32

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

Stuttgarter Beiträge zur Naturkunde

Serie A (Biologie)

Herausgeber:

Staatliches Museum für Naturkunde, Rosenstein 1, D-7000 Stuttgart 1

Stuttgarter Beitr. Naturk.	Ser. A	Nr. 450	9 S.	Stuttgart, 31. 8. 1990

A New Species of the Lantern Shark Genus *Etmopterus* from Southern Africa (Elasmobranchii: Squalidae)

By Ronald Fricke and Isabel Koch, Stuttgart

With 4 figures and 1 table

SMITHSONIAN NOV 29 1990 LIBRARIES

Summary

Etmopterus compagnoi **n. sp.** is described from the lower continental shelf and upper continental slopes of South Africa. It is closely related to *Etmopterus spinax* from the northeastern Atlantic, but characterized by its strongly bent, stout, bristlelike lateral trunk denticles, by the distance between the corners of the mouth which is greater than the preoral length, the prepectoral fin length 4.6–5.2 in TL[1]), the interorbital 2.48–2.90 in head length, the suprapelvic dark streak which extends before the beginning of the pelvic fin, and the presence of black streaks on the second dorsal fin. A key to South African species of *Etmopterus* is presented.

Zusammenfassung

Etmopterus compagnoi **n. sp.** wird vom unteren Kontinentalschelf und vom oberen Kontinentalabhang Südafrikas beschrieben. Von der nah verwandten Art *Etmopterus spinax* unterscheidet sie sich durch folgende Merkmale: dicke, flexible, stark gebogenen Zähnchen in der lateralen Rumpfhaut; Distanz zwischen den Mundwinkeln größer als die Präorallänge; Präpektorallänge 4,6–5,2 in Totallänge; Interorbitale 2,48–2,90 in Kopflänge. Der suprapelvikale dunkle Streifen reicht bis vor den Beginn der Bauchflosse, und auf der zweiten Rückenflosse befinden sich zwei schwarze Linien. Der Bestimmungsschlüssel für die südafrikanischen *Etmopterus*-Arten wurde überarbeitet.

1. Introduction

Etmopterus Rafinesque-Schmaltz, 1810 is a genus of small squalid sharks of the continental shelf and continental slopes which is characterized by its upper jaw teeth which have lateral cusps while the lower jaw teeth are bladelike, and the presence of

[1]) Proportion "prepectoral fin length 4.6–5.2 in TL" means "prepectoral fin length 4.6–5.2 times in total length"; the value is calculated by dividing the total length (TL) by the prepectoral fin length.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

minute light organs scattered on the sides of the body. The genus is distributed worldwide in tropical and temperate waters.

Etmopterus was revised by COMPAGNO (1984: 69–88), who recognized a worldwide total of 17 valid species. Since 1984, the following species were described as new: *Etmopterus perryi* and *E. carteri* from the Caribbean Sea by SPRINGER & BURGESS (1985: 585–591), *E. schmidti* by DOLGANOV (1986:149–151), and *E. splendidus* from Japan and Indonesia by YANO (1988: 421–425).

The South African species of *Etmopterus* were recently treated by BASS et alii (1986: 55–57); a total of 5 species from the area was recognized: *Etmopterus brachyurus* Smith & Radcliffe, 1912 (1912: 677–685); *E. granulosus* (Günther, 1880) (1880: 19, pl. 2 C); *E. lucifer* Jordan & Snyder, 1903 (1903: 79); *E. pusillus* (Lowe, 1839) (1839: 19); *E. sentosus* Bass, D'Aubrey & Kistnatsamy, 1976 (1976: 22). In addition, specimens of a sixth species „*Etmopterus* sp." were described (BASS et alii 1986: 57), allied to and probably previously misnamed as *Etmopterus spinax,* which could not definitely be named as a new species but appeared to be distinct from *E. spinax* (Linnaeus, 1758) (1758: 233).

Specimens of this *Etmopterus* sp. from South Africa were presented to the Staatliches Museum für Naturkunde in Stuttgart by R. RAU (Cape Town, South Africa) in 1965. During a recent re-examination of the material and a revisionary study of the *Etmopterus spinax* complex, it turned out to be a species unknown to science which is described in the present paper.

