



New taxa and taxonomic revisions to the Poraniidae (Valvatacea; Asteroidea) with Comments on Feeding Biology

CHRISTOPHER L. MAH¹ & DAVID W. FOLTZ²

¹Dept. of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

²Dept. of Biological Sciences, Louisiana State University, Baton Rouge, LA

Table of contents

Abstract	328
Introduction	328
Material and methods	329
Phylogenetic results and classification	329
Systematics	330
Poraniidae Perrier 1893	330
<i>Bathyporania</i> n. gen.	331
<i>Bathyporania ascendens</i> n. sp.	331
<i>Chondraster</i> Verrill, 1895	333
<i>Chondraster elattosis</i> H. L. Clark 1923	333
<i>Chondraster grandis</i> (Verrill 1878)	334
<i>Clavaporania</i> nov. gen.	335
<i>Clavaporania fitchorum</i> nov. sp.	335
<i>Culcitopsis</i> Verrill 1914b	337
<i>Culcitopsis borealis</i> (Süssbach & Breckner 1911)	338
<i>Glabraster</i> A.H. Clark 1916	338
<i>Glabraster antarctica</i> (E. A. Smith, 1876)	339
<i>Marginaster</i> Perrier 1881	344
† <i>Noriaster</i> Blake, Tintori & Hagdorn 2000.	345
<i>Noriaster barberoi</i> Blake et al. 2000.	345
<i>Porania</i> Gray 1840	345
<i>Porania pulvillus</i> (O.F. Müller 1776)	346
“ <i>Porania</i> ” (<i>Pseudoporania</i>) <i>stormi</i> (Dons 1936)	349
<i>Poraniomorpha</i> Danielssen & Koren 1881	350
<i>Poraniomorpha abyssicola</i> (Verrill 1895)	351
<i>Poraniomorpha bidens</i> Mortensen 1932	351
<i>Poraniomorpha hispida</i> (M. Sars 1872)	353
<i>Poraniomorpha tumida</i> (Stuxberg 1878)	356
<i>Poraniopsis</i> Perrier 1891	356
<i>Poraniopsis echinaster</i> Perrier 1891	357
<i>Poraniopsis inflata</i> (Fisher 1906)	360
<i>Spoladaster</i> Fisher 1940	361
<i>Spoladaster veneris</i> Perrier 1879	361
Discussion	363
Summary of Taxonomic Changes	363
Acknowledgements	364
References	364

Abstract

New molecular phylogenetic data and new specimens provide the basis for a revision of the family Poraniidae. We present molecular phylogenetic data for five out of 11 genera in the Poraniidae including a newly discovered taxon from the North Pacific. *Bathyporania ascendens* **nov. gen., nov. sp.**, is described from Davidson Seamount (35°43'N, 122°43'W). Another newly discovered poraniid taxon, *Clavaporania fitchorum* **nov. gen., nov. sp.** is described from south of Macquarie Island (56°21'S, 158°28'E) but was not included in the analysis. Revision of the Poraniidae has been undertaken. We present two new genera and reinstate the previously synonymized genus *Glabraster* and return *Culcitopsis* to genus level. The genus *Porania* sensu Clark (1993) and Clark and Downey (1992) is not monophyletic. *Porania*, *Poraniomorpha* and *Poraniopsis* are revised. *In situ* feeding observations of *Bathyporania* are described and compared with other poraniid feeding accounts.

Key words:

Introduction

The Poraniidae represents a small but poorly studied group of cold to temperate water asteroids (Valvatacea) occurring throughout the Atlantic, Indian, Pacific and Southern Oceans (A.M. Clark 1993; A.M. Clark 1984). Recent research has suggested that the group possibly occupies a more significant role in the ecology of deep-sea benthos than has been reported. For example, Bowden *et al.* (2010) has observed “*Porania*” *antarctica* (see changes below) feeding on stalked crinoids on Antarctic seamounts north of the Ross Sea. Further discussion of the relevance of feeding observations is presented below.

Porania, as a member of the Asterinidae, was among the earliest asteroids described by Gray (1840). Perrier (1893, 1894) established the Poraniidae with subsequent additions summarized in Clark and Downey (1992). Superficially similar morphology in the Poraniidae and the Asteropseidae led to the two groups being combined by Spencer and Wright (1966). This classification was rejected (Hotchkiss & Clark 1976), and with the exception of *Dermasterias* most evidence has shown the Asteropseidae as having closer relationship with members of the Oreasteridae (e.g. Blake 1981, 1987; Mah & Foltz 2011). Blake (1981, 1987) provided skeletal evidence that supported the Poraniidae as a member of the Valvatida rather than the Spinulosida.

Blake (2000) discussed the difficulties of interpreting the thick dermal tissue present on the Poraniidae and the Asteropseidae. One taxon demonstrates how this character has been problematic. Prior accounts (e.g., Spencer and Wright, 1966) have placed the North Pacific *Dermasterias* into the Poraniidae and to the Asteropseidae (Blake 1987, A.M. Clark 1984, Hotchkiss and Clark 1976). Mah and Foltz (2011) support *Dermasterias* away from the Poraniidae and located distantly from nominal asteropseids *Asteropsis* and *Petricia*. *Dermasterias* was shown as a derived taxon, occurring on a long branch as the sister to a clade containing asterinids, solasterids, and ganeriids. Its position requires further study but the soft-skin like covering and associated morphology it shares with either the Poraniidae or the nominal Asteropseidae appears to be best explained as parallelism or convergence. Given the derived status it occupies, we have removed *Dermasterias* from consideration herein in order to avoid confusion with the Poraniidae.

The three-gene molecular phylogeny from Mah and Foltz (2011a) showed the Poraniidae as a sister group to the Valvatida, which was consistent with fossil occurrence suggesting the group as an early stem taxon within the greater Valvatacea. Hess (1972) described a poraniid from the Middle Jurassic. Blake *et al.* (2000) described a new early crown-group member of the Poraniidae from the Triassic, which places poraniid occurrence early in the history of post-Paleozoic asteroids. Significance of the Poraniidae as a stemward form was an important consideration in the revisions for this group.

This study was further motivated by the discovery of a small, unidentified poraniid by the Monterey Bay Aquarium Research Institute (MBARI) from Davidson Seamount in the North Central Pacific, which we have identified as a new species. A second new taxon from the NMNH-US Antarctic Research Program collections is also described herein but DNA was unavailable for the phylogenetic analysis. Results from available poraniids provided the basis for revisions to poraniid classification presented below. Species-level range extensions and revisions are listed below.

- 4 *Culcitopsis* is returned to genus level status.
- 5 *Porania pulvillus insignis* is synonymized with *P. pulvillus*.
- 6 *Poraniomorpha hispida rosea* is synonymized with *P. hispida*.
- 7 *Poraniopsis mira* is synonymized with *P. echinaster*
- 8 *Spoladaster brachyactis* is synonymized with *S. veneris*.

