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The Fauna of Akkeshi Bay

XI Medusae¹⁾

By

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(With 7 textfigures)

This paper is a report on the medusae collected in the environs of Akkeshi Bay during these ten years. For these specimens the writer must express his cordial thanks to Ass. Prof. Y. Hada of the Fishery Institute, Agricultural Faculty, who had resided as the assistant in the Akkeshi Marine Biological Station since the establishment of the Station in 1930. The medusae examined belong to 34 species, including 24 Hydromedusae, 7 Scyphomedusae and 3 Ctenophorae. These medusae being mostly boreal and littoral forms, Narcomedusae and Siphonophorae could not be observed. There has been reported no new species but an unrecorded form, *Stomotoca pterophylla*, as is shown in the following list.

Hydromedusae

Anthomedusae

1. *Sarsia tubulosa* (SARS)
2. *Hydrocoryne miurensis* STECHOW
3. *Euphysa japonica* (MAAS)
4. *Hybocodon prolifer* AGASSIZ
5. *Climacocodon ikarii* UCHIDA
6. *Cladonema radiatum* var. *mayeri* PERKINS
7. *Stomotoca pterophylla* HAECKEL
8. *Leuckartiara octona* (FLEMING)
9. *Halitholus pauper* HARTLAUB

1) Contributions from the Akkeshi Marine Biological Station, No. 34.

10. *Catablema multicirrata* KISHINOUE
11. *Urashimea globosa* KISHINOUE
12. *Turritopsis nutricula* MCCRADY
13. *Nemopsis dofleini* MAAS
14. *Rathkea octopunctata* (M. SARS)
15. *Polyorchis karafutoensis* KISHINOUE
16. *Proboscidactyla flavicirrata* BRANDT

Leptomedusae

17. *Melicertum octocostatum* (M. SARS)
18. *Eutonia indicans* (ROMANCES)
19. *Stauróphora mertensi* BRANDT

Linnomedusae

20. *Gonionemus oshoro* UCHIDA
21. "*Gonionemus agassizi* MURBACH & SHEARER"
22. *Eperetmus typicus* BIGELOW

Trachomedusae

23. *Aglaura hemistoma* PÉRON et LESUEUR
24. *Aglantha digitale* MÜLLER

Scyphomedusae

Stauromedusae

25. *Halicylistus borealis* UCHIDA
26. *Halicylistus steinegeri* KISHINOUE
27. *Thaumatoscypus distinctus* KISHINOUE

Semaestomae

28. *Chrysaora helvola* BRANDT
29. *Dactylometra pacifica* GOETTE
30. *Cyanea capillata* ESCHSCHOLTZ
31. *Aurelia limbata* BRANDT

Ctenophora

32. *Hormiphora palmata* CHUN
33. *Bolinopsis mikado* (MOSER)
34. *Beroë cucumis* FABRICIUS

Out of the medusae above referred, the ones which are indigenous to Akkeshi Bay are the following:

<i>Cladonema raditum</i> var. <i>mayeri</i>	<i>Polyorchis karafutoensis</i>
<i>Proboscidactyla flavicirrata</i>	<i>Gonionemus oshoro</i>
<i>Eutonia indicans</i>	<i>Halicylistus borealis</i>
<i>Eperetmus typicus</i>	<i>H. steinegeri</i>
<i>Thaumatocoryphus distinctus</i>	

In these medusae time and locality of appearance are certain. But in the following medusae, time of appearance is certain but locality of appearance is uncertain, though they are probably indigenous to the bay.

<i>Turritopsis nutricula</i>	<i>Nemopsis dofleini</i>
<i>Chrysaora helvola</i>	<i>Aurelia limbata</i>

These indigenous species are almost boreal in distribution but *Cladonema radiatum* var. *mayeri* is common in temperate regions and three hydromedusae, *Turritopsis nutricula*, *Nemopsis dofleini* and *Gonionemus oshoro* are distributed in southern regions in Japan.

Among the visiting medusae to Akkeshi Bay the following five species are very common and often abundantly found:

<i>Sarsia tubulosa</i>	<i>Catablema multicirrata</i>
<i>Aglantha digitale</i>	<i>Staurophora mertensi</i>

These medusae are all boreal forms and surely carried from northern parts such as Kamchatka, Kurile Islands or the Sea of Okhotsk.

The medusae listed below are casual visitors which are scarce in number.