2. Methods and Materials

Methods follow COMPAGNO (1984), SPRINGER & BURGESS (1985) and BASS et alii (1986).

The type material of the new species is deposited in the Staatliches Museum für Naturkunde, Stuttgart (SMNS). Comparative material from the following institutions was examined:

BM (NH) = British Museum (Natural History) (London); – *ISH* = Bundesforschungsanstalt für Fischerei, Institut für Seefischerei (Hamburg); – *NZNM* = New Zealand National Museum (Wellington, New Zealand); – *SMNS* = Staatliches Museum für Naturkunde (Stuttgart); – *USNM* = National Museum of Natural History, Smithsonian Institution (Washington D.C.); – *ZMB* = Zoologisches Museum der Humboldt-Universität (Berlin, GDR).

3. *Etmopterus compagnoi* new species (Figs. 1, 2A)

Etmopterus spinax (non Linnaeus, 1758): BARNARD, 1925: 49 (Cape Point, South Africa, 417 fms.). COMPAGNO, 1984: 85 (part: South Africa). WHITEHEAD et alii, 1984: 141 (part: South Africa).
Etmopterus granulosus (non Günther, 1880): SMITH, 1953: 58–59 (part).
Etmopterus sp.: BASS et alii, 1986: 57, fig. 5.16 (South Africa).

Holotype: SMNS 8999, 1 male, 327 mm TL, off Cape Town, South Africa, 34°41′S 18°37′E, R. RAU, 1965.
Paratypes: SMNS 9000, 3 females, 282–358 mm TL, with the same data as the holotype.

Etymology

Etmopterus compagnoi n. sp. is named in honour of Dr. L. J. V. COMPAGNO appreciating his excellent revision of the sharks of the world.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

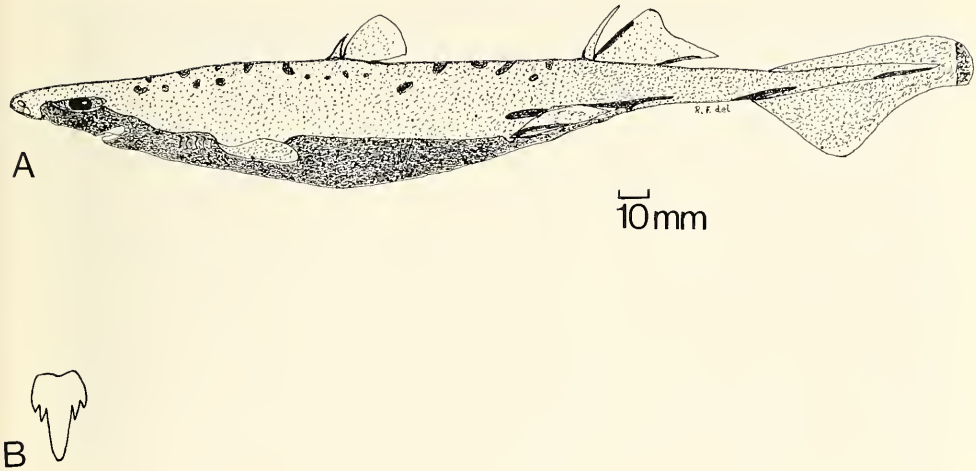

Fig. 1. *Etmopterus compagnoi* n. sp.; holotype, SMNS 8999, male, 327 mm TL, off Cape Town, South Africa. – A. Lateral view, – B. Median tooth from the upper jaw.

Diagnosis

A moderately stout-bodied lanternshark with a fairly long tail; lateral trunk denticles with relatively slender, strongly bent conical crowns, stouter than those of *E. spinax;* upper jaw teeth with less than 3 lateral pairs of cusplets; distance between corners of mouth greater than preoral length; interorbital 2.5–2.9 in head; prepectoral length 4.6–5.2 in total length.

