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The Type Material of Hydrozoa described by Eberhard Stechow in the Zoologische Staatssammlung München

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As first of two catalogues on the type specimens of the collection of Hydrozoa of the Zoologische Staatssammlung München, a list of the type material deposited by Eberhard Stechow (1883-1959) is provided. Stechow was a hydrozoan taxonomist at the ZSM who assembled a vast collection of Hydrozoa in the first part of the 20th century. The material comprises 592 ethanol samples and micro-preparations referencing 130 species descriptions. Type material is only missing for a single species described by Stechow. It thus can be assumed that the Stechow collection survived World War II largely undamaged. The taxa are listed in alphabetical order by genus and species names with details on the material and references to the original descriptions.

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Introduction

The "Section Evertebrata varia" of the Zoologische Staatssammlung München (= ZSM) was created in 1999 by the fusion of the echinoderm and the cnidarian collections and the inclusion of all minor non-arthropod evertebrate taxa. With approximately 5600 samples (3900 micro slides, 1700 ethanol samples) the hydrozoan collection represents the most important taxon of this section. This collection predominantly comprises material accumulated by the hydrozoan taxonomist Eberhard Stechow (1883-1959) (fig. 1).

The study of Schuchert (1998) on the overall number of hydrozoan species made clear that Stechow played an extraordinary role in describing species of this taxon. The number of valid species of Hydrozoa is estimated 3200 (Schuchert 1998). Stechow introduced about 100 currently accepted species names and is ranked number four in describers of hydrozoans. Numerous other names introduced by Stechow have been snynonymized, while several of his currently accepted names are only new names proposed by Stechow based mainly on literature data.

We found that Stechow described at least 130 new species based on material he had at hand. In addition, he introduced about eleven new species names mainly by renaming species that had been described by other researchers. Most of the latter taxa are based on literature information only, but some are also based on information taken from Stechow's observations on specimens of the ZSM collection. These samples, however, are not considered herein. Easy access to this type material with the help of a data base or a published catalogue of the ZSM hydrozoan type specimens, therefore, would be of major help for taxonomic-systematic research of this taxon. A revision of this vast type material is an extensive task that has now been initiated through funding within the German GBIF-D framework.

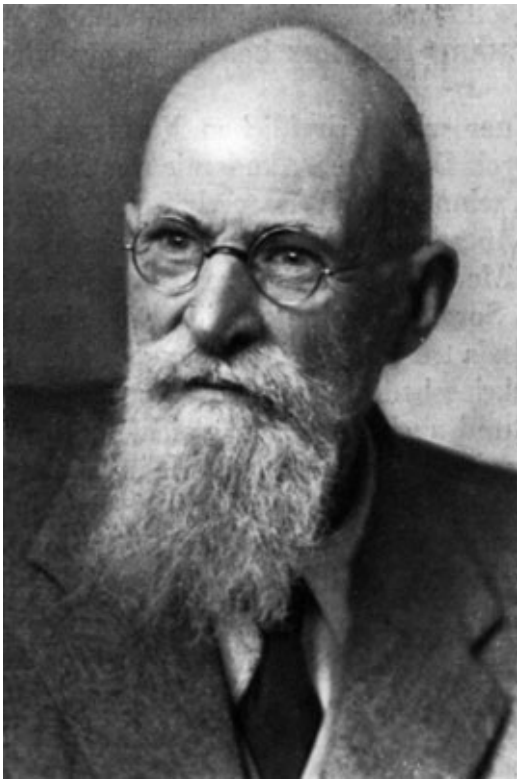

Fig. 1. Portrait of the late Eberhard Stechow.

As a first step in this revision, a list is presented of the collection material which Stechow based his new species on. Another catalogue listing the type specimens of other researchers is planned.

According to Schuchert (1998), Stechow is notorious for his unfounded taxonomic splitting and more of his species might have to be invalidated. Nevertheless, easy access to the material will prove particularly helpful for clarifying various taxonomic problems relating to Stechow's descriptions. Hence, the primary aim of this catalogue is the listing of the material the Stechow descriptions are based upon to make them easy accessible for future taxonomic studies.

History

At the beginning of the 20th century various collections of marine invertebrates were established at the ZSM. These activities were initiated by the two leading personalities in zoology in Munich for that period – Richard Hertwig (director of the zoological institute and first "Konservator"/director of the ZSM) and Franz Doflein (second "Konservator"/director of the ZSM). Among the first scientists conducting systematic research on marine animals at the ZSM was Eberhard Stechow, a scholar of Richard Hertwig. Stechow was active at the ZSM from 1905 until after World War II (Engelhardt, 1960). It seems he had only been dealing with hydrozoan systematics until the appearance of his last (in his time) hydrozoan paper in 1932. Accordingly, it was a period of approximately 27 years of intense work on Hydrozoa. His interest apparently had been triggered by the expedition of Franz Doflein to East Asia (1904/1905: Doflein,1906a). This expedition together with the results of earlier expeditions to Japan, like those of Karl A. Haberer, yielded extensive marine material including invertebrates from the Sagami Bay (near Tokyo/Yokohama). After the return of Doflein in 1905 Stechow started working on his doctoral dissertation (Stechow 1909), which dealt with the morphology of the giant Japanese hydrozoan *Branchiocerianthus imperator*. Prior to finishing his doctoral thesis, his first systematic study, dealing with species descriptions of Japanese Hydrozoa of the Doflein/Haberer collection material (Stechow 1907), had been published. Later extensive and detailed studies on the Japanese material (Stechow 1909, 1913c) appeared in the comprehensive supplements of the Abhandlungen der Königlich Bayerischen Akademie der Wissenschaften on the marine fauna of Japan which were edited by Doflein. As a result of those studies he rose in rank to become the primary authority on systematics of the Hydrozoa in Germany and received important expedition material for examination. Among this material were the Hydrozoa of the most important German marine expedition, the "German Deep Sea Expedition Valdivia" (1898-1899). The results of these studies were published in a number of smaller papers (e.g. Stechow 1911, 1921b, 1923a,b) and finally in a very detailed comprehensive publication (1925a) in the Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition "Valdivia". Other important hydrozoan expedition material was received by Stechow for examination – from the Wilhelm Michaelson & H. Robert Hartmeyer-Expedition (1905: Hartmeyer 1907) to SW-Australia (Stechow 1924, 1925b), the Hugo Merton-Expedition (1907/1908: Merton 1910) to the Aru Islands (Stechow & Müller 1923) or the collecting activities of Sanji Hozawa and colleagues in the Mutsu Bay in Northern Japan (Stechow 1931, Stechow & Uchida 1931). He also carried out collecting expeditions by himself. From the collection data of the material it is possible to reconstruct the dates of his travels to the Mediterranean coasts of France and Italy (1910/1911), to the Caribbean (1912) and to the German coasts (1925).

During his activities he had intense correspondence with scientists of other museums, namely specialists on Hydrozoa, resulting in extensive exchange of material. In this way he received material from all parts of the world, mostly material other workers had used for faunistic taxonomic revisions and which contained substantial portions of type material. He also used such material to establish new species. Most of these descriptions, together with those of material from various sources, were compiled in two more large publications (Stechow 1919a, 1923c). The last paper (Stechow 1962) was published post mortem many years after Stechow had lost his interest in the Hydrozoa.

During World War II, prior to the almost complete destruction of the ZSM building by bomb raids, the majority of the collections were moved elsewhere, which was also the case for all marine invertebrate collections. While there are reports on losses of other marine invertebrate taxa (Tiefenbacher 1992), no information is yet available concerning the fate and losses of the cnidarian collections during World War II. It seems likely – and will also be shown by the results of this study – that the collection of the Hydrozoa survived largely undamaged. However, there were obviously enormous losses in written documentation which probably had not been removed before the devastations. This might explain the nearly complete absence of correspondence, catalogues, lists etc. from the pre- and inter-war periods in the invertebrate sections of the ZSM.

Since the end of Stechow's interest in Hydrozoa and his retirement from the ZSM, the collection has mainly been used for loans of material. Only minor material acquisitions occurred and custodial work has largely been restricted to conservation.

Problems and methods

Problems in the preparation of this catalogue encountered from the beginning were:

- There is no written documentation like lists or catalogues available aside from the information on the labels.
- Stechow was fairly inconsequent when dealing with type material. Only part of the type material was labelled as such and in his publications he hardly ever explicitly referred to type specimens.
- Stechow's labelling is generally confusing since, for example, he frequently changed names on labels by simply overwriting the old names or replacing old labels in the case of taxonomic changes (e.g. fig. 2).
- In many cases Hydrozoa live as epizoans (Fig. 3), often on other hydrozoan species. There are cases of Stechow describing both the substratum and the epizoic species as new. As a result the type material of both may be found in a single sample. If only one species is type material, it was not necessarily mentioned as the first species on the label.
- At the beginning of this project it was not known to what degree the collection had been reduced by losses during World War II.

Fig. 2. *Campanularia* (?) *villafrancensis* Stechow, 1919, ZSM 20041895, type material.

The first attempt of a simple and careful screening of the material for samples labelled as type material revealed only a relatively small portion of the whole type material to be expected. Therefore, the entire material of the collection was registered in a simple one-dimensional data base (MS Access). This included several fields to file information taken from the sample labels.

In addition, almost the entire literature (in total over 1300 pages) of Stechow was digitized using a scanner or digital camera. It was saved in *.pdf format after OCR reading of the text. The literature then was screened for species description and sections of taxonomic relevance. Search functions in both the *.pdf file and the database enabled efficient comparison of all kinds of information including exchange partners, localities or synonyms. These procedures permitted the identification of nearly all the crucial material, including the types, of the collection. In addition, in many cases the morphology of the specimens was compared macroscopically (Fig. 4) or microscopically (Fig. 5) with images or descriptions in the literature to identify type material.

Collections of the Museum für Naturkunde Berlin (ZMB) and the Zoologisches Museum Hamburg (ZMH) were visited to clarify the presence of syntypes of ZSM type material.

Type material

Stechow hardly ever referred to type material in his descriptions. Accordingly, complete sets of material used for descriptions are regarded as syntypic material. The size of such a set of syntypic material var-

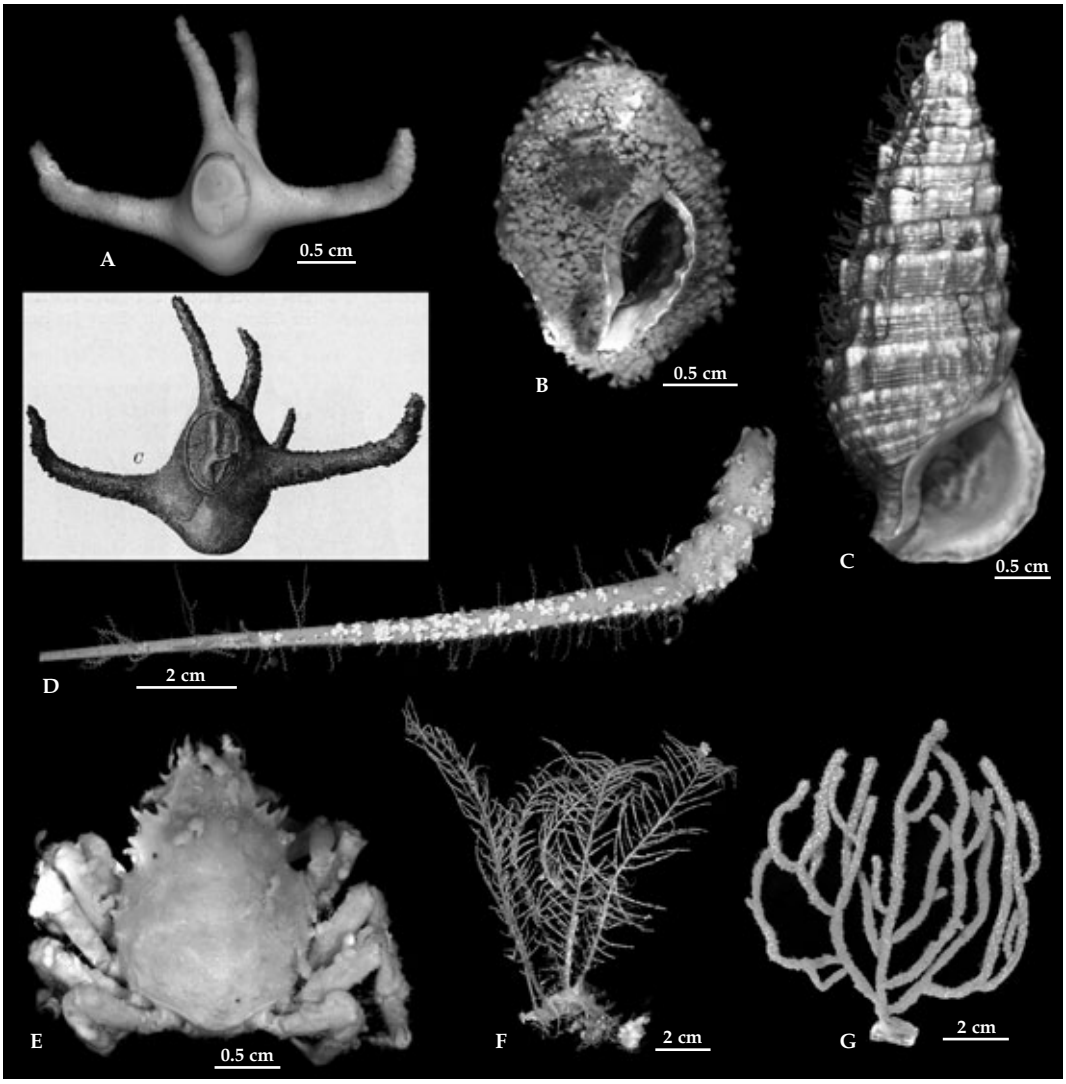

Fig. 3. Examples of epizoic growing type material. **A.** *Janaria mirabilis* Stechow, 1921, from ZSM 20051734, growing on the hermit crabs *Eupagurus varians* Benedict, from "ventral" specimen, top: recent photograph (one dorsal hook taken off by Stechow for micro-preparations), bottom: drawing from Doflein (1914, fig. 302C). **B.** *Hydractinia epiconcha* Stechow, 1907, from ZSM 20060488, colony covering the shell of a gastropod with soft body. **C.** *Perigonimus nudus* Stechow, 1919, ZSM 20040161 colony growing on the gastropod *Cerithium vulgatum* Bruguiere. **D.** *Sertularella japonica* Stechow, 1926, ZSM 20040217 colony covering a single antenna of a palinurid crustacean. **E.** *Corymorpha (Euphysa) balssi* Stechow, 1932, from ZSM 20040176, growing on the crab *Schizophrys dama* (Herbst). **F.** Colony of the Hydrozoa *Idieall pristis* (Lamouroux), from ZSM 20040664, substratum for type material of *Cyclonia gracilis* Stechow, 1921. **G.** Colony of the gorgonarian *Anthoplexaura dimorpha* Kükenthal 1909, from ZSM 20051737, substratum for type material of *Hydrichthella epigorgia* Stechow, 1909.

