Head and trunk compressed. Eyes large. Mouth usually terminal (inferior in Loweina, Gonichthys and Centrobranchus); jaws extending to or far beyond vertical through posterior margin of eye. Jaws (premaxillaries in upper, and dentaries in lower jaws) with bands of closely-set teeth, the inner ones of which may be enlarged; posterior teeth on jaws broad-based and strongly hooked forward in some species of Diaphus. Teeth also present on roof of mouth (palatines with a long, narrow band of closely-set small teeth or with one or two rows of enlarged, widely-spaced ones; mesopterygoids with a patch of closely-set and small or widely-spaced and enlarged teeth; most species with a cluster of minute teeth on each side of vomer). Branchiostegal rays 7 to 11, but there may be as few as 6 and as many as 12. Well developed gill rakers present in all genera except Centrobranchus. All fins lacking spines; adipose fin present; origin of anal fin under or close behind base of dorsal fin. Pelvic fins with 8 rays, except in Notolychnus (6) and Gonichthys (sometimes 7); caudal fin with 10 dorsal and 9 ventral principal rays. Discrete, round or kidney-shaped photophores in distinct groups on trunk and head of all species except Taaningichthys paurolychnus. Much smaller, secondary photophores on trunk and head in some species. Additional luminous organs of various shapes and sizes present on head, caudal peduncle, or on both. Scales usually cycloid or smooth to touch (ctenoid or comb-like in a few species of Myctophum), firm in forms found in relatively shallow depths, loose and easily lost in deeper-dwelling species.

Colour: the majority of lanternfishes are brown to nearly black. Those that live in relatively shallow depths (e.g., Gonichthys Centrobranchus) are silvery, and members of the genera Diaphus and Lobianchia have bluish iridescens scales, especially along the lateral line.

Myctophids range in size (adults) from about 2 cm to 30 cm. They are very common and occur in all oceans, from arctic to antarctic waters, and from the very surface at night to depths exceeding 2 000 m. They have been collected predominantly in open oceanic waters but are also found over continental and island shelves. The adults of a number of species have been observed and/or taken very near the bottom. With few exceptions, myctophids migrate from their daytime depths to the upper, mixed layer at night. While many spend the night at depths between 30 and 100 m, a good number of species enter the uppermost 10 m. Several of the latter are commonly dipnetted at the surface or taken with neuston nets.
Although abundant and widespread, myctophids are only now beginning to draw attention as a potentially exploitable source of animal protein. Some 15 t of a single species, Diaphus dumerilii, were taken in a single haul at a depth of 260 to 265 m off Uruguay (R/V WALTHER HERWIG sta. 208/1966, Institut für Seefischerei, Hamburg). Myctophids (mostly Lampanyctodes hectoris) have accounted for 0.30 percent to 10.45 percent of the total fish catch landed by South African pelagic fishing boats during the years 1969-73. Results of recent biochemical experiments in the Soviet Union do not preclude the use of the southern hemisphere myctophid, Gymnoscopelus nicholsi, for human consumption.

To date, more than 340 species of myctophids have been described. These have been assigned to some 50 genera. Of the approximately 240 species (30 genera) currently recognized, 83 species (21 genera) occur in the Western Indian Ocean (Fishing Area 51).

SIMILAR FAMILIES OCCURRING IN THE AREA:

Gonostomatidae: posterior portion of upper jaw contributed by toothed maxilla (MAX); dorsal and anal fins generally displaced posteriorly; one or more horizontal rows of photophores on ventral part of body and head.

Neoscopelidae: maxilla (MAX) greatly expanded posteriorly and, as in Myctophidae, completely excluded from gape by toothed premaxilla (PREMAX); dorsal fin well in advance of anal fin; large, oval-shaped, superficial photophores arranged linearly in horizontal series on ventral part of body and along periphery of tongue.
KEY TO GENERA OCCURRING IN THE AREA:

1 a. Minute, "secondary" photophores on head, on body under each scale, and on fin membranes; "primary" body photophores (i.e., PLO, PO, VO, etc.) indistinct (= Fig. 1) ........................................ Scopelopsis

1 b. "Secondary" photophores absent or, if present, clearly distinct from "primary" body photophores

