

Deep-sea fauna of European seas: An annotated species check-list of benthic invertebrates living deeper than 2000 m in the seas bordering Europe. Holothuroidea

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ABSTRACT: An annotated check-list is given of Holothuroidea species occurring deeper than 2000 m in the seas bordering Europe. The check-list is based on published data. The check-list includes 78 species. For each species synonymy, data on localities in European seas and general species distribution are provided. Station data are presented separately in the present thematic issue.

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KEY WORDS: deep-sea fauna, European seas, Holothuroidea.

Глубоководная фауна европейских морей: аннотированный список видов донных беспозвоночных, обитающих глубже 2000 м в морях, окружающих Европу. Holothuroidea

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РЕЗЮМЕ: Приводится аннотированный список видов Holothuroidea, обитающих глубже 2000 м в морях, окружающих Европу. Список основан на опубликованных данных. Список насчитывает 78 видов. Для каждого вида приведены синонимия, данные о находениях в европейских морях и сведения о распространении. Данные о станциях приводятся в отдельном разделе настоящего тематического выпуска.

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КЛЮЧЕВЫЕ СЛОВА: глубоководная фауна, европейские моря, Holothuroidea.

Phylum Echinodermata**Class Holothuroidea****Order Apodida****Family Myriotrochidae****Genus *Acanthotrochus*****Danielssen et Koren, 1879**

TYPE SPECIES: *Acanthotrochus mirabilis* Danielssen et Koren, 1879.

COMPOSITION: 3 species (Belyaev, Mironov, 1981a).

DISTRIBUTION: Arctic — 1, Pacific — 1, Antarctic — 1 species.

Acanthotrochus mirabilis**Danielssen et Koren, 1879**

Acanthotrochus mirabilis Danielssen, Koren, 1879: 115, pl. 3–4, figs. 8–20; Danielssen, Koren, 1882: 35, pls. 5–6, figs. 8–20; Clark, 1908: 130, pl. 8 figs. 1–6; Djakonov, 1933: 158, fig. 83; Heding, 1935: 24, text-figs. 4, 5, pl. 3 figs. 3–10; Östergren, 1938: pl. 2 fig. 11; Belyaev, Mironov, 1981a: 522, fig. 1 figs. 1–3; Belyaev, Mironov, 1982: 108, fig. 17 (map); Madsen, Hansen, 1994: 127, figs. 91–93, map 38.

LOCALITIES: Norwegian North-Atlantic Expedition (1876–1878), St. 295 (Danielssen, Koren 1879, 1882); “Sebastopol”, St. 1351 (Belyaev, Mironov, 1982), 1712, 1713, 1714, 1742, 2482 (Belyaev, Mironov, 1982 — only as dots on the map); “Polarstern” ARK XIII/2 cruise, St. 059-GKG(bio+geo), 068-GKG(bio), 093-GKG(bio) (det. A.V. Smirnov, unpublished); BIOICE, St. 3637 (unpublished).

DISTRIBUTION: Arctic: Norwegian and Greenland Seas, Litke Trough.

DEPTH RANGE: 1090–3705 m.

Genus *Myriotrochus* Steenstrup, 1851

TYPE SPECIES: *Myriotrochus rinkii* Steenstrup, 1851.

COMPOSITION: 16 species (Belyaev, Mironov, 1982; Gage, Billett, 1986; Smirnov, 1999).

DISTRIBUTION: Arctic — 2, Atlantic — 5, Atlantic and Pacific — 2, Pacific — 6, Antarctic — 3 species.

***Myriotrochus bathybius* H.L. Clark, 1920**

Myriotrochus bathybius Clark, 1920: 126, pl. 4, fig. 3; Carney, Carey, 1976: 69; Gage et al., 1985: 202; Gage, Billett, 1986: 234, figs. 3–6, 7A, B, 9A, B, 18B; Harvey et al., 1988: 190; Smirnov, 1999: 17.

REMARKS: The wheels of the North-East Atlantic specimens described by Gage, Billett (1986) differ somewhat from the wheels of the holotype of *M. bathybius* (see Smirnov, 1999, fig. 4). Only after examination of new findings of *M. bathybius* from the type locality (eastern tropical Pacific) it will be

possible to justify the determination of the North-East Atlantic material as *M. bathybius*.

LOCALITIES: “Challenger” (1973–1985), St. ES 06, ES 27, ES 56, ES 118, ES 129, ES 137, ES 147, ES 152, ES 164, ES 169, ES 172, ES 180, ES 184, ES 185, SBC 188, ES 190, ES 204, ES 207, ES 231, AT 267, AT 282, ES 283, ES 289 (Gage et al. 1985; Gage, Billett, 1986; Harvey et al. 1988); “Discovery” (1977–1980), St. 9638#2, 9756#14; “Challenger, 50304, 50812#1, 50910 (Gage, Billett 1986); BIOICE, St. 2863 (unpublished data).

DISTRIBUTION: Cosmopolitan. In the North-East Atlantic: Rockall Trough and Porcupine Seabight. Described from the East Tropical Pacific (Clark, 1920), also found in the North-East Pacific (Carney, Carey, 1976).

DEPTH RANGE: 1800–4310 m.

***Myriotrochus giganteus* H.L. Clark, 1920**

Myriotrochus giganteus Clark, 1920: 127, pl. 4, fig. 4; Gage et al., 1985: 203; Gage, Billett, 1986: 239, figs. 7C, 8, 9C, 10–12, 24B; Harvey et al., 1988: 190. *Myriotrochus* sp. ex gr. *macquoriensis* — *giganteus* Belyaev, Mironov, 1982: 102, figs. 13, 14, pl. II figs. 6, 7.

LOCALITIES: “Challenger” (1977–1985), St. AT 131, ES 137, ES 164, ES 169, ES 207, ES 231, ES 283 (Gage, Billett, 1986; Harvey et al., 1988).

DISTRIBUTION: Eastern Tropical Pacific and North-East Atlantic. In the North-East Atlantic: Rockall Trough.

DEPTH RANGE: 2898–3665 m. In the North-East Atlantic: 2898–2946 m.

***Myriotrochus clarki* Gage et Billett, 1986**

Myriotrochus clarki Gage, Billett, 1986: 247, figs. 7D, 9D, 13–17, 18A; Harvey et al., 1988: 190; Smirnov, 1999: 17; Rogacheva et al., 2013: 612–613, fig. 171. *Myriotrochus vitreus* — Cherbonnier, 1970: 1269. *Myriotrochus* sp. — Gage et al., 1985: 203.

LOCALITIES: “Challenger” (1975–1983), St. ES 34, ES 185, ES 197, ES 200, ES 218, ES 231, ES 232 (Gage et al., 1985; Gage, Billett, 1986; Harvey et al., 1988); “James Cook” ECOMAR, Sts. JC011/75, JC011/101, JC037/15, JC037/19, JC037/27, JC037/61, JC037/67, JC037/70, JC048/49, JC048/50, JC048/52 (Rogacheva et al., 2013).

DISTRIBUTION: North-East Atlantic: Rockall Trough, coast of Spain and northern Mid-Atlantic Ridge.

DEPTH RANGE: 480–2907 m.

**Genus *Prototrochus*
Belyaev et Mironov, 1982**

TYPE SPECIES: *Myriotrochus zenkevitchi* Belyaev, 1970.

COMPOSITION: 20 species and subspecies (Belyaev, Mironov, 1982; Gage, Billett, 1986).

DISTRIBUTION: Arctic — 1, Atlantic — 5, Pacific — 10, Indian Ocean and Pacific — 1, Antarctic — 3 species.

***Prototrochus zenkevitchi rockallensis*
Gage et Billett, 1986**

Prototrochus zenkevitchi rockallensis Gage, Billett, 1986: 252, figs. 7E, F; 18C–E; 19–23; 24A; Harvey et al., 1988: 190. *P. zenkevitchi* (Belyaev, 1970) subsp. — Gage et al., 1985: 204.

LOCALITIES: “Challenger” (1973–1985), St. ES 06, ES 10, ES 34, ES 56, ES 57, ES 118, ES 129, ES 135, ES 137, ES 147, SBC 159, SBC 160, SBC 163, ES 169, ES 172, ES 176, ES 184, ES 185, ES 190, ES 197, ES 200, ES 204, ES 207, SBC 215, SB C216, ES 218, ES 231, ES 232, ES 283, ES 285, ES 289 (Gage et al., 1985; Gage, Billett, 1986; Harvey et al., 1988).

DISTRIBUTION: North-East Atlantic: Rockall Trough, Porcupine Seabight, Whittard Canyon, continental slope of northern Bay of Biscay.

DEPTH RANGE: 1000–2946 m.

***Prototrochus mediterraneus*
Belyaev et Mironov, 1982**

Prototrochus mediterraneus Belyaev, Mironov, 1982: 89–90, fig. 5a, pl. 1 figs. 5, 6.

LOCALITIES: “Vityaz”, St. 7930 (Belyaev, Mironov, 1982).

DISTRIBUTION: Mediterranean Sea.

DEPTH RANGE: 2890 m.

***Prototrochus theeli* (Östergren, 1905)**

Myriotrochus theeli — Östergren, 1905: CLIX–CLXI; 1938: taf. 3 figs. 1–4; Belyaev, Mironov, 1982: 86–87; Madsen, Hansen, 1994: 124, fig. 87, map 36. *Prototrochus theeli* — Smirnov, Smirnov, 2006: 105–106.

LOCALITIES: Swedish Zoological (Kolthoff’s) Polar Expedition (1900), St. 29 (Östergren, 1905; 1938); “Polarstern” ARK XI/1 cruise (1995), St. 23a, 44-GKG (bio1), 44-GKG (bio2), 49-GKG (bio2) (det. A.V. Smirnov, unpublished).

DISTRIBUTION: Arctic: Norwegian and Greenland Seas, Laptev Sea, Amundsen Basin.

REMARKS: Hansen and Madsen (1994) indicate that this species “has been... found in several localities in the Norwegian Basin, between Iceland and Norway, during the “Håkon Mosby” expeditions 1981–1984. (T. Brattegard, personal communication)” Unfortunately they published the findings of *P. theeli* only as dots on the map, without station data.

DEPTH RANGE: 600–3900 m.

Genus *Siniotrochus* Pawson, 1971

TYPE SPECIES: *Siniotrochus phoxus* Pawson, 1971.

COMPOSITION: 3 species (Pawson, 1971; Belyaev, Mironov, 1981b; Belyaev, Mironov, 1982; Gage, Billett, 1986).

DISTRIBUTION: North Atlantic and North Pacific; Atlantic — 2, Pacific — 1 species.

***Siniotrochus myriodontus*
Gage et Billett, 1986**

Siniotrochus myriodontus Gage, Billett, 1986: 266, figs. 28C–E, 29–31.

LOCALITIES: “Discovery” (1978), St. 9756#14; “Challenger” (1979–1982), 50603#1, 50604#1, 51415#1 (Gage, Billett, 1986).

DISTRIBUTION: North-East Atlantic: Porcupine Seabight.

DEPTH RANGE: 3490–4000 m.

Genus *Parvotrochus* Gage et Billett, 1986

TYPE SPECIES: *Parvotrochus belyaevi* Gage et Billett, 1986.

COMPOSITION: 1 species (Gage, Billett, 1986).

DISTRIBUTION: North Atlantic.

***Parvotrochus belyaevi* Gage et Billett, 1986**

Parvotrochus belyaevi Gage, Billett, 1986: 263, figs. 24C–F, 26, 27.

LOCALITIES: “Challenger” (1976–1985), St. ES 57, ES 135, ES 143, ES 147, ES 152, ES 169, ES 172, ES 180, ES 204, ES 207, ES 285 (Gage, Billett, 1986; Harvey et al., 1988).

DISTRIBUTION: North-East Atlantic: Rockall Trough.

DEPTH RANGE: 1160–2921 m.

Family Synaptidae

**Genus *Protankyra* Östergren, 1898,
emend. Rowe et Pawson, 1967**

TYPE SPECIES: *Synapta abyssicola* Théel, 1886 [= *Protankyra brychia* (Verrill, 1885)].

COMPOSITION: 35 species (Östergren, 1898; Clark, 1908; Heding, 1928).

DISTRIBUTION: Atlantic — 5, Indian Ocean — 10, Indian Ocean and Pacific — 4, Pacific — 15, Atlantic and Pacific — 1 species.

***Protankyra brychia* (Verrill, 1885)**

Synapta brychia Verrill, 1885: 539. *Protankyra brychia* — Östergren, 1898: 116; Clark, 1908: 25, 105, pl. 4 figs. 12–14; Deichmann, 1930: 209; Deichmann, 1940: 229, pl. 41 figs. 1–3; Deichmann, 1954: 408; Madsen, 1953: 151, fig. 1; Sibuet, 1977: 554; Gage et al., 1985: 201; Harvey et al., 1988: 190. *Synapta abyssicola* Théel, 1886a: 14, pl. 1 fig. 11. *Protankyra abyssicola* — Perrier, 1902: 538; Clark, 1908: 25, 105, Pl. 4 figs. 8–11; Clark, 1913: 227; Clark, 1920: 124; Clark, 1924: 496, pls. 11 figs 6–7, 12 fig. 1; Hérouard, 1923: 140; Ludwig, Heding, 1935: 146, figs. 12–13. *Protankyra abyssicola* var. *pacifica* Ludwig, 1894: 174, pl. 18 figs. 13–19. *Protankyra pacifica* — Clark, 1908: 25, 105; Clark, 1920: 124; Heding, 1928: 252; Ludwig, Heding, 1935: 149; Carney, Carey, 1982: 69; Maluf, 1988: 163. *Synapta* sp. — Théel, 1886b: 20.

LOCALITIES: “Princesse Alice II” (1910), St. 2986 (Hérouard, 1923); “Challenger” (1975–1982), St. ES 32, ES 56, ES 118, ES 152, ES 164, ES 169, ES 172, ES 180, ES 185, SBC 188, ES 207 (Gage et al., 1985; Harvey et al., 1988; Pawson et al., 2003).

DISTRIBUTION: Atlantic, Pacific. In the North-East Atlantic: Rockall Trough, Bay of Biscay.

DEPTH RANGE: 869–4990 m. In the North-East Atlantic: 2871–4879 m.

Genus *Labidoplax* Östergren, 1898, sensu Heding, 1931

TYPE SPECIES: *Synapta tenera* Norman, 1864 (nomen nudum) = *Synapta buski* McIntosh, 1866.

COMPOSITION: 5 species (Östergren, 1898; 1905; Heding, 1931a; Gage, 1985; Smirnov, 1997).

DISTRIBUTION: North Atlantic — 4, Pacific — 1 species.

Labidoplax southwardorum Gage, 1985

Labidoplax southwardorum Gage, 1985: 255, figs. 1, 3a, d (left and bottom), e, f; Gage et al., 1985: 200; Harvey et al., 1988: 186, fig. 3a.

