

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

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**ABSTRACT:** An annotated check-list is given of Cirripedia species occurring deeper than 2000 m in the seas bordering Europe. The check-list is based on published data. The check-list includes 38 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, Cirripedia.

## **Глубоководная фауна европейских морей: анnotatedенный список видов донных беспозвоночных, обитающих глубже 2000 м в морях, окружающих Европу. Cirripedia**

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**РЕЗЮМЕ:** Приводится аннотированный список видов Cirripedia, обитающих глубже 2000 м в морях, окружающих Европу. Список основан на опубликованных данных. Список насчитывает 38 видов. Для каждого вида приведены синонимия, данные о находках 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, Cirripedia.

**Phylum Crustacea**  
**Class Thecostraca**  
**Subclass Cirripedia**  
**Superorder Thoracica**  
**Order Pedunculata**  
**Suborder Scalpellomorpha**  
**Family Calanticidae**  
**Genus *Newmanilepas***  
**Zevina et Yakhontova, 1987**

COMPOSITION: 1 species.  
 TYPE SPECIES: *Newmanilepas mirifica* (Zevina, 1976).  
 DISTRIBUTION: North Atlantic — 1 (Zevina, Yakhontova, 1987).

***Newmanilepas mirifica* (Zevina, 1976)**  
*Scillaelepas mirifica* — Zevina, 1976: 1152, fig. 2; Zevina, 1981a: 67, fig. 40.  
 LOCALITIES: "Akademik Kurchatov", St. 443 (Zevina, 1976).  
 DISTRIBUTION: North Atlantic,  
 DEPTH RANGE: 3120–3460 m (Zevina, Yakhontova, 1987).

**Genus *Smilium* Gray, 1825**  
 COMPOSITION: 11 species. TYPE SPECIES: *Smilium peronii* Gray, 1825.  
 DISTRIBUTION: Indo – West Pacific — 7, Indo – West Pacific, subtropical Atlantic — 1, South Atlantic — 1, South Pacific — 1, west Pacific — 1 (Zevina, 1981a).  
 CENTRE OF DIVERSITY: Indo-West Pacific.

***Smilium acutum* (Hoek, 1883)**  
*Scalpellum acutum* — Hoek, 1883: 80, pl. 3, fig. 19, pl. 8, fig. 12; Hoek, 1907a: 64, pl. VII, fig. 1; Gruvel, 1920: 12, pl. II, fig. 7; *Scalpellum longirostrum* — Gruvel, 1902a: 70, 124, pl. 2, figs. 4, 5, pl. 3, figs. 17–20; Weltner, 1922: 70; *Scalpellum hastatum* — Weltner, 1922: 68, Taf. II, fig. 3; (?) *Scalpellum bengalense* — Annandale, 1906: 395; Annandale, 1916: 128, pl. VI, figs. 3, 4, pl. VII, fig. 3, pl. VIII, figs. 1–5; *Scalpellum (Smilium) acutum* — Annandale, 1910: 154, fig. 2; Annandale, 1916: 128, pl. VIII, fig. 4; Calman, 1918: 101; Nilsson-Cantell (1921): 170, textfig. 23.

LOCALITIES: "Princesse-Alice" and "Hirondelle", St. 1116, 3119, (Gruvel, 1920); ABYPLANE St. CP 68, CP 69 (Foster, Buckeridge, 1995a); "Cryos", St. BIOGAS V CP 07, EP I I CP 38, CP 39, PL 18 (Foster, Buckeridge, 1995a).

DISTRIBUTION: Indo – West Pacific, subtropical Atlantic, 61–2480 m (Zevina, 1981a).

**Family Scalpellidae**  
**Subfamily Meroscalpellinae**  
**Genus *Gymnoscalpellum***  
**Newman and Ross, 1971**

COMPOSITION: 5 species.

TYPE SPECIES: *Gymnoscalpellum tarasovi* Newman and Ross, 1971.

DISTRIBUTION: Antarctic Ocean (Atlantic sector) — 2, northeast Atlantic — 1, southeast Pacific — 1, Central Pacific — 1 (Zevina 1981a).

***Gymnoscalpellum insigne* (Hoek, 1883)**  
*Scalpellum insigne* — Hoek, 1883: 68, pl. II, figs. 3, 4.

LOCALITIES: "Challenger", St. 6 (Hoek, 1883), 2775 m (single locality).

DISTRIBUTION: Northeast Atlantic (Zevina, 1981a).

***Genus Litoscalpellum* Newman, Ross, 1971**

COMPOSITION: 23 species.  
 TYPE SPECIES: *Litoscalpellum korotkevitschae* (Zevina 1968).

DISTRIBUTION: Indo – West Pacific — 2; South Pacific — 4; East Pacific — 1; tropical West Pacific — 1; North Pacific — 3; Antarctic Ocean (Atlantic + Pacific sectors) — 2; Indian Ocean — 3; South Atlantic — 2; tropical Atlantic — 3; North Atlantic — 2 (Zevina, 1981a, 1983; Young, Leta, 1996; Young, 1998b, 2004).

***Litoscalpellum anceps* (Aurivillius, 1898)**

*Scalpellum anceps* — Aurivillius, 1898: 191, figs. 1a–c; Gruvel, 1920: 25, pl. V, figs. 1–3; *Teloscalpellum anceps* — Zevina, 1978b: 1350.

LOCALITIES: "Princesse-Alice" and "Hirondelle", St. 652 (Aurivillius, 1898; Gruvel, 1920), 4261 m.