Acknowledgements

The authors are grateful to several individuals for their assistance with specimens and specimen collections. We are grateful to Jim Barry, Lonny Lundsten, and the crews and staff at the Monterey Bay Aquarium Research Institute for collection of *Bathyporania*. Lara Atkinson, South Africa Egagasini Offshore Node (SAEON) collected South African specimens for morphological examination. Martha Nizinski and Cheryl Ames, National Marine Fisheries Service (NMFS), provided and assisted with specimens from the North Atlantic. Jerry Hoff, NMFS provided assistance with locating locality data from the North Pacific. Museum specimen assistance was provided by Bob Van Syoc and Chrissy Piotrowski (CASIZ), Paul Greenhall, Tim Coffey and Linda Ward (USNM) and Marc Eleaume and Nadia Ameziane (MNHN in Paris). We are grateful to Peter Schuchert at the Muséum d'histoire naturelle in Geneva, Switzerland for images of the *Poraniopsis mira* lectotype. James W. Halk and Scott D. Fatland assisted with the molecular work. Funding was provided by NSF award DEB-1036358 to Foltz and Mah.

References

- Ahearn, C.G. (1995) Catalog of the type specimens of seastars (Echinodermata: Asteroidea) in the National Museum of Natural History, Smithsonian Institution. *Smithsonian Contributions to Zoology*, 572, 1–59.
<http://dx.doi.org/10.5479/si.00810282.572>
- Alton, M. (1966) Bathymetric distribution of sea stars (Asteroidea) off the Northern Oregon coast. *Journal of the Fisheries Research Board of Canada*, 23 (11), 1673–1714.
<http://dx.doi.org/10.1139/f66-158>
- Alvarado, J.J., Solis-Marin, F.A. & Ahearn, C.G. (2010) Echinoderm (Echinodermata) diversity in the Pacific coast of Central America. *Marine Biodiversity*, 40, 45–56.
<http://dx.doi.org/10.1007/s12526-009-0032-5>
- Anderson, R.C. (1990) Exhibiting sea stars (Asteroidea) at the Seattle Aquarium. *International Zoo Yearbook*, 29, 53–60.
<http://dx.doi.org/10.1111/j.1748-1090.1990.tb03329.x>
- Anderson, R.C. & Shimek, R.L. (2010) Arm deflation in the rare thorny sea star *Poraniopsis inflata* (Asteroidea; Poraniidae), a defensive response to other sea stars? *Canadian Field-Naturalist*, 124 (3), 199–203.
- Anisimova, N.A. & Cochrane, S.J. (2003) An annotated checklist of the echinoderms of the Svalbard and Franz Josef Land archipelagos and adjacent waters. *Sarsia*, 88, 113–135.
<http://dx.doi.org/10.1080/00364820310000102>
- Barattini, L.P. (1938) Equinodermos Uruguayos (contribucion al conocimiento de las especies qui viven en nuestras aguas). *Boletín Servicio Oceanographica Pesca, Montevideo*, 1938, 17–29.
- Bell, F.J. (1891) Stray notes on the nomenclature etc. of some British starfishes. *Annals of the Magazine of Natural History*, 7 (6), 233–235 (1–3).
<http://dx.doi.org/10.1080/00222939109460600>
- Bell, F.J. (1893) *Catalogue of the British echinoderms in the British Museum (Natural History)*. London, xvii + 202 pp., 16 pls.
- Bergmann, M., Dannheim, J., Bauerfeind, E. & Klages, M. (2009) Trophic relationships along a bathymetric gradient at the deep-sea observatory HAUSGARTEN. *Deep-Sea Research I*, 56, 408–424.
<http://dx.doi.org/10.1016/j.dsr.2008.10.004>
- Bernasconi, I. (1964) Asteroideos argentinos. Claves para los órdenes, familias, subfamilias y géneros. *Physis B. Aires*, 24, 241–277.
[http://dx.doi.org/10.1016/0011-7471\(76\)91184-0](http://dx.doi.org/10.1016/0011-7471(76)91184-0)
- Bernasconi, I. (1973) Los equinodermos colectados por el Walther Herwig en el Atlántico sudoeste. *Revista Museo Argentino de Ciencias Naturales Bernardino Rivadavia. Hidrología*, 3 (3), 287–334.
- Bernasconi, I. (1980) Asteroideo Argentinos.7. Familia Echinasteridae. *Revista Museo Argentino de Ciencias Naturales Bernardino Rivadavia. Zoología*, 5 (12), 247–258.
- Blake, D.B. (1981) A reassessment of the sea-star orders Valvatida and Spinulosida. *Journal of Natural History*, 15, 375–394.
<http://dx.doi.org/10.1080/00222938100770291>