<i>Euphysa japonica</i>	<i>Urashimea globosa</i>
* <i>Leuckartiara octona</i>	<i>Halitholus pauper</i>
* <i>Stomatoca pterophylla</i>	<i>Rathkea octopunctata</i>
<i>Melicertum octocostatum</i>	<i>Climacocodon ikarii</i>
* <i>Aglaura hemistoma</i>	* <i>Dactylometra pacifica</i>
<i>Cyanea capillata</i>	* <i>Hormiphora palmata</i>
* <i>Bolinopsis mikado</i>	<i>Beroë cucumis</i>

Most of these medusae are boreal forms but those with an asterisk are northward immigrants from the warmer waters. The three boreal species, *Urashimea globosa*, *Rathkea octopunctata* and *Beroë cucumis* are distributed far southwards in Japanese waters.

Informations as regards the distribution in Japanese waters of the medusae considered in this report are most important to investigate the specificity of Akkeshi Bay.

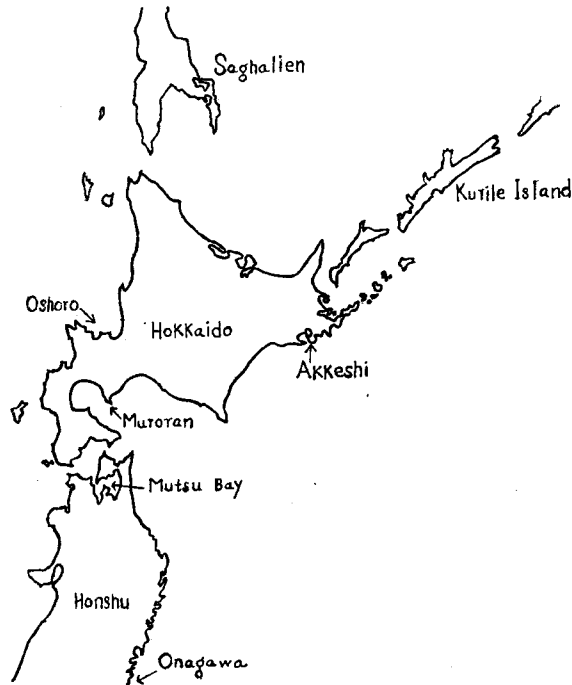


Fig. 1. Hokkaido and its environs.

In the first place, we will learn the distribution of medusae in other localities.

Medusae occurring in Oshoro

- | | |
|--|--|
| * <i>Sarsia tubulosa</i> | * <i>Hybocodon prolifer</i> |
| * <i>Climacocodon ikarii</i> | * ! <i>Cladonema radiatum</i> var. <i>mayeri</i> |
| * ! <i>Urashimea globosa</i> | * ! <i>Turritopsis nutricula</i> |
| * ! <i>Nemopsis dofleini</i> | * ! <i>Rathkea octopunctata</i> |
| * <i>Proboscidactyla flavicirrata</i> | ! <i>Phialidium discoida</i> |
| ! <i>Gastroblasta raffaelei</i> var. <i>chengshanensis</i> | * ! <i>Gonionemus oshoro</i> |
| * <i>Aglantha digitale</i> | ! <i>Stenoscypus inabai</i> |
| ! <i>Halicystus auricula</i> | ! <i>Sasakiella cruciformis</i> |
| o <i>Charybdea rastonii</i> | ! <i>Aurelia aurita</i> |
| ? <i>Beroë ramosa</i> | |

Among the medusae above listed, those with the asterisk are boreal, those with the mark ! are temperate and that with the mark circle is tropical forms. The medusan fauna of Oshoro containing species of rather warmer waters is more like to that of Mutsu Bay than to that of Akkeshi Bay as shown in the following list.

Medusae occurring in Mutsu Bay

* <i>Sarsia tubulosa</i>	! <i>Hydrocoryne miurensis</i>
* <i>Hybocodon prolifer</i>	! <i>Cladonema radiatum</i> var. <i>mayeri</i>
* ! <i>Urashimea globosa</i>	! <i>Leuckartiara octona</i>
* <i>Catablema multicirrata</i>	! <i>Podocoryne simplex</i>
* ! <i>Turritopsis nutricula</i>	* ! <i>Rathkea octopunctata</i>
! <i>Spirocodon saltatrix</i>	* <i>Proboscidaetyla flavicirrata</i>
* <i>Melicertum octocostatum</i>	! <i>Eucheilota paradoxica</i>
! <i>Phialidium discoida</i>	! <i>Aequorea coerulescens</i>
* ! <i>Gonionemus oshoro</i>	* <i>Aglantha digitale</i>
! <i>Liriope tetraphylla</i>	o <i>Charybdea rastonii</i>
! <i>Stenoscyphus inabai</i>	! <i>Haliclystus auricula</i>
! <i>Sasakiella cruciformis</i>	! <i>Dactylometra pacifica</i>
* <i>Cyanea capillata</i>	! <i>Rhopilema asamushi</i>
! <i>Hormiphora palmata</i>	! <i>Beroë ramosa</i>

The medusan fauna on the coasts of Northern Honshu facing to the Japan Sea accords largely with that of Mutsu Bay and Oshoro, while the medusae on the Pacific coasts of Northern Honshu are more or less different from the former, including some boreal forms as shown in the collection of Onagawa Bay. These boreal forms were probably drifted by the cold current from northern parts.