LOCALITIES: “Challenger” (1973–1985), St. ES 10, ES 27, ES 28, ES 34, SBC 48, ES 53, ES 56, ES 57, SBC 58, ES 59, SBC 61, ES 111, ES 118, ES 129, ES 135 (Gage, 1985; Gage et al., 1985), ES 137, ES 140, ES 143, ES 147, ES 152, ES 164, ES 169, ES 172, SBC 174, ES 176, ES 180, ES 184, ES 185, ES 190, ES 197, ES 200, ES 204, ES 218, ES 244, ES 283, ES 285, ES 289 (Gage, 1985; Gage et al., 1985; Harvey et al., 1988).

DISTRIBUTION: North-East Atlantic: Rockall Trough.

DEPTH RANGE: 1000–2946 m.

Labidoplax similimedia Gage, 1985

Labidoplax similimedia Gage, 1985: 259, figs. 2, 3b, d right and top; Gage et al., 1985: 201; Harvey et al., 1988: 187.

LOCALITIES: “Challenger” (1975–1985), St. ES 34, ES 118, ES 129, ES 137, ES 143, ES 147, ES 164, ES 169, ES 172, ES 176, ES 180, ES 185, ES 190, ES 200, ES 204, ES 218, ES 244, ES 283, ES 285, ES 289 (Gage, 1985; Gage et al., 1985; Harvey et al., 1988).

DISTRIBUTION: North-East Atlantic: Rockall Trough.

DEPTH RANGE: 1101–2946 m.

Order Elasipodida Family Laetmogonidae

Genus *Benthogone* Koehler, 1896

TYPE SPECIES: *Benthogone rosea* Koehler, 1896.

COMPOSITION: 3 species.

DISTRIBUTION: Indian Ocean — 1, Indonesia — 1, cosmopolitan — 1 species.

Benthogone rosea Koehler, 1896

Benthogone rosea Koehler, 1896: 114–117, figs. 2, 3, 36, 46; Perrier, 1902: 399–405, pls. XIV: 1–2, XIX: 8–14; Grieg, 1921: 5–6; Hérouard, 1923: 38–39; Heding, 1940: 369; Madsen, 1947: 15–16; Pawson, 1965: 219–221, pl. 5. *Benthogone rosea* var. *cylindrica* Perrier, 1896: 900. *Benthogone rosea* var. *4-lineata* Perrier, 1896: 900. *Benthogone quadrilineata* — Heding, 1940: 369; Heding, 1942a: 15. Non *Benthogone quatuorlineata* — Augustin, 1908.

LOCALITIES: “Princesse Alice II”, St. 2290; “Michael Sars”, St. 25A; “Talisman”, St. 35, 58, 59 (Perrier, 1902); Porcupine Abyssal Plain (Billett, 1991); BIOGAS, St. 1, 2, 3 (Sibuet, 1977); BIOGAS VII CP 26, BIOGAS IX CP 33 (Massin, 1984); numerous “Discovery” stations (Billett, 1988).

DISTRIBUTION: Eastern Atlantic from Ireland to the Cape Verde Islands; western Indian Ocean; north of New Zealand.

DEPTH RANGE: 1103–2480 m.

Genus *Laetmogone* Théel, 1879

COMPOSITION: 12 species.

TYPE SPECIES: *Laetmogone wyvillethomsoni* Théel, 1879.

DISTRIBUTION: Atlantic — 2, Pacific — 7, Antarctic and Pacific — 1, Pacific and Indian — 1, cosmopolitan — 1 species.

Laetmogone billetti Rogacheva et Gebruk in Rogacheva et al., 2013

Laetmogone billetti Rogacheva et al., 2013: 595–598, figs. 5, 6, 17h, i, 18k, 19g–i.

LOCALITIES: “James Cook” ECOMAR, Sts. JC048/24 Dive 165, JC048/16 Dive 162, JC048/56 Dive 180 (Rogacheva et al., 2013).

DISTRIBUTION: Known from its type locality on the Northern Mid-Atlantic Ridge, Charlie-Gibbs Fracture Zone area.

DEPTH RANGE: 2272–2758 m.

Family Psychropotidae

Genus *Benthodytes* Théel, 1882

TYPE SPECIES: *Benthodytes typica* Théel, 1882.

COMPOSITION: 10 species.

DISTRIBUTION: Atlantic and Indonesia — 1, Atlantic — 2, Indian — 3, Pacific — 1, Indonesia — 1, cosmopolitan — 2 species.

Benthodytes valdiviae Hansen, 1975

Benthodytes valdiviae Hansen, 1975: 82–84, figs. 30–31; Thandar, 1999: 384–386, fig. 7; Gebruk, 2008: 50, 51.

LOCALITIES: “Valdivia”, St. 33 (Hansen, 1975); “G.O. Sars”, MAR-ECO cruise, St. 46/372. (Gebruk, 2008).

DISTRIBUTION: North and South Atlantic (off South Africa).

DEPTH RANGE: 2480–3050 m.

***Benthodytes lingua* Perrier, 1896**

Benthodytes lingua Perrier, 1896: 902; Perrier, 1902: 456–461, pls. XII: 1–2, XXI: 1–9; Deichmann, 1930: 124–125; Deichmann, 1940: 200–201, pl. XXXV: 3–4; Hedding, 1942a: 15; Deichmann, 1954: 384; Rogacheva et al., 2013: 599, fig. 18b. *Benthodytes janthina* von Marenzeller, 1882 — Grieg, 1921: 11; Hedding, 1942a: 15. *Pannychia glutinosa* Hérouard, 1902: 32, pl. IV: 17.

LOCALITIES: “M. Sars”, St. 10; “Ingolf”, St. 18, 20; “Talisman” and “Travailleur” St. 38, 39, 44 (Perrier, 1902); “Valdivia”, St. 33 (Hedding, 1942a); BIOGAS St. 2 (Sibueta, 1977); “Discovery” St. 11121#10 (Billett et al., 1985); “G.O. Sars”, MAR-ECO cruise, St. 40/367, 46/372, 50/373 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC037/27, JC048/36 Dive 171, JC048/48 Dive 176 (Rogacheva et al., 2013).

DISTRIBUTION: North and South Atlantic.

DEPTH RANGE: 860–3192 m.

***Benthodytes typica* Théel, 1882**

Benthodytes typica Théel, 1882a: 103–104, pls. XXVII: 7, XXXV: 4, XXXVIII: 5, XLIV: 8; Théel, 1886: 2; von Marenzeller, 1893b: 12; Grieg, 1921: 10, fig. 8, pl. III: 6–7; Hérouard, 1923: 101–102, pl. VI: 4; Deichmann, 1930: 123–124; Deichmann, 1940: 200, pl. XXXV: 1–2; Hedding, 1940: 368; Madsen, 1953: 160–161, fig. 8; Deichmann, 1954: 384. *Benthodytes papillifera* Théel, 1882a: 102–103, pl. XXXIV: 14. *Benthodytes glutinosa* Perrier, 1896: 902–903; Perrier, 1902: 462–465, pls. XIII: 5, XX: 31; Koehler, Vaney, 1905: 72–74, pl. XII: 10; Clark, 1920: 141; Grieg, 1921: 10–11, pl. III: 1–2. *Benthodytes janthina* von Marenzeller, 1882 — Hérouard, 1902: 30; Hérouard, 1923: 103.

LOCALITIES: “Swedish Deep–Sea Expedition” St. 313, 357, 387 (Madsen, 1953); “Ingolf”, St. 20; “Princesse Alice II”, St. 2111; “Michael Sars”, St. 35, 53; “Hirondelle”, St. 248; “Talisman” and “Travailleur”, 32°19′–34°46′N, 36°11′–38°04′W, 3175–3243 m (Perrier, 1902); Porcupine Abyssal Plain (Billett, 1991); numerous “Discovery” stations in the North-East Atlantic (Billett, 1988); “G.O. Sars”, MAR-ECO cruise, St. 40-367, 42-368, 46-372, 50-373, 52-374, 54-377.

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 1873–4700 m.

***Benthodytes sanguinolenta* Théel, 1882**

Benthodytes sanguinolenta Théel, 1882a: 104–105, Pls. XXIII, XL: 4–5, XLII: 6; Ludwig, 1894: 53–60, Pl. I: 1–8; Koehler, Vaney, 1905: 72; Clark, 1913: 233; Ohshima, 1915: 245; Clark, 1920: 142; Clark, 1923a: 162; Clark, 1923b: 420; Hedding, 1940: 367; Hansen, 1956: 44–45; Hansen, 1975: 94–96; Pls. III–VI, IX: 6–7, XII: 4–5; Carney, Carey, 1976: 69; Pawson, 1982: 129–145; Bluhm, Gebruk, 1999: 175, Fig. 3D; Gebruk, 2008: 50, 51; Rogacheva et al., 2009: 463–464, fig. 2.

LOCALITIES: “G.O. Sars”, MAR-ECO cruise, St. 40/367, 54/377, 64/381, 66/383, 68/384, 74/387

(Gebruk, 2008); “James Cook” ECOMAR, St. JC037/19 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 768–7250 m.

***Benthodytes gosarsi* Gebruk, 2008**

Benthodytes gosarsi Gebruk, 2008: 49–52, figs. 1A, 2, 3.

LOCALITIES: “G.O. Sars”, MAR-ECO cruise, St. 40/367, 54/377 (Gebruk, 2008); BIOICE St. 2862, 3572; “James Cook” ECOMAR, Sts. JC011/23, JC011/75, JC011/101, JC037/15, JC037/19, JC037/27, JC037/61, JC037/67, JC037/70; “James Cook”, St. JC036/04, JC36/21 (Rogacheva et al., 2013).

DISTRIBUTION: Atlantic: Mid-Atlantic Ridge from Azores to Iceland and Northeast Atlantic, Whittard Canyon (Rogacheva et al., 2013).

DEPTH RANGE: 2967–3670 m.

Genus *Psychropotes* Théel 1882

TYPE SPECIES: *Psychropotes longicauda* Théel, 1882.

COMPOSITION: 10 species.

DISTRIBUTION: Atlantic — 3, Indian — 2, Antarctic — 1, Pacific — 2, cosmopolitan — 2 species.

***Psychropotes semperiana* Théel, 1882**

Psychropotes semperiana Théel, 1882a: 100–101, pl. XXXIV: 10–11; Hansen, 1975: 102–105, figs. 41–42. *Psychropotes kerhervei* Hérouard, 1902: 27–30, pl. IV: 1–9. *Euphronides kerhervei* — Hérouard, 1923: 104, pl. III: 4–5; Deichman, 1940: 202–203, pl. XXXV: 9–12; Madsen, 1953: 161–163, fig. 9.

LOCALITIES: “Princesse Alice”, St. 749, “Princesse Alice II”, St. 1306, 2111; Porcupine Abyssal Plain (Billett, 1991); BIOGAS (1972–1974) “Jean Charcot”, St.2.

DISTRIBUTION: Atlantic and the western part of Indian Ocean.

DEPTH RANGE: 1433–5600 m.

***Psychropotes depressa* (Théel, 1882)**

Euphronides depressa — Théel, 1882a: 93–96, pls. XXVI, XXX: 5–6, XL: 7, XLVI: 4; Ohshima, 1915: 244–245, fig. 1; Ohshima, 1916–1919, with three figures. *Psychropotes depressa* — Hansen, 1975: 106–111, figs. 43–44; Gebruk, 2008: 50, 51; Rogacheva et al., 2013: 599, fig. 17f, g. *Euphronides depressa* var. *minor* Théel, 1886b: 2. *Euphronides cornuta* Verrill, 1884: 217; Verrill, 1885: 518, 538, figs. 32–33; Deichmann, 1930: 127–128; Hedding, 1940: 368. *Euphronides tanneri* — Ludwig, 1894: 39–44, pls. III: 7, IV, V: 17–19. *Euphronides auriculata* Perrier, 1896: 901–902; Perrier, 1902: 434–438, pls. XIII: 1–2, XX: 12–13; Grieg, 1921: 8–9. *Euphronides violacea* Perrier, 1896: 902; Perrier, 1902: 438–441, pl. XX: 14; Deichmann, 1930: 128–129; Deichmann, 1940: 201–202; Hedding, 1942a: 15–16; Madsen, 1947: 16; Deichmann, 1954: 384. *Euphronides talismani* Perrier, 1896: 902;

Perrier, 1902: 441–444, pl. XX: 15; Hérouard, 1902: 30–31, pl. II: 19–22; Deichmann, 1930: 129; Heding, 1942a: 15, fig. 15. *Benthodytes assimilis* Théel, 1886b: 2–3.

LOCALITIES: “Ingolf”, St. 11, 18, “M. Sars”, St. 25A; “Princesse Alice”, St. 673; “Skagerak” (Madsen, 1947); “Talisman” and “Travailleur”, St. 129, St. 38, (Perrier, 1902); Porcupine Abyssal Plain (Billett, 1991); BIOGAS (1972–1974) “Jean Charcot”, St. 2, 3; numerous “Discovery” stations (Billett, 1988); “G.O. Sars”, MAR-ECO cruise, Sts. 40/367, 42/368, 46/372, 66/383, 72/386 (Gebruk, 2008). BIOICE, Sts. 2854, 2855, 3070, 3073, 3074, 3075, 3077, 3172, 3571, 3572, 3574 (unpublished); “James Cook” ECOMAR, Sts. JC011/23, JC011/101, St. JC037/15, St. JC037/19, JC037/27, JC037/61, JC037/67, JC037/70 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 957–4060 m.

Psychropotes longicauda Théel, 1882

Psychropotes longicauda Théel, 1882a: 96–98, pls. XXVII: 1, XXVIII, XXXV: 13–17, XXXVII: 10; Agatep, 1967b: 67, pl. XI: 1–7; Hansen, 1975: 115–126, figs. 49–54; Billett et al., 1985: 405, figs. 1, 4; Walker et al., 1987: 277–282; Gebruk, 1993: 240, fig. 6: 4–5; Bluhm, Gebruk, 1999: 173–174; Wigham et al., 2003: 409–441; Gebruk, 2008: 50, 51; Rogacheva et al., 2009: 473–474, fig. 7. *Psychropotes longicauda* var. *monstrosa* Théel, 1882a: 98–99, pls. XXIX: 2, XXX, XXXIX: 1. *Psychropotes longicauda* var. *Fusco-purpurea* Théel, 1882a: 99, pls. XXIX: 1, XXXV: 11. *Psychropotes longicauda* var. *antarctica* Vaney, 1908: 419–420. *Psychropotes buglossa* E. Perrier, 1886: 283, fig. 200; R. Perrier, 1902: 445–453, fig. 7, pls. XIII: 3–4, XX: 16–28; Hérouard, 1923: 105–108, pls. I: 32, VI: 2. *Psychropotes varipes* Ludwig, 1894: 48–51, pl. IV: 1–16; Ohshima, 1915: 244; Ohshima, 1916–1919: with one figure; Clark, 1920: 140–141, pl. I: 1. *Psychropotes dubiosa* Ludwig, 1894: 52–53, pl. II: 5–7. *Psychropotes grimaldii* Hérouard, 1896: 167, fig. 2; Hérouard, 1902: 25–27, pl. III: 1–2. *Psychropotes fucata* Perrier, 1896: 902; Perrier, 1902: 453–455, pl. XX: 29–30. *Psychropotes laticauda* Vaney, 1908: 420–422, pl. II: 14, 24. *Psychropotes brucei* Vaney, 1908: 422–423, pls. I: 13, II: 21–22, III: 41–42. *Euphronidia dyscrita* Clark, 1920: 139, pl. II: 3. *Nectothuria translucida* Belyaev, Vinogradov, 1969: 711–716, figs. 1–4. ?*Psychropotes longicauda* — Carney, Carey, 1982: 597–607.