ies greatly. Mostly it consists of a colony sample in ethanol and one or several micro-preparations (Fig. 6). The latter typically were prepared by Stechow using material removed from the ethanol sample and consist of different portions of the colony on a micro slide. In some cases – primarily from Stechow's early period – serial sections are also present. There can also be several ethanol samples collected from different localities. For some species only micro-preparations could be found; with only

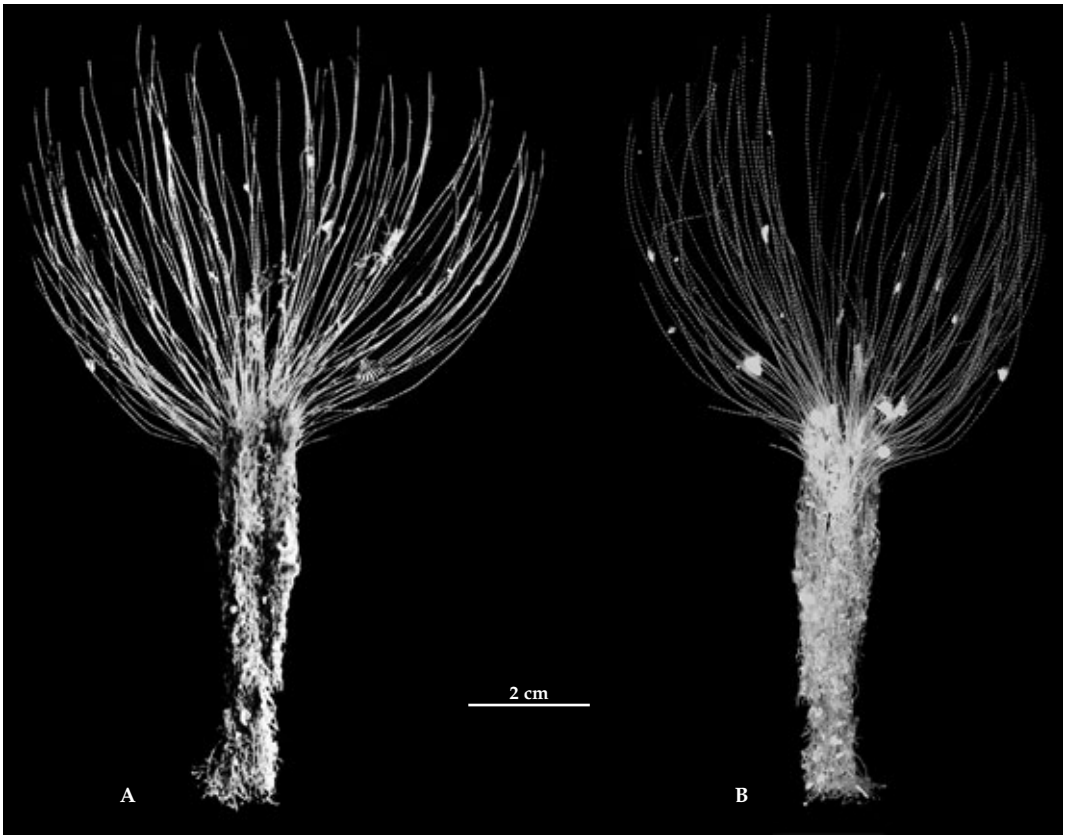

Fig. 4. *Antennellopsis dofleini* Stechow, 1907, ZSM 20041018, syntype. **A.** Photograph of the detailed description (Stechow, 1909 tab. II, fig. 4). **B.** Recent photograph (opposite side than A.).

a single slide in some cases (Fig. 2). There are even cases with a single small colony portion representing the only type material of the species. Many of the described species are epizoic. The respective substratum, a crustacean, a gastropod shell or another hydrozoan usually is contained in the type sample (Fig. 3).

The collection data as provided in this catalogue are combined from information taken from the labels and from the original descriptions of Stechow. If available, published data of travelogues (Schott 1902, p. 80-99, Doflein 1906b, p. 5-9, Hartmeyer 1907, p. 109-112, Merton 1910, p. 205, Stechow 1925a, p. 391-396) were utilized to complete or correct the other information. In case inconsistencies from different sources could not be clarified this is mentioned in the catalogue.

A new numbering system is used to catalogue and register the material. Each of these ZSM numbers consists of the year of registration plus four additional alphanumerical characters. These numbers reflect the sequence of registration only and have no systematic relevance. Three old numbering systems were encountered among the material; the Doflein expedition numbers (Fig. 6B); the Haberer collection numbers and numbers apparently giving the old entry catalogue numbers. They were all included in the present catalogue.

Hardly any attention has ever been paid to the specific type status of Stechow's type material. Thus, nearly all of the type material must be regarded as syntypic. This is not mentioned separately with the samples here.

It was also not our intention to judge on the validity of species or synonymies. Such information is given inconsequently in some cases only.

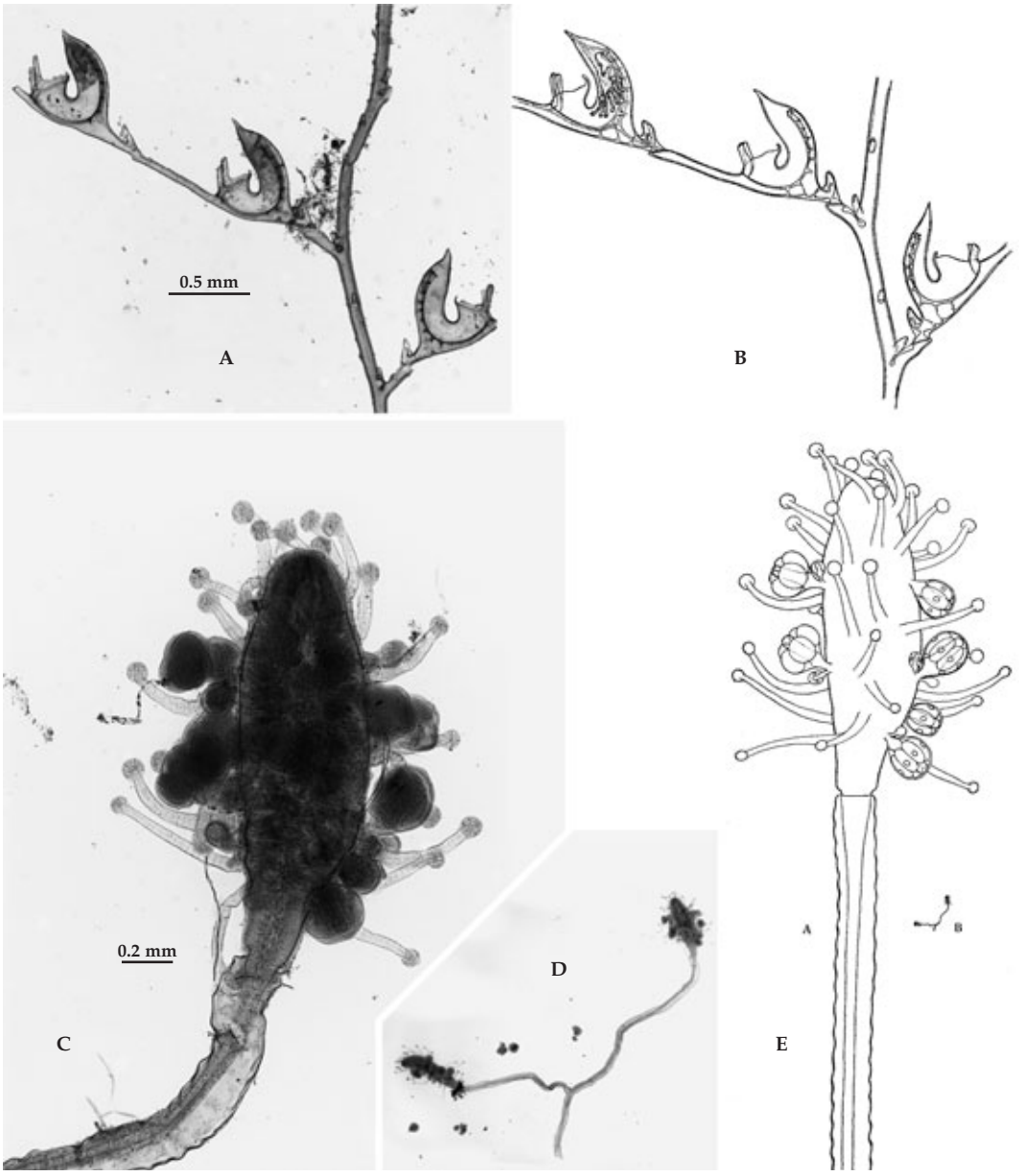

Fig. 5. Details of micro-preparations, original drawings from Stechow and recent photographic images (extended focus microscopic photograph series assembled with the software Auto Montage) of the corresponding details. **A,B.** *Dinotheca dofleini* Stechow, 1911 (ZSM 20041714), syntype. **C-E.** *Coryne uchidai*, ZSM 20041634, type material. **B.** From Stechow (1911, fig. p. 195). **C.** Hydranth. **D.** Total colony. **E.** From Stechow & Uchida (1931, fig. 1), with hydranth (little A) and total colony (little B).

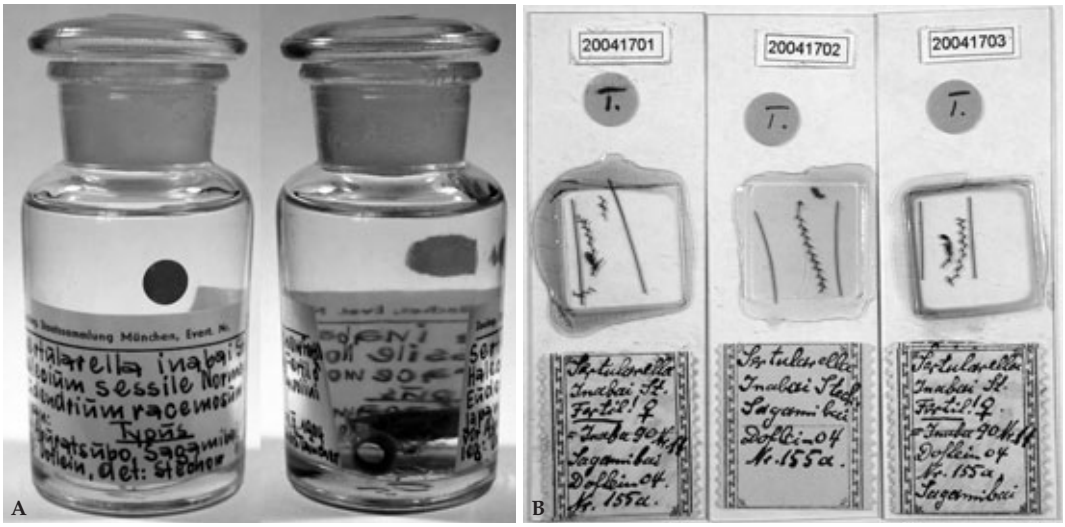

Fig. 6. *Sertularella inabai* Stechow, 1913, whole set of type material. **A.** Ethanol sample ZSM 20040216 from two sides, colony pieces on tube like substratum. **B.** Micro slides containing colony pieces ZSM 20041701-20041703.

List of type material

Abietinaria elsae-oswaldae Stechow, 1923

Stechow (1923b), Zool. Anz. 56, p. 115-116.

ZSM 20041602 micro slide with two colony pieces, USA, California, Monterey Bay, Pacific Grove, on the back of the crab Oregonia gracilis Dana, leg. E. Stechow, 1912.
Note: The material might well origin from the same crab specimen like the one of *Aglaophenia lophocarpa* Allman, 1877 (ZSM 20041183, ethanol sample with crab) with the identical locality (Stechow 1923c).

Abietinaria pacifica Stechow, 1923

Stechow (1923c), Zool. Jb. Syst. 47, p. 197-198, fig. F[1].

No type material found.
Note: Might refer to the same crab specimen like the one of *Aglaophenia lophocarpa* Allman 1877 (ZSM 20041183, ethanol sample with crab) with the identical locality (Stechow 1923c)

Aglaophenia bifida Stechow, 1923

Stechow (1923b), Zool. Anz. 56, p. 117-118.

