

# A review of the Mesozoic Record of the Carcharhiniformes

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## Abstract

Although the Carcharhiniformes represent one of the most diverse and important groups of sharks alive today, their early history is very poorly known. Reinterpretation of previously figured Jurassic and Cretaceous fossils, along with collection of new specimens from the Cretaceous of the British Isles, has allowed the early record of this order to be reinterpreted. Whereas members of only one carcharhiniform family have been previously recorded from the Jurassic, and two from the Cretaceous, it is considered here that fossils of two families are known from Jurassic rocks, and at least five families from the Cretaceous. The relative timing of familial appearances is consistent with the predictions derived from cladistic analyses, although some of the cladogenic events can now be shown to have been earlier than previously recognised.

## Introduction

The Carcharhiniformes sensu COMPAGNO (1973) represent one of the most diverse groups of selachians. Modern examples of this order vary in size from under 30 centimetres to over five metres in length, and are distributed from the ocean floor to intertidal areas, with some species being oceanic pelagics and others entering fresh water. Although much of the radiation within carcharhiniform families occurred within the Caenozoic, a number of families first appeared within the Jurassic and Cretaceous. Despite their importance within modern marine environments and their phylogenetically predicted early radiation (e.g., SHIRAI 1996), the early record of the group is very poorly known. There are eight extant families: the Carcharhinidae, Hemigaleidae, Leptochariidae, Proscylliidae, Pseudotriakidae, Scyliorhinidae, Sphyrnidae, and Triakidae. Only the Scyliorhinidae and the Triakidae have previously been recognised in the Mesozoic, although a number of carcharhiniform teeth have been figured that do not closely match those of extant members of those families (UNDERWOOD 2006).

## Material

Much of the material considered here has been figured in other publications, although the taxonomic affinities of a number of these specimens have been reassessed for this study as described in the text below. In addition, a number of taxa are considered here that have not yet been figured elsewhere. A number these taxa form part of extensive faunas currently under study by the authors. These specimens were recovered from a number of horizons of phosphatic chalk from the Santonian to Lower Campanian of southern England, and from a Coniacian phosphatic greensand from Northern Ireland. In addition, a triakid tooth from the British Cenomanian found in the collections of the Natural History Museum, London, is figured.

All specimens figured here are deposited in the Natural History Museum, London (prefix BHNMP.) or in the Liverpool Museum (National Museums and Galleries on Merseyside) (prefix LIVCM).

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