- Blake, D.B. (1987) Classification and phylogeny of post-Paleozoic sea stars (Asteroidea, Echinodermata). *Journal of Natural History*, 21, 481–528.
<http://dx.doi.org/10.1080/00222938700771141>
- Blake, D.B., Tintori, A. & Hagdorn, H. (2000) A new, early crown-group asteroid (Echinodermata) from the Norian (Triassic) of Northern Italy. *Rivista Italiana di Paleontologia e Stratigrafia*, 106, 141–156.
- Bosch, I. (1989) Contrasting modes of reproduction in two Antarctic asteroids of the genus *Porania*, with a description of unusual feeding and non-feeding larval types. *Biological Bulletin*, 177, 77–82.
<http://dx.doi.org/10.2307/1541836>
- Bowden, D.A., Schiaparelli, S., Clark, M. & Rickard, G.J. (2011) A lost world? Archaic crinoid-dominated assemblages on an Antarctic seamount. *Deep Sea Research pt. II, Topical Studies in Oceanography*, 58 (1–2), 119–127.
<http://dx.doi.org/10.1016/j.dsr2.2010.09.006>
- Branch, M.L., Jangoux, M., Alva, V., Massin, C. & Stampanato, C. (1993) The Echinodermata of subantarctic Marion and Prince Edward Islands. *South African Journal of Antarctic Research*, 23 (1&2), 37–70.
- Carrera-Rodriguez, C.J. & Tommasi, L.R. (1977) Asteroidea de la plataforma continental de Rio Grande do Sul (Brasil). *Boletim. Instituto Oceanographica du Sao Paulo*, 26 (1), 51–130, pls. 33.
<http://dx.doi.org/10.1590/s0373-55241977000100004>
- Cherbonnier, G. & Sibuet, M. (1973) Résultats scientifique de la campagne Noratlante, Astéroïdes et Ophiurides. *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 76 (1972), 1333–1394.
- Clark, A.H. (1916) Seven new genera of echinoderms. *Journal of the Washington Academy of Sciences*, 6, 115–222.
- Clark, A.H. (1949) Echinoderms from the mid-Atlantic dredged by the *Atlantis* in the summer of 1948. *Journal of the Washington Academy of Science*, 39, 371–377.
- Clark, A.M. (1952) Some echinoderms from South Africa. *Transactions of the Royal Society of South Africa*, 33, 193–221.
<http://dx.doi.org/10.1080/00359195109519884>
- Clark, A.M. (1962) Asteroidea. *B.A.N.Z. Antarctic Research Expedition 1929–1931. BANZARE Reports*, Ser. B, 9, 1–104.
- Clark, A.M. (1976) Asterozoa from Amsterdam and St. Paul Islands, Southern Indian Ocean. *Bulletin of the British Museum of Natural History*, 30 (6), 247–261.
- Clark, A.M. (1984) Notes on Atlantic and other Asteroidea. 4. Families Poraniidae and Asteropseidae. *Bulletin of the British Museum of Natural History (Zoology)*, 47 (1), 19–51.
- Clark, A.M. (1993) An index of names of recent Asteroidea – Part 2, Valvatida. *Echinoderm Studies*, 4, 187–366.
- Clark, A.M. & Courtman-Stock, J. (1976) *The Echinoderms of Southern Africa*. Publ. 766 BMNH, London, 277 pp.
- Clark, A.M. & Downey, M.E. (1992) *Starfishes of the Atlantic*. Chapman and Hall, London, 820 pp.
- Clark, H.E.S. (1963) The fauna of the Ross Sea. Part 3. Asteroidea. (*New Zealand Oceanographic Institute Memoir* 21) *Bulletin of the New Zealand Dept. of Scientific and Industrial Research*, 151, 1–84.
- Clark, H.E.S. & McKnight, D.G. (2001) The Marine Fauna of New Zealand, Echinodermata, Asteroidea (sea-stars), Order Valvatida. *NIWA Biodiversity Memoir*, 117, 1–270.
- Clark, H.L. (1923) The Echinoderm fauna of South Africa. *Annals of the South African Museum*, 13 (7), 221–435.
- Danielssen, D.C. & Koren, J. (1881) Fra den norske Nordhavsexpedition, Echinodermer. *Nyt Magazin for Naturvidenskaberne*, 26, 177–195.
- Danielssen, D.C. & Koren, J. (1884) Asteroidea. *Den Norske Nordhavs Expedition 1876–1878*, 11, 1–119.
- Dartnall, A. (1970) A new species of *Marginaster* (Asteroidea, Poraniidae) from Tasmania. *Proceedings of the Linnean Society of New South Wales*, 94 (3), 207–211.
- Dilman, A. (2006) Asteroid fauna of the Reykjanes Ridge. In: Mironov, A.N., Gebruk, A.V. & Southward, A.J. (Eds.), *Biogeography of the North Atlantic seamounts*, KMK Scientific Press Ltd., Moscow, pp. 177–192.
<http://dx.doi.org/10.1134/s106307400705015x>
- Djakonov, A.M. (1933) *Les Echinodermes des mers arctiques*. Izdatel'stvo Akademii Nauk 8, 1–166.
- Djakonov, A.M. (1946) Individual and age variability in some groups of echinoderms. *Trudy Zoologicheskogo Instituta Akademiyi Nauk SSSR (Leningrad)*, 8, 145–193. [in Russian]
- Djakonov, A.M. (1950) Morskije Zvezdy Morei SSSR. *Tableaux analytiques de la faune de U.R.S.S.*, 34, 1–203. [Translated as Dyakonov, A.M. 1968. *Sea stars (Asteroids) of the USSR Seas. Keys to the Fauna of the USSR*, 34. Zoological Institute of the Academy of Sciences of the USSR, ed. by A.A. Strelkov. Israel Program for scientific translations Ltd. Jerusalem, 183 pp.]
- Döderlein, L. (1900) Die Echinodermen. Zoologische Ergebnisse einer Untersuchungsfahrt des deutschen Seefischerei-Vereins nach der Bäreninsel und Westspitzbergen ausgeführt im Sommer 1898 auf S.M.S. *Olga. Wissenschaftliche Meeresuntersuchungen* (n.s.) (Helgoland), 2, 195–248.
- Döderlein, L. (1928) *Die Seesterne der Deutschen Südpolar-Expedition, 1901–3. Deutsche Südpolar-Expedition, 1901–3*, XIX, 291–301.
<http://dx.doi.org/10.5962/bhl.title.11346>
- Dons, C. (1938) Zoologische Notizen. 26. *Pseudoporania stormi* . gen., n. sp. *Kongelige Norske Videnskabers Selskab Foerhandling*, 10, 16–19, 161–164, 165–169.
- Dons, C. (1938) Zoologische Notizen. 34. *Hippasteria insignis* n. sp. 35. *Sphaeraster Berthae* n. gen., n. sp. 36. *Sphaeraster Bjorlykkei* n. sp. *Kongelige Norske Videnskabers Selskab Foerhandling*, 10, 16–19, 161–164, 165–168.