Medusae found in Onagawa Bay

* <i>Sarsia tubulosa</i>	! <i>Hydrocoryne miurensis</i>
* <i>Leuckartiara brevicornis</i>	* ! <i>Turritopsis nutricula</i>
* ! <i>Nemopsis dofleini</i>	! <i>Spirocodon saltatrix</i>
* <i>Proboscidaetyla flavicirrata</i>	? <i>Eucope fragilis</i>
* <i>Eutonia indicans</i>	* <i>Tima formosa</i>
! <i>Aequorea coerulescens</i>	* <i>Aglantha digitale</i>
! <i>Haliclystus auricula</i>	! <i>Sasakiella cruciformis</i>
! <i>Sasakiella tsintaensis</i>	o <i>Charybdea rastonii</i>
o <i>Pelagia panopyra</i>	! <i>Dactylometra pacifica</i>

The medusae so far reported from Saghalien almost agree with those from Akkeshi Bay as follows.

* <i>Polyorchis karafutoensis</i>	* <i>Staurophora mertensi</i>
* <i>Tima saghalinensis</i>	* <i>Haliclystus steinegeri</i>
* <i>Thaumatocoryphus distinctus</i>	* <i>Cyanea capillata</i>
* <i>Aurelia limbata</i>	

The glimpse of the medusan fauna of Saghalien shows that it belongs to that of Okhotsk and the Aleutian Islands. The interesting spot is Muroran in which the cold and warm currents come across.

Medusae found in Muroran

- | | |
|---------------------------------|--|
| ! <i>Hydrocoryne miurensis</i> | ! <i>Cladonema radiatum</i> var. <i>mayeri</i> |
| * <i>Catablema multicirrata</i> | * <i>Melicertum octocostatum</i> |
| * ! <i>Gonionemus oshoro</i> | ! <i>Halicystus auricula</i> |
| ! <i>Sasakiella cruciformis</i> | * <i>Thaumatoscyphus distinctus</i> |
| * <i>Aurelia limbata</i> | |

Judging from these facts the fauna of the Okhotsk Sea and Aleutian Islands covers Saghalien, Kurile Islands and south-eastern parts of Hokkaido. This surplus drifts southwards to Muroran and Pacific coasts of Northern Honshu such as Onagawa Bay. Among the casual visitors to Akkeshi Bay are found several medusae of warm current, such as *Leuckartiara octona*, *Aglaura hemistoma*, *Dactylometra pacifica*, and *Bolinopsis mikado*. Akkeshi Bay seems to mark the northern limit of some temperate forms which are carried away by a branch of the Kuroshio current.

Hydromedusae

Anthomedusae

Family Codoniidae

1. *Sarsia tubulosa* (SARS)

Sarsia tubulosa: UCHIDA, 1938, pp. 37-38, 48.

(Fig. 2)

This medusa seems to occur almost the whole year throughout but is especially common during May-August in the Bay. Umbrella high bell-shaped, exceeding over 10 mm in height. Jelly rather thin and soft. Manubrium and tentacles very extensile. Manubrium very variable in length, sometimes being completely withdrawn in the bell cavity, but sometimes extending about three times the height of the bell cavity. The short distal part of the manubrium is not extensile, because it is observable in the well-extended state. Radial canals slightly undulated. Ocelli distinct.

Coloration. Manubrium bluish yellow with slightly pinkish lip. Tentacles pinkish, especially in contracted state. Ocelli blackish brown.

Distribution. North Atlantic coasts of Europe and North America. In Japan: Kurile Islands, Hokkaido and Mutsu Bay. Mr. T. Hikita obtained several specimens from Gamema Bay, Shumushu Island, the northernmost Island of the Kurile Islands at the beginning of August, 1938.

2. *Hydrocoryne miurensis* STECHOW

Hydrocoryne miurensis: UCHIDA, 1938, pp. 37-38, 48.

Only hydroids were collected.