2 a. Three photophores (VLO, SAO3 and Pot very close to dorsal contour of body; 2 Prc; Prc2 well above midlateral line (Fig. 2) ........................................ Notoicyynchus

2 b. No photophores close to dorsal contour of body; 2 or more Prc; Prc2 never above horizontal septum or lateral line

3 a. PLO (see Figs. 4 to 6) from less than its diameter above to well below level of upper end of base of pectoral fin

4 a. PLO well below level of upper end of base of pectoral fin; AO not distinctly divided into AOa and AOp; Pol not differentiated; mouth terminal, snout no', protruding; caudal peduncle not markedly slender, its least depth less than 2.5 times in its length (Fig. 3)

5 a. PLO in front of and, often, slightly higher than PVO1; PLC), PVO1 and PVO2 on a somewhat angulated line (Fig. 4) ........................................ Protomyctophum

5 b. PLO over PVC1; PLO, PVO1, and PVO2 forming a triangle (Fig. 5) ............... Electrona

4 b. PLO at or slightly above level of upper end of base of pectoral fin; AO divided into AOa and AOp; Pol well differentiated; mouth subterminal, snout more or less protruding; caudal peduncle markedly slender, its least depth 2.5 times or more in its length (Fig. 6)

6 a. Gill rakers absent .................. Centrobranchus

6 b. Gill rakers present

7 a. Origin of anal fin about under middle of base of dorsal fin; none or only one AOp over base of anal fin; least depth of caudal peduncle about 2.5 times in its length (Fig. 7). ............ Loweina

*Abbreviations correspond to designations of luminous organs
7 b. Origin of anal fin on or slightly in front of vertical through end of base of dorsal fin; 5 to 7 AOp over base of anal fin; least depth of caudal peduncle 3.5 times or more in its length (Fig. 8) ............... ............ ..... Gonichthys

3 b. PLO More than its diameter above level of upper end of base of pectoral fin

8 a. PVO₂ well above level of upper end of base of PLO pectoral fin

9 a. Two, sometimes 3, Pol horizontally arranged; AO₁ not elevated; 3 (2+1) Prc (Fig. 9) ........................... Notooscopelus

9 b. Two Pol vertically or subvertically arranged; AO₁ elevated; 5 (4+1) Prc (Fig. 10) ........................................ Gyrnoscopelus (subgenus Nasolychnus)

8 b. PVO₂ at or below level of upper end of base of pectoral fin

10 a. Two Prc

11a. PVO arranged horizontally or nearly so, with PVO₁ not more than its diameter below level of PVO₂; VO₂ more or less elevate

12a. Prc₂, much higher than Prc₁, lying twice its own diameter or less below lateral line; small, simple teeth on premaxillaries and dentaries (Fig. 11)......... Benthosema

12b. Pre₂ slightly higher than Prc₁; premaxillary teeth flattened, lanceolate, many with minute denticle on each edge at widest point; outer anterior teeth on dentary close-set and flattened, posterior ones broad-based and sharply hooked forward (Fig. 12) ................ Diogenichthys

11b. PVO on an inclined line, with PV0₁ more than its own diameter below level of PVO₂; all VO at same level

13 a. Two Pol (Fig. 13) .......... Hygophum

13 b. One Pol
14 a. SAO strongly angulated; SAO\textsubscript{1} in advance of, seldom directly over VO\textsubscript{3} (Fig. 14). ........... *Symbolophorus*

14 b. SAO on a straight or slightly angular line; SAO\textsubscript{1} behind VO\textsubscript{3} (Fig. 15) .................. *Myctophum*

10 b. More than 2 Pre or Pre absent

15 a. More than 4 Pre

16 a. PVO arranged horizontally or nearly so; PO\textsubscript{3} elevated; Aoa\textsubscript{1} not elevated; 1 Pol; SAO\textsubscript{3} and Pol low (Fig. 16) ............. *Lampanyctodes*

16 b. PVO arranged vertically or nearly so; PO\textsubscript{3} not elevated; Aoa\textsubscript{1} elevated; 2 Pol, SAO\textsubscript{3} and Pol\textsubscript{2} high (Fig. 17) ........... *Gymnoscopelus* (subgenus *Gymnoscopelus*)