ZSM 20041148 colony in ethanol, ZSM 20041606 -20041608 micro slides with branches of colony, southern part of the Agulhas Bank, South Africa. 35°27'S, 20°56'E, depth 100 m, leg. "Valdivia", station 106, 03.XI.1898.
Note: A redescription based on the type material is given by Stechow (1925a, p. 515-516, fig. 53).

Aglaophenia bilobidentata Stechow, 1907

Stechow (1907), Zool. Anz. 32, p. 198-199.

ZSM 20040246 colony in ethanol, ZSM 20041627 micro slide with one branch, Japan, Sagami Bay, between Ito and Hatsushima Island, depth 150 m, growing between some bryozoans, leg. K. A. Haberer, nr. 4879, III.1903.
Note: A redescription based on the type material is given by Stechow (1909, p. 91-93, VI, fig. 9).

Aglaophenia Ijimai Stechow, 1907

Stechow (1907), Zool. Anz. 32, p. 197-198.

ZSM 20040248 colonies in ethanol together with of much organic sediment like hexactinellid sponges, ZSM 20051491, 200051492, 20051497 microslides with colony branches, leg. K. A. Haberer, nrs. 9386 (ZSM 20051491), 4763 (ZSM 200051492, ZSM 20051497), VI.1901, Japan, Sagami Bay (nr. 9386), 20.II.1903, Japan, Sagami Bay, Ito (nr. 4763).
Notes: Together with a redescription Stechow (1909, p. 89-91, pl. I, fig. 10, pl. VI, figs. 7-8) synonymized the species (*Aglaophenia Suensonii* Jäderholm var. *Ijimai* n. var.). Here more accurate details on the material are given, that seem to allow identifying the type material. ZSM 20040248 might represent the Haberer samples nr. 4763-4766 because of the collecting data and general description of the sample.

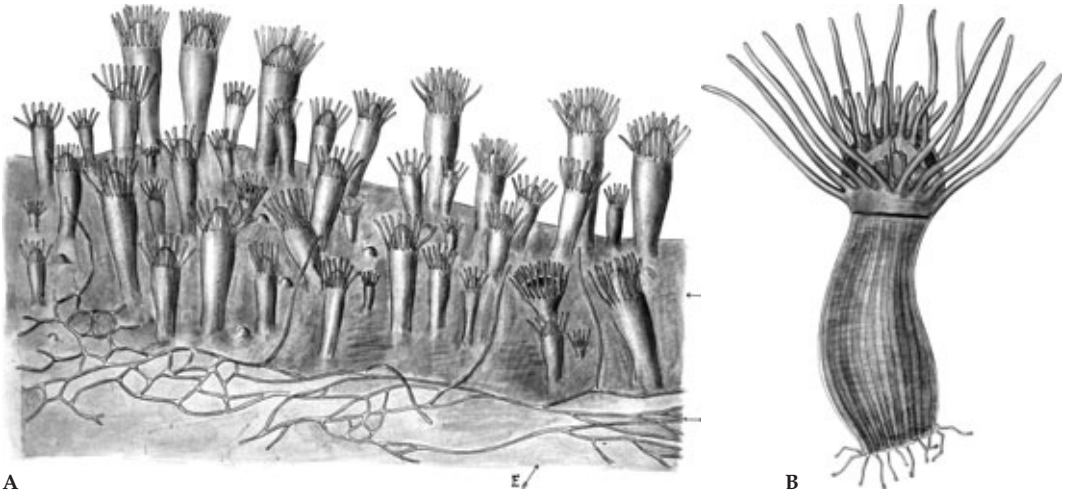

Fig. 7. Drawings probably prepared for the original descriptions by E. Stechow and his graphicist W. Rössler but never published, from the collection of the ZSM. **A.** *Podocoryna corii* Stechow, 1929. **B.** *Corymorpha (Euphysa) balssi* Stechow, 1932.

Aglaophenia nanella Stechow, 1919

Stechow (1919), Zool. Jb. Syst. 42, p. 145-147, fig. E2.

ZSM 20041551, 20041552 micro slides with two small pieces each, France, Villefranche, growing on an elongate algal leave together with *Halecium lankesterii* (Bourne, 1890) [= *H. robustum Pieper*, 1884 (nec. Verrill, 1873!)], leg. E. Stechow, V.1910.

Amphisbetia pacifica Stechow, 1931

Stechow (1931), Zool. Anz. 96, p. 185-186.

ZSM 20040209, 20040791 colonies in ethanol, ZSM 20041667 micro slide with branches, Japan, Northern Japan, Mutsu-Bay, Oma-shimote, growing on algae, leg. S. Hozawa, Takatsuki & Sato, 18.VIII.1927.
Note: A redescription based on the type material is given by Stechow & Uchida (1931, p. 563-565, fig. 11).

Antennellopsis dofleini Stechow, 1907

Stechow (1907), Zool. Anz. 32, p. 196-197

ZSM 20041018 (fig. 4) colony in ethanol, Japan, Uraga Channel, Golden Hind, 35°07'N 139°44'E, depth 38 m, leg. probably A.Owston (Nr. 6675), 23.XI.1904, F. Doflein expedition Nr. 348, ZSM 20041019 colony in ethanol, ZSM 20041628, 20041629 micro slides with several colony rods, Japan, Sagami Bay near Misaki, Golden Hind, 35°60'N 139°41'E, depth 45.75 m, leg. probably A.Owston (Nr. 8348), 05.IX. 1903, F. Doflein expedition Nr. 347.
Notes: A more detailed redescription based on the type material is given in Stechow (1909, p. 86-88, tab. II, fig. 4 und tab. VI, fig. 6). Stechow (1923c, p. 232) later synonymized the species with *Antennellopsis interregima* Jäderholm, 1896. More type material, a colony piece in ethanol, is housed by the ZMB (Nr. 14898).

Antennularia dendritica Stechow, 1907

Stechow (1907), Zool. Anz. 32, p. 195-196.

ZSM 20051181 colony in ethanol, ZSM 20041090 micro slide with single rod, Japan, Sagami Bay, NE of Okinose Bank, 35°01'N 139°33'20"E, depth 600 m, leg. F. Doflein expedition, "Zuso Maru", station 5, Nr. 353, 10.XI.1904.
ZSM 20041082 colony in ethanol, ZSM 20051194, micro slide with two rods, Japan, Sagami Bay, near (?) Okinose Bank (?), leg. F. Doflein expedition, Nr. 358, 10.XI.1904
ZSM 20051710 colony in ethanol, ZSM 20051186, micro slide with single rod, Japan, Sagami Bay, Okinose Bank, 34°59'30"N 139°34'50"E, depth 70-180 m, leg. F. Doflein expedition, "Zuso Maru", station 7, Nr. 362, 10.XI.1904.
Notes: Together with a redescription Stechow (1909, p. 81-82) synonymized the species (*Antennularia Perrieri*, Billard). Here more accurate details on the material are given, that allow identifying the type material. Later (Stechow 1913c, p. 93) he synonymized the species with *Nemertesia irregularis* (Quelch 1885). All these changes can be traced by corrections on the labels carried out by Stechow. The jar of ZSM 20051710 in addition contains *Antennularia antennina* (L.) var. *minor* Kirchenpauer, which

grows on the same substratum like the colony of *Antennularia dendritica* Stechow, 1907.

***Antennularia japonica* Stechow, 1907**

Stechow (1907), Zool. Anz. 32, p. 196.

ZSM 20040755 long colony in ethanol with missing tip, *Halecium mediterraneum* Weismann, 1883 and *Filellum serratum* (Clarke) growing on its base, ZSM 20051184, 20051195-20051197 micro slides with pieces probably representing the tip of the colony, Japan, Sagami Bay, Okinose Bank, 34°59'30"N, 139°34'50"E, depth 250 m, leg. Doflein, "Zuso Maru", station 6, Nr. 361, 10.XI.1904.
Notes: A more detailed redescription based on the type material is given by Stechow (1909, p. 80-81, V, fig 6). Micro slides ZSM 20051195-20051197 do not show detailed collecting data. But it is highly likely that they are type material as they were collected by F. Doflein. Stechow later (1914, p. 230) changed the genus to *Nemertesia*, which is also displayed on all labels. Bedot (1917, p. 37) synonymized it with *Nemertesia intermedia* (Kirchenpauer) which is also shown on the label of ZSM 20051184.

***Bimeria* (?) *baltica* Stechow, 1927**

Stechow (1927), Zool. Anz. 70, p. 306-308, figs. 1, 2.

ZSM 20040264 colonies rising from a hydrocaulus creeping on a 8 cm long fragment of root, in ethanol, ZSM 20000435, 20060340, 20060341 micro slides with several colonies on each, Baltic Sea, Germany, Greifswalder Bodden.
Note: Vervoort (1964, p. 139-141) investigated the material except for ZSM 20000435. He regards the name as a synonym of *Cordylophora caspia* (Pallas, 1771).

***Bimeria crassa* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 103.

ZSM 20041344 small colony in ethanol, ZSM 20000436, 20000437 micro slides with several colony pieces, Arabian Sea off Somalia, 6°44'N, 49°44'E, depth 741 m, leg. "Valdivia", station 266, 30.III.1899.
Note: A redescription based on type material is given by Stechow (1925a, p. 414-415, fig. 4).

***Bimeria fragilis* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 28-30, fig. E.

ZSM 20040342 colonies in ethanol, ZSM 20000438, 20000439, 20000441-20000443 micro slides with branches, France, off Villefranche, growing on *Eudendrium racemosum* (Cav.), leg. E. Stechow, 1910
ZSM 20000441 micro slide with branches, Italy, Ligurian coast, off Bordighera, original sample was growing on a sponge, leg. E. Stechow, 1905.
Notes: Sample ZSM 20040342 also contains *Sertularella crassicaulis* (Heller). The original sample of ZSM 20000441 also contained *Clytia* (?) *paulensis* (Vanhöffen).

***Bougainvillia balei* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 58-59.

ZSM 20040345 colony in ethanol, ZSM 20000459 -20000462 micro slides with pieces of the colony, Australia (West) NNE of Heirisson Prong in Shark Bay, depth 11-12 m, growing on trunk and cladiae of *Lytoscyphus fruticosus* (Esper) and of *Macrorhynchia phoenicea* (Busk), leg. W. Michaelsen & R. Hartmeyer expedition, station 15, 18.VI.1905.
Note: Stechow (1925b, p. 199-202, fig. B) provides a more detailed redescription based on type material.

***Bougainvillia longicirra* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 121-122, fig. 1.

ZSM 20000479, 20000480 micro slides with colony pieces, U.S. Virgin Islands, St. Thomas Island, Charlotte Amalia, growing on algae, surface waters, leg. E. Stechow, 18.III.1912.
Note: Stechow (1919a, p. 25-27) provides a more detailed redescription based on type material.

***Branchiaria mirabilis* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, 249-250.

ZSM 20041441 tissue consisting mainly of stalk in ethanol, ZSM 20041669-20041681 micro slides with histological serial sections of different portions like roots, blastostyl or hydrocaulus, Japan, Sagami Bay near Misaki, depth 200-300 m, F. Doflein expedition, nr. 343, X.1904.
Note: This species description refers to the description of the unnamed *Branchiocerianthus* n. sp. (Stechow 1913c, p. 54-55). This in turn refers to the description of part of the material of *Branchiocerianthus imperator* Allman, 1885 (Stechow 1909, VII, 1-4, 7).

***Campanopsis dubia* Stechow, 1913**

Stechow (1913a), Zool. Anz. 41, p. 583-585, 1 figure.

ZSM 20041633 micro slide with several individual polyps, locality unknown, probably eastern Mediterranean.

***Campanularia alta* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 54-57, fig. P.

ZSM 20040528 in ethanol, France, off Villefranche, depth 30 m, on Sertularella crassicaulis (Heller), leg. E. Stechow, 1910 nr. 3631.
ZSM 20040530, 20040531 in ethanol, ZSM 20041507 -200415012, 20041515, 20043789 micro slides with colony pieces, Italy, off Naples, on spines of the sea urchin *Dorocidaris*.
ZSM 20040532 in ethanol, France, off Villefranche, depth 30 m? litoral, leg. E. Stechow, 01.V.1910, nr. 3680.
ZSM 20041513, 20043783, 20043788 micro slides with colony pieces, France, off Villefranche, partly on *Nemertesia ramosa* Lmx., partly together with *Clytia johnstoni*.
ZSM 20041510, 20041514, 20043790-20043792, 20043782, 20043784, 20043785 micro slides with colony pieces, Italy, off Naples, partly on *Sertularella crassicaulis* (Heller), partly together with *Clytia* (?) *paulensis* or *C. johnstoni*.

***Campanularia australis* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 61.

ZSM 20040182 colony in ethanol, ZSM 20041613, 20041614 micro slides containing several pieces, Australia, Shark Bay, South Passage, depth 9 m, leg. W. Michaelsen & R. Hartmeyer expedition, station 23, 16.VI.1905.
Notes: A more detailed redescription based on the type material is given by Stechow (1925b, p. 206-208, fig. D). More type material, many colony pieces in ethanol, are housed in the ZMH (nr. C 5872).

***Campanularia brachycaulis* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 68-69, fig. T.

ZSM 20041504, 20041505 micro slides colony pieces, France, off Villefranche, leg. E. Stechow, IV.1910.
Notes: It remains unclear if Stechow (1923c, p. 101, fig. J) in his redescription of the species was dealing with the same (type) material. Although being imprecise, the collection data are identical. This suggests that the material is identical. This stands in contrast to the fact that in the redescription he compares the new (?) material with that of the original description. This might suggest that he was dealing with additional material.

