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Harold Heath's Type Solenogasters
(Mollusca, Amphineura, Aplacophora)
in the California Academy of Sciences,
Department of Invertebrate Zoology

By

Charles R. Stasek

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A compilation of type specimens contained in the Department of Invertebrate Zoology has been recently published (Stasek, 1966). The present list is a continuation of that compilation, but covers only 29 species of solenogasters transferred in 1965 from Stanford University to the California Academy of Sciences. The group is so distinctive that it was thought feasible to issue a separate list to encompass available material. The specimens were originally obtained by Harold Heath through the efforts of several Pacific Ocean expeditions undertaken between 1899 and 1906 by the U.S.S. *Albatross*. All but one species (*Limifossor talpoideus* Heath, 1904) were characterized in a single paper (Heath, 1911), and page numbers associated with each item of the list refer to that paper.

The present types are represented by serial sections and, usually, by mounted pieces of the body containing spicules or by dissociated spicules. For *Limifossor talpoideus* alone, an isolated radula accompanies the serial sections.

While each of the slide series contains the designation "type," Heath did not distinguish holotypes in publication. With regard to *Chaetoderma attenuata* and *Strophomenia farcimen* the word "type" was incidentally employed.

In each of these two instances, as well as in those where a single specimen only was used for the description, I have distinguished the available material as holotypical. Where more than one specimen was apparently utilized in the characterization of a species, the available serial sections are held to represent a syntype. Where the spicule preparation was not stated on the slide as having come from the same specimen as the serial sections, separate type numbers have been allocated. Finally, only where a single specimen was available to him is there no question regarding the individual referred to in Heath's figures.

This work has been supported by National Science Foundation Grant GB 1535.

Phylum **MOLLUSCA**

Class **Amphineura**

Order **APLACOPHORA**

Family **CHAETODERMATIDAE**

- Chaetoderma argentea* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 190. Page 62; pl. 4, fig. 7; pl. 26, figs. 2, 5; pl. 36, fig. 1; pl. 37, fig. 6. *Albatross* Station 4231; Behm Canal, southern Alaska; 82-113 fathoms, green mud. [CAS type slide series, slides nos. 88-91 (serial sections) and slide no. 92 (spicules). Description based on single specimen.]
- Chaetoderma attenuata* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 191. Page 55; pl. 12, fig. 4; pl. 25, figs. 1-10; pl. 36, fig. 2. *Albatross* Station 4250; opposite the mouth of the Stikine River, Alaska, 61-66 fathoms, green mud. [CAS type slide series, slides nos. 93-97 (serial sections) and slide no. 98 (spicules). Of 16 specimens available to Heath, this individual was said to be the "type."]
- Chaetoderma californica* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 192. Page 64; pl. 4, fig. 6; pl. 31, figs. 1-4; 7, 8, 10; pl. 35, fig. 11; pl. 37, fig. 14. *Albatross* Station 4381; near San Diego, California, 618-667 fathoms. [CAS type slide series, slide nos. 99-102 (serial sections) and slide no. 103 (spicules). Description based on a single specimen.]
- Chaetoderma hawaiiensis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 193. Page 49. *Albatross* Station 3992 or 4130; vicinity Kauai Island, Hawaiian Islands. [CAS type slide series, slide nos. 104-106 (serial sections) and slide no. 107 (metathorax). One of two specimens used for description.]
- Chaetoderma japonica* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 224. Page 67; pl. 3, figs. 7, 8; pl. 30, figs. 7-9, 11, 12; pl. 31, figs. 5, 6. *Albatross* Station 3721; off Honshu Island, Japan, 207-250 fathoms. [CAS type slide series, slide nos. 295-296 (serial sections). Description based on one specimen.]