DISTRIBUTION: North Atlantic.

***Litoscalpellum meteoria* Young, 1998b**

*Litoscalpellum meteoria* Young, 1898b: 16, fig. 12.

LOCALITIES: "Meteor", the following localities without station numbers: 42°55.4'N, 14°07.9'W (depth 5250 m); 42°44.5'N, 13°29.8'W (5315 m); 42°38.5'N, 13°31.0'W (5318 m); 42°04.1'N, 14°55.6'W (5275 m) (Young, 1998b).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 5260–5318 m (only 5 localities) (Young, 1998b).

***Genus Neoscalpellum* Pilsbry, 1907a**

COMPOSITION: 5 species.

TYPE SPECIES: *Neoscalpellum debile* (Aurivillius, 1898).

DISTRIBUTION: boreal Atlantic — 1, Antarctic Ocean (Pacific sector) — 1, Indo – West Pacific — 1, tropical Pacific 2 (Zevina, 1981a).

***Neoscalpellum debile* (Aurivillius, 1898)**

*Scalpellum debile* — Aurivillius, 1898: 189; Gruvel, 1905: 27; Gruvel, 1920: 31, pl. V, figs. 13–15; Nilsson-Cantell, 1955: 217; *Scalpellum edwardsi* — Gruvel, 1900a:

189; Gruvel, 1902a: 63, pl. 2, figs. 3B, 16a, b; Gruvel, 1905: 28, fig. 27; *Scalpellum alboranense* — Gruvel, 1920: 33, pl. 5, figs. 4–6; *Scalpellum dicheloplax* — Pilsbry, 1907a: 70, fig. 28; Hoek, 1914: 4; *Scalpellum dicheloplax bentophila* — Pilsbry, 1907a: 73, fig. 28d; (?) *Scalpellum (Arcoscalpellum) dicheloplax bentophila* — Weltner, 1922: 67; *Meroscalpellum bifurcatum* — Foster, Buckeridge, 1995a: 173, fig. 7A–B.

LOCALITIES: “Talisman”, St. 136 (Gruvel, 1900a), “Pincesse-Alice” and “Hirondelle”, Sts. 650, 652, 749 (Aurivillius, 1898; Gruvel, 1920); “Vityaz”, St. 7943 (Poltarukha, Zevina, 2006b); “Meteor”, St. 3–29 and localities without station numbers: 42° 55.4'N, 14°07.9'W (depth 5250 m); 42°44.5'N, 13°29.8'W (5315 m); 42°38.5'N, 13°31.0'W (5318 m); 42°04.1'N, 14°55.6'W (5275 m) (Young, 1998b); “Jean Charcot”, Sts. 131, 202, 245, 249, 250 (Young, 1998a); BIOGAS XI CP 35 (Poltarukha, Zevina, 2006a, b); MAR-ECO, St. 54/377, 64/381 (Poltarukha, 2007).

DISTRIBUTION: boreal Atlantic.

DEPTH RANGE: 2120–5318 m (Zevina, 1981a; Young, 1998b).

### Subfamily Arcoscalpellinae

#### Genus *Amigdoscalpellum* Zevina, 1978b

COMPOSITION: 20 species.

TYPE SPECIES: *Amigdoscalpellum manum* (Zevina, 1973).

DISTRIBUTION: Cosmopolitan (exclusion of Arctic Ocean) — 1, Indian Ocean, southwest Pacific, South Atlantic — 1, Indo – West Pacific — 3, Indo – West Pacific, North Atlantic — 1, Indian Ocean — 4, southeast Pacific — 1, North Pacific — 2, southwest Pacific — 2, Atlantic Ocean — 1, North Atlantic — 2, South Atlantic — 1, west Atlantic — 1 (Zevina, 1981a; Foster, Buckeridge 1995a; Young, 2001, 2002).

#### *Amigdoscalpellum praeceps* (Hoek, 1907)

*Scalpellum praeceps* Hoek, 1907a: 114, pl. VIII, fig. 13.

LOCALITIES: BIOGAS VIII, CP 30, CP 35 (Foster, Buckeridge, 1995a).

DISTRIBUTION: Indo – West Pacific, North Atlantic.

DEPTH RANGE: 411–4720 m (Zevina, 1981a; Foster, Buckeridge, 1995a).

#### *Amigdoscalpellum rigidum*

(Aurivillius, 1888)

*Scalpellum rigidum* — Aurivillius, 1898: 189; Gruvel, 1905: 86; Zevina, 1976: 1155; *Scalpellum striatum* — Gruvel, 1900a: 191; Gruvel, 1902a: 77, 133, pl. 2, fig. 3I, pl. 4, figs. 3, 5, 7, 8; Gruvel, 1905: 72, fig. 81; Gruvel, 1920: 23, pl. 2, figs. 4–6, 9–11, pl. 7, fig. 11; Nilsson-Cantell, 1955: 219; Belloc, 1959: 3; *Scalpellum talismani* — Gruvel, 1900a: 193; Gruvel, 1902a: 86, pl. 2, figs. 3D, 6, 7; Gruvel, 1905: 86, fig. 96; Gruvel, 1920: 23; Broch, 1953: 8, fig. 4; Nilsson-Cantell, 1955: 219; *Amigdo-*

*scalpellum talismani* Zevina, 1978b: 1349; Zevina, 1981a: 269, fig. 203.