***Campanularia gaussica* Stechow, 1923**

Stechow (1923c), Zool. Jb. Syst. 47, p. 102-104, fig. K.

ZSM 20040183 colony in ethanol, ZSM 20041610 micro slide with piece of the colony, Antarctic, 66°02'09"S 89°38'05"W, depth 385 m, among *Sertularella glacialis* Jäderholm, Deutsche Südpolar Expedition Gauss, 18.II.1903.
Note: Stechow provides two redescriptions based on the type material (1924a, p. 62; 1925a, p. 422-423).

***Campanularia indopacifica* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 156-157.

ZSM 20040184 colony in ethanol, ZSM 20043819 -20043822 micro slides with pieces of the colony, Japan, Sagami Bay, on broad algal leave, leg. A. Owston, 28.V.1899 (purchased by F. Doflein 1904).
Note: A redescription based on the type material with a drawing is given by Stechow (1923c, p. 101-102, fig. J).

***Campanularia* (?) *intermedia* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 66-68, fig. V.

ZSM 20044977-20044981 micro slides with polyps and colony pieces, France, off Marseilles, growing on *Posidonia* and a bryozoan, leg. E. Stechow, 02. III.1910.
Note: The collecting year 1904 from the original labels seems unlikely. Stechow later (1925a, p. 521) renamed the species as *Orthopyxis intermedia*.

***Campanularia rara* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 60-61, fig. R.

ZSM 20041506 micro slide with single theca, France, off Marseille, leg. E. Stechow, 1910.

***Campanularia* (?) *villafrancensis* nov. nom. Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 61-62, 157, fig. S.

ZSM 20041895 (fig. 2) micro slide with several branches of *Sertularella polyzonias* (L.), France, Villefranche, on theca of *Sertularella polyzonias* (L.), leg. E. Stechow, 1910.
Notes: The label shows several corrections probably reflecting Stechows changing minds on the taxonomic status: *Campanularia* (?) *attenuat*a is overwritten with *C.* (?) *villafrancensis* nov. nom., as in the same paper (Stechow 1919a, p. 61-62, fig. S) he already described the species as *Campanularia* (?) *attenuata*. He later (1923c) changed his mind again and shifted it to the genus *Clytia* and overwrote "*Campanularia*" with "*Clytia*". The label also says "*Halecium tenellum*". The preparation contains this species too. The sites marked with dark spots appear to be the ones with *Campanularia* (?) *villafrancensis*.

***Campanulina baltica* Stechow, 1927**

Stechow (1927), Zool. Anz. 70, p. 309-310, fig. 3.

ZSM 20043627, micro slide with colony branches, Baltic Sea, Germany, off Warnemünde, growing on Bryozoans.
Note: Stechow (1927) gives a very vague species designation, written in subjunctive. In the heading of the description he names it *Campanulina repens* Allman, 1864.

***Cladocarpus* (?) *valdiviae* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 116-117.

ZSM 20041603-20041605 micro slides with parts of a single small colony, Agulhas current, off South Africa, 35°16'S, 22°26.7'E, depth 155 m, leg. "Valdivia", station 104, 02.XI.1898.
Note: A redescription based on the type material is given by Stechow (1925a, p. 507-508, fig. 48).

***Clytia elsae-oswaldae* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 125-127, fig. 4.

ZSM 20041517-20041519 micro slides with parts of a colony, U.S. Virgin Islands, St. Thomas Island, harbour of Charlotte Amalia, growing on algae and on old wooden boat, surface waters, leg. E. Stechow, 18.III.1912.

***Clytia mollis* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 44-45, fig. L.

ZSM 20040186 several fragments on algal substratum in ethanol, ZSM 20044415-20044416 micro slides with fragments on algal substratum, France, off Sète, leg. Collin.

***Clytia obeliformis* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 128-129, fig. 6.

ZSM 20041520 micro slide with part of a colony, Norway, off Bergen, leg. Ewald, IX.1908.

***Clytia* (?) *ulvae* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 47-48, fig. N.
ZSM 20041516 micro slide with part of a colony on algal substratum, France, Marseilles, leg. E. Stechow, 1910.

***Corymorpha (Euphysa) balssi* Stechow, 1932**

Stechow (1932), Zool. Anz. 100, p. 82-83.

ZSM 20040176 (fig. 3E) polyps on crab *Schizophrys dama* (Herbst) in ethanol, Australia, Western Australia, NNE of Heirisson Prong, Shark Bay, depth: 11-12.5 m, leg. W. Michaelsen & R. Hartmeyer expedition, station 15, 18.VI.1905.
ZSM 20041651 micro slide with polyps, Australia, Western Australia, Useless Inlet, Shark Bay, leg. W. Michaelsen & R. Hartmeyer expedition, station 21 ("King leg."), 23-30.VIII.1905.
ZSM 20041647-20041650micro slides with polyps, Australia, Western Australia, Shark Bay, leg. W. Michaelsen & R. Hartmeyer expedition.
Notes: According to Stechow (1932, p. 82) more type material ("Typus") is housed by the ZMH, but it is missing there. A figure was found in the collection of the ZSM obviously prepared for the original description (Fig. 7B).

***Coryne epizoica* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, p. 248.

ZSM 20040166 colony on snail *Rissoa alata* Phil. in ethanol, ZSM 20045125 micro slide with colony parts together with *Thaumantias (Campanularia) raridentata* (Alder), Italy, off Naples, leg. M. Bedot.
Note: A more detailed redescription based on the type material is given in Stechow (1923c, p. 41-42, fig. C).

***Coryne uchidai* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 178-179.

ZSM 20041634 micro slide with fragment with two hydranths (fig. 5C-E). Japan, Northern Japan, Mutsu Bay, off Tsuchiya at Atsamuchi.
Notes: A more detailed redescription based on the type material is given in Stechow & Uchida (1931, p. 556-558, fig. 1). As suggested by Schuchert (2001), this preparation clearly represents the type material (holotype). The arrangement of the hydrants on the micro slide is figured in Stechow & Uchida (1931, fig. 1B).

***Cryptolaria bulbosa* Stechow, 1932**

Stechow (1932), Zool. Anz. 100, p. 87.

ZSM 20040683 small colony growing on sponge in ethanol, ZSM 20001072, 20001073 micro slides with colony branches, Japan, Sagami Bay, leg. F. Doflein expedition, 1904.

***Cuspidella gigantea* Stechow, 1923**

Stechow (1923d), J. Coll. Sci. Univ. Tokyo. 44, p. 8-9.

ZSM 20001061, 20043714-20043716 micro slides with colony pieces growing on *Clytia gracilis* (Sars), on the crab *Halimus diacanthus* (De Haan), Japan, Sagami Bay, leg. F. Doflein expedition, 1904.

Notes: A more detailed redescription based on the type material is given in Stechow (1923c, p. 131-132, fig S). Stechow (1932, p. 86-87) later changed the genus name to *Laodicea* and overwrote *Cuspidella* on the label. He also changed the identification of the substratum hydrozoan from *Gonothyraea* sp. to *Clytia gracilis* (Sars.). The label of the slides also says *Croatella corrugata* (Thornely) which occurs together with *Cuspidella gigantea*. None of the *Halimus diacanthus* (De Haan) crabs of the crustacean collection perfectly matches the collection data of the hydrozoan micro slides, so the substratum crab probably has been lost.

Cyclonia gracilis Stechow, 1921

Stechow (1921b), Zool. Anz. 53, p. 230.

ZSM 20040664 (fig. 3F) on colonies of the Hydrozoa *Idieallana pristis* (Lamouroux) and *Nigellastrum digitale* (Busk) in ethanol, U.S. Virgin Islands, St. Thomas Island, Savana Passage, leg. W. Kükenthal & R. Hartmeyer expedition, 24.I.1907.
ZSM 20045173-20045180 micro slides with colony pieces, partly on other Hydrozoa (ZSM 20045173 on *Idieallana pristis* (Lamouroux), ZSM 20045180 on *Lytoscyphus marginatus*), U.S. Virgin Islands, St. Thomas Island.
Note: It seems likely that the micro slide material origins from the same material as the ethanol sample.

Dicoryne valdiviae Stechow, 1923

Stechow (1923a), Zool. Anz. 56, p. 2-3.

ZSM 20040357 epizoic on the pagurid crab *Parapylocheles scorpio* Alcock in ethanol, on two specimens of *Parapylocheles scorpio* Alcock housed in the ZSM crustacean collection (no registration numbers) in ethanol, ZSM 20000528-20000531 micro slides with colony parts, Western Sumatra, 26 nautical miles south of Pulo Nias, 0°15.2'N, 98°09'E, depth 614 m, leg. "Valdivia", station 194, 01.II.1899.
ZSM 20040358, 20040359 epizoic on the pagurid crabs *Parapylocheles scorpio* Alcock (one specimen each in bamboo tube) and on the outside of tube, ZSM 20000532-200005325 micro slides with colony parts, Western Sumatra, south-west of Pulo Nias, 0°16'N, 98°04'E, depth 470 m, leg. "Valdivia", station 199, 02.II.1899.
Note: Stechow (1925a, p. 412-414, fig. 3) provides a more detailed redescription based on the type material. Balss (1912) gives details on the crab Parapylocheles scorpio Alcock.

Dictyocladium coactum Stechow, 1923

Stechow (1923a), Zool. Anz. 56, p. 107-109.

ZSM 20040797 base of a colony in ethanol, ZSM 20041575, 20041576 micro slides with colony branches, South Africa, Francis Bay, shallow water at the northern part of Agulhas Bank, 34°8.9'S, 24°59.3'E, depth 100 m, leg. "Valdivia", station 100, 29.X. 1898.
ZSM 20040796 colony branches in ethanol, ZSM 20041577 micro slide with colony branches, South Africa, Agulhas stream on Agulhas Bank, 35°16'S, 22°26.7'E, depth 155 m, leg. "Valdivia", station 104, 02.XI.1898.
Note: Stechow (1925a, p. 466-467, fig. 27) provides a more detailed redescription based on the type material.

Dinotheca dofleini Stechow, 1911

Stechow (1911), Zool. Anz. 37, p. 194-197, fig. p.195.

ZSM 20041237 colony in ethanol, ZSM 20041714 (fig. 5A,B)-20041718, 20051714-20051718 micro slides with parts of the colony, East Africa, near the coast of Somalia, 0°24.5'S, 42°49.4'E, depth 1019 m, leg. "Valdivia", station 252, 25.III.1899.
Notes: In Stechow (1920, p. 401-405, figs. 1-2) a detailed redescription very similar to the originals description is provided. In another redescription (Stechow 1923a, p. 17) the collection data are corrected ("… now the locality is known …"). The same data are given in the last, thorough redescription (Stechow 1925a, p. 508-513, figs. 49-52). There are some discrepancies between the information on the material of the original description (Stechow 1911) and the redescriptions (Stechow 1923a, 1925a). It appears that he originally had only a small branch with insufficient collection data. This might by represented by micro slide ZSM 20041714 (Fig. 5A). Colony portions of that slide very much resemble those figured in the original description (Figs 5A,B). When Stechow later got hold of the whole colony he might have corrected the collection data on the label of ZSM 20041714, which differ from those of the original description. Although the material other than ZSM 20041714 was not mentioned in the original description it should be regarded as type material, because – as can be deduced from Stechow (1923a, 1925a) – it belongs to the same colony.

Diphasia nuttingi Stechow, 1913

Stechow (1913b), Zool. Anz. 43, p. 142-143.

ZSM 20041522 micro slide with small part of a colony, Japan, Sagami Bay, Okinose bank, 34°59'30"N, 139°34'50"E, depth 70-180 m, F. Doflein expedition, "Zuso Maru", station 7, 10.XI.1904.

Note: A detailed redescription based on the type material is provided in Stechow (1913c, p. 142, fig. 116).

***Dynamena japonica* Stechow, 1919**

Stechow (1919b), Sitz. Ber. Ges. Morphol. Physiol. München, p. 18.

ZSM 20040982, 20051732 colonies in ethanol, ZSM 20041721-20041731 micro slides with colony parts, Japan, Sagami Bay near Misaki, depth 15-20 m, leg. F. Doflein expedition nrs. 363b (ZSM 20040982, 20041724-20041731) and 1550 (ZSM 20051732, 20041721-20041723), 11.X.1904.
Note: This new species is based on a detailed description of a species earlier identified (Stechow 1913c, p. 152-154, figs. 131-134) as *Thuiaria articulata* (Pallas, 1766).

***Dynamena tropica* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 101.

ZSM 20041639 micro slide with two small colony pieces, U.S.A., Florida, Tortugas, at the trunk of *Eudendrium racemosum* (Gmelin, 1791) = *Eudendrium carneum* Clarke, 1882, leg. 1913.
Note: The sample *Eudendrium racemosum* (Gmelin, 1791) = *Eudendrium carneum* Clarke, 1882 in ethanol, ZSM 20041382 is also still present.

***Egmundella gracilis* Stechow, 1921**

Stechow (1921b), Zool. Anz. 53, p. 226.

ZSM 20040180 colony in ethanol growing on rod like substratum, ZSM 20043653-20043655 micro slides with parts of the colony, Canada, Strait of Georgia off Vancouver, leg. C. McL. Fraser 1914.
Note: A redescription based on the type material is given in Stechow (1923c, 124-126, fig. Q).

***Egmundella superba* Stechow, 1921**

Stechow (1921b), Zool. Anz. 53, p. 226-227.

ZSM 20043652 micros slide with part of a colony, U.S. Virgin Islands, St. Thomas Island.
Note: A redescription based on the type material is given in Stechow (1923c, 126-127, fig. R).