- Dons, C. (1939) Zoologische Notizen. 37. Die Asteriden Gattung *Sphaeriaster*, nomen novum, *Kongelige Norske Videnskabers Selskab Foerhandlingar*, 11, 37.
- Downey, M.E. (1973) Starfishes from the Caribbean and the Gulf of Mexico. *Smithsonian Contributions to Zoology*, 126, 1–158.
<http://dx.doi.org/10.5479/si.00810282.126>
- Edgar, R.C. (2004) MUSCLE, multiple sequence alignment with high accuracy and high throughput. *Nucleic Acids Research*, 32, 1792–1797.
<http://dx.doi.org/10.1093/nar/gkh340>
- Einarsson, H. (1948) Echinoderma. *The Zoology of Iceland*, Vol. IV, pt. 70, 1–67.
- Ericsson, J. & Hansson, H.G. (1973) Observations on the feeding biology of *Porania pulvillus* (O. F. Müller), (Asteroidea), from the Swedish west coast. *Ophelia*, 12 (1–2), 53–58.
<http://dx.doi.org/10.1080/00785326.1973.10430119>
- Farran, G.P. (1913) The deep water Asteroidea, Ophiuroidea, and Echinoidea of the west coast of Ireland. *Scientific Investigations of the Fish Board of Ireland*, 1912 (6), 1–66.
- Fisher, W.K. (1906) Two new starfishes from Monterey Bay, California. *Zoologischer Anzeiger*, 30 (10), 299–302.
- Fisher, W.K. (1910) New starfishes from the North Pacific. *Zoologischer Anzeiger*, 35, 568–574.
- Fisher, W.K. (1911) Asteroidea of the North Pacific and adjacent waters. I. Phanerozoia and Spinulosida. *Bulletin of the US National Museum*, 76, xiii, 1–420 pp.
<http://dx.doi.org/10.5479/si.03629236.76.i>
- Fisher, W.K. (1913) New starfishes from the Philippine Islands, Celebes, and the Moluccas. *Proceeding of the US National Museum*, 46, 201–224.
<http://dx.doi.org/10.5479/si.00963801.46-2022.201>
- Fisher, W.K. (1917) XIV. Notes on Asteroidea. *Annals and Magazine of Natural History*, 20(8), 166–173.
<http://dx.doi.org/10.1080/00222931709486985>
- Fisher, W.K. (1919) Starfishes of the Philippine seas and adjacent waters. *Bulletin of the US National Museum*, 3 (1000), 1–547.
<http://dx.doi.org/10.1126/science.50.1293.348>
- Fisher, W.K. (1931) Report on the South American sea stars collected by Waldo L. Schmitt. *Proceedings of the US National Museum*, 78, 1–10.
<http://dx.doi.org/10.5479/si.00963801.78-2859.1>
- Fisher, W.K. (1939) A new sea star of the genus *Poraniopsis* from Japan. *Proceedings of the U.S. National Museum*, 86, 469–472.
<http://dx.doi.org/10.5479/si.00963801.86-3059.469>
- Fisher, W.K. (1940) Asteroidea. *Discovery Reports*, 20, 69–306.
- Foltz, D.W., Bolton, M.T., Kelley, S.P., Kelley, B.D. & Nguyen, A.T. (2007) Combined mitochondrial and nuclear sequences support the monophyly of forcipulatacean sea stars. *Molecular Phylogenetics & Evolution*, 43, 627–634.
<http://dx.doi.org/10.1016/j.ympev.2006.10.012>
- Foltz, D., Fatland, S., Eléaume, M., Markello, K., Howell, K., Neil, K. & Mah, C. (2013) Global population divergence of the sea star *Hippasteria phrygiana* corresponds to onset of the last glacial period of the Pleistocene. *Marine Biology*, 160 (5), 1285–1296. <http://dx.doi.org/10.1007/s00227-013-2180-1>
- Forbes, E. (1839) On the Asteriadae of the Irish Sea. *Memoirs of the Wernerian Natural History Society, Edinburgh*, 8, 114–129.
- Forbes, E. (1841) *A history of British starfishes and other animals of the class Echinodermata*. John Van Voorst, London, 267 pp.
- Franz, D.R., Worley, E.K. & Merrill, A.S. (1981) Distribution patterns of common seastars of the Middle Atlantic continental shelf of the Northwest Atlantic (Gulf of Maine to Cape Hatteras) *Biological Bulletin*, 160, 394–418.
<http://dx.doi.org/10.2307/1540848>
- Gage, J.D., Pearson, M., Clark, A.M., Paterson, G.L.J. & Tyler, P.A. (1983) Echinoderms of the Rockall Trough and adjacent areas. *Bulletin of the British Museum of Natural History (Zoology)*, 45 (5), 263–308.
- Gallo, V.R. (1937) Sur le genre '*Culcitopsis*' Verrill (Asteroïdes). *Compte Rendu XIIIe Congres Internationale Zoologique, Lisbon*, 1935. pp. 1664–1667.
- Gasko, F. (1876) Descrizione di alcuni Echinodermi nuovi o per la prima volta trovati nel Mediterraneo. *Rendiconto dell'Accademia delle Scienze Fisiche e Matematiche, Napoli*, 15 (2), 32–41.
- Gemmill, J.F. (1915) On the ciliation of Asterids, and on the question of ciliary nutrition in certain species. *Proceedings of the Zoological Society of London*, 1915, 1–21, 21–23.
<http://dx.doi.org/10.1111/j.1469-7998.1915.00001.x>
- Gosner, K.L. (1971) *Guide to identification of Marine and Estuarine Invertebrates*. John Wiley, New York, xix + 693 pp.
<http://dx.doi.org/10.1002/iroh.19740590252>
- Gotschall, D.W. (1994) *Guide to marine invertebrates, Alaska to Baja California*. Sea Challengers, Monterey, CA, 103 pp.
- Gouy, M., Guindon, S. & Gascuel, O. (2010) SeaView Version 4, a multiplatform graphical user interface for sequence alignment and phylogenetic tree building. *Molecular Biology & Evolution*, 27, 221–224.

<http://dx.doi.org/10.1093/molbev/msp259>

- Grainger, E.H. (1966) Sea Stars (Echinodermata, Asteroidea) of Arctic North America. *Fisheries Research Board of Canada Bulletin*, 152, 1–70.
- Gray, J.E. (1840) A synopsis of the genera and species of the class Hypostoma (*Asterias* Linnaeus). *Annals of the Magazine of Natural History*, 6, 175–184, 275–290.
<http://dx.doi.org/10.1080/03745484009443296>
- Gray, I.E., Downey, M.E. & Cerase-Vivas, M.J. (1968) Seastars of North Carolina. *Fisheries Bulletin of the US Fish & Wildlife Service*, 67, 127–163.
- Grieg, J.A. (1895) Om Echinodermen-faunen i de Vestlandske Fjorde. *Bergens Museums. Aarbog*, 1894–95 (12), 1–13.
- Grieg, J.A. (1896) Om Echinodermfaunaen i de vestlandske Fjorde. *Bergens Museums. Aarbog*, 1896, 34–46.
- Grieg, J.A. (1898) Skrabninger i Vaagsfjorden og Ulversund ytre Nordfjord. *Bergens Museums. Aarbog*, 1897 (16), 1–28.
- Grieg, J.A. (1902) Oversigt over det nordlige Norges Echinoderm. *Bergens Museums. Skrifter*, 1902 (1), 1–38.
- Grieg, J.A. (1907) Echinodermen von dem norwegischen Fischereidampfer Michael Sars in den Jahren 1900–1903 gesammelt. 3. Asteroidea. 1. *Bergens Museums. Skrifter*, 1906 (13), 1–87.
- Grieg, J.A. (1913) Bidrag til kundskaben om Hardanger-fjordens fauna. *Bergens Museums. Skrifter*, 1913 (1), 1–147. [Echinodermata pp. 108–140]
- Grieg, J.A. (1927) Echinoderms from the west coast of Norway. *Nyt Magazin for Naturvidenskaberne*, 65, 127–136.
- Haedrich, R.L. & Maunder, J.E. (1984) *The echinoderm fauna of the Newfoundland continental slope*. Proceedings of the Fifth International Echinoderm Conference, Galway. Balkema, Rotterdam, 662 pp.
- Harvey, R., Gage, J.D., Billet, D.S.M., Clark, A.M. & Paterson, G.L.J. (1988) Echinoderms of the Rockall Through and adjacent areas. 3. Additional records. *Bulletin of the British Museum of Natural History (Zoology)*, 54 (4), 53–198.
- Hayashi, R. (1940) Contributions to the classification of the sea-stars of Japan I. Spinulosa. *Journal of the Faculty of Science, Hokkaido Imperial University, series VI, Zoology*, 6 (3), 107–204.
- Hayne, K.J.R. & Palmer, A.R. (2013) Intertidal sea stars (*Pisaster ochraceus*) alter body shape in response to wave action. *Journal of Experimental Biology*, 216, 1717–1725.
<http://dx.doi.org/10.1242/jeb.078964>
- Heimeier, D., Lavery, S. & Sewell, M.A. (2010) Using DNA barcoding and phylogenetics to identify Antarctic invertebrate larvae, Lessons from a large scale study. *Marine Genomics*, 3, 165–177.
<http://dx.doi.org/10.1016/j.margen.2010.09.004>
- Hendrickx, M., Mah, C. & Zarate, C.-M. (2011) Deep-water Asteroidea (Echinodermata) collected during the slope cruises in the Gulf of California, Mexico. *Revista Mexicana de Biodiversidad*, 82, 798–824.
- Herdman, W.A. (1895) Eighth Annual Report of the Liverpool Marine Biology Committee and their biological station at Port Erin. *Proceedings and Transactions. Liverpool Biological Society*, 9, 26–75.
- Hess, H. (1972) Eine Echinodermen-Fauna aus dem mittleren Dogger des Aargauer Juras. *Schweizerische Paläontologische Abhandlungen Mémoires suisses de Paléontologie*, 92, 1–87.
- von Hofsten, N. (1915) Die Echinodermen des Eisfjords. (Schwedischen Exp nach Spitzbergen 1908). *Kungliga Svenska Vetenskapsakademiens Handlingar*, 54 (2), 1–282.
<http://dx.doi.org/10.5962/bhl.title.12542>
- Hotchkiss, F.H.C. & Clark, A.M. (1976) Restriction of the family Poraniidae, sensu Spencer & Wright, 1966 (Echinodermata, Asteroidea). *Bulletin of the British Museum of Natural History*, 30 (6), 263–268.
- Jangoux, M. (1982) Food and feeding mechanisms, Asteroidea. In: Jangoux, M. & Lawrence, J.M. (Eds.), *Echinoderm Nutrition*. AA Balkema, Rotterdam, pp. 117–159.
- Jangoux, M. (1985) *Catalogue commenté des types d'Echinodermes actuels conservés dans les collections nationales suisses, suivi d'une notice sur la contribution de Louis Agassiz à la connaissance des échinodermes actuels*. Genève, Muséum d'Histoire Naturelle, 67 pp.
- Janosik, A.M. & Halanych, K.M. (2010) Unrecognized Antarctic Biodiversity, A Case Study of the Genus *Odontaster* (Odontasteridae; Asteroidea). *Integrative and Comparative Biology*, 50 (6), 981–992.
<http://dx.doi.org/10.1093/icb/icq119>
- Janosik, A.M., Mahon, A.R. & Halanych, K.M. (2011) Evolutionary history of Southern Ocean *Odontaster* sea star species (Odontasteridae; Asteroidea). *Polar Biology*, 34, 575–586.
<http://dx.doi.org/10.1007/s00300-010-0916-7>
- Jones, D.O.B., Gates, A.R., Curry, R.A., Thomson, M., Pile, A. & Benfield, M. (Eds.) (2009) SERPENT project. Media database archive. Available from: <http://archive.serpentproject.com/1861/> (accessed 03 May 2013)
- Kirby, R.R. & Lindley, J.A. (2005) Molecular analysis of Continuous Plankton Recorder samples, an examination of echinoderm larvae in the North Sea. *Journal of the Marine Biological Association of the United Kingdom*, 85, 451–459.
<http://dx.doi.org/10.1017/s0025315405011392>
- Koehler, R. (1906) Echinodermes. (Stéllérides, Ophiures et Echinides). *Expédition Antarctique Française (1903–1905) commandée par le Dr. Jean Charcot*. Sciences naturelles, documents scientifique. Masson et Cie, Paris, 41 pp.
- Koehler, R. (1909) Echinodermes provenant des campagnes du yacht *Princesse Alice*. *Results Campagne Scientifique, Prince Albert fasc*, 34, 1–317.
- Koehler, R. (1911) Astéries, Ophiures et Echinides. *Scientific Report of the British Antarctic Expedition 2, Biology*, 4, 25–66.

