BULLETIN DE L'INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE, BIOLOGIE, **57:** 41-42, 1987
BULLETIN VAN HET KONINKLIJK BELGISCH INSTITUUT VOOR NATUURWETENSCHAPPEN, BIOLOGIE, **57:** 41-42, 1987

Contributions to the study of the comparative morphology of teeth and other relevant ichthyodorulites in living supraspecific taxa of Chondrichthyan fishes*

Editor: M. STEHMANN

General introduction

by J. HERMAN

The main aim of this series is to present a large variety of photographic material with very concise comments only. It will include several fascicles, which will deal with three subdivisions: Selachians, Batoids and Chimaeroids.
The order of publishing the consecutive fascicles will depend on the completion of the scanning pictures. Each fascicle will deal with one or more families, eventually with a whole order, but they will not necessarily appear in systematic order.
In addition to the oral teeth the other ichthyodorulites of the Batoids and Chimaeroids, such as spinules, thornlets, and thorns will also be presented.
The systematic concepts of the following authors will be considered: A.J. BASS, J.D. d'AUBREY & N. KISTNASAMY, H.B. BIGELOW & W.C. SCHROEDER, J. CADENAT, L.J.V. COMPAGNO, G. DINGERKUS, J.A.F. GARRICK, G. KREFFT, J.D. McEACHRAN, S. SPRINGER, M. STEHMANN, J.H. WALLACE.

PART A: SELACHII

The Selachian micro-teeth of one representative per supraspecific taxon, that have not been fully studied yet, will be figured and described. The large teeth of which an abundant iconography exists, will be described as concisely as possible.
An odontological systematic will be proposed in the form of identification keys that include both large and micro-teeth.
For each taxon, a series of scanning pictures will illustrate the different characteristic forms of teeth in function at their position in the jaws (symphysis, anterior, lateral, commisural, upper and lower...), and an eventual sexual dimorphism.

* This series is dedicated to the memory of Dr. E. CASIER (1904 - 1976).

As far as possible the teeth of mature specimens of medium size of the supraspecific taxon concerned, were selected, as they are most typical.
Whenever different types of tooth morphology are observed among the species of a genus (e.g. *Triakis*), not only teeth of the type species will be presented and commented on, but in addition also those of species representing the extremes of natural and/or interspecific variation and differences.
The detailed study of the tooth morphology of thousands of specimens representing all the living genera, or some 550 species of Chondrichthyans confirmed that teeth are a fundamental systematical tool.
The dermal denticles and fin spines of the Selachians will not be dealt with. Dermal denticles of Selachians were the object of an important monography (W. Reiff, 1985).
As for the litigious cases (doubtful validity of genera or subgenera, such as e.g. *Lepidorhinus, Centroselachus, Rhinotriacis*...), the odontological observations will be more elaborated on, and the degree in which they contribute to validate or invalidate certain hypotheses, will be demonstrated.
Scientific rigour imposes to mention some rare exceptions, such as the difficult odontological distinction between isolated teeth of a few species of *Squatina*, or of *Mustelus*. However, at the superspecific level, tooth morphology is an infallible key character.
The objective of this long-term research is to give evidence that paleontological determinations based on isolated chondrichthyan teeth, which are fairly common fossils, are not merely possible but are reliable.
The scientific work of M. LERICHE brilliantly illustrated their stratigraphical, paleo-ecological and paleo-biogeographical importance.
C. ARAMBOURG enhanced the importance of such studies and E. CASIER developed the study method, and the evolutive implications of the root structures.
Both these eminent successors of LERICHE, as well as all the later disciples, have had difficulties in ascertaining the generic assignment of their fossils because of their lack of knowledge of the dentition of living species.

The zoological literature giving elaborated anatomical and physiological information, or more recently also on social behaviour, sensorial abilities and ecological details, remains very insignificant as far as the morphology and micro-structure of chondrichthyan teeth are concerned.
Though the general shape of the crown may have been superficially described, or illustrated and the number of the tooth rows occasionally determined, further details of ornamentation and micro-ornamentation of the crown, of morphology, vascularization and innervation of the roots, which is fundamental information, are never mentioned. This is particularly true for the small-sized species, which represent more than 90% of this group of fish.
This series of fascicles will try to fill this gap, offering any researcher a commented photographic catalogue of the different types of tooth morphology of all the living supraspecific taxa of the Chondrichthyans. It may enable researchers to detect a link between fossil teeth and a living taxon or to be convinced of their generic uniqueness, respectively to grasp their affinities and to formulate hypotheses concerning their phylogeneses.
The material required for this investigation was provided by recent and ancient collections of European and American institutions, private collections, expeditions made by the authors along the American, African and European coasts, and by donations from friends, who are fishermen.

The North Atlantic deepwater specimens came from many fishermen friends in Brittany, especially P. GUEGUEN, Lorient, whom I accompanied many times. Thanks to them, certain species that had been considered as very rare were collected relatively frequently. The preparation and cleaning of all this material, — for which solutions of pancreatine, pepsine, antiformine were very useful —, required benevolent collaboration of a lot of friends and other researchers.

I would like to point out that fundamental help to obtain basic material was offered by J.V.L. COMPAGNO, and that the practical materialization of this study is due to M. STEHMANN.
The helpfulness of X. MISONNE, director of the I.R.S.N.B. - Brussels, enabled me to obtain the numerous scanning pictures indispensable to launch this project. I would also like to express my gratefulness to D. and M. HOVESTADT for their permanent intense collaboration and friendship.
I am also deeply indebted to H. STOUT, Brussels for the careful printing of the thousands of photographs for this study.

The figured teeth will be deposited in the following institutions:
— Institut Royal des Sciences Naturelles de Belgique (I.R.S.N.B.), Bruxelles, Belgium.
— Natur-Museum und Forschungsinstitut Senckenberg (S.M.F.), Frankfurt/M., F.R. of Germany.