***Egmundella valdiviae* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 5-6.

ZSM 20043651 micro slide with polyps, from the bamboo tubes that house the pagurid crab *Parapylocheles scorpio* Alcock, Western Sumatra, south-west of Pulo Nias, 0°16'N, 98°4'E, depth 470 m, leg. „Valdivia", station 199, 02.II.1899.

Notes: A redescription based on the type material is given in Stechow (1925a, 438-439, fig. 14). The ethanol samples of the crabs with tubes, ZSM 20040358, 20040359 (1 specimen each in bamboo tube) are also in the collection. They contain type material of the *Dicoryne valdiviae* Stechow, 1923.

***Eucalix paradoxus* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 104-105.

ZSM 20041571, 20041572, 20043322 micro slides colony pieces growing on Sertularella arbuscula (Lamouroux), southern part of the Agulhas Bank, South Africa. 35°27'S, 20°56'E, depth 100 m, leg. "Valdivia", station 106, 03.XI.1898.
Notes: A redescription is based on the type material given in Stechow (1925a, 433-435, fig. 11). ZSM 20040567 in ethanol growing on *Halecium beani* (Johnston) is mentioned here and might represent additional type material since it stems from "Valdivia" station 106, too. From the same "Valdivia" station there is also the preparation ZSM 20041573 on a micro slide growing on *Filellum serratum* (Clarke).

***Eudendrium antarcticum* Stechow, 1921**

Stechow (1921b), Zool. Anz. 53, p. 225.

ZSM 20041564 ethanol sample with tube worms and *Halisiphonia nana* Stechow, 1921, ZSM 20000729 -20000730 micro slides with colony parts, ZSM 20000729 together with *Halisiphonia nana* Stechow, 1921, east side of Bouvet Island, Antarctic, 54°29'S, 3°30'E, depth 457 m, leg. "Valdivia", station 131, 28.XI.1898.
Notes: A redescription based on the type material is given in Stechow (1925a, 415-416, fig. 5). Stechow (1921b) gives bryozoans as substratum which cannot be detected in sample ZSM 20041564. Since the locality and the association with *Halisiphonia nana* Stechow are identical as in the original description it should still be regarded as the type material.

***Eudendrium elsae-oswaldae* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, p. 252.

ZSM 20040383 colony branches in ethanol, ZSM 20000764-20000766 micro slides with colony branches, Italy, off Naples, Posolippo, "Tartanello", depth 20 m.
Notes: The original description is a short diagnosis only, without giving locality details. A detailed redescription based on the type material is given by Stechow (1921e, 81-83, fig. G).

***Gonothyraea* (?) *nodosa* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 132-134, fig. 8.

ZSM 20040188 colony in ethanol growing on a piece of shell, ZSM 20041739-20041741 micro slides containing colony branches, Brasilia, Rio de Janeiro, leg. H. de Beaurepaire Aragao, 29.VI.1912.

***Grammaria scandens* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p. 140-141.

ZSM 20040698 colony in ethanol at the trunk *Halicornaria expansa* Jäderholm, ZSM 20043392-20043395 micro slides with parts of the colony, Japan, Sagami Bay near Misaki, leg. F. Doflein expedition, nr. 350a, 18.-30.X.1904.
Notes: A very detailed redescription based on the type material is given in Stechow (1913c, p. 118-121, figs. 90-91). Details given here allow identifying the type material.

***Halecium crinis* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p. 138-139.

ZSM 20040201 colony in ethanol, ZSM 20041704 -20041706 micro slides with colony parts, Japan, Sagami Bay, NE of Okinose Bank, 35°01'N 139°33' 20"E, depth 600 m, leg. F. Doflein expedition, "Zuso Maru", station 5, Nr. 1608c, 10.XI.1904.
Note: A more detailed redescription based on the type material is given in Stechow (1913c, p. 79-81, fig. 44) which allows identifying the type material.

***Halecium reflexum* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 37-39, figs. G,H.

ZSM 20040202 colony in ethanol on *Sertularella polyzonias* (L.), ZSM 20041748-20041757 micro slides with colony pieces, France, Villefranche, litoral, leg. E. Stechow, 1910.

***Halicornaria ishikawai* Stechow, 1907**

Stechow (1907), Zool. Anz. 32, p. 198-199.

ZSM 20040252 colonies in ethanol, ZSM 20041630, 20041631 micro slides with colony branches, Japan, Suruga Bay, depth 130 m, leg. F. Doflein expedition, Nr. 351, 1904.
Note: The detailed redescription (Stechow 1909, p. 100-101, figs. 14-15) allows identifying the type material.

***Halisiphonia nana* Stechow, 1921**

Stechow (1921b), Zool. Anz. 53, p. 227-228.

ZSM 20040700 ethanol sample with tube worms, on *Eudendrium antarcticum* Stechow, 1921, ZSM 20043399 -20043396, 20000729 micro slides with colony parts, ZSM 20000729 on *Eudendrium antarcticum* Stechow, 1921, east side of Bouvet Island, Antarctic, 54°29'S, 3°30'E, depth 457 m, leg. "Valdivia", station 131, 28.XI.1898.
Note: Stechow (1925a, p. 452-453, fig. 22) provides a redescription based on the type material.

***Halocharis indopacifica* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 152-153.

ZSM 20041553 micro slide with single hydranth, Japan, Sagami Bay, leg. Doflein expedition 1904
Note: A drawing of the material is provided by Stechow (1923c, p. 44, fig. D).

***Hebella longa* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 98-99.

ZSM 20040194 colony in ethanol epizoic on *Sertularella polyzonias* (L.), ZSM 20043418 micro slide with part of the colony on *Sertularella polyzonias* (L.), Norway.
Notes: Boero et al. (1997) question the validity of that species. They are in error stating that Stechow's description is based on older literature only.

***Hebella neglecta* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p. 139.

ZSM 20040708 on colony in ethanol epizoic on *Synthecium tubithecum* (Allman), ZSM 20043419-20043422 micro slides with colony parts on *Synthecium tubithecum* (Allman), Japan, Uraga Channel, depth 91.5 m, leg. A.Owston, 02.IX.1900, Nr. 7270, F. Doflein expedition Nr. 1703a.
Note: A redescription based on the type material with drawing is provided by Stechow (1913c, p. 107-108, fig. 83).

***Hebellopsis hartmeyeri* Stechow, 1923**

Stechow & Müller (1923), Abh. Senck. Natf. Ges. 35, 463-464, fig. 4.

ZSM 20043457, 20043458 micro slides with colony parts growing epizoic on *Thyroscypus fruticosus* (Esper, 1793), Indonesia, Moluccas, Aru Islands, Strait of Dobo, depth 40 m, lime rock bottom, leg. H. Merton, dredge haul 4, 20.III.1908.
Note: Ethanol sample ZSM 20040986 of *Thyroscypus fruticosus* (Esper, 1793) with identical collection data

might also contain *Hebellopsis hartmeyeri* Stechow, 1923. The Forschungsinstitut und Naturmuseum Senckenberg (Frankfurt) houses more type material of this species. Boero et al. (1997) consider this species as doubtful.

***Heteroplon (Plumularia) michaelseni* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 68.

ZSM 20040235 colony on algal leave in ethanol, ZSM 20041737, 20041738 micro slides with colony parts, Australia, SW Australia, Fremantle district, south of Fremantle, on algal leaves on beach, leg. W. Michaelsen & R. Hartmeyer expedition, station 43, 01.X. 1905.
Note: Stechow (1925b, p. 251-252, fig. Q) later renames the species as *Plumularia (Heteroplon) michaelseni* and gives a more detailed redescription.

***Heteroplon jaederholmi* Stechow, 1912**

Stechow (1912), Zool. Jb. Syst. 32, p. 366-368, figs. F, G.

ZSM 20051220-20051223 micro slides with colony parts, probably collected off South Africa by Salmin.
Notes: Stechow (1925a) later synonymized it with *Plumularia (Heteroplon) africana* (Marktanner, 1890). This is also what the labels on the on the micro slides show.

***Heteroplon valdiviae* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 15-16.

ZSM 20041138 colony in ethanol, ZSM 20051335 -20051337 micro slides with colony parts, off South Africa, Plettenberg Bay, shallow water in the northern part of Agulhas Bank, 34°7'S, 23°28'E, depth 100 m, leg. "Valdivia", station 99, 28.X.1898.
Note: Stechow (1925a, p. 495-498, figs. 42, 43) later renames the species as *Thecocaulus* (?) *valdiviae* and gives a detailed redescription based on the type material.

***Hydractinia epiconcha* Stechow, 1907**

Stechow (1907), Zool. Anz. 32, p. 192.

ZSM 20060487 colonies covering the surface of four gastropod shells containing the soft bodies of the gastropods in ethanol, Japan, Sagami Bay near Misaki, leg. F. Doflein expedition, Nr. 1549, 1904
ZSM 20060488 (fig. 3B) colonies covering the surface of six gastropods shells containing the soft bodies of the gastropods in ethanol, Japan, Sagami Bay near Misaki, leg. F. Doflein expedition, Nr. 367 (?), 1904.
ZSM 2000567-2000570, 2000574-2000578, 2000581, 2000582 micro slides with total polyps and colony portions, longitudinal (ZSM 2000581, 2000582) and cross section series (ZSM 2000574, 2000577) and skeletal elements (ZSM 2000578), Japan, Sagami Bay near Misaki, growing on the shell of living gastropods, leg. F. Doflein expedition, Nr. 367, 1904.
ZSM 20060486 colony covering the surface of a gastropods shells containing the soft body of the gastropod in ethanol, Japan, Sagami Bay near Fukuura, depth 150 m, leg. K. A. Haberer, 01-12.III. 1903.
ZSM 20000579, 20000580 micro slides with total polyps and colony portions, Japan, Sagami Bay near Fukuura, depth 150 m, growing on the shell of living gastropods, leg. K. A. Haberer, nrs. 7810 (ZSM 20000579) and 7876 (ZSM 20000580), 1903.
Note: A detailed redescription based on the type material is given in Stechow (1909, p. 18-21, Tab. III, figs. 4, 5).

***Hydrichthella doederleini* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 96-98.

ZSM 20040167 colonies at the stalk of two specimens of an alcyonacean (*Dendronephthya* ?) in ethanol, ZSM 20041635-20041638 micro slides with polypes, Japan, Suruga Bay, "Golden Hind", west coast of Izu Peninsula, 34°47'N, 138°44'E, depth 128 m, leg. 17.IV. 1902.

***Hydrichthella epigorgia* Stechow, 1909**

Stechow (1909), Beiträge z. Naturgesch. Ostasiens, in Abh. K. Bayer. Akad. Wiss., Mathem.-phys. Kl. I. Suppl.-Bd. 6. Abhdl., p. 31-33, table IV, fig. 9.

ZSM 20040168 growing in the gorgonarian *Anthoplexaura dimorpha* Kükenthal 1909 in ethanol, ZSM 20041746 micro slide with polyps, Japan, Sagami Bay near Enoshima, Doflein expedition nr. 150a, 1904.
ZSM 20051737 (fig. 3G) growing in the gorgonarian *Anthoplexaura dimorpha* Kükenthal 1909 in ethanol, Japan Sagami Bay near Enoshima, Doflein expedition, 1904.
ZSM 20060408 growing in the gorgonarian *Anthoplexaura dimorpha* Kükenthal 1909 in ethanol, Japan Sagami Bay near Misaki, depth 15-20 m, Doflein expedition, 11.X.1904.
ZSM 20060409 growing in the gorgonarian *Anthoplexaura dimorpha* Kükenthal 1909 in ethanol, Japan Sagami Bay near Misaki, Doflein expedition, X. 1904.
ZSM 20041747 micro slide with a serial section series together with *Anthoplexaura dimorpha* Kükenthal 1909, Japan Sagami Bay near Misaki, depth 20 m, Doflein expedition nr. 103a, 14.X.1904.

Notes: ZSM 20040168, 20041746, 20041747, 20060408, 20060409 also represents type material of the gorgonarian *Anthoplexaura dimorpha* Kükenthal, 1909. There are more samples from the Doflein expedition that contain this species and it is very difficult to decide which ones represent type material. This is mainly because the Doflein numbers are conserved in few cases only. In the present listing those were chosen that match the collection data given by Stechow (1909). A redescription partly based on type material is given in Stechow (1913c, p. 48-49, fig. 4).

Hydrocorella africana Stechow, 1921

Stechow (1921c), Verh. Deutsch. Zool. Ges. 26, p. 29-30.

ZSM 20040157 growing on shell of the gastropod *Melapium lineatum* (Lamarck) with the hermit crab *Diogenes brevirostris* Stimpson in ethanol, South Africa, shallow water of the northern part of Agulhas Bank, 35°2.5'S, 19°58.5'E, depth 80 m, leg. "Valdivia", station 96, 27.X.1898.
ZSM 20040153 growing on shells of the gastropod *Nassa arcularia* L. with the hermit crab *Diogenes brevirostris* Stimpson in ethanol, South Africa, Plettenberg Bay, shallow water in the northern part of Agulhas Bank, 34°7'S, 23°28'E, depth 100 m, leg. "Valdivia", station 99, 28.X.1898.
ZSM 20040154 growing on shell of a gastropod with the hermit crab *Diogenes brevirostris* Stimpson in ethanol, ZSM 20040158 growing of five gastropod shells of the species the shells of the gastropods *Nassa arcularia* L., *Melapium lineatum* (Lamarck) and *Olivancillaria auricularia* L., ZSM 20000603-20000609 micro slides with colony parts, South Africa, Francis Bay, shallow water at the northern part of Agulhas Bank, 34°8.9'S, 24°59.3'E, depth 100 m, leg. "Valdivia", station 100, 29.X.1898.
ZSM 20040155 growing on shell of the gastropod *Cancellaria* (*semidisjuncta* aff.) with the hermit crab *Diogenes brevirostris* Stimpson in ethanol, South Africa, south of Plettenberg Bay, 35°10.5'S, 230°2'E, depth 500 m, leg. "Valdivia", station 103, 2.XI.1898.
Note: The original description is a short notice only. A detailed redescription mostly based on type material is given by Stechow (1925a, p. 409-412).

