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Hydroid Fauna of Japanese and its Adjacent Waters

By
Mayumi YAMADA

SAPPORO, JAPAN

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Mayumi YAMADA

Zoological Institute, Faculty of Science, Hokkaido University, Sapporo
and Stazione Zoologica di Napoli, Napoli.

This paper is a list of the hydroid species known from Japanese and its adjacent waters, from the Sea of Okhotsk to Formosa, with the synonymy, distribution and some notes for each species. The species here treated comprise the marine and brackish forms of the Orders Athecata (Anthomedusae) and Thecata (Leptomedusae), those of which only the medusa stage is known from Japan being excluded. The freshwater forms and the Order Limnomedusae are not treated in the list.

The early literature on the hydroid fauna of Japanese waters appeared about a century ago, basing on the small collections of some foreigners. Stimpson (1859) was first to describe *Hydractinia sodalis* (=*Hydrissa sodalis*) from Hakodate, Hokkaido. Following Stimpson, Kirchenpauer (1872, 1884), Allman (1876, 1883, 1888), Mereschkowsky (1878), Marktanner (1890), etc. successively published reports on Japanese hydroids.

The first worker who studied rather thoroughly Japanese hydroids was Inaba. In 1890-1892 he published several papers on the hydroids from Misaki, Kishu and Shima, and recorded 47 species, most of which, however, were not exactly determined.

Some years later Jäderholm (1896, 1902, 1903) reported several species from several different localities of Japan, but some of his new species were described without recognizing Inaba's papers.

Incidental to Doflein's Far East Expedition, Japanese waters, especially Sagami Bay, were explored in the years 1904-1905. Much material of hydroids was included in this collection. These hydroid specimens were handed to Stechow who published two excellent papers (1909, 1913a) about them. In these reports he described totally 91 species, including members of 2 new genera, *Hydrichthella* and *Hydrocoryne*, and also reproduced in them Inaba's original descriptions which were translated into English by Goto after careful consult with Stechow.

Linko (1911, 1912) and Kudelin (1914) studied the hydroid materials from Russian coasts including the Far East and recorded many species

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from the Sea of Japan, the Sea of Okhotsk and Kamchatka. In 1919 Jäderholm reported Japanese hydroids again, and 73 species were recorded by him from Misaki, Kyushu and the Bonin Islands.

After some additional species were recorded by Stechow from some localities of Japan, he published in 1923 a check-list of the everknown Japanese hydroids, including 211 species and 7 varieties, of which 30 athecates and 188 thecates were enumerated. In his large works (1919a, 1923a) Stechow attempted changes in hydroid nomenclature to the greatest extreme. He discarded most of old established generic names and introduced so many new ones. The new names were adopted also in the above list of Japanese hydroids.

Beginning from 1924 Uchida has published a number of papers on Japanese hydromedusae. His attention has also been paid for hydroids and several species of athecate hydroids, including *Climacocodon ikarii,* have been treated by him. He reported also 17 hydroids from Mutsu Bay, northern Japan, together with Stechow in 1931. Fraser (1935, 1936) and Leloup (1938, 1940) who studied some materials from Sagami Bay described some new species from Japan. Recently the author has been engaged in studies on Japanese hydroids under the guidance of Prof. T. Uchida and reported the hydroids from Akkeshi and other regions. In addition to the above described works a number of small papers which treated one or, at the most, several species of Japanese hydroids, have been published. The author, however, is not prepared to resume here about each of them.

Thanking above mentioned literature the hydroid fauna of Japanese and its adjacent waters has been fairly well known. Unfortunately, however, our knowledge on their life history is at present too little for unifying two different systems of polypoid and medusa. Nevertheless I attempt with some efforts in this paper a possible rearrangement of families and genera in this respect of unisystem, within our modern knowledge.

As is clear in the following list of species, 315 species and 7 varieties are contained here, which are divided into 28 families. Neither species nor varieties are newly described or recorded here. Of a rather large number of species among them, it has been impossible to examine the specimens for myself. These species were considered only through literature and are indicated with asterisks in the following list.

The author wishes to acknowledge here his great indebtedness to Prof. Tohru Uchida for his kind guidance.

LIST OF SPECIES

Athecata

Corynidae
- *Coryne pusilla* Gaertner
- *Coryne uchidai* Stechow
- *Sarsia nipponica* Uchida

Zancleidae
- **Zanclea costata* Gegenbaur
- **Zanclea indopacifica* (Stechow)

Cladonemidae
- *Cladonema uchidai* Hirai

Hydrocorynidae
- *Hydrocoryne miurensis* Stechow

Cladocorynidae
- *Cladocoryne pelagica* Allman

Ptilocodiidae
- *Ptilocodium repens* Coward
- *Hydrichthella epigorgia* Stechow
- **Hydrichthella doederleini* Stechow

Solanderiidae
- *Dendrocoryne misakiensis* Inaba
- *Dendrocoryne secunda* Inaba
- **Solanderia leuckarti* Marshall
- **Solanderia* sp.

Halocordylidae
- *Halocordyle disticha* (Goldfuss)
- **Halocordyle tiarella* (McCrady)
- **Halocordyle australis* (Bale)

Tubulariidae
- *Tubularia mesembryanthemum* Allman
- **Tubularia sagamina* Stechow
- *Tubularia radiata* Uchida
- *Tubularia venusta* Yamada
- **Tubularia spherogonia* Hargitt
- **Hybocodon amoyensis* Hargitt

Corymorphidae
- *Corymorpha tomoensis* Ikeda
- **Corymorpha carnea* (Clarke)
- *Corymorpha iyoensis* Yamada
- *Branchiocerianthus imperator* (Allman)
- **Branchiaria mirabilis* Stechow

Margelopsidae
- *Climacocodon ikarii* Uchida

Clavidae
- *Clava* sp.
- *Cordylophora japonica* Itô
- *Cordylophora mashikoi* Itô

Campaniclava clionis Vanhöffen
Tubidendridae
Belella mirabilis (Nutting)
Hydractiniidae
Stylactis piscicola Komai
Stylactis yerii (Iwasa)
Stylactis misakiensis (Iwasa)
Stylactis carcinicola Hiro
Stylactis conchicola Yamada
Stylactis uchidai Yamada
Podocorella minoi (Alcock)
Hydractinia epiconcha Stechow
Hydractinia spiralis Goto
Hydrissa sodalis (Stimpson)
Cytaeis japonica Uchida
Bougainvilliidae
Bougainvillia ramosa (van Beneden)
Bimeria amoyensis Hargitt
Pandeidae
Leuckartiara octona (Fleming)
Hydrichthidae
Hydrichthys pacificus Miyashita
Eudendriidae
Eudendrium capillare Alder
Eudendrium sagaminum Yamada
Eudendrium biseriale Fraser
Eudendrium tenellum Allman
Eudendrium pusillum var. *amoyensis* Hargitt
Eudendrium insigne Hincks
Eudendrium laxum Allman
Eudendrium japonicum Yamada
Eudendrium lineale Yamada
Eudendrium ramosum (Linné)
Eudendrium californicum Torrey
Eudendrium vaginatum Allman
Eudendrium boreale Yamada
Eudendrium rameum (Pallas)
Eudendrium armstrongi Stechow
Eudendrium magnificum Yamada
Eudendrium imperiale Yamada
Eudendrium racemosum (Gmelin)
Eudendrium annulatum Norman
Proboscidactylidae
Proboscidactyla flavicirrata Brandt

Thecata

Haleciidae
Eugymnanthea japonica (Yamada)
Halecium pygmaeum Fraser
Halecium repens Jäderholm

**Halecium delicatulum* Coughtrey
Halecium crinis Stechow
Halecium tenellum Hincks
Halecium flexile Allman
Halecium flexile var. *japonica* Leloup
Halecium nanum Alder
Halecium cymiforme Allman
Halecium beani (Jäderholm)
Halecium sessile Norman
**Halecium reversum* Nutting
**Halecium muricatum* (Ellis & Solander)
**Halecium ochotense* Linko
**Halecium halecinum* (Linné)
**Halecium speciosum* Nutting
**Halecium labrosum* Alder
**Halecium brashnikowi* Linko
Halecium magellanicum (Hartlaub)
Halecium cymosum Fraser
Halecium flabellatum Fraser
Halecium minor Fraser
Halecium nullinodum Fraser
Halecium vasiforme Fraser
Endothecium reduplicatum Fraser
Diplocyathus dichotomus Allman
Diplocyathus sibogae Billard
Ophiodissa arborea (Allman)

Campanulariidae

**Campanularia gracilis* Allman
**Campanularia tincta* Hincks
Campanularia indopacifica Stechow
**Campanularia hincksi* var. *grandis* Billard
Campanularia urceolata Clarke
Campanularia volubilis (Linné)
**Campanularia sulcata* Jäderholm
Campanularia africana Stechow
Campanularia groenlandica Levinsen
**Campanularia* sp.
Rhizocaulus chinensis (Marktanner)
**Rhizocaulus verticillatus* (Linné)
**Tulpa speciosa* (Clarke)
Orthopyxis caliculata (Hincks)
Orthopyxis compressa (Clarke)
Orthopyxis platicarpa Bale
Clytia raridentata (Alder)
Clytia delicatula (Thornely)
Clytia edwardsi (Nutting)
Clytia linealis (Thornely)
Clytia gracilis (M. Sars)
**Clytia minuta* (Nutting)
**Clytia stechowi* Hargitt

Clytia obliqua (Clarke)
Obelia geniculata (Linné)
Obelia dichotoma (Linné)
**Obelia gracilis* Calkins
**Obelia everta* Hargitt
Obelia plana (M. Sars)
**Obelia longissima* (Pallas)
**Obelia chinensis* Marktanner
Gonothyraea bicuspidata (Clarke)
**Gonothyraea inornata* Nutting

Campanuliniidae
Egmundella humilis Fraser
**Campanulina chilensis* Hartlaub
**Campanulina denticulata* Clarke
**Operculariella hispida* Nutting
Cuspidella gigantea Stechow
**Eupoma maxima* (Levinsen)
Stegopoma fastigiatum (Alder)
**Stegopoma plicatile* (M. Sars)
**Lovenella quadridentata* (Hincks)
Calycella syringa (Linné)

Hebellidae
Hebella parasitica (Ciamician)
Hebella brevitheca Leloup
Hebella corrugata (Thornely)
Hebella neglecta Stechow
Hebellopsis calcarata (A. Agassiz)

Bonneviellidae
Bonneviella grandis (Allman)
**Bonneviella regia* (Nutting)
**Bonneviella ingens* Nutting

Lafoeidae
Lictorella stechowi Jäderholm
Zygophylax biarmata Billard
Zygophylax curvitheca Stechow
Zygophylax tizardensis Kirkpatrick
**Zygophylax brevitheca* Jäderholm
Zygophylax cervicornis (Nutting)
Zygophylax pacifica Stechow
Acryptolaria pulchella (Allman)
**Acryptolaria crassicaulis* (Allman)
**Acryptolaria symmetrica* (Nutting)
Acryptolaria conferta var. *australis* (Ritchie)
Acryptolaria bulbosa (Stechow)
Cryptolaria exserta Busk
Lafoea tenellula Allman
Lafoea dumosa (Fleming)
Lafoea fruticosa (M. Sars)
**Lafoea gracillima* (Alder)
**Lafoea paxi* Stechow

**Filellum contortum* (Nutting)
Filellum serratum (Clarke)
Grammaria scandens Stechow
Grammaria immersa Nutting

Syntheciidae

Synthecium tubithecum (Allman)
**Synthecium orthogonium* (Busk)
Synthecium campylocarpum Allman
Hincksella cylindrica var. *pusilla* Ritchie

Sertulariidae

**Diphasia nuttingi* Stechow
**Diphasia dubia* Hargitt
Diphasia palmata Nutting
**Diphasia scalariforme* Kirkpatrick
Diphasia digitale (Busk)
**Diphasia thornelyi* Ritchie
**Diphasia derbecki* Kudelin
Idia pristis Lamouroux
Dynamena hozawai (Stechow)
Dynamena japonica Stechow
Dynamena crisioides Lamouroux
Dynamena quadridentata (Ellis & Solander)
Dynamena quadridentata var. *elongata* Stechow & Müller
Dynamena quadridentata var. *nodosa* Hargitt
**Dynamena dubia* Hargitt
Dynamena cornicina McCrady
Dynamena brevis Fraser
Symplectoscyphus turgidus (Trask)
Symplectoscyphus gotoi (Stechow)
Symplectoscyphus tricuspidatus (Alder)
**Symplectoscyphus tricuspidatus* var. *acuminata* (Kirchenpauer)
**Symplectoscyphus tropicus* (Hartlaub)
**Symplectoscyphus cumberlandicus* (Jäderholm)
**Symplectoscyphus rubellus* (Kirchenpauer)
**Symplectoscyphus pinnatus* (Clarke)
Sertularella mirabilis Jäderholm
Sertularella gigantea Mereschkowsky
Sertularella levigata Stechow
**Sertularella brandti* Linko
Sertularella miurensis Stechow
Sertularella miurensis var. *pungens* Stechow
Sertularella miurensis var. *obtusa* Stechow
Sertularella sagamina Stechow
**Sertularella japonica* Stechow
Sertularella inabai Stechow
**Sertularella albida* Kirchenpauer
Sertularella diaphana (Allman)
**Sertularella quinquelaminata* Stechow
**Sertularella mutsuensis* Stechow
Sertularella rugosa (Linné)

Sertularella spirifera Stechow
**Sertularella spinosa* Kirchenpauer
Sertularella areyi Nutting
Sertularella tenella (Alder)
Sertularella sinensis Jäderholm
**Sertularella gayi* var. *gracilescens* Jäderholm
**Sertularella costata* Leloup
Abietinaria abietina (Linné)
Abietinaria variabilis (Clarke)
Abietinaria filicula (Ellis & Solander)
Abietinaria traski (Torrey)
Abietinaria costata (Nutting)
**Abietinaria juniperus* Kirchenpauer
**Abietinaria tilesii* Kirchenpauer
**Abietinaria merki* Kirchenpauer
**Abietinaria melo* Kirchenpauer
**Lagenitheca compressa* (Mereschkowsky)
Amphisbetia furcata (Trask)
Amphisbetia pacifica Stechow
**Amphisbetia nasonowi* (Kudelin)
Sertularia distans (Lamouroux)
Sertularia distans var. *gracilis* Hassall
Sertularia turbinata (Lamouroux)
**Sertularia rugosissima* (Thornely)
Sertularia exigua Allman
Sertularia hattorii Leloup
Sertularia tenera G. O. Sars
Sertularia cupressoides Clarke
**Sertularia heteroclada* (Jäderholm)
**Sertularia suensoni* Levinsen
**Sertularia nuttingi* Levinsen
**Sertularia intermedia* Levinsen
Salacia pyriformis (Fraser)
**Salacia lonchitis* (Ellis & Solander)
**Salacia marktanneri* (Stechow)
**Salacia lichenastrum* (Pallas)
**Salacia stelleri* (Kirchenpauer)
**Salacia acutiloba* (Kirchenpauer)
**Salacia crassicaulis* (Allman)
**Salacia coronata* (Allman)
**Pericladium tataricum* (Kedelin)
**Pericladium bidentatum* Allman
**Pericladium ochotense* (Mereschkowsky)
Selaginopsis triserialis Mereschkowsky
**Selaginopsis pinnata* Mereschkowsky
**Selaginopsis allmani* Norman
**Selaginopsis cedrina* (Linné)
**Selaginopsis purpurea* (Linné)
**Selaginopsis thuja* Mereschkowsky
Selaginopsis breitfussi (Kudelin)

Selagniopsis decemserialis Mereschkowsky

Plumulariidae

**Kirchenpaueria curvata* (Jäderholm)
Pycnotheca mirabilis (Allman)
Antenella secundaria (Gmelin)
**Antenella suensoni* Jäderholm
Antenella paucinoda Fraser
Antenella variabilis Fraser
Monotheca obliqua (Thompson)
Monotheca spinulosa var. *obtusa* Stechow
Plumularia setacea (Linné)
**Plumularia setaceoides* Bale
Plumularia caliculata Bale
Plumularia filicaulis var. *japonica* Jäderholm
**Plumularia spiralis* Billard
Plumularia strictocarpa var. *japonica* Stechow
**Plumularia badia* Kirchenpauer
Plumularia undulata Yamada
Dentitheca habereri (Stechow)
Dentitheca hertwigi (Stechow)
Monostaechas quadridens (McCrady)
**Thecocaulus plagiocampus* (Pictet)
Nemertesia minor Kirchenpauer
Nemertesia japonica Stechow
Nemertesia ciliata Bale
Antennellopsis integerrima Jäderholm
Heterotheca campanula (Busk)
Heterotheca sp.
Haliaria vegae (Jäderholm)
Haliaria indivisa (Fraser)
Halicetta expansa (Jäderholm)
Halicetta gracilicaulis (Jäderholm)
Gymnangium hians (Busk)
**Gymnangium speciosum* (Allman)
**Gymnangium ishikawai* (Stechow)
Gymnangium roretzi (Marktanner)
Macrorhynchia balei (Nutting)
**Macrorhynchia singularia* (Billard)
Macrorhynchia phoenicea (Busk)
**Macrorhynchia nuttingi* Hargitt
**Macrorhynchia pennarius* (Linné)
**Cladocarpus crenatus* var. *allmani* Ritchie
Cladocarpus bocki Jäderholm
Lytocarpia nigra (Nutting)
**Lytocarpia myriophyllum* var. *orientalis* Billard
**Aglaophenia bilobidentata* Stechow
Aglaophenia whiteleggei Bale
Aglaophenia suensoni Jäderholm
Aglaophenia amoyensis Hargitt
**Aglaophenia simplex* (d'Orbigny)

Description

ATHECATA

Corynidae

Coryne pusilla Gaertner

Coryne pussila: Inaba, 1890, no. 1, fig. 1-4; Stechow, 1907, p. 199; ——, 1909, p. 33; ——, 1913a, p. 49;——, 1923, p. 2, no. 1; —— & Uchida, 1931, p. 545, pl. 15, fig. 1; Yamada, 1950, p. 2;——, 1958, p. 52.

The species is commonly found in the shallow waters of Hokkaido and Honshu. It is widely distributed in the world.

Distribution. Akkeshi (Yamada), Mutsu Bay (Stechow & Uchida), Sagami Bay (Inaba, Stechow), Matsuyama (Yamada); California; Arctic Ocean; whole coasts of Europe; Mediterranean; South Africa.

Coryne uchidai Stechow

Coryne uchidai: Stechow, 1931, p. 178; —— & Uchida, 1931, p. 546, fig. 1.

The species has been recorded from Mutsu Bay. It is similar to the preceding species, *C. pusilla,* but distinguishable in its periderm of the stem and branches, which is not distinctly annulated but only wavy.

Distribution. Asamushi, Mutsu Bay (Stechow & Uchida).

Sarsia nipponica Uchida

Sarsia nipponica: Uchida, 1927a, p. 183, pl. 10, fig. 1; ——, 1940, p. 222, fig. 1-4.
Syncoryne nipponica: Nakamura, 1940, p. 255, fig. 1-12.

The species was originally described by Uchida (1927) on the medusa generation. The hydroids were then found in Misaki and reported by Uchida. The colonies are attached on wood- or bamboo-piles or *Mylilus*-shells in the shallow water, attaining 5 mm in height, covered with a jelly-like substance. The hydrocaulus is unbranched, covered with the smooth periderm. The hydranth is typical *Coryne*-type, with 15-20 scattered capitate tentacles. The medusa-buds are borne on the lower half of the hydranth, 2-8 in each polyp. Nakamura (1940) described that this hydroid was in most luxurant growth in October.

Distribution. Misaki (Uchida, Nakamura), Seto (Uchida).

Zancleidae

Zanclea costata Gegenbaur

Gemmaria gemmosa: Stechow, 1909, p. 34.
Halocharis gemmosa: Stechow, 1923, p. 2, no. 3.
Zanclea gemmosa: Uchida, 1947, p. 300.

Stechow (1909) found this species among Doflein's collection from Japan. The specimens were collected from depth of 600 m, on the body of an Holothurian, *Synallactes chuni* Aug., together with a hydroid, *Leuckartiara octona* (Fleming). The hydranths are cylindrical, with about 50 capitate tentacles which are scattered upon the whole hydranth. No medusa-buds were found. The medusa and hydroid of *Zanclea* or *Gemmaria* were thoroughly studied by Russell and Rees (1936) and Russell (1956), and according to Russell the old name *Gemmaria gemmosa* should be now called as *Zanclea costata* Gegenbauer. A medusa which is referable to this species was found at the Palao Islands and recorded by Uchida (1947).

Distribution. Sagami Bay (Stechow), Palao Isls. (Uchida); Atlantic coast of North America; Norway; British Isls.; Belgium; Mediterranean; Red Sea.

Zanclea indopacifica (Stechow)

Halocharis indopacifica: Stechow, 1919a, p. 152; ——, 1923, p. 2, no. 4; ——, 1923a, p. 44, fig. D.

Only a specimen of the hydroid was collected from Japan. The exact locality is unknown. The polyp is larger than the preceding species, *Z. costata*, attaining 1.3 cm in height. The hydranths are cylindrical, with 60-70 scattered capitate tentacles. The medusa-buds were not found.

Distribution. Japan (Stechow).

Cladonemidae

Cladonema uchidai Hirai

Cladonema radiatum v. *mayeri*: Uchida, 1925, p. 81, fig. 7; ——, 1927, p. 218; ——, 1927a, p. 200, pl. 10, fig. 4; ——, 1938, p. 38; ——, 1940a, p. 284; Hirai & Kakinuma, 1957, p. 49, fig. 1, pl. 1-2; —— & ——, 1957a, p. 55, fig. 1, Uchida, 1958, p. 164.
Cladonema uchidai: Hirai, 1958, p. 25.

The medusa hitherto known as *Cladonema radiatum* var. *mayeri* Perkins is commonly found in the Japanese waters from the Kuril Isls. southward to Misaki. Recently the life cycle of the species was studied by Hirai and Kakinuma. According to them the Japanese hydroid is

different from the hydroids which has been known from the European and American coasts. The hydranths are provided with 4, rarely 3, 5 or more, capitate tentacles, while entirely devoid of filiform ones. This difference was regarded to be sufficient to separate it from *C. radiatum* and its variety and the species was described as a new form, *C. uchidai*, by Hirai (1958).

Distribution. Kuril Isls., Akkeshi (Uchida), Oshoro (Uchida), Asamushi (Uchida, Hirai & Kakinuma, Hirai), Sado (Uchida), Misaki (Uchida).

Hydrocorynidae

Hydrocoryne miurensis Stechow

Hydrocoryne miurensis: Stechow, 1907, p. 193; ——, 1909, p. 35, pl. 3, fig. 1-3, pl. 5, fig. 1-4, pl. 7, fig. 10-11; ——, 1923, p. 2, no. 6; Uchida, 1932, p. 135, fig. 1; ——, 1938, p. 37; ——, 1938a, p. 48; ——, 1940a, p. 283, ——, 1958, p. 163.

This species was originally described by Stechow on the specimens of Doflein's collection from Sagami Bay. He gave a detailed description on the hydroid. The polyps are borne in crowds, usually unbranched, attaining 3 cm in length in extended state. The hydranths are provided with a conical hypostome and 20-80 capitate tentacles which are arranged in some whorls. The medusa-buds are given off from the basal part of the hydrocaulus. The medusa of this species was first described by Uchida (1932). The young liberated medusae are cubic, with 4 radial canals, a ring canal, 4 tentacles with many nematocyst clusters. The manubrium is simple. The medusae has been known only from Mutsu Bay.

Distribution. Akkeshi (Uchida), Hakodate, Mutsu Bay (Uchida), Onagawa (Uchida), Sado (Uchida), Sagami Bay (Stechow), Shimoda.

Cladocorynidae

Cladocoryne pelagica Allman

Cladocoryne pelagica: Inaba, 1890, no. 2; Stechow, 1913, p. 50; ——, 1923, p. 2, no. 5.

This hydroid was recorded by Inaba (1890) from shallow water in Misaki. The specimens covered the surface of Sargassum. The stem attains 5 mm in height, usually unbranched, with several distinct annular rings at the base. The hydranths bear simple and branched capitate tentacles together: the simple ones are 4-6 in number, in a whorl around the mouth; the branched ones are arranged in 3-4 circular rows, each of the branched ones having 7-15 short capitate branches. The gonophores are borne on the axils of the branched tentacles, with short stalks. The species is distinguishable from *C. floccosa* in the presence of distinct an-

nular rings at the hydrocaulus base.

Distribution. Sagami Bay (Inaba, Stechow); Indonesia; Australia; Indian Ocean; Atlantic coast of North America.

Ptilocodiidae

Ptilocodium repens Coward

Ptilocodium repens: Coward, 1909, p. 635, pl. 1; Leloup, 1940, p. 1, fig. 1.

This is an aberrant hydroid. The species was originally described by Coward (1909). Her material was of the "Siboga" Expedition, and was found on a pennatulid, *Ptilosarcus sinuosus* (Gray), which was collected at Timor Island, Indonesia, from depth of 112 m. The second record of this species was reported by Leloup (1940) from the eastern part of Sagami Bay at the depth of 80 m. The specimen from Sagami Bay well agrees with Coward's description except some small characters. It is attached to the body of a pennatulid, consisting of gastrozooids and dactylozooids. The stolons form a continuous coenosarc. The gastrozooids are borne on the stolon, sac-like, without tentacles. The dactylozooids are sessile, provided with 4, rarely 5, short capitate tentacles. The female gonophores are borne on the base of the gastrozooids, ovate, with 4 radial canals and 8 rudimental tentacular processes.

Distribution. Sagami Bay (Leloup); Indonesia.

Hydrichthella epigorgia Stechow

Hydrichthella epigorgia: Stechow, 1909, p. 31, pl. 3, fig. 7-9; ——, 1913a, p. 48, fig. 4; ——, 1923, p. 2, no. 2.