Description

Head length in the male 5.7 in TL, in the females 5.95–6.25 in TL. Maximum head width 1.5–1.9 in head length. Eyes moderately large, horizontal eye diameter in the male 3.4 in head, in the females 2.4–3.0 in head. Anterior and posterior corners of eye acute, posterior corner slightly before mid of upper jaw. Preorbital length 3.0–4.1 in head. Interorbital distance 2.4–2.9 in head. Nasal apertures moderately large, oblique, nearly triangular, not visible from above. Prenasal length 9.2–15.0 in head. Internasal width 3.3–6.5 in head. Maximum snouth width 1.9–2.4 in head. Lower jaw width 2.0–3.0 in head. Preoral length 1.9–2.3 in head. Spiraculum slightly before corner of mouth. Prespiracular length 1.1–1.5 in head. Body moderately stout. Maximum body depth in the male 7.8 in TL, in the females 8.2–9.7 in TL. Maximum body width in the male 16.0 in TL, in the females 11.6–12.1 in TL. Lateral trunk denticles bristle-like, irregular, densely arranged; each denticle strongly bent, stout (Fig. 2A). Precaudal vertebrae 57–60. Monospondylic vertebrae 43–45.

Fins relatively small, the second dorsal fin nearly twice the area of the first dorsal fin. Spine of first dorsal fin 25.4–34.4 in TL; its width at the base 95–113 in TL. Maximum height of first dorsal fin 15.1–18.5 in TL, the length of its base 17.0–24.2 in TL. Predorsal (1) length 3.0–3.2 in TL. Interspace between first and second dorsal fins 4.2–4.5 in TL. Spine of second dorsal fin 14.8–15.7 in TL, its width at the base 79–98 in TL. Maximum height of second dorsal fin 12.0–14.2 in TL, the length of its base 13.6–15.1 in TL. Predorsal (2) length 1.58–1.73 in TL. Interspace between

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

Table 1. Meristic data of holotype and paratypes of *Etmopterus compagnoi* n. sp. (expressed as thousandths of TL).

	Holotype SMNS 8999 male, 327 mm TL	Paratypes SMNS 9000 females, 282–358 mm TL
Predorsal (1) length	332	312–324
Predorsal (2) length	589	576–631
Prepectoral fin length	215	193–213
Prepelvic fin length	524	519–553
Head length	175	160–168
Body depth	128	103–122
Body width	62	83– 86
Eye diameter	51	55– 66
Interorbital	62	55– 68
Maximum head width	91	94–108
Prespiracular length	117	123–138
Maximum snout width	73	69– 84
Preorbital length	45	39– 54
Prenasal length	12	12– 17
Preoral length	91	84–102
Lower jaw width	59	72– 85
Internasal width	27	29– 50
D1 spine length	29	36– 39
Basal D1 spine width	9	9– 10
Maximum D1 height	60	53– 66
D1 base length	41	54– 59
D2 spine length	64	64– 67
D2 spine width	11	10– 12
Maximum D2 height	75	70– 83
D2 base length	73	66– 73
Pectoral fin length	83	83– 94
Pelvic fin length	102	105–107
Pelvic fin base length	51	51– 69
D1 – D2 interspace	224	223–238
D2 – dorsal C interspace	105	99–109
P2 – ventral C interspace	176	139–142
P1 – P2 distance	338	323–362

second dorsal fin and dorsal margin of caudal fin 9.1–10.1 in TL. Pectoral fin length 10.6–12.1 in TL. Prepectoral fin length 4.6–5.2 in TL. Distance between beginning of pectoral fin and beginning of pelvic fin 2.7–3.1 in TL. Pelvic fin length 9.3–9.8 in TL. Prepelvic fin length 1.81–1.93 in TL. Interspace between pelvic fin and ventral margin of caudal fin in the male 5.7 in TL, in the female 7.0–7.3 in TL.

Color in alcohol: Head and body brown, belly blackish (pattern see Fig. 1). Suborbital area blackish. Back scattered with dark brown spots. Dark suprapelvic streak extending before the beginning of the pelvic fin. Anterior and posterior margins of second dorsal fin with a black streak each. Caudal fin with two black streaks on the lower side of the tail. Distal margin of caudal fin dusky.