LOCALITIES: “Talisman”, St. 131, 136 (Young, 2002); “Pincesse-Alice” and “Hirondelle”, St. 527, 650, 652, 753 (Aurivillius, 1898; Gruvel, 1920); “Meteor”, St. 3–29 and localities without station numbers: 42°55.4'N, 14°07.9'W (depth 5250 m); 42°04.1'N, 14°55.6'W (5275 m); 42°38.5'N, 13°31.0'W (5318 m) (Young, 1998b); “Ingolf”, St. 20 (Broch, 1953; Zevina, 1981a); “Jean Charcot”, St. 174, 176, 202, 206, 227, 245, 251 (Young, 1998a); BENGAL 2, St. 13078/27 (Young, 2001).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 1265–4400 m (Zevina, 1981a).

#### *Amigdoscalpellum vitreum* (Hoek, 1883)

*Scalpellum vitreum* — Hoek, 1883: 115, pl. 5, fig. 14; Weltner, 1897: 251; Gruvel, 1902a: 54; Gruvel, 1905: 84, fig. 94; Nilsson-Cantell, 1955: 219; Zevina, 1973a: 137; *Scalpellum formosum* — Hoek, 1907a: 110, pl. 8, fig. II, IIa; Stubnings, 1936: 55 (part); Nilsson-Cantell, 1938: 21; Nilsson-Cantell, 1955: 219; Tarasov, Zevina, 1957: 140, pl. 1, fig. 1; *Arcoscalpellum formosum* — Newman, Ross, 1971: 60, pl. VIIIG, textfig. 26; *Arcoscalpellum vitreum* Newman, Ross, 1971: 87, pl. VIIIE, F, text-fig. 44–47; Foster (1978): 58, pl. 7D, fig. 34.

LOCALITIES: “Akademik Kurchatov”, St. 432, (Zevina, 1976).

DISTRIBUTION: cosmopolitan, excluding Arctic Ocean.

DEPTH RANGE: 558–6096 m (Zevina, 1981a).

#### Genus *Arcoscalpellum* Hoek, 1907

COMPOSITION: 39 species. TYPE SPECIES: *Arcoscalpellum michelottianum* (Seguenza, 1876).

DISTRIBUTION: Pacific Ocean — 10, North Atlantic — 8, South Atlantic — 7, North Atlantic, Indian Ocean, Indo – West Pacific — 1, Atlantic and Pacific Oceans — 1, tropical Atlantic — 3, Indian Ocean — 3, Indo – West Pacific — 4, South Atlantic, South Indian Ocean — 2 (Zevina, 1981a, 1993; Young, 1992, 1998a, 2001; Foster, Buckeridge, 1995a).

#### *Arcoscalpellum atlanticum* (Gruvel, 1900)

*Scalpellum atlanticum* — Gruvel, 1900a: 190; Gruvel, 1902a: 74, pl. 2, figs. 3F, 17, 18; Gruvel, 1902b: 246; Gruvel, 1902c: 523; Gruvel, 1905: 68, fig. 76; Gruvel, 1920: 26, pl. 7, fig. 5; Hoek, 1914: 4; Belloc, 1959: 3; *Teloscalpellum atlanticum* — Zevina, 1978b: 1350; Zevina, 1981a: 377, fig. 294; *Arcoscalpellum crenulatum* — Foster, Buckeridge, 1995a: 170, fig. 5a–f; *Arcoscalpellum tritonis* — Young, 1998a: 19, figs. 15, 16; Young, 1998b: 36, fig. 1 [non *Arcoscalpellum tritonis* (Hoek, 1883)].

LOCALITIES: BIOGAS VIII CP 30 (Foster, Buckeridge, 1995a); “J. Charcot”, St. 251 (Young, 1998a).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 960–3600 m (Young, 2002).

***Arcoscalpellum eponkos* Young, 1998a**

*Arcoscalpellum eponkos* Young, 1998a: 36, fig. 3, 4.  
LOCALITIES: "Jean Charcot", St. 249 (Young, 1998a).

DISTRIBUTION: North Atlantic.  
DEPTH RANGE: 4620–4690 m (single locality) (Young, 1998a).

***Arcoscalpellum mamillatum*  
(Aurivillius, 1892)**

*Scalpellum mamillatum* — Aurivillius, 1892: 191; Gruvel, 1905: 69; Gruvel, 1920: 21, pl. 5, figs. 19–21; Nilsson-Cantell, 1955: 218; Belloc, 1959: 3; Zevina, 1976: 1155; *Amigdoscalpellum mamillatum* — Zevina, 1978b: 1349; Zevina, 1981a: 269, in part, not fig. 202.

LOCALITIES: "Pincesse-Alice" and "Hironnelle", St. 527 (Aurivillius, 1898; Gruvel, 1920); St. 652 (Aurivillius, 1898); ECOFER 1, St. CP 01 (Young, 2001); "Vityaz", St. 7943, 45°35'N, 12°35'W (Poltarukha, Zevina, 2006b).

DISTRIBUTION: North Atlantic.  
DEPTH RANGE: 3017–4900 m (Zevina, 1981a; Poltarukha, Zevina, 2006b).