Distribution. Only in Japan: Pacific coasts of Hokkaido and Honshu, from Akkeshi southwards to Shimoda, Shizuoka Pref.

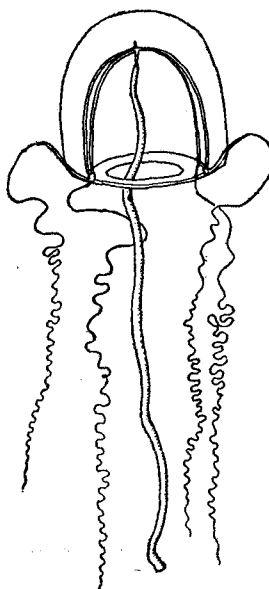


Fig. 2. *Sarsia tubulosa* (Sars)

Family Tubulariidae

3. *Euphysa japonica* (MAAS)

Euphysa japonica: UCHIDA, 1933, pp. 127-128.

This species is frequently obtained around the coasts of Hokkaido and the Kurile Islands. In Akkeshi Bay it is occasionally found in the spring.

Distribution. Western Aleutians. In Japan: from the Kurile Islands to Hokkaido.

4. *Hybocodyn prolifer* L. AGASSIZ

Hybocodon prolifer: UCHIDA, 1938, p. 38.

This medusa is often caught in the spring in the Bay. It is one of common circumboreal forms.

Distribution. North Atlantic coasts of America and Europe. In Japan; around the coasts of Hokkaido, Kurile Islands and Mutsu Bay.

Family Malgelopsidae

5. *Climacocodon ikarii* UCHIDA

Climacocodon ikarii: UCHIDA, 1926, p. 197-198, pl. 10, fig. 5.

A single specimen of this peculiar medusa was collected off Tokotan near Akkeshi. The specimen is the largest ever examined and furnished with 13 tentacles arranged along on each radial canal. The first four sets, each composed of 1, 2, 2, 2 tentacles respectively, are arising from the exumbrellar parts above the bell margin, while the rest are clustered near the base of the radial canals. These tentacles are all filamentar and slightly shorter than the bell-diameter.

Distribution. Only in Japan, around the coasts of Hokkaido.

Family Cladonematidae

6. *Cladonema radiatum* var. *mayeri* PERKINS

Cladonema radiatum var. *mayeri*: UCHIDA, 1938, pp. 38-39.

This medusa is abundantly found in summer among eel grass growing the inner part of the Bay.

Distribution. The Bahamas, off the Atlantic coast of North America. In Japan: from Misaki northward to Mutsu Bay, around the coasts of Hokkaido and the Kurile Islands.

Family Tiaridae

7. *Stomotoca pterophylla* HAECKEL

Stomotoca pterophylla: BIGELOW, 1918, p. 370-372.

(Fig. 3)

This medusa is a temperate or a subtropical form and has never been reported from the Pacific coasts of Asia. Five specimens were caught associated with *Leuckartiara octona* in October, 1937. Bell conical, 12-15 mm high and 13-17 mm wide, with widely flaring sides and bluntly-pointed apical projection. Gelatinous substance very thick near the apex but thin at the bell margin. Tentacles, two in number, arising from the base of 2 of radial canals, 180° apart, long and tapering. In each octant are found about 20 ten-

tacle-bulbs. Radial canals, four in number, wider than the ring canal, flat and ribbon-like. There is a very wide, conical peduncle which extends about to the level of the velar opening. Gastric part of manubrium large, widened and lying mainly outside of the bell cavity. Lips well-developed complexly crenulated. Gonads represented by eight adradial swellings, each traversed by 10–12 swollen, leaf-like ridges. Stomach and tentacle-bulbs brown in colour. Bigelow (1918) well pointed out that *S. indivisa* reported by Maas (1897) from Panama Bay, Pacific coast of Central America, is synonymous with the present species.

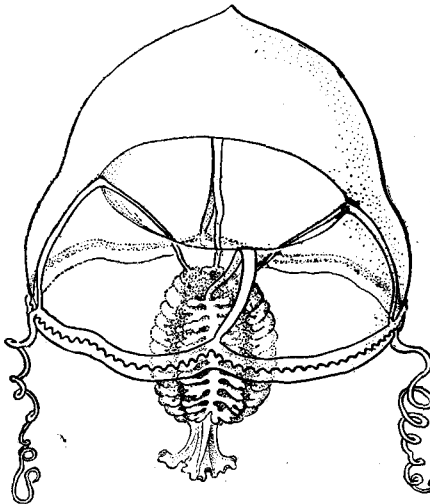


Fig. 3. *Stomotoca pterophylla* Haeckel

Distribution. The West Indies and the warmer parts of the Gulf Stream. In the Pacific, Panama Bay. The medusa was probably a temporary visitor to Akkeshi Bay.