- Koehler, R. (1912) Echinodermes (Astéries, Ophiures et Echinides). *Deuxième Expédition Antarctique Française (1908–1910). Sciences Naturelles*. Masson et Cie, Paris, 272 pp.
- Koehler, R. (1917) Echinodermes (Astéries, Ophiures et Echinides) recueillis par M. Rallier du Baty, aux Iles de Kerguelen, en 1913–14. *Annales. Institut Oceanographique du Monaco*, 7 (8), 1–82.
- Koehler, R. (1920) Echinodermata, Asteroidea. *Scientific Reports of the Australasian Antarctic Expedition*, C8, 1–308.
- Koehler, R. (1921) Echinodermes. *Faune de France*, 1, 1–210.
- Koehler, R. (1923) Astéries et Ophiures recueillies par l'Expédition Antarctique Suédoise. *Further Zoological Research, Swedish Antarctic Expedition*, 1 (1), 1–145.
- Koehler, R. (1924) *Les Echinodermes des Mers d'Europe. Vol 1. Généralités, Astérides, Ophiuridés*. Librairie Octave Doin, Paris, xii + 360 pp.
- Kohtsuka, H. & Saba, M. (2002) Notes on the starfish, Asteroidea (Echinodermata) from the Noto Peninsula, the Sea of Japan. Part–I. *Reports of the Noto Marine Center*, 8 (7), 7–16.
- Kozloff, E.N. (1987) *Marine Invertebrates of the Pacific Northwest*. University of Washington Press, 511 pp.
- Lamb, A. & Hanby, B.P. (2005) *Marine life of the Pacific Northwest, A photographic encyclopedia of invertebrates, seaweeds and selected fishes*. Harbour Publishing, British Columbia, 398 pp.
- Lambert, P. (1978a) British Columbia Marine Faunistic Survey Report, Asteroidea from the Northeast Pacific. *Fisheries and Marine Service Technical Report*, 773, 1–23.
- Lambert, P. (1978b) New geographic and bathymetric records for some northeast Pacific asteroidea (Echinodermata; Asteroidea). *Synopsis*, 11, 61–64.
- Lambert, P. (2000) *Sea Stars of British Columbia, Southeast Alaska, and Puget Sound*. Royal British Columbia Museum Handbook. University of British Columbia Press, 186 pp.
- Leipoldt, F. (1895) Asteroidea der Vettor–Pisani Expedition (1882–1885). Anhang, Die von F. Orsini im Rothen Meere gesammelten Asteroideen. *Zeitschrift für wissenschaftliche Zoologie*, 59, 545–654.
- deLoriol, P. (1904) *Notes pour servir à l'étude des Echinodermes, 2me Ser.*, 2. Bâle et Genève, pp. 51–116.
- deLoriol, P. (1906) Rectification de nomenclature. *Revue du Paléozoologie, Paris*, 10, 77–78.
- Ludwig, H. (1900) Arktische Seesterne. *Fauna Arctica*, 1 (3), 447–502.
- Ludwig, H. (1903) Seesterne. *Résultats du Voyage du S.Y. Belgica Zoologie*, 1–72.
<http://dx.doi.org/10.1126/science.20.512.536>
- Ludwig, H. (1905) Asterien und Ophiuren der schwedischen Expedition nach den Magalhaenslaendern 1895–1897. *Zeitschrift für Wissenschaftliche Zoologie*, 82, 39–79.
- Lütken, C. (1857) *Oversigt over Grønland Echinodermata. 1. Systematisk oversigt over Grønland Echinoderm. 2. Om de nordiske Echinodermers geografiske Udbredning. 3. De nordiske Echinodermers bathymetriske Udbredning*. Kjobenhavn, 109 pp. [Also in 3 parts in *Videnskabelige Meddelelser Dansk Naturhistorisk Forening*, 1857, 1–55, 56–99, 100–109]
- Madsen, F.J. (1955) Echinoderms other than Holothurians collected in Sub–Antarctic and Antarctic seas, mainly by the Norvegia Expeditions 1928–30. *Scientific Results of the Norwegian Antarctic Expeditions*, 37, 1–17.
- Madsen, F.J. (1956) Reports of the Lund University Chile Expedition 1948–49. 24. Asteroidea with a survey of the Asteroidea of the Chilean Shelf. *Acta Universitatis Lundensis*, 52 (2), 1–53.
- Madsen, F.J. (1959) A new North–Atlantic sea–star *Chondrastra hermanni* n. sp. with some remarks on related forms. *Videnskabelige Meddelelser Dansk Naturhistorisk Forening*, 121, 161–170.
- Madsen, F.J. (1961a) The Porcellanasteridae, A monographic revision of an abyssal group of sea–stars. *Galathea Report*, 4, 33–174.
[http://dx.doi.org/10.1016/0011-7471\(65\)91460-9](http://dx.doi.org/10.1016/0011-7471(65)91460-9)
- Madsen, F.J. (1961b) On the zoogeography and origin of the abyssal fauna in view of the knowledge of the Porcellanasteridae. *Galathea Report*, 4, 177–218.
- Mah, C.L. (2007) Asteroidea. In: Carlton, J.T. (Ed.), *The Light & Smith Manual, Intertidal Invertebrates from the Central California to the Oregon coasts, Fourth Edition*. University of California Press, Berkeley and Los Angeles, 1019 pp.
- Mah, C.L. & Foltz, D.W. (2011) Molecular Phylogeny of the Valvatacea (Asteroidea, Echinodermata). *Zoological Journal of the Linnean Society*, 161, 769–788.
<http://dx.doi.org/10.1111/j.1096-3642.2010.00659.x>
- Mah, C. & Hansson, H. (2012) Poraniidae. In: Mah, C.L. (Ed.), World Asteroidea database. Available from: <http://www.marinespecies.org/asteroidea/aphia.php?p=taxdetails&id=123138> (accessed 9 May 2014)
- Maluf, Y. (1988) Composition and distribution of the central eastern Pacific echinoderms. *Natural History Museum of Los Angeles County, Technical Reports*, 2, 1–242.
<http://dx.doi.org/10.2307/25157578>
- Manjón-Cabeza, M.E., Lirio, Y. & Ramos, A. (2001) Distribution of asteroid genera (Echinodermata) off South Shetland Islands and the Antarctic Peninsula. *Boletín. Instituto Español de Oceanografía*, 17 (3 and 4), 263–270.
- McClintock, J.B. (1994) Trophic biology of Antarctic shallow–water echinoderms. *Marine Ecology Progress Series*, 111, 191–202.
<http://dx.doi.org/10.3354/meps111191>
- McKnight, D.G. (1976) Asteroids from the Ross Sea and the Balleny Islands. *NZOI Records*, 3 (4), 21–31.