- Chaetoderma montereyensis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 194. Page 61. Undesignated *Albatross* Station in deeper waters of Monterey Bay, California; mud. [CAS type slide series, slide nos. 108-112 (serial sections). One of 155 specimens.]
- Chaetoderma nanula* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 195. Page 66; pl. 4, figs. 1, 12; pl. 28, fig. 10; pl. 37, fig. 18. *Albatross* Station 4369; off the coast of southern California, 260-284 fathoms. [CAS type slide series, slide nos. 113-116 (serial sections) and slide no. 117 (spicules). Description based on single female specimen.]
- Chaetoderma robusta* HAROLD HEATH, 1911. SYNTYPE. CAS no. 196. Page 68. *Albatross* Station 3210; south of Alaska peninsula, 54° N. Lat., 162° 40' 30'' W. Long., 483 fathoms, green mud. [CAS type slide series, slide nos. 118-123 (serial sections). One of four specimens.]
- Chaetoderma scabra* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 223. Page 63; pl. 4, figs. 2, 16; pl. 29, figs. 6, 7, 9-11; pl. 30, figs. 1, 3; pl. 37, fig. 19. *Albatross* Station 4538; Monterey Bay, California, 795-871 fathoms. [CAS type slide series, slide nos. 292-293 (serial sections) and slide no. 294 (spicules). Description based on one specimen.]
- Limifossor fratula* HAROLD HEATH, 1911. SYNTYPE. CAS no. 197. Page 72. *Albatross* Station 4369; off the coast of southern California, 260-284 fathoms. [CAS type slide series, slide nos. 124-128 (serial sections). Two individuals recorded from the type locality. See syntype 198.]
- Limifossor fratula* HAROLD HEATH, 1911. SYNTYPE. CAS no. 198. Page 72. *Albatross* Station 4369; off the coast of southern California, 260-284 fathoms. [CAS type slide series, slide no. 129 (spicules). Heath did not indicate on the slide that these spicules came from the same specimen represented by the serial sections of syntype 197. The slide has, therefore, been given a separate type number.]
- Limifossor talpoideus* HAROLD HEATH, 1904. SYNTYPE. CAS no. 199. Zool. Anz., vol. 28, p. 330. Either Yakutat Bay, Alaska (sent to Heath in 1895 by Mr. Cloudsley Rutter, U. S. Fish Commission) or an *Albatross* Station in Lynn Canal and Chatham Straits, Alaska, 300 fathoms, 1903. [CAS type slide series, slides nos. 130-133 (serial sections). One of a number of specimens. Refer to CAS nos. 200 and 201.]
- Limifossor talpoideus* HAROLD HEATH, 1904. SYNTYPE. CAS no. 200. Zool. Anz. vol. 28, p. 330. Either Yakutat Bay, Alaska (sent to Heath in 1895 by Mr. Cloudsley Rutter, U. S. Fish Commission) or an *Albatross* Station in Lynn Canal and Chatham Straits, Alaska, 300 fathoms, 1903. [CAS type slide series, slide no. 134 (radula). From an individual other than CAS no. 199.]
- Limifossor talpoideus* HAROLD HEATH, 1904. SYNTYPE. CAS no. 201. Zool. Anz., vol. 28, p. 330. *Albatross* Station 4264; off Freshwater Bay, Chatham

Strait, Alaska, 293-282 fathoms, green mud. [CAS type slide series, slide no. 135 (spicules). From one of a number of specimens, probably not the same as CAS nos. 199 or 200.]

Family DONDESIIDAE

Dondersia californica HAROLD HEATH, 1911. HOLOTYPE. CAS no. 219. Page 155; pl. 3, fig. 9; pl. 5, fig. 4; pl. 6, fig. 2; pl. 23, figs. 1-8; pl. 32, fig. 8; pl. 35, fig. 12; Heath's reference to pl. 8, fig. 8, is erroneous and should be pl. 23, fig. 8. *Albatross* Station 4303; off southern California, 21 fathoms. [CAS type slide series, slide nos. 278-280 (serial sections). Description based on one immature specimen fixed in corrosive acetic acid, which destroyed all traces of calcareous structures.]

Herpomenia platypoda HAROLD HEATH, 1911. SYNTYPE. CAS no. 222. Page 159. *Albatross* Station 4781; near Agattu Island, Aleutian Islands, 482 fathoms, attached to a colony of a campanularian hydroid. [CAS type slide series, slide no. 287-290 (serial sections) and slide no. 291 (spicules). One of 11 specimens from the type locality.]

Ichthyomenia porosa HAROLD HEATH, 1911. SYNTYPE. CAS no. 220. Page 159. *Albatross* Station 4400; off the coast of southern California, 500-507 fathoms, green mud. [CAS type slide series, slide nos. 281, 283-285 (serial sections) and slide no. 286 (spicules). One of twenty specimens from Station 4400, two others having been obtained from Station 4402. One slide of the original series had been broken and apparently discarded by Heath, who replaced it with CAS slide no. 282 (syntype 221).]