***Arcoscalpellum michelottianum*  
(Seguenza, 1876)**

*Scalpellum michelottianum* — Seguenza, 1876: 381, pl. 6, figs. 15–25, pl. 10, fig. 26; Withers, 1953: 225; *Scalpellum velutinum* — Hoek, 1883: 96, pl. 4, figs. 10–11, pl. 9, figs. 7–9; Weltner, 1897: 251; Weltner, 1922: 75; Gruvel, 1902a: 56, pl. 2, figs. 3c, 10a, 10b, 14, pl. 3, figs. 1, 27–31, pl. 4, figs. 6, 11–22; Gruvel, 1905: 73, fig. 83; Gruvel, 1912: 2; Hoek, 1907a: 59, 79, 87; Pilsbry, 1907a: 26, pl. 3, figs. 2, 3; Annandale, 1908: pl. 4, fig. 7; Annandale, 1911: 588; Annandale, 1913: 229; Calman, 1918: 108; Barnard, 1925: 1; Nilsson-Cantell, 1927: 743, fig. 1; Nilsson-Cantell, 1928: 4; Nilsson-Cantell, 1931: 7; Broch, 1931: 18; Stubbings, 1936: 28, fig. 12; Stubbings, 1967: 234; Tarasov, Zevina, 1957: 24; Zevina, 1972: 43, fig. 2; *Scalpellum eximum* — Hoek, 1883: 100, pl. 4, figs. 6, 7, pl. 9, fig. 10; Weltner, 1897: 247; *Scalpellum sordidum* — Aurivillius, 1898: 190; *Scalpellum erectum* — Aurivillius, 1898: 192; Gruvel, 1905: 74; *Scalpellum alatum* — Gruvel, 1900a: 192; Gruvel, 1902a: 57.

LOCALITIES: "Pincesse-Alice" and "Hironnelle", St. 515 (Aurivillius, 1898; Gruvel, 1920); "Akademik Kurchatov", St. 444, (Zevina, 1976); ABYPLANE St.CP 68, "Jean Charcot", St. KG 229 (Foster, Buckeridge, 1995a).

DISTRIBUTION: North Atlantic (72°N–34°S), Indian Ocean, Pacific Ocean.  
DEPTH RANGE: 64–3010 m (Zevina, 1981a).

***Arcoscalpellum pentagonum*  
(Nilsson-Cantell, 1955)**

*Scalpellum pentagonum* Nilsson-Cantell, 1955: 215, fig. 1.

LOCALITIES: "Albatross", 40°33'N, 35°24'W (Nilsson-Cantell, 1955).

DISTRIBUTION: North Atlantic (single locality) (Zevina, 1981a).

DEPTH RANGE: 4540–4600 m (Zevina, 1981a).

**Genus *Catherinum* Zevina, 1978b**

COMPOSITION: 15 species. TYPE SPECIES: *Catherinum recurvitergum* (Gruvel, 1902a).

DISTRIBUTION: Pacific Ocean — 5, Indo-West Pacific — 2, Indian Ocean — 4, South Indian Ocean — 1, North Atlantic Ocean, Indian Ocean — 1, North Atlantic Ocean — 2 (Zevina, 1981a; Zevina, Galkin, 1993).

CENTRE OF DIVERSITY: Pacific Ocean, Indo-West Pacific.

***Catherinum albatrossianum*  
(Pilsbry, 1907)**

*Scalpellum albatrossianum* — Pilsbry, 1907a: 54, fig. 19; Annandale, 1908: pl. VIII, fig. 10; Annandale, 1913: 232; Annandale, 1916: pl. VI, fig. 9 (non Nilsson-Cantell, 1925); Stubbings, 1936: 66; Broch, 1953: 6, fig. 3; Zevina, 1973a: 847.

LOCALITIES: not exactly known; presence in the deep north-east Atlantic mentioned in (Zevina, 1981a).

DISTRIBUTION: North Atlantic, Indian Ocean.  
DEPTH RANGE: 760–4180 m (Zevina, 1981a).

***Catherinum recurvitergum* (Gruvel, 1900)**

*Scalpellum recurvitergum* — Gruvel, 1900a: 190; Gruvel, 1902a: 67, pl. 2, figs. 3H, 21, 22; Gruvel, 1905: 49, fig. 54; Weltner, 1922: 72; Zevina, 1976: 1155.

LOCALITIES: "Talisman", St. 118 (Gruvel, 1900a); "Jean Charcot", Sts. 202, 245 (Young, 1998a); ECOFER 1, St. CP 01, CP 02 (Young, 2001); "Vityaz", St. 7943 (Poltarukha, Zevina, 2006b); "Akademik Mstislav Keldysh", St. 500 (Poltarukha, Zevina, 2006b); MAR-ECO, St. 52/374, 64/381, 72/386 (Poltarukha, 2007).

DISTRIBUTION: North Atlantic, west Indian Ocean.

DEPTH RANGE: 1289–4297 m (Zevina, 1981a; Young, 1998a).

**Genus *Planoscalpellum* Zevina, 1978**

COMPOSITION: 5 species.

TYPE SPECIES: *Planoscalpellum planum* (Hoek, 1883).

DISTRIBUTION: South Indian Ocean — 1, Indo-West Pacific — 1, North Atlantic — 1, Pacific Ocean — 1, west Indian Ocean — 1 (Zevina, 1981a; Shreider, 1994).

***Planoscalpellum limpidus* (Zevina, 1976)**

*Scalpellum limpidus* Zevina, 1976: 1152, fig. 2.

LOCALITIES: "Meteor", St. 3-29 and localities without station numbers: 42°55.4'N, 14°07.9'W

(depth 5250 m); 42°04.1'N, 14°55.6'W (5275 m) (Young, 1998b); "Akademik Kurchatov", St. 431 (Zevina, 1976); "Jean Charcot", Sts. 245, 249 (Young, 1998a); "Akademik Mstislav Keldysh", St. 390-3, (Poltarukha, Zevina, 2006a).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 4270–5900 m (Zevina, 1981a; Young, 1998a).