The species was originally described by Stechow (1909) on the materials from Sagami Bay. The colony attached on a gorgonid, *Anthoplexaura dimorpha* Kükenthal, consisting of gastrozooids, dactylozooids and blastostyles. The gastrozooids are rather large, much in number, without any tentacles, terminated with a large mouth. Two kinds of dactylozooids are present; the ones of a kind are provided with 4-8 capitate tentacles which are arranged in a whorl at the distal end, while others are devoid of any such tentacles. The blastostyles are small, without tentacles. The gonophores are sporosacs, borne on the blastostyles.

Distribution. Sagami Bay (Stechow).

Hydrichthella doederleini Stechow

Hydrichthella doederleini: Stechow, 1926, p. 96.

The material was found on an alcyonarian which was collected from

Suruga Bay, west coast of Izu peninsula, in depth of 128 m. The colony consists of polymorphic polyps, namely gastrozooids, dactylozooids and gonophore-bearing blastostyles. The trophosome of this species is similar to that of the preceding species in general but differs in some small points. Two kinds of dactylozooids are also present in this species. All these dactylozooids are much in number, while in the preceding species only small number of dactylozooids are present. A kind of dactylozooids is provided with 5-20 (usually 10-18) capitate tentacles which are in 1-3 whorls closely placed. Although Stechow asserted the validity of this species, I think that more detailed observations are desirable for this hydroid. No figures were given by Stechow.

Distribution. Suruga Bay (Stechow).

Solanderiidae

Dendrocoryne misakiensis Inaba

Dendrocoryne misakiensis: Inaba, 1892, no. 41, fig. 106-110; Goto, 1897, p. 93, pl. 6, fig. 1-6; Stechow, 1909, p. 39, pl. 2, fig. 3; Jäderholm, 1919, p. 3; Stechow, 1923, p. 2, no. 8.

Spongocladium laeve: Jäderholm, 1896, p. 6, pl. 1, fig. 3-6.

This hydroid is commonly found in shallow waters in central and southern Japan. The colony attains 15 cm in height, shrub-like, with an upright, branched skeleton covered with ectoderm. The hydranths are elongated elliptical, with scattered capitate tentacles. The gonophores are cryptomedusoid, borne on the branches. The species has been recorded also from Helgoland, North Sea, by Stechow. As he also described, the material from Helgoland was only some incomplete pieces and so this record seems to be unreliable.

Distribution. Muroran, Tobishima, off Yamagata Pref., Misaki (Inaba, Goto, Stechow, Jäderholm), Hirado strait, Kyushu (Jäderholm).

Dendrocoryne secunda Inaba

Dendrocoryne secunda: Inaba, 1892, no. 41, fig. 111-113; Goto, 1897, p. 95, pl. 6, fig. 7-11; Stechow, 1909, p. 40, pl. 2, fig. 1-2; ——, 1923, p. 2, no. 7.

Solanderia rufescens: Jäderholm, 1896, p. 5, pl. 1, fig. 1-2.

This species is also common in shallow waters in central and southern Japan. The species is closely related to the preceding species but is different in some respects. The colony is large, attaining 50 cm in height, fully branched forming a fan-like appearance. A detailed description of *Dendrocoryne* has been given by Goto (1897).

Distribution. Japan (Jäderholm), Misaki (Inaba, Goto, Stechow), Bonin Isls. (Inaba, Goto).

Solanderia leuckarti Marshall

Solanderia leuckarti: Marshall, 1892.
Dendrocoryne (*Solanderia*) *leuckarti*: Stechow, 1923, p. 2, no. 9.

The species was described by Marshall (1892). The locality was not exactly given but probably from Japan. As Marshall's paper has never been available for me unfortunately, I can not say now more on this species.

Distribution. Japan (?) (Marshall).

Solanderia sp.

Solanderia sp.: Stechow, 1923, p. 2, no. 10.

Weltner (1893) recorded a *Solanderia*-species from Enoshima and Hakodate, and Stechow listed it as a Japanese hydroid. It seems, however, that this may be synonymous with *Dendrocoryne misakiensis* or *D. secunda*.

Distribution. Enoshima and Hakodate (Weltner).

Halocordylidae

Halocordyle disticha (Goldfuss)

Pennaria sp.: Inaba, 1890, no. 32, fig. 89-91.
Pennaria cavolini: Stechow, 1913a, p. 50, fig. 5-6; Jäderholm, 1919, p. 3.
Halocordyle disticha: Stechow, 1923, p. 2, no. 11, Yamada, 1958, p. 52.

The species is rather commonly found in the shallow waters of central Japan. The colony attains 10 cm in height, consisting of an upright stem and regular alternate branches. The hydranths are provided with 10-12 filiform tentacles arranged in a basal whorl and also capitate ones which are arranged in 4-5, more or less regular whorls. The medusa-buds arise from just above the whorl of filiform tentacles.

Distribution. Sagami Bay (Inaba, Stechow), Matsuyama (Yamada), Bonin Isls. (Jäderholm); Indonesia; Mediterranean.

Halocordyle tiarella McCrady

Pennaria tiarella: Hargitt, 1924, p. 475; ——, 1927, p. 501.

The species has been recorded by Hargitt from South China and the Philippine Islands.

Distribution. Amoy, South China (Hargitt); Philippines; Pacific and Atlantic coasts of North and Central America; Mediterranean; West coast of Africa.

Halocordyle australis (Bale)

Pennaria australis: Hargitt, 1927, p. 501.

The species has been also recorded by Hargitt from South China.

Distribution. Amoy, South China (Hargitt); Australia.

Tubulariidae

Tubularia mesembryanthemum Allman

Tubularia sp.: Inaba, 1890, fig. 92-95.

Tubularia mesembryanthemum: Stechow, 1913a, p. 52, fig. 7-10; ——, 1923, p. 3, no. 12; Hargitt, 1927, p. 494; Hiro, 1939, p. 172.

The species has been known from Misaki and Seto. The hydrocauli are unbranched, about 3 cm in height, with undistinct rings on perisarc. The hydranths are provided with 10 distal and 20 proximal tentacles. The gonophores are elongated elliptical, with 5-6 irregular processes. Hiro (1939) reported the species attached to the carapace of the giant crab, *Macrocheira kaempferi* de Haan.

Distribution. Sagami Bay (Inaba, Stechow), Seto (Hiro), Amoy, South China (Hargitt); West coast of Europe; Mediterranean.

Tubularia sagamina Stechow

Tubularia sagamina: Stechow, 1907, p. 194: ——, 1909, p. 43, pl. 3, fig. 6, pl. 5, fig. 5, pl. 6, fig. 22-25; ——, 1923, p. 3, no. 13.

The species was described by Stechow from Sagami Bay. The hydrocauli are unbranched, covered with almost smooth perisarc, attaining 15 cm in height. The hydranths are provided with 20-25 distal and about 50 longer proximal ones. The species seems to be closely related to the preceding one, *Tubularia mesembryanthemum* Allman.

Distribution. Sagami Bay (Stechow).

Tubularia radiata Uchida

Tubularia radiata: Uchida, 1937, p. 157, fig. 1-2; Yamada, 1950, p. 3.

The species occurs usually attached to eel-grass. A colony consists of 15-20 or more polyps. The hydrorhiza creeps on eel-grass, forming a radiate form. The hydrocaulus attains 5 cm in height, with a well-developed perisarc marked with indistinct irregular annulations. The hydranths are large, bearing about 22 distal and about 28 proximal tentacles. The gonophores grow on 10-12 peduncles which are sparsely branched.

Distribution. Akkeshi (Uchida, Yamada).

Tubularia venusta Yamada

Tubularia venusta: Yamada, 1950, p. 3, pl. 1, fig. 1-2.

The species is commonly found in Akkeshi Bay, attached to rocks or stones in shallow water. The hydrocaulus attains 5 cm in height, not so straight and somewhat wavy, covered with indistinct annulations. The hydranths are rather small, with about 20 distal and about 28 proximal tentacles. The gonophores develop on about 10 usually unbranched peduncles.

Distribution. Akkeshi (Yamada).

Tubularia spherogonia Hargitt

Tubularia spherogonia: Hargitt, 1927, p. 495.

The species was described by Hargitt from Amoy, without giving no figures. According to his description, the species is characteristic in its shape of gonophores which are subspherical.

Distribution. Amoy, South China (Hargitt).

Hybocodon amoyensis Hargitt

Hybocodon amoyensis: Hargitt, 1927, p. 496, fig. 2, pl. 2, fig. 3.

A specimen was collected from Amoy, South China and described by Hargitt. The polyps are about 2 cm. in height. The hydrocaulus is upright, supported with 2-4 auxiliary stems, covered with the perisarc which is marked with indistinct annulations.

Distribution. Amoy, South China (Hargitt).

Corymorpha tomoensis Ikeda

Corymorpha tomoensis: Ikeda 1910, p. 153, pl. 5; Jäderholm, 1919, p. 3; Stechow, 1923, p. 3, no. 14.

The species was described by Ikeda from Tomo, the Japanese Inland Sea, and afterwards recorded again by Jäderholm from the Goto Islands, Kyushu. The hydroid is solitary, attaining 5 cm in height, consisting of hydranth and hydrocaulus. The hydranth is provided with 2 whorls of filiform tentacles; the proximal ones being 38-40 while the smaller distal ones about 70 in number. The basal end of the hydrocaulus is expanded, with numerous filaments. Although the gonophores have been described by Ikeda, the development of gonophores and the liberated medusae have been remained unknown.

Distribution. Tomo, Hiroshima Pref. (Ikeda), Goto Isls., Kyushu (Jäderholm).

Corymorpha carnea (Clarke)

Corymorpha carnea: Stechow, 1909, p. 47, pl. 5, fig. 7-9; ——, 1913a, p. 53; ——, 1923, p. 3 no. 15.

This species was recorded by Stechow from Sagami Bay. The hydroid is solitary, large, attaining 30 cm in height. The hydranth bears about 120 proximal tentacles and numerous long distal ones. The hydroid is easily distinguishable from other *Corymorpha* in its great number of tentacles.

Distribution. Sagami Bay (Stechow); Alaska.

Corymorpha iyoensis Yamada

Corymorpha iyoensis: Yamada 1958, p. 52, fig. 1.

This species has been recently described by the author from Matsuyama. The hydroid is smaller than the two preceding species, attaining 0.8 cm in height, growing on a tetraxonian sponge. The hydranth is distinctly separated from the hydrocaulus, provided with 14-20 proximal tentacles and 16-24 distal ones. The basal part of the hydrocaulus sends out some processes to sides or is divided into some irregular root-like processes. The liberated medusae are unknown.

Distribution. Matsuyama (Yamada).

Branchiocerianthus imperator (Allman)

Monocaulus imperator: Allman, 1885, p. 753; ——, 1888, p. 5, pl. 3, fig. 1-7.
Branchiocerianthus imperator: Miyajima, 1900, p. 235, pl. 14-15; Stechow, 1908, fig. 1-4, 6; ——, 1909, p. 49, fig. 1-4, pl. 7, fig. 5, 5a, 6, 8; Jäderholm, 1919, p. 4; Stechow, 1923, p. 3, no. 17; Nutting, 1927, p. 200.

This remarkable giant hydroid was originally found off Yokohama, at the great depth of 5200 m, and later described by Miyajima and Stechow also from Sagami Bay. The detailed description and figures have been given by them. The polyp attains 150 cm in height.

Distribution. Sagami Bay (Allman, Miyajima, Stechow, Jäderholm); Alaska; Bay of Panama; Indian Ocean; East Africa.

Branchiaria mirabilis Stechow

Branchiocerianthus imperator: Stechow, 1908, fig. 5, 7-10; ——, 1909, pl. 7, fig. 1-4, 7.
Branchiocerianthus sp.: Stechow, 1913a, p. 54.
Branchiaria mirabilis: Stechow, 1921, p. 249; ——, 1923, p. 3, no. 16.

Stechow separated the species from the preceding species, *Branchiocerianthus imperator*, in its branched "radial canals" which are situated

between the blastostyles and the proximal tentacles. In other respects the species is very similar to it. I think that it may be synonymous with it.

Distribution. Sagami Bay. (Stechow).

Margelopsidae

Climacocodon ikarii Uchida

Climacocodon ikarii: Uchida, 1924, p. 59, fig. 1-6; ——, 1927a, p. 197, pl. 10, fig. 5; ——, 1940, p. 284.

The hydroid of this species has the pelagic habitat. The hydroid is about 1 mm in length, without stem. Usually 4 or 8 short distal tentacles encircle the mouth and longer proximal tentacles are also present in 2-3 whorls. The medusa-buds grow between the distal and proximal tentacles. This species was originally described by Uchida and the life cycle was also studied in detail by him. The medusae and hydroids are found in Hokkaido.

Distribution. Akkeshi, Biro, Muroran, Oshoro (all Uchida).

Clavidae

Clava sp.

Clava sp.: Yamada, 1946, p. 304, fig. 1.

A specimen was found in Muroran, on the carapace of a crab, *Pugettia quadridens* (de Haan). The trophosome is of typical *Clava*-type, but the gonophores develop on short blastostyles which grow directly from the hydrorhiza. These hydroids are occasionally called as *Rhizogeton*. This species, however, differs from the known species of *Rhizogeton* in several respects.

Distribution. Muroran (Yamada).

Cordylophora japonica Itô

Cordylophora japonica: Itô, 1951, p. 163, fig. 1-4.

This hydroid is a brackish water form, and has been reported by Itô from a brackish creek in Kochi, Shikoku. The hydrocaulus is branched, 1-6.5 cm in height, covered with the perisarc. The hydranth is club-shaped, with 10-30 scattered filiform tentacles. The female gonophores are elongated oval, borne on the main hydrocaulus. According to Itô, this species is distinguishable from the well-known *C. lacustris* in the female gonophores.

Distribution. Kochi (Itô).

Cordylophora mashikoi Itô

Cordylophora mashikoi: Itô, 1952, p. 55, fig. 1-3.

This species was found in a brackish lake, Kahokugata, near Kanazawa, on the coast of the Sea of Japan. The colony is larger than *C. japonica*, attaining 18 cm in height. The hydrocaulus is marked with distinct close annulations of 5-16 in number at the origin of each ramulus. The species is easily distinguishable from the preceding species in the gonophores as well as the distinctly annulated hydrocauli.

Distribution. Kahokugata (Itô).

Campaniclava clionis Vanhöffen

Campaniclava clionis: Vanhöffen, 1910, p. 280, fig. 7; Stechow, 1923, p. 3, no. 18.

The species was recorded by Vanhöffen from the China Sea. The hydroid was collected attached to the body of a pelagic pteropod, *Clio balantium*. The polyp is unbranched, without hydrocaulus, provided with 9-10 tentacles which are irregularly scattered at the upper part of the polyp, and one of these tentacles is remarkably larger than the others. The medusa-buds arise from the stolon.

Distribution. China Sea (Vanhöffen); Polynesia; Tropical and South Atlantic.

Tubidendridae

Balella mirabilis (Nutting)

Balea mirabilis: Nutting, 1905, p. 940, pl. 2, fig. 3, pl. 7, fig. 3-4; Jäderholm, 1919, p. 4, pl. 1, fig. 1.

Balella mirabilis: Stechow, 1923, p. 3, no. 19.

The colony consists of an upright stem and alternate branches which are arranged almost in one plane consequently forming a flabellate appearance. The stem attains 1.2 cm in height, polysiphonic, covered with naked coenosarc. The hydranths are borne on branches, elongated, with 2 whorls of filiform tentacles, distal one with 8-10 and proximal one with 10-12 tentacles. The blastostyles are small, without tentacles, each bearing 3-4 medusa-buds. The medusa-buds are provided with 4 small tentacles. Jäderholm reported the species from the Bonin Islands but did not describe liberated medusae.

Distribution. Bonin Isls. (Jäderholm); Hawaii.

Hydractiniidae

Stylactis piscicola Komai

Stylactis piscicola: Komai, 1932, p. 448, fig. 2, pl. 27-28.

This hydroid was found on the body surface of a scorpaenoid fish, *Erosa erosa* (Langsdorf). The polyps covered the whole body of the host but especially on the dorsal surface. The gastrozooids are slender, attaining 1 cm. in height, provided with a whorl of 15-25 tentacles. The blastostyles are smaller than the gastrozooids, 5-8 or more tentacles, bearing 1-3 gonophores. The gonophores are sporosacs of the eumedusoid-type. Some spines are found, while no nematozooids are present.

Distribution. Seto (Komai).

Stylactis yerii (Iwasa)

Stylactella (*Stylactis*) *yerii*: Iwasa, 1934, p. 269, fig. 23-30.

This species was found on the shell of a living gastropod, *Turricula* (*Surcula*) *kamakurana* Pilsbry, collected from Yahagigake, off Misaki, at the depth of 100 m. The hydrorhiza creeps on the shell-surface, forming a network, and gives rise to gastrozooids and gonophore-bearing blastostyles. The gastrozooids are provided with a whorl of 10-14 tentacles. The blastostyles are small, with 4 tentacles, bearing mostly 4 gonophores. No nematozooids nor spines are present.

Distribution. Misaki (Iwasa).

Stylactis misakiensis (Iwasa)

Stylactella misakiensis: Iwasa, 1934a, p. 289, fig. 1.

A specimen was collected on the shell of a gastropod, *Nassarius dominulus* (Tapparone-Canefri), which was obtained in Masaki. The hydrorhiza forms a regular quadrangular network covering the shell surface. Gastrozooids and small spines are present. The gastrozooids have 10-12 long tentacles. The gonosomes are unknown.

Distribution. Misaki (Iwasa).

Stylactis carcinicola Hiro

Stylactis carcinicola: Hiro, 1939, p. 167, fig. 1-2.

This species was found usually on the surface of the abdomen of the giant crab, *Macrocheira kaempferi* de Haan. The gastrozooids are rather slender, attaining 1 cm in height, with a whorl of 12-30 tentacles. The blastostyles are smaller, with 6-10 tentacles, producing medusa-buds somewhat below the tentacles. The liberated medusae are provided with 4 radial canals and 8 small tentacles.

Stylactis conchicola Yamada

Stylactis conchicola: Yamada, 1947, p. 383, fig. 1-4.

This species was found on the surface of a living gastropod, *Homalopoma sangarensis* (Schrenck). The gastrozooids attain 2 mm in height, with usually 4 or less, rarely 5, tentacles. The blastostyles are small, usually 4 small tentacles. The gonophores are sporosacs. Many spines are present on the stolon. Nematozooids absent.

Distribution. Muroran (Yamada).

Stylactis uchidai Yamada

Stylactis uchidai: Yamada, 1947, p. 385, fig. 5-7.

The colony grows on rocks, stones or barnacle-shells in shallow waters in Muroran. It seems that the species has not so exact host-specificity as in the most allied species. The gastrozooids attain 3 mm in height, with a whorl of 6-9 tentacles. The blastostyles are smaller, with 4-6 tentacles. The spines and nematozooids are also found. This species is very similar to the preceding species, but distinguishable in the gonophores.

Distribution. Muroran (Yamada).

Podocorella minoi (Alcock)

Stylactis minoi: Franz & Stechow, 1908, p. 752.
Podocoryne minoi: Stechow, 1909, p. 17, pl. 4, fig. 8; ——, 1913a, p. 56, fig. 11.
Podocorella minoi: Stechow, 1923, p. 3, no. 20; Komai, 1932, p. 446, fig. 1, pl. 26.

The species is found on the surface of a scorpaenoid fish, *Minous inermis* Alcock. The hydroid covers almost all the surface of the fish. The hydrorhiza is covered with thin coenosarc. No spines are found. The gastrozooids are rather large, cylindrical, with a whorl of 30-40 tentacles. The blastostyles are much smaller than the gastrozooids, with or without degenerated small tentacles. The medusa-buds arise from the upper part of the blastostyle, 1-4 in number, with 4 tentacles. The liberated medusae are devoid of oral tentacles. Some small nematozooids are found.

Distribution. Misaki (Stechow, Komai); Indian Ocean.

Hydractinia epiconcha Stechow

Podocoryne sp.: Inaba, 1890, no. 3, fig. 5-7.
Hydractinia epiconcha: Stechow, 1907, p. 192;——, 1909, p. 18, pl. 3, fig. 4-5; ——, 1913a, p. 58; Jäderholm, 1919, p. 4; Stechow, 1923, p. 4, no. 21; Leloup, 1938, p. 2, pl. 1, fig. 1; Yamada, 1950, p. 4; Yoshida, 1954, p. 67, fig. pl. 1.

This hydroid is commonly found in shallow waters in Japan. The colony covers the shell of a living gastropod, *Cantharus undulatus*, in central Japanese waters, while in Akkeshi the shell of a gastropod, *Neptunea arthritica*, which is tenanted by a hermit-crab. The morphology has been described in detail by Stechow.

Distribution. Akkeshi (Yamada), Misaki (Inaba, Stechow, Jäderholm, Yoshida), Goto Isls., Kyushu (Jäderholm).

Hydractinia spiralis Goto

Hydractinia spiralis: Goto, 1910, p. 489, fig. 19-23.

This species is similar to the preceding species. Although Stechow (1913) stated that this species is distinguishable from *H. epiconcha* in the mode of spines and gonophores, I have some doubts on this species.

Distribution. Misaki (Goto).

Hydrissa sodalis (Stimpson)

Podocoryne sp.: Inaba, 1890, fig. 103-105.
Hydractinia sodalis: Stechow, 19007, p. 192; ——, 1909, p. 21, pl. 1, fig. 1-8, pl. 4, fig. 1-6; Goto, 1910, p. 470, fig. 1-18; Stechow, 1913a, p. 59.
Hydrissa sodalis: Stechow, 1923, p. 4, no. 23.

The species forms a well-developed hard chitinous skeleton. The spines are characteristic, very numerous, usually very large, attaining 2 cm in height, with some branches. Gastrozooids, dactylozooids and blastostyles are found.

Distribution. Hakodate (Stimpson), Sagami Bay (Inaba, Stechow, Goto).

Cytaeis japonica Uchida

Cytaeis japonica: Uchida, 1927a, p. 215, fig. 39, pl. 10, fig. 7; Komai, 1931, p. 256, fig. A.

The species was originally described by Uchida on the medusa stage. Afterwards the hydroid was found by Komai and described by him. The hydroid covers the shell of a living gastropod, *Nassarius livescens* Philippi. The polyp is provided with a whorl of about 10 tentacles which encircle the mouth and with a cupule of periderm at the base. The medusa-buds grow from the stolon. No spines nor nematozooids found.

Distribution. Misaki (Uchida, Komai), Seto (Uchida).

Bougainvilliidae

Bougainvillia ramosa (van Beneden)

Bougainvillia sp.: Inaba, 1890, fig. 87-88.
Bougainvillia ramosa: Stechow, 1909, p. 26; ——, 1913a, p. 60; ——, 1923, p. 4, no. 25.

The hydroid has been recorded from Sagami Bay by Inaba and Stechow. The colony is 2-3 cm in height, irregularly branched, with fascicled stem. The hydranths are provided with a whorl of 15-20 tentacles. The medusa-buds arise from just below the hydranth on the branches, with 4 radial canals and corresponding 4 pairs of marginal tentacles.

Distribution. Sagami Bay (Inaba, Stechow); Indonesia; Atlantic coast of Europe; Mediterranean.

Bimeria amoyensis Hargitt

Bimeria amoyensis: Hargitt, 1927, p. 492, fig. 1.

This species was described by Hargitt as a new species from South China. The stem attains 1.5 cm in height, irregularly branched. The gonophores are borne on stem or branches. Although it can be recognized as a member of *Bimeria* from his description, it seems that the difference from other known *Bimeria* is not clear.

Distribution. Amoy, South China (Hargitt).

Pandeidae

Leuckatiara octona (Fleming)

Perigonimus repens: Stechow, 1909, p. 25; Jäderholm, 1919, p. 4; Hargitt, 1924, p. 470; Hiro, 1938, p. 53, 408.
Perigonimus pusilla: Leloup, 1938, p. 3.
Leuckartiara pusilla: Stechow, 1923, p. 4, no. 24.
Leuckartiara octona: Uchida, 1927a, p. 211, fig. 38; ——, 1930, p. 331; ——, 1938, p. 39; Hiro, 1939, p. 170, fig. 3-4; Uchida, 1940a, p. 285.

The medusae of this species were recorded several times from the Japanese waters. The hydroid of this species has been recorded from Japan mostly under the name of *Perigonimus repens*. Hiro (1939) found the hydroid on the giant crab, *Macrocheira kaempferi* de Haan from Seto, and recorded the development of gonophores to liberated medusae. Stechow (1909) recorded this hydroid from Sagami Bay of 600 m in depth, which was associated with a see-cucumber.

Distribution. Sakhalin, Akkeshi (Uchida), Mutsu Bay (Uchida), Sagami Bay (Stechow, Uchida), Kiushu (Jäderholm, Uchida), Seto (Hiro); Philippines; Pacific and Atlantic coasts of North America; Atlantic coast of Europe; Mediterranean.

Hydrichthyidae

Hydrichthys pacificus Miyashita

Hydrichthys pacificus: Miyashita, 1941, p. 151, fig. 1-4.

A specimen of this species was found on the surface of a fish, *Xesurus* sp. The polyps are elongated club-shaped, irregularly branched, without tentacles. The medusa-buds are elongated cylindrical, with 2 large stumpy tentacle buds. Liberated medusae unknown.

Distribution. Seto (Miyashita).

Eudendriidae

Eudendrium capillare Alder

Eudendrium sp.: Inaba, 1890, no. 35, fig. 99-102.

Eudendrium capillare: Stechow, 1909, p. 29; ——, 1913a, p. 61, fig. 15-17; ——, 1923, p. 4, no. 26; Hargitt, 1927, p. 201; Leloup, 1938, p. 3; Yamada, 1950, p. 5; ——, 1954, p. 16, fig. 14.

The colony is small, attaining 2 cm in height. The stem is not fascicled, irregularly branched. The periderm of the stem and branches is almost smooth, but some annulations are present at the base of the branches and hydranth pedicels. The male gonophores are 2- or 3-chambered, borne on reduced hydranths which have 10-17 small tentacles.

Distribution. Akkeshi (Yamada), Sagami Bay (Inaba, Stechow, Leloup, Yamada); Pacific and Atlantic coasts of North America; Philippines; Australia; whole coasts of Europe; Mediterranean.