Sexual dimorphism: Males have a slightly bigger head, a slightly deeper but more slender body, smaller eyes, and a larger interspace between the pelvic fin and the ventral margin of the caudal fin. Otherwise, they differ externally from females as usual.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

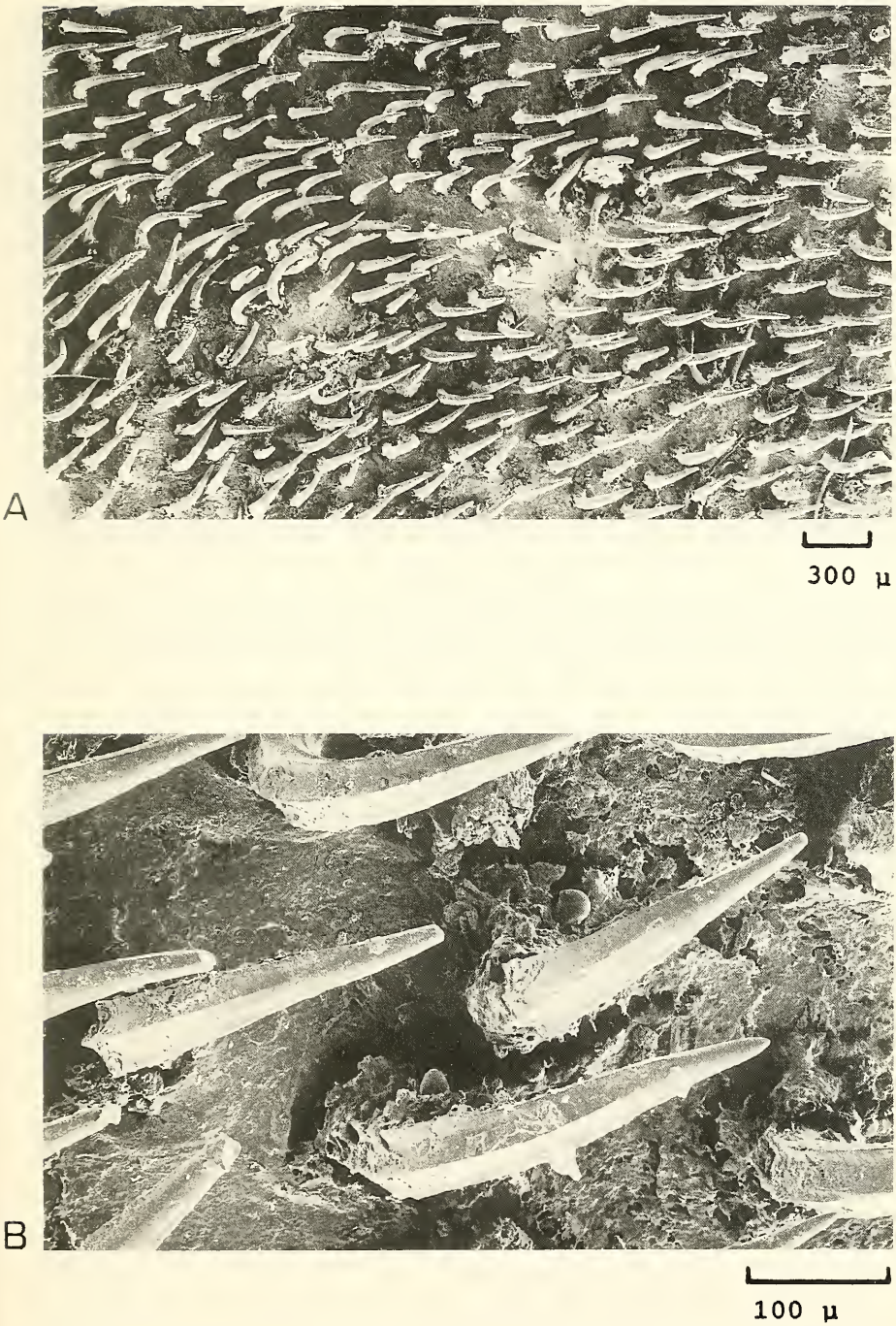

Fig. 2. *Etmopterus compagnoi* n. sp.; lateral trunk denticles (SEM); paratype, SMNS 9000, 358 mm TL, off Cape Town, South Africa. – A. General arrangement of denticles, – B. Closeup view of single denticles.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

