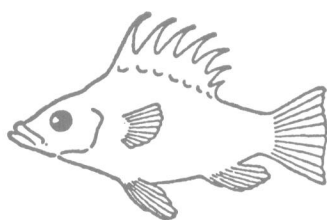


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Number I

Fishes of the
Western North Atlantic



PART SEVEN

Order Iniomi (Myctophiformes)

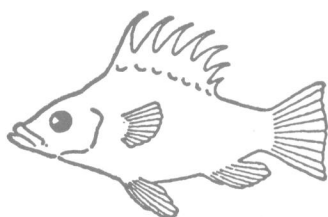
NEOSCOPELIDAE AND MYCTOPHIDAE
and
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NEW HAVEN, 1977

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Fishes of the Western North Atlantic



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In memory of Rolf L. Bolin, who set
the standards in lanternfish taxonomy.

Introduction

THIS seventh part of FISHES OF THE WESTERN NORTH ATLANTIC includes accounts of two ininomous (myctophiform) families for which short interim accounts have previously appeared in Part Five. These are the Neoscopelidae, which has few genera and species, and the Myctophidae, which has many genera and several hundred species in the world's oceans and is exceedingly important in the economy of the open sea. Also included is a special contribution on Atlantic Mesopelagic Zoogeography, based primarily on the species of Myctophidae. This section synthesizes a large amount of data to provide a scheme for relating fish distributions to characteristics of the Atlantic Ocean. These accounts were to have been written by Rolf Bolin, who was unquestionably the leading authority on lanternfishes. Rolf is no longer with us, and we miss him. This volume is dedicated to him.

Recent years have seen a great surge in the exploration of the open sea. As a result, the study of deep-sea fishes is receiving more attention than ever before. Lanternfishes are so abundant and speciose that they must be taken into account in any consideration of the dynamics and energetics of biological communities in oceanic midwaters. We have been fortunate, therefore, in enlisting the efforts of several leading scientists in preparing this volume, which we hope will be a guide and inspiration to others. There is still a great deal to be learned.

Users of this volume will notice that several names of species are spelled slightly differently than in much of the most recent literature. Some of the revised spellings are reversions to the *original spelling*, as used in the description of the species by the author who first named it. This follows a recent decision by the International Commission on Zoological Nomenclature, which had previously ruled that singular male patronyms should end in a single i, whether the original author used none, one, or two. The names so changed here, correctly spelled, are:

Electrona risso

Hygophum reinhardtii

Hygophum bygonii

Gonichthys cocco

Lobianchia gemellarii

Diaphus rafinesquii

Notoscopelus kroeyerii

Ceratoscopelus warmingii

Diaphus dumerilii

The use of diacritical marks in a scientific name is not accepted by the International Code of Zoological Nomenclature, and letters that originally employed an umlaut are to be transliterated (for example, ü becomes ue). This rule has been followed by some workers, but not by others. The names involved here are:

Diaphus luetkeni

Lepidophanes guentheri

Notoscopelus kroeyerii

One other name has been changed here from the spelling currently in use. *Myctophum obtusirostre* employs the correct neuter adjectival ending.

The Synonyms and References sections in this volume are limited to those names and references that were considered most important. For much fuller synonymies, readers should refer to the work by Krefft and Bekker (1973).

Two species names that have appeared in the literature recently, one of them having been in use for a long time, are herein newly relegated to the synonymy of an earlier-named species:

Myctophum selenoides Wisner is placed in the synonymy of

Myctophum selenops Tåning.

Diaphus elucens (Brauer) is placed in the synonymy of

Diaphus perspicillatus (Ogilby).

The following abbreviations have been used throughout in order to avoid repetition of the names of natural history collections housing the preserved specimens upon which the accounts have been based.

AMS	—	Australian Museum, Sydney
BMNH	—	British Museum (Natural History), London
BOC	—	Bingham Oceanographic Collection, Yale University, New Haven
CAS(SU)	—	Stanford University collections, now at California Academy of Sciences, San Francisco
ISH	—	Institut für Seefischerei, Hamburg
LACM	—	Los Angeles County Museum of Natural History
MCZ	—	Museum of Comparative Zoology, Harvard University
MMF	—	Museu Municipal do Funchal, Madeira
MOM	—	Musée Océanographique, Monaco
NMFS	—	National Marine Fisheries Service
NRMG	—	Naturhistoriska Riksmuseet, Göteborg
RMNH	—	Rijksmuseum van Natuurlijke Historie, Leiden
ROM	—	Royal Ontario Museum of Zoology, Toronto
SIO	—	Scripps Institution of Oceanography, La Jolla
USNM	—	National Museum of Natural History, Washington
WHOI	—	Woods Hole Oceanographic Institution
ZMHU	—	Zoologisches Museum der Humboldt Universität, Berlin
ZMO	—	Zoologisk Museum, Oslo
ZMUC	—	Zoological Museum, University of Copenhagen