Eudendrium sagaminum Yamada

Eudendrium sagaminum: Yamada, 1954, p. 14, fig. 12.

The colony is small, attaining 2 cm in height. The stem is not fascicled, irregularly branched. The periderm is smooth in some parts, while indistinctly annulated or irregularly wavy in other parts especially on pedicels of hydranths or at the base of branches. The male gonophores are 2-chambered, borne on fully reduced hydranths. The female ones are on reduced hydranths in a whorl of 6-7 in number.

Distribution. Sagami Bay (Yamada).

Eudendrium biseriale Fraser

Eudendrium biseriale: Fraser, 1935, p. 105, pl. 1, fig. 1; Yamada, 1954, p. 15, fig. 13.

The species was originally described by Fraser from Sagami Bay. The colony is rather small, attaining 2 cm in height. The stem is simple,

irregularly branched. The perisarc is not smooth, annulated or wrinkled in different degree. The male gonophores are 1-chambered, growing on reduced hydranths. The female ones are borne on reduced hydranths which are still provided with 5-7 small tentacles.

Distribution. Sagami Bay (Fraser, Yamada).

Eudendrium tenellum Allman

Eudendrium tenellum: Yamada, 1954, p. 17, fig. 15.

The colony is small, attaining 2 cm in height. The stem is not fascicled, usually branched. The periderm is almost smooth, but some annulations are present at the base of branches and hydranth pedicels. The male gonophores are 2-chambered, arranged on almost normal hydranths in a whorl. The female ones are borne also on almost unreduced hydranths, forming a whorl of 3-5 in number.

Distribution. Sagami Bay (Yamada); Pacific and Atlantic coasts of North America; Atlantic coast of Northern Europe; Mediterranean.

Eudendrium pusillum amoyensis Hargitt

Eudendrium pusillum amoyensis: Hargitt, 1927, p. 500, pl. 2, fig. 1.

This hydroid is of small size, attaining a height of 1.5 cm. The stem is not fascicled, branched irregularly. The periderm on the stem and branches is irregularly and slightly annulated. The female gonophores are borne in clusters on fully reduced hydranths. The typical form of the species has been known from Australia.

Distribution. Amoy, South China (Hargitt).

Eudendrium insigne Hincks

Eudendrium insigne: Yamada, 1954, p. 4, fig. 3.

The colony is small, attaining 3 cm in height. The stem is simple, giving off some branches. The perisarc of the stem and branches is more or less annulated. The female gonophores arise on unreduced hydranth, 3-6 in number in each hydranth.

Distribution. Japan (Yamada); Indonesia; Pacific and Atlantic coasts of North America; North Atlantic; British Isles; Mediterranean; Antarctic Sea.

Eudendrium laxum Allman

Eudendrium laxum: Yamada, 1954, p. 13, fig. 11.

The colony attains 4 cm in height. The stem is simple, irregularly

branched. The perisarc is almost smooth. The male gonophores are 2-chambered, borne on slightly reduced hydranths. A single specimen has been collected from Sagami Bay in depth of 70-90 m.

Distribution. Sagami Bay (Yamada); Florida.

Eudendrium japonicum Yamada

Eudendrium japonicum: Yamada, 1954, p. 11, fig. 9.

The colony attains 9 cm in height. The stem is simple, not fascicled, irregularly branched. The periderm is almost smooth. The male gonophores are 3-chambered, arranged on fully reduced hydranths. The female ones are on somewhat reduced hydranths.

Distribution. Sagami Bay (Yamada).

Eudendrium lineale Yamada

Eudendrium lineale: Yamada, 1954, p. 12, fig. 10.

The colony attains 11 cm in height. The stem is not fascicled, irregularly branched. The periderm is mostly smooth. The male gonophores are 3- or 4-chambered, arranged on fully reduced hydranth. The female ones are on somewhat reduced hydranths.

Distribution. Matsugasaki, Fukui Pref. (Yamada).

Eudendrium ramosum (Linné)

Eudendrium ramosum: Yamada, 1954, p. 10, fig. 8.

The colony attains 1 cm in height. The stem is almost simple but slightly fascicled at the base, irregularly branched. The perisarc of the stem and branches are mostly smooth. The male gonophores are 2-chambered, borne on unreduced hydranth, 5-8 on a hydranth. The female ones are on slightly reduced hydranths, 3-5 in number on a hydranth.

Distribution. Sagami Bay (Yamada); Pacific and Atlantic coasts of North America; North Atlantic; whole coast of Europe; Mediterranean.

Eudendrium californicum Torrey

Eudendrium californicum: Hargitt, 1927, p. 500, pl. 2, fig. 4.

The species was recorded by Hargitt from South China. The colony attains 14 cm in height. The stem is simple, with many branches. The perisarc of stem and branches is closely and distinctly annulated. According to Hargitt the species is similar to *E. vaginatum* but differs in the closely annulated periderm.

Distribution. Hong Kong (Hargitt); Pacific coast of North America.

Eudendrium vaginatum Allman

Eudendrium sp.: Inaba, 1890, no. 34, fig. 96-98.
Eudendrium vaginatum: Stechow, 1913a, p. 62, fig. 18-19; ——, 1923, p. 4, no. 27.

The species was recorded by Stechow from Japan. His description is a reproduction of the Inaba's. According to Inaba, the colony attains 10 cm in height, with fascicled stem. The basal part of the hydranths is enveloped with the cup-like expansion of the periderm. The gonophores were not found.

Distribution. Sagami Bay (Inaba, Stechow); Pacific and Atlantic coasts of North America; North Sea; Sweden; British Isles.

Eudendrium boreale Yamada

Eudendrium boreale: Yamada, 1954, p. 3, fig. 2.

The colony attains 10 cm in height. The main stem is upright, usually simple but at times slightly fascicled at the base, irregularly branched. The stem and branches are covered with a well-developed perisarc which are marked with distinct annulations. The lower part of the hydranth is enveloped with an extension of the perisarc. The male gonophores are 2-chembered, borne on unreduced hydranths. The female gonophores are in clusters in unreduced hydranths.

Distribution. Akkeshi, Muroran, Oshoro (Yamada).

Eudendrium rameum (Pallas)

Eudendrium rameum: Nutting, 1905, p. 939; Stechow, 1909, p. 27; Jäderholm, 1919, p. 4; Stechow, 1923, p. 4, no. 29; Yamada, 1954, p. 7, fig. 6.

The colony attains 11 cm in height. The main stem is fascicled, branched irregularly. The periderm of branches is mostly smooth, but with some indistinct annulations at the base. The species is very widely distributed in the world.

Distribution. Sagami Bay (Stechow, Jäderholm, Yamada); Hawaii; Pacific and Atlantic coasts of North America; Arctic Sea; North Atlantic; whole coasts of Europe; Mediterranean.

Eudendrium armstrongi Stechow

Eudendrium armstrongi: Stechow, 1909, p. 28; ——, 1923, p. 4, no. 28.

A colony was collected from Sagami Bay and described by Stechow (1909). The colony is 6.5 cm in height and the stem is fascicled and irregularly branched. The periderm is almost smooth but in some parts indistinctly annulated. The male gonophores are 1-chambered, borne on

fully reduced hydranth in a whorl of 10-18 in number.

Distribution. Sagami Bay (Stechow); Indian Ocean.

Eudendrium magnificum Yamada

Eudendrium magnificum: Yamada, 1954, p. 7, fig. 5.

The colony is large, attaining 10 cm in height. The stem and main branches are fascicled. The periderm of the stem and branches is mostly smooth but with some wrincles or annulations in some parts. The gonophores are 1- or 2-chambered, radially arranged on reduced hydranths.

Distribution. Sagami Bay (Yamada).

Eudendrium imperiale Yamada

Eudendrium imperiale: Yamada, 1954, p. 9, fig. 7.

The colony attains 16 cm in height. The stem is fascicled, irregularly branched. The perisarc of the branches is almost smooth, with some wrinckes in some places. The male gonophores are 2-chambered, arranged on fully reduced hydranths, about 20-30 in a hydranth. The female gonophores are present on reduced hydranths, 5-8 in a hydranth.

Distribution. Sagami Bay (Yamada).

Eudendrium racemosum (Gmelin)

Eudendrium racemosum: Stechow, 1913a, p. 63; ——, 1923, p. 4, no. 30; Yamada, 1954, p. 5, fig. 4.

This European species was recorded by Stechow (1913a) from Sagami Bay. The colony is large, attaining 11 cm in height. The stem is fascicled, irregularly branched. The perisarc is more or less annulated, smooth in somewhere. The female gonophores are borne on reduced hydranths, in a whorl of 3-5 in number.

Distribution. Sagami Bay (Stechow, Yamada); Mediterranean.

Eudendrium annulatum Norman

Eudendrium annulatum: Yamada, 1954, p. 2, fig. 1.

The species is known from northern Japan. The colony attains 8 cm in height. The stem is large, fascicled, irregularly branched. The stem and branches are covered with perisarc which are closely and distinctly annulated. The male gonophores are 1-chambered, borne on fully reduced hydranths.

Distribution. Akkeshi, Muroran, Oshoro (Yamada); Indonesia; Atlantic coast of Canada; North Atlantic; Arctic Sea; British Isles; Antarctic Sea.

Proboscidactylidae

Proboscidactyla flavicirrata Brandt

Willsia flavicirrata: Uchida, 1938, p. 41; ——, 1938a, p. 51.
Proboscidactyla flavicirrata: Uchida, 1940, p. 228; —— & Okuda, 1941, p. 431, fig. 1-11.
Lar flavicirrata: Yamada, 1950, p. 6.

The species has a very curious habitat. The colony of the hydroid grows always on the tubes of a sedentary polychaete, *Potamilla myriops* in northern Japan. The gastrozooids are present on the distal margin of the tube, with a pair of tentacles and a head-like lobe. The blastostyles are slender, cylindrical, with 2-7 medusa-buds. A rather complete description about the hydroid and the liberated medusa has been given by Uchida and Okuda (1941). The hydroid is commonly found in shallow waters in Hokkaido, and the medusa has been recorded by Uchida from Akkeshi, Mutsu Bay and Onagawa. I note here that the species has recently been considered by some workers as a member of the order Limnomedusae, after studying its nematocysts.

Distribution. Akkeshi (Uchida, Uchida & Okuda, Yamada), Muroran, Oshoro; Pacific coast of North America.

Thecata

Haleciidae

Eugymnanthea japonica (Yamada)

Ostrehydra japonica: Yamada, 1950a, p. 117, fig. 1.

This curious hydroid was found in the interior of shells of a Japanese oyster, *Ostrea gigas,* in Onomichi, the Japanese Inland Sea. The polyp is solitary, attached with a pedal disk on the gill surface of the oyster, with a whorl of 15-20 filiform tentacles at the distal end. No gonophores found. The life history of this species unfortunately remains unknown and I created a new genus, *Ostreohydra,* for this species without describing the gonophores. Recently, however, Crowell (1957) published a paper on a Neapolitan hydroid, *Eugymnanthea inquilina,* which is also symbiotic with pelecypods, and described that the species of *Ostreohydra* should be named as *Eugymnanthea japonica.* Although the sufficient material has not yet been available for me, I adopt here the genus *Eugymnanthea.* It is noteworthy that the medusae liberated from Neapolitan *E. inquirina* are Eucopiid-type, with a gonad on each of 4 radial canals.

Distribution. Onomichi (Yamada).

Halecium pygmaeum Fraser

Halecium pygmaeum: Stechow, 1923a, p. 89, fig. H.

The species was found on the carapace of a crab, *Achaeus japonicus* de Haan from Hong Kong, South China. It is a minute species. The hydrocaulus is unbranched, very short.

Distribution. Hong Kong (Stechow); Vancouver, Canada.

Halecium repens Jäderholm

Halecium repens: Stechow, 1913a, p. 78, fig. 43; ——, 1923, p. 4, no. 31.

The species is also very small in size. Some small colonies with gonosomes have been collected from Sagami Bay at the depth of 70-250 m.

Distribution. Sagami Bay (Stechow); Arctic Sea.

Halecium delicatulum Coughtrey

Halecium delicatulum: Stechow, 1913a, p. 79; ——, 1923, p. 5, no. 32.

The colony is very small in size. It attains 4 mm. in height.

Distribution. Sagami Bay (Stechow); New Zealand; Southern end of South America.

Halecium crinis Stechow

Halecium crinis: Stechow, 1913, p. 138; ——, 1913a, p. 79, fig. 44; ——, 1923, p. 5, no. 33; Hiro, 1939, p. 174, fig. 7.

The species is originally described by Stechow from Sagami Bay. Hiro (1939) reported it on the giant crab, *Macrocheira kaempferi* de Haan. The colony attains 4 cm in height. The hydrocaulus is straight, dichotomously branched.

Distribution. Sagami Bay (Stechow), Seto (Hiro).

Halecium tenellum Hincks

Halecium tenellum: Jäderholm, 1919, p. 5, pl. 1, fig. 3; Stechow, 1923, p. 5, no. 34; Hargitt, 1927, p. 507.

This well-known cosmopolitan hydroid has been known also from Japan. The stem is slender and sinous, attaining 1.5 cm in height. The hydrothecae are shallow, with everted margin.

Distribution. Sagami Bay (Jäderholm), Bonin Isls. (Jäderholm); Indo-China; Australia; New Zealand; Indian Ocean; Pacific and Atlantic coasts of North America; Panama; Galapagos; Arctic Sea; Greenland; whole coast of Europe; Mediterranean; West Africa; Chile; Patagonia; Antarctic.

Halecium flexile Allman

Halecium sp.: Inaba, 1890, no. 16, fig. 41-45.
Halecium flexile: Jäderholm, 1904, p. 265; Stechow, 1913a, p. 81, fig. 45-49; Jäderholm, 1919, p. 6, pl. 1, fig. 4-5.
Halecium gracile: Jäderholm, 1904, p. 266, pl. 1, fig. 2-3.
Halecium mediterraneum: Stechow, 1923, p. 5, no. 35.

The species is rather commonly found in central and southern Japan. The stem attains 1.5 cm or more in height, irregularly branched.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm), Kyushu (Jäderholm), Bonin Isls. (Jäderholm); Indo-China; Australia; Tasmania; Patagonia; Indian Ocean; New Zealand; West Africa; Mediterranean.

Halecium flexile var. *japonica* Leloup

Halecium flexile japonica: Leloup, 1938, p. 4, fig. 1.

Leloup described this variety from Sagami Bay. The specimens collected are attached on *Symplectoscyphus tricuspidatus* (Alder).

Distribution. Sagami Bay (Leloup).

Halecium nanum Alder

Halecium nanum: Leloup, 1938, p. 4.

Leloup reported the species from Sagami Bay in depth of 12-15 m. A number of colonies with female gonosomes were collected.

Distribution. Sagami Bay (Leloup); Indo-China; Australia; Pacific and Atlantic coasts of North America; West Indies; Atlantic coast of France; Azores; Mediterranean.

Halecium cymiforme Allman

Halecium sp.: Inaba, 1892c, no. 46, fig. 6-10.
Halecium cymiforme: Stechow, 1913a, p. 84, fig. 50-53; ——, 1923, p. 5, no. 36; Hargitt, 1927, p. 507.

Distribution. Sagami Bay (Inaba, Stechow); South China (Hargitt); Pataginia.

Halecium beani (Johnston)

Halecium beani: Stechow, 1913, p. 85; ——, 1923, p. 5, no. 37.

This species is widely distributed in the world. The specimens with female gonophores were collected from Sagami Bay, in depth of 70-180 m.

Distribution. Sagami Bay (Stechow); Pacific and Atlantic coasts of North America; Chile; Australia; Arctic Sea; Greenland; Atlantic coast of Europe; Mediterranean.

Halecium sessile Norman

Halecium sp.: Inaba, 1890, no. 15, fig. 39-40.
Halecium sessile: Stechow, 1913a, p. 86, fig. 54; ——, 1923, p. 5, no. 38; Hargitt, 1927, p. 506.

Distribution. Sagami Bay (Inaba, Stechow), Amoy, South China (Hargitt); Australia; Pacific and Atlantic coasts of North America; Iceland; North Atlantic; Madeira; Mediterranean; Red Sea.

Halecium reversum Nutting

Halecium reversum: Linko, 1911; Stechow, 1923, p. 5, no. 39.

Distribution. Sakhalin (Linko); Alaska.

Halecium muricatum (Ellis & Solander)

Halecium muricatum: Linko, 1911, p. 56; Stechow, 1923, p. 5, no. 40.

Distribution. Sea of Okhotsk (Linko); Alaska; Arctic Sea; North Atlantic coast of North America; North Atlantic.

Halecium ochotense Linko

Halecium ochotense: Linko, 1911 p. 44; Stechow, 1923, p. 5, no. 41.

Distribution. Sea of Okhotsk (Linko).

Halecium halecinum (Linné)

Halecium halecinum: Linko, 1911, p. 40; Stechow, 1923, p. 5, no. 42.

Distribution. Sea of Okhotsk (Linko); Pacific and Atlantic coasts of North America; Ecuador; Greenland; Atlantic coast of Europe; Mediterranean.

Halecium speciosum Nutting

Halecium speciosum: Linko, 1911, p. 19; Stechow, 1923, p. 5, no. 43.

Distribution. Sea of Okhotsk (Linko); Pacific coast of North America.

Halecium labrosum Alder

Halecium labrosum: Linko, 1911, p. 37; Stechow, 1923, p. 5, no. 44.

Distribution. East Sakhalin (Linko); Northern parts of Pacific and Atlantic coasts of North America; Arctic Sea; Greenland; East Atlantic; Azores; Mediterranean.

Halecium brashnikowi Linko

Halecium brashnikowi: Linko, 1911, p. 71; Stechow, 1923, p. 5, no. 45.
Distribution. Sea of Okhotsk (Linko).

Halecium magellanicum (Hartlaub)

Halecium magellanicum: Linko, 1911, p. 15, fig. 2; Yamada, 1950, p. 6, pl. 1, fig. 3-4.
The species is often found in shallow waters of Akkeshi Bay.
Distribution. Akkeshi (Yamada); Vladivostok (Kudelin); Arctic Sea.

Halecium cymosum Fraser

Halecium cymosum: Fraser, 1935, p. 107, pl. 1, fig. 4.
Distribution. Sagami Bay (Fraser).

Halecium flabellatum Fraser

Halecium flabellatum: Fraser, 1935, p. 108, pl. 2, fig. 5.
Distribution. Shiono-Misaki, Wakayama Pref. (Fraser).

Halecium minor Fraser

Halecium minor: Fraser, 1935, p. 108, pl. 2, fig. 6.
Distribution. Sagami Bay (Fraser).

Halecium nullinodum Fraser

Halecium nullinodum: Fraser, 1935, p. 109, pl. 2, fig. 7.
Distribution. Sagami Bay (Fraser).

Halecium vasiforme Fraser

Halecium vasiforme: Fraser, 1935, p. 109, pl. 2, fig. 8.
Distribution. Sagami Bay (Fraser).

Endothecium reduplicatum Fraser

Endothecium reduplicatum: Fraser, 1935, p. 107, pl. 1, fig. 3.
Distribution. Sagami Bay (Fraser).

Diplocyathus dichotomus Allman

Diplocyathus dichotomus: Billard, 1929, p. 71, fig. 1B-1C; Leloup, 1938, p. 5, fig. 2.

The species was reported by Leloup (1938) from Sagami Bay. The colony attains 4 cm in height, remarkably ramified and anastomosed.

Distribution. Sagami Bay (Leloup); Indonesia; Australia.

Diplocyathus sibogae Billard

Diplocyathus sibogae: Billard, 1929, p. 70, fig. 1A; Leloup, 1938, p. 6.

This species was also reported from Sagami Bay by Leloup. The species is larger in size of colony, attaining 12 cm in height.

Distribution. Sagami Bay (Leloup); Indonesia.

Ophiodissa arborea (Allman)

Ophiodissa arborea: Stechow, 1913a, p. 87; Jäderholm, 1919, p. 6, pl. 1, fig. 6; Stechow, 1923, p. 5, no. 46; ——, 1923a, p. 92.

The stem is very rigidly fascicled, attaining 7.5 cm in height. The species was reported from Sagami Bay in depth of 70-180 m.

Distribution. Sagami Bay (Stechow); Antarctic Sea.

Campanulariidae

Campanularia gracilis Allman

Campanularia gracilis: Allman, 1876, p. 260, pl. 12, fig. 2, 4; Stechow, 1923, p. 6, no. 47.

This hydroid was described by Allman (1876) from Japan. The exact locality is unknown. A number of colonies was found attached to *Bonneviella grandis* (Allman). The pedicel is unbranched, with 2 annular constrictions just below the hydrotheca and 1-2 constrictions at the base. The gonothecae are cylindrical, regularly annulated.

Distribution. Japan (Allman).

Campanularia tincta Hincks

Campanularia tincta: Jäderholm, 1919, p. 12, pl. 3, fig. 3; Stechow, 1923, p. 6, no. 48.

The pedicels are short, irregularly undulated throughout the length, with an annular constriction just below the hydranth. The gonosomes are unknown from Japan.

Distribution. Sagami Bay (Jäderholm), Bonin Isls. (Jäderholm); Australia.

Campanularia indopacifica Stechow

Campanularia indopacifica: Stechow, 1919a, p. 156; ——, 1923, p. 6, no. 49; ——, 1923a, p. 102, Fig. J.

The species was described by Stechow (1919) from Sagami Bay. The hydrorhiza creeps on an alga, straight, not winding as in other *Campanularia*. The pedicels are almost unbranched, variable in length. The wall of pedicels is partly smooth and partly undulate. The female gonothecae are rather large, campanulate, truncated above.

Distribution. Sagami Bay (Stechow).

Campanularia hincksi var. *grandis* Billard

Campanularia hincksi grandis: Stechow, 1913a, p. 77, fig. 42; Jäderholm, 1919, p. 12; Stechow, 1923, p. 6, no. 50.

The hydrothecae are not cylindrical, rather conical, with quadrate teeth. Pedicels with entire wall, and a globular annulation just below the hydrotheca.

Distribution. Sagami Bay (Stechow), Bonin Isls. (Jäderholm); Australia; East Atlantic.

Campanularia urceolata Clarke

Campanularia urceolata: Linko, 1911, p. 162; Nutting, 1915, p. 40, pl. 4, fig. 4-5; Stechow, 1923, p. 6, no. 51; Hargitt, 1927, p. 502; Yamada, 1950, p. 9, pl. 1, fig. 8.

The hydrothecae are usually urceolate but variable in some degree in shape. The pedicels are unbranched, transversely annulated throughout the length. The species is very similar to the following species, *C. voluvilis*, but is distinguishable in some small characters of its shape of hydrotheca and pedicel.

Distribution. Kuril Isls. (Linko), Akkeshi (Yamada), Hong Kong (Hargitt); Pacific and Atlantic coasts of North America.

Campanularia volubilis (Linné)

Campanularia volubilis: Linko, 1911, p. 157, fig. 26; Nutting, 1915, pl. 33, pl. 1, fig. 4-6; Stechow, 1923, p. 6, no. 52; Yamada, 1950, p. 8, pl. 1, fig. 7; Uchida, 1958, p. 163.

The hydrothecae are tubular or deep campanulate. The pedicels are spirally annulated throughout.

Distribution. Sakhalin (Linko), Akkeshi (Yamada), Sado (Uchida); Bering Sea; Pacific coast of North and Central America; Atlantic coast of North America; East Atlantic; Mediterranean.

Campanularia sulcata Jäderholm

Campanularia sulcata: Jäderholm, 1896, p. 8, pl. 1, fig. 7; Stechow, 1923, p. 6, no. 53.

This species was described by Jäderholm (1896) from Hirado strait, Kyushu, in depth of 80 m. The hydrothecae are deep campanulate, with 16 teeth on the margin. The hydrothecal wall is marked with longitudinal ribs formed running from the spaces between the teeth throughout the length. The pedicels are shorter than the hydrothecae, with smooth wall. Gonosome unknown.

Distribution. Hirado strait, Kyushu (Jäderholm).

Campanularia africana Stechow

Campanularia africana: Leloup, 1938, p. 13, fig. 9.

Leloup reported this species from Sagami Bay. The gonothecae are elliptical, with smooth wall.

Distribution. Sagami Bay (Leloup); South Africa.

Campanularia groenlandica Levinsen

Campanularia groenlandica: Linko, 1911, p. 179; Stechow, 1913a, p. 76, fig. 37-41; ——, 1923, p. 6, no. 54; Leloup, 1938, p. 14; Yamada, 1958, p. 54.

The species is not rare in Japanese waters. The hydrothecae are campanulate or cylindrical, much variable in its shape, with longitudinal ribs on the wall. The wall of pedicels is smooth or somewhat wavy, not distinctly annulated.

Distribution. Sagami Bay (Stechow, Leloup), Matsuyama (Yamada), Sea of Okhotsk (Linko); Bering Sea; Pacific and Atlantic coasts of North America; Arctic Sea; Greenland; Norway.

Campanularia sp.

Campanularia sp.: Linko, 1911, p. 183; Stechow, 1923, p. 6, no. 55.

Distribution. Sakhalin (Linko).

Rhizocaulus chinensis (Marktanner)

Campanularia chinensis: Marktanner, 1890, p. 203, pl. 3, fig. 1; Linko, 1911, p. 200; Jäderholm, 1919, p. 13, pl. 3, fig. 4; Fraser, 1935, p. 106, pl. 1, fig. 2.
Rhizocaulus chinensis: Stechow, 1923, p. 6, no. 56.

The species was originally described by Marktanner (1890), and afterwards Linko, Jäderholm and Fraser reported it from different regions of Japanese waters. The colony is large, attaining 10 cm in height. The

stem is composed of a number of tubules, from which the pedicels with hydrothecae grow out. The hydrothecal wall is marked with longitudinal ribs and the pedicels are smooth.

Distribution. Sagami Bay (Jäderholm, Fraser), Bonin Isls. (Jäderholm), Tschifu, South China (Marktanner), Sakhalin and Sea of Okhotsk (Linko).