15b. Three to 4 Pre or Pre absent; PVO not arranged horizontally or nearly so; PO\textsubscript{3} and PO\textsubscript{5} not elevated

17 a. First PO and 2 PVO on a straight, ascending line; first 3 VO on a straight ascending line; males with supracaudal, females with infracaudal luminous glands or caudal glands absent; 4 Prc

18 a. More than one pair of luminous organs on head; caudal luminous glands absent; usually a luminous scale at PLO (Fig. 18) .................. *Diaphus*

18 b. Only one pair (Dn) of luminous organs on head; supracaudal (males); and infracaudal (females) luminous glands well developed; no luminous scale at PLO (Fig. 19) ................. *Lobianchia*

17 b. First PO and 2 PVO not on a straight line; first 3 VO not on a straight, ascending line; both sexes with supracaudal and infracaudal luminous glands; 3 to 4 Prc

19 a. Caudal luminous glands large, undivided, bordered by black pigment; one Pol or none; 3 Pre or none (Fig. 20)
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20 a. Origin of dorsal fin directly ever or somewhat in front of base of pelvic fin; photophores well developed; 3 SAO; lateral line well developed; no large crescent of whitish tissue on posterior half of iris (except for L. chavesi which has one on dorsal half of iris) (Fig. 21) ........................................ Lampadena

20 b. Origin of dorsal fin behind base of pelvic fin; photophores present or absent; if present, poorly developed; one SAO; lateral line very poorly developed or absent; a large crescent of whitish tissue on posterior half of iris (best seen in preserved specimens)(Fig.22)............................ Taaningichthys

19 b. Caudal luminous glands consisting of a series of overlapping scale-like structures not bordered by black pigment; 2 Pol; 3 to 4 Pre (Fig. 23)

21a. PO₄ not elevated; luminous scale-like structures midventrally between bases of pelvic fins or between bases of pelvic fins and anus; 4 Pre (Fig. 24) .................. Ceratoscopelus

21b. PO₄ highly elevated; no luminous scale-like structures midventrally between bases of pelvic fins or between bases of pelvic fins and anus; 3 to 4 Prc

22 a. Four VO; 4 Prc (Fig.25) ...................... Lampanyctus

22 b. Five VO; 3 Prc

23a. SAO strongly angulated (as in Lampanyctus, Fig. 25), a line through SAO₁ and SAO₂ not intersecting VO series; 3 Prc evenly spaced or nearly so; luminous tissue, other than photophores, restricted to caudal glands (Fig. 26) ............................... Triphoturus

23 b. SAO weakly angulated, a line through SAO₁ and SAO₂ intersecting VO series; 3 Prc in a 2 + 1 configuration; patches of luminous tissue at bases of median and, often, paired fins, anterior part of trunk and on top of head (Fig. 27)......................... Bolinichthys
LIST OF SPECIES OCCURRING IN THE AREA:

- **Benthosema fibulatum** (Gilbert & Cramer, 1897)
- **Benthosema pterotaa** (Alcock, 1891)
- **Benthosema suborbitale** (Gilbert, 1913)

- **Bolinichthys indicus** (Nafrican & Nafrican, 1969)
- **Bolinichthys longipes** (Brauer, 1906)
- **Bolinichthys photothorax** (Parr, 1928)

- **Centrobranchus andreae** (Lütken, 1892)
- **Centrobranchus nigrocellatus** (Günther, 1873)

- **Ceratoscopelus warmingii** (Lütken, 1892)