- McKnight, D.G. (1984) Echinoderms from Macquarie Island and the Macquarie Ridge. *NZOI Records*, 4 (12), 139–147.
- McKnight, D.C. (2006) The Marine Fauna of New Zealand, Echinodermata, Asterozoa (sea-stars). 3. Orders Velatida, Spinulosida, Forcipulatida, Brisingida with addenda to Paxillosida, Valvatida. *NIWA Biodiversity Memoir*, 120, 1–187.
- Metaxas, A. & Davis, J. (2005) Megafauna associated with assemblages of deep-water gorgonian corals in Northeast Channel, off Nova Scotia, Canada. *Journal of the Marine Biological Association of the United Kingdom*, 85 (6), 1381–1390. <http://dx.doi.org/10.1017/s0025315405012567>
- Michailovski, M. (1903) Zoologische Ergebnisse der Russischen Expeditionen nach Spitzbergen. Echinodermen. *Annuaire du Musée zoologique de l'Académie impériale des sciences de St. Pétersbourg*, 7, 460–546.
- Milne-Edwards, H. (1882) Rapport sur les travaux de la Commission chargée par M le Ministre de l'Instruction Publique d'étudier la faune sous-marine dans les grandes profondeurs de la Méditerranée et de l'Atlantique. *Archives des Missions Scientifiques et Littéraires, Paris; Rapports et Instructions*, 9 (3), 1–59. [new echinoderms by Perrier]
- Monteiro Marques, V. (1980) Echinodermes recueillis pendant le mission *Hesperides 76* du N/O *Jean Charcot*. *Arquivos, Museu Bocage*, 2 (7), 95–107.
- Moore, J.A., Vecchione, M., Collette, B.B., Gibbons, R., Hartel, K.E., Galbraith, J.K., Turnipseed, M., Southworth, M. & Watkins, E. (2003) Biodiversity of Bear Seamount, New England Seamount Chain, Results of Exploratory Trawling. *Journal of Northwest Atlantic Fishery Science*, 31, 363–372.
- Moore, J.M., Rouse, G.W. & Wilson, N.G. (2013) Does the Scotia Arc facilitate connectivity between South America and Antarctica? An example from the sea star *Porania antarctica*. Abstracts, Society for Integrative and Comparative Biology, Jan 3–7. Available from: <http://www.sicb.org/meetings/2013/schedule/abstractdetails.php?id=718> (accessed 17 June 2013)
- Mortensen, T. (1912) Report on the Echinoderms collected by the Danmark–Expedition to North–East Greenland. *Meddelelser om Grønland*, 45, 237–302.
- Mortensen, T. (1913) Echinoderm. Conspectus Faunae Groenlandicae. *Meddelelser om Grønland*, 23 (2), 99–379.
- Mortensen, T. (1914) *Conspectus faunae Groenlandicae, Echinoderm*. København, pp. 299–379. [Also as, Grønlands Echinoderm. Catalogue of the Echinodermata of Greenland, *Meddelelser Grønland*, 23 (2), 299–379 (1913)]
- Mortensen, T. (1924) Pighude (Echinoderm). *Danmarks Fauna*, 27, 1–274.
- Mortensen, T. (1927) *Echinoderms of the British Isles*. Oxford University Press, 471 pp. <http://dx.doi.org/10.5962/bhl.title.6841>
- Mortensen, T. (1932) Echinoderms of the Godthaab Expedition of 1928. *Meddelelser om Grønland*, 79, 1–62.
- Mortensen, T. (1933) Echinoderms of South Africa (Asterozoa and Ophiurozoa). *Videnskabelige Meddelelser fra Dansk naturhistorisk Forening i. København*, 93, 215–400.
- Müller, O.F. (1776) *Zoologiae Danicae Prodrromus, seu Animalium Daniae et Norvegiae indigenarum, etc.* Havniae, xxx. +282 pp.
- Müller, O.F. & Troschel, F.H. (1842) *System der Asteriden. I. Asteriae. 2. Ophiuridae*. Braunschweig, xx + 134 pp.
- Mutschke, E. & Mah, C. (2009) Asterozoa–Starfish. In: Häussermann, V. & Försterra, G. (Eds.), *Marine Benthic Fauna of Chilean Patagonia*. Nature in Focus, Santiago, Chile, 1000 pp.
- Naughton, K.M. & O'Hara, T.D. (2009) A new brooding species of the biscuit star *Tosia* (Echinodermata, Asterozoa, Goniasteridae), distinguished by molecular, morphological and larval characters. *Invertebrate Systematics*, 23 (4), 348–366. <http://dx.doi.org/10.1071/is08021>
- Norman, A.M. (1893) A month on the Trondhjem fiord. 1. *Annals and Magazine of Natural History*, 12 (6), 341–367. <http://dx.doi.org/10.1080/00222939308677634>
- Norman, A.M. (1903) Notes on the natural history of East Finmark. Echinodermata. *Annals of the Magazine of Natural History*, 12 (7), 406–417. <http://dx.doi.org/10.1080/00222930308678875>
- O'Hara, T. (1999) Systematics and biology of Macquarie Island echinoderms. *Memoirs of Museum Victoria*, 57 (2), 167–223.
- Östergren, H. (1901) Über die von der Schwedischen Zoologischen Polarexpedition 1900 eingeselten, Asterozoa, Echinozoa, Holothurozoa und Crinozoa. *Zoologische Anzeiger*, 24, 252–232.
- Östergren, H. (1904) Über die arktischen Seesterne. *Zoologische Anzeiger*, 27, 614–616.
- Pawson, D.L. & Ahearn, C.G. (2000) Bathyal echinoderms of the Galapagos Islands. In: Barker, M. (Ed.), *Echinoderms 2000*. Swets & Zeitlinger, Lisse, pp. 41–46.
- Pearcey, F.G. (1902) Notes on the marine deposits of the Firth of Forth, and their relation to its animal life. *Transactions of the Society of Glasgow* (n.s.), 6, 217–251.
- Perrier, E. (1869) Recherches sur les pedicellaires et les ambulacres des astéries et des oursins. Masson, Paris, 188 pp. [Also in *Ann. Sci. Nat.*, (5), 12 (1876), 197–304, pls. 17, 18; 13 (1870), 1–81. Echinides.] <http://dx.doi.org/10.5962/bhl.title.14144>
- Perrier, E. (1875) *Révision de la collection de stellérides du Museum d'Histoire naturelle de Paris*. Reinwald, Paris, 384 pp.
- Perrier, E. (1879) Les Stellérides de l'île Saint–Paul. *Archives du Zoologie Experimentale et Generale*, 31, 47–49.
- Perrier, E. (1881) Description sommaire des espèces nouvelles de Astéries. *Bulletin of the Museum of Comparative Zoology Harvard*, 9, 1–31.
- Perrier, E. (1884) Mémoire sur les d'étoiles de mer recueillis dans la Mer des Antilles et la Golfe de Mexique. *Nouvelles Archives des Musée de Histoire Naturelle. Paris*, 6 (2), 127–276.