Ichthyomenia porosa HAROLD HEATH, 1911. SYNTYPE. CAS no. 221. Page 159. Undesignated *Albatross* Station 4400 or 4402; off the coast of southern California, 500-507 or 542 fathoms respectively, green mud. [CAS type slide series, slide no. 282 (serial sections). This slide was inserted among the series of syntype 220 by Heath to replace a broken slide of that series. (See syntype 220).]

Family NEOMENIIDAE

Drepanomenia vampyrella HAROLD HEATH, 1911. HOLOTYPE. CAS no. 202. Page 77; pl. 2, fig. 2, pl. 6, fig. 3; pl. 7, fig. 4; pl. 11, fig. 1; pl. 32, fig. 6; pl. 37, fig. 7. *Albatross* Station 3907; off the southern coast of Oahu Island, Hawaiian Islands, 304 fathoms. [CAS type slide series, slide nos. 136-140 (serial sections) and slide no. 141 (spicules). Description based on single specimen.]

Pachymenia abyssorum HAROLD HEATH, 1911. HOLOTYPE. CAS no. 203. Page 72; pl. 38, fig. 11; pl. 39, figs. 1-4, 6, 8; pl. 40, figs. 1-4, 6-10. *Albatross* Station 4397; off the southern coast of California, 2196-2228 fathoms.

[CAS type slide series, slide nos. 142-156 (serial sections) and slide no. 157 (spicules). Description based on a single specimen. This is the greatest depth recorded for any solenogaster.]

Family PRONEOMENIIDAE

- Dorymenia acuta* HAROLD HEATH, 1911. SYNTYPE. CAS no. 204. Page 72. *Albatross* Station 4415; NE. point Santa Barbara Island, bearing N. 89° W., 8.6 miles, California, 638-302 fathoms. [CAS type slide series, slide nos. 158-160, cont. 276-277 (serial sections) and slide no. 161 (spicules). One of 11 specimens from the type locality.]
- Proneomenia hawaiiensis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 205. Page 82. *Albatross* Station 4001; near Kapuai Point off the western extremity of Kauai Island, Hawaiian Islands, 230-277 fathoms, coarse sand. [CAS type slide series, slide nos. 162-199 (serial sections). The serial sections seem to represent an entire individual, only one of which was obtained at the above locality. However, Heath used three individuals in his description (see syntype 206). Two specimens were sectioned, so that correlation of the available serial sections with the figures has not been assumed.]
- Proneomenia hawaiiensis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 206. Page 82. *Albatross* Station 3864; vicinity of Mokuhooniki Islet, Molokai Island, Hawaiian Islands, 163-198 fathoms, shells and fine volcanic sand. [CAS type slide series, slide no. 200 (spicules). From one of two imperfect specimens from Station 3864. Refer to syntype no. 205.]
- Proneomenia insularis* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 207. Page 90; pl. 8, fig. 4; pl. 37, fig. 16. *Albatross* Station 4157; vicinity of Modu Manu (Bird Island), Hawaiian Islands, 762-1000 fathoms, white mud and foraminiferous sand. [CAS type slide series, slide no. 201-202 (serial sections) and slide no. 203 (spicules). Description based on a small portion of the anterior end of one individual.]
- Strophomenia farcimen* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 208. Page 119; pl. 1, fig. 1; pl. 7, fig. 1; pl. 11, fig. 4; pl. 17, figs. 10-12, 14-17; pl. 33, fig. 2; pl. 34, fig. 15. *Albatross* Station 3748; off the southern end of Honshu Island, Japan, 73-200 fathoms. [CAS type slide series, slide nos. 204-213 (serial sections) and slide no. 214 (spicules). Of two specimens, this one was distinguished as the "type."]
- Strophomenia ophidiana* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 209. Page 112; pl. 1, fig. 2; pl. 8, fig. 5; pl. 9, fig. 1; pl. 17, figs. 8, 9, 13; pl. 18, figs. 1-4; pl. 33, fig. 9; pl. 36, fig. 17. *Albatross* Station 3755; off the southern end of Honshu Island, Japan, 52-77 fathoms, attached to an alcyonarian coral, *Acanthogorgia angustiflora*. [CAS type slide series,

slide nos. 215-220 (serial sections) and slide no. 221 (spicules). Description based on one specimen.]