LOCALITIES: “Princesse Alice”, St. 527, “Princesse Alice II”, 2948, 2964, 2986; “Talisman” and “Travailleur”, St. 135; localities without station numbers: 30°09′–44°29′N, 15°52′–23°37′W, 2110–5005 m (Perrier, 1902); BIOGAS (1972–1974) “Jean Charcot”, Sts. 2, 3, 4, 5; Porcupine Abyssal Plain (Billett, 1991); “G.O. Sars”, MAR-ECO cruise, Sts. 40/367, 54/377 (Gebruk, 2008).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 2210–5173 m.

Family Elpidiidae

Genus *Peniagone* Théel, 1882

TYPE SPECIES: *Peniagone wyvillii* Théel, 1882.

COMPOSITION: about 20 species.

DISTRIBUTION: widely distributed in the world ocean, except for the Arctic. Highest species diversity is found in the Pacific and the Antarctic.

Peniagone azorica von Marenzeller, 1892

Peniagone azorica von Marenzeller, 1892: 64; von Marenzeller, 1893b: 12–13, pls. I: 4, II: 5; Hérouard, 1902: 42–43, pl. IV: 21–26; Hérouard, 1923: 87–88; Grieg, 1921: 8, fig. 4; Heding, 1942a: 20; Hansen, 1975: 138–142 (*partim*: fig. 63, 5–9); Gebruk, 1990: 110–111, fig. 45 (*partim*); Rogacheva et al., 2013: 603–605, figs. 9, 12h, i, 17j, 19d.

LOCALITIES: “Hirondelle”, St. 248; “Princesse Alice”, St. 527, “Princesse Alice II”, 2990, 3006; “Ingolf”, Sts. 11, 41; “Michael Sars”, St. 88; BIOGAS (1972–1974) “Jean Charcot”, Sts. 1, 2, 4; other numerous localities in the North-East Atlantic (Gage et al., 1985; Tyler et al., 1985); “G.O. Sars” MAR-ECO cruise, St. 50/373; BIOICE, St. 734, Sample Nr 2862, 2863, 3169, 3170, 3172; “James Cook” ECOMAR, Sts. JC011/101, JC011/106, JC011/111, JC037/79, JC048/24 Dive 165 (Rogacheva et al., 2013).

DISTRIBUTION: Reliable records in the central and eastern North Atlantic (Rogacheva et al., 2013).

DEPTH RANGE: 1385–4020 m.

Peniagone porcella Perrier, 1896

Peniagone porcella Perrier, 1896: 901; Perrier, 1902: 426–429, pls. XIII: 7–9, XIX: 13–23; Madsen, 1953: 155–156, fig. 4; Hansen, 1975: 134; Gebruk, 1990: 97–98, fig. 37: 1–9.

LOCALITIES: “Talisman” St. 134, 42°19′N, 23°36′W, 4060 m (Perrier, 1902).

DISTRIBUTION: Atlantic, North Indian Ocean and Antarctic.

DEPTH RANGE: 3400–5044 m.

Peniagone islandica Deichmann, 1930

Peniagone islandica Deichmann, 1930: 137; Heding, 1942a: 20–21, fig. 19; Hansen, 1975: 150; Gebruk, 1990: 95–96, fig. 35.

REMARKS: may be a synonym of *P. azorica* (Rogacheva et al., 2013).

LOCALITIES: “Ingolf”, St. 18; “James Cook” ECOMAR, Sts. JC011/23, JC037/15, JC037/19, JC037/27, JC037/79, JC048/43 Dive 174, JC048/54 Dive 179 (Rogacheva et al., 2013).

DISTRIBUTION: Northern Mid-Atlantic Ridge, from Charlie-Gibbs Fracture Zone Area to Iceland.

DEPTH RANGE: 2137–2758 m.

Peniagone diaphana (Théel, 1882)

Scotoanassa diaphana Théel, 1882a: 55–56, pls. IX: 3–5, XXXV: 18, XLIV: 9. *Peniagone diaphana* — Hansen, 1975: 153–155, fig. 71; Gebruk, 1990: 91–93, fig. 33. *Scotoanassa translucida* Hérouard, 1899: 71–72, fig. 3; Hérouard, 1902: 43–45, pls. III: 4–6, VI: 17–20; Hérouard, 1923: 88–90, pls. III: 7–8, IV: 4; Madsen, 1953: 158–159, fig. 6.

LOCALITIES: “Princesse-Alice”, St. 749, 753, “Princesse Alice II”, 1558, 2983, 2997; “Vityaz”, St. 7943; “Meteor”, 1988/6 MOC1-11: B5, B8, B9; BIOGAS (1972–1974) “Jean Charcot”, Sts. 1, 2, 3, 4, 5, 6; also numerous stations of “Discovery” and “Challenger” in the North-East Atlantic (Billett et al., 1985; Gage et al., 1985; Billett, 1991); “G.O. Sars”, MAR-ECO cruise, St. 68/384.

DISTRIBUTION: throughout the North Atlantic, common in the North Pacific, Antarctic.

DEPTH RANGE: 1529–5600 m.

***Peniagone longipapillata* Gebruk, 2008**

Peniagone longipapillata Gebruk, 2008: 56–59, figs. 1B, 9, 10; Rogacheva et al., 2013: 606–608, figs. 12k–m, 17o, 18f, g, p.

LOCALITIES: “G.O. Sars”, MAR-ECO cruise, St. 40/367, 46/372, 50/373, 52/374, 68/384, 72/386; “James Cook” ECOMAR, Sts. JC011/111, JC048/16 Dive 162, JC048/24 Dive 165. DISTRIBUTION: North Atlantic, Mid-Atlantic Ridge from the Azores to the Charlie-Gibbs Fracture Zone, and Northeast Atlantic (Porcupine Seabight and Whittard Canyon) [Rogacheva et al., 2013].

DEPTH RANGE: 2398–3036 m.

***Peniagone marecoi* Gebruk, 2008**

Peniagone marecoi Gebruk, 2008: 54–56, figs. 7, 8.

LOCALITIES: “G.O. Sars”, MAR-ECO cruise, Sts. 42/368, 46/372, 50/373, 52/374, 54/377, 72/386.

DISTRIBUTION: Atlantic, Mid-Atlantic Ridge from the Azores to the Charlie-Gibbs Fracture Zone.

DEPTH RANGE: 1771–3509 m.

***Peniagone purpurea* (Théel, 1882)**

Elpidia purpurea Théel, 1882a: 21–23, pls. VII: 4–6, XXXIII: 13–14, XLIV: 6. *Peniagone purpurea* — Hansen, 1975: 151–152; Gebruk, 1990: 111–113, fig. 46. *Elpidia ambigua* Théel, 1882a: 27–28, pl. XXXIII: 6. *Peniagone lacinora* Agatep, 1967: 53–55, pl. III: 1–9. *Peniagone vexillum* Perrier, 1902: 429, pls. XII: 6, XIX: 24–25. *Peniagone ferruginea* Grieg, 1921: 7–8, fig. 3, pl. I: 4–6.

LOCALITIES: “Talisman”, St. 134, 42°19'N, 25°36'W, 4060 m (Perrier, 1896).

DISTRIBUTION: Antarctic, Atlantic, West Pacific.

DEPTH RANGE: 2800–5610 m.

***Peniagone coccinea* Rogacheva et Gebruk in Rogacheva et al., 2013**

Peniagone coccinea Rogacheva et al., 2013: 608–610, figs. 13, 14, 18h, i, o, 19e, *in situ* video record (online suppl.).

LOCALITIES: “James Cook” ECOMAR, Sts. JC037/15, JC037/19, JC037/27, JC048/38 Dive 172, JC048/43, Dive 174, JC048/54, Dive 179.

DISTRIBUTION: Mid-Atlantic Ridge, Charlie-Gibbs Fracture Zone Area.

DEPTH RANGE: 2600–2750 m.

Genus *Achlyonice* Théel, 1879

TYPE SPECIES: *Achlyonice ealcareia* Théel, 1879.

COMPOSITION: 5 species (Gebruk, 1990, 1997).

DISTRIBUTION: West Pacific — 3, central Atlantic — 1, cosmopolitan — 1 species.

***Achlyonice myriamae* Gebruk, 1997**

Achlyonice myriamae Gebruk, 1997: 214–215, fig. 2.

LOCALITIES: BIOGAS III CV 26).

DISTRIBUTION: known only from type locality.

DEPTH: 2822 m.

Genus *Amperima* Pawson, 1965

TYPE SPECIES: *Periamma roseum* Perrier, 1896.

COMPOSITION: 8 species.

DISTRIBUTION: Pacific — 2, Antarctic — 2, Atlantic — 1, cosmopolitan — 3 species.

***Amperima rosea* (Perrier, 1896)**

Periamma roseum Perrier, 1896: 901; Perrier, 1902: 419–423, pls. XIII: 10–12, XX: 1–11; Hérouard, 1923: 91–94. *Amperima rosea* — Hansen, 1975: 158–159, fig. 74; Gebruk, 1990: 140–141, fig. 61: 3–6.

LOCALITIES: “Talisman” (Perrier, 1902): 42°19'–44°29'N, 15°52'–23°36'W, 4060–5005 m; 44°20'N, 19°31'W, 4255 m; 44°29'N, 15°52'W, 5005 m; “Princesse-Alice II”, St. 2994; Porcupine Abyssal Plain (Billett, 1991; Wigham et al., 2003); BIOGAS (1972–1974) “Jean Charcot”, Sts. 1, 2, 3, 5, 6; “G.O. Sars”, MAR-ECO cruise, St. 50/373.

DISTRIBUTION: North Atlantic, North-West Pacific.

DEPTH RANGE: 4060–5740 m.

***Amperima furcata* (Hérouard, 1899)**

Kolga furcata Hérouard, 1899: 171, fig. 2; Hérouard, 1902: 40–41, pls. III: 7, VI: 4–10, VIII: 17. *Amperima furcata* — Hansen, 1975: 159, fig. 75; Gebruk, 1990: 141–142, fig. 61: 7–9; Rogacheva et al., 2013: 600–601, figs. 7a–e, 17k, 18m, n, 19c. *Periamma furcata* — Hérouard, 1923: 91.

LOCALITIES: “Princesse-Alice II”, St. 2990; “G.O. Sars”, MAR-ECO cruise, St. 40/367 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC011/23, jc037/15, JC048/43 Dive 174, JC048/54 Dive 179 (Rogacheva et al., 2013).

DISTRIBUTION: North Atlantic, North Pacific.

DEPTH RANGE: 1846–3015 m.

Genus *Penilpidia* Gebruk, 1988

TYPE SPECIES: *Kolga ludwigi* von Marenzeller, 1893.

COMPOSITION: 4 species.

DISTRIBUTION: Atlantic — 2 species, Mediterranean — 1, Pacific — 1.

Penilpidia midatlantica Gebruk, 2008

Penilpidia midatlantica Gebruk, 2008: 52–56, figs. 4–6; Rogacheva et al., 2013: 610–611.

Locality: “G.O. Sars”, MAR-ECO cruise, St. 46/368; “James Cook” ECOMAR, St. JC037/19.

DISTRIBUTION: Atlantic, Mid-Atlantic Ridge.

DEPTH RANGE: 2063–2750 m.

Genus *Kolga* Danielssen et Koren, 1879

TYPE SPECIES: *Kolga hyalina* Danielssen et Koren, 1879.

COMPOSITION: 1 (probably 3) species.

DISTRIBUTION: Cosmopolitan, 652–6235 m.

Kolga hyalina Danielssen et Koren, 1879

Kolga hyalina Danielssen, Koren, 1879: 83–106, pl. I, II; Danielssen, Koren, 1882: 3–20, pls. I–III, Théel, 1882a: 39; Ludwig, 1898: 12; Ludwig, 1901: 140; Michailovskij, 1903:4; Mortensen, 1927: 27; Deichmann, 1930: 132–133; Mortensen, 1932: 43, fig. 5; Djakonov, 1933: 135, fig. 69c; Heding, 1942a: 19, textfig. 18; Gorbunov, 1946: 47; Gurjanova, 1957: 361; Koltun, 1964: 46, 47, 53, 62, 68–69, 76, 77, 78; Baranova, 1964: 368; Agatep, 1967a: 140 (*partim*); Hansen, 1975: 170, figs. 86, 95, 2–3, pl. 9: 8, pl. 12: 11; Gebruk, 1990: 121, fig. 51; Hansen, Madsen, 1994: 88, fig. 56, 57, map 22; Rogacheva, 2007: 384–391, figs. 11–13; Rogacheva, 2012: 1185–1186, figs. 2–3; non *Kolga hyalina* — Billett, Hansen, 1982: 799, fig. 1–8; Gage et al., 1985: 200; Harvey et al., 1988: 185; non *Kolga nana* — Théel, 1882a: 39–42, pls. 2, 34, 33 (1–2), 34 (5), 36 (26), 42 (5, 8); non *Elpidia nana* Théel, 1879: 15–16, figs. 20–22.