### **Genus *Teloscalpellum* Zevina, 1978b**

COMPOSITION: 20 species.

TYPE SPECIES: *Teloscalpellum spicatum* (Zevina, 1975).

DISTRIBUTION: Indo – West Pacific — 6, Indian Ocean — 2, Pacific Ocean — 1; South Pacific — 1, West Pacific — 1; East Pacific — 2; tropical Pacific — 1; North Atlantic, Indo – West Pacific — 1; east Atlantic — 2; west Atlantic — 3 (Zevina, 1981a; Young, 2001; 2004).

### ***Teloscalpellum luteum* (Gruvel, 1900)**

*Scalpellum luteum* — Gruvel, 1900a: 192; Gruvel, 1902a: 80, 135, pl. 2, figs. 3E, 11, pl. 4, figs. 4, 9, 10; Gruvel, 1905: 84, fig. 93.

LOCALITIES: "Talisman", St. 118 (Gruvel, 1900a), "Jean Charcot", St. 129 (Young, 1998a).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 3000–3175 m (Zevina, 1981a; Young, 1998a).

### **Genus *Trianguloscalpellum* Zevina, 1978b**

COMPOSITION: 23 species.

TYPE SPECIES: *Trianguloscalpellum balanoides* (Hoek, 1883)

DISTRIBUTION: Indo – West Pacific — 9, Pacific — 1, West Pacific — 2; East Pacific — 1; boreal Pacific — 1; South Indian Ocean — 2; North Atlantic — 2; South Atlantic — 2; west Atlantic — 1; Tropical Atlantic — 1; Antarctic Ocean (Atlantic and Indian sectors) — 1 (Zevina, 1981a; Young, Leta, 1996; Young, 1998a, b).

CENTRE OF DIVERSITY: Indo – West Pacific.

### ***Trianguloscalpellum ovale* (Hoek, 1883)**

*Scalpellum regium* — Wyvile Thomson, 1873: 347 (in part, only figs. 1, 2); Wyvile Thomson, 1877: (in part, only figs. 2, 3); Pilsbry, 1907a: (in part, only pl. III, fig. 4); *Scalpellum regium* var. *ovale* — Hoek, 1883: 109, pl. V, figs. 5, 6; *Scalpellum gigas* — Gruvel, 1902a: 52, 126, pl. II, fig. 3A, pl. III, figs. 22–26 [non *Scalpellum gigas* Hoek, 1883]; *Trianguloscalpellum regium ovale* — Zevina, 1981a: 311, fig. 235; *Trianguloscalpellum gigas* — Foster, Buckeridge, 1995a: 169, fig. 2E [non *Scalpellum gigas* Hoek, 1883].

LOCALITIES: "Meteor", localities without station numbers: 45°48.6'N, 17°15.8'W (depth 4740 m); 45°49.8'N, 17°14.2'W (depth 4730 m); 42°

55.4'N, 14°07.9'W (depth 5250 m); 42°44.5'N, 13°29.8'W (5315 m); 42°38.5'N, 13°31.0'W (5318 m); 42°04.1'N, 14°55.6'W (5275 m) (Young, 1998b); "Cryos", St. CP 42 (Foster, Buckeridge, 1995a); "Jean Charcot", St. 249, (Young, 1998a); "Discovery" St. 1336#53 (Young, 2001); "Akademik Mstislav Keldysh", St. 503 (Poltarukha, Zevina, 2006b).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 4620–5211 m (Zevina, 1981a; Young, 1998a).

### ***Trianguloscalpellum regium* (Wyvile Thomson, 1873)**

*Scalpellum regium regium* — Wyvile Thomson, 1873: 347 [in part, not figs. 1, 2 = *Trianguloscalpellum ovale* (Hoek, 1883)]; Wyvile Thomson, 1877: 4 [in part, not figs. 2, 3 = *Trianguloscalpellum ovale* (Hoek, 1883)]; Hoek, 1883: 106: pl. 4 figs. 3–5; Hoek, 1884: 10; Pilsbry, 1907a: 28, pl. 3 figs. 4, 5 [in part, not pl. III, fig. 4 = *Trianguloscalpellum ovale* (Hoek, 1883)]; Gruvel, 1912: 2; Gruvel, 1920: 30, pl. 1 fig. 7; *Scalpellum molle* — Aurivillius, 1898: 191; Gruvel, 1905: 77; Gruvel, 1920: 29, pl. V, figs. 10–12; Nilsson-Cantell, 1955: 218; Belloc, 1959: 3; Zevina, 1976: 1155; *Trianguloscalpellum regium regium* Zevina, 1981a: 309, fig. 234; non *Scalpellum regium* — Zevina, 1970: 263, pls. 10, 11; Zevina, 1973ñ: 136 [= *Trianguloscalpellum gigas* (Hoek, 1883)]; not *Trianguloscalpellum regium* — Zevina, 1981b: 86; Foster, Buckeridge, 1995b: 355, fig. 6K [= *Trianguloscalpellum?* *mollucanum* (Hoek, 1883)].

LOCALITIES: "Pincesse-Alice" and "Hironnelle", St. 527, 3006 (Aurivillius, 1898; Gruvel, 1920); "Meteor", St. 3-29 (Young, 1998b); BIO-GAS VII CP 28, CP 30 (Foster, Buckeridge, 1995a); "Discovery" St. 13078#27, 13200/93, 13627#11 (Young, 2001); "Vityaz", St. 7943 (Poltarukha, Zevina, 2006b); "Jean Charcot", St. 129 (Young, 1998a); "Jean Charcot", St. 202, 245, 251 (Young, 1998a); "Akademik Mstislav Keldysh", St. 500 (Poltarukha, Zevina, 2006b); MAR-ECO, St. 40/367 (Poltarukha, 2007).