- **Diaphus aliciae** Fowler, 1934
- **Diaphus antonbruuni** Nafrican, 1978
- **Diaphus arabicus** Nafrican, 1978
- **Diaphus brachycephalus** Tåning, 1928
- **Diaphus coeruleus** (Klunzinger, 1871)
- **Diaphus diadematus** Tåning, 1932
- **Diaphus diademophilus** Nafrican, 1978
- **Diaphus drachmanni** Tåning, 1932
- **Diaphus effulgens** (Goode & Bean, 1896)
- **Diaphus fragilis** Tåning, 1928
- **Diaphus fulgens** (Brauer, 1904)
- **Diaphus garmani** Gilbert, 1906
- **Diaphus holti** Tåning, 1918
- **Diaphus jenseni** Tåning, 1932
- **Diaphus knappi** Nafrican, 1978
- **Diaphus lobatus** Nafrican, 1978
- **Diaphus lucidus** (Goode & Bean, 1896)
- **Diaphus luetkeni** (Brauer, 1904)
- **Diaphus malayanus** Weber, 1913
- **Diaphus meadi** Nafrican, 1978
- **Diaphus megalops** Nafrican, 1978
- **Diaphus metopoclampus** (Cocco, 1829)
- **Diaphus mollis** Tåning, 1928
- **Diaphus nielseni** Nafrican, 1978
- **Diaphus ostenfeldi** Tåning, 1932
- **Diaphus parti** Tåning, 1932
- **Diaphus perspicillatus** (Ogilby, 1898)
- **Diaphus phillipsi** Fowler, 1934
- **Diaphus problematicus** Parr, 1928
- **Diaphus regani** Tåning, 1932
- **Diaphus richardsoni** Tåning, 1932
- **Diaphus signatus** Gilbert, 1908
- **Diaphus splendidus** (Brauer, 1904)
- **Diaphus suborbitalis** Weber, 1913
- **Diaphus thiolierei** Fowler, 1934
- **Diaphus watasei** Jordan & Starks, 1904

- **Diogenichthys panurgus** Bolin, 1946
- **Electrona paucirastra** Bolin in Andriashev, 1962
- **Electrona risso** (Cocco, 1829)
- **Electrona ventralis** Becker, 1963

- **Gonichthys barnesi** Whitley, 1943

- **Gymnoscopelus (Nasolychnus) fraseri** (Fraser-Brunner, 1931)
- **Gymnoscopelus (Nasolychnus) microlampas** Hulley, 1981
Hygophum hansenii (Tåning, 1932)
Hygophum hygonii (Lütken, 1892)
Hygophum proximum (Becker, 1965)

Lampadena anomala Parr, 1928
Lampadena chavesi Collette, 1905
Lampadena dea Fraser-Brunner, 1949
Lampadena luminosa (Garman, 1899)
Lampadena notialis Nafpaktitis & Paxton, 1968
Lampadena speculigera Goode & Bean, 1896

Lampanyctodes hectoris ( Günther, 1876)
Lampanyctus achirus Andriashev, 1962
Lampanyctus alatus Goode & Bean, 1896
Lampanyctus ater Tåning, 1928
Lampanyctus australis Tåning, 1932
Lampanyctus intricarius Tåning, 1928
Lampanyctus lepidolychnus Becker, 1967
Lampanyctus lineatus Tåning, 1928
Lampanyctus macropterus (Brauer, 1904)
Lampanyctus nobilis Tåning, 1928
Lampanyctus pusillus (Johnson, 1890)
Lampanyctus steinbecki Bolin, 1939
Lampanyctus tenuiformis (Brauer, 1906)

Lobianchia dobleini (Zugmayer, 1911)
Lobianchia gemellarii (Cocco, 1838)

Loweina interrupta (Tåning, 1928)

Myctophum asperum Richards 7845
Myctophum aurolaternatum Garman, 1899
Myctophum nitidulum Garman, 1899
Myctophum obtusirostre Tåning, 1928
Myctophum phengodes (Lütken, 1892)
Myctophum spinosum (Steindachner, 1867)

Notolychnus valdiviae (Brauer, 1904)

Notoscopelus caudispinosus (Johnson, 1863)
Notoscopelus resplendens (Richardson, 1845)

Protomyctophum normani (Tåning, 1932)
Protomyctophum parallelum (Ldnnberg, 1905)
Protomyctophum subparallelum (Tåning, 1932)

Scopelopsis multipunctatus Brauer, 1906

Symbolophorus barnardi (Tåning, 1932)
Symbolophorus evermanni (Gilbert, 1905)
Symbolophorus rufinus (Tåning, 1928)

Taaningichthys bathyphilus (Tåning, 1928)
Taaningichthys minimus Tåning, 1928
Taaningichthys paurolychnus Davy, 1972

Triphoturus nigrescens (Brauer, 1904)