Hydrocoryne miurensis Stechow, 1907

Stechow (1907), Zool. Anz. 32, p. 193-194.

ZSM 20040421 colony in ethanol on a piece of volcanic tuff, ZSM 20000854-20000856 micro slides with skeletal parts, ZSM 20000857-20000863 micro slides with medusae, polyps and gonophorae, ZSM 20000863-20000871, 20060677-20060679 micro slides with longitudinal and histological cross section series of polyps and gonophorae, Japan, Sagami Bay near Misaki, leg. Doflein expedition, nr. 727, 1904.
Notes: A very detailed redescription based on the type material is given in Stechow (1909, p. 35-39, figs. 1-8, III, 1-4, V, 10,11, VII). More type material, some polyps in ethanol are housed in the ZMB (Nr. 14807).

Janaria mirabilis Stechow, 1921

Stechow (1921), Verh. Deutsch. Zool. Ges. 26, p. 29.

ZSM 20051734 (housed in crustacean collection of the ZSM) two colonies ("specimens") on the hermit crabs *Eupagurus varians* Benedict in ethanol (fig. 3A), ZSM 20000705-20000721 micro slides with preparations of one spine, ZSM 20000705-20000708 histological cross section series of decalcified spine, ZSM 20000709-20000721 polyps and skeletal parts treated differently, Gulf of California, 22°52'00"N, 109°55' 00"W, depth: 56.7 m, U.S. Fish Commission steamer "Albatross", station 2829.
Notes: The original description is a short diagnosis only. It refers to a figure in the book "Tierbau und Tierleben" (Doflein 1914, p. 350, fig. 302C) (Fig. 6A bottom), which enabled to identify the sample the description is based on. Stechow (1962, p. 424-427, figs. 4-7) provides a very detailed redescription based on the type material. According to this, the two "specimens" have different localities near to each other. One is from a depth of 7m only. Accordingly the details of the locality on the type specimen sample appear to belong to one of the two "specimens" only.

Lafoea (?) *paxi* Stechow, 1932

Stechow (1932), Zool. Anz. 100, p. 86-87.

ZSM 20040196 colony in ethanol, ZSM 20043522 micro slide containing several pieces, Japan, Okinose bank in Sagami Bay, at the base of colonies of Halecium mediterraneum Weismann, 34°59'30"N, 139° 34'50"E, 70-80-180 m depth, Doflein expedition, "Zuso Maru" station 7, 10.XI.1904.

Laomedea sphaeroidea Stechow, 1932

Stechow (1932), Zool. Anz. 100, p. 85-86.

ZSM 20040189 colonies on sea grass ("algal") leaves in ethanol, ZSM 20041652, 20041653 micro slides with colony parts, France, Sète, Etang de Thau, leg. Collin.
Note: This is a species description from material included in different species in an earlier study (Stechow 1919a, *"Campanularia angulata"*, p. 63-65, fig. U), where a drawing is provided.

***Lictorella abyssicola* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 99-101.

ZSM 20040197, 20040726 colonies in ethanol, ZSM 20043537-20043542 micro slides with colony parts, off East Africa,01°48.2'N, 45°42.5'E, depth 1644 m, leg. "Valdivia", station 257, 27.III.1899.

***Nemertesia valdiviae* Stechow, 1919**

Stechow (1919b), Sitz. Ber. Ges. Morphol. Physiol. München. 1919: 33-34.

ZSM 20040236 colony in ethanol, ZSM 20051284, 20051285, 20051288-20051290 micro slides with colony portions, Cape Verde Islands, west of Boavista, 16°17'N, 22°51'W, depth 77 m, leg. "Valdivia", station 38, 29.VIII.1898.
Notes: Stechow (1921b, p. 232-233, 1925a, p. 503-505, fig. 46) provided two redescriptions based on the type material. In the latter he states (p. 505) that he now tends to include the species in the genus *Plumularia* instead of *Nemertesia*. The labelling on the micro slides shows this changed opinion.

***Nigellastrum* (?) *densum* Stechow, 1923**

Stechow & Müller (1923), Abh. Senck. Natf. Ges. 35, p. 467, fig. 7.

ZSM 20041688 micro slide with single colony with ?*Hebellopsis contorta* (Marktanner, 1890) growing on it, Indonesia, Moluccas, Aru Islands, SW of Lola, depth 8-10 m, stony bottom, leg. H. Merton, dredge haul 9, 01.IV.1908.

***Obelia longa* Stechow, 1921**

Stechow (1921), Zool. Anz. 53, p. 221-223, fig. p.222.

ZSM 20041560-20041563 micro slides with large colony portions, from bank in the east of the Kerguelen Islands, 48°57.8"S, 70°0.6"E, depth 88 m, leg. "Valdivia", station 161, 29.XII.1898.
Note: A redescription based on the type material is given in Stechow (1925a, p. 436-437, fig. 13).

***Obelia (?) oxydentata* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 131-132, fig. 7.

ZSM 20040190 colony growing in phytal substratum in ethanol, ZSM 20041742-20041745, 20044941 micro slides with colony parts, U.S. Virgin Islands, St. Thomas Island, Charlotte Amalia, surface waters, leg. E. Stechow. 18.III.1912.

***Obelia* (?) *undotheca* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 4.

ZSM 20041565 micro slide with small colony portion, Bering Sea, Kamtschatka Peninsula, Awatsch (?Bay), growing on two specimens of the crabs *Oregonia gracilis* Dana.
Notes: A redescription based on the type material is given in Stechow (1923c, p. 115-117, fig. O). The *Oregonia gracilis* specimens the material stems from are still present in the ZSM crustacean collection (old. reg. Nr. 510/4).

***Orthopyxis pacifica* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 69-70, fig. Wb.

ZSM 20040652 piece of a colony on (phytal?) substratum in ethanol, ZSM 20044985-20044988 micro slides with polyps and parts of the colony, Vancouver Island area.
Notes: The locality "Vancouver" given by Stechow (1919a, p. 69) is probably erroneous. The label of the material, which Stechow received by exchange from C. McL. Fraser, says "Friday harbor, Vancouver". This may mean Friday Harbor (San Juan Archipelago, Washington State, U.S.A.) in the area of Vancouver Island.

***Pasya elongata* Stechow, 1923**

Stechow & Müller (1923), Abh. Senck. Natf. Ges. 35, p. 469-471, XXVII fig. 8.

ZSM 20040847 colony growing on *Macrorhynchia* (?) *longicornis* (Busk) in ethanol, ZSM 20041689, 20041690, micro slides with colony portions, Indonesia, Moluccas, Aru Islands, SW of Lola, depth 8-10 m, stony bottom, leg. H. Merton, dredge haul 9, 01.IV.1908.
Note: The Forschungsinstitut und Naturmuseum Senckenberg (Frankfurt) houses more type material of this species.

***Perigonimus* (?) *nanellus* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 14-15, fig. C.

ZSM 20040162 colony on spine of the sea urchin *Dorocidaris papillata* among a dense colony of *Thamnitis ("Perigonimus") cidaritis* (Weismann) in ethanol, ZSM 20000643, 20000644 micro slides with colony branches, Italy, Naples.

***Perigonimus nudus* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 16-17, fig. D.

ZSM 20040161 (fig. 3C) colony on the gastropd *Cerithium vulgatum* Bruguiere in ethanol, ZSM 20000649 micro slide with small colony portions, France, Villefranche, leg. E. Stechow, V.1910.

ZSM 20000645-20000648 micro slides with colony portions and polyps, Italy, Trieste, leg. Maas, 1908

***Phylactotheca armata* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 59-60.

ZSM 20041611, 20041612 micro slides with colony pieces, Australia, SW-Australia, Geraldton District, Champion Bay, depth 3-14 m, growing on algae, leg. W. Michaelsen & R. Hartmeyer expedition, station 31, 12.VII.1905.
Note: A more detailed redescription based on the type material is provided by Stechow (1925b, p. 204-206, fig. C).

***Phylactotheca pacifica* Stechow, 1913**

Stechow (1913c), Beiträge z. Naturgesch. Ostasiens, in Abh. K. Bayr. Akad. Wiss., Mathem.-phys. Kl. III. Suppl.-Bd. 2. Abhdl., p. 155-156, fig. 135.

ZSM 20040203 small colony portion in ethanol on substratum that might represent the trunk of *Aglaophenia perforata* Kirchenpauer, ZSM 20041891-20041894 micro slides (bad condition – partly broken) with small colony pieces, Tonga Islands.
Notes: More type material, the main portion of the colony in ethanol is housed in the ZMH (nr. C 5775).

***Plumularia habereri* Stechow, 1909**

Stechow (1909), Beiträge z. Naturgesch. Ostasiens, in Abh. K. Bayer. Akad. Wiss., Mathem.-phys. Kl. I. Suppl.-Bd. 6. Abhdl., p. 77-79, table IV, fig. 4.

ZSM 20040238 numerous colonies growing on a single large epizoanthid colony in ethanol, ZSM 20041623, 20041624 micro slides with colony branches, Japan, Sagami Bay, leg. K. A. Haberer, V.1901.
ZSM 20041113 numerous colonies growing on a single large gorgonarian colony in ethanol, ZSM 20041622, 20041625, 20050999-20050103 micro slides with colony branches, Japan, Sagami Bay, between Ito and Hatsu-Shima Island, depth 150 m, leg. K. A. Haberer, nr. 4781, III.1903.
Notes: Stechow (1919b, p. 33) includes this species into his newly introduced genus *Dentitheca*. This is also shown on some of the labels. More type material, colony pieces in ethanol are housed in the ZMB (nr. 14907).

***Plumularia hertwigi* Stechow, 1907**

Stechow (1907), Zool. Anz. 32, p. 195.

ZSM 20040240, 20040241 large colonies in ethanol, ZSM 20041700 micro slide with colony branch, Japan, Sagami Bay, near Misaki, depth 15-20 m, leg. F. Doflein expedition, 11.X.1904.
ZSM 20040239, 20041114 large colonies in ethanol, Japan, Sagami Bay, near Misaki, depth 15-20 m, leg. F. Doflein expedition, 14.X.1904.
ZSM 20051235-20051241 micro slides with colony branches, Japan, Sagami Bay, near Misaki, depth 15-20 m, leg. F. Doflein expedition, X.1904.
Notes: In a more detailed redescription Stechow (1909, p. 76-77, tab. VI, 1-3) refers only to part of the material listed above, which was collected at 11.X. 1904. Since these details are missing in the original description, the whole material matching the locality given there is listed as type material herein. More type material, colony pieces in ethanol are housed in the ZMB (nr. 14896).

***Plumularia nodosa* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 67.

ZSM 20041115 small colonies on a piece of rock in ethanol, ZSM 20041621 micro slide with five small colonies, Australia, South-West Australia, Albany district, Middleton Beach, leg. W. Michaelsen & R. Hartmeyer expedition, station 62, VIII.1905.
Note: A redescription with a drawing based on the type material is given by Stechow (1925b, p. 247-248, fig. P).

***Podocoryna corii* Stechow, 1929**

Stechow (1929), Zool. Anz. 86, p. 150-151.

ZSM 20040150 colony on a scale of the polychaete *Aphrodite aculeata* in ethanol, Belgium, 5 km off Oostende, depth 5 m.
Note: A figure was found in the collection of the ZSM obviously prepared for the original description (Fig. 7A)

***Polyhydra spinifera* Stechow, 1962**

Stechow (1962), Zool. Anz. 169, p. 420-422, fig. 3.

ZSM 20040179 colonies on five gastropod shells (*Nassa tritoniformis* (Kiener), *Turritella ungulina* var. *nivea* Reeve, *Natica* sp. and *Pleurotoma* or *Pisania* sp.) in ethanol, three of them occupied by the pagurid hermit crab *Diogenes pugilator* var. *cristata* (H. Milne Edwards), ZSM 20041732, 20041733 micro slides with polyps from the colonies, Côte d'Ivoire, Addah, depth 10 m, on sandy bottom, 15.IX.1888.

***Sarsia nana* Stechow, 1923**

Stechow (1923c), Zool. Jb. Syst. 47, p. 40, fig. B.

ZSM 20041609 micro slide containing several pieces, European coasts.
Note: Schuchert (2001) regards this as holotypic material and questions the validity of the species.

***Sertularella atlantica* Stechow, 1919**

Stechow (1919b), Sitz. Ber. Ges. Morphol. Physiol. München 1919, p. 21-22, fig. 2A.

ZSM 20041559 micro slide with parts of a colony, west of the Shetland Islands, 60°42'N, 3°11'W, depth 486 m, leg. "Valdivia", station 4, 06.VIII.1898.
Note: A redescription based on the type material is given in Stechow (1923c, p. 183-184, fig. A[1]a).

***Sertularella fusoides* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 103-104.

ZSM 20040894 colony branches in ethanol, ZSM 20041641 micro slide containing several colony pieces, U.S.A., California, Pacific Grove, Monterey Bay, surface, growing on algae, leg. W. S. Wallace.

***Sertularella goliathus* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 112-113.

ZSM 20040900 colony in ethanol, *Filellum serpens* (Hassall) growing on it, South Africa, Agulhas stream on Agulhas Bank, 35°16'S, 22°26.7'E, depth 155 m, leg. "Valdivia", station 104, 02.XI.1898.
ZSM 20040901 small colony in ethanol, ZSM 20041597, 20041598 micro slides with colony pieces, South Africa, southern part of the Agulhas Bank, 35°27'S, 20°56'E, depth 100 m, leg. "Valdivia", station 106, 03.XI.1898.
Note: A redescription based on the type material is given in Stechow (1925a, p. 481-482, fig. 37.