- Strophomenia regularis* HAROLD HEATH, 1911. HOLOTYPE. CAS no. 210. Page 116; pl. 24, figs. 7, 9, 10, 13, 14; pl. 26, fig. 8. *Albatross* Station 3717; off the southern end of Honshu Island, Japan, 75-100 fathoms. [CAS type slide series, slide nos. 222-223 (serial sections). Represented only by the posterior end of one specimen originally preserved in formalin, which decalcified the fragment.]
- Strophomenia scandens* HAROLD HEATH, 1911. SYNTYPE. CAS no. 211. Page 106. *Albatross* Station 4156; vicinity of Bird Island, Hawaiian Islands, 286-586 fathoms, white mud and foraminiferous rock. [CAS type slide series, slide nos. 224-231 (serial sections) and slide no. 232 (spicules). One of three specimens, all attached to a colony of *Acanthogorgia armata*.]
- Strophomenia spinosa* HAROLD HEATH, 1911. SYNTYPE. CAS no. 212. Page 122. Page 122. Unspecified *Albatross* Station 4935-6 or 3748; vicinity of Misaki, southern Japan, 73-200 fathoms, all attached to alcyonarian coral, *Acanthogorgia japonica*. [CAS type series, slide nos. 233-238 (serial sections). One of five specimens. See syntype 213.]
- Strophomenia spinosa* HAROLD HEATH, 1911. SYNTYPE. CAS no. 213. Page 122, Unspecified *Albatross* Station 4935-6 or 3748; in vicinity of Misaki, southern Japan, 73-200 fathoms, all attached to alcyonarian coral, *Acanthogorgia japonica*. [CAS type slide series, slide no. 239 (spicules). From one of five specimens and not the same as CAS no. 212.]
- Strophomenia triangularis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 214. Page 125. Unspecified *Albatross* Station 3716, 4935, or 4936; off the southern end of Honshu Island, Japan, 65-125 fathoms, coiled around the stem of an alcyonarian coral, *Calicogorgia* sp. [CAS type slide series, slide nos. 240-246 (serial sections). One of five specimens. See syntype 215.]
- Strophomenia triangularis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 215. Page 125. Unspecified *Albatross* Station 3716, 4935, or 4936; off the southern end of Honshu Island, Japan, 65-125 fathoms, coiled around the stem of an alcyonarian coral, *Calicogorgia* sp. [CAS type slide series, slide no. 247 (spicules). From one of five specimens, perhaps not that represented by syntype no. 214.]

Family PRUVOTINIIDAE

- Alexandromenia agassizi* HAROLD HEATH, 1911. SYNTYPE. CAS no. 216. Page 133. *Albatross* Station 2992; near the Revillagigedo Islands off the coast of Mexico, 460 fathoms. [CAS type slide series, slide nos. 248-259 (serial sections) and slide no. 260 (spicules). One of six specimens from the type locality.]

- Alexandromenia valida* HAROLD HEATH, 1911. SYNTYPE. CAS no. 217. Page 142. *Albatross* Station 4282; off the coast of southern California, 642-666 fathoms. [CAS type slide series, slide nos. 261-267 (serial sections) and slide no. 268 (spicules). One of four specimens, each from a separate locality.]
- Halomenia gravida* HAROLD HEATH, 1911. SYNTYPE. CAS no. 218. Page 146. *Albatross* Station 4804; off Simushir Island, Kurile Islands, Japan, 229 fathoms, in dead barnacle shells. [CAS type slide series, slide nos. 269-274 (serial sections) and slide no. 275 (spicules). One of two specimens from the type locality.]
- Lophomenia spiralis* HAROLD HEATH, 1911. SYNTYPE. CAS no. 225. Page 128. *Albatross* Station 4176; vicinity of Niihau Island, Hawaiian Islands, 537-672 fathoms, wrapped about the stalk of a colony of the hydroid *Cryptolaria operculata* Nutting. [CAS type slide series, slide nos. 298-299 (serial sections) and slide no. 300 (spicules). One of two specimens from the type locality.]

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