Rhizocaulus verticillatus (Linné)

Campanularia verticillatus: Linko, 1911, p. 195, 197.
Rhizocaulus verticillatus: Stechow, 1923, p. 6, no. 57.

This species is similar to the preceding species, *R. chinensis*. The colony is large and the stems are fascicled. The pedicels are long, annulated or wavy through the length.

Distribution. Sea of Okhotsk and Kamchatka (Linko); Bering Sea; Pacific and Atlantic coasts of North America; Arctic Sea; Northern Atlantic; Patagonia; Antarctic Sea.

Tulpa speciosa (Clarke)

Campanularia crenata: Allman, 1876, p. 258, pl. 11, fig. 1-2.
Campanularia speciosa: Linko, p. 1911, p. 185.
Tulpa speciosa: Stechow, 1923, p. 6, no. 58.

The hydrothecae are unceolate, very large, attaining 2 mm in length, with undulating margin. The hydrothecal wall is marked with longitudinal lines. The pedicels are annulated throughout.

Distribution. Japan (Allman), Sea of Okhotsk (Linko); Pacific and Atlantic coasts of Canada; Arctic Sea; Greenland; Norway.

Orthopyxis caliculata (Hincks)

Campanularia sp.: Inaba, 1892a, no. 39, fig. 1-3; ——, 1892c, fig. 3-5.
Campanularia sp.: Inaba, 1892a, no. 40, fig. 4-5.
Campanularia integra: Linko, 1911, p. 165; Stechow, 1913a, p. 73, fig. 30-36; ——, 1923, p. 7, no. 59.
Orthopyxis caliculata: Stechow, 1923, p. 7, no. 60; Yamada, 1958, p. 54.

The species is commonly found attached usually on algae in central Japanese waters. The hydrothecae are variable in size and shape, with the thickened hydrothecal wall.

Distribution. Sagami Bay (Inaba, Stechow), Kishu, Wakayama Pref. (Inaba), Matsuyama (Yamada), Sakhalin (Linko); Pacific coast of North and Central America; Atlantic coast of North America; Arctic Sea.

Orthopyxis compressa (Clarke)

Campanularia compressa: Linko, 1911, p. 172.

Orthopyxis compressa: Stechow, 1923, p. 7, no. 61.

This species is distinguishable from the preceding species in its strongly compressed hydrothecae.

Distribution. Sakhalin (Linko); Pacific coast of North America; Chile; Patagonia; Antarctic Sea.

Orthopyxis platycarpa Bale

Orthopyxis platycarpa: Stechow & Uchida, 1931, p. 548, fig. 2, pl. 15, fig. 2; Yamada, 1950, p. 7.

This Australian hydroid was reported by Stechow & Uchida (1931) from Mutsu Bay, and the author found it also from various localities of Hokkaido. This is one of the commonest hydroid in Hokkaido, abundantly found attached on eel-grass or algae. The species is distinguishable from *O. caliculata* in the smooth hydrothecal wall and from *O. compressa* in the regularly twisted pedicel.

Distribution. Akkeshi, Muroran, Oshoro (Yamada), Mutsu Bay (Stechow & Uchida); Australia.

Clytia raridentata (Alder)

Campanularia sp.: Inaba, 1892b, fig. 11-12; ——, 1892c.
Campanularia raridentata: Stechow, 1913a, p. 72, fig. 29.
Thaumantias raridentata: Stechow, 1923, p. 7, no. 60.
Laomedea raridentata: Lelop, 1937, p. 21, fig. 15; ——, 1938, p. 13.

The colony is delicate, attaining 3 mm in height. The pedicels are unbranched, with rings at each end. The hydrothecae are deeply campanulate, with 8-9 teeth.

Distribution. Sagami Bay (Inaba, Stechow, Leloup), Shima (Mié Pref.) (Inaba); Indo-China; Pacific and Atlantic coasts of North America; West Indies; Atlantic coast of Europe; Mediterranean; Indian Ocean; Patagonia.

Clytia delicatula (Thornely)

Clytia sp.: Inaba, 1890, no. 13, fig. 34-35.
Campanularia delicatula: Jäderholm, 1902, p. 3.
Clytia delicatula: Stechow, 1913a, p. 65, fig. 20-21; ——, 1923, p. 7, no. 63: ——, 1923a, p. 109; Hargitt, 1924, p. 482; Stechow & Uchida, 1931, p. 550, fig. 3; Hiro, 1939, p. 173, fig. 5; Yamada, 1958, p. 54.
Laomedea delicatula: Leloup, 1938, p. 12.

The species is very commonly found in the shallow waters of central and southern Japan.

Distribution. Mutsu Bay (Stechow & Uchida), Sagami Bay (Inaba, Stechow, Leloup), Seto (Hiro), Matsuyama (Yamada), Hirado strait, Kyushu (Jäderholm), Niigata (Stechow); Philippines; New Britain.

Clytia edwardsi (Nutting)

Clytia edwardsi: Stechow, 1913a, p. 69, fig. 25; ——, 1923, p. 7, no. 64; Yamada, 1958, p. 55.

The colony is usually branched irregularly. The stem and branches are straight, annulated in each end. The hydrothecae are campanulate, with 10-14 teeth.

Distribution. Sagami Bay (Stechow), Matsuyama (Yamada); Pacific and Atlantic coasts of North America; Galapagos Isls.

Clytia linearis (Thornely)

Clytia sp.: Inaba, 1890, no. 14, fig. 36-38.
Clytia linearis: Stechow, 1913, p. 66, fig. 22-24; Jäderholm, 1919, p. 12, pl. 3, fig. 3, fig. 1; Stechow, 1923, p. 7, no. 65.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm); New Britain; Indian Ocean.

Clytia gracilis (M. Sars)

Gonothyraea gracilis: Nutting, 1915, p. 70, pl. 17, fig. 3; Stechow, 1919a, p. 51.
Clytia gracilis: Stechow, 1923, p. 7, no. 66; ——, 1923a, p. 111.

A small number of colonies from Sagami Bay was examined by Stechow (1923a). The specimen was found on the carapace of a crab, *Halimus diacanthus* (de Haan).

Distribution. Sagami Bay (Stechow); Pacific and Atlantic coasts of North America; Iceland; Greenland; Atlantic coast of Europe; Patagonia.

Clytia minuta (Nutting)

Campanularia minuta: Nutting, 1901, p. 345.
Clytia minuta: Nutting, 1915, p. 61, pl. 14, fig. 1-4; Hargitt, 1927, p. 503.

This American hydroid has been known from South China.

Distribution. Amoy, South China (Hargitt); Pacific and Atlantic coasts of North America.

Clytia stechowi Hargitt

Clytia stechowi: Hargitt, 1927, p. 504, fig. 3.

Distribution. Amoy, South China (Hargitt).

Clytia obliqua (Clarke)

Clytia obliqua: Fraser, 1936, p. 49, pl. 1, fig. 1.

Distribution. Sagami Bay (Fraser); Gulf of Panama.

Obelia geniculata (Linné)

Obelia sp.: Inaba, 1890, no. 8, fig. 20-21.
Obelia geniculata: Inaba, 1890, no. 7, fig. 17-19; Stechow, 1913a, p. 69, fig. 26-27; ——, 1923, p. 7, no. 67; Hiro, 1939, p. 174, fig. 6; Yamada, 1958, p. 55.

This well-known cosmopolitan species is very common also in the Japanese waters. The stem attains 1.5 cm in height, definitely geniculate, with alternate pedicels of the hydrothecae on shoulder-like processes of each internode.

Distribution. Sagami Bay (Inaba, Stechow), Seto (Hiro), Matsuyama (Yamada); Philippines; Indonesia; Australia; New Zealand; Arctic Sea; Pacific and Atlantic coasts of North America; Galapagos; Peru; whole European coasts; Mediterranean; East and West coasts of Africa; Antarctic.

Obelia dichotoma (Linné)

Obelia dichotoma: Yamada 1950, p. 8, pl. 1, fig. 5.
Laomedea dichotoma: Leloup, 1937, p. 19, fig. 13; ——, 1938, p. 12.

The species is also widely distributed in the world. It is similar to the preceding species, but the colony is usually larger. There is no remarkable thickning of the periderm of the stem.

Distribution. Akkeshi (Yamada), Sagami Bay (Leloup); Indo-China; Pacific and Atlantic coasts of North and Central America; South America; Arctic Sea; North Atlantic; Africa.

Obelia gracilis Calkins

Obelia gracilis: Hargitt, 1927, p. 504.

Hargitt reported the species from South China, basing upon only single small colony. This Hargitt's record, however, seems somewhat doubtful.

Distribution. South China (Hargitt); Pacific coast of Canada.

Obelia everta Hargitt

Obelia everta (?): Hargitt, 1927, p. 505, fig. 4.

The species was described by Hargitt. His description is brief and only on trophosome.

Distribution. South China (Hargitt).

Obelia plana (M. Sars)

Obelia flabellata: Marenzeller, 1902, p. 2.

Obelia plana: Stechow, 1923, p. 7, no. 68; Yamada, 1950, p. 7, pl. 1, fig. 5; ——, 1957, p. 156.

This hydroid is a boreal form. The colony is large, attaining 16 cm in height. The stem and branches are dichotomously and plentifully branched, showing a fan-shaped appearance. In Akkeshi it is collected very commonly attached on eel-grass, shell-surface, wood-piles, boat-bottoms, etc.

Distribution. Akkeshi (Yamada), Vladivostok (Marenzeller, Yamada); Atlantic coast of North America; Greenland; British Isles; West coast of France.

Obelia longissima (Pallas)

Obelia longissima: Linko, 1911, p. 234; Stechow, 1923, p. 7, no. 69.

The species was reported by Linko from northern Japanese waters.

Distribution. Sea of Japan (Linko), Sea of Okhotsk (Linko); Pacific and Atlantic coasts of North America; Atlantic coast of Europe.

Obelia chinensis Marktanner

Obelia chinensis: Marktanner, 1890, p. 209, pl. 3, fig. 6-7; Stechow, 1923, p. 7, no. 70.

The species was originally described by Marktanner (1890) from Yellow Sea.

Distribution. Yellow Sea (Marktanner).

Gonothyraea bicuspidata (Clarke)

Gonothyraea longicyatha: Stechow, 1913a, p. 71, fig. 28; Jäderholm, 1919, p. 12, pl. 3, fig. 2.
Gonothyraea bicuspidata: Stechow, 1923, p. 7, no. 7, no. 71; Yamada, 1958, p. 55.
Laomedea longicyatha: Leloup, 1938, p. 13.

The hydrothecae are deeply campanulate, with 12-14 teeth, each of which provided with 2 sharp points. The gonothecae are elongated oval, borne from the axils of hydrothecal pedicels.

Distribution. Sagami Bay (Stechow, Jäderholm, Leloup), Matsuyama (Yamada); California; Atlantic coast of North America; West Indies; Brazil; Roscoff; Mediterranean.

Gonothyraea inornata Nutting

Gonothyraea inornata: Hargitt, 1927, p. 506.

Distribution. Amoy, South China (Hargitt); Pacific coast of North America.

Campanuliniidae

Egmundella humilis Fraser

Egmundella humilis: Fraser, 1936, p. 50, pl. 1, fig. 2.

The species was described by Fraser from Sagami Bay. The specimens were found on a bryozoan from the depth of 90 m. The operculum of the hydrothecae is made of 10 flaps. Some nematophores are present on the stolon. The gonosome is unknown.

Distribution. Sagami Bay (Fraser).

Campanulina chilensis Hartlaub

Campanulina chilensis: Stechow, 1913a, p. 123, fig. 93; ——, p. 8, no. 72; ——, 1923a, p. 128.

Several colonies attached on other thecate hydroids were found from Sagami Bay. The pedicel is not clearly separated from the hydrotheca, without distinct spiral annulations.

Distribution. Sagami Bay (Stechow); Chile; Falkland Isl.; Antarctic Sea.

Campanulina denticulata Clarke

Campanulina denticulata: Stechow, 1913a, p. 122, fig. 92; ——, p. 8, no. 73.

The colony is attached on other hydroids, attaining 8 mm in height. The stem is straight, without nodes, with several alternate hydrothecae with small pedicels. The species is known from Sagami Bay, attached on *Halicetta expansa* (Jäderholm).

Distribution. Sagami Bay (Stechow); Peru.

Opercularella hispida Nutting

Opercularella lacerata: Jäderholm, 1903, p. 272.
Opercularella hispida: Stechow, 1913a, p. 124, fig. 94; ——, 1923, p. 8, no. 74.

Only a small colony attached on a species of *Halecium* has been collected from Sagami Bay. The pedicel is marked with distinct spiral annulations. Gonosomes not found.

Distribution. Sagami Bay (Stechow); Hong Kong (Jäderholm); Mergui Archipelago; British Isles.

Cuspidella gigantea Stechow

Cuspidella gigantea: Stechow, 1923, p. 8, no. 77; ——, 1923a, p. 131, fig. S.

A colony was found on the hydrorhiza of a species of *Gonothyraea*,

which covers the carapace of a crab, *Halimus diacanthus*. The hydrothecae are partly sessile and partly free from the substratum, with some duplications of the distal margin. The operculum is composed of about 15 flaps. Gonosomes unknown.

Distribution. Sagami Bay (Stechow).

Eupoma maximum (Levinsen)

Lafoeina maxima: Linko, 1912, p. 72, pl. 1, fig. 3.
Eupoma maximum: Stechow, 1923, p. 9, no. 78.

Distribution. Sakhalin (Linko).

Stegopoma fastigiatum (Alder)

Stegopoma gilberti: Stechow, 1913a, p. 122.
Stegopoma fastigiatum: Jäderholm, 1919, p. 13, pl. 3, fig. 5; Stechow, 1923, p. 8, no. 75.

The species of *Stegopoma* are easily distinguishable from other Campanulinian hydroids in its operculum which is composed of 2 flaps. The specimens from Misaki were found on *Halicetta expansa* (Jäderholm).

Distribution. Misaki, Sagami Bay (Stechow), Bonin Isls. (Jäderholm); Hawaii; Europe.

Stegopoma plicatile (M. Sars)

Calycella plicatilis: Marenzeller, 1902, p. 564.
Stegopoma plicatile: Linko, 1912, p. 45, fig. 7, pl. 1, fig. 2; Stechow, 1923, p. 8, no. 76; Nutting, 1927, p. 204.

The species has been reported from Vladivostok and also from Sakhalin. Clearly different from the preceding species this species shows a rather large colony, attaining 7 cm or more in height. The stem is fascicled and alternately branched.

Distribution. Vladivostok (Marenzeller), Sakhalin (Linko); Pacific and Atlantic coasts of Canada; Arctic Sea; Greenland; North Sea; Philippines; Indo-China.

Lovenella quadridentata (Hincks)

Lovenella quadridentata: Broch, 1910, p. 166, fig. 24; Linko, 1912, p. 79, fig. 12.
Tetrapoma quadridentatum: Stechow, 1923, p. 11, no. 111.

This species has reported from Sakhalin by Linko (1912). According to his description the hydrothecae are cylindrical, gradually tapering downwards to spirally twisted pedicel, and the margin has 4 lower teeth and is decked with an operculum of 4 flaps. Gonosomes unknown. In his list of the Japanese hydroids Stechow used the genus *Tetrapoma* for the species and placed it in Sertulariidae. I think that this is a problem which

should be discussed in future, but I treat it here as a species of *Lovenella*.

Distribution. Sakhalin (Linko); Arctic Sea; Iceland; Greenland.

Calycella syringa (Linné)

Calycella syringa: Marktanner, 1890, p. 213; Marenzeller, 1890, p. 564; Stechow, 1913a, p. 125; ——, 1923, p. 9, no. 79; Yamada, 1950, p. 9.
Calycella pygmaea: Stechow, 1923, p. 9, no. 80.

The colony creeps on other hydroids or bryozoans. The hydrothecae are tubular, with the operculum of 8-10 flaps. The pedicel varies in length, with 4-7 spiral annulations. Stechow (1923) identified some specimens from Sagami Bay with *C. pygmaea*, but I think it unreasonable. It is very widely distributed in the world.

Distribution. Akkeshi (Yamada), Sagami Bay (Stechow), Vladivostok (Marenzeller), Yellow Sea (Marktanner); Indo-China; Australia; Hawaii; Pacific and Atlantic coasts of North America; North Atlantic; Europe; Mediterranean; Red Sea.

Hebellidae

Hebella parasitica (Ciamician)

Lafoea sp.: Inaba, 1890, no. 30, fig. 71, 86.
Hebella parasitica: Marktanner, 1890, p. 213; Stechow, 1913a, p. 103, fig. 75-78; ——, 1919, p. 76; ——, 1923, p. 9, no. 81; Leloup, 1938, p. 8, fig. 5; Yamada, 1958, p. 56.

This species is found rather commonly in central and southern Japan. The colony is attached on the body of other hydroids. The following hydroids are known from Japan as the substrata for this species: *Obelia dichotoma, Synthecium tubithecum, Dynamena japonica, D. quadridentata* var. *elongata, Dentitheca hertwigi, Gymnangium hians, Aglaophenia whiteleggei, A. suensoni.*

Distribution. Sagami Bay (Inaba, Stechow, Leloup), Matsuyama (Yamada); Mediterranean.

Hebella brevitheca Leloup

Hebella brevitheca: Leloup, 1938, p. 7, fig. 4, pl. 1, fig. 3.

The species was found in Sagami Bay attached on *Macrorhynchia phoenicea*. The species is distinguishable from other Japanese *Hebella* in that the hydrothecae are cup-shaped, not so elongated as in other species.

Distribution. Sagami Bay (Leloup).

Hebella corrugata (Thornely)

Hebella corrugata: Jäderholm, 1919, p. 11, pl. 2, fig. 6; Stechow, 1913a, p. 105, fig. 80-82; ——, 1923a, p. 139; Hargitt, 1924, p. 487.
Croatella corrugata: Stechow, 1923, p. 9, no. 83.

The species has been reported from Sagami Bay attached on the following hydroids: *Halecium flexile, Gonothyraea* sp., *Synthecium campylocarpum, Sertularella areyi, Lytocarpia nigra.*

Distribution. Sagami Bay (Stechow, Jäderholm); Philippines; Ceylon; St. Helena.

Hebella neglecta Stechow

Hebella neglecta: Stechow, 1913, p. 139; ——, 1913a, p. 108, fig. 83; Jäderholm, 1919, p. 10, pl. 2, fig. 5; Nutting, 1927, p. 208.
Croatella neglecta: Stechow, 1923, p. 9, no. 84.
Scandia neglecta: Fraser, 1936, p. 50, pl. 1, fig. 3.

This species was originally described by Stechow from Sagami Bay. The hydrothecal wall is not corrugated and the pedicels are very short and without annulations. The species was found on *Synthecium tubithecum* in Sagami Bay, and on *Zygophylax tizardensis* in the Bonin Islands.

Distribution. Sagami Bay (Stechow, Fraser), Bonin Isls. (Jäderholm); Philippines; India.

Hebellopsis calcarata (A. Agassiz)

Lafoea cylindrica: Jäderholm, 1904, p. 274.
Hebella calcarata: Stechow, 1913a, p. 105, fig. 79.
Hebellopsis calcarata: Stechow, 1923, p. 9, no. 82.

This well-known tropical hydroid has been reported from Sagami Bay, on *Dynamena japonica.*

Distribution. Sagami Bay (Stechow); Indonesia; Singapore; Australia; New Zealand; Pacific and Atlantic coasts of Central America; West Indies; Indian Ocean; Red Sea.

Bonneviellidae

Bonneviella grandis (Allman)

Campanularia grandis: Allman, 1876, p. 259, pl. 12, fig. 2-4; Broch, 1909, p. 200; Linko, 1911, p. 150.
Bonneviella grandis: Stechow, 1923, p. 9, no. 85.

This species was originally described by Allman from Tsugaru strait, northern Japan. The colony is large, attaining 15 cm in height, composed

of fascicled stem and branches. The hydrothecae are irregularly borne from stem and branches, deep campanulate, with pedicels which have an annular constriction just below the hydrotheca. The species is a boreal one, and is collected from rather deep waters.

Distribution. Tsugaru strait (Allman), Sea of Okhotsk (Linko).

Bonneviella regia (Nutting)

Bonneviella regia: Nutting, 1915, p. 95, pl. 26, fig. 2-4; Stechow, 1923, p. 9, no. 86.

Distribution. Japan (Nutting); Bering Sea; Northern Pacific coast of North America; Arctic Sea; Greenland.

Bonneviella ingens (Nutting)

Bonneviella ingens: Nutting, 1915, p. 97, pl. 27, fig. 4-5.
Hebomma ingens: Stechow, 1923, p. 10, no. 87.

Distribution. Kuril Isls. (Nutting).

Lafoeidae

Lictorella stechowi Jäderholm

Lictorella stechowi: Jäderholm, 1919, p. 11, pl. 2, fig. 7; Stechow, 1923, p. 10, no. 88.

The stem is straight, attaining 3.5 cm in height, fascicled. The branches are not fascicled, regularly alternate on the stem. No nematophores. Gonosomes not known.

Distribution. Sagami Bay (Jäderholm), Goto Isls., Kyushu (Jäderholm).

Zygophylax biarmata Billard

Zygophylax biarmata: Jäderholm, 1919, p. 8, pl. 12, fig. 3; Stechow, 1923, p. 10, no. 89; Leloup, 1938, p. 9, fig. 6.

Distribution. Sagami Bay (Leloup), Bonin Isls. (Jäderholm); Indian Ocean.

Zygophylax curvitheca Stechow

Zygophylax curvitheca: Stechow, 1913, p. 139; ——, 1913a, p. 116, fig. 89; Jäderholm, 1919, p. 9; Stechow, 1923, p. 10, no. 90; Nutting, 1927, p. 212.

The species was originally described by Stechow from Sagami Bay, and afterwards reported by Jäderholm also from Sagami Bay. The gonosomes were not found among the specimens from Japan, while Nutting

(1927) described them of the Philippine specimens; the gonagia form a coppinia mass.

Distribution. Sagami Bay (Stechow, Jäderholm); Philippines.

Zygophylax tizardensis Kirkpatrick

Zygophylax tizardensis: Kirchenpauer, 1890, p. 12, pl. 3, fig. 3, 3a-d; Stechow, 1913a, p. 117; Jäderholm, 1919, p. 10; Stechow, 1923, p. 10, no. 91.

Distribution. Sagami Bay (Stechow, Jäderholm), South China (Kirckpatrick), Bonin Isls. (Jäderholm).

Zygophylax brevitheca Jäderholm

Zygophylax brevitheca: Jäderholm, 1919, p. 9, pl. 2, fig. 4; Stechow, 1923, p. 10, no. 92.

The species was described by Jäderholm (1919) from the Bonin Islands, in depth of 144 m. He described that the species may be closely related to *Z. biarmata,* but is distinguishable in its larger hydrothecae with wide aperture.

Distribution. Bonin Isls. (Jäderholm).

Zygophylax cervicornis (Nutting)

Lictorella cervicornis: Nutting, 1905, p. 946, pl. 4, fig. 1, pl. 10, fig. 5-9.
Zygophylax cervicornis: Jäderholm, 1919, p. 10; Stechow, 1923, p. 10, no. 93; Leloup, 1938, p. 10.

Distribution. Sagami Bay (Leloup), Bonin Isls. (Jäderholm); Hawaii; Antarctic Sea.

Zygophylax pacifica Stechow

Zygophylax biarmata: Stechow, 1913, p. 114, fig. 88.
Zygophylax pacifica: Stechow, 1920, p. 19; ——, 1923, p. 10, no. 94; ——, 1923a, p. 141; Leloup, 1938, p. 10.

Distribution. Sagami Bay (Stechow, Leloup).

Acryptolaria pulchella (Allman)

Cryptolaria pulchella: Allman, 1888, p. 40, pl. 19, fig. 2, 2a; Nutting, 1905, p. 947; Stechow, 1913a, p. 112.
Oswaldaria pulchella: Stechow, 1923, p. 11, no. 102.
Acryptolaria pulchella: Nutting, 1927, p. 210.

The species was reported by Stechow from Sagami Bay, in depth of 70-180 m.

Distribution. Sagami Bay (Stechow); Philippines; Hawaii; Pacific coast of Central America.

Acryptolaria crassicaulis (Allman)

Cryptolaria crassicaulis: Allman, 1888, p. 41, pl. 19, fig. 3, 3a; Stechow, 1913a, p. 113; Jäderholm, 1919, p. 8, pl. 2, fig. 2.
Oswaldaria crassicaulis: Stechow, 1923, p. 11, no. 104.

A genus *Oswaldaria* was created by Stechow (1921) taking this species as the genotype. I think, however, that this genus seems to be questionable.

Distribution. Sagami Bay (Stechow), Kiushu (Jäderholm); Australia; Antarctic Sea.

Acryptolaria symmetrica (Nutting)

Cryptolaria symmetrica: Nutting, 1905, p. 947, pl. 4, fig. 2, pl. 10, fig. 10-11; Stechow, 1913a, p. 112.
Oswaldaria symmetrica: Stechow, 1923, p. 11, no. 103.

The colony collected is not large attaining 2 cm in height. Gonosomes unknown. The species was found on a bryozoan from Sagami Bay in depth of 70-180 cm.

Distribution. Sagami Bay (Stechow); Hawaii.

Acryptolaria conferta var. *australis* (Ritchie)

Cryptolaria conferta australis: Jäderholm, 1919, p. 7, pl. 2, fig. 1.
Oswaldaria conferta australis: Stechow, 1923, p. 11, no. 105.

Jäderholm's material was found on a bryozoan from Sagami Bay in depth of 360 m. Gonosomes unknown.

Distribution. Sagami Bay (Jäderholm); Australia; New Zealand.

Acryptolaria bulbosa (Stechow)

Cryptolaria bulbosa: Stechow, 1932, p. 87.

Distribution. Sagami Bay (Stechow).

Cryptolaria exserta Busk

Perisiphonia exserta: Stechow, 1913, p. 117; Jäderholm, 1919, p. 8.
Acryptolaria exserta: Stechow, 1923, p. 10, no. 95.