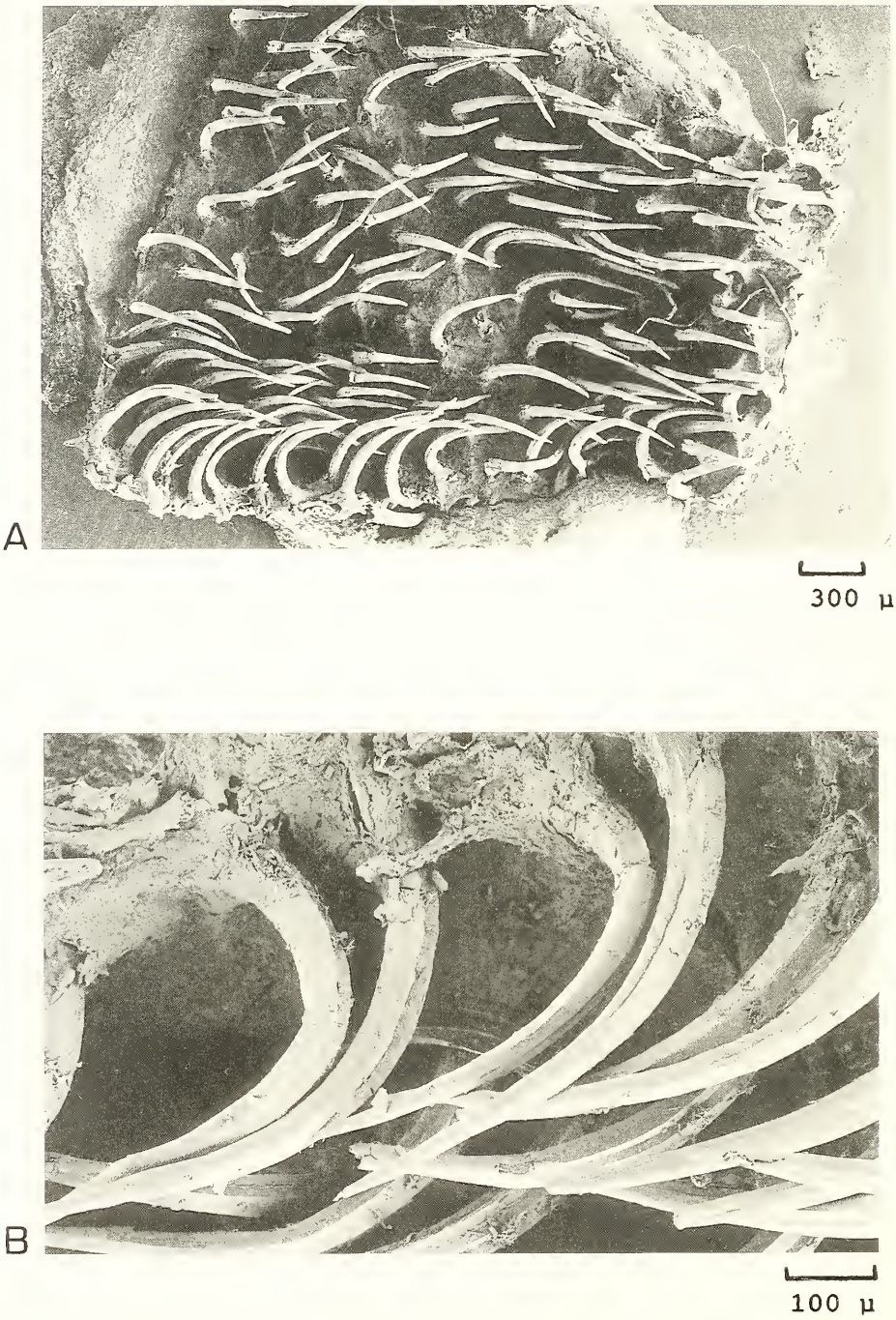

Fig. 3. *Etmopterus spinax* (Linnaeus, 1758); lateral trunk denticles (SEM); SMNS 539, 279 mm TL, Nice, Mediterranean Sea. – A. General arrangement of denticles, – B. Closeup view of single denticles.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

Table 2. Characters distinguishing *Etmopterus compagnoi* n. sp. and *E. spinax* (Linnaeus, 1758).