LOCALITIES: “Vøringen”, Norwegian North-Atlantic Expedition (1876–1878), St. 295, 303, 353 (Danielssen, Koren, 1879, 1882); “Ingolf” (1895–1896), St. 20, 36, 37, 112 (Heding, 1942a); Second Test Cruise on the Icebreaker “Ermak” (1899), St. 31 (Michailovskij, 1903); Swedish Zoological Polar Expedition (1898), St. 26, 27; Swedish Zoological Polar Expedition (1900), St. 13 (unpublished data); I High Latitude Arctic Expedition on the Ice Steamer “Sadko” (1935), St. 3/16 (Rogacheva, 2007), 6, 10 (det. G.P. Gorbunov, unpublished), 59 (Gorbunov, 1946); III High Latitude Arctic Expedition on the Ice Steamer “Sadko” (1937–1938), St. 97, 100 (Gorbunov, 1946); Drifting Station “Severnyi Polus–3” [“North Pole”–3] (1954–1955), St. 18 (Gurjanova, 1957; Koltun, 1964); Drifting Station “Severnyi Polus–4” [“North Pole”–4] 1st shift (1954–1955), St. 4, 7, 8 (Gurjanova, 1957; Koltun, 1964); Drifting Station “Severnyi Polus–4” [“North Pole”–4] 2nd shift (1955), St. 2, 4 (Rogacheva, 2007), 3 (det. T. S. Saveljeva, unpublished); Drifting Station “Severnyi Polus–5” [“North Pole”–5] (1955), St. 1, 2, 4 (Rogacheva, 2007, original identification by T.S. Saveljeva); High Latitude Oceanographic Ex-

pedition on the Ice Steamer “Lena” (1955), St. 35, 37 (Koltun, 1964; Baranova, 1964); High Latitude Oceanographic Expedition on the Ice Steamer “Ob” (1956), St. 6, 22, 45 (Koltun, 1964); “Sevastopol”, St. 1709 (Rogacheva, 2007); Arctic Research Laboratory Ice Station 2, St. 380 (Agatep, 1967a); Drifting Station “Severnyi Polus–22” [“North Pole”–22] (1976–1980), St. 58; Drifting Station “Severnyi Polus–23” [“North Pole”–23] (1977), St. 4 (Rogacheva, 2007, original identification by G.M. Belyaev); “Håkon Mosby” St. 82.11.21.2, 82.11.21.4, 83.06.10.1, 83.06.11., St. 84.03.17.1, 84.03.17.2, 86.06.12.1, 86.07.24.1, 86.07.26.1, 86.07.28.1, 87.06.14.1 (Rogacheva, 2007); “Polarstern” ARK IX/4 cruise (1993): St. 32, 50, 54 (Rogacheva, 2007, original identification by A.V. Smirnov); “Polarstern” ARK XI/1 cruise (1995), St. 44-GKG(bio1), 49-GKG(bio1) (det. A.V. Smirnov, unpublished); “Polarstern” ARK XV/1 cruise (1999), Dive 4 [as *Irpa abyssicola* in Gebruk et al. (2003)]; “Healy”, St. 11, 13 (Rogacheva, 2007).

REMARKS. *Kolga hyalina* was regarded as cosmopolitan for many years. Evidence from recent revision of Arctic elpidiids suggests that this species is confined to the Arctic deep-sea biogeographical subregion (Rogacheva, 2007).

DISTRIBUTION: confirmed as common in the Arctic Basin and the Norwegian Sea north of the Faroe-Iceland Ridge.

DEPTH RANGE: 659–4106 m.

Kolga nana (Théel, 1979)

Elpidia nana Théel, 1879: 15–16, figs. 20–22. *Kolga nana* — Théel, 1882a: 39–42, pls. 2, 34, 33 (1–2), 34 (5), 36 (26), 42 (5, 8); Rogacheva, 2012: 1186–1190, figs. 4–7. *Kolga hyalina* — Hansen, 1975: 170–171 (*partim*); Billett, Hansen, 1982: 804–806, Figs. 2 (1–9), 4–6; Gage et al., 1985: 200; Harvey et al., 1988: 185; Gebruk, 1990: 121–122 (*partim*); *Kolga* sp. — Gebruk, 2008: 50, 51, 52, 58, fig. 1c.

LOCALITIES: “Discovery”, St. 7711#62, 7711#85, 9756#9, 9756#14 10113#1, 10114#1, 10115#1, “Challenger”, St. 50603#1, 50604#1, 50605#1, (Billett, Hansen, 1982); “Challenger” (1980–1983), St. ES 172 (Gage et al., 1985), ES 266 (Harvey et al., 1988); “G.O. Sars”, MAR-ECO cruise, St. 64–381 (Gebruk, 2008); BIOICE, St. 3176, 3571.

DISTRIBUTION: North Atlantic, Antarctic and Subantarctic.

DEPTH RANGE: 1484–6235 m (Rogacheva, 2012).

Genus *Ellipinion* Hérouard, 1923

TYPE SPECIES: *Scotoplanes delagei* Hérouard, 1896.

COMPOSITION: 9 species.

DISTRIBUTION: Atlantic — 2, Pacific — 3, Atlantic and Pacific — 1, Indian — 1, Antarctic — 1, cosmopolitan — 1.

***Ellipinion delagei* (Hérouard, 1896)**

Scotoplanes delagei Hérouard, 1896: 167–168, fig. 3. *Ellipinion delagei* — Gebruk, 1990: 133, fig. 58 (list); Rogacheva et al., 2013: 601, figs. 8, 17n, 19f.

LOCALITIES: “James Cook” ECOMAR, Sts. JC037/15, JC037/19, JC048/24 Dive 165 (Rogacheva et al., 2013).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 1165–2750 m.

***Ellipinion alani* Rogacheva et Gebruk in Rogacheva et al., 2013**

Ellipinion alani Rogacheva et al., 2013: 601–603, figs. 8, 17n, 19f.

LOCALITIES: “James Cook” ECOMAR, Sts. JC048/24 Dive 165, JC048/43 Dive 174 (Rogacheva et al., 2013).

DISTRIBUTION: Known from its type locality on the Northern Mid-Atlantic Ridge, Charlie-Gibbs Fracture Zone area.

DEPTH RANGE: 2398–2620 m.

Genus *Elpidia* Théel, 1876

TYPE SPECIES: *Elpidia glacialis* Théel, 1876.

COMPOSITION: 22 species.

DISTRIBUTION: cosmopolitan, especially common in trenches, most diversity in the Pacific (Belyaev, 1975).

***Elpidia gracilis* Belyaev, 1975**

Elpidia gracilis Belyaev, 1975: 266–267, fig. 6; Gebruk, 1993: 235–236, fig. 3(1–5); Thandar, 1999: 392–396, figs. 11, 15e.

LOCALITIES: “Discovery”, Sts. 9754#3, 9753, 9756#14, “Challenger”, Sts. 50602#2, 50603#1, 50604#1 (Budaeva, Rogacheva, 2013).

REMARKS: Perier described the species *Tutela echinata* based on specimens collected off Morocco (Perier, 1896). In the description details on body and ossicle morphology and illustrations were lacking. Later Perier (1902) assigned *Tutela echinata* to *Elpidia glacialis*. Belyaev (1971) considered this species as *Elpidia* sp. 2 since insufficiency of description. According to Belyaev, the species name «echinata» implies ossicles with long vertical apophyses similar to those in *E. gracilis*. If the two species are conspecific, the name *E. echinata* has a priority.

E. gracilis is the only species in the genus reliably known from the north and equatorial Atlantic. There are two records of *Elpidia* in the Atlantic that may be related to *E. gracilis* (*E. echinata*): south of Canaries (Heding, 1940 as *E. glacialis*) and in the Romanche Trench (Belyaev, 1971 as *Elpidia* sp. 3).

DISTRIBUTION: South Atlantic (off the South Orkney islands), Weddell Sea, North-East Atlantic (Porcupine Seabight and Porcupine Abyssal Plain).

DEPTH RANGE: 1484–6145 m, in the North Atlantic up to 4000 m.

***Elpidia heckeri* Baranova, 1989**

Elpidia heckeri Baranova, 1989: 218–222, figs. 1–3; Smirnov, Smirnov, 2006: 102–103 fig. 13 (*partim*); Rogacheva, 2007: 376–378, figs. 3, 4. *Elpidia glacialis* — Danielssen, Koren, 1882: 80 (*partim*); Heding, 1942a: 16–19 (*partim*); Gorbunov, 1946: 47, 98 (*partim*); Baranova, 1964: 367–368; Koltun, 1964: 46, 47, 68–69, 76; Bluhm, 1999: 10, 11. *Elpidia glacialis glacialis* — Agatep, 1967a: 135–139, fig. 1a–d; Hansen, 1975: 176–178, figs. 90, 91 (*partim*).

LOCALITIES: “Vøringen”, Norwegian North-Atlantic Expedition (1876–1878), St. 53, 295, 353; “Ingolf”, St. 113; “Ermak”, St. 14/50, 34/60; “Sadko”, St. 10/32, 59, 100; Drifting station “Severnyi Polus–2”, St. 9; “Fedor Litke”, Sts. 35, 37; Drifting station “Severnyi Polus–4/(2)” [“North Pole”–4/(2)], St. 2, 3, 4; Drifting station “Severnyi Polus–5” [“North Pole”–5], St. 5; “Ob”, St. 45; Drifting station “ARLIS II”, St. 29; “NORBI”, St. 10; Drifting station “Severnyi Polus–22” [“North Pole”–22], St. 14, 21, 27, 58; “Alaid”, Sts. 30.4, 30.5; “Håkon Mosby”, Sts. 81.08.14.5, 82.11.24.1, 83.06.11.1, 85.01.10.1; “Polarstern”, ARKTIS IX/4, Sts. 32, 54; “Polarstern”, ARKTIS XI/1, St. 23a; “Polarstern”, ARKTIS XV/1, dive 3; “Polarstern”, ARKTIS XVII/1, St.81-1; “Polarstern”, ARKTIS XVIII/1a, St. 62-42, 62-60; “Healy”, St. 6, 15 (Rogacheva, 2007); Swedish Zoological Polar Expedition (1898), St. 26, 27; Swedish Zoological Polar Expedition (1900), 72°50'N 3°08'W (station number unknown) and St. 29 (unpublished data); BIOICE, St. 3203, 3204, 3211, 3213, 3214, 3649 (Budaeva, Rogacheva, 2013 and unpublished data).

DISTRIBUTION: Arctic Basin and the Norwegian Sea north of the Faroe-Iceland Ridge.

DEPTH RANGE: 1700–5550 m.

***Elpidia belyaevi* Rogacheva, 2007**

Elpidia belyaevi Rogacheva, 2007: 378–382, figs. 6–9. *Elpidia glacialis* — Danielssen, Koren, 1882: 80 (*partim*). Mortensen, 1932: 41–43, pl. 1 figs. 4–5; Heding, 1942a: 16–19, tables I, II (*partim*); Gorbunov, 1946: 47, 98 (*partim*); Koltun, 1964: 77; Piepenburg et al., 1996: 440, 444; Vinogradova et al., 1996: 203, 204, 206. *Elpidia glacialis glacialis* — Hansen, 1975: 176–178, figs. 90 1–3, 91 3–8. *Elpidia* sp.1 — Belyaev, 1971: 356–357. *Elpidia heckeri* — Smirnov, Smirnov, 2006: 102–103 fig. 13 (*partim*).

LOCALITIES: “Vøringen”, Norwegian North-Atlantic Expedition (1876–1878), St. 40; “Michael Sars” St. 9; “Sadko”, St. 98; Drifting station “Severnyi Polus–3” [“North Pole”–3], St. 6; “Håkon Mosby”, Sts. 81.06.07.3, 81.08.15.4, 85.01.11.3, 87.06.13.2; “Akademik Mstislav Keldysh”, St. 2079, 2091, 2679, 2702, 2737, 3153, 3177, 3287, 3291, 3318; “Polarstern”, ARKTIS VIII/2, St. 108; BIOICE, Sts. 3204, 3207, 3210, 3230, 3637, 3638, 3648, 3649 (Rogacheva, 2007, and unpublished data).

REMARKS: Both *Elpidia heckeri* and *E. belyaevi* are often confused with *Elpidia glacialis*, an

upper bathyal and sublittoral species occurring at depths of 70–610 m in the Kara and north-eastern Barents Seas (Rogacheva, 2007) and at 250 m off Franz Josef Fjord in East Greenland (unpublished data).

DISTRIBUTION: Arctic basin, Norwegian Sea north of the Faroe-Iceland Ridge, Baffin Bay.

DEPTH RANGE: 610–2222 m.

Genus *Psychroplanes* Gebruk, 1988

TYPE SPECIES: *Elpidia rigida* Théel, 1882.

COMPOSITION: 4 species.

DISTRIBUTION: circumtropical and in part in mid latitudes. Atlantic — 1, Indian — 2, Pacific — 3 species.

Psychroplanes obsoleta (Hérouard, 1899)

Kolga obsoleta Hérouard, 1899: 170, fig. 1; Hérouard, 1902: 41–42, pls. VI: 11–15, VIII: 16, 18. *Psychroplanes obsoleta* — Gebruk, 1990: 82–84, fig. 29. *Kolga foliacea* Hérouard, 1912: 5–6, figs. 3–4. *Peniagone foliacea* — Hérouard, 1923: 86–87, pls. I: 31, IX: 1–2. *Peniagone nybelini* — Madsen, 1953: 157–158, fig. 5. *Peniagone obsoleta* Hansen, 1975: 134–135, fig. 56.

LOCALITIES: “Princesse-Alice”, St. 753, “Princesse-Alice II”, St. 1306; “Vityaz”, St. 7943.

DISTRIBUTION: Atlantic and Pacific (one locality east of the Japanese Trench).

DEPTH RANGE: 4275–6096 m.

Family Pelagothuriidae

Genus *Eynpniastes* Théel, 1882

TYPE SPECIES: *Eynpniastes eximia* Théel, 1882.

COMPOSITION: 1 species.

DISTRIBUTION: cosmopolitan (Gebruk, 1989).

Eynpniastes eximia (Théel, 1882)

Eynpniastes eximia Théel, 1882a: 56–57, pl. VIII: 6–7 (full synonymy in Gebruk, 1989).

LOCALITIES: “Meteor”, 1988/6 MOC1-11: B-7; “Discovery”, St. 9756#6 (Gebruk et al., 1997); numerous other localities in the North-East Atlantic (Billett et al., 1985); “James Cook” ECOMAR, St. JC048/43 Dive 174 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan, in the North-East Atlantic very common (Billett et al., 1985; Gebruk, 1989).

DEPTH RANGE: from surface to 5433 m.

Family Deimatidae

Genus *Deima* Théel, 1879

TYPE SPECIES: *Deima validum* Théel, 1879.

COMPOSITION: 1 species with 2 subspecies.

DISTRIBUTION: cosmopolitan.

Deima validum validum Théel, 1879

Deima validum Théel, 1879: 5, figs. 36–38; Théel, 1882a: 68–70, pls. XVIII, XIX, XXXI: 4–9, XXXVI: 4,

XXXVII: 8, XLIII: 7, XLIV: 13, XLVI: 5; Sluiter, 1901b: 60. *Deima validum validum* — Hansen, 1967: 488–490, fig. 5; Rogacheva et al., 2013: 595, fig. 18e. *Deima fastosum* Théel, 1879: 5–6, figs. 1–3; Théel, 1882a: 71–73, pls. XX, XXI: 1, XXXI: 10–13, XXXV: 7–10, XXXVI: 7, XXXVII: 3, XLIII: 2–3, 5, XLVI: 8. *Deima blakei* Théel, 1886b: 1–2, figs. 1–2; Koehler, Vaney, 1905: 55–57, pl. XI: 13–15; Hérouard, 1923: 40–41, pls. V: 7, VI: 5; Deichmann, 1930: 115–116, pls. X: 7–11, XI: 1–3; Deichmann, 1940: 198–199. *Deima atlanticum* Hérouard, 1898: 88–89, figs. 1–2; Hérouard, 1902: 32–35, pls. III: 3, IV: 18, V: 1–5, VIII: 26–29, Grieg, 1921: 4, pl. I: 2–3. *Deima mosaicum* Ohshima, 1915: 233–234, Ohshima, 1916–1919.