8. *Leuckartiara octona* (FLEMING)

Leuckartiara octona: UCHIDA, 1938, p. 39; —, Hiro, 1939, pp. 170–172.

Only a single specimen was obtained in Oct. 1937. This is also a temporary visitor. Recently Hiro reported the hydroids (*Perigonimus repens*) attached to the giant crab, *Macrocheira kaempferi* from Seto, Wakayama Pref. The hydroids gave rise to young medusae with two opposite tentacles. The medusa is often collected in several parts of Japan but not in great numbers.

Distribution. Widely distributed in the warmer parts of the Atlantic and Pacific. In Japan, Saghalien, Hokkaido, Honshu.

9. *Halitholus pauper* HARTLAUB

Halitholus pauper: UCHIDA, 1933, pp. 128–130.

(Fig. 4)

This medusa was firstly reported from the Pacific by the writer (1933). Several specimens were found in the surface tow on June 27, 1939 in the Bay. The specimens were found better developed than those collected from the Kurile Islands. Umbrella about 10 mm high and 8 mm wide, with a wide gelatinous apical dome. Lips complexly crenulated. Gonads complicatedly folded. Ocellus and tentacle bulbs pink. Tentacle slightly pinkish. This species is one of the circumboreal forms.

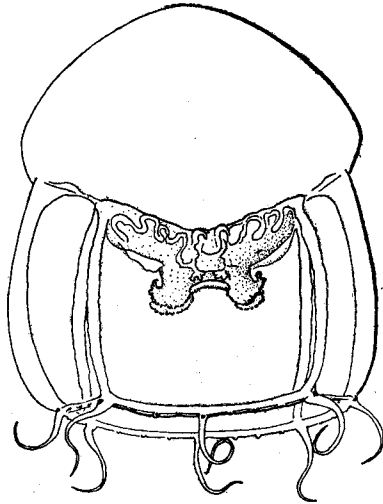


Fig. 4. *Halitholus pauper* Hartlaub

Distribution. Greenland and Iceland. In Japan, Kurile Islands and Akkeshi.

10. *Catablema multicirrata* KISHINOUE

Catablema multicirrata: UCHIDA, 1933, p. 130; —, 1938, p. 39.

This medusa is not infrequently obtained in the Bay during summer. It is one of the common medusae distributed in Northern Japan. The largest specimen hitherto examined is 27 mm high and 20 mm wide. The gonads are crescent in form and furnished with many longitudinal folds.

Distribution. Kurile Islands, Hokkaido, Mutsu Bay, further Unalaska Island and Greenland.

11. *Urashimea globosa* KISHINOUE

Urashimea globosa: UCHIDA, 1938, p. 39.

Two large specimens were caught in September, 1937. This medusa is widely distributed in Northern Japan.

Distribution. Only in Japan: Saghalien, through Hokkaido to the middle part of Honshu, common.

Family Cytaeidae

12. *Turritopsis nutricula* MCCRADY

Turritopsis nutricula: UCHIDA, 1938 (a), p. 40; —, 1938 (b) p. 50.

This medusa occurs in the Bay from September to December and very abundantly in October. It is one of the commonest medusae in Japan.

Distribution. Atlantic coasts of Europe and North America. Mediteranean Sea. In the Pacific, from Hokkaido to Tsingtao, China.

Family Bougainvilliidae

13. *Nemopsis dofleini* MAAS

Nemopsis dofleini: UCHIDA, 1938 (b), p. 50.

This medusa is often collected from May to July. Large specimens are parasitized by a pelagic Amphipod *Hyperia galba*. It must be noted that specimens from Northern Japan have always brown gonads, while those from Middle Japan are furnished with bluish brown gonad. In Middle Japan the medusa occurs abundantly in spring, but in Akkeshi Bay the following fact was observed. Specimens collected from May to July are rather small in bell size, generally 7–12 mm high and have gonads only restricted in the manubrium. In the later part of June the writer frequently found several specimens with the gonads restricted to the manubrium and not extend onto the radial canals. In these specimens, male and female gonads were found both well developed; the male being bright brown and the female dark brown. In the subumbrellar cavity of the female many planulae were swimming or attaching to the subumbrellar wall and the manubrium. Tentacles of these specimens were somewhat degenerated and easily shed off. Compound tentacle pads blackish brown and axial ocelli blackish brown. These medusae will probably degenerate before long. But, from the end of August many medusae belonging to *Nemopsis* are found among sea-weed and sea-algae. These specimens are generally over 12 mm high and sometimes 25 mm high, and provided with ribbon-like gonads well developed on the manubrium and radial canals. These medusae have tentacles orange-coloured or colourless and gonads water-coloured, purplish white or brown. It cannot be determined for the present whether

these two medusae belong to two separate species or individuals of different generations.