- Perrier, E. (1888) Sur la collection d'étoiles de mer recueillie par la Commission scientifique du Cap Horn. *Comptes-rendus Hebdomadaires des Seances Academie des Sciences (Paris)*, 106, 763–765. [new names nomina nuda]
- Perrier, E. (1891) Echinoderma I. Stellérides. *Mission Scientifique du Cap Horn, 1882–83. 6. Zoologie*, (3), 1–198.
- Perrier, E. (1893) *Traité de Zoologie, 1 (2)*. Masson, Paris, 864 pp.
- Perrier, E. (1894) Stellérides. *Expédition Scientifique du Travailleur–Talisman*, 3, 1–431.
- Perrier, E. (1896) Contribution a l'étude des Stellérides de l'Atlantique Nord. *Résultats des Campagnes Scientifiques Accomplies sur son Yacht par Albert I Prince Souverain de Monaco*, 11, 1–57.
- Petersen, C.G.K. & Levinsen, J.C.L. (1900) Trawlings in the Skager Rack and Cattegat in 1897 and '98. *Reports of the Danish Biological Station*, 9 (1899), 1–56.
- Pfeffer, G. (1894) Fische, Mollusken und Echinodermen von Spitzbergen, gesammelt von Prof. Kükenthal im Jahre 1886. Echinodermen von öst-Spitzbergen nach der Ausbeute der Herrn Prof. W. Kükenthal und Dr. Alfr. Walter im Jahre 1889. *Zoologische Jahrbuecher Systematik*, 8, 91–99, 100–127.
- Philippi, A. (1858) Beschreibung einiger neuer Seesterne aus dem Meere von Chiloe. *Archive fuer Naturgeschichte* (Berlin), 24, 264–272.
- Rivera, V. (1930) Algunos Asteridos de España. *Boletin de la Real Sociedad Espanola de Historia Natural*, 30, 101–106.
- Sars, M. (1861) *Oversigt af Norges Echinodermes*. Christiania, 160 pp.
- Sars, M. (1872) Tillaeg. In: Sars, G.O. (Ed.), Nye Echinodermes fra den Norske Kyst. *Kongelige Videnskabernes Selskabsforhandlinge*, Trondheim 1871, pp. 27–31.
- Sars, M. (1877) New Echinoderms. *Fauna littoralis Norvegiae*, 3, 49–75.
- Serrano, A., Sánchez, F., Punzón, A., Velasco, F. & Olaso, I. (2011) Deep sea megafaunal assemblages off the northern Iberian slope related to environmental factors. *Scientia Marina*, 75 (3), 425–437.
<http://dx.doi.org/10.3989/scimar.2011.75n3425>
- Shin, S. & Rho, B.J. (1996) *Illustrated Encyclopedia of Fauna and Flora of Korea. Vol. 36. Echinodermata*. Ministry of Education, Korea, 780 pp.
- Simpson, J. (1903) Catalogue of echnoderms found at Aberdeen and neighbourhood. *Transactions of the Aberdeen Working Mens Natural History Society*, 1, 39–43.
- Sladen, W.P. (1883) IX. Asteroidea dredged in the Faerøe Channel during the cruise of H.M.S. Triton in August 1882. *Transaction of the Royal Society of Edinburgh*, 32, 153–164.
<http://dx.doi.org/10.1017/s0080456800026703>
- Sladen, W.P. (1889) Asteroidea. *Report of the Scientific Results of H.M.S. Challenger*, 30, 1–893.
- Sluiter, C.P. (1895) Die Asteriden Sammlung des Museums zu Amsterdam. *Bijdragen Tot De Dierkunde*, 17, 49–64.
- Smith, E.A. (1876) Descriptions of species of Asteroidea and Ophiuridae from Kerguelen Island. *Annals and Magazine of Natural History*, 4 (17), 105–113.
<http://dx.doi.org/10.1080/00222937608681912>
- Smith, E.A. (1879) Echinodermata of Kerguelen Island. *Philosophical Transactions of the Royal Society of London*, 168, 270–281.
- Spencer, W.K. & Wright, C.W. (1966) Asterozoans, Part U, Echinodermata. *Treatise on Invertebrate Paleontology*, 3 (1), U4–U107.
- Stampanato, S. & Jangoux, M. (1993) Les astérides (Echinodermata) de la Baie Breid (Côte de la Princesse Ragnhild, quartier Enderby, Antarctique), avec la description d'une nouvelle espèce de *Solaster*. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Biologie*, 63, 175–184.
- Stampanato, S. & Jangoux, M. (1997) Les astérides (Echinodermata) récoltés autour es Îles Saint–Paul et Amsterdam (océan Indien sud). *Zoosystema*, 19 (1), 27–33.
- Stampanato, S. & Jangoux, M. (2004) The asteroid fauna (Echinodermata) of Marion & Prince Edward Islands. *Annals of the South African Museum*, 112 (1), 1–16.
- Storm, V. (1878) Beretning om Selskabets zoologiske Samling I Aaret 1877. *Kongelige Norske Videnskabers Selskab Skrifter*, 8, 223–261.
- Storm, V. (1870) Bidrag til Kundskab om Thronhjemsfjordens Fauna. I. 1879. *Kongelige Norske Videnskabers Selskab Skrifter*, 9–36.
- Storm, V. (1881) Bidrag til Kundskab om Thronhjemsfjordens Fauna. I. 1881. *Kongelige Norske Videnskabers Selskab Skrifter*, 73–96.
- Studer, T. (1876) Über Echinodermen aus dem antarktischen Meere und zwei neue Seeigel von den Papua–Inseln gesammelt auf der Reise S.M.S. Corvette *Gazelle* um die Erde. *Monatsbericht der Königlich–Preussischen Akademie der Wissenschaften zu Berlin*, 1876, 425–465.
- Studer, T. (1884) Verzeichniss der während der Reise S.M.S. *Gazelle* um die Erd 1874–76 gesammelten Asteriden und Euryaliden. *Physikalische Abhandlungen Akademie der Wissenschaftlichen Berlin 1883, 1884*, (3), 1–64.
- Studer, T. (1885) Die Seesterne Süd–Georgiens mnach der Ausbeute der deutschen Polar–station in 1882 und 1883. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*. Hamburg, 11, 143–166.
- Stuxberg, A. (1878) Echinodermes fran Novaja Zemljashaf samlade under Nordenskiöldska Expeditionerna, 1875 och 1876. *Öfversigt af Kongliga Vetenskaps Akademien Förhandlingar Stockholm*, 1878 (3), 27–40.
- Süssbach, S. & Breckner, A. (1911) Die Seeigel, Seesterne und Schlangensterne der Nord–und Ostee. *Wissenschaftliche*