LOCALITIES: “Princesse Alice”, St. 753, “Princesse Alice II”, St. 3006; BIOGAS (1972–1974), “Jean Charcot”, St. 2, 3, 4, 5 (Sibuet, 1977); “Challenger” (1981–1982), 51216#1, 51414#2, 51415#1, 51608#1; “G.O. Sars” MAR-ECO cruise, St. 40-367 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC011/23, JC048/36 Dive 171, JC048/43 Dive 174 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 724–4820 m. In the North-East Atlantic: 2779–4360 m.

Genus *Oneirophanta* Théel, 1879

TYPE SPECIES: *Oneirophanta mutabilis* Théel, 1879.

COMPOSITION: 3 species.

DISTRIBUTION: Pacific — 1, Indian — 1, cosmopolitan — 1 species.

Oneirophanta mutabilis mutabilis Théel, 1879

Oneirophanta mutabilis Théel, 1879: 6–7, figs. 4–6; Théel, 1882a: 62–68, pls. XXI: 2, XXII, XXXI: 1–3, XXXVI: 1–2, 8–11, XXXVII: 4, 13, XXXVIII: 11–12, XL: 1–3, XLI: 1–2, 4, XLII: 9, XLIII: 1,6, XLV, XLVI: 6–7; Perrier, 1902: 374–380, pl. XVIII: 10–15; Clark, 1913: 232; Grieg, 1921: 5, pl. II: 1–2; Hérouard, 1923: 39–40, pls. IV: 10, V: 3–4; Ekman, 1927: 364–366, figs. 1–2; Agatep, 1967b: 63–65, pl. X: 1–7. *Oneirophanta mutabilis mutabilis* — Hansen, 1967: 485–488, figs. 3–4. *Oneirophanta alternata* Perrier, 1900: 117–118; Perrier, 1902: 380–386, pls. XIV: 3–4, XVIII: 16–22. *Oneirophanta alternata* var. *talismani* Perrier, 1902: 386–388, fig. 6.

LOCALITIES: “Princesse Alice II”, St. 2986; “Travailleur” and “Talisman” St. 133, 134, 135, 137, 138, 139 (Perrier, 1902); “M. Sars”, St. 10 (Grieg, 1921); “Discovery” St. 12930#26, 12930#46, 12930#64, 12930#78, 13078#29, 13078#37, 13200#09, 13925#1, 14317#1; “Challenger” St. 54301#06 (Witbaard et al., 2003); BIOGAS (1972–1974) “Jean Charcot”, St. 1, 2, 3, 4, 5; INCAL WS 04, CP 10, CP 11 (Massin, 1984); “G.O. Sars”, MAR-ECO cruise, St. 40-367, 46/372 (Gebruk, 2008).

DISTRIBUTION: cosmopolitan; in the North-East Atlantic very common.

DEPTH RANGE: 3200–6000 m.

Order Aspidochirotida

Family Synallactidae¹

Genus *Bathyplores* Östergren, 1896

TYPE SPECIES: *Bathyplores natans* (M. Sars, 1868).

COMPOSITION: ca. 20 species.

DISTRIBUTION: Pacific — 7; Indo-Pacific — 2; Indian Ocean — 5; Caribbean — 1; North Atlantic — 1; Antarctic — 1; cosmopolitan — 2 species.

Bathyplores natans (M. Sars, 1868)

Holothuria natans M. Sars, 1868: 20. *Bathyplores natans* — Östergren, 1896: 352–353, pl. 18: 27–35; Östergren, 1902: 6; Ludwig, 1901: 137; Grieg, 1921: 7; Mortensen, 1927: 384–385, textfigs. 228: 2, 229; Deichmann, 1930: 100–102, pl. 9: 1–2, 9; Deichmann, 1954: 386; Heding, 1942a: 10–12, textfigs. 10, 11: 1–10, textfig. 12: 1–2; Pawson, 1963b: 90–94, pl. 7: 1–7; Pawson, 1965: 16–18, fig. 4; Gage et al., 1985: 194; Harvey et al., 1988: 183; Miller, Pawson, 1990: 4; Madsen, Hansen, 1994: 79–82, figs. 48–50, map 20; Rowe, Gates, 1995: 328; Liao, 1997: 73–74, fig. 39. *Stichopus natans* — G.O. Sars, 1872: 30; M. Sars, 1877: 58, pl. 7: 18–41; Théel, 1886a: 193; Bell, 1892: 51. *Stichopus pourtalesii* Théel, 1886a: 4. *Stichopus tizardi* Théel, 1882b: 696; Bell, 1892: 51; Koehler, 1895: 48–50, textfigs. 13–14. *Bathyplores tizardi* — Östergren, 1896: 354; Ludwig, 1901: 138, pl. 12: 3–4, pl. 18: 19; Perrier, 1902: 350; Mitsukuri, 1912: 35–39, textfig. 8; Grieg, 1921: 4. *Bathyplores pourtalesii* — Mortensen, 1927; Deichmann, 1930: 102, pl. 9: 3–7; Deichmann, 1940: 186, pl. 31: 34; Deichmann, 1954: 386; Rowe, Gates, 1995: 328. *Bathyplores fallax* Östergren, 1896: 355, pl. 18: 44. *Herpyssidia reptans* Perrier, 1898: 247–248. *Bathyplores reptans* — Perrier, 1902: 352–358, pl. 12: 3–4, pl. 18: 1–9; Mortensen, 1927: 384. *Bathyplores assimilis* Koehler, Vaney, 1905: 25–26, pl. 3: 3, pl. 10: 1–3. *Bathyplores papillosus* — Koehler, Vaney, 1905: 28–29, pl. 10: 21–24. Non *Bathyplores papillosa* Koehler, Vaney, 1905: 2 (list). *Bathyplores patagiatus* Fisher, 1907: 688–690, pl. 72: 1, 1a–k. *Bathyplores ostergreni* Ohshima, 1915: 225–226, pl. 8: 3a–d. *Bathyplores heterostylides* Heding, 1942a: 12–13, textfig. 12: 3–5, textfig. 13: 1–15. *Bathyplores bipartitus* Hérouard, 1923: 34–36.

LOCALITIES: “Talisman”, St. 42 (Perrier, 1902); “James Cook” ECOMAR, Sts. JC037/19 (Rogacheva et al., 2013).

DISTRIBUTION: essentially cosmopolitan. In the East Atlantic known from the Lofoten Islands (Norway) to Cap Vert. Reported from the eastern and northern Gulf of Mexico; the Rockall Trough (Gage et al., 1985). Also recorded from Wanganella Bank (New Zealand), Tasman Sea, East China Sea (Liao, 1997) and Japan (Ohta, 1983).

DEPTH RANGE: 193–2750 m.

Genus *Benthothuria* Perrier, 1898

TYPE SPECIES: *Benthothuria funebris* Perrier, 1898.

COMPOSITION: 5 species.

DISTRIBUTION: Indian Ocean — 3; Indo-Pacific — 1; Atlantic — 1 species.

Benthothuria funebris Perrier, 1898

Benthothuria funebris Perrier, 1898: 1665; Perrier, 1899: 248; Perrier, 1902: 365–371; Mortensen, 1927: 378; Deichmann, 1930: 91; Heding, 1940: 363–364; Heding, 1942a: 6; Gage et al., 1985: 194–195; Harvey et al., 1988: 183.

Localities (not complete): “Ingolf”, St. 36; “Discovery”, St. 9640; St. 13914#1; “Challenger” (1973–1985), St. ES 27, ES 28, AT 119, AT 121, ES 147, ES 152, ES 169, SWT 12, SWT 27, OTSB 51001, OTSB 51301 (Gage et al., 1985); ES 204, AT 284, ES 285, AT 286, OTSB3/85/5 (Harvey et al., 1985); “G.O. Sars”, MAR-ECO cruise, Sts. 40/367, 52/374, 54/377, 64/381, 66/383, 74/387 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC011/23, JC011/75, JC011/101, JC037/15, JC037/19, JC037/27, JC037/61 (Rogacheva et al., 2013).

DISTRIBUTION: off North-West Africa and South-West Greenland; Rockall Trough, North-East Atlantic (Harvey et al., 1988); off Moroccan coast (specimens collected by the “Talisman”); off Sudan (Red Sea) and Senegal (Deichmann, 1930); North-West Atlantic (Heding, 1942a).

DEPTH RANGE: 782–3757 m. It appears that this species occurs deeper in more northerly latitudes in the North-East Atlantic (2700–3757 m) than off North-West Africa (782–1230 m) (Billett, 1991).

Genus *Paroriza* Hérouard, 1902

TYPE SPECIES: *Paroriza prouhoi* Hérouard, 1902 by monotypy.

COMPOSITION: 4 species.

DISTRIBUTION: Pacific — 2, Atlantic — 2 species.

Paroriza pallens (Koehler, 1895)

Stichopus pallens Koehler, 1895: 50–52, textfig. 15. *Paroriza pallens* — Clark, 1922: 46 (list).

Type locality: “Caudan”, St. 15.

LOCALITIES: BIOGAS (1972–1974) “Jean Charcot”, St. 2 (Sibuet, 1977); “G.O. Sars”, MAR-ECO cruise, St. 66/384 (Gebruk, 2008).

DISTRIBUTION: North-East Atlantic; northern Spain north to the Porcupine Seabight.

DEPTH RANGE: 1300–2900 m (Koehler, 1896; Khripounoff, Sibuet, 1980).

Paroriza prouhoi Hérouard, 1902

Paroriza prouhoi Hérouard, 1902: 24–25, pl. 7: 1–2, pl. 8: 30; Hérouard, 1923: 29–30, pl. 2: 3–4; Perrier, 1901: 323; Mortensen, 1927: 386; Deichmann, 1930: 112–113. *Mesothuria expectans* — Perrier, 1899: 245; Perrier, 1902: 317–320; Deichmann, 1930: 92, Tortonese, 1949: 11 (list); Madsen, 1953: 168 (list).

¹ Synonymy after Solis-Marín, 2003.

LOCALITIES: “Princesse Alice”, St. 753 (Hérouard, 1902); “Princesse-Alice II”, St. 2964 (Hérouard, 1923); “Challenger”, St. 50811#1 (Solís-Marín, 2003); “Talisman”, St. 136; BIOGAS (1972–1974) “Jean Charcot”, St. 2 (Sibuet, 1977); “Discovery”, St. 14317#1 (Wigham et al., 2003).

DISTRIBUTION: North-East Atlantic, off the Azores, the Bay of Biscay and the Porcupine Seabight; Mediterranean Sea.

DEPTH RANGE: 4080–4880 m.

Genus *Paelopatides* Théel, 1886

TYPE SPECIES: *Paelopatides confundens* Théel, 1886.

COMPOSITION: 19 species (see Solís-Marín, 2003).

DISTRIBUTION: Pacific — 6, Atlantic — 3, Indian Ocean — 8, Indonesia — 2 species.

Paelopatides atlantica Hérouard, 1902

Paelopatides atlantica Hérouard, 1902: 16, pl. 1: 15; Hérouard, 1923: 16; Mortensen, 1927: 388 (key); Deichmann, 1930: 106.

LOCALITIES: known only from the type locality, “Princesse Alice”, St. 527, off the Azores.

DEPTH RANGE: 4020 m.

Paelopatides gigantea (Verrill, 1884)

Benthodytes gigantea Verrill, 1884: 216; Verrill, 1885: 538, pl. 11: 31 a–b; Grieg, 1921: 9, textfigs. 5–6. *Paelopatides gigantea* — Deichmann, 1930: 104–106 (partim); Miller, Pawson, 1990: 5. *Paelopatides agassizi* Théel, 1886a: 3. *Paelopatides grisea* — Perrier, 1902: 381; Mortensen, 1927: 388.

LOCALITIES: “Discovery” St. 9775#3; BIOGAS (1972–1974) “Jean Charcot” St. 5, 6.

DISTRIBUTION: North Atlantic Ocean (Deichmann, 1930; Pérez et al., 1984).

DEPTH RANGE: 2454–2653 m.

Paelopatides grisea Perrier, 1898

Paelopatides grisea Perrier, 1898: 1665; Perrier, 1899: 248; Perrier, 1902: 361–365; Mortensen, 1927: 388; Hedding, 1940: 351; Billett et al., 1985: 407; Gage et al., 1985: 195–196; Harvey et al., 1988: 183; Miller, Pawson, 1990: 5; Gebruk, 2008: 50, 51; Rogacheva et al., 2013: 593, fig. 18a. *Paelopatides gigantea* — Deichmann, 1930: 104–106 (partim); Sibuet, 1977: 554; Miller, Pawson, 1990: 35.

LOCALITIES: “Talisman”, St. 134; “Discovery” St. 9775#3 (Billett et al., 1985); “G.O. Sars”, MAR-ECO cruise, Sts. 66/383, 68/384, 72/386 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC011/23, JC011/101, JC011/106, JC011/111, JC037/15, JC037/19, JC037/61, JC048/06 Dive 159, JC048/15 Dive 161 (Rogacheva et al., 2013).

DISTRIBUTION: North Atlantic, Caribbean.

DEPTH RANGE: 1695–4060 m.

Genus *Molpadiodemas* Heding, 1935 sensu O’Loughlin et Ahearn, 2005

TYPE SPECIES: *Molpadiodemas acaudum* Hedding, 1935, junior synonym of *Pseudostichopus atlanticus* Perrier, 1898, according to O’Loughlin, 2002.

COMPOSITION: 16 species.

DISTRIBUTION: Pacific — 3, South Pacific and Antarctic — 1, Antarctic — 3, Atlantic — 4, Indonesia — 1, cosmopolitan — 4 species.

Molpadiodemas atlanticus (Perrier, 1898)

Pseudostichopus atlanticus Perrier, 1898: 165; Perrier, 1899: 246–247; Perrier, 1902: 333–337, pl. 17: 15–20; Mortensen, 1927: 386–387; Deichmann, 1930: 87–88; O’Loughlin, 2002: 315. *Molpadiodemas atlanticus* — Hedding, 1940: 353–359; O’Loughlin, Ahearn, 2005: 153, fig. 3a, b, 4a–d, 6a, b. *Meseres atlanticus* — O’Loughlin, 1998: 497; Thandar, 1999: 376–379, fig. 4. *Molpadiodemas acaudum* — Hedding, 1935: 78–80, Pl. 6, fig. 1, 2; Hedding, 1940: 354–355, 357; Deichmann, 1940: 209, 211; Hedding, 1942a: 4–5. *Meseres acaudum* — O’Loughlin, 1998: 497.

LOCALITIES: Talisman, St. 134, off the Azores (type locality); “Ingolf”, St. 37, (type locality of *Molpadiodemas acaudum*, Hedding, 1935), West European Basin, 4780–4795 m (O’Loughlin, Ahearn 2005).