Distribution. Sagami Bay (Stechow, Jäderholm), Kiushu (Jäderholm), Bonin Isls. (Jäderholm); Australia; East Atlantic.

Lafoea tenellula Allman

Lafoea tenellula: Allman, 1877, p. 12, pl. 8, fig. 3-4; Stechow, 1913a, p. 110; ——,

1923, p. 10, no. 96.

The colony collected in Sagami Bay attains 8 cm in height. The gonosomes are unknown in Japan.

Distribution. Sagami Bay (Stechow); Australia; Florida; West Indies; Mediterranean.

Lafoea dumosa (Fleming)

Lafoea dumosa: Linko, 1911, p. 95; Stechow, 1923, p. 10, no. 97.

Distribution. Sakhalin (Linko); Indonesia; Australia; New Zealand; Bering Sea; Pacific and Atlantic coasts of North America; Arctic Sea.

Lafoea fruticosa (M. Sars)

Lafoea fruticosa: Inaba, 1890, no. 6, fig. 14-16; ——, 1892b; Marenzeller, 1902, p. 564; Linko, 1911, p. 100; Stechow, 1913a, p. 109, fig. 84; Jäderholm, 1919, p. 6, pl. 1, fig. 7; Stechow, 1923, p. 10, no. 98; —— & Uchida, 1931, p. 550, pl. 15, fig. 3; Leloup, 1938, p. 10, fig. 7.

The well-known and widely distributed species is also rather commonly found in Japanese waters in moderate depth. The pedicels of the hydrothecae are usually twisted 1 or 2 times. The hydrothecae and pedicels spring in comparatively large angles with the stem, sometimes almost a right angle.

Distribution. Mutsu Bay (Stechow & Uchida), Sagami Bay (Inaba, Stechow, Jäderholm, Leloup), Shima, Mié Pref. (Inaba), Kyushu (Jäderholm), Vladivostok (Marenzeller), Sea of Japan (Linko); Bering Sea; Pacific and Atlantic coasts of North America; Arctic Sea; British Isles; Australia; Hawaii; Chile.

Lafoea gracillima (Alder)

Lafoea gracillima: Marktanner, 1890, p. 217, pl. 3, fig. 18-19; Jäderholm, 1919, p. 7, pl. 1, fig. 8; Stechow, 1923, p. 10, no. 99.

The species is very similar to the preceding species, *L. fruticosa*. The pedicels usually have 2-3 twists. The pedicels and hydrothecae do not make so much angles in general as in *L. fruticosa*, but this may not be a clear distinction.

Distribution. Bonin Isls. (Jäderholm), Yellow Sea (Marktanner); Pacific and Atlantic coasts of North America; Arctic Sea; Indo-China; Arabian Sea; Australia; Antarctic Sea.

Lafoea paxi Stechow

Lafoea (?) *paxi*: Stechow, 1932, p. 86.

The species was reported by Stechow (1932) from Sagami Bay, in

depth of 70-18 m. The material collected was very little, containing only some hydrothecae.

Distribution. Sagami Bay (Stechow).

Filellum contortum (Nutting)

Lafoea contorta: Nutting, 1905, p. 945, pl. 3, fig. 6, pl. 9, fig. 8-9.
Filellum contortum: Stechow, 1913a, p. 110; ——, 1923, p. 10, no. 100.

The species was found on *Aglaophenia whiteleggei* from Sagami Bay. The hydrothecae are sessile, bent, very long; the margin often reduplicated. The gonosomes are unknown.

Distribution. Sagami Bay (Stechow); Hawaii.

Filellum serratum (Clarke)

Filellum serratum: Stechow, 1913, p. 111, fig. 85; Jäderholm, 1919, p. 7; Stechow, 1923, p. 11, no. 101; ——, 1923a, p. 145; Hargitt, 1924, p. 488; Leloup, 1937, p. 28; ——, 1938, p. 11.

The species is not rare usually on other hydroids or sometimes on gorgonid anthozoans in the central and southern Japanese waters. Stechow (1913) reported the following hydroids as the substrata: *Halecium flexile, H. beanii, Symplectoscyphus gotoi, Macrorhynchia phoenicea, Aglaophenia whiteleggei.* Leloup's specimen was found on *Zygophylax pacifica.* This species is clearly different from the preceding species in the hydrothecae. The free portion of the hydrothecae is shorter, and adnate portion is marked with many narrow ridges of the perisarc.

Distribution. Sagami Bay (Stechow, Leloup), Bonin Isls. (Jäderholm); Philippines; Indo-China; Indonesia; Indian Ocean; Australia; West Indies; Mediterranean; Red Sea.

Grammaria scandens Stechow

Grammaria scandens: Stechow, 1913, p. 140; ——, 1913a, p. 118, fig. 90-91; Jäderholm, 1919, p. 7; Stechow, 1923, p. 11, no. 106; ——, 1923a, p. 147; Leloup, 1938, p. 12, fig. 8.

The species was originally described by Stechow (1913) and afterwards Jäderholm (1919) and Leloup (1938) reported it from Sagami Bay.

Distribution. Sagami Bay (Stechow, Jäderholm, Leloup).

Grammaria immersa Nutting

Grammaria immersa: Stechow, 1913, p. 121; ——, 1923, p. 11, no. 107; Yamada, 1957, p. 157, fig. 1.

Stechow's specimen from Sagami Bay is only a small fragment of a

colony and attains 2 cm in height, while the specimens from Vladivostok which were examined by the author are large and rigid, attaining 16 cm in height. The species is a typical boreal form.

Distribution. Sagami Bay (Stechow), Vladivostok (Yamada); Bering Sea; Arctic Sea; Iceland; Greenland.

Syntheciidae

Synthecium tubithecum (Allman)

Sertularia tubitheca: Allman, 1877, p. 24, pl. 16, fig. 5-6; Jäderholm, 1902, p. 5.
Synthecium tubithecum: Nutting, 1904, p. 134, pl. 41, fig. 1; ——, 1905, p. 950; Stechow, 1913, p. 126; Jäderholm, 1919, p. 14; Stechow, 1923, p. 11, no. 110; Nutting, 1927, p. 221.

This species was reported several times from the central and southern coasts of Japan, and gonosome has been also known. The gonosomes of this species are very characteristic, having a narrow neck and everted margin and closely and deeply annulated throughout. Hargitt (1924) described *Synthecium flabellatum* from the Philippine Islands. Nutting (1927) suspected, however, that Hargitt's species may be synonymous with this species.

Distribution. Sagami Bay (Stechow), Hirado strait and Okinoshima, Kyushu (Jäderholm), Bonin Isls. (Jäderholm); Philippines; Hawaii: Indonesia: West Indies; Brazil.

Synthecium orthogonium (Busk)

Synthecium orthogonium: Jäderholm, 1903, p. 289; Stechow, 1923, p. 11, no. 109.

This species was reported by Jäderholm (1903) from southern Japan but no records have been present since. Jäderholm's specimens are of the Vega-Expedition, collected from 90 m deep, and are fragments of colonies without gonosomes. The species is somewhat similar to the preceding *S. tubithecum*. As Stechow (1923a) indicated, the species, however, is distinguishable from that species in its rather approximated hydrothecal pairs and smooth gonothecal wall.

Distribution. Southern Japan (Jäderholm); Hong Kong; Hawaii; Tahiti, South Pacific; Australia.

Synthecium campylocarpum Allman

Synthecium campylocarpum: Allman, 1888, p. 78, pl. 37, fig. 1; Marktanner, 1890, p. 248; Stechow, 1913, p. 127, fig. 96-97; Jäderholm, 1919, p. 14, pl. 3, fig. 6; Stechow, 1923, p. 11, no. 108.
Sertularia sp.: Inaba, 1890, no. 19, fig. 52-54.

The species has been reported from the shallow waters of Sagami Bay and the Goto Islands. The specimens which Inaba (1890) and Jäderholm (1919) studied were destitute of gonosomes. The distal part of hydrothecae is turned obliquely away from the stem but not at right angles to the stem, and so the hydrothecal margin is present obliquely to the stem and not parallel to it. In this respect the species is distinguishable from two preceding species of *Synthecium*.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm), Goto Isls. (Jäderholm); Indonesia; New Zealand; Australia.

Hincksella cylindrica var. *pusilla* (Ritchie)

Sertularella cylindrica pusilla: Ritchie, 1910, p. 817, pl. 77, fig. 9.
Hincksella cylindrica pusilla: Billard, 1925, p. 124.
Synthecium cylindricum pusilla: Leloup, 1940, p. 3, fig. 2.

The variety was described by Leloup for the material which was collected from the northern part of Sagami Bay in about 9 m depth. The material was a small fragment of 3 mm in height without gonosomes and covered a colony of *Macrorhynchia phoenicea*. In his great work of the Siboga hydroids, Billard (1925) created the genus *Hincksella* for the species bearing the hydrothecae which are alternately arranged, with entire margin and no operculum. Although Stechow and some other workers did not agree with Billard's opinion, I will adopt here the genus *Hincksella*. Siboga's specimen was found also on *Macrorhynchia phoenicea*.

Distribution. Sagami Bay (Leloup); Mergui Archipelago, Lower Burma; Indonesia; West Indies.

Sertulariidae

Diphasia nuttingi Stechow

Diphasia nuttingi: Stechow, 1913, p. 142; ——, 1913a, p. 142, fig. 116.
Nigellastrum nuttingi: Stechow, 1923, p. 12, no. 112.

Only one record of this species has been present. The material was found among Doflein's collection from Sagami Bay which was studied by Stechow. The material consists of only a small colony which bears 6 hydrothecae. The stem is straight, unbranched, 3 mm in length, divided into regular internodes. The hydrothecae are alternately arranged, tubular, with an operculum of an adcauline flap. Gonosome unknown. The species was found on the surface of *Aglaophenia whiteleggei* which was found in Okinose Bank of Sagami Bay, from 70-180 m in depth. The species is distinguishable from other species of the genus in the hydrothecae which are arranged very alternately.

Distribution. Sagami Bay (Stechow).

Diphasia dubia Hargitt

Diphasia dubia (?): Hargitt, 1927, p. 511, pl. 1, fig. 2.
Distribution. Amoy, South China (Hargitt).

Diphasia palmata Nutting

Diphasia palmata: Nutting, 1905, p. 950, pl. 4, fig. 6, pl. 11, fig. 8-10; Stechow, 1913a, p. 143, fig. 117; Jäderholm, 1919, p. 16.
Nigellastrum palmatum: Stechow, 1923, p. 12, no. 113.

The material from Sagami Bay bears female gonosomes which are characteristic for this species. Stechow described that the species was found on some colonies of *Macrorhynchia phoenicea* and other hydroids. The species has been reported from Japan and Hawaii.

Distribution. Sagami Bay (Stechow); Goto Isls., Kyushu (Jäderholm); Hawaii.

Diphasia scalariformis Kirkpatrik

Diphasia scalariformis: Jäderholm, 1903, p. 287; Billard, 1925, p. 216, fig. 55-56.
Nigellastrum scalariforme: Stechow, 1923, p. 12, no. 114.

The species has once reported by Jäderholm (1903) from South Japan. The material with many gonothecae was collected between Nagasaki and Hong Kong, in depth of 90-100 m, by Vega-Expedition. The gonothecae are oval, with many small spines on upper surface and with a small round orifice on a short neck at the top.

Distribution. South Japan (Jäderholm); Indonesia; Australia.

Diphasia digitalis (Busk)

Diphasia digitalis: Jäderholm, 1919, p. 16; Hargitt, 1924, p. 501; Billard, 1925, p. 209; Nutting, 1927, p. 218.
Nigellastrum digitale: Stechow, 1923, p. 12, no. 115.

This species is rather widely distributed in the tropical seas of the world and has been reported from various localities of the Atlantic, Pacific and Indian Oceans. Jäderholm (1919) described the species from the Bonin Islands, in 65 m in depth.

Distribution. Bonin Isls. (Jäderholm); Philippines; Indonesia; Australia; Indian Ocean; West Indies; Brazil; West Africa.

Diphasia thornelyi Ritchie

Diphasia thornelyi: Ritchie, 1910, p. 13, pl. 4, fig. 4-5; Jäderholm, 1919, p. 16, pl. 4, fig. 2-3; Billard, 1925, p. 215, fig. 54.

Nigellastrum thornelyae: Stechow, 1923, p. 12, no. 116.

Jäderholm reported this species from the Goto Islands. The specimens with many gonothecae were collected from 370 m in depth, attached on the surface of *Macrorhynchia pennarius*. The gonothecae are similar to those of *D. scalariformis*, with small spines on upper surface. Ritchie's specimen was attached on *Macrorhynchia pennarius* as the Japanese one and Billard described that his specimen was found on *Hemicarpus fasciculatus* (Thornely).

Distribution. Goto Isls., Kyushu (Jäderholm); Indonesia; Andaman Isls.

Diphasia derbecki Kudelin

Diphasia derbecki: Kudelin, 1913, p. 333; ——, 1914, p. 449.
Nigellastrum derbecki: Stechow, 1923, p. 12, no. 117.

The species has been known only from the Sea of Okhotsk. The colony is rather large and attains 9 cm in height. The hydrothecae are arranged in 8 longitudinal series, with a round aperture decked with an adcauline flap. The species looks like a form of *Selaginopsis* for its hydrothecal arrangement of 8 longitudinal series, but differs from it in having the adcauline hydrothecal flap. Stechow (1920) created a genus, *Abacella*, for this species, but afterwards he treated the species as *Nigellastrum derbecki* in his list of Japanese hydroids.

Distribution. Sea of Okhotsk (Kudelin).

Idia pristis Lamouroux

Idia pristis: Allman, 1888, p. 83, pl. 39, fig. 1-10; Stechow, 1913a, p. 141; Jäderholm, 1919, p. 16; Hargitt, 1924, p. 490, pl. 4, fig. 14; Billard, 1925, p. 219, fig. 58, pl. 8, fig. 33; Nutting, 1927, p. 217.
Idiella pristis: Stechow, 1923, p. 12, no. 118.

It has been known that the coenosarc of this species is divided by transverse septa into intercommunicated chambers. The character of this species was regarded by such workers as Allman, Fraser, etc. enough to represent a family. I think, however, that this opinion is not reasonable and it may be a member of the Sertulariidae. The distribution of this species is almost world-wide in tropical and temperate oceans, especially in Asiatic waters.

Distribution. Hirado strait, Kyushu (Stechow), Formosa (Marktanner), Bonin Isls. (Jäderholm); Philippines; Indo-China; Indonesia; Malay Peninsula; Indian Ocean; New Zealand; Australia; West Indies; Brazil.

Dynamena hozawai (Stechow)

Sertularella sp.: Inaba, 1890, fig. 26-28.

Sertularella solidula: Stechow, 1913, p. 136, fig. 108-110.
Symplectoscyphus indivisus: Stechow, 1923, p. 12, no. 123.
Symplectoscyphus hozawai: Stechow, 1931, p. 179; —— & Uchida, 1931, p. 551, fig. 4; Yamada, 1955, p. 17, fig. 1.

The species was described by Stechow (1931) from Mutsu Bay on trophosome only. Recently I have reported it from Muroran, and described gonosomes. The gonosomes grow from the interior of the hydrthecae, taking the place of hydranth. The specimens from Mutsu Bay and from Muroran recall us to a hydroid reported as *Sertularella* sp. by Inaba and afterwards as *Sertularella solidula* Bale and as *Symplectoscyphus indivisus* (Bale) by Stechow. Inaba's textfigures (Fig. 27-28), which are reproduced in Stechow's paper (1913), are quite similar to my specimens from Muroran. Some years ago I had an opportunity to examine the hydroid specimens in the Biological Laboratory of the Imperial Palace, Tokyo, and I found several materials of this species among them. The examination of these materials revieled that the hydranths of this species are devoid of abcauline blind sacs. Inaba's figure (Fig. 28) shows also the fact. The species differs in some respects from Australian *Symplectoscyphus solidulus* or *Sympl. indivisus*. In Muroran the species is rather commonly found attached on algae near low water mark.

Distribution. Muroran (Yamada), Mutsu Bay (Stechow & Uchida), Sagami Bay (Inaba, Stechow).

Dynamena japonica Stechow

Sertularia sp.: Inaba, 1890, no. 18, fig. 49-51.
Thuiaria articulata: Stechow, 1913a, p. 152, fig. 131-134.
Dynamena japonica: Stechow, 1920, p. 18; ——, 1923, p. 12, no. 120; ——, 1923a, p. 164.

The species is rather commonly found in the shallow water of Sagami Bay. The colony is large, attaining 17 cm in height. The stem is straight, with opposite branches arranged regularly. The hydrothecae are opposite or sub-opposite, tubular, almost wholly immersed, with 2 lateral low teeth and an operculum of 2 flaps. The gonothecae are borne from just below the hydrothecae of branches, irregularly ovate, with somewhat truncate large aperture.

Distribution. Sagami Bay (Inaba, Stechow).

Dynamena crisioides Lamouroux

Sertularia tubuliformis: Jäderholm, 1919, p. 15.
Dynamena tubuliformis: Stechow, 1923, p. 12, no. 121; Yamada, 1955, p. 354, pl. 23, fig. 1-2.

Thuiaria tubuliformis: Hargitt, 1924, p. 493, pl. 4, fig. 16; ——, 1927, p. 508, pl. 1, fig. 4-5.

Dynamena crisioides: Billard, 1925, p. 181, fig. 36-37, pl. 7, fig. 21; Yamada, 1958, p. 56, fig. 2.

This species has been reported by Jäderholm from Misaki and the Bonin Islands and recently I have described it from the Tokara Islands and also from Matsuyama. The gonosomes found among the specimens from Matsuyama agree well with the description of Billard (1925). The species is widely distributed in the tropical and subtropical regions of the world.

Distribution. Misaki (Jäderholm), Shirahama, Matsuyama (Yamada), Tokara Isls. (Yamada); Amoy, South China; Philippines; Indo-China; Indonesia; Micronesia; Indian Ocean; Red Sea; West Africa; Pacific and Atlantic coasts of Central America; Brazil.

Dynamena quadridentata (Ellis & Solander)

Pasythea quadridentata: Nutting, 1904, p. 75, pl. 13, fig. 4-7; Hargitt, 1927, p. 509, pl. 2, fig. 1.

Distribution. Amoy, South China (Hargitt); Indo-China; Australia; Hawaii; Pacific coast of North and Central America; Atlantic coast of North America; South Africa.

Dynamena quadridentata var. *elongata* Stechow & Müller

Pasya elongata: Stechow & Müller, 1923, p. 469, pl. 27, fig. 8.

Dynamena quadridentata v. *elongata*: Billard, 1925, p. 195, fig. 43; Leloup, 1938, p. 16, fig. 8.

Some colonies attaining 2 cm in height were found on the surface of a *Gorgonia*-species from Sagami Bay.

Distribution. Sagami Bay (Leloup); Indonesia.

Dynamena quadridentata var. *nodosa* Hargitt

Pasythea sp.: Inaba, 1892a, no. 42, fig. 11-14; ——, 1892c.

Pasythea nodosa: Hargitt, 1908, p. 114, fig. 13-15; Stechow, 1913a, p. 150, fig. 129-130; ——, 1923, p. 12, no. 122.

The species is widely distributed in the tropical and subtropical regions of the world. Some varieties of the species have been described and the problem about the subdivision to varieties has been discussed by several workers. I think that the species which Stechow (1913a) identified with *Pasythea nodosa* may be a variety of this well known species. The variety is rather common in the central and southern Japanese waters. It has been reported by Inaba from Misaki and Kishu, Wakayama Pref., and by Stechow from Misaki. Inaba's specimens from Kishu were found

on Sargassum at 2 m in depth, while Stechow's ones on the basal part of *Dentitheca hertwigi* at 15-20 m in depth. These specimens were all destitute of gonosomes.

Distributbion. Sagami Bay (Inaba, Stechow), Kishu, Wakayama Pref. (Inaba); Woods Hole.

Dynamena dubia Hargitt

Pasythea dubia: Hargitt, 1927, p. 511, pl. 1, fig. 5.

Distribution. Hong Kong (Hargitt).

Dynamena cornicina McCrady

Dynamena cornicina: Billard, 1925, p. 188, pl. 7, fig. 43; Leloup, 1937, p. 31: ——, 1938, p. 15, fig. 10.

Some small, young colonies of 3-4 mm in height were found in Sagami Bay on the hydrorhiza of *Macrorhynchia phoenicea*. It seems to me that this species is rather common in the central and southern Japanese waters.

Distribution. Sagami Bay (Leloup); Indo-China; Indonesia; Pacific and Atlantic coasts of North America; Bermuda; Brazil; Mediterranean; East Africa.

Dynamena brevis (Fraser)

Sertularia minuta: Hargitt, 1924, p. 494, pl. 5, fig. 18.

Sertularia brevis: Fraser, 1935, p. 110, pl. 2, fig. 9.

This species was reported by Fraser from Sagami Bay. The colony, growing on Sargassum, consists of simple, unbranched stems which attain 0.7 cm in height. The stems are divided into regular internodes, each of which bears a pair of opposite hydrothecae. The gonothecae are obovate, with a round margin, marked with distinct transverse corrugations. Fraser described that this species is identical with *Sertularia minuta* which was described by Hargitt as a new species from the Philippine Islands. The name *S. minuta,* however, is preoccupied by Bale for an Australian hydroid, so Fraser proposed a new name, *S. brevis.*

Distribution. Sagami Bay (Fraser); Philippines.

Symplectoscyphus turgidus (Trask)

Diphasia sp. ?: Inaba, 1890, no. 12, fig. 32-33.

Sertularella turgida: Nutting, 1904, p. 95, pl. 22, fig. 2-5; Stechow, 1913a, p. 133, fig. 105.

Symplectoscyphus turgidus: Stechew, 1923, p. 12, no. 124.

The species was recorded by Nutting (1904) among the "Albatross" collection which were get off Japan in 100 m in depth, and also recorded

by Inaba and Stechow from Misaki. The stem attains 5 cm in height. The gonothecae are large, elliptical, with several scattered spines in the distal half.

Distribution. Off Japan (Nutting), Misaki (Inaba, Stechow); Pacific coast of North America; Australia.

Symplectoscyphus gotoi (Stechow)

Sertularella gotoi: Stechow, 1913, p. 142; ——, 1913a, p. 132, fig. 104.
Symplectoscyphus gotoi: Stechow, 1923, p. 13, no. 125.

The species was originally described by Stechow (1913) from Sagami Bay. The gonothecae of this species are very characteristic. These grow from the basal part of stem or directly from hydrorhiza, large, elongate oval, with many, long and sharply pointed spines scattered over the surface. It seems that the species is commonly distributed in the middle and southern Japanese waters.

Distribution. Sagami Bay (Stechow).

Symplectoscyphus tricuspidatus (Alder)

Sertularella tricuspidata: Jäderholm, 1896, p. 12; Linko, 1912, p. 103, fig. 14; ——, 1919, p. 18, pl. 4, fig. 7.
Symplectoscyphus tricuspidatus: Stechow, 1923, p. 13, no. 126; Leloup, 1938, p. 17, fig. 12; Yamada, 1950, p. 10, pl. 1, fig. 9.

This well-known boreal form has been reported from several parts of the Japanese waters, in depths of 1-80 m. The species is widely distributed in north polar and north temperate regions of the world.

Distribution. Akkeshi (Yamada), Misaki (Jäderholm, Leloup), Hirado strait, Kyushu (Jäderholm), Sea of Okhotsk (Linko); Kamchatka; Arctic Sea; Greenland; Iceland; North Atlantic; British Isls.; Pacific and Atlantic coasts of North America.

Symplectoscyphus tricuspidatus var. *acuminata* (Kirchenpauer)

Sertularella tricuspidata acuminata: Kirchenpauer, 1884, p. 45; Linko, 1912, p. 112, fig. 15.
Symplectoscyphus triculspidatus acuminata: Stechow, 1923, p. 13, no. 127.

According to Kirchenpauer's description the variety is slightly different from the typical form in the shape of hydrothecae.

Distribution. Sea of Okhotsk (Linko); Arctic Sea.

Symplectoscyphus tropicus (Hartlaub)

Sertularella sp.: Stechow, 1913a, p. 139, fig. 114.
Sertularella tropica: Nutting, 1904, p. 102, pl. 26, fig. 3-4; Jäderholm, 1919, p. 19,

pl. 4, fig. 8; Billard, 1925, p. 165, fig. 26.
Symplectoscyphus tropicus: Stechow, 1923, p. 13, no. 128.

The records of this species by Jäderholm and by Stechow are all of rather deep waters, in depths of 145-360 m. The specimens of these records lack gonosomes.

Distribution. Sagami Bay (Stechow, Jäderholm), Goto Isls., Okinoshima, Kyushu (Jäderholm), Bonin Isls. (Jäderholm); Indonesia; Gulf of Panama; Equador.

Symplectoscyphus cumberlandicus (Jäderholm)

Sertularella cumberlandica ?: Stechow, 1913a, p. 140, fig. 115.
Symplectoscyphus cumberlandicus: Stechow, 1923, p. 13, no. 129.

The species was recorded by Stechow (1913) from Sagami Bay, in depth of 70-180 m, based on a colony which bears only 3 hydrothecae. It seems to me that some doubts remain about the exact identification.

Distribution. Sagami Bay (Stechow); South Georgia Isl.

Symplectoscyphus rubellus (Kirchenpauer)

Sertularella rubella: Kirchenpauer, 1884, p. 48, pl. 16, fig. 2, 2a-b; Hartlaub, 1900, p. 45, pl. 2, fig. 42; Linko, 1912, p. 115.
Symplectoscyphus rubellus: Stechow, 1923, p. 13, no. 130.

The species has been recorded from Kamchatka. The stem is irregularly and plentifully branched several times, attaining 6 cm in height. The hydrothecae are cylindrical, with 3 teeth. Gonosome unknown.

Distribution. Kamchatka (Kirchenpauer).

Symplectoscyphus pinnatus (Clarke)

Sertularella pinnata: Mereschkowsky, 1878, p. 450, pl. 17, fig. 23; Kirchenpauer, 1884, p. 47; Nutting, 1904, p. 94, pl. 21, fig. 10-12; Linko, 1912, p. 117, fig. 16.
Sertularella fruticulosa: Kirchenpauer, 1884, p. 50, pl. 16, fig. 8, 8a-b.
Symplectoscyphus pinnatus: Stechow, 1923, p. 13, no. 131.