	E. compagnoi	*E. spinax*
Lateral trunk denticles	strongly bent, stout, shorter	slightly bent, tall, longer
Distance between corners of mouth	greater than preoral length	smaller than preoral length
Prepectoral length in total length	4.6 – 5.2	4.3 – 4.7
Interorbital in head	2.48 – 2.90	2.09 – 2.15

Distribution

This new species is known only from the lower continental shelf and upper continental slopes of South Africa, occurring between southwestern Cape Province and northern Natal (Bass et alii, 1986).

Relationships

The new species is related to *Etmopterus spinax* by having very long, slender and bristle-like lateral trunk denticles, differing in this character from all other species of *Etmopterus*. It is distinguished from *E. spinax* by the characters given in Table 2. The lateral trunk denticles of *E. compagnoi* n. sp. and *E. spinax* are shown in Figs. 2–3. The coloration of the two species is compared in Figs. 1 and 4. They differ in the shape and extent of the black suprapelvic streak and in the presence of black streaks on the second dorsal fin of *E. compagnoi* n. sp.

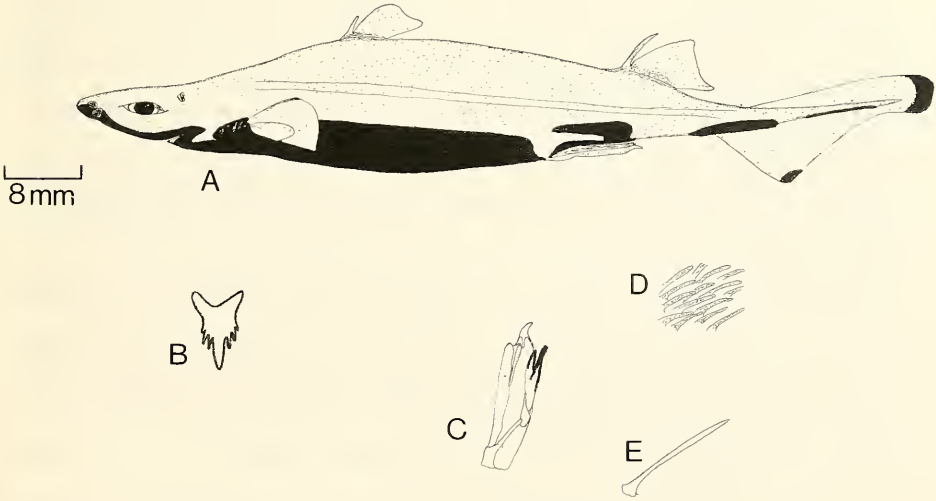

Fig. 4. *Etmopterus spinax* (Linnaeus, 1758); BM (NH) 1973.10.29.18, male, 352 mm TL, off Ireland. – A. Lateral view, – B. Median tooth from the upper jaw, – C. Clasper, – D. Lateral trunk denticles, – E. Single lateral trunk denticle.

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

4. Key to South African Species of *Etmopterus*

1 Lateral trunk denticles flat, concave, without a spine ..... ***Etmopterus pusillus***
– Lateral trunk denticles with a spine 2
2 2–3 short rows of enlarged denticles on each trunk side below 1st dorsal fin; denticles distaly concave ..... ***Etmopterus sentosus***
– No enlarged denticles below 1st dorsal fin; denticles distally not concave 3
3 Denticles arranged irregularly, not in rows ..... ***Etmopterus compagnoi* n. sp.**
– Denticles arranged in regular rows 4
4 Denticles on top of head not in longitudinal rows; suprapelvic black streak not extending before the beginning of pelvic fin ..... ***Etmopterus granulosus***
– Denticles on top of head in longitudinal rows; suprapelvic black streak extending on line or before the beginning of pelvic fin 5
5 Body slender, body depth at P1 origin 7.9–9.0% TL; posterior branch of suprapelvic-black streak very narrow ..... ***Etmopterus brachyurus***
– Body stout, body depth at P1 origin 9.4–11.8% TL; posterior branch of suprapelvic black streak broad and short ..... ***Etmopterus lucifer.***

5. Acknowledgments

We would like to thank the following individuals for the permission to examine specimens in their collections, for informations, or for the loan of material: Dr. N. Merrett [BM(NH), London]; Dr. M Stehmann (ISH, Hamburg); Dr. A. Stewart (NZNM, Wellington); Dr. V. G. Springer (USNM, Washington D.C.); Dr. H.-J. Paepke (ZMB, Berlin). We are grateful to Dr. R. Wild (SMNS, Stuttgart) who took X-rays of the shark specimens, and to S. Fiechtner (SMNS) who made scanning electron microscopic photographs.