Distribution. Only in Japan: Kurile Islands, Saghalien, Hokkaido, Honshu (from Mutsu Bay southward to the Inland Sea).

14. *Rathkea octopunctata* (M. Sars)

Rathkea octopunctata: UCHIDA, 1938 (a), p. 40.

This medusa is rarely found in summer plankton. It is one of the most common species widely distributed in the circumboreal regions. Recently Rees and Russell recorded young polyps of the medusa (Jour. Mar. Biol. Assoc. Unit. Kingd., vol. 22, 1937, pp. 71-74). In Japan Mr. N. Nakamura collected some hydroid specimens together with the hydroid of *Sarsia nipponica* in Oct., 1937. Hydroids of Nakamura seemingly resemble those described by Rees and Russell.

Distribution. Circumboreal. In Japan: Kurile Islands, Hokkaido, Honshu and Korea.

Family Polyorchidae

15. *Polyorchis karafutoensis* KISHINOUE

Polyorchis karafutoensis: UCHIDA, 1927, pp. 227-229.

This medusa is abundant during May-July, and many specimens in different developmental stages were examined. The medusa harbours larvae of the pyngonid, *Ammothea alaskensis*. The medusa is common in Saghalien in summer but has hitherto never been recorded from Honshu and another locality of Hokkaido. It is a medusa of cold waters and inhabits usually bays and lagoons in low salinity.

Distribution. Only in Japan: Saghalien, South-Eastern part of Hokkaido.

Family Williidae

16. *Proboscidactyla flavicirrata* BRANDT

Willsia flavicirrata: UCHIDA, 1938 (a), p. 41; —, 1938 (b), p. 51.

This medusa is found in this bay almost all the year round. As to the synonymy of this species with *W. pacifica* and *W. stellata* from Japan, the writer remarked in the preceding papers. The hydroid of this medusa is commonly found growing on the aperture of the tube of *Potomilla myriops*. As to the hydroid the writer is preparing another paper, in which the union of *Willsia* with *Proboscidactyla* will also be discussed.

Leptomedusae
Family Laodiceidae

17. *Melicertum octocostatum* (M. Sars)

Melicertum octocostatum: UCHIDA, 1938, p. 41.

A single specimen was obtained off Akkeshi Bay in August, 1936. This species is known from Muroran and Mutsu Bay.

Distribution. Northern parts of the Atlantic, on European and American coasts.

Family Eucopidae

18. *Eutonia indicans* (ROMANCES)

Eutonia indicans: UCHIDA, 1938 (b), p. 53.

(Fig. 5)

This medusa is one of the commonest species in this Bay. It begins to appear in later part of May and disappears in November. The hydroids, which give rise to the medusae, seem to lurk among eel grass of luxuriant growth, because young medusae are abundant in July–August among eel grass.

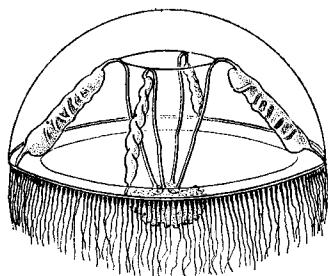


Fig. 6. *Eutonia indicans*
(Romances)

Distribution. Northern parts of the Atlantic. Pacific coasts of North America. In Japan: Kurile Islands, South-eastern coasts of Hokkaido, Pacific coasts of northern parts of Honshu.

19. *Staurophora mertensi* BRANDT

Staurophora mertensi: UCHIDA, 1925, pp. 93-94; KRAMP & DAMAS, 1925, pp. 288-290; KRAMP, 1933, pp. 559-560.

Staurophora discoidea: KISHINOUE, 1910, p.