Distribution. Kamchatka (Kirchenpauer); Alaska; Pacific coast of North America; Canadian Arctic.

Sertularella mirabilis Jäderholm

Sertularella mirabilis: Jäderholm, 1896, p. 9, pl. 2, fig. 1; ——, 1902, p. 4, pl. 1, fig. 1; ———, 1903, p.281; ——, 1919, p. 17; Nutting, 1927, p. 216, pl. 42, fig. 3-4.
Serta mirabilis: Stechow, 1923, p. 13, no. 132.

The species is very characteristic in its appearance. The colony is

cylindrical, attaining 10 cm in height. The stem is irregularly branched, and the branches and branchlets are very profusely anastomosed, giving a sponge-like appearance. The hydrothecae are alternate, distinct, rather small, with 2-4 low rugosities. The gonothecae are small, sphaerical, with 4-5 irregular annular corrugations. Stechow (1919) separated the species from *Sertularella* and proposed a new genus *Serta* for it, but I think that the species is a member of *Sertularella* because of its character of hydrothecae.

Distribution. Misaki (Jäderholm), Hirado-strait, Goto Isls., Okinoshima, Kyushu (Jäderholm); South Japan (Jäderholm); Amoy and Hong Kong (Jäderholm, Nutting).

Sertularella gigantea Mereschkowsky

Sertularella gigantea: Mereschkowsky, 1878, p. 330, pl. 14, fig. 6-7; Jäderholm, 1896, p. 10; Stechow, 1923, p. 14 no. 142; Yamada, 1950, p. 11, pl. 1, fig. 10; ——, 1955, p. 18, fig. 2; ——, 1957, p. 158.

Sertularella polyzonias gigantea: Kirchenpauer, 1884, p. 38; Linko, 1912, p. 126, fig. 19.

This is one of the typical boreal species and has been reported from northern Japanese water, southwards to Korea strait. In Akkeshi Bay the species can not be found in shallow water and is always get washed ashore.

Distribution. Akkeshi (Yamada), Vladivostok (Yamada), Korea strait (Jäderholm), northern part of the Sea of Japan (Linko), Sakhalin (Linko), Sea of Okhotsk (Linko), Kamchatka (Linko); Bering Sea; Alaska; Arctic Sea; Iceland; Greenland; Antarctic.

Sertularella levigata Stechow

Sertularella levigata: Stechow, 1931, p. 183; —— & Uchida, p. 559, fig. 9; Leloup, 1940, p. 9.

Some specimens were collected from Mutsu Bay and described by Stechow. The colony is rather small, attaining 12 mm in height. The gonothecae are not known. The species was afterwards reported from Sagami Bay by Leloup.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida), Sagami Bay (Leloup).

Sertularella brandti Linko

Sertularella brandti: Linko, 1912, p. 119, fig. 17; Kudelin, 1914, p. 494; Stechow, 1923, p. 14, no. 143; ——, 1926, p. 102.

Linko (1912) described the species from Kamchatka. According to his description, the hydrothecae are very closely placed, with smooth wall and a large aperture which is margined with 4 very low teeth. The gonothecae are unknown.

Distribution. Kamchatka (Linko); Alaska.

Sertularella miurensis Stechow

Sertularella sp.: Inaba, 1890, no. 9, fig. 22-25; ——, 1892a.
Sertularella indivisa: Stechow, 1913, p. 134, fig. 106-107.
Sertularella miurensis: Stechow, 1921c, p. 258; ——, 1923, p. 13, no. 134; ——, 1923a, p. 175, fig. T; Yamada, 1950, p. 11; ——, 1957, p. 158; ——, 1958, p. 57; Uchida, 1958, p. 163.

This is one of the commonest hydroid in Japan. The colonies are found on algae in shallow water and attract one's attention for its yellowish brown colour. A wide range of variation is visible within this species, of which I will discuss in other report.

Distribution. All around Hokkaido (Yamada), Matsushima, Sagami Bay (Inaba, Stechow), Sado (Uchida), Maizuru, Sugashima, Kishu (Inaba), Matsuyama (Yamada), Vladivostok (Yamada).

Sertularella miurensis var. *pungens* Stechow

Sertularella miurensis pungens: Stechow, 1931, p. 182; —— & Uchida, 1931, p. 556, fig. 7.

The variety was described by Stechow (1931) for some specimens from Mutsu Bay. The gonothecae are characteristic, oval with 3 large prominent spines on the top.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida), Hakodate.

Sertularella miurensis var. *obtusa* Stechow

Sertularella obtusa: Stechow, 1931, p. 182; —— & Uchida, 1931, p. 558, fig. 8.

Stechow (1931) described *Sertularella obtusa* from Mutsu Bay. As stated above, a wide range of variation is recognizable in this species, this Stechow's species should be a variety of this species.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida).

Sertularella sagamina Stechow

Sertularella sagamina: Stechow, 1921c, p. 257; ——, 1923, p. 13, no. 135; ——, 1923a, p. 177, fig. U.; Yamada, 1950, p. 13, pl. 1, fig. 13-14.

Although Stechow described that the gonothecae spring directly from hydrorhiza, I found the specimens of which the gonothecae spring both from hydrorhiza and from hydrocauli.

Distribution. Sagami Bay (Stechow), Akkeshi (Yamada).

Sertularella japonica Stechow

Sertularella japonica: Stechow, 1926, p. 104.

The material, on which Stechow (1926) described this species, was found from Sagami Bay, covering an antenna of a Palinurid lobster. Although no figures are given by him, his description shows that the stem is unbranched or rarely branched, attaining 1.3 cm in height, and the hydrothecae are alternate, without annular constrictions, with 3 rather large teeth and 3 large inner teeth. Gonosome unknown.

Distribution. Sagami Bay (Stechow).

Sertularella inabai Stechow

Diphasia sp. ?: Inaba, 1890, no. 11, fig. 29-31.
Sertularella inabai: Stechow, 1913, p. 141; ——, 1913a, p. 130, fig. 101-103; Jäderholm, 1919, p. 19; Stechow, 1923, p. 14, no. 138; —— & Uchida, 1931, p. 561; Uchida, 1958, p. 163.

The species is distinguishable from other members of *Sertularella* in its shape of gonothecae. The gonothecae (female) are large, elongated oval, with 6-7 longitudinal ribs which become to be distinct spines upwards, and with a mouth with 6 teeth. The species is rather commonly found in shallow sea from Mutsu Bay to Kyushu.

Distribution. Mutsu Bay (Stechow & Uchida); Sagami Bay (Inaba, Stechow, Jäderholm), Sado (Uchida), Kyushu.

Sertularella albida Kirchenpauer

Sertularella albida: Kirchenpauer, 1884, p. 42; Nutting, 1904, p. 86, pl. 19; fig. 1-2; Linko, 1912, p. 116; Stechow, 1923, p. 14, no. 144.
Sertularella robusta: Hartlaub, 1900, p. 26, fig. 6, 7, 15, 21, 25.

This species was first described by Kirchenpauer (1884) from Kamchatka and afterwards reported from several localities in the northern Pacific.

Distribution. Kamchatka (Kirchenpauer); Bering Sea; Pacific coast of Canada.

Sertularella diaphana (Allman)

Thuiaria sp.: Inaba, 1890, no. 17, fig. 46-48.
Sertularella tridentata: Stechow, 1913a, p. 137, fig. 111-113.
Sertularella lata ?: Stechow, 1923, p. 14, no. 139.
Thuiaria quadrilateralis: Hargitt, 1924, p. 493, pl. 5, fig. 17.
Sertularella diaphana: Billard, 1925, p. 157, fig. 22, pl. 7, fig. 12-13; Yamada, 1958, p. 58, fig. 3.

The species has been treated by some workers under different names as shown above synonymic list. It seems most reasonable to identify them with this species. The species is probably not rare in the central Japanese water.

Distribution. Misaki (Inaba, Stechow), Matsuyama (Yamada); Philippines; Indonesia; Hawaii; West Indies; Australia.

Sertularella quinquelaminata Stechow

Sertularella quinquelaminata: Stechow, 1931, p. 180: —— & Uchida, 1931, p. 553, fig. 5.

Stechow (1931) described this species from Mutsu Bay. The hydrothecae are of elongated flask shape, distinctly narrowed a little apart from the mouth, with 5 large distinct inner teeth. Gonosome unknown.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida).

Sertularella mutsuensis Stechow

Sertularella mutsuensis: Stechow, 1931, p. 181; —— & Uchida, 1931, p. 554, fig. 6.

Only one colony bearing 2 hydrothecae has been collected from Mutsu Bay. Gonothecae are not known.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida).

Sertularella rugosa (Linné)

Sertularella rugosa: Mereschkowsky, 1878 p. 19; Kirchenpauer, 1884, p. 42; Nutting, 1904, p. 82, pl. 17, fig. 1-5; Linko, 1912, p. 133, fig. 20; Yamada, 1950, p. 13, pl. 1, fig. 12.

This well-known species has been recorded from Akkeshi. The hydrothecae are very closely placed, borrel-shaped, and the hydrothecal wall is marked by 2-4 remarkable rugosities which are indistinct in abcauline side.

Distribution. Akkeshi (Yamada); Bering Sea; Pacific and Atlantic coasts of North America; British Isls.; Helgoland; Arctic Sea; Peru, Garapagos; India.

Sertularella spirifera Stechow

Sertularella spirifera: Stechow, 1931, p. 184; —— & Uchida, 1931, p. 561, fig. 10, pl. 15, fig. 4.

The colony is rather large, attaining 8 cm in height, consisting of stems and branches. The hydrothecae are rather distantly placed each other, with 2-3 distinct rugosities on the wall. The gonothecae are large, elongate oval, with transverse rings and with 3-5 spines around the mouth somewhat apart from the top.

Distribution. Mutsu Bay (Stechow, Stechow & Uchida).

Sertularella spinosa Kirchenpauer

Sertularella spinosa: Kirchenpauer, 1884, p. 43, pl. 15, fig. 5, 5a; Jäderholm, 1902, p. 4; Stechow, 1923, p. 14, no. 141.

The species has been known only from the Japanese waters. Kirchenpauer's figure (1884, Fig. 5) shows the hydrothecae with rather distinct annular rugosities, while Hartlaub says that the hydrothecal wall is not so corrugated. The gonothecae are annulated with 6-8 rugosities and bear 2-3 long or short remarkable spines.

Distribution. Yokohama (Kirchenpauer), Nagasaki (Kirchenpauer, Jäderholm), Goto Isls., Kyushu (Jäderholm).

Sertularella areyi Nutting

Sertularella areyi: Nutting, 1904, p. 83, pl. 17, fig. 6; Stechow, 1913a, p. 128, fig. 98; Jäderholm, 1919, p. 18, pl. 4, fig. 6; Stechow, 1923, p. 13, no. 133.

The species has been known from Sagami Bay, Kyushu and the Bonin Isls., but the collected materials are not so much. The hydrothecae are very distantly placed, bearing the wall marked with 2 distinct annular rugosities. Jäderholm (1919) described the gonothecae; these are oval, with 9-10 distinct annular rugosities and 4 conical spines at the top.

Distribution. Sagami Bay (Stechow), Kagoshima (Jäderholm), Bonin Isls. (Jäderholm); West Indies.

Sertularella tenella (Alder)

Sertularella tenella: Kirchenpauer, 1884, p. 44; Nutting, 1904, p. 83, pl. 18, fig. 1-2; Jäderholm, 1919, p. 17, fig. 4; Stechow, 1923, p. 13, no. 136; Yamada, 1950, p. 12, pl. 1, fig. 11.

Sertularella atlantica: Stechow, 1920, p. 21, fig. 2A; ——, p. 183, fig. Ala.

This widely distributed species has been known from the Bonin Islands and Akkeshi. Stechow (192, 1923) redescribed the species which had been described under the name of this species and divided them into 3 different species, namely *Sertularella atlantica, S, tenella* and *S. geniculata*, and referred Jäderholm's species to *S. atlantica*. I think, however, that this Stechow's subdivision is unreasonable.

Distribution. Akkeshi (Yamada), Bonin Isls. (Jäderholm); Pacific and Atlantic coasts of North America; West Indies; Brazil; Greenland; British Isls.; Atlantic coast of France; Portugese West Africa; Angola.

Sertularella sinensis Jäderholm

Sertularella sp.: Inaba, 1892c, fig. 11-12.

Sertularella sinensis: Jäderholm, 1896, p. 11, pl. 2, fig. 2-3; ——, 1903, p. 280;

Stechow, 1913a, p. 129, fig. 99-100; Jäderholm, 1919, p. 17; Stechow, 1923, p. 13, no. 137; Hiro, 1939, p. 175, fig. 8.

The species is rather commonly found in southern Japanese coast in moderate depth. Hiro (1938) reported the species from off Seto which covers the carapace of the giant crab, *Macrocheira kaempferi* de Haan.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm), Seto (Hiro), Goto Isls. (Jäderholm), South Japan (Jäderholm), Formosa strait (Jäderholm), Bonin Isls. (Jäderholm).

Sertularella gayi var. *gracilescens* Jäderholm

Sertularella gayi gracilescens: Jäderholm, 1919, p. 17, pl. 4, fig. 5; Stechow, 1923, p. 14, no. 140.

The variety was first described by Jäderholm (1919) from the Goto Islands, in the depth of 180 m. We have no further records since. It differs from the typical form in branches springing towards all sides of stem and also in smaller hydrothecae. Gonothecae unknown. The species has a world-wide distribution; it is known from all around the coasts of the Atlantic, the Indian Ocean, western Pacific and the Antarctic.

Distribution. Goto Isls. (Jäderholm).

Sertularella costata Leloup

Sertularella costata: Leloup, 1940, p. 11, fig. 1.

Distribution. Sagami Bay (Leloup).

Abietinaria abietina (Linné)

Abietinaria abietina: Kirchenpauer, 1884, p. 31; Nutting, 1904, p. 114, pl. 32, fig. 1-3; Stechow, 1923, p. 14, no. 149.

This well-known species has been recorded from Kamchatka. The colony is very large, usually 8-10 cm high but attaining 30 cm in largest specimen. The gonothecae are elliptical, with the smooth or slightly corrugated wall and an entire margin at the distal end.

Distribution. Kamchatka (Kirchenpauer); Arctic Sea; Bering Sea; Alaska; Pacific and Atlantic coasts of North America; Greenland; British coasts; Mediterranean; Madeira.

Abietinaria variabilis (Clarke)

Abietinaria variabilis: Nutting, 1904, p. 115, pl. 32, fig. 4-7; Stechow, 1913a. p. 144, fig. 118; ——, 1923, p. 14, no. 146.

Stechow (1913a) reported this species from Sagami Bay, in depth of 70-180 m. As the material was destitute of gonothecae, he said that

the identification was not so perfectly certain.

Distribution. Okinose, Sagami Bay (Stechow); Arctic Sea; Bering Sea; Aleutian Isls.; Alaska; California.

Abietinaria filicula (Ellis & Solander)

Abietinaria filicula: Kirchenpauer, 1884, p. 32; Nutting, 1904, p. 117, pl. 34, fig. 1; Stechow, 1923, p. 14, no. 150.

The species was reported by Kirchenpauer from Kamchatka. It is very similar to *A. abietina* but usually smaller than it.

Distribution. Kamchatka (Kirchenpauer); Aleutian Isls.; Alaska; Pacific and Atlantic coasts of North America; White Sea; Greenland; North Atlantic.

Abietinaria traski (Torrey)

Abietinaria traski: Nutting, 1904, p. 118, pl. 33, fig. 6-11; Stechow, 1913a, p. 145; —— 1923, p. 14, no. 145.

The species has been recorded by Stechow from Sagami Bay, in 180 m deep. The specimen collected attains 5 cm in height, with no gonothecae.

Distribution. Sagami Bay (Stechow); Pacific coast of North America.

Abietinaria costata (Nutting)

Abietinaria costata: Nutting, 1904, p. 122, pl. 36, fig. 9-12; Yamada, 1950, p. 14, pl. 1, fig. 15; ——, 1957, p. 158.

Diphasia costata: Kudelin, 1914, p. 411, fig. 125, 142, pl. 3, fig. 9.

This is one of the commonest hydroids in shallow water in northern Japan. The colony attains a height of 6 cm. The gonothecae are oblong-ovate in shape, with a small tubular neck and a round aperture, with 4-5 remarkable longitudinal ridges.

Distribution. Akkeshi, Muroran (Yamada) and other coasts of Hokkaido, Vladivostok (Kudelin, Yamada), Kamchatka (Kudelin); Alaska.

Abietinaria juniperus Kirchenpauer

Abietinaria juniperus: Kirchenpauer, 1884, p. 33, pl. 14, fig. 2; Stechow, 1923, p. 14, no. 147.

This Kirchenpauer's species has been known from the Kuril Islands. The colony is rather small, 2-3 cm high, looking like a delicate bush. The gonothecae are oval, with distinct annular rugosities.

Distribution. Kuril Isls. (Kirchenpauer).

Abietinaria tilesii Kirchenpauer

Abietinaria tilesii: Kirchenpauer, 1884, p. 34, pl. 14, fig. 3; Stechow, 1923, p. 15, no. 151.

The species was described by Kirchenpauer from Kamchatka. The colony is 6-7 cm in height. The gonothecae are rather characteristic, elongate oval, with 4-5 annular rugosities on lower half and a mouth on upper half; the mouth is situated on the side, comparatively large, elliptical in shape, with several small spines which are turning inwards.

Distribution. Kamchatka (Kirchenpauer).

Abietinaria merki Kirchenpauer

Abietinaria merki: Kirchenpauer, 1884, p. 35, pl. 14, fig. 1; Stechow, 1923, p. 15, no. 152.

According to Kirchenpauer's description, this species is similar to *A. tilesii* Kirchenpauer, but is distinguishable in some smaller points of its trophosome and gonosome. Further material of this species is desirable to get in future.

Distribution. Kamchatka (Kirchenpauer).

Abietinaria melo Kirchenpauer

Abietinaria melo: Kirchenpauer, 1884, p. 33, pl. 14, fig. 4; Stechow, 1923, p. 14, no. 148.

Kirchenpauer described the species from the Kuril Islands. The colony attains 10 cm in height. The gonothecae are elongated, slightly expanded in somewhat upper or lower part from the middle, tapering to both ends. The gonothecal wall is marked with some transverse and longitudinal rugosities.

Distribution. Kuril Isls. (Kirchenpauer).

Lagenitheca compressa (Mereschkowsky)

Sertularia compressa: Mereschkowsky, 1878, p. 446, pl. 17, fig. 17-19.
Lagenitheca compressa: Stechow, 1923, p. 15, no. 154.

The species is characterized by the compressed form of its hydrothecae. Stechow (1921) proposed a genus, *Lagenitheca*, for this species. It seems to me that some doubts have yet remained about its systematic position.

Distribution. Port Ajan, Sea of Okhotsk (Mereschkowsky).

Amphisbetia furcata (Trask)

Sertularia sp.: Inaba, 1892, no. 41, fig. 6-10.

Sertularia pulchella: Nutting, 1904, p. 55, pl. 2, fig. 6-7.
Sertularia furcata: Stechow, 1913, p. 148, fig. 126-128.
Amphisbetia furcata: Stechow, 1923, p. 15, no. 155; Yamada, 1958, p. 59.

The species is rather commonly found in the central Japanese water, mainly attached on algae. The stem is unbranched, 5-8 mm in height, with 6-12 pairs of opposite hydrothecae. A gonotheca grows in each stem, globular, with a round aperture.

Distribution. Kishu, Wakayama Pref. (Inaba, Stechow), Matsuyama (Yamada); Pacific coasts of North and Central America; Brazil; Australia.

Amphisbetia pacifica Stechow

Amphisbetia pacifica: Stechow, 1931, p. 185; —— & Uchida, 1931, p. 563, fig. 11; Yamada, 1955b, p. 19, fig. 3.

The species was originally described by Stechow (1931) from Mutsu Bay on the specimens without gonosomes. Recently I have reported the gonosome from Muroran. The species is very similar to the preceding species, *A. furcata*, in both trophosome and gonosome. The species, however, is distinguishable from it in having 2 distinct spiral constrictions at the base of the stem and in gonothecae which are not globular but elongated oval and having unremarkable shoulders.

Distribution. Muroran (Yamada), Mutsu Bay (Stechow, Stechow & Uchida).

Amphisbetia nasonowi (Kudelin)

Sertularia nasonowi: Kudelin, 1913, p. 334.
Amphisbetia nasonowi: Stechow, 1923, p. 15, no. 156.

This species has been reported from the Sea of Okhotsk. The species is easily distinguishable from preceding 2 species of *Amphisbetia* in its larger colony. The colony attains 7 cm in height.

Distribution. Sea of Okhotsk (Kudelin).

Sertularia distans (Lamouroux)

Sertularia sp.: Inaba, 1890, no. 22, fig. 60-62.
Sertularia distans: Stechow, 1913a, p. 147, fig. 125; ——, 1919a, p. 94, fig. K1; Jäderholm, 1919, p. 14, pl. 3, fig. 7; Leloup, 1938, p. 17; Yamada, 1955, p. 355, pl. 23, fig. 3; Uchida, 1958, p. 163.
Dynamena distans: Stechow, 1923, p. 12, no. 119.
Caminothujaria sagamina: Stechow, 1923a, p. 203.

The species is found on algae in the central and southern Japanese waters. The stem attains 10 mm in height. The gonosomes have not yet been found from Japan.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm, Leloup), Sado (Uchida), Tokara Isls. (Yamada), Bonin Isls. (Jäderholm).

Sertularia distans var. *gracilis* Hassall

Sertularia sp.: Inaba, 1890, no. 20, fig. 55-56.
Sertularia gracilis: Stechow, 1913, p. 146, fig. 121-124.
Tridentata gracilis: Stechow, 1923, p. 15, no. 157.
Sertularia distans gracilis: Billard, 1925, p. 175, fig. 33.

The variety has been identified by many workers with *Sertularia gracilis*, for these years. As the difference between *S. distans* and *S. gracilis* is not much, it seems to be reasonable to treat our specimens as a variety of *S. distans*. The gonosomes have not yet been found from Japan.

Distribution. Misaki (Inaba, Stechow); Indonesia; Indian Ocean; Atlantic coast of North America; West Indies; British Isles; Atlantic coast of France; Azores.

Sertularia turbinata (Lamouroux)

Sertularia sp.: Inaba, 1890, no. 21, fig. 57-59.
Sertularia turbinata: Stechow, 1913, p. 145, fig. 119-120; Jäderholm, 1919, p. 14, pl. 3, fig. 8.
Tridentata turbinata: Stechow, 1923, p. 15, no. 158.

The species has been known from Sagami Bay and from the Bonin Islands. It is similar to the preceding variety, *S. distans gracilis*, but according to Inaba it is distinguishable from the latter in having a fold on the inner side of the hydrotheca and in the form of the joint of the stem. The gonosomes are unknown in Japan.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm), Bonin Isls. (Jäderholm); Indonesia; Mergui Archipelago; West Indies; Antarctic Sea.

Sertularia rugosissima (Thornely)

Sertularia rugosissima: Thornely, 1904, p. 118, pl. 2, fig. 4; Jäderholm, 1919, p. 15, pl. 3, fig. 9.
Tridentata rugosissima: Stechow, 1923, p. 15, no. 159.

Jäderholm (1919) reported the species from the Bonin Islands. The stem attains 8 mm in height, unbranched. The hydrothecae are oppositely arranged, with 10-12 annular rugosities in the wall, of which the species can be distinguishable from other species of *Sertularia*. Gonosome unknown.

Distribution. Bonin Isls. (Jäderholm); Ceylon.

Sertularia exigua Allman

Sertularia exigua: Allman, 1877, p. 24, pl. 16, fig. 7-8; Fraser, 1936, p. 50, pl. 1, fig. 4.

Some specimens with gonosomes were collected from Sagami Bay in

5 m in depth, and reported by Fraser (1936). According to Fraser's description, the stems are scarcely branched, attaining 1.5 cm in height, and the hydrothecae are opposite on stem or branches. The gonothecae are oval or slightly ovate, with a distinct neck and a round margin.

Distribution. Sagami Bay (Fraser); Pacific and Atlantic coasts of North America.

Sertularia hattorii (Leloup)

Sertularia hattorii: Leloup, 1940, p. 3, fig. 1.

Distribution. Sagami Bay (Leloup).

Sertularia tenera G. O. Sars

Thuiaria tenera: Nutting, 1904, p. 70, pl. 11, fig. 9-12.
Sertularia tenera: Kudelin, 1914, p. 148, fig. 21-23; Jäderholm, 1919, p. 15, pl. 6, fig. 1; Stechow, 1923, p. 15, no. 163; Yamada, 1950, p. 15, pl. 1, fig. 16.

This species is distributed in the northern Japanese sea, extending southwards to the Sea of Japan and the Goto Islands. The stem attains 5 cm in height, giving off alternate branches at nearly right angles with the stem. The branches are present almost in one plane. Gonosomes unknown.

Distribution. Akkeshi (Yamada), Sea of Okhotsk (Kudelin), Sea of Japan (Kudelin), Goto Isls., Kyushu (Jäderholm); Bering Sea; Pacific and Atlantic coasts of Canada; Greenland; Norway; Sweden; British Isles and France.

Sertularia cupressoides Clarke

Thuiaria dalli: Nutting, 1904, p. 68, pl. 10, fig. 4-6.
Sertularia cupressoides: Kudelin, 1914, p. 200, fig. 46-48; Yamada, 1950, p. 15, pl. 1, fig. 17-19; ——, 1957, p. 159.

The colony is plumose in appearance, usually 6-10 cm in height but may be attaining 16 cm. The gonosomes are provided with 2 remarkable horn-like shoulder spines.

Distribution. Akkeshi (Yamada), Vladivostok (Yamada), Sea of Okhotsk (Kudelin); Alaska; Pacific coast of North America; Newfoundland.