6. References

Barnard, K. H. (1925): A monograph of the marine fishes of South Africa. Part 1. – Ann. S. Afr. Mus., 13: 1–418, pls. 1–17; Cape Town.

Bass, A. J., L. J. V. Compagno & P. C. Heemstra (1986): Family No. 5: Squalidae. pp. 49–63. – *In:* Smith, M. M. & P. C. Heemstra (eds.): Smith's sea fishes, XX + 1047 pp., 144 pls.; Grahamstown, South Africa (J. L. B. Smith Inst. Ichthyol.).

Bass, A. J., J. D. D'Aubrey & N. Kistnasamy (1976): Sharks of the east coast of southern Africa. 6. The families Oxynotidae, Squalidae, Dalatiidae and Echinorhinidae. – Investl Rep. oceanogr. Res. Inst., No. 43: 1–103, pls. 1–11; Durban.

Compagno, L. J. V. (1984): FAO species catalogue, Vol. 4. Sharks of the world. Part 1. Hexanchiformes to Lamniformes. 249 pp.; Rome (FAO).

Dolganov, V. N. (1986): Description of new species of sharks of the family Squalidae (Squaliformes) from the north-western part of the Pacific Ocean, with remarks of validity of *Etmopterus frontimaculatus.* – Zool. Zh., 65 (1): 149–153; Moscow. [In Russian, with English summary.]

Günther, A. (1880): Report on the shore fishes procured during the voyage of H. M. S. "Challenger" in the years 1873–76. – Rep. Voy. H. M. S. "Challenger", 1 (6): 1–82, pls. 1–32; London.

Jordan, D. S. & J. O. Snyder (1903): Descriptions of two new species of squaloid sharks from Japan. – Proc. U. S. natn. Mus., 25 (1279): 79–81, (1902); Washington D.C.

Linnaeus, C. (1758): Systema naturae per regna tria naturae. 1, ed. 10, reformata. pp. 230–338. Holmiae (Laurentii Salvii).

Lowe, R. T. (1839): Supplement to „A synopsis of the fishes of Madeira". – Proc. zool. Soc. Lond., 7: 1–20; London.

Smith, H. M. & L. Radcliffe (1912): The squaloid sharks of the Philippine Archipelago, with descriptions of new genera and species. – Proc. U. S. natn. Mus., 41 (1877): 677–685, pls. 50–54; Washington D.C.

Smith, J. L. B. (1953): The sea fishes of southern Africa. 3rd ed. 564 pp., 107 pls.; Cape Town (Central News Agency).

download Biodiversity Heritage Library, http://www.biodiversitylibrary.org/

SPRINGER, S. & G. H. BURGESS (1985): Two new dwarf dogsharks (*Etmopterus*, Squalidae), found off the Caribbean coast of Colombia. – Copeia, **1985** (3): 584–591; Washington D.C.

WHITEHEAD, P. J. P. et alii (1984): Fishes of the North-Eastern Atlantic and the Mediterranean. Vol. **1**, 510 pp.; Paris (UNESCO).

YANO, K. (1988): A new lanternshark *Etmopterus splendidus* from the East China Sea and Java Sea. – Jap. J. Ichthyol., **34** (4): 421–425; Tokyo.

Authors' Address:

Dr. RONALD FRICKE and Dipl.-Biol. ISABEL KOCH, Staatliches Museum für Naturkunde (Museum Schloss Rosenstein), Rosenstein 1, D-7000 Stuttgart 1, Federal Republic of Germany.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Stuttgarter Beiträge Naturkunde Serie A [Biologie]

Jahr/Year: 1990

Band/Volume: 450_A

Autor(en)/Author(s): Fricke Ronald, Koch Isabel

Artikel/Article: A New Species of the Lantern Shark Genus Etmopterus from Southern Africa (Elasmobranchii: Squalidae) 1-9