(Fig. 6)

This large Leptomedusa is occasionally carried into Akkeshi Bay from off the Bay. From the specimens so far collected, the medusa is common in summer near the Marine Biological Station. The largest specimen hitherto examined measures 163 mm in diameter and 18 mm in height. Bell dome-like but aboral side smoothly rounded. Gelatinous substance thick but fragile. Tentacles arising

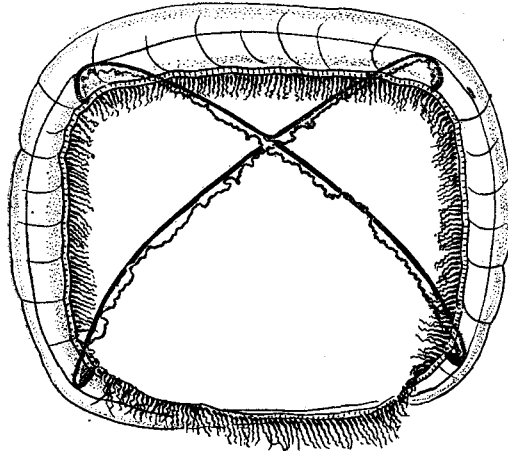


Fig. 6. *Staurophora mertensi* Brandt

from tentacle pads are numerous and thickly set on the margin. Tentacles short, coiled and hollow. A single, small, dark-brown ocellus existing on the axial side of the tentacle bulbs. Above the base of each tentacle-bulb is found a single inclosed statocyst cavity containing a spherical concretion. Without manubrium. Mouth represented by an enormously elongated, cruciform slit extending down the 4 radial-canals, barely reaching the bell margin. Four

radial canals thus converted into open gutters. The edges of the radial canals give rise to numerous, short, branched diverticula, over which folded gonads are developed. Gonads and tentacles slightly bluish or sandy coloured.

Distribution. Circumboreal. In the Atlantic the species has been often reported. In the Pacific Brandt (1938) was the first to describe the medusa from the Aleutian Islands. In Japan, it is rather common on the coasts of Saghalien, Kurile Islands and South-western coasts of Hokkaido.

Limnomedusae
Family Olindiidae

20. *Gonionemus oshoro* UCHIDA

Gonionemus oshoro: UCHIDA, 1929, pp. 359-360.

This medusa is abundantly found among eel grass in Akkeshi Bay during July-September. It is common among *Sargassum* on other coasts of Hokkaido, such as Oshoro and Muroran and on the coasts of Honshu, such as Yura, Yamagata Pref. and Mutsu Bay.

Distribution. Only in Japan around the coasts of Hokkaido and northern parts of Honshu.

21. "*Gonionemus agassizi* MURBACH & SHEARER"

Gonionemus agassizi: MURBACH & SHEARER, 1902, p. 185, Pl. 21, Fig. 1-3; Pl. 22, Fig. 3; —; BROCH, 1929, p. 489.

Several large specimens of *Gonionemus* coincided with the descriptions of *G. agassizi* were obtained by dredging on July 25, 1933 near the quay (Honmachi), in this locality Akkeshi Bay being connected with Akkeshi Lake. The similar specimens were also found among eel grass on coasts of Saghalien in August. The specific distinction is very obscure in the genus *Gonionemus*. These large medusae may be better developed forms of *G. oshoro*.

Distribution. Reported from Unalaska.

22. *Eperetmus typicus* BIGELOW

Eperetmus typicus: UCHIDA, 1929, pp. 364-366.

(Fig. 7)

This medusa has hitherto been reported from Alaska and Hokkaido, and only six preserved specimens (three by H. B. Bigelow and three by the present author respectively) have been examined. In Akkeshi Bay this medusa is indigenous and common from the later part of August to the middle part of September among sea-algae. The youngest specimen hitherto collected is 5 mm in diameter and 5 mm high. The gonads of this medusa developed on almost the whole length of radial canals and scarcely folded. Tentacles

arising from well-developed tentacle knobs, arranged spirally and deficient in adhesive pads. In this young specimen, five large, five intermediate and about ten minute tentacles were counted in each octant. The largest specimen examined is 25 mm in diameter and 15 mm in height and provided with gonads which are 5 times folded and 20 large, 7 or small tentacles in each octant. Colour in living specimens, pale brown in tentacles and gonads.

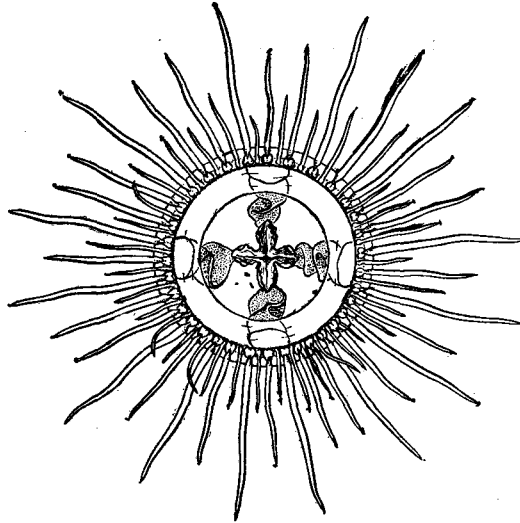


Fig. 7. *Eperetmus typicus* Bigelow

Distribution. Only Northern Pacific. Alaska. Hokkaido.

