HAY (1903) described, among other species, †*Rhinobatos eretes* and †*Raja whitfieldi* from Hgula. SAINT-SEINE (1949), studying the Jurassic fish fauna from Cerin, France, discussed the phyletic problems of guitarfishes, including some Lebanese taxa (e.g., †*R. grandis*, †*R. maronita*, †*R. latus*, †*R. tenuirostris* and †*R. intermedius*), while SIGNEUX (1951) erected †*Rhinobatos berytensis* from the Santonian of Sahel Alma.

CAPPETTA (1980a,b) reviewed the elasmobranch fauna from the Upper Cretaceous of Lebanon. He showed (CAPPETTA, 1980b) that †*Raja primarmata* and †*Rhinobatos berytensis* were the same species, and placed it and †*Raja whitfieldi*, within *Rhinobatos*. In the same paper, he placed †*Raja expansa* into a new genus †*Pararaja*, and created two new guitarfish taxa: †*Rhinobatos hakelensis* and †*Rhombopterygia rajoides*, both from the Cenomanian of Haqil. He also reaffirmed the species †*R. grandis*.

MAISEY (1991) suggested a close relationship between †*R. beurleni* (= †*Iansan beurleni*) from the Lower Cretaceous of Brazil and †*R. hakelensis*, †*R. primarmatus*, and *Platyrrhina*, based on tooth morphology and the form of the snout.

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