Other often used abbreviations are:

TL	—	total length
SL	—	standard length
hl	—	head length
m.w.		
or m.w.o.	—	meters of wire out
f.w.o.	—	feet of wire out

The editors are grateful to the authors for their contributions and to the home institutions of the authors for supporting their work. We also thank the several agencies and foundations that have supported the authors in many ways, as the authors have noted in their acknowledgments. The museum community deserves special appreciation, for without their cooperation, good and comprehensive studies as exemplified by this series would be impossible. Finally, we renew our thanks to the Sears Foundation for the publication of this volume. The Editor-in-Chief points out the many services provided by the Smithsonian Institution during preparation of this volume and thanks Mrs. Jane Shaw for her diligence and hard work in preparing the manuscript for the printer and seeing it through to publication.

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Washington, D. C.

ROBERT H. GIBBS, JR.
Editor-in-Chief

Fishes of the
Western North Atlantic

Part 7

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Family Neoscopelidae

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This study received financial support through a grant (GB 13389) from the National Science Foundation.

General Characters. Deep-sea pelagic and benthopelagic fishes with compressed bodies and heads. Eyes lateral, small in *Scopelengys* and *Solivomer*, large in *Neoscopelus*. Mouth large, terminal; upper jaw extending to or beyond vertical through posterior margin of orbit; maxillary greatly expanded and truncate posteriorly, toothless and completely excluded from the gape by the premaxillary. Dorsal fin well in advance of anal fin. Adipose fin present. Lateral-line organs weakly developed. Scales large, deciduous and cycloid, except in *Solivomer arenidens*, which has ctenoid scales on body and cycloid ones on head (Miller, 1947). Luminous organs present in *Neoscopelus* only.

Dentition. In general, premaxillaries and dentaries with closely set villiform teeth; a band of small teeth on each palatine and similar ones on vomer and basibranchials.

Skeletal Characters. Six circumorbital bones. Subocular shelf absent. A long slender supra-maxillary present along dorsal margin of posterior part of maxillary. Branchiostegals 8 in *Scopelengys*, 8–9 in *Neoscopelus*, and 10 (9–11) in *Solivomer*. Gill rakers well developed. Vertebrae 29–35. Three ventral and 4 dorsal hypurals; 3 epurals. Six to 8 dorsal and 5–7 ventral, soft procurrent caudal-fin rays; principal caudal-fin rays 10 (9) dorsal and 9 (8) ventral. Pelvic-fin rays 8. A small, spinelike splint at base of 1st dorsal-, 1st anal-, uppermost pectoral-, and outermost pelvic-fin ray in *Neoscopelus*; the same element is either very soft or absent altogether in *Scopelengys*.

Luminous Organs. The species of *Neoscope-lus* have numerous photophores arranged linearly in horizontal series on the ventral part of the body and along the periphery of the tongue (Fig. 1). The photophores are superficial, oval in shape with a rim of black pigment along their dorsal and posterior margins. Their