DISTRIBUTION: North Atlantic, South-East Atlantic, Pacific.

DEPTH RANGE: 2610–4795 m.

Molpadiodemas depressus (Hérouard, 1902)

Pseudostichopus depressus Hérouard, 1902: 15–16, pl. 2: 15–18, Mortensen, 1927: 387, Deichmann, 1930: 88. *Molpadiodemas depressus* — O’Loughlin, Ahearn, 2005: 158–159, fig. 3h, 4i–l. *Pseudostichopus (Pseudostichopus) depressus* — Hedding, 1940: 359 (key).

LOCALITIES: “Princesse Alice”, St. 753, between Portugal and Azores; West European Basin, 4426–4435 m (O’Loughlin, Ahearn 2005). North Atlantic, 40°N, 20°W to 20°N, 75°W, 2995–4360 m (Madsen, 1953).

DISTRIBUTION: North and South Atlantic Ocean; West European Basin, Sargasso Sea, off Bahamas and West Indies.

DEPTH RANGE: 1353–5690 m.

Molpadiodemas involutus (Sluiter, 1901)

Meseres involutus Sluiter, 1901a: 11–12; Sluiter, 1901b: 49–50, pl. 8, fig. 6; Perrier, 1902: 359; O’Loughlin, 2002: 306, fig. 2e, tables 1, 3, 4. *Molpadiodemas involutus* — O’Loughlin, Ahearn, 2005: 160–161, fig. 3m–o, 4u–x. *Pseudostichopus globigerinae* Hérouard, 1923: 23–25, pl. 4: 6; Mortensen, 1927: 386, 388; Deichmann, 1930: 87, 90; Sibuet, 1977: 554; Gebruk, 2008: 50, 51. *Pseudostichopus (Pseudostichopus) globigerinae* — Hedding, 1940: 353, 357; Imaoka, 1978: table 1–1; Thandar, 1992: 167. *Meseres globigerinae* — O’Loughlin, 2002: 305. *Pseudostichopus (Pseudostichopus) dilatorbis* Imaoka, 1978: 378–380, 384, fig. 1b–e, tabl. 1–1. *Pseudostichopus villosus*

sus — Hansen, 1956: 47–48 (*partim*, non *Pseudostichopus villosus* Théel, 1886).

LOCALITIES: “Chain”, [USNM 1005340], West European Basin, 4426–4435 m (O’Loughlin, Ahearn, 2005); BIOGAS (1972–1974) “Jean Charcot”, St. 1, 2, 4 (Sibuet, 1977); BIOICE, St. 3070, 3073, 3169 (unpublished data).

DISTRIBUTION: North and South Atlantic, including Antarctic waters (Scotia Sea), North Pacific, East China Sea, Indonesia and Tasman Sea.

DEPTH RANGE: 400–5801 m.

Molpadiodemas villosus (Théel, 1886)

Pseudostichopus villosus Théel, 1886a: 170–171, Hérouard, 1896: 164 (distribution list), Hérouard, 1902: 11–13, pl. 2: 1–3, pl. 7: 3, Hérouard, 1923: 23, Vaney, 1908: 407–408, Grieg, 1921: 4, Hérouard, 1923: 23, Mortensen, 1927: 387, 388, Deichmann, 1930: 89, Heding, 1940: 353–360, Hansen, 1956: 47–48. *Molpadiodemas villosus* — O’Loughlin, Ahearn, 2005: 164–165, tabl. 3, figs. 2a, e, 7d–f, 8q–t, 12a–d. *Pseudostichopus villosus* var. *violaceus* Théel, 1886a: 172, pl. 10: 6b. *Meseres villosus* — O’Loughlin, 1998: 497; O’Loughlin, 2002: 313, figs. 3a–b. Type locality: “Challenger”, St. 156, 62°26’S, 95°44’E, 3594 m, 26–02–1874.

LOCALITIES: “Princesse Alice II”, St. 1306 (Hérouard, 1923); “Michael Sars”, St. 53 (Grieg, 1921); “Discovery”, St. 9638#2, 10115#1, 11908#44, 11908#68, 12930#37, 12930#46, 12930#60, 12930#64, 12930#78, 13078#29, 13078#31, 13078#37, 13200#9, 13200#27, 13200#35, 13200#60, 13200#88, 13200#99, 13368#23, 13368#51, 13369#1, 13627#10, 13627#23, 13907#1, 13925#1; “Challenger” St. 50514#1, 50515#1, 50711#1, 50812#2, 50910#1, 51414#1, 52216#8, 52403#25, 52701#42, 53201#1, 53201#24, 53201#28, 53205#3, 54301#6, 54301#8, 54901#2, 54901#5, 54901#7, 54902#1, 54903#1; “Meteor” St. 52602#1 (Solís-Marín, 2003).

DISTRIBUTION: Bay of Biscay, Mediterranean Sea (Tortonese, 1949); North-West Atlantic (Solís-Marín, 2003); North-East Atlantic (Deichmann 1930, referred as *P. atlanticus*); Caribbean Sea, (Deichmann 1930, referred as *P. atlanticus*); South Atlantic, African coast (Thandar, 1999). The Pacific Ocean records need validation.

DEPTH RANGE: 896–7000 m (Deichmann, 1930; Hansen, 1956).

Molpadiodemas violaceus (Théel, 1886)

Pseudostichopus villosus var. *violaceus* Théel, 1886: 172, pl. 10, fig. 6b. *Molpadiodemas violaceus* — O’Loughlin, Ahearn, 2005: 165, figs. 1e, i, 2f, 7g–i, 8u–x (list); Rogacheva et al., 2013: 592. *Pseudostichopus villosus* Théel, 1886: 170–171 (*partim* — syntypes of *Pseudostichopus villosus* from HMS “Challenger” Sts. 61, 147, 325).

LOCALITIES: “James Cook”, St. JC011/75 (Rogacheva et al., 2013).

DISTRIBUTION: Antarctic and Subantarctic, North Atlantic and South Pacific.

DEPTH RANGE: 2196–6354 m, in the North Atlantic 2605–5212 m (Rogacheva et al., 2013).

Genus *Pseudostichopus* Théel, 1886 sensu O’Loughlin et Ahearn, 2005

TYPE SPECIES: *Pseudostichopus mollis* Théel, 1886 (subsequent designation by Fisher, 1907).

COMPOSITION: 11 species.

DISTRIBUTION: North-East Atlantic — 2, Pacific — 4, Indian Ocean — 1, Antarctic — 1, cosmopolitan — 3 species.

Pseudostichopus aemulatus Solís-Marín et Billet, 2004 in Solís-Marín et al., 2004

Pseudostichopus aemulatus Solís-Marín et al., 2004: 1079–1081, fig. 1A–I; O’Loughlin, Ahearn, 2005: 169–170, Fig. 11a, b, 12m; *Pseudostichopus* sp. — Billett et al., 2001: 336.

LOCALITIES: “Challenger”, St. 52701#42, 54901/5, 54901/7, 54901/9, 54903/1, 54905/1; “Discovery”, St. 12930#46, 12930#78, 13078#29, 13627#10.

DISTRIBUTION: North-East Atlantic, Porcupine Abyssal Plain.

DEPTH RANGE: 4350–4850 m.

Pseudostichopus peripatus (Sluiter, 1901) sensu O’Loughlin et Ahearn, 2005

Meseres peripatus Sluiter, 1901a: 10–11; Sluiter, 1901b: 48–49, pl. 5 fig. 5, pl. 8 fig. 7; Perrier, 1902: 359. *Pseudostichopus peripatus* — O’Loughlin, Ahearn, 2005: 174–175, Figs. 1f, 10f–h, 11i–1, 12g, h. *Pseudostichopus occultatus* — Hérouard, 1902: 14–15, pl. 2 figs 4–14 (*partim*, illustrated; non *Pseudostichopus occultatus* Marenzeller, 1893). *Pseudostichopus occultatus* var. *plicatus* Koehler, Vaney, 1905: 9–10, pl. 3 fig. 8, pl. 9 figs 1–3; Heding, 1940: 353 (non *Pseudostichopus occultatus* Marenzeller, 1893). *Plicastichopus plicatus* — Heding, 1940: 354–356; Heding, 1942a: 6. *Pseudostichopus propinquus* Fisher, 1907: 691–693, pl. 71 fig. 3, pl. 72 fig. 2, pl. 73 fig. 3, pl. 74 fig. 1, pl. 76 fig. 3; Imaoka, 1978: 382. *Pseudostichopus* (*Trachostichopus*) *propinquus* — Heding, 1940: 357; Imaoka, 1978: table 1–1; Imaoka, 1990: 148, 152. *Meseres propinquus* — O’Loughlin, 2002: 309. *Pseudostichopus aleutianus* Ohshima, 1915: 228, pl. 8 figs 5a–c; Imaoka, 1978: 380. *Pseudostichopus* (*Trachostichopus*) *aleutianus* — Heding, 1940: 353–359; Imaoka, 1978, table 1–2. *Pseudostichopus unguiculatus* — Ohshima, 1915: 230–231, pl. 8 figs 7a–c; Imaoka, 1978: 384; Rowe, 1995: 285. *Pseudostichopus* (*Pseudostichopus*) *unguiculatus* — Heding, 1940: 353–360; Imaoka, 1978: table 1–1; Imaoka, 1990: 152; Thandar, 1992: 167. *Pseudostichopus marenzelleri* Hérouard, 1923: 25; Mortensen, 1927: 287–288; Deichmann, 1930: 90; Gebruk, 2008: 50, 51. *Pseudostichopus* (*Pseudostichopus*) *marenzelleri* — Heding, 1940: 353–359; Imaoka, 1978: table 1–1; Thandar, 1992: 167. *Pseudostichopus lapidus* Hérouard, 1923: 26–28, pl. 4 fig. 5; Mortensen, 1927: 387; Deich-

mann, 1930: 90. *Pseudostichopus* (*Pseudostichopus*) *lapidus* — Heding, 1940: 353–360. *Plicastichopus ingolfi* Heding, 1942a: 5–6, figs 4–5, pl. 1 figs 4–5. *Meseres ingolfi* — Rowe, 1995: 285. *Pseudostichopus* (*Trachostichopus*) *tuberculatus* — Imaoka, 1990: 149–152, pl. p. 149, fig. P. 15.

LOCALITIES: “Princesse Alice”, St. 527 (type locality of *Pseudostichopus lapidus* Hérourard, 1923), St. 650 (type locality of *Pseudostichopus marenzelleri* Hérourard, 1923), “Ingolf”, St. 18, (type locality of *Plicastichopus ingolfi* Heding, 1942a); “G.O. Sars”, MAR-ECO cruise, Sts. 68/384, 72/386; “James Cook” ECOMAR, Sts. JC011/23; JC011/75; JC011/101; JC011/106; JC037/15; JC037/19; JC037/27; JC037/61; JC037/67; JC037/70, JC048/24 Dive 165 (Rogacheva et al., 2013).

DISTRIBUTION: Mediterranean, North and South Atlantic Ocean, Indo-Pacific Region, North and South Pacific Ocean, Scotia Sea, Antarctic Ocean, Ross Sea, Weddell Sea.

DEPTH RANGE: 134–5453 m.

***Scotothuria* Hansen, 1978**

TYPE SPECIES: *Scotothuria herringi* Hansen, 1978.

COMPOSITION: 1 species.

***Scotothuria herringi* Hansen, 1978**

Scotothuria herringi Hansen, 1978: 34–37, figs. 1–9; Billett et al., 1985: 406–407, fig. 5; Miller, Pawson, 1990: 4.

LOCALITIES: “Discovery”, St. 9022#1, 9801#90, 10651#1, 10651#2, 11121#22, 11121#23 (Billett et al., 1985).

REMARKS: Benthopelagic species; swims using undulating movements of ventro-lateral fringe.

DISTRIBUTION: Numerous records in the East Atlantic in pelagic trawls from 20 to 3900 m above seafloor. The only record in the benthic trawl at the *Galathea* St. 238 in the Indian Ocean off Kenya.

DEPTH RANGE: 1250–4980 m.

Genus *Synallactes* Ludwig, 1893

TYPE SPECIES: *Synallactes alexandri* Ludwig, 1893.

COMPOSITION: 22 species.

DISTRIBUTION: Pacific — 11, Atlantic — 6, Indian Ocean — 4, Antarctic — 1 species.

***Synallactes crucifera* Perrier, 1898**

Synallactes crucifera Perrier, 1898: 1665; Perrier, 1899: 247; Perrier, 1902: 339–345, pl. 12: 5–6, pl. 17: 21–35; Mortensen, 1927: 378 (key), textfig. 224, fig. 9; Deichmann, 1930: 106 (*passim*); Deichmann, 1940: 186, pl. 31: 5–6; Gebruk, 2008: 50, 51.

LOCALITIES: “Talisman”, St. 40.

DISTRIBUTION: North-East Atlantic Ocean, coast of Morocco; Caribbean Sea, off Venezuela;

Mid-Atlantic Ridge, south of the Charlie-Gibbs Fracture Zone.

DEPTH RANGE: 2160–2340 m.

***Synallactes longipapillata* Sibuet, 1978**

Synallactes longipapillata Sibuet, 1978: 311–318, pls. 1–3.

LOCALITIES: BIOGAS (1972–1974) “Jean Charcot”, St. 2, DS 40. Known only from the type locality.

DISTRIBUTION: North-East Atlantic, Bay of Biscay.

DEPTH RANGE: 3345 m.

Family Mesothuriidae

Genus *Mesothuria* Ludwig, 1894

TYPE SPECIES: *Mesothuria multiples* Ludwig, 1894.

COMPOSITION: 27 species (Solis-Marin, 2003; Gebruk et al., 2012).

DISTRIBUTION: Pacific — 9; Indian Ocean — 6; Atlantic — 6; Caribbean — 3; Antarctic to North Atlantic — 1; Antarctic — 1; cosmopolitan — 1 species.

***Mesothuria bifurcata* Hérourard, 1901**

Mesothuria bifurcata Hérourard, 1901: 40; Hérourard, 1906: 4–6, pl. 2: 3; Jangoux, Massin, 1986: 84 (list); O’Loughlin et al., 1994: 553–554; O’Loughlin, 2002: 313, 315; Gebruk et al., 2012: 283–284, fig. 5. *Mesothuria* (*Mesothuria*) *bifurcata* — Heding, 1940: 333; Heding, 1942a: 8, text fig. 7, figs. 1–6.

LOCALITIES: “Ingolf”, St. 18 (Heding, 1942a); BIOICE, St. 2914, 3077, 3572, 3574 (unpublished data).

DISTRIBUTION: Antarctic species. One record in the North Atlantic.

DEPTH RANGE: 320–2337 m (Heding, 1942a; O’Loughlin, 2002).