Meeresuntersuchungen Kiel, 12, 167–300.

- Tablado, A. (1982) Asteroideos Argentinos. Familia Poraniidae. *Comunicaciones del Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" e Instituto Nacional de Investigacion de las Ciencias Naturales (Argentina)*. *Hidrobiologia*, 2 (8), 86–106.
- Tamura, K., Peterson, D., Peterson, N., Stecher, G., Nei, M. & Kumar, S. (2011) MEGA5, Molecular Evolutionary Genetics Analysis using Maximum Likelihood, Evolutionary Distance, and Maximum Parsimony Methods. *Molecular Biology & Evolution*, 28 (10), 2731–2739.
<http://dx.doi.org/10.1093/molbev/msr121>
- Templeton, R. (1836) A catalogue of the species of rayed animals found in Ireland as selected from the papers of the late J. Templeton, Esq. Of Cranmore, with notices of localities and with some descriptions and illustrations. *Magazine of Natural History*, 9, 236–238, 422.
- Tommasi, L.R. & Oliveira, E. de. (1976) Equinodermos do Brasil. 5. Sobre algumas especies coletados durante viagens do N/O. Prof. W. Besnard, *Boletim do Instituto Oceanográfico, Universidad de Sao Paulo*, 25 (1), 77–100.
<http://dx.doi.org/10.1590/s0373-55241976000100005>
- Tortonese, E. (1955) Notes on Asteroidea. *Annals of the Magazine of Natural History*, 8 (12), 675–684.
<http://dx.doi.org/10.1080/00222935508655683>
- Tortonese, E. (1965) Echinodermata. *Fauna d'Italia*, 6, i–xv + 1–422.
<http://dx.doi.org/10.1002/iroh.19680530111>
- Verrill, A.E. (1878) Notice of recent additions to the marine fauna of the eastern coast of North America. 1 & 2. *American Journal of Science*, 16, 207–215, 371–378.
<http://dx.doi.org/10.2475/ajs.s3-16.93.207>
- Verrill, A.E. (1879) *Preliminary checklist of the marine Invertebrata of the Atlantic coast, from Cape Cod to the Gulf of St. Lawrence*. A.E. Verrill, New Haven, 32 pp.
- Verrill, A.E. (1880) Notice of recent additions to the marine Invertebrata of the northeastern coast of America, with descriptions of new genera and species and critical remarks on others. *Proceedings of the US National Museum*, 2, 165–202.
<http://dx.doi.org/10.5479/si.00963801.284.315>
- Verrill, A.E. (1882) Notice of the remarkable marine fauna occupying the outer banks off the southern coast of New England. 3 & 4. *American Journal of Science*, 23, 135–142, 216–225.
<http://dx.doi.org/10.2475/ajs.s3-23.135.216>
- Verrill, A.E. (1884) Notice of the remarkable marine fauna occupying the outer banks off the southern coast of New England, and of some additions to the fauna of Vineyard Sound. *Report of the US Fish Commission 1882*, 641–669 (1–29).
- Verrill, A.E. (1885) [Echinoderms] in Results of the explorations made by the steamer *Albatross* off the northern coast of the United States in 1883. *Report of the US Fish Commission 1883*, 503–645 (1–142), pls. 10–21.
- Verrill, A.E. (1895) Distribution of the echinoderms of north-eastern America. *American Journal of Science*, 49, 127–141.
- Verrill, A.E. (1899) Revision of certain genera and species of starfishes, with descriptions of new forms. *Transactions of the Connecticut Academy of Arts and Sciences*, 10 (1), 145–234.
- Verrill, A.E. (1914a) Monograph of the shallow-water starfishes of the North Pacific coast from the Arctic Ocean to California. *Harriman Alaska series, US National Museum*, 14, 1–408 pp.
- Verrill, A.E. (1914b) Revision of some genera and species of starfishes, with descriptions of a few new genera. *Annals and Magazine of Natural History, Series 8*, 14 (79), 13–22.
<http://dx.doi.org/10.1080/00222931408693536>
- Verrill, A.E. (1915) Report on the starfishes of the West Indies, Florida and Brazil. *Bulletin of the Laboratory of Natural History, State University of Iowa*, 7 (1), 1–232.
- Viguier, C. (1878) Classification des Stellérides. *Comptes Rendus Academie des Sciences de Paris*, 84, 681–583. [Also in *Annals of the Magazine of Natural History*, 2 (5), 103–105]
- Viguier, C. (1879) Anatomie comparée du squelette des Stellérides. *Archives de Zoologie Experimentale et Generale*, 7, 33–250.