DISTRIBUTION: boreal and tropical Atlantic, Pacific, Indian Ocean.

DEPTH RANGE: 1507–6135 m (Zevina, 1981a).

### **Genus *Verum* Zevina, 1978**

COMPOSITION: 25 species.

TYPE SPECIES: *Verum zenkevitchi* (Zevina, 1972).

DISTRIBUTION: Arctic Ocean, North Atlantic — 1, southeast Atlantic, southwest Indian Ocean — 4, North Atlantic Ocean — 3, Indo – West Pacific — 6, South Pacific, west Indian Ocean, North Atlantic — 4, North Pacific — 1, All tropical seas — 1, southeast Pacific — 1, Pacific Ocean — 1, Indian Ocean — 2, unknown — 1 (Zevina, 1981a; Foster, Buckeridge, 1995a; Young, 1998b).

CENTRE OF DIVERSITY: Indo – West Pacific.

***Verum carinatum* (Hoek, 1883)**

*Scalpellum carinatum* — Hoek, 1883: 76, pl. III, figs. 7, 8; Pilsbry, 1907a: 53, fig. 18; Gravel, 1920: 20; Barnard, 1925: 3; Broch, 1953: 7; *Scalpellum imperfectum* — Pilsbry, 1907a: 75, fig. 30, pl. IV, figs. 15–18; Barnard, 1924: 47; Broch, 1953: 9.

LOCALITIES: “Pincesse-Alice” and “Hironnelle”, St. 515 (Aurivillius, 1898; Gravel, 1920).

DISTRIBUTION: Atlantic Ocean, 37°N–34°S, 73°W–17°E.

DEPTH RANGE: 1102–2234 m (Zevina, 1981a).

***Verum frillosum* Foster et Buckeridge, 1995**

*Verum frillosum* Foster, Buckeridge, 1995a: 174, fig. 8

LOCALITIES: BIOGAS VII CP 28, (Foster, Buckeridge, 1995a).

DISTRIBUTION: central Atlantic region, 3380 m (single locality) (Foster, Buckeridge, 1995a).

***Verum minutum* (Hoek, 1883)**

*Scalpellum minutum* — Hoek, 1883: 113, pl. V, fig. 12; Stubbings, 1936: 28.

LOCALITIES: ABYPLANE St. CP 68, CP 69 (Foster, Buckeridge, 1995a).

DISTRIBUTION: South Pacific, west Indian Ocean, subtropical east Atlantic Ocean.

DEPTH RANGE: 802–2639 m (Zevina, 1981a; Foster, Buckeridge, 1995a).

***Verum parazelandiae* Young, 1998**

*Scalpellum novae-zelandiae* — Gruvel, 1902a: 54, pl. II, fig. 12, 13, 15; *Verum novaezelandiae* — Foster, Buckeridge, 1995a: 174, fig. 7C–E (in part: specimens from Atlantic).

LOCALITIES: ABYPLANE St. CP 38, CP 39 (Foster, Buckeridge, 1995a).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 882–4850 m (Young, 1998b).

***Verum striolatum* (G.O. Sars, 1877)**

*Scalpellum striolatum* — G. Sars, 1877: 364; Tarasov, 1936: 46; Tarasov, 1937: 45; Tarasov, 1945: 54, pl. 1, fig. 3; Broch, 1953: 5, fig. 2; Tarasov, Zevina, 1957: 138, figs. 10, 42, 43; Zevina, Tarasov, 1964: 232, figs. 4–6; *Scalpellum albatrossianum* — Nilsson-Cantell, 1925: 7, fig. 2; Nilsson-Cantell, 1926: 2.

LOCALITIES: “Ingolf”, St. 113 (Broch, 1953); “North Pole-4”, 76°47'N, 173°17'E, (Zevina, 1981a); “North Pole-22”, St. 58, (Zevina, 1981a); “Marvel”, St. PL 1196 (Young, 2001).

DISTRIBUTION: Arctic Ocean, North Atlantic.

DEPTH RANGE: 348–3941 m (Zevina, 1981a).

**Genus *Weltnerium* Zevina, 1978**

COMPOSITION: 13 species.

TYPE SPECIES: *Weltnerium nymphocola* (Hoek, 1883).

DISTRIBUTION: Arctic Ocean, Subarctic — 1, Antarctic Ocean (Atlantic, Indian, Pacific sectors) —

1, South Atlantic — 5, North Atlantic — 2, Indo – West Pacific — 2, Sea of Okhotsk — 1, unknown — 1 (Zevina, 1981a; Young, 2000, 2002).

CENTRE OF DIVERSITY: not determined.

***Weltnerium pusillum* (Aurivillius, 1898)**

*Scalpellum pusillum* — Aurivillius, 1898: 194; Gruvel, 1920: 24, pl. 6, fig. 10.

LOCALITIES: “Pincesse-Alice” and “Hironnelle”, St. 188 (Aurivillius, 1898; Gruvel, 1920).

DISTRIBUTION: North Atlantic Ocean.

DEPTH RANGE: 1267–2000 m (Zevina, 1981a).

**Suborder Lepadomorpha****Family Poecilasmatidae****Genus *Dichelaspis* Darwin, 1852**

COMPOSITION: 5 species.