***Mesothuria cathedralis* Heding, 1940**

Mesothuria (*Allantis*) *cathedralis* — Heding, 1940: 338–340, textfig. 5; *Mesothuria* (*Penichrothuria*) *cathedralis*, — Heding, 1942a: 8–9, textfig. 8, figs. 1–5; non *Mesothuria* (*Allantis*) *candelabra* — Heding, 1940: 334–335, textfig. 3, figs. 1–6; *Mesothuria cathedralis*, Gage et al., 1985: 196; Gebruk, 2008: 50, 51; Gebruk, 2012: 284, 286–289, fig. 7.

LOCALITIES: “Ingolf”, St. 18; “Challenger”, St. ES 10; “G.O. Sars”, MAR-ECO cruise, St. 72/386 (Gebruk 2008); “James Cook”, Sts. JC011/17, JC011/23, JC011/75, JC011/101, JC037/15, JC037/19, JC037/27, JC037/27, JC037/70, JC048/16 Dive 162 (Rogacheva et al., 2013).

DISTRIBUTION: Atlantic; Gulf of Guinea, off Cape Bojador (Morocco), Irminger Basin off southern Greenland and Gulf of Mexico.

***Mesothuria milleri* Gebruk et Solís-Marín,
2012 in Gebruk et al., 2012**

Mesothuria milleri Gebruk et al., 2012: 274–283, fig. 4. *Holothuria verrilli* (Théel, 1886a) — Marenzeller, 1893b: 7–9, pl. 1: 2, pl. 2: 2. *Mesothuria verrilli* (Théel, 1886) — Östergren, 1896: 345; Perrier, 1902: 307–312, pl. 16: 22–31; Hérouard, 1923: 10–13; Mortensen, 1927: 381–382, fig. 224: 4–5; Grieg, 1921: 4.

LOCALITIES: numerous throughout east Atlantic, e.g. “Talisman”, Sts. 75, 129, 134, 135, 136; BIOICE, Sts. 2861, 3070, 3572.

DISTRIBUTION: This species is widely distributed in the North-Eastern North Atlantic: off north-west Africa, the Canary Islands (Perrier, 1902; Grieg, 1932) the Azores (Hérouard, 1902; 1923; Perrier, 1902), the Bay of Biscay (Koehler, 1896; Perrier, 1902) the Porcupine Seabight (Mortensen, 1927), Goban Spur, Rockall Trough (Harvey et al., 1988), off British Isles, the Azores, the Canary Islands and Morocco (Perez et al., 1984).

DEPTH RANGE: 550–4255 m (Perrier, 1902). Perrier was uncertain about two records from deeper than 4000 m. Excluding these records, the lower limit is 3018 m (Hérouard, 1923). In the North-East Atlantic this species was found to be most abundant between 1430 and 1530 m (Billett, 1988).

***Mesothuria intestinalis* (Ascanius, 1805)**

Holothuria intestinalis Ascanius, 1805: 5, pl. 45; Marenzeller, 1893a: 15; Marenzeller, 1895: 21; Ludwig, 1893: 174; Théel, 1886: 209; Théel, 1901: 1–38, pls. 1–2: 1–19, textfigs. 1–12; Bell, 1892: 48–49, pl. 5: 3; Hérouard, 1896: 163. *Mesothuria intestinalis* — Östergren, 1896: 347–351, pl. 18: 1–26; Östergren, 1902: 6–7; Perrier, 1902: 304–307, text figs. 1–2, pl. 16: 19–21; Ludwig, 1901: 139; Théel, 1902: 4–34, pl. 1–2: 1–19 and 12 text figs.; Hérouard, 1923: 10, pl. 5: 5–6; Mortensen, 1927: 381, text fig. 225, 228: 3; Koehler, 1927: 240, pl. 15: 3 (*partim*); Deichmann, 1930: 94–95, pl. 6: 9–10; Deichmann, 1954: 385–386; Tortonese, 1949: 13 (list); Tortonese, 1965: 69–70, text fig. 26; Sibuet, 1974a: 795; Harvey et al., 1988: 184; Madsen, Hansen, 1994: 76–79, figs. 46–47, map 29; Massin, 1996: 43; Gebruk et al., 2012: 291–300, figs. 1, 9c–d. *Fistularia mollis* Sars, 1835: 40. *Thyonidium scabrum* Sars, 1868: 19–20. *Holothuria verrilli* — Marenzeller, 1893b: 7–9, pl. 1: 2, pl. 2: 2. *Allantia intestinalis* var. *verrilli* — Hérouard, 1902: 18–21, pl. 1: 3–6 (*partim*); *Allantia intestinalis* — Heding, 1942a: 7, text fig. 6. Non *Allantia intestinalis* var. *verrilli* — Hérouard, 1902 (= *Mesothuria verrilli*). *Mesothuria* (*Allantia*) *intestinalis* — Heding, 1942a: 7, textfig. 6, figs. 1–7; Panning, 1952: 123–125, figs. 1–3. *Mesothuria verrilli* — Tortonese, 1952: 228; Tortonese, 1961, pl. 1, text fig. 1. *Mesothuria triradiata* Heding, 1942b: 217–218, textfig. 1, figs. 1–6.

DISTRIBUTION: widely distributed in the North-East Atlantic (Harvey et al., 1988) from off North-West Africa (Hérouard, 1923) to the coast of Norway, although nowhere in the deep sea does it appear to be particularly common. A few specimens are known from the Mediterranean (Perrier, 1902;

Koehler, 1927; Sibuet, 1977) and the western Atlantic (Deichmann, 1930). The species may occur in the Gulf of Mexico (Deichmann, 1954).

DEPTH RANGE: 18–4255 m (Tortonese 1949). The shallowest records come only from cold waters off Norway.

***Mesothuria maroccana* Perrier, 1899**

Mesothuria maroccana Perrier, 1899: 245; Perrier, 1902: 312–317, pl. 16: 32–35; Hérouard, 1923: 17; Deichmann, 1930: 97, pl. 7: 2–7; Deichmann, 1940: 191; Deichmann, 1954: 385; Grieg, 1921: 4; Hansen, 1956: 46, fig. 14a; Gebruk, 2008: 50, 51; Gebruk et al., 2012: 301–303, figs. 9a, b; Rogacheva et al., 2013: 592, fig. 17d. *Holothuria intestinalis* var. *verrilli* — Hérouard, 1896: 163. *Mesothuria murrayi* var. *grandipes* Hérouard, 1923: 15, pl. 4: 7–9. *Mesothuria* (*Mesothuria*) *maroccana* — Heding, 1940: 333, Heding, 1942a: 8.

LOCALITIES: “Talisman”, Sts. 35, 39 (Perrier, 1902); “Ingolf”, Sts. 18, 65 (Heding, 1942a); “Michael Sars”, St. 88 (Grieg, 1921); BIOGAS (1972–1974) “Jean Charcot”, Sts. 1, 2, 6 (Sibuet, 1977); “G.O. Sars”, MAR-ECO cruise, Sts. 40/367, 42/368, 50/373, 64/381 (Gebruk, 2008); “Challenger”, St. 50518 #1, “Discovery”, St. 10106 #1 (unpublished); “James Cook” ECOMAR, Sts. JC011/17, JC011/75, JC037/15, JC037/19, JC037/27, JC048/40 Dive 173 (Rogacheva et al., 2013).

DISTRIBUTION: Caribbean Sea, Gulf of Mexico, North Atlantic.

DEPTH RANGE: 700–3120 m.

Genus *Zygothuria* Perrier, 1898

TYPE SPECIES: *Zygothuria lactea* (Théel, 1886) designated by Hérouard (1902).

COMPOSITION: 6 species (Solís-Marín, 2003; Gebruk et al., 2012).

DISTRIBUTION: Atlantic — 3, Pacific — 2, cosmopolitan — 1 species.

***Zygothuria lactea* (Théel, 1886)**

Holothuria lactea Théel, 1886a: 6–7; Théel, 1886b: 183–184, pl. 9: 15. *Zygothuria lactea* — Gebruk et al., 2012: 310–321, figs. 13, 14. *Mesothuria lactea* (Théel) — Sluiter, 1901a: 25; Hérouard, 1902: 21–23, pl. 1: 17–19; Hérouard, 1923: 13–15, pl. 4: 1–3; Mortensen, 1927: 382–383 (*partim*), fig. 227. *Mesothuria* (*Zygothuria*) *lactea* (Théel) — Heding, 1940: 340–341, fig. 7. *Mesothuria* (*Zygothuria*) *lactea lactea* (Théel) — Heding, 1942a: 9–10, fig. 9. *Mesothuria lactea* (Théel) — Perrier, 1902: 322–327 (*partim*), pl. 17: 1–6; Deichmann, 1930: 108–111, pl. 8: 8–9; Deichmann, 1940: 190–191; Deichmann, 1954: 386.

DISTRIBUTION: Cosmopolitan species. However, some old records may not be reliable because most authors did not recognize the species *oxysclera* and these two species could have been confused. This is especially likely with the records from the Gulf of Mexico and the Caribbean (Deichmann,

1930) where *Z. oxysclera* occurs. Numerous records from the eastern North-East Atlantic, also known from the North-West Atlantic, off West Africa, South-East Atlantic, Indo-Malayan archipelago and New Zealand waters (Gebruk et al., 2012).

DEPTH RANGE: reliable bathymetric range from 694 m (Sluiter, 1901a) to 2102 m (Hérouard, 1902). *M. lactea* var. *spinosa* (Heding, 1940), recorded from 5108 m, differs significantly from *Z. lactea* both in the shape and the size of ossicles and should probably be assigned to *Z. candelabri* (Hérouard, 1923). Another deep record, from 4400 m (Sibuet, 1977), was not supported by morphological details and hence is not reliable. In the Porcupine Seabight the species was most abundant between 1430 and 1930 m (for detailed distribution, see Billett, 1988).

***Zygothuria candelabri* (Hérouard, 1923)**

Mesothuria candelabri Hérouard, 1923: 17–19, pl. 1: 1–10; Madsen, 1953: 153. Non *Mesothuria* (*Allantisia*) *candelabri* — Heding, 1940 [= *Mesothuria* (*Penichrothuria*) *cathedralis*]. *Zygothuria candelabri* — Deichmann, 1930: 111; Gebruk et al., 2012: 322–325, fig. 16.

REMARKS: This species was described from some fragments. The tables are indicated to have relatively few holes in the skin and excessively long diverging spines on top of the spire, with a few small teeth scattered along the sides of the spines. It is likely identical with *Z. lactea* var. *spinosa* and *Z. thomsoni* (Gebruk et al., 2012). Some authors have mis-spelt “*candelabri*” as “*candelabra*”.

LOCALITIES: “Princesse Alice”, St. 2986, Bay of Biscay; Swedish Deep-Sea Expedition, St. 387; Porcupine Seabight, Porcupine Abyssal Plain (Billett, 1991).

DISTRIBUTION: North-East Atlantic Ocean.

DEPTH RANGE: 3890–4870 m.

Order Dendrochirotida

Family Cucumariidae

Genus *Staurocucumis* Ekman, 1927

TYPE SPECIES: *Cucumaria liouvillei* Vaney, 1914.

COMPOSITION: 6 species.

DISTRIBUTION: Atlantic Ocean — 1, Antarctic — 4, cosmopolitan — 1 species.

***Staurocucumis abyssorum* (Théel, 1886)**

Cucumaria abyssorum Théel, 1886a: 66–67, pl. 4, fig. 6, pl. 16, fig. 6; von Marenzeller, 1893b: 14; Ludwig, 1894: 122–125, pl. 9, figs. 28–29, pl. 13, figs. 1–5; Grieg, 1921: 11, text-fig. 9; Ludwig, Heding, 1935: 179; Chéronnier, 1941: 93–96, 101, fig. 1, 3j, n, o, p. *Staurocucumis abyssorum* — Ekman, 1927: 385–387; Clark, Deichmann, 1936: 566; Hansen, 1988: 302–303, fig. 1; Rogacheva et al., 2013: 590, fig. 17a. *Abyssocucumis abyssorum* — Heding, 1942a: 33–35, figs. 34–36; Gage et al., 1985: 191. *Cucumaria abyssorum* var. *grandis* Théel, 1886a: 67–68, pl. 5 fig. 1. *Cucumaria abyssorum* var.

hyalina — Théel, 1886a: 68–69, pl. 4 fig. 7. *Cucumaria sluiteri* — Ohshima, 1915: 263, pl. 10, fig. 21a, b. *Cucumaria ingolfi* Deichmann in Mortensen, 1927: 396. *Staurocucumis ingolfi* — Clark, Deichmann, 1936: 567. *Cucumaria albatrossi* Chéronnier, 1941: 96–101, 103, fig. 2, 3a–I, k–m.

LOCALITIES: “Hirondelle”, St. 248, (von Marenzeller, 1893b); “M. Sars”, St. 88 (Grieg, 1921); “Challenger”, SWT 15, (Gage et al., 1985); “G.O. Sars”, MAR-ECO cruise, Sts. 52/374, 54/377 (Gebruk, 2008); “James Cook” ECOMAR, Sts. JC011/17, JC011/23, JC037/15, JC37/019, JC37/027 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan (Atlantic, Pacific, Indian Oceans and Antarctic).

DEPTH RANGE: 869–4025 m, Ekman (1927) referred to a juvenile specimen from 385 m in the Antarctic, but Hansen (1975) believed that it might have been misidentified.

Genus *Echinocucumis* M. Sars, 1859²

TYPE SPECIES: *Echinocucumis typica* M. Sars, 1859 (= *Eupyrgus hispidus* Barrett, 1857) by monotypy.

COMPOSITION: 7 species.

DISTRIBUTION: Atlantic — 2, Atlantic and Pacific — 1, Pacific — 2, Indian Ocean — 1, Antarctic — 1 species.

***Echinocucumis hispida* (Barrett, 1857)**

Eupyrgus hispidus Barrett, 1857: 46, pl. 4 fig 1 a, b. *Echinocucumis hispida* — Mortensen, 1927: 404, figs. 242–I, 243; Deichmann, 1930: 150, pl. 18 fig. 9; Ludwig, Heding, 1935: 167; Heding, 1942a: 29–31, figs. 31, 32; Panning, 1949: 454; Pawson, 1965: 8–10, fig. 2; Sibuet, 1977: 554; Gage et al., 1985: 194; Thandar, 1999: 370–373, fig. 2. *Echinocucumis typica* M. Sars, 1861: 102, pl. 10 figs. 11–20, pl. 11 figs. 1–17; Théel, 1886a: 118–119; Théel, 1886b: 9, fig. 3; Hérouard, 1923: 118–127, pl. VII figs. 7, 10. *Cucumaria typica* Ludwig, 1901: 149.

TYPE LOCALITY: Nordland (western Norway, Lofoten area).

LOCALITIES: “Princesse Alice II”, St. 1116 (Hérouard, 1923); BIOGAS, St. 4 (Sibuet, 1977).

DISTRIBUTION: Atlantic, off east coast of New Zealand.

DEPTH RANGE: 50–3257 m.