Sertularia heteroclada (Jäderholm)

Thuiaria heteroclada: Jäderholm, 1902, p. 5, pl. 1, fig. 2-4.
Sertularia heteroclada: Stechow, 1923, p. 15, no. 164.

The species has been collected in Hirado strait in Kyushu and described by Jäderholm. The stem attains 9 cm in height. In lower part of the colony, the branches are regularly alternate, while in upper part

these are irregularly sub-divided and are towards all sides of the stem showing a bush-like appearance. The gonothecae are obconical, having 12-17 remarkably long spines above. The species is similar to *Salacia aculiloba,* however, the hydrothecal margin is entirely smooth and the spines of gonothecae are less in number.

Distribution. Hirado strait (Jäderholm).

Sertularia suensoni Levinsen

Sertularia suensoni: Levinsen, 1913, p. 300, pl. 4, fig. 16-20; Stechow, 1923, p. 15, no. 160.

Only one colony without gonosomes was collected at the north-east coast of Korea from 110 m in depth. This species and two following ones were described as new species by Levinsen (1913), from the Japanese water. These species are very similar to each other in trophosome and also in gonosome, and I have some doubts for separating them into 3 different species. As the examination of the type specimens is now impossible to me, I describe here provisionally 3 different species.

Distribution. North-east coast of Korea (Levinsen).

Sertularia nuttingi Levinsen

Sertularia nuttingi: Levinsen, 1913, p. 303, pl. 4, fig. 1-4; Stechow, 1923, p. 15, no. 161.

Eight colonies with gonangia were collected between the Goto Islands and Kyushu, from 60 m in depth.

Distribution. Goto Isls., Kyushu (Levinsen).

Sertularia intermedia Levinsen

Sertularia intermedia: Levinsen, 1913, p. 304, pl. 4, fig. 7-10; Stechow, 1923, p. 15, no. 162.

One mature and 2 small immature colonies were collected at the Korea Strait, from 90 m in depth. The mature colony attains 9.5 cm in height.

Distribution. Korea-Strait (Levinsen).

Salacia pyriformis (Fraser)

Sertularia pyriformis: Fraser, 1936, p. 51, pl. 2, fig. 5.

The colony is small. The stem is unbranched or branched, about 8 mm in height. The hydrothecae are opposite on stem or branches, without teeth on the margin. The gonothecae are rather large, pear-shaped.

Distribution. Sagami Bay (Fraser).

Salacia lonchitis (Ellis & Solander)

Thuiaria lonchitis: Jäderholm, 1903, p. 288.
Salacia lonchitis: Stechow, 1923, p. 16, no. 168.

Jäderholm's record of this species in Japan originates from the specimens collected in South Japan, in depth of ca. 55 m. The exact locality is unknown.

Distribution. South Japan (Jäderholm); Pacific and Atlantic coasts of North America; North-eastern Atlantic; Arctic Sea.

Salacia marktanneri (Stechow)

Monopoma variabilis: Marktanner, 1890, p. 246, fig. 10, 10a-c.
Thuiaria marktanneri: Stechow, 1913, p. 143; ——, 1913a, p. 155.
Salacia marktanneri: Stechow, 1923, p. 16, no. 171.

Distribution. Yellow Sea (Marktanner).

Salacia lichenastrum (Pallas)

Thuiaria lichenastrum: Kirchenpauer, 1884, p. 23, pl. 13, fig. 1.
Salacia lichenastrum: Stechow, 1923, p. 16, no. 174.

Distribution. Kamchatka (Kirchenpauer); Philippines; Indonesia; Singapore; Ceylon; Australia.

Salacia stelleri (Kirchenpauer)

Thuiaria stelleri: Kirchenpauer, 1884, p. 20, pl. 12, fig. 4.
Salacia stelleri: Stechow, 1923, p. 16, no. 173.

Distribution. Kamchatka (Kirchenpauer).

Salacia acutiloba (Kirchenpauer)

Thuiaria acutiloba: Kirchenpauer, 1884, p. 19, pl. 12, fig. 2.
Salacia acutiloba; Stechow, 1923, p. 16, no. 172.

A fragment of a colony attaining 4 cm in height was collected from the North Pacific, probably from Kamchatka or the Kuril Islands. A bush-like colony has a stem and branches which are irregularly given rise and bears gonothecae. The gonothecae are provided with 5-6 remarkable long processes on the distal end.

Distribution. Probably Kamchatka or Kuril Isls. (Kirchenpauer).

Salacia crassicaulis (Allman)

Thuiaria crassicaulis: Allman, 1876, p. 267, pl. 16, fig. 1-5.

Salacia crassicaulis: Stechow, 1923, p. 16, no. 169.
Distribution. Japan (Allman).

Salacia coronata (Allman)

Thuiaria coronifera: Allman, 1876, p. 268, pl. 17, fig. 1-3.
Salacia coronata: Stechow, 1923, p. 16, no. 170.

According to Allman's description the gonothecae are ovate, with 9 bifurcating spines.

Distribution. Japan (Allman).

Pericladium tataricum (Kudelin)

Sertularia tatarica: Kudelin, 1913, p. 335.
Pericladium tataricum: Stechow, 1923, p. 16, no. 166.

The species was described by Kudelin (1913) from the northern part of the Sea of Japan. The branches are given off spirally from the stem. The hydrothecae are arranged in 6 longitudinal rows.

Distribution. Gulf of Tartary (Mamiya-strait) (Kudelin).

Pericladium bidentatum Allman

Pericladium bidentatum: Allman, 1876, p. 273, pl. 20, fig. 1-4; Stechow, 1923, p. 16, no. 165.

Allman (1876) reported the species from Japan. The stem attains about 10 cm in height, giving off the branches to all sides spirally. Allman did not describe the number of hydrothecal rows, but it seems to be 8-10, surmising from his figures.

Distribution. Japan (Allman).

Pericladium ochotense (Mereschkowsky)

Selaginopsis ochotensis: Mereschkowsky, 1878, p. 440, pl. 16, fig. 11-12.
Pericladium ochotense: Stechow, 1923, p. 16, no. 167.

The stem bears branches on all sides, each of which is divided into 6 branchlets. The hydrothecae are arranged in 8-9 longitudinal rows. The gonothecae are pyriform, with the smooth wall.

Distribution. Sea of Okhotsk (Mereschkowsky).

Selaginopsis triserialis Mereschkowsky

Selaginopsis triserialis: Mereschkowsky, 1878, p. 435, pl. 16, fig. 1-2; Nutting, 1904, p. 129, pl. 39, fig. 1-2; Stechow, 1923, p. 17, no. 181; Yamada, 1950, p. 16, pl. 1, fig. 20.

Sertularia triserialis: Kudelin, 1914, p. 324.

The colony shows rather slender, not so robust appearance in comparison with the following forms of *Selaginopsis*. The hydrothecae are arranged in 3 rows on the distal part of the branches, while in 2 rows on the proximal part. The species was first described by Mereschkowsky (1878) from Kamchatka and recently has reported from Akkeshi. This is a boreal form, and is one of the common hydroids in the northern Japanese waters, in depth of some meters.

Distribution. Akkeshi (Yamada); Kamchatka (Mereschkowsky); Sea of Okhotsk; Arctic Sea; Alaska; California.

Selaginopsis pinnata Mereschkowsky

Selaginopsis pinnata: Mereschkowsky, 1878, p. 436, pl. 16, fig. 3-4; Nutting, 1904, p. 130, pl. 39, fig. 6; Stechow, 1923, p. 16, no. 177.

The colony is pinnate, about 7 cm in height, with regular branches which are all in one plane. The hydrothecae are arranged in 4 longitudinal rows. The gonosome is unknown.

Distribution. Port Ajan, Sea of Okhotsk (Mereschkowsky); Bering Sea; Pacific coast of Canada.

Selaginopsis allmani Norman

Selaginopsis fusca: Allman, 1876, p. 272, pl. 12, fig. 1, pl. 19, fig. 1-2.
Selaginopsis allmani: Stechow, 1923, p. 16, no. 176.

The stem is irregularly branched, attaining 10 cm in height. The branches are present in one plane. The hydrothecae are arranged in 4 longitudinal rows. The gonosome is unknown.

Distribution. Japan (Allman).

Selaginopsis cedrina (Linné)

Selaginopsis pacifica: Mereschkowsky, 1878, p. 438, pl. 16, fig. 5-7.
Selaginopsis cedrina: Kirchenpauer, 1884, p. 8, pl. 11, fig. 1, 1a-b; Nutting, 1904, p. 130; Stechow, 1923, p. 17, no. 180.

The species has been reported by Kirchenpauer from Kamchatka. The branches are irregularly alternate and are usually branched again. The hydrothecae are arranged in 4, rarely 5, rows. The gonothecae are obovate, with slight transverse corrugations.

Distribution. Kamchatka (Kirchenpauer); Bering Sea.

Selaginopsis purpurea (Linné)

Selaginopsis purpurea: Kirchenpauer, 1884, p. 9, pl. 11, fig. 3.

Abacella purpurea: Stechow, 1923, p. 15, no. 153.

The species was reported from Kamchatka by Kirchenpauer. The hydrothecae are arranged in 4 longitudinal rows.

Distribution. Kamchatka (Kirchenpauer).

Selaginopsis thuja Mereschkowsky

Selaginopsis thuja: Mereschkowsky, 1878, p. 439, pl. 16, fig. 8-10; Stechow, 1923, p. 16, no. 179.

In this species the branches spring from all sides of the stem and the hydrothecae are arranged in 6-7 longitudinal rows. The gonothecae are oval.

Distribution. North Pacific Ocean, probably from the Sea of Okhotsk or Kamchatka (Mereschkowsky).

Selaginopsis breitfussi (Kudelin)

Thuiaria breitfussi: Kudelin, 1914, p. 244, fig. 78, 78a, pl. 2, fig. 9.
Selaginopsis breitfussi: Yamada, 1950, p. 17, pl. 1, fig. 23.

The species has been reported from Akkeshi. The gonosome is unknown.

Distribution. Akkeshi (Yamada); Arctic Sea.

Selaginopsis decemserialis Mereschkowsky

Selaginopsis decemserialis: Mereschkowsky, 1878, p. 442, pl. 17, fig. 13-16; Stechow, 1923, p. 16, no. 178; Yamada, 1950, p. 16, pl. 1, fig. 21-22.

The branches spring from all sides of the bending point of the stem and are divided more. The hydrothecae are arranged in 9-12 longitudinal rows. The gonothecae are elongate oval, with a broad collar and smooth wall.

Distribution. Akkeshi (Yamada); North Pacific Ocean (Mereschkowsky).

Plumulariidae

Kirchenpaueria curvata Jäderholm

Halecium magellanicum: Linko, 1911, p. 15.
Kirchenpaueria curvata: Stechow, 1923, p. 17, no. 182.

Distribution. Vladivostok (Linko).

Pycnotheca mirabilis (Allman)

Plumularia producta: Inaba, 1890, no. 25, fig. 69-70; ——, 1892c, fig. 1-2.

Diplocheilus allmani: Stechow, 1907, p. 199; ——, 1909, p. 88.
Diplocheilus mirabilis: Stechow, 1913a, p. 88, fig. 55-56.
Plumularia (*Diplocheilus*) *mirabilis*: Jäderholm, 1919, p. 23.
Pycnotheca mirabilis: Stechow, 1923, p. 17, no. 183; Yamada, 1958, p. 59.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm), Matsuyama (Yamada), Okinoshima, Kyushu (Jäderholm), Bonin Isls. (Jäderholm); California; Australia; South Africa.

Antenella secundaria (Gmelin)

Plumularia sp.: Inaba, 1890, fig. 63-64; ——, 1892.
Antenella secundaria: Stechow, 1907, p. 199; ——, 1909, p. 84; ——, 1913a, p. 89; Jäderholm, 1919, p. 20; Stechow, 1923, p. 17, no. 184; Billard, 1913, p. 8, fig. 1, pl. 1, fig. 1-3; Leloup, 1938, p. 18, fig. 13; Yamada, 1958, p. 59.

This well-known cosmopolitan hydroid is also commonly found in the central and southern Japanese coasts. In Sagami Bay the species has been collected in the depths of 0-720 m.

Distribution. Sagami Bay (Inaba, Stechow, Jäderholm, Leloup), Sugashima (Inaba), Matsuyama (Yamada), Bonin Isls. (Jäderholm); Indonesia; Indian Ocean; around Africa; Mediterranean; Atlantic coast of Europe; West Indies.

Antenella suensoni (Jäderholm)

Antenella suensoni: Jäderholm, 1896, p. 13, pl. 2, fig. 5; Stechow, 1923, p. 17, no. 185.

The hydrorhiza of this species is very well developed. It is plentifully branched, somewhat rising from the substratum forming a dense compact layer. The species is distinguishable from other 2 species of *Antennella* in this character. The species was reported by Jäderholm (1896) from Kyushu, in depth of 80 cm.

Distribution. Hirado strait, Kyushu (Jädenholm).

Antenella paucinoda Fraser

Antenella paucinoda: Fraser, 1935, p. 110, pl. 2, fig. 10.

The hydrocladia spring directly from hydrorhiza, attaining 3.5 cm in height. The species was reported by Fraser (1935) from Sagami Bay, in 70-80 m.

Distribution. Hayama, Sagami Bay (Fraser).

Antenella variabilis Fraser

Antenella variabilis: Fraser, 1936, p. 52, pl. 2, fig. 6.

The species is distinguishable from the preceding species, *A. paucinoda*, in the hydrocladia, in which these are oblique and transverse nodes

alternately, and in the large lateral supracalycine nematophores. Fraser (1936) reported this species from Sagami Bay, in 45-110 m. in depth.

Distribution. Hayama, Sagami Bay (Fraser).

Monotheca obliqua (Thompson)

Plumularia obliqua: Jäderholm, 1919, p. 22, pl. 5, fig. 5.
Plumularia (*Monotheca*) *obliqua*: Stechow & Uchida, 1931, p. 565.
Monotheca obliqua: Stechow, 1923, p. 17, no. 186; Yamada, 1955, p. 355, pl. 23, fig. 4.

The colony is small, delicate, attaining about 8 mm in height. The species is one of the commonest hydroid in Japanese waters.

Distribution. Misaki (Jäderholm), Mutsu Bay (Stechow & Uchida), Tokara Isls. (Yamada); Australia; Mediterranean; British Isls.

Monotheca spinulosa var. *obtusa* Stechow

Monotheca spinulosa: Stechow, 1921, p. 260; ——, 1923 p. 17, no. 187.
Monotheca spinulosa obtusa: Stechow, 1923a, p. 224.

This variety was described by Stechow (1923a) from Ito, Sagami Bay. Stechow described that the Japanese material is somewhat different from the Australian typical form and it may be a variety of this species. This variety is similar to the preceding one but differs from it in the larger interthecal ridge and more or less projection of the pinna upwards into a spine.

Distribution. Ito, Sagami Bay (Stechow).

Plumularia setacea (Linné)

Plumularia setacea: Inaba, 1890, no. 4, fig. 8-10; Jäderholm, 1896, p. 16; Stechow, 1909, p. 79; ——, 1913a, p. 89; Billard, 1913, p. 32; Jäderholm, 1919, p. 20; Stechow, 1923, p. 17, no. 188; Yamada, 1955, p. 356, pl. 24, fig. 1-2; ——, 1958, p. 60.

This well-known species is commonly found also in the Japanese waters.

Distribution. Misaki (Inaba, Stechow, Jäderholm), Matsuyama (Yamada), Hirado strait and Goto Isls., Kyushu (Jäderholm), Tokara Isls. (Yamada), Bonin Isls. (Jäderholm); Indo-China; Indonesia; Australia; New Zealand; Indian Ocean; Red Sea; Pacific and Atlantic coasts of North America; Iceland; Greenland; Norway; Sweden; whole coasts of Europe; Mediterranean; west coast of Africa; Brazil.

Plumularia setaceoides Bale

Plumularia setaceoides: Hargitt, 1927, p. 513.

Distribution. Amoy, South China (Hargitt); Australia; Atlantic coast of North America.

Plumularia caliculata Bale

Plumularia sp.: Inaba, 1890, no. 5, fig. 11-13.
Plumularia lagenifera: Stechow, 1913a, p. 90, fig. 57-58; Hargitt, p. 513.
Plumularia caliculata: Stechow, 1923, p. 17, no. 189.

The species is similar to the preceding species. According to Inaba, it is, however, smaller, attaining 1 cm in height, and the perisarc is rather thick and 2 hydrothecae are present on each hydrocladium. The gonosomes have never been reported from Japan.

Distribution. Misaki (Inaba, Stechow); Australia.

Plumularia filicaulis var. *japonica* Jäderholm

Plumularia filicaulis japonica: Jäderholm, 1919, p. 21, pl. 5, fig. 2-3; Stechow, 1923, p. 18, no. 190; Yamada, 1958, p. 60.
Plumularia japonica: Stechow, 1923a, p. 223.

The hydrocladia grow from the stem or directly from the hydrorhiza, and show the strong thickness of the chitinous wall above and below each hydrotheca. Two types of the gonosomes are found. A type of them grows from the hydrorhiza and is closely adhering to substratum. The another one grows from the stem. It seems that this hydroid is not rare in the central and southern Japanese waters. The species has been known from Chile, Australia, South Africa and Japan.

Distribution. Sugashima, Matsuyama (Yamada), Kyushu (Jäderholm).

Plumularia spiralis Billard

Plumularia spiralis: Billard, 1913, p. 49, pl. 2, fig. 26-27; Jäderholm, 1919, p. 22, pl. 5, fig. 5; Stechow, 1923, p. 18, no. 191.

The species has been reported by Jäderholm (1919) from the Bonin Islands, in 54 m in depth. The material is composed of some pieces of the branch. It seems that the stem probably attains 30 cm or more in height. The branches are more or less spirally arranged on the stem.

Distribution. Bonin Isls. (Jäderholm); Indonesia.

Plumularia strictocarpa var. *japonica* Stechow

Plumularia strictocarpa japonica: Stechow & Uchida, 1931, p. 565, fig. 12, pl. 15, fig. 6.

The colony is small, attaining 9 mm in height. The hydrocladia are alternate on the stem, divided into alternate long thecate and non-thecate

internodes. The gonothecae are borne on the basal part of the stem, oval, with 4-6 rather sharp transverse corrugations. According to Stechow & Uchida (1931) the variety is distinguished from the typical form in its smaller size and in the gonothecae. The gonothecae of the typical form are longer and marked with 10-14 corrugations. The species and its varieties have been known from some parts of Indonesia and the south of Azores.

Distribution. Mutsu Bay (Stechow & Uchida).

Plumularia badia Kirchenpauer

Plumularia badia: Hargitt, 1927, p. 512.

Distribution. Amoy, South China (Hargitt); Australia.

Plumularia undulata Yamada

Plumularia undulata: Yamada, 1950, p. 17, pl. 1, fig. 24-26.

The species is widely distributed in northern Japan, from Akkeshi to Matsushima, Miyagi Pref.

Distribution. Akkeshi (Yamada), Muroran, Matsushima.

Dentitheca habereri (Stechow)

Plumularia sp.: Inaba, 1892b, no. 44, fig. 8-10; ——, 1892c.
Plumularia habereri: Stechow, 1909, p. 77, pl. 6, fig. 4; ——, 1913a, p. 91, fig. 59-60.
Dentitheca habereri: Stechow, 1923, p. 18, no. 192.

The stem attains 30 cm in height, composed of many tubules, giving off alternate branches which are almost in one plane. Billard (1913) reported the species from Indonesia and described 5 different varieties. The species is found rather commonly in central and southern Japanese waters, in depth of 1-10 m.

Distribution. Sagami Bay (Inaba, Stechow), Shima (Inaba); Indonesia.

Dentitheca hertwigi (Stechow)

Plumularia sp.: Inaba, 1890, no. 24, fig. 65-68.
Plumularia hertwigi: Stechow, 1907, p. 195; ——, 1909, p. 76, pl. 1, fig. 9, pl. 6, fig. 1-3; ——, 1913a, p. 93; ——, p. 117, fig. T1.
Dentitheca hertwigi: Stechow, 1923, p. 18, no. 193.

The species forms large colonies which are 20-50 cm in height. The stem is composed of several tubules, giving off more or less spirally branches. The hydrothecae have two sharply projecting teeth, of which the species is distinguished from the preceding species, *D. habereri*. The

male gonophores were reported by Stechow (1919).

Distribution. Sagami Bay (Inaba, Stechow).

Monostaechas quadridens (McCrady)

Monostaechas quadridens: Nutting, 1900, p. 75, pl. 13, fig. 1-4; Jäderholm, 1903, p. 292; Nutting, 1905, p. 952; Stechow, 1907, p. 199; ——, 1909, p. 83; Jäderholm, 1919, p. 20; Stechow, 1923, p. 18, no. 195.

The species is characteristic in its branching. The colony is dichotomously branched and the hydrocladia are given off from the upper side of the branches only. The species is very widely distributed in the world.

Distribution. Sagami Bay (Stechow), Goto Isls., Kyushu (Jäderholm), South Japan (Jäderholm), Bonin Isls. (Jäderholm); Hawaii; Australia; Pacific and Atlantic coasts of North and Central America; Brazil; Cape Verde Isl.

Thecocaulus plagiocampus (Pictet)

Plumularia plagiocampa: Billard, 1913, p. 31, fig. 23; Jäderholm, 1919, p. 21, pl. 5, fig. 1.

Thecocaulus plagiocampus: Stechow, 1923, p. 18, no. 194.

This species has been reported by Jäderholm from the Bonin Islands, in depth of 35-180 m. The colonies collected cover sponges, 1-2 cm in height. The species has been known from Amboina by Pictet and also some parts of Indonesia by Billard.

Distribution. Bonin Isls. (Jäderholm); Indonesia.

Nemertesia minor Kirchenpauer

Antennularia octoseriata: Jäderholm, 1896, p. 15, pl. 2, fig. 6.
Antennularia dendritica: Stechow, 1907, p. 195.
Antennularia perrieri: Stechow, 1909, p. 81.
Antennularia antennina minor: Stechow, 1909, p. 82.
Antennularia perrieri antennoides: Stechow, 1909, p. 82.
Antennularia perrieri irregularis: Stechow, 1909, p. 83.
Nemertesia irregularis: Stechow, 1913a, p. 93; Jäderholm, 1919, p. 23, pl. 5, fig. 7.
Nemertesia minor: Stechow, 1923, p. 18, no. 196.

The species has been treated under several different names from Japan. Although some doubts remain on the exact identification, I adopt here this name according to Stechow's opinion.

Distribution. Sagami Bay (Stechow Jäderholm), Hirudo strait, Kyushu (Jäderholm), Bonin Isls. (Jäderholm); Gibraltar; Madeira.

Nemertesia japonica Stechow

Antennularia japonica: Stechow, 1907, p. 196; ——, 1909, p. 80, fig. 5, pl. 6, fig. 5.
Nemertesia japonica: Stechow, 1919, p. 124; ——, 1923, p. 18, no. 197.

The stem attains 30 cm in height, composed of many tubules at the basal half, about 6 mm in diameter at the basal end. The species has been described by Stechow from Sagami Bay in depth of 250 m. The gonothecae are unknown.

Distribution. Sagami Bay (Stechow).

Nemertesia ciliata Bale

Nemertesia ciliata: Jäderholm, 1919, p. 23; Stechow, 1923, p. 18, no. 198.

The gonothecae are unknown from Japan. The species has been reported by Bale and Briggs from Australia and Tasmania respectively.

Distribution. Sagami Bay (Jäderholm), Goto Isls., Kyushu (Jäderholm); Australia; Tasmania.

Antennellopsis integerrima Jäderholm

Antennellopsis integerrima: Jäderholm, 1896, p. 16, pl. 2, fig. 7-8; ——, 1919, p. 20; Stechow, 1923, p. 18, no. 199.
Antennellopsis dofleini: Stechow, 1907, p. 196; ——, 1909, p. 86, pl. 2, fig. 5, pl. 6, fig. 6.

The hydrorhiza is composed of compactly anastomosing stolons which are raised from the substratum forming a pile. The hydrocladia are borne directly from the hydrorhiza, unbranched, each of them with 80-120 hydrothecae, attaining 10 cm in height.

Distribution. Sagami Bay (Stechow, Jäderholm), Hirado strait and Okinoshima, Kyushu (Jäderholm).

Heterotheca campanula (Busk)

Plumularia campanula: Jäderholm, 1919, p. 22, pl. 5, fig. 4; Billard, 1913, p. 17, pl. 1, fig. 11-13.
Heterotheca campanula: Stechow, 1923, p. 18, no. 200.
Halopteris campanula: Leloup, 1938, p. 20, fig. 14.

Leloup's specimens which were collected from Sagami Bay are very small, about 5 mm in height.

Distribution. Sagami Bay (Leloup), Goto Isls., Kyushu (Jäderholm), Bonin Isls. (Jäderholm); Indonesia; Australia; New Zealand.

Heterotheca sp.

Heterotheca sp.: Yamada, 1955, p. 356, pl. 24, fig. 3-4.

Some frangments of a hydroid of *Heterotheca* were found among the specimens collected at the Tokara Islands, but unfortunately could not be exactly identified because of its dried state. The specimens were destitute of gonosomes.

Distribution. Tokara Isls. (Yamada).

Haliaria vegae (Jäderholm)

Halicornaria vegae: Jäderholm, 1903, p. 301, pl. 15, fig. 1-4; ——, 1919, p. 26.
Haliaria vegae: Stechow, 1923, p. 18, no. 201.

The species has been known from southern Japan. The colony is large, attaining 17 cm in height. The stem is composed of some tubules which are covered by many hydrorhizal stolons, and gives off some branches irregularly.

Distribution. Kagoshima, Goto Isls. and Okinoshima, Kyushu (Jäderholm), South Japan (Jäderholm).

Haliaria indivisa (Fraser)

Halicornaria indivisa: Fraser, 1936, p. 52, pl. 2, fig. 7.

The colony attains 25 cm in height. The main stem is not branched, regularly giving off hydrocladia alternately. The species is easily distinguishable from the preceding species in its shape of the colony. Fraser (1936) described this species from Sagami Bay in depth of 90 m.