TYPE SPECIES: *Dichelaspis orthogonia* Darwin, 1852.

DISTRIBUTION: Indo – West Pacific — 1, North Atlantic, Indian Ocean — 1, North Atlantic — 2, Pacific Ocean — 1 (Zevina, 1982; Young, 1998b).

***Dichelaspis thieli* Young, 1998**

*Dichelaspis thieli* — Young, 1998b: 7, figs. 5, 6.

LOCALITIES: SEAMOUNT 2, St. TS 267 (Young, 2001).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 1300–2235 m (Young, 2001).

***Dichelaspis* sp.**

LOCALITIES: SEAMOUNT 2, St. CP 268 (Young, 2001).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 2145–2205 m (Young, 2001).

**Genus *Glyptelasma* Pilsbry, 1907a**

COMPOSITION: 12 species.

TYPE SPECIES: *Glyptelasma subcarinatum* (Pilsbry, 1907 a).

DISTRIBUTION: Cosmopolitan — 1, tropical Pacific, Atlantic and Indian Oceans — 1, Indo – West Pacific — 3, Indo – West Pacific, northwest Atlantic — 1; Indian Ocean — 2, South Pacific — 1, northwest Atlantic — 2, northwest Atlantic, Indian Ocean — 1 (Zevina, 1982, 1990; Zevina, Shreider, 1992).

CENTRE OF DIVERSITY: Indo – West Pacific.

***Glyptelasma carinatum* (Hoek, 1883)**

*Poecilasma carinatum* — Hoek, 1883 : 44, pl. 1, figs. 8–10, pl. 2, fig. 1, pl. 7, figs. 6–7; *Poecilasma (Glyptelasma) carinatum* — Nilsson-Cantell, 1921: 258; *Glyptelasma carinatum* — Broch, 1931: 32, fig. 11; *Megalasma (Glyptelasma) carinatum* — Pilsbry, 1907a: 93; Pilsbry, 1907b: 416; Calman, 1918: 401, figs. 1–3; Barnard, 1924: 54; Zevina, 1982: 92, fig. 82.

LOCALITIES: "Pincesse-Alice" and "Hiron-delle", St. 1116 (Gruvel, 1920); "Seamount 2", St. TS 267 (Young, 2001).

DISTRIBUTION: cosmopolitan.

DEPTH RANGE: 60–2865 m (Zevina, 1982).

### ***Glyptelasm hamatum* (Calman, 1919)**

*Megalasma (Glyptelasma) hamatum* — Calman, 1919: 370, figs. 5–7; Nilsson-Cantell, 1927: 770, fig. 12; Nilsson-Cantell, 1928: 23, fig. 11; Nilsson-Cantell, 1931: 10; Nilsson-Cantell, 1934: 49; Nilsson-Cantell, 1955: 219; Weisbord, 1979: 48, pl. 5, figs. 1, 2, pl. 14, fig. 3; Zevina, 1982: 93, fig. 83; *Megalasma carinatum* — Foster, 1978: 26, pl. 3b, fig. 12 [not *Megalasma carinatum* (Hoek, 1883)].

LOCALITIES: "Jean Charcot", St. 202, 227 (Young, 1998a); SEAMOUNT 2, St. TS 267 (Young, 2001).

DISTRIBUTION: tropical Pacific, Atlantic and Indian Oceans.

DEPTH RANGE: 366–3660 m (Zevina, 1982).

### **Suborder Heteralepadomorpha**

#### **Family Heteralepadidae**

##### **Genus *Heteralepas* Pilsbry, 1907**

COMPOSITION: 23 species.

TYPE SPECIES: *Heteralepas rex* (Pilsbry, 1907a).

DISTRIBUTION: Indo – West Pacific — 5, west Pacific — 4, central Pacific — 1, east Pacific — 3, South Pacific — 2, Indian Ocean — 1, Atlantic Ocean, Pacific Ocean — 1, Atlantic Ocean — 6 (Zevina, Kolbasov, 2000; Young, 2001).

CENTRE OF DIVERSITY: Indo – West Pacific.

##### ***Heteralepas segonzaci* Young, 2001**

*Heteralepas segonzaci* Young, 2001: 711–715, figs. 4–5.

LOCALITIES: SEAMOUNT 2, St. TS 267, 2235 m (single locality) (Young, 2001).

DISTRIBUTION: North Atlantic.

### **Order Sessilia**

### **Suborder Verrucomorpha**

#### **Family Verrucidae**

##### **Genus *Altiverruca* Pilsbry, 1916**

COMPOSITION: 34 species.

TYPE SPECIES: *Altiverruca hoeki* (Pilsbry, 1907).

DISTRIBUTION: cosmopolitan — 2, Indo – West Pacific — 5, west Pacific — 9, central Pacific — 3, east Pacific — 2, boreal Pacific — 1, South Atlantic — 3, northwest Atlantic — 3, North Atlantic — 6 (Aurivillius, 1898; Hoek, 1913; Pilsbry, 1916; Nilsson-Cantell, 1929, 1955; Rao, Newman, 1972; Zevina, 1975, 1987a, b, 1988, 1990; Rosell,

1991; Zevina, Galkin, 1992; Buckeridge, 1994, 1997; Young, 1998a).

CENTRE OF DIVERSITY: west Pacific.

##### ***Altiverruca erecta* (Gruvel, 1900)**

*Verruca erecta* Gruvel, 1900b: 243.