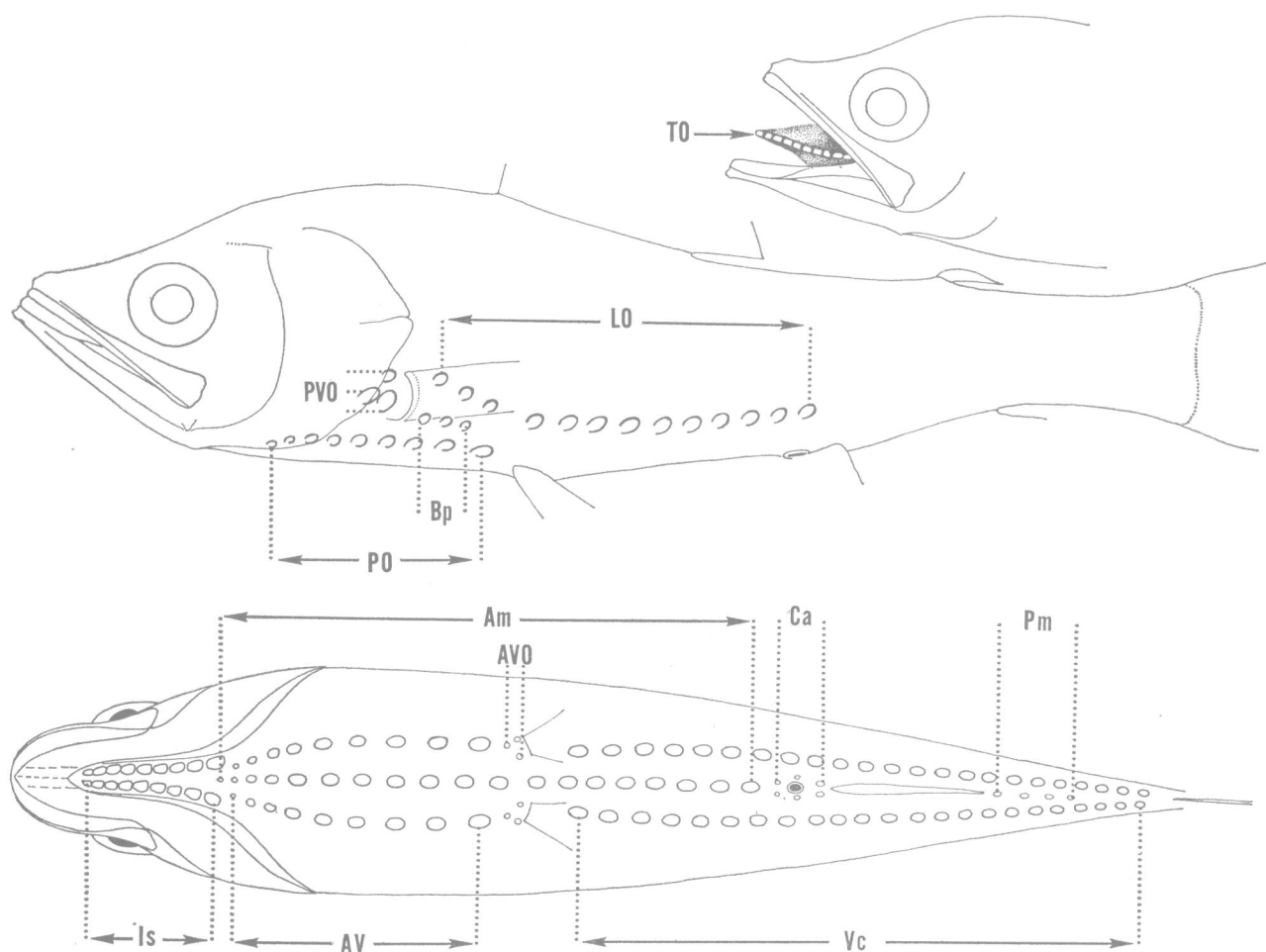


FIGURE 1. Arrangement of photophores in *Neoscopelus*. Terminology follows Matsubara (1943). Am, anteromedian; Av, anteroventral; AVO, accessory ventral; Bp, basipectoral; Ca, circumanal; Is, isthmus organs; LO, lateral; Pm, posteromedian; PO, thoracic; PVO, prepectoral; TO, tongue organs; Vc, ventrocaudal.

anteroventral margins are often indistinct, the reflective layer fading into the surrounding silver of the lower half of the body. The small mass of photogenic tissue is restricted to the posterodorsal or posterior part of each organ. The scales overlying the photophores are not modified into lenses. No other luminous organs or luminous tissue are evident on the bodies and heads of these fishes.

Swimbladder. A swimbladder is present in the monotypic *Solivomer* (Miller, 1947) and in *Neoscopelus*. The organ is absent in *Scopelengys*.

The swimbladder of *Neoscopelus macrolepidotus* was found by Marshall (1960: 42) to be capacious, with a gas gland that covers

some two-thirds of its floor and supplied by 5 massive retia mirabilia. Marshall was able to find no trace of an oval or of any specialized region that might function in gas resorption.

Development. The larvae of *Scopelengys* have been studied by Moser and Ahlstrom (1970: 142) and found to bear a striking resemblance to certain myctophid larvae, especially those of the genus *Lampanyctus*. In their recent review of the genus *Scopelengys*, Butler and Ahlstrom (1976) described and illustrated a 13.9-mm larva of *Scopelengys tristis* and a 15.2-mm larva of a new species of this genus from the central North Pacific Ocean.

Diversity and Range. The Neoscopelidae are