***Sertularella gotoi* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p. 142.

ZSM 20040227 two colony pieces in ethanol, *Plumularia setacea* (L.) growing on it, ZSM 20050746-20050752 micro slides with colony pieces, Japan, Sagami Bay, NE of Okinose Bank, 35°01'N 139°33' 20"E, depth 600 m, leg. F. Doflein expedition, Zuso Maru" station 5, Nr. 357a, 10.XI.1904.
Notes: A redescription based on the type material is provided by Stechow (1913c, p. 132-133, fig. 104). Stechow (1923c) later includes the species in the newly established genus *Symplectoscyphus*.

***Sertularella inabai* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p. 141-142.

ZSM 20040216 (fig. 6A) two colony pieces on tube like substratum in ethanol, *Halecium sessile* Norman and *Eudendrium racemosum* (Cavolini) growing on it, ZSM 20041701-20041703 (fig. 6B) micro slides containing colony pieces, Japan, Sagami Bay, off Aburatsubo, depth 5-20 m, F. Doflein expedition, nr. 155a, 10.XI.1904.

Notes: In the brief original descriptions Stechow (1913b) hardly provides any information on the type material. However, it seems very likely that the material of the more detailed redescription (Stechow 1913c, p. 132-133, fig. 104) represents the type material.

***Sertularella japonica* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 104-105.

ZSM 20040217 (fig. 3D) colony in ethanol, densely covering a single antenna of a palinurid crustacean, ZSM 20041642-20041645 micro slides containing colony branches, Japan, Tokio Bay, Uraga Channel, leg. A. Owston, 13.VII.1903.

***Sertularella lagenoides* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 86-87, fig. C.

ZSM 20040218 several colonies in ethanol, France, Villefranche, leg. E. Stechow, III-V.1910
ZSM 20051723 colony in ethanol, ZSM 20050445 -20050446 micro slides with colony pieces, France, Villefranche, leg. E. Stechow, IV.1910.
ZSM 20051726 colony in ethanol, ZSM 20041760 -20041762, 20050447-20050448 micro slides with colony pieces, France, Sète, harbour, growing on algae, leg. Collin.
ZSM 20051727 colony in ethanol, France, Villefranche, leg. E. Stechow.
ZSM 20041758-20041759 micro slides with colony pieces, France, Villefranche, leg. E. Stechow, 1910.

***Sertularella levigata* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 183-184.

ZSM 20040219, 20040905 colony pieces in ethanol, ZSM 20041663, 20041664 micro slides with colony branches, Japan, Mutsu-Bay, Tsuchiya near Asamushi, leg. 01.VII.1926.
Notes: A redescription with a drawing is given in Stechow & Uchida (1931, p. 559-561, fig. 9). The name of the collector on the label of sample ZSM 20040219 (T. Uchida) and the one given in the description (S. Hozawa) do not match each other.

***Sertularella lineata* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 109.

ZSM 20040906 colony in ethanol on brown algal (?) substratum, ZSM 20041580-20041582 micro slides containing several small pieces of the colony, South Africa, Simon's Bay, 34°20'S, 18°36'E, depth 70 m, leg. "Valdivia", station 114, 05.XI. 1898.
Note: A more detailed redescription based on the type material is given by Stechow (1925a, p. 469-470, fig. 29).

***Sertularella longa* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 109.

ZSM 20040907 several colony branches in ethanol, ZSM 20041583, 20041584 micro slides with colony pieces, South Africa, Cape Agulhas, shallow waters of the northern part of the Agulhas Bank, 35°2.5'S, 19°58.5'E, depth 80 m, leg. "Valdivia", station 96, 27.X.1898.
ZSM 20041570, 20041585-20041593 micro slides with colony pieces, South Africa, Plettenberg Bay, 34°7.3'S, 23°27.8'E, depth 100 m, leg. "Valdivia", station 99, 28.X.1898.
Notes: A more detailed redescription based on the type material is given by Stechow (1925a, p. 483-485, fig. 38). ZSM 20041570 is also type material of *Tubularia sertularellae* Stechow, 1923, which grows on *Sertularella longa* Stechow, 1923.

***Sertularella megista* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 97-119.

ZSN 20040911 colony in ethanol, ZSM 20041594 -20041596 micro slides with colony branches, South Africa, Francis Bay, shallow waters of the northern part of the Agulhas Bank, 34°08.9'S, 24°59.3'E, depth 100 m, leg. "Valdivia", station 100, 29.X.1898.
Notes: *Antenella africana*, *Clytia paulensis* (Vanhöffen) & *Clytia gracilis* (M. Sars) are growing on stems and thecae of the colony. A detailed redescription based on the type material is provided by Stechow (1925a, p. 480-481, fig. 36).

***Sertularella miurensis* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, p. 258.

ZSM 20040913 colony in ethanol in brown algae, ZSM 20050470, 20050471, 20050473 micro slides with colony branches, Japan, Sagami Bay, off Aburatsubo, floating on water surface, leg. F. Doflein expedition, Nr. 1707b, 06.X.1904.
Notes: The original description is a short note and based on his (Stechow 1913c, p. 134-135, figs. 106-107) description of *Sertularella indivisa* Bale, 1882. The material this study is based on must be regarded as type material. A redescription again based on this material is provided by Stechow (1923c, p. 175-177, fig. T).

***Sertularella mutsuensis* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 177-187.

ZSM 20041658 micro slide with small piece of a colony with few zoids, Japan, Mutsu Bay, Suzu-uti Mura near Asamushi, growing on algae, leg. S. Hozawa.
Note: A redescription based on the type material is provided by Stechow & Uchida (1931, p. 554-556, fig. 6).

***Sertularella obtusa* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 182-183.

ZSM 20040221, 20040914 colonies in ethanol, ZSM 20041659, 20041660 micro slides containing several pieces of the colonies, Japan, Mutsu Bay, Emmusubi-Jizo near Asamushi, growing on algae among colonies of *Sertularella miurensis* var. *pungens* Stechow, 1931, leg. S. Hozawa.
Note: A redescription based on the type material is given by Stechow & Uchida (1931, p. 585-589, fig. 8).

***Sertularella pulchra* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 113-114.

ZSM 20040922 colony branches in ethanol, ZSM 20041599-20041601 micro slides with colony branches, South Africa, Simons Bay, 34°20'S, 18°36'E, depth 70 m, leg. "Valdivia", station 114, 05.XI.1898.
Note: Stechow (1925a, p. 485-487, fig. 39) provides a redescription based on the type material.

***Sertularella quinquelaminata* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 180-181.

ZSM 20040223 colony branches on brown algal substratum in ethanol, ZSM 20041656, 20041657 micro slides with three small pieces of the colony each, Japan, Mutsu Bay, Hadakashima, growing on algae, leg. Ito, 10.VII.1926.
Note: A redescription based on the type material is given by Stechow & Uchida (1931, p. 553-554, fig. 5)

***Sertularella sagamina* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, p. 257-258.

ZSM 20040224 colony growing on sponge (?) substratum in ethanol, Japan, Sagami Bay, Ito, growing on a hexactinellid sponge, leg. K. A. Haberer, 20.II. 1903.
Notes: The original description is a short note only that lacks details on the material. A detailed redescription on material that very likely represents the type material is given in Stechow (1923c, p. 177-179, fig. U).

***Sertularella spirifera* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 184-185.

ZSM 20040925, 20040926 colony portions in ethanol, ZSM 20041665, 20041666 micro slides with large

colony branches, Japan, Mutsu Bay, Noheji near Asamushi, leg. Kokubo & Kamada, 22.VIII. 1926.
Note: A redescription based on the type material is given by Stechow & Uchida (1931, p. 561-563, fig. 10, XV fig. 4).

***Sertularella striata* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 10.

ZSM 20040927 colony in ethanol on piece of a brown algal trunk together with *Plumularia setacea*, ZSM 20041542, 20041544 micro slides with colony pieces, South Africa, Cape Agulhas, shallow waters of the northern part of the Agulhas Bank, 35°2.5'S, 19°58.5'E, depth 80 m, leg. "Valdivia", station 96, 27.X.1898.
Notes: Sample ZSM 20040927 also contains *Plumularia setacea* (L.). Stechow (1925a, p. 470-471, fig. 30) provided a redescription partly based on the type material.

***Sertularella tongensis* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 89-91, figs. F, G.

ZSM 20041539-20041541 micro slides containing one branch of a colony each, Tonga Islands.

***Sertularella valdiviae* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p.11.

ZSM 20040930 colony portions in ethanol, ZSM 20050520-20050523 micro slides with colony pieces, ZSM 20041566-20041569 micro slides with colony pieces with *Zygophylax valdiviae* Stechow, 1923 growing on it, ZSM 20043881 micro slide with colony piece growing on *Symplectoscyphus paulensis* Stechow, 1923, contains also *Antennella secundaria*, Indian Ocean, 7 km south of St. Paul, growing on *Symplectoscyphus paulensis* Stechow, 1923, epizoic growing on it *Zygophylax valdiviae* Stechow, 1923, *Halisiphonia megalotheca* Allman, *Lafoea benthophila* Ritchie und *Filellum contortum* (Nutting), 8°40'S, 77°38.6'E, depth 672 m, leg. "Valdivia", station 165, 03.I.1899.
Notes: ZSM 20040930 contains type-material of *Symplectoscyphus paulensis* as well. Stechow (1925a, p. 471-472, fig. 30) provides a redescription.

***Sertularella wallacei* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 101-102.

ZSM 20041640 micro slide with what might be a colony fragment, U.S.A. California, Monterey Bay, leg. W. S. Wallace.

***Sertularella xantha* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 109-110.

ZSM 20040931 small colony with sponge (?) on the base in ethanol, ZSM 20041578, 20041579 micro slides with large colony pieces, South Africa, near Cape Town, northern part of the Agulhas Bank, 33°41'S, 18°00'E, depth 178 m, leg. "Valdivia", station 92, 26.X.1898.
Note: A redescription based o the type material is provided by Stechow (1925a, p. 472-473, fig. 32).

***Sertularia bellis* Stechow, 1924**

Stechow (1924a), Zool. Anz. 59, p. 57-69.

ZSM 20040225 colony in ethanol, ZSM 20041618 -20041620 micro slides with large colony pieces, South-west Australia, Albany District, Oyster Harbour, growing on algae, depth 0.75-5.5 m, leg. W. Michaelsen & R. Hartmeyer expedition, station 64, 21.VIII.1905.
Notes: A redescription based on the type material is provided by Stechow (1925b, p. 239-240, fig. O). More type material, many colony pieces in ethanol is housed in the ZMH (nr. C 5866).

***Sertularia densa* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 93-94, fig. J.

ZSM 20051729 many colonies on large piece of heterogeneous substratum in ethanol, ZSM 20050221, 20050224-20050226, 20050228, 20050229 micro slides with colony pieces, France, Villefranche, depth 1-2 m, E. Stechow, IV.1910.
Note: Stechow (1919, p. 15) transferred this species to the genus *Dynamena*.

Sertularia mertoni Stechow, 1923

Stechow & Müller, (1923) Abh. Senck. Natf. Ges. 35, p. 472-473, XXVII, figs 9,10.

ZSM 20040226 colony pieces in ethanol, 20041691 -20041694 micro slides with colony pieces, Indonesia, Moluccas, Aru Islands, SW of Lola, depth 8-10 m, stony bottom, leg. H. Merton, dredge haul 9, 01.IV. 1908.
Note: The Forschungsinstitut und Naturmuseum Senckenberg (Frankfurt) houses more type material of this species.

***Sertularia perpusilla* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 99-101, fig. M[1].

ZSM 20040233 colonies on two pieces of *Posidonia* leaves in ethanol, ZSM 20041549 micro slide with colony branches, Monaco, Cap d'Ail, growing on

Posidonia leaves, dredge haul, depth 30 m, leg. E. Stechow, 12.VI.1910.
ZSM 20051730 colony on a pieces of a *Posidonia* leave in ethanol, ZSM 20041547, 20041548 micro slides with small colony pieces, France, Isle d'Endoume near Marseille, growing on *Posidonia* leaves, leg. E. Stechow, 02.III.1904.
ZSM 20051731 colonies on several *Posidonia* leaves in ethanol, ZSM 20041545, 20041546 micro slides containing several pieces of the colony, Italy, Porto Fino near Genua, depth 1 m, leg. R.Issel, VIII.1912.
Note: Stechow (1919b, p. 30) places the species into the newly establishes genus *Tridentata* and selects it as type species.

***Sertularia tongensis* Stechow, 1919**

Stechow (1919a), Zool. Jb. Syst. 42, p. 101-102, fig. N[1].

ZSM 20041550 micro slide with small piece of a colony, Tonga Islands, leg. Kirchenpauer.

***Stylactella (Hydractinia) elsae-oswaldae* Stechow, 1921**

Stechow (1921d), Arch. f. Naturgesch. 87, p. 251.

ZSM 20040164 colonies growing on a bryozoan encrusting part of a piece of rock in ethanol, ZSM 20000682 micro slide containing several Hydroids, Italy, Nisida Island near Naples, leg. (? "material") M. Bedot (Nr. 145).
Note: The original description is a short note only. A more detailed redescription is given in Stechow (1923c, p. 64-65, fig. E).

***Stylactella siphonis* Stechow, 1921**

Stechow (1921b), Zool. Anz. 53, p. 224-225.