LOCALITIES: "Talisman", St. 118 (Gruvel, 1900b); "Marvel", St. PL 1196 (Young, 2001).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 2295–3175 m (Gruvel, 1900b; Nilsson-Cantell, 1955; Young, 2001).

##### ***Altiverruca longicarinata* (Gruvel, 1900)**

*Verruca longicarinata* Gruvel, 1900b: 242.

LOCALITIES: "Akademik Mstislav Keldysh", St. 3452, 3956, 3959, 3982 (Poltarukha, Zevina, 2006b).

DISTRIBUTION: North Atlantic.

DEPTH RANGE: 2400–3432 m (Nilsson-Cantell, 1955; Poltarukha, Zevina, 2006b).

##### ***Altiverruca obliqua* (Hoek, 1883)**

*Verruca obliqua* — Hoek, 1883: 143, pl. 12, figs. 15–17; Hoek, 1907b: 9; Weltner, 1897: 274; Gruvel, 1905: 173, fig. 191; *Verruca (Altiverruca) obliqua* — Pilsbry, 1916: 40; *Altiverruca vertica* — Foster, Buckeridge, 1995a: 180, fig. 14.

LOCALITIES: "Challenger", St. 6 (Hoek, 1883).

DISTRIBUTION: Northeast Atlantic.

DEPTH RANGE: 1182–2775 m (Hoek, 1883; Foster, Buckeridge, 1995a; Young, 1998a).

##### ***Altiverruca quadrangularis* (Hoek, 1883)**

*Verruca quadrangularis* Hoek, 1883: 140, pl. 11, figs. 10, 11, pl. 12, figs. 8–12.

LOCALITIES: "Pincesse-Alice" and "Hiron-delle", St. 3119 (Gruvel, 1920); "Marvel", St. PL 1196 (Young, 2001).

DISTRIBUTION: Cosmopolitan.

DEPTH RANGE: 2380–3475 m (Young, 1998a).

##### **Genus *Costatoverruca* Young, 1998a**

COMPOSITION: 13 species.

TYPE SPECIES: *Costatoverruca alba* (Pilsbry, 1907).

DISTRIBUTION: northwest Atlantic — 6, northwest Atlantic, Indo – West Pacific — 1, west Atlantic — 1, northeast Atlantic — 2, east Indian Ocean — 1, west Indian Ocean — 1, west Pacific — 1 (Gruvel, 1912; Nilsson-Cantell, 1929; Weisbord, 1979; Foster, Buckeridge, 1995b; Buckeridge, 1997; Young, 1998a, 2000).

CENTRE OF DIVERSITY: northwest Atlantic.

##### ***Costatoverruca grimaldi* (Gruvel, 1912)**

*Verruca grimaldi* — Gruvel, 1912: 5; Gruvel, 1920: 48, pl. 2, figs. 14, 15, pl. 3, figs. 5, 6.

LOCALITIES: "Pincesse-Alice" and "Hiron-delle", St. 3119 (Gruvel, 1920), 2380 m.

DISTRIBUTION: northeast Atlantic (Gruvel, 1920).

### Genus *Metaverruca* Pilsbry, 1916

COMPOSITION: 17 species.

TYPE SPECIES: *Metaverruca coraliophila* (Pilsbry, 1916).

DISTRIBUTION: Indo – West Pacific — 2, southwest Pacific — 6, Indo – West Pacific, northeast Atlantic, northwest Atlantic — 1, tropical Indian Ocean — 3, tropical and subtropical Atlantic — 5 (Aurivillius, 1898; Gruvel, 1911, 1920; Broch, 1931; Zevina, 1971, 1987a, 1990; Buckeridge, 1994, 1997; Foster, Buckeridge, 1995a, 1995b; Young, 1998a, 1998b).

CENTRE OF DIVERSITY: Indo – West Pacific.

#### *Metaverruca aequalis* (Aurivillius, 1898)

*Verruca aequalis* — Aurivillius, 1898: 196; Gruvel, 1905: 176; Gruvel, 1920: 42, pl. 5, figs. 28–29, pl. 6, figs. 6–7; Hoek, 1907b: 9; Belloc, 1959: 4.

LOCALITIES: "Jean Charcot", St. 171, 174 (Young, 1998a).

DISTRIBUTION: northeast Atlantic.

DEPTH RANGE: 1022–3215 m (Aurivillius, 1898; Gruvel, 1920; Young, 1998a).

#### *Metaverruca recta* (Aurivillius, 1898)

*Verruca recta* — Aurivillius, 1898: 195; *Verruca sculpta* — Aurivillius, 1898: 197; *Verruca linearis* — Gruvel, 1900b: 243; Gruvel, 1902a: 107, pl. 5, figs. 11, 12; *Verruca magna* — Gruvel, 1901: 261; *Verruca halotheca* — Pilsbry, 1907b: 188, pl. 12 figs. 9, 10; *Verruca capsula* — Hoek, 1907a: 130, pl. 12, figs. 1–3, pl. 13, figs. 1–4; *Verruca coraliophila* — Pilsbry, 1916: 21, pl. 1, figs. 1–5; *Verruca cookei* — Rosell, 1991: 299, pl. 11 figs. r, s, u, v (non *Verruca cookei* Pilsbry, 1927).

LOCALITIES: ABYPLANE St. CP 38 (Foster, Buckeridge, 1995a).

DISTRIBUTION: Indo – West Pacific, North Atlantic.

DEPTH RANGE: 240–2100 m (Foster, Buckeridge, 1995a; Young, 1998a).

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