Family Ypsilothuriidae

Genus *Ypsilothuria* E. Perrier, 1886

TYPE SPECIES: *Ypsilothuria talismani* E. Perrier, 1886.

COMPOSITION: 2 species

DISTRIBUTION: Atlantic (*Y. talismani*); Atlantic and Pacific (*Y. bitentaculata*).

² Smirnov (2012: 822) transferred this genus from family Ypsilothuriidae into family Cucumariidae.

Ypsilothuria talismani talismani**E. Perrier, 1886**

Ypsilothuria talismani Perrier E., 1886: 286, fig. 294; Perrier R., 1902: 518, textfig. 12, Pl. XII figs. 9–10. *Ypsilothuria talismani talismani* — Heding, 1942a: 26–27, textfig. 24, textfig. 25, 5, 6, textfig. 26, 1, 3, textfig. 27, 3, textfig. 28, 1, 2, textfig. 29; Gebruk, 2008: 50, 51. *Echinocucumis typica* var. *abyssalis* — Koehler, 1896: 118, fig. 22.

LOCALITIES: “Travailleur” (1881) Dragage 1 (Perrier, 1902); “G.O. Sars”, MAR-ECO cruise, Sts.: 54377, 64381, 66383 (Gebruk, 2008); BIO-ICE, Sts.: 2854, 2863, 3169, 3170, 3172, 3176 (unpublished data).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 480–3527 m.

Ypsilothuria bitentaculata attenuata**E. Perrier, 1886**

Ypsilothuria attenuata Perrier E., 1886: 285, fig. 203; Perrier R., 1902: 522, textfig. 13. *Ypsilothuria bitentaculata attenuata* — Heding, 1942a: 28, pl. 2 figs. 1–10; textfig. 25 1–4, 9–10, textfig. 26 4–7, textfig. 27 2, 5, textfig. 30; Gage et al., 1985: 192; Harvey et al., 1988: 183; Alvà, 1991: 459–460; Massin, 1996: 44–46, fig. 1A–G, fig. 2A–B. *Ypsilothuria bitentaculata* — Thandar, 1999: 373–376, fig. 3, 14D–F. *Sphaerothuria bitentaculata* — Deichmann, 1930: 152, pl. 19 figs. 4–5. *Echinocucumis typica* — Clark, 1923: 418 (non *Echinocucumis typica* M. Sars, 1859 = *E. hispida* Barrett, 1857). *Ypsilothuria talismani* — Mortensen, 1932: 49; Tyler, Gage, 1983: 609–616 (non *Ypsilothuria talismani* E. Perrier, 1886)

LOCALITIES: “Challenger” (1973–1985): Sts. ES 06, ES 08, ES 10, ES 12, ES 27, ES 34, ES 52, ES 54, ES 55, ES 56, ES 57, ES 59, ES 111, ES 118, AT 119, AT 121, ES 122, ES 129, AT 130, ES 137, ES 140, ES 141, ES 143, AT 144, ES 147, SBC 150, AT 151, ES 152, AT 153, AT 154, ES 164, AT 167, ES 169, AT 171, ES 172, AT 175, ES 176, AT 177, ES 180, AT 181, ES 184, ES 185 (Gage et al., 1985; Harvey et al., 1988), AT 186 (Gage et al., 1985), ES 190 (Gage et al., 1985; Harvey et al., 1988), AT 191, AT 195, ES 197, AT 198 (Gage et al., 1985), ES 200 (Gage et al., 1985; Harvey et al., 1988), AT 201, ES 202 (Gage et al., 1985), ES 204 (Gage et al., 1985; Harvey et al., 1988), ES 218, ES 231, ES 232, AT 233, ES 244, AT 245, ES 266, AT 267, AT 271, AT 273, AT 282, ES 283, ES 285, AT 286, AT 288, ES 289 (Tyler, Gage, 1983; Gage et al., 1985; Harvey et al., 1988).

DISTRIBUTION: possibly cosmopolitan.

DEPTH RANGE: 375–3231 m.

Order Molpadiida**Family Molpadiidae****Genus *Molpadia* (Cuvier, 1817) Risso, 1826**TYPE SPECIES: *Molpadia musculus* Risso, 1826.

COMPOSITION: about 58 nominal species.

DISTRIBUTION: 3 species known from the Atlantic, others from the Indo-Pacific, Antarctic and Arctic.

REMARKS. In the list below the shallow-water species *Molpadia borealis* M. Sars, 1859, is not included, although it was mentioned from the depth ca. 2000 m by Harvey et al. (1988) (“Challenger” St. AT107A).

***Molpadia musculus* Risso, 1826**

Molpadia musculus Risso, 1826: 293; Clark, 1908: 165 (complete list of references till 1907); Ohshima, 1915: 250; Hérouard, 1923: 123, p. 132, pl. 5 fig. 1; Deichmann, 1930: 198, pl. 23, figs. 4–7; Heding, 1931b: 279; Deichmann, 1940: 225, pl. 40 figs. 1–15; Deichmann, 1947: 342; Deichmann, 1954: 405; Djakonov et al., 1958: 376; Cherbonnier, 1965: 17, pl. 7 figs. i–q, pl. 8 figs. a–j; Pawson, 1965: 11, fig. 3 1, 4–6; Tortonese, 1965: 98, fig. 42; Pawson, 1977: 100, fig. 1–3, 4a–e, map 1 (complete list of references); Pawson et al., 2001: 317–318, fig. 2a–c. *Ankyroderma musculus* — Perrier, 1902: 529–533, pl. 22 figs. 16–22. *Molpadia violacea* — Studer, 1876: 464; Pawson, 1963a: 15–16, pl. 3, figs. 4–8; Pawson, 1965: 12–13. *Trochostoma violaceum* Théel, 1886a: 42, pl. 2, fig. 6; Lampert, 1889: 842; Perrier, 1905: 65. *Haplodactyla violacea* — Heding, 1931b: 280. *Eumolpadia violacea* — Heding, 1935: 42, textfig. 8 7–10, pl. 5 fig. 10, pl. 7 fig. 3, pl. 8 fig. 4; Ludwig, Heding, 1935: 144–145, textfig. 11. *Ankyroderma danielsseni* Théel, 1886a: 39, pl. 2 fig. 6. *Ankyroderma loricatum* Perrier, 1898: 1666; Perrier, 1902: 535, pl. 22 figs. 23–28; Hérouard, 1923: 133. *Eumolpadia asaphes* Heding, 1935: 42–44, textfig. 9, pl. 5 fig. 9, pl. 7 fig. 2.

LOCALITIES: “Princesse Alice”, St. 515 (Hérouard, 1902, 1923); “Talisman”, St. 97 (Perrier, 1902); “Ingolf”, St. 36 (Heding, 1935); “G.O. Sars”, MAR-ECO cruise, Sts. 54/377, 64/381, 66/383 (Gebruk, 2008); BIOICE, St. 3172 (unpublished data); “James Cook” ECOMAR, Sts. JC011/17, JC011/101, JC011/111, JC037/15, JC037/19, JC037/27, JC037/61 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 35–5205 m (Pawson, 1977).

***Molpadia blakei* (Théel, 1886)**

Trochostoma blakei Théel, 1886b: 16, pl. 1 fig. 8; Perrier, 1902: 525, pl. 22 fig. 3–6. *Molpadia blakei* — Clark, 1908: 33, 168; Deichmann, 1930: 196–197, pl. 22 fig. 19–23; Deichmann, 1940: 224, pl. 38 fig. 6–8; Sibuet, 1977: 554; Khripunov, Sibuet, 1980: 187; Gage et al., 1985: 205; Tyler et al., 1987: 388; Harvey et al., 1988: 191; Pawson et al., 2001: 320–322, fig. 3. *Trochostoma blakei* var. *excentrica* Hérouard, 1923: 136–137, pl. 9 figs. 3–9. *Trochostoma angulatum* Hérouard, 1923: 136, pl. 3 fig. 6, pl. 8 fig. 3. *Trochostoma grossularia* Hérouard, 1923: 137–139, pl. 9 figs. 13–16, 21–32. *Paratrochostoma spiniferum* Heding, 1935: 72–76, fig. 21, pl. 4 figs. 13–14, pl. 5 figs. 20–21.

LOCALITIES: “Princesse Alice II”, St. 3006 (Hérouard, 1923 as *Trochostoma blakei* var. *excen-*

trica); “Princesse Alice, St. 757, “Princesse Alice II”, St. 2994 (Hérouard, 1923 as *Trochostoma grossularia*); “Challenger” St.: ES 143, AT 144, SBC 150, AT 151, ES 152, AT 153, AT 167, AT 171, AT 175, ES 176, AT 177, AT 181, ES 184, ES 185, AT 191, AT 195, ES 197, AT 198, ES 200, AT 201, ES 202, ES 207 (Gage et al., 1985), ES 283, AT 288, 3/85/5 OTSB (Harvey et al., 1988); “Discovery” St. 9638#2, “Challenger” St. 50515, 50711, 50811 (Tyler et al., 1987); Porcupine Abyssal Plain, 2470–4795 m (Billett, 1991); BIOGAS (1972–1974) “Jean Charcot” St. 2-6 (Sibuet, 1977); BIOICE, St. 2863, 3176 (unpublished data).

DISTRIBUTION: North Atlantic (Hérouard, 1923; Heding, 1935; Sibuet, 1977; Gage et al., 1985; Harvey et al., 1988; Billett, 1991), Gulf of Mexico and off east Coast of Brazil (Pawson et al., 2001).

DEPTH RANGE: 1727–5270 m.

Genus *Cherbonniera* Sibuet, 1974

TYPE SPECIES: *Cherbonniera utriculus* Sibuet, 1974.

COMPOSITION: monotypic.

DISTRIBUTION: North Atlantic.

Cherbonniera utriculus Sibuet, 1974

Cherbonniera utriculus Sibuet, 1974b: 1443–1445, pl. 1; Sibuet, 1977: 554; Gage et al., 1985: 205; Tyler et al., 1987: 385; Harvey et al., 1988: 191; Pawson et al., 2001: 315–317, fig. 1A–D.

LOCALITIES: POLYGAS and BIOGAS 4 (1972 and 1974), DS 20, DS 21, DS 25, DS 51, DS 55, DS 56, DS 59; “Challenger”: St. ES 02, ES 06, ES 08, ES 10, ES 27, ES 28, ES 34, ES 55, ES 56, ES 57, SBC 58, ES 59, ES 111, ES 118, AT 119, ES 129, ES 135, ES 137, ES 140, ES 143, ES 147, SBC 150, ES 164, ES 169, ES 172, ES 180, ES 185, SBC 188, ES 190, ES 204, SBC 205, ES 207 (Gage et al. 1985), SBC 174, ES 231, ES 283, ES 285 (Harvey et al., 1988); “Discovery” 9576#14, “Discovery” St. 50604#1, 10114#1, 10115#1 (Tyler et al., 1987); Porcupine Abyssal Plain, 2820–4140 m (Billett, 1991); BIOGAS Sts. 2, 3, 6 (Sibuet, 1977).

DISTRIBUTION: Atlantic Ocean: Bay of Biscay (Sibuet, 1974b) Rockall Trough and adjacent areas (Gage et al., 1985; Harvey et al., 1988); Porcupine Abyssal Plain (Billett, 1991), off New York, east of Cape Hatteras, and north-east of the Falkland Islands (Pawson et al., 2001).

DEPTH RANGE: 2039–5223 m.

Family Caudinidae

Genus *Hedingia* Deichmann, 1938

TYPE SPECIES: *Trochostoma albicans* Théel, 1886.

COMPOSITION: 6 species (Deichmann, 1938).

DISTRIBUTION: Atlantic — 1, Pacific — 4, cosmopolitan — 1 species.

Hedingia albicans (Théel, 1886)

Deichmann, 1938

Trochostoma albicans Théel, 1886a: 44, pl.11, fig. 3; Perrier, 1902: 526–528, pl. 22, figs. 7–8; Koehler, Vaney, 1905: 89–90, pl. 13, figs. 9–10. *Hedingia albicans* — Deichmann, 1938: 112; Deichmann, 1940: 216–217; Harvey et al., 1988: 191–192; Pawson et al., 2001: 324–325, fig. 4C; Bohn, 1985: 33. *Caudina albicans* — Clark, 1908: 37, 174–175, pl. 10 fig. 12; Heding, 1931b: 283. *Haplodactyla albicans* — Heding, 1935: 65–67, fig. 18, 19 (erroneously 21), pl. 4 fig. 9, pl. 5 fig. 17, pl. 8 fig. 10. *Trochostoma albicans* var. *glabra* Théel, 1886a: 46. *Caudina arenata* var. *armata* Théel, 1886b: 17 [nec *Caudina arenata* (Gould, 1841)].

LOCALITIES: Porcupine Abyssal Plain, 1430–2790 m (Billett, 1991).

DISTRIBUTION: North Atlantic, Mediterranean, Indian Ocean, New Zealand.

DEPTH RANGE: 494–3200 m.

Family Gephyrothuriidae

Genus *Gephyrothuria*

Koehler et Vaney, 1905

TYPE SPECIES: *Gephyrothuria alcocki* Koehler et Vaney, 1905.

COMPOSITION: monotypic.

DISTRIBUTION: cosmopolitan.

Gephyrothuria alcocki

Koehler et Vaney, 1905

Gephyrothuria alcocki Koehler, Vaney, 1905: 78–80, pl. 5, fig. 6–8; Clark, 1908: 22, 186; Hérouard, 1923: 33; Deichmann, 1930: 202; Heding, 1935: 78; Deichmann, 1940: 209–211; Heding, 1940: 358; Hansen, 1956: 48; O’Loughlin, 1998: 495–496, fig. 1; Rogacheva et al., 2013: 613–614, figs. 16c, d. 191. *Himasthlephora glauca* — Clark, 1908: 22, 40–41, 185 pl. 13, fig. 1–4; Heding, 1935: 78. *Gephyrothuria glauca* — Hérouard, 1923: 33; Deichmann, 1930: 202–203; Deichmann, 1940: 209–211; Heding, 1940: 358; Hansen, 1956: 48. *Gephyrothuria europeensis* — Hérouard, 1923: 30–33, pl. IX: 10a, b; Deichmann, 1940: 209–211; Heding, 1940: 358; Sibuet, 1977: 554.

REMARKS: Species *Gephyrothuria europeensis* Hérouard, 1923 was synonymized with *Gephyrothuria alcocki* Koehler et Vaney, 1905 by O’Loughlin (1998).

LOCALITIES: “Princesse-Alice II”, St. 2990 (type locality of *Gephyrothuria europeensis*); “James Cook” ECOMAR, Sts. JC011/17, JC011/23, JC110/75, JC11/101, JC11/106, JC037/15, JC037/19, JC037/27, JC037/61, JC037/67, JC037/70 (Rogacheva et al., 2013).

DISTRIBUTION: cosmopolitan (Atlantic, Indian, Pacific Oceans).

DEPTH RANGE: 732–3499 m.

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