ZSM 20041876 micro slide with several polyps, off South Africa, Agulhas Stream, 35°10.5'S, 23°02'E, depth 500 m, leg. "Valdivia", station 103, 02.XI. 1898.
Note: A redescription of the species is given in Stechow (1925a, p. 407-408, fig. 2) where it is regarded as a member of the genus *Halerella* Stechow, 1922.

***Symplectoscyphus hozawai* Stechow, 1931**

Stechow (1931), Zool. Anz. 96, p. 179-180.

ZSM 20040228 two colony branches in ethanol, ZSM 20041654, 20041655 micro slides with colony branches, Japan, Mutsu-Bay, Oma-Shimote, growing on the gastropod *Haliotis gigantea*, leg. S. Hozawa, Takatsuki & Sato, 18.VIII.1927.
Note: A more detailed redescription is given in Stechow & Uchida (1931, p. 551-553, fig. 4).

***Symplectoscyphus paulensis* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 8-10.

ZSM 20040973 colonies in ethanol, ZSM 20043881 -20043883 micro slides with pieces of the colony, Indian Ocean, 7 km E of St. Paul, 38°40'S, 77°38.6 E, depth 672 m, "Valdivia" station 165, 03.I.1899.
Notes: ZSM 20040930 also contains type material of *Sertularella valdiviae* (Stechow, 1923), which grows on *Symplectoscyphus paulensis* Stechow, 1923. A redescription is given by Stechow (1925a, p. 467-468, fig. 28).

***Thaumantias* (?) *elsae-oswaldae* Stechow, 1914**

Stechow (1914), Zool. Anz. 45, p. 120-136, fig. 2.

ZSM 20041521 micro slide with colony growing on a bryozoan, U.S. Virgin Islands, St. Thomas Island, Charlotte Amalia, surface waters, growing on a tree-like branched bryozoan, leg. E. Stechow, 18.III. 1912.

***Tridentata occulta* Stechow, 1926**

Stechow (1926), Zool. Anz. 68, p. 105-106.

ZSM 20041646 micro slide with tiny piece of a colony, location unknown ("probably Indian Ocean").

***Tridentata rigida* Stechow, 1924**

Stechow (1924), Zool. Anz. 59, p. 234-236, fig. M.

ZSM 20040999 several large colony pieces in ethanol, ZSM 20041615-20041617 micro slides with large colony pieces, SW Australia, Fremantle District, Southern Flats, Cockburn Sound, brown algae, depth 3-4 m, leg. W. Michaelsen & R. Hartmeyer expedition, station 50, 30.IX.1905.
Note: More type material, colony pieces in ethanol are housed in the ZMH (nr. C 5843).

***Tridentata westindica* Stechow, 1919**

Stechow (1919b), Sitz. Ber. Ges. Morphol. Physiol. München. 1919, p. 30-31, fig. 5.

ZSM 20041000 colony with sponge in ethanol, ZSM 20050705, 20050706 micro slides with colony pieces, French West Indies' islands, Martinique, St. Anne, leg. F. Doflein, 03.IV.1898.
Notes: The micro slides are labelled as *Sertularia westindica*; the synonym is mentioned in the literature as well as the location, therefore the micro slides are probably type material of *Tridentata westindica*. The micro slides are labelled as *Sertularia westindica*. A redescription based on the type material is given by Stechow (1923c, p. 210-211, fig. H).

***Tubularia sagamina* Stechow, 1907**

Stechow (1907), Zool. Anz. 32, p.194-195.

ZSM 20040174 large colony in ethanol, ZSM 20041524 -20041532, 20041534, 20041536, 20041538, 20060286, micro slides with colony parts like polyps, tentacles, gonophores, ZSM 20041523, 20041533, 20041535, 20041537 micro slides with serial sections of portions like polyps, stalks or gonophores, Japan, Sagami Bay, near Misaki, litoral, leg. F. Doflein expedition, nr. 350a, 1904.
Notes: A detailed redescription based on the type material is provided by Stechow (1909, p. 43-47, III, fig 6, V, fig 5, VI, fig. 22-25. More type material, a colony piece in ethanol, is housed in the ZMB (Nr. 14857).

***Tubularia sertularellae* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 97-98.

ZSM 20041570 micro slide with polyps growing on two branches of Sertularella longa Stechow, 1923, off South Africa, Plettenberg Bay, 34°7.3'S, 23°27.8'E, depth 100 m, leg. "Valdivia", station 99, 28.X.1898.
Notes: The preparation contains also type material of *Sertularella longa* Stechow, 1923. A redescription based on the type material is provided by Stechow (1925a, p. 406).

***Zygophylax africana* Stechow, 1923**

Stechow (1923b), Zool. Anz. 56, p. 106-107.

ZSM 20040731 colony pieces with some substratum in ethanol, ZSM 20041574, 20043579 micro slides with colony branches, South Africa, near Cape Town, northern part of the Agulhas Bank, 33°41'S, 18°00'E, depth 178 m, leg. "Valdivia", station 92, 26.X.1898.
Note: A redescription based on the type material is provided by Stechow (1925a, p. 445-446, fig. 18).

***Zygophylax curvitheca* Stechow, 1913**

Stechow (1913b), Zool. Anz. 43, p.139-140.

ZSM 20040199 parts of a colony in ethanol, ZSM 20043570-20043574 micro slides with colony pieces, Japan, Sagami Bay, Haidashi Bank, 35°08'15"N, 139°29'40"E, depth 600 m, leg. F. Doflein expedition, "Zuso Maru" station 2, Nr. 1604, 08.XI.1904.
Note: A redescription based on the type material is given by Stechow (1913c, 116-117, fig. 89).

***Zygophylax pacifica* Stechow, 1919**

Stechow (1919b), Sitz. Ber. Ges. Morphol. Physiol. München. 1919, p. 11.

ZSM 20040198 colony in ethanol, ZSM 20041554 -20041556, 20043569 micro slides with colony pieces, Japan, Sagami Bay, Okinose Bank, 34°59'30"N, 139°34'50"E, depth 250 m, leg. F. Doflein expedition, "Zuso Maru" station 6, Nr. 772, 10.XI.1904.
Note: The brief species description is based on the detailed description of a material identified as *Zygophylax biarmata* Billard, 1905 (Stechow 1913c, p. 114-115, fig. 88).

***Zygophylax valdiviae* Stechow, 1923**

Stechow (1923a), Zool. Anz. 56, p. 1-20.

ZSM 20041566-20041569 micro slides with colony parts epizoic growing on *Sertularella valdiviae* Stechow, 1923, together with *Fillelum contortum* (Nutting), *Lafoea benthophila* Ritchie or *Antenella secundaria* (Gm.), Indian Ocean, 7 km south of St. Paul, 38°40'S, 77°38.6'E, depth 672 m, leg. "Valdivia", station 165, 03.I.1899.
Notes: A detailed redescription based on type material is given by Stechow (1925a, 446-447, fig. 19). Ethanol sample ZSM 20040930 (type material of *Sertularellae valdiviae* Stechow, 1923) from the same "Valdivia" station might contain more type material of *Zygophylax valdiviae* Stechow, 1923.

Concluding Remarks

595 type specimen objects were identified for 130 original species descriptions. 470 of these are micro preparations (mainly total preparations) and 125 are ethanol samples. No type material could be found for a single species *(Abietinaria pacifica)* only. In case of another species *(Dinotheca dofleini)* the assignment of the type material remained questionable. 23 species are represented by micro preparations, twelve of which with a single one only. These numbers of course only represent the current state of knowledge. Continuous search would provide more material, although the number would not increase substantially anymore.

According to the numbers given above, the type material of the Stechow descriptions is fairly complete present at the ZSM. The same probably holds true for the other hydrozoan material of the collection. It, thus, can be stated that the hydrozoan collection survived World War II to a great extent unharmed.

It is not the purpose of the present study to judge about the reliability of the Stechow species descriptions. Nevertheless, the composition of the type material gives insight in his way of working. Particularly the cases where descriptions are based on a single micro slide – with for example *Campanularia rara* containing a single polyp only – give the impression that not all descriptions were carried out with sufficient carefulness. This gives support to Schuchert (1998), who suspects that more of Stechow's nominal species must be regarded as dubious or unidentifiable.

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Buchbesprechungen

1. Amiet F., M. Herrmann, A. Müller & R. Neumeyer: Apidae 5 *Ammobates*, *Ammobatoides*, *Anthophora*, *Biastes*, *Ceratina*, *Dasypoda*, *Epeoloides*, *Epeolus*, *Eucera*, *Macropis*, *Melecta*, *Melitta*, *Nomada*, *Pasites*, *Tetralonia*, *Thyreus*, *Xylocopa*. – Fauna Helvetica 20; Centre suisse de cartographie de la faune und Schweizerische Entomologische Gesellschaft, Neuchatel, 2006, 356 S., ISBN 978-2-88414-032-4/ISSN 1422-6367.

Der mittlerweile 5. Band über die Bienen der Schweiz, herausgegeben von der Schweizerischen Entomologischen Gesellschaft und dem Centre suisse de cartographie de la faune, behandelt die Familie Melittidae sowie die Unterfamilie Apinae (außer den Gattungen *Apis, Bombus* und *Psithyrus*). Das in Deutsch und Französisch verfasste Buch gliedert sich wie alle bisher erschienen Bände der Reihe jeweils in einen Bestimmungsschlüssel für die Arten jeder Gattung und Bemerkungen zu den behandelten Arten. Insgesamt werden so 140 Bienenarten (131 Apinae, 9 Melittidae) vorgestellt. Mit dem vorliegenden Werk können daher auch fast alle in Deutschland vorkommenden Bienenarten dieser Bienengruppen bestimmt werden, lediglich 2 Arten innerhalb der Melittidae (*Dasypoda suripes* (Christ), *Melitta wankowiczi* (Radoszkowski)) sowie 4 Arten innerhalb der Apinae (*Anthophora borealis* Morawitz, *Epeolus schummeli* Schilling, *Nomada discedens* Pérez, *N. rostrata* Herrich-Schäffer) werden nicht berücksichtigt. Die mit zahlreichen guten Zeichnungen illustrierten Bestimmungsschlüssel sind klar strukturiert und beschränken sich auf die wirklich wesentlichen Unterscheidungsmerkmale, wodurch eine angenehme Übersichtlichkeit erreicht wird. Im Beschreibungsteil der einzelnen Arten werden neben morphologischen Kurzbeschreibungen beider Geschlechter auch Angaben zu Verbreitung, Flugzeit, Pollensammelverhalten, Kuckucksbienen und Wirtsarten aufgeführt. Die Verbreitung der einzelnen Arten in der Schweiz wird zusätzlich anhand von Verbreitungskarten dokumentiert.

Da für die o. g. Bienengattungen bereits gut illustrierte Bestimmungswerke für Deutschland und Österreich vorliegen, können die in diesem Buch präsentierten Bestimmungsschlüssel lediglich als Erweiterung und Ergänzung zu diesen angesehen werden, zumal auch kaum neue Merkmale und Strukturen illustriert und daher keine wirklich neuen Erkenntnisse präsentiert werden. Somit sind es streng genommen allein die faunistischen Daten für die Schweiz, die den eigentlichen wissenschaftlichen Wert dieses Buches ausmachen. Im Kontext einer Fauna Helvetica hat dieses Buch sicherlich seine Berechtigung. Ob die Autoren aber vor dem Hintergrund der bereits existierenden Bestimmungswerke so viel Zeit und Energie in eine eigene Version hätten investieren, oder sich besser nur auf die Schweiz betreffende Ergänzungen der bereits vorliegenden Literatur hätten beschränken sollen, ist dennoch fraglich.

Andreas Dubitzky

2. Ruiz Ruiz, A., A. Cárcaba Pozo, A. I. Porras Crevillen & J. R. Arrébola Burgos: Caracoles Terrestres de Andalucía. Guía y manual de identificación. – Fundación Gypaetus, Cazorla, Sevilla, 2007. 303 pp., including many color photographs, illustrations and maps. ISBN 84-935194-2-1

This booklet (15.5 × 10.5 cm) is a catalogue of all 115 terrestrial shelled pulmonate gastropod species of Andalusia, southern Spain. Distributional information was compiled from extensive literature and over 2000 collecting sites, many of them also visited by the authors. An instructive technical, shell-morphological and biological introduction is followed by the species part. Arranged in systematic order, each family is briefly characterized and colour photographs of living specimens of at least some selected species are presented. Each species is then described and illustrated by colour photographs of shells, usually from dorsal, ventral and frontal positions. A brief glossary, list of abbreviations, index of scientific species names, list of references and a key to the quite many symbols used to point towards e.g. geographical distributions, habitats, and need for conservation are also given.

Edited by a non-profit organisation, this book is very reasonably priced and offers an excellent value to all naturalists, amateur collectors and professionals that are interested in getting a sound overview on the southern Spain land molluscs. Conservationists and decision makers get a perfect tool to evaluate local faunas. The text is in Spanish only, but the extensive use of pictograms and photographs makes the catalogue accessible also by an international readership. Printed in colours throughout, readers discover the widely neglected beauty of living specimens, additionally to conventional shell photographs. Because of its pocket size, this book is an indispensable and practical mate especially on field trips. However, and this is a major drawback, there is no identification key, neither to family nor to species level. Trying to track down a shell of unknown systematic placement the entire catalogue has to be searched for photographs that might match the request. In most cases where scientific genus or species names are already known the index might be quite helpful, but it is not complete. A very positive point is that the authors classify the species into those which virtually cannot be misidentified because of having a diagnostic shell, and others that have to be compared more carefully. In the latter cases, similar species are mentioned and distinctive features are noted. Highly recommendable.

Michael Schroedl