Distribution. Sagami Bay (Fraser).

Halicetta expansa (Jäderholm)

Halicornaria expansa: Jäderholm, 1903, p. 303, pl. 14, fig. 5-7; Stechow, 1907, p. 200; ——, 1909, p. 103, fig. 8; Jäderholm, 1919, p. 26, pl. 6, fig. 7.
Halicetta expansa: Stechow, 1923, p. 19, no. 202.

The colony is large, attaining 30 cm in height. The stem is monosiphon, not straight and forming more or less a zigzag shape, giving off branches spirally. The species has been collected in depths of 55-720 m in Japanese waters.

Distribution. Sagami Bay (Stechow, Jäderholm), South Japan (Jäderholm), Bonin Isls. (Jäderholm).

Halicetta gracilicaulis (Jäderholm)

Lytocarpus gracilicaulis: Jäderholm, 1903, p. 299, pl. 14, fig. 3-4.

Halicornaria gracilicaulis: Bilard, 1913, p. 63; Jäderholm, 1919, p. 26.
Halicetta gracilicaulis: Stechow, 1923, p. 19, no. 203.

The colony attains 15 cm in height. The stem is straight, with alternately arranged hydrocladia which are almost in one plane. The hydrothecae are different from the preceding species, without any teeth on margin. The gonangia are unknown. The species has been found from moderate depth from Japan like the preceding species.

Distribution. South Japan (Jäderholm), Bonin Isls. (Jäderholm); Indonesia; Indian Ocean; Red Sea.

Gymnangium hians (Busk)

Halicornaria sp.: Inaba, 1890, fig. 71-73.
Halicornaria hians: Stechow, 1907, p. 200; ——, 1909, p. 101, pl. 1, fig. 11, pl. 6, fig. 16-17; ——, 1913a, p. 94, fig. 61; Billard, 1913, p. 68.
Halicornaria hians profunda: Jäderholm, 1919, p. 26, pl. 6, fig. 6.
Gymnangium hians: Stechow, 1923, p. 19, no. 204; Yamada, 1958, p. 61.

The species is rather commonly found in the central and southern Japanese waters. The stem is unbranched, plumose, attaining 10 cm in height, giving off the hydrocladia alternately. The hydrothecae are flask-shaped, with a large internal septum. The gonosomes are borne on the front of the stem.

Distribution. Sagami Bay (Inaba, Stechow), Matsuyama (Yamada), Goto Isls. and Okinoshima, Kyushu (Jäderholm); Indian Ocean; Australia.

Gymnangium speciosa (Allman)

Halicornaria speciosa: Nutting, 1900, p. 127, pl. 33, fig. 1-3; Hargitt, 1927, p. 516.

Distribution. Amoy, South China (Hargitt), West Indies.

Gymnangium ishikawai (Stechow)

Halicornaria ishikawai: Stechow, 1907, p. 197; ——, 1909, p. 100, pl. 6, fig. 14-15; ——, 1913a, p. 95.
Gymnangium (?) *ishikawai*: Stechow, 1923, p. 19, no. 205.

The species has been reported from Sagami Bay in depths of 130 and 150 m. The stem is unbranched, attaining 25 cm in length, with alternate hydrocladia.

Distribution. Misaki (Stechow).

Gymnangium roretzi (Marktanner)

Aglaophenia roretzii: Marktanner, 1890, p. 271, pl. 6, fig. 22.
Halicornaria roretzii: Stechow, 1907, p. 200; ——, 1909, p. 102, pl. 6, fig. 18.

Gymnangium (?) *roretzii*: Stechow, 1923, p. 19, no. 206.
Distribution. Japan (Marktanner), Sagami Bay (Stechow).

Macrorhynchia balei (Nutting)

Lytocarpus balei: Nutting, 1906, p. 954, pl. 6, fig. 1, pl. 13, fig. 7-8; Stechow, 1907, p. 200; ——, 1909, p. 99, pl. 6, fig. 13; Billard, 1913, p. 81.
Macrorhynchia balei: Stechow, 1923, p. 19, no. 207.

Stechow (1909) reported the species as one of the Japanese hydroids, but afterwards (1919) he revised his identification, and divided it into 2 different species, namely this species and the following one.

Distribution. Sagami Bay (Stechow); Hawaii; Indonesia.

Macrorhynchia singularia (Billard)

Lytocarpus balei: Stechow, 1909, p. 99, pl. 6, fig. 12.
Lytocarpus singularis: Billard, 1913, p. 79.
Lytocarpia singularia: Stechow, 1919, p. 134.
Macrorhynchia singularia: Stechow, 1923, p. 19, no. 208.
Distribution. Sagami Bay (Stechow); Indonesia.

Macrorhynchia phoenicea (Busk)

Aglaophenia phoenicea: Inaba, 1892, no. 43; ——, 1892.
Lytocarpus phoeniceus: Marktanner, 1890, p. 276, pl. 6, fig. 8; Stechow, 1907, p. 200; ——, 1909, p. 97; ——, 1913, p. 95, fig. 62-64; Billard, 1913, p. 74; Jäderholm, 1919, p. 25; Nutting, 1927, p. 233; Leloup, 1938, p. 21.
Lytocarpus spectabilis: Jäderholm, 1896, p. 20; Nutting, 1927, p. 234; Hargitt, 1927, p. 514.
Macrorhynchia phoenicea: Stechow, 1923, p. 19, no. 209; Yamada, 1958, p. 62.

The species is commonly found in the central and southern Japanese waters.

Distribution. Japan (Marktanner), Sagami Bay (Inaba, Stechow, Jäderholm, Leloup), Shima (Inaba), Matsuyama (Yamada), Hirado strait, Kyushu (Jäderholm), Amoy, South China (Hargitt); Philippines; Singapore; Indonesia; Australia; Hawaii; Indian Ocean.

Macrorhynchia nuttingi Hargitt

Lytocarpus nuttingi: Hargitt, 1927, p. 515, fig. 5, pl. 2, fig. 2.
Distribution. Amoy, South China (Hargitt).

Macrorhynchia pennarius (Linné)

Aglaophenia crispata: Kirchenpauer, 1872, p. 36, pl. 1, 2, fig. 16; Hincks, 1887, p. 134.

Aglaophenia secunda: Kirchenpauer, 1872, p. 35, pl. 1, 2, 3, fig. 15.
Lytocarpus secundus: Jäderholm, 1896, p. 19; ——, 1903, p. 298.
Lytocarpus pennarius: Jäderholm, 1919, p. 25; Nutting, 1927, p. 234.
Lytocarpus hawaiensis: Nutting, 1906, p. 954.
Hemicarpus pennarius: Stechow, 1923, p. 20, no. 212.

The species has been reported from several localities of southern Japan. The species is distributed in the central and western Pacific and the Indian Ocean. The hydrothecae of this species are more or less variable in the shape.

Distribution. Goto Isls. and Okinoshima, Kyushu (Jäderholm), Korea strait (Jäderholm), South Japan (Jäderholm), China Sea (Kirchenpauer), Formosa (Kirchenpauer); Philippines; Singapore; Indonesia; Hawaii; Indian Ocean.

Cladocarpus crenatus var. *allmani* Ritchie

Cladocarpus formosus: Allman, 1883, p. 51, pl. 16, fig. 4-5.
Cladocarpus crenatus allmani: Ritchie, 1909, p. 313, fig. 1-2; Stechow, 1923, p. 19, no. 210.

Allman (1883) described *Cladocarpus formosus* in his monograph of the Challenger hydroid. The specimens were found in Sagami Bay in depth of 650-1400 m.

Distribution. Sagami Bay (Allman).

Cladocarpus bocki Jäderholm

Cladocarpus bocki: Jäderholm, 1919, p. 24, pl. 6, figs. 3-4.
Cladocarpus (?) *bocki*: Stechow, 1923, p. 19, no. 211.

A fragment of a probably large colony was collected in Kyushu and was described by Jäderholm (1919). No gonosomes were found.

Distribution. Okinoshima, Kyushu (Jäderholm).

Lytocarpia nigra (Nutting)

Aglaophenia sp.: Inaba, 1890, fig. 82-85; ——, 1892.
Thecocarpus niger: Nutting, 1905, p. 953, pl. 5, fig. 5, pl. 13, fig. 1-6; Stechow, 1907, p. 200; ——, 1909, p. 97; ——, 1913a, p. 96, fig. 65-67.

The colony attains 20 cm in height, irregularly branched. The distal end of the branches are often curled up, and here are absent the hydrothecae. The colony shows a remarkable black colour in general. The species is commonly found in the central and southern Japanese waters, in depth of 1-10 m.

Distribution. Sagami Bay (Inaba, Stechow), Shima (Inaba), Wakayama (Inaba); Hawaii.

Lytocarpia myriophyllum var. *orientalis* Billard

Thecocarpus myriophyllum orientalis: Billard, 1913, p. 91, pl. 5, fig. 43; Jäderholm, 1919, p. 25, pl. 6, fig. 5; Stechow, 1923, p. 20, no. 214.

The variety was reported by Jäderholm from Kyushu. Jäderholm's material shows the straight, 3.5-5 cm long, stem which is fascicled in basal part and with closely arranged hydrocladia. The gonosomes are unknown from Japan.

Distribution. Goto Isls. and Okinoshima, Kyushu (Jäderholm); Indonesia.

Aglaophenia bilobidentata Stechow

Aglaophenia bilobidentata: Stechow, 1907, p. 198; ——, 1909, p. 91, pl. 6, fig. 9; ——, 1913a, p. 98; ——, 1919, p. 148; ——, 1923, p. 20, no. 215.

This species has been reported by Stechow from Sagami Bay. Stechow (1913) described the trophosome rather completely, but the gonosome is not yet known. Some doubts still remain on its exact systematic position.

Distribution. Sagami Bay (Stechow).

Aglaophenia whiteleggei Bale

Aglaophenia sp.: Inaba, 1890, no. 28, fig. 78-81.

Aglaophenia laxa: Stechow, 1907, p. 199; ——, p. 93, fig. 7, pl. 6, fig. 10-11.

Aglaophenia whiteleggei: Stechow, 1913a, p. 99, fig. 68-70; Jäderholm, 1919, p. 24, pl. 6, fig. 1; Stechow, 1923, p. 20, no. 216; —— & Uchida, 1931, p. 568, pl. 15, 7; Yamada, 1958, p. 62; Uchida, 1958, p. 163.

This is one of the commonest hydroids in Japan. The colony attains 20 cm in height, irregularly giving off branches. The hydrocladia are rather delicate, white in colour giving the whole colony white colour.

Distribution. Mutsu Bay (Stechow & Uchida), Sagami Bay (Inaba, Stechow), Matsuyama (Yamada), Sado (Uchida), Bonin Isls. (Jäderholm); Australia.

Aglaophenia suensoni Jäderholm

Aglaophenia pluma: Inaba, 1890, no. 27, fig. 74-77; ——, 1892b, fig. 7-8.

Aglaophenia suensoni: Jäderholm, 1896, p. 18, pl. 2, fig. 9; Stechow, 1913, p. 101, fig. 71-74; ——, 1923, p. 20, no. 217; Uchida, 1958, p. 163.

Aglaophenia ijimai: Stechow, 1907, p. 197.

Aglaophenia suensoni ijimai: Stechow 1909, p. 89, pl. 1, fig. 10; Jäderholm, 1919, p. 24, pl. 6, fig. 2.

The species is widely distributed in central and southern Japan. The stem attains 4 cm in height, unbranched, showing a plumose appearance. The species is easily distinguishable from the preceding one in its closed corbulae.

Distribution. Misaki, Kominato (Inaba, Stechow), Shima (Inaba), Hirado strait, Kyushu (Jäderholm), Sado (Uchida), Bonin Isls. (Jäderholm).

Aglaophenia amoyensis Hargitt

Aglaophenia amoyensis: Hargitt, 1927, p. 517, pl. 1, fig. 3; Yamada, 1955, p. 357, pl. 24, fig. 5-6.

The species was originally described by Hargitt (1927) from Amoy, South China, and recently I have reported it from the Tokara Islands. The gonosome has been known in Amoy.

Distribution. Tokara Isls. (Yamada); Amoy, South China (Hargitt).

Aglaophenia simplex (d'Orbigny)

Aglaophenia simplex: Kirchenpauer, 1872, p. 25, pl. 1, fig. 1; Stechow, 1923, p. 20, no. 218.

Kirchenpauer's note is so brief that we can not surely say about this species.

Distribution. China Sea (Kirchenpauer).

GEOGRAPHIC DISTRIBUTION

In considering geographic distribution of the hydroids of Japanese and its adjacent waters, all the species and varieties which have been reported from the whole of this region are listed in the following table to indicate their distribution.

For the purpose of preparing the table, the whole region has been divided, in convenience, into 7 areas.

The first area occupies the most northern part of the region, including Kamchatka, the Kurile Islands, the Sea of Okhotsk and Sakhalin. The records of hydroids in this area are mostly of such workers as Mereschkowsky, Kirchenpauer, Linko and Kudelin. The species of this area are represented almost by thecate ones and most of them are of typical boreal forms including the following forms which have been known only from the seas of high north latitudes: *Halecium reversum, H. muricatum, Tulpa speciosa, Lovenella quadridentata, Lafoea dumosa, Sertularella brandti, S. albida, Selaginopsis pinnata* and *S. cedrina.*

The second area includes the whole coast of Hokkaido with the exception of Hakodate and its vicinity which are included in the next area. The hydroids representing this area are composed of species of some different nature. It is well known that two different currents flow along

the Japanese coast, the Oyashio, a cold current from the north and the Kuroshio, a warm current from the south. The hydroid fauna of the Okhotsk coast of Hokkaido is mainly influenced by the Oyashio and consequently most of the species are common to the forms of the first area, although it contains some southern forms which seem to have been distributed from the Sea of Japan through the Soya-Strait. The Oyashio washes also the Pacific coast of Hokkaido but the influence of Kuroshio from the south is more or less recognized in this coast. The boreal forms are more dominant in the eastern part of the coast than in the western part. Most of the species found in Akkeshi Bay are boreal forms but some southern forms such as *Hydrocoryne miurensis, Sertularella miurensis,* are also found there. The hydroid fauna of the west coast of Hokkaido is also more or less mixed with northern and southern forms. Different from the above Pacific coast, however, there is no remarkable regional difference of the species constitution between the northern and southern part of this coast.

The third area includes the coasts of the south-western end of Hokkaido, the northern end of Honshu and the Tsugaru-Strait between them. This area is also represented by northern and southern forms together. The boreal forms such as *Orthopyxis platicarpa* and *Bonneviella grandis* are known from this area, while on the other hand some species which are commonly found in southern Japan such as *Clytia delicatula* and *Aglaophenia whiteleggei* are also found here.

The fourth area includes the coast of Honshu at the side of the Sea of Japan and also almost the whole of the Sea off the coast, although it does not contain the northern part of the Sea. The Sea of Japan is mainly washed by the Oyashio, cold current, but the influence of the warm Kuroshio which flows in from the Tsugaru- and Korea-Strait is also recognized. The hydroid fauna of this area has not yet been well studied.

The fifth area has a large extent occupying the Pacific coast of Honshu and the whole coasts of Shikoku and Kyushu, including the Japanese Inland Sea. This area has been rather extensively studied by several workers, especially by Inaba, Stechow and Jäderholm. Over the half of the Japanese hydroids has been recorded in this area and the nearly all the species are temperate or tropical forms.

The sixth area occupies also a large extent, including the Yellow Sea, China Sea, and the coasts of the Tokara Islands, Ryukyu Islands, Formosa and South China such as Amoy and Hong Kong. Many of the species in this area are common to ones of the preceding area, but several tropical forms which have been known from the Indo-Pacific are also found in this area.

The seventh area is the region of the Bonin Islands. The hydroid

fauna of this region has been worked only by Jäderholm. Although the reported species in this area are rather small in number and not enough to discuss the nature of the species constitution, it will be said that the nature of this area seems to be, in general, almost the same of the preceding area.

In spite of the unsatisfactory data in the areas except the fifth, a remarkable fact is recognized in the distribution of some families. In general, the family Sertulariidae is well represented in the first and the second areas, while the species of the Plumulariidae are very small in number in these areas. This coincides with the fact described by Fraser (1937) on the distribution of hydroids of the Pacific coast of the North America. The Athecata is not well represented in the first area. It seems, however, to be the reason that the species which have been known in this area are the sum of the species of some different gross collections.

It is generally concluded that the hydroid fauna of Japanese and its adjacent waters is the mixture of boreal, temperate and tropical forms which are distributed mainly with two different currents, the cold Oyashio and the warm Kuroshio.

Distribution Table

(* the species with record of indefinite locality)

	I	II	III	IV	V	VI	VII	
Coryne pusilla		×	×		×			
C. uchidai			×					
Sarsia nipponica					×			
Zanclea costata					×			
Z. indopacifica								*
Cladonema uchidai		×	×	×	×			
Hydrocoryne miurensis		×	×	×	×			
Cladocoryne pelagica					×			
Ptilocodium repens					×			
Hydrichthella epigorgia					×			
H. doederleini					×			
Dendrocoryne misakiensis		×		×	×			
D. secunda					×			*
Solanderia leuckarti								*(?)
S. sp.			×		×			
Halocordyle disticha					×		×	
H. tiarella						×		
H. australis						×		
Tubularia mesembryanthemum					×	×		
T. sagamina					×			
T. radiata		×						

	I	II	III	IV	V	VI	VII
T. venusta		×					
T. spherogonia						×	
Hybocodon amoyensis						×	
Corymorpha tomoensis					×		
C. carnea					×		
C. iyoensis					×		
Branchiocerianthus imperator					×		
Branchiaria mirabilis					×		
Climacocodon ikarii		×					
Clava sp.		×					
Cordylophora japonica					×		
C. mashikoi				×			
Campaniclava clionis						×	
Belella mirabilis							×
Stylactis piscicola					×		
S. yerii					×		
S. misakiensis					×		
S. carcinicola					×		
S. conchicola		×					
S. uchidai		×					
Podocorella minoi					×		
Hydractinia epiconcha		×			×		
H. spiralis					×		
Hydrissa sodalis		×			×		
Cytaeis japonica					×		
Bougainvillia ramosa					×		
Bimeria amoyensis						×	
Leuckartiara octona	×	×	×		×		
Hydrichthys pacificus					×		
Eudendrium capillare		×			×		
E. sagaminum					×		
E. biseriale					×		
E. tenellum					×		
E. pusillum amoyensis						×	
E. insigne					×		
E. laxum					×		
E. japonicum					×		
E. lineale				×			
E. ramosum					×		
E. californicum						×	
E. vaginatum					×		
E. boreale		×					
E. rameum					×		
E. armstrongi					×		
E. magnificum					×		
E. imperiale					×		
E. racemosum					×		
E. annulatum		×					

	I	II	III	IV	V	VI	VII	
Proboscidactyla flavicirrata		×						
Eugymnanthea japonica					×			
Halecium pygmaeum						×		
H. repens					×			
H. delicatulum					×			
H. crinis					×			
H. tenellum					×			*
H. flexile					×			*
H. flexile japonica					×			
H. nanum					×			
H. cymiforme					×	×		
H. beani					×			
H. sessile					×	×		
H. reversum	×							
H. muricatum	×							
H. ochotense	×							
H. halecinum	×							
H. speciosum	×							
H. labrosum	×							
H. brashnikowi	×							
H. magellanicum		×		×				
H. cymosum					×			
H. flabellatum					×			
H. minor					×			
H. nullinodum					×			
H. vasiforme					×			
Endothecium reduplicatum					×			
Diplocyathus dichotomus					×			
D. sibogae					×			
Ophiodissa arborea					×			
Campanularia gracilis								*
C. tincta					×		×	
C. indopacifica					×			
C. hincksi grandis					×		×	
C. urceolata	×	×						
C. volubilis	×	×		×				
C. sulcata					×			
C. africana					×			
C. groenlandica	×				×			
C. sp.	×							
Rhizocaulus chinensis	×				×	×	×	
R. verticillatus	×							
Tulpa speciosa	×							*
Orthopyxis caliculata	×				×			
O. compressa	×							
O. platicarpa		×	×					
Clytia raridentata					×			
C. delicatula			×	×	×			

	I	II	III	IV	V	VI	VII	
C. edwardsi					×			
C. linearis					×			
C. gracilis					×			
C. minuta						×		
C. stechowi						×		
C. obliqua					×			
Obelia geniculata					×			
O. dichotoma		×			×			
O. gracilis						×		
O. everta						×		
O. plana		×		×				
O. longissima	×			×				
O. chinensis						×		
Gonothyraea bicuspidata					×			
G. inornata							×	
Egmundella humilis					×			
Campanulina chilensis					×			
C. denticulata					×			
Opercularella hispida					×	×		
Cuspidella gigantea					×			
Eupoma maximum	×							
Stegopoma fastigiatum					×			
S. plicatile	×			×				
Lovenella quadridentata	×							
Calycella syringa		×		×	×	×		
Hebella parasitica					×			
H. brevitheca					×			
H. corrugata					×			
H. neglecta					×		×	
Hebellopsis calcarata					×			
Bonneviella grandis	×		×					
B. regia								*
B. ingens	×							
Lictorella stechowi					×			
Zygophylax biarmata					×		×	
Z. curvitheca					×			
Z. tizardensis					×	×	×	
Z. brevitheca							×	
Z. cericornis					×		×	
Z. pacifica					×			
Acryptolaria pulchella					×			
A. crassicaulis					×			
A. symmetrica					×			
A. conferta australis					×			
A. balbosa					×			
Cryptolaria exserta					×		×	
Lafoea tenellula					×			
L. dumosa	×							

	I	II	III	IV	V	VI	VII	
L. fruticosa			×	×	×			
L. gracillima						×	×	
L. paxi					×			
Filellum contortum					×			
F. serratum					×		×	
Grammaria scandens					×			
G. immersa				×	×			
Synthecium tubithecum					×		×	
S. orthogonium						×		
S. campylocarpum					×			
Hincksella sylindrica pusilla					×			
Diphasia nuttingi					×			
D. dubia						×		
D. palmata					×			
D. scalariforme						×		
D. digitale							×	
D. thornelyi					×			
D. derbecki	×							
Idia pristis					×	×	×	
Dynamena hozawai		×	×		×			
D. japonica					×			
D. crisioides					×	×		
D. quadridentata						×		
D. quadridentata elongata					×			
D. quadridentata nodosa					×			
D. dubia						×		
D. cornicina					×			
D. brevis					×			
Symplectoscyphus turgidus					×			*
S. gotoi					×			
S. tricuspidatus	×	×			×			
S. tricuspidatus acuminata	×							
S. tropicus					×		×	
S. cumberlandicus					×			
S. rubellus	×							
S. pinnatus	×							
Sertularella mirabilis					×	×		
S. gigantea	×	×		×				
S. levigata			×		×			
S. brandti	×							
S. miurensis		×		×	×			
S. miurensis pungens			×					
S. miurensis obtusa			×					
S. sagamina		×			×			
S. japonica					×			
S. inabai			×	×	×			
S. diaphana					×			
S. quinquelaminata			×					

	I	II	III	IV	V	VI	VII	
S. mutsuensis			×					
S. *rugosa*		×						
S. spirifera			×					
S. spinosa					×			
S. areyi					×		×	
S. tenella		×					×	
S. sinensis					×	×	×	
S. gayi gracilescens					×			
S. costata					×			
Abietinaria abietina	×							
A. variabilis					×			
A. filicula	×							
A. traski					×			
A. *costata*	×	×		×				
A. juniperus	×							
A. tilesii	×							
A. merki	×							
A. melo	×							
Lagenitheca compressa	×							
Amphisbetia furcata					×			
A. pacifica		×	×					
A. nasonowi	×							
Sertularia distans				×	×	×	×	
S. distans gracilis					×			
S. turbinata					×			
S. *rugosissima*							×	
S. exigua					×			
S. hattorii					×			
S. tenera	×	×		×	×			
S. cupressoides	×	×		×				
S. heteroclada					×			
S. suensoni				×				
S. nuttingi					×			
S. intermedia					×			
Salacia pyriformis					×			
S. lonchitis						×		
S. marktanneri						×		
S. *lichenastrum*	×							
S. stelleri	×							
S. acutiloba	×							
S. crassicaulis								*
S. coronata								*
Pericladium tataricum	×							
P. bidentatum								*
P. ochotense	×							
Selaginopsis triserialis	×	×		×				
S. pinnata	×							
S. allmani								*

	I	II	III	IV	V	VI	VII	
S. cedrina	×							
S. purpurea	×							
S. thuja	×							
S. breitfussi		×						
S. decemserialis		×						
Kirchenpaueria curvata				×				
Pycnotheca mirabilis					×		×	
Antenella secunda					×		×	
A. suensoni					×			
A. paucinoda					×			
A. variabilis					×			
Monotheca obliqua			×		×	×		
M. spinulosa obtusa						×		
Plumularia setacea					×	×	×	
P. setaceoides						×		
P. caliculata					×			
P. filicaulis japonica					×			
P. spiralis							×	
P. strictocarpa japonica			×					
P. badia						×		
P. undulata		×						
Dentitheca habereri					×			
D. hertwigi					×			
Monostaechas quadridens					×	×	×	
Thecocaulus plagiocampus							×	
Nemertesia minor					×		×	
N. japonica					×			
N. ciliata					×			
Antennellopsis integerrima					×			
Heterotheca campanula					×		×	
H. sp.						×		
Haliaria vegae					×	×		
H. indivisa					×			
Halicetta expansa					×	×	×	
H. gracilicaulis						×	×	
Gymnangium hians					×			
G. speciosa						×		
G. ishikawai					×			
G. roretzi					×			*
Macrorhynchia balei					×			
M. singularia					×			
M. phoenicea					×	×		*
M. nuttingi						×		
M. pennarius					×	×		
Cladocarpus crenatus allmani					×			
C. bocki					×			
Lytocarpia nigra					×			
L. myriophyllum orientalis					×			

	I	II	III	IV	V	VI	VII
Aglaophenia bilobidentata					×		
A. whiteleggei			×	×	×		×
A. suensoni				×	×		×
A. amoyensis						×	
A. simplex						×	

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