Trachomedusae

23. *Aglaura hemistoma* PÉRON et LESUEUR

Aglaura hemistoma: UCHIDA, 1928, p. 78.

This medusa belongs rather to the tropical forms. The adult medusa has never been observed in Bay, but a young form metamorphosing towards medusa was obtained in August, 1933.

Distribution. Temperate and tropical regions of the Atlantic and the Pacific. In Japan: common on the Pacific coasts of the middle part of Honshu southwards.

24. *Aglantha digitale* MÜLLER

Aglantha digitale: UCHIDA, 1938 (a), p. 43.

The species is a common circumboreal medusa. In Akkeshi Bay it is found almost the whole year throughout, but seems to be specially abundant during the winter months.

Distribution. Circumboreal. In Japan: Kurile Islands, Hokkaido, Northern half of Honshu.

Scyphomedusae
Stauromedusae
Family Haliclystidae

25. *Haliclystus borealis* UCHIDA

Haliclystus borealis: UCHIDA & HANAOKA, 1934, pp. 212-224.

The detailed description of this stalked medusa was given in 1934. In the living specimen, the species is easily distinguished from other species by the presence of white stripes in interradial.

Distribution. Hitherto only recorded from Japan. Akkeshi and Urakawa, both on the south-western coasts of Hokkaido.

26. *Haliclystus steinegeri* KISHINOUE

Haliclystus steinegeri: UCHIDA & HANAOKA, 1934, pp. 224-226.

The species was also described in detail in the previous paper. It is characterized in having umbrella, wider than high. It is common in August.

Distribution. From Alaska to Hokkaido and Saghalien through the Commander Islands and the Kurile Islands. In Japan: Akkeshi, Urakawa and Abashiri, all in Hokkaido.

Family Cleistocarpidae

27. *Thaumatocyphus distinctus* KISHINOUE

Thaumatocyphus distinctus: UCHIDA & HANAOKA, 1933, pp. 135-153; HANAOKA (early development), 1934, pp. 117-120; — (polarity and regeneration), 1935, pp. 159-181.

This medusa was described in detail in 1933. In the next year Hanaoka published a paper on its early development from segmentation to planula-formation. In 1935 the same author reported an experimental work. This medusa is very common upon the eel grass during July-August in this bay.

Distribution. Only in Japan and North Saghalien. In North Saghalien; Cape Moshia. In Japan; Akkeshi, Abashiri, Urakawa and Muroran, all in Hokkaido.

Semaeostomae
Family Pelagidae

28. *Chrysaora helvola* BRANDT

Chrysaora helvola: UCHIDA, 1935, pp. 43-44.

This medusa seems to be widely distributed in the northern cold waters of the Pacific. In Akkeshi Bay the medusa is common from June to August. From the occurrence of metaphyrae it seems to be indigenous to the bay.

Distribution. Distributed in Arctic regions of the Pacific. In Japan; Saghalien, Kurile Islands and Hokkaido.

29. *Dactylometra pacifica* GOETTE

Dactylometra pacifica: UCHIDA, 1935, p. 44; —, 1938, p. 52.

This medusa is occasionally obtained in this bay in summer months. Specimens here caught were always well-developed and sometimes more or less damaged. They were surely carried here by the current from Honshu. The species is a temperate form and not indigenous to Hokkaido.

Distribution. From the middle part of Honshu to Formosa through Kiushu and Loo choo Islands.

Family Cyaneidae

30. *Cyanea capillata* ESCHSCHOLTZ

Cyanea capillata: UCHIDA, 1938, p. 45.

The medusa is a circumboreal form and was obtained in abundance in Saghalien, but is not common in Akkeshi Bay. It rarely visits here in summer and autumn.

Distribution. Circumboreal. In Japan; Saghalien, Kurile Islands, Hokkaido and Northern parts of Honshu.

Family Ulmaridae

31. *Aurelia limbata* BRANDT

Aurelia limbata: UCHIDA, 1934, p. 698-700.

The large medusa is common off Akkeshi Bay. It seems to be found almost all the year round, but to be most abundant in summer. The medusa is clearly distinguished from *A. aurita* by complicated canal system, long deep brown marginal lappets, rather long tentacles of the same colour and slightly complicated oral arms. It is a typical boreal form in the Pacific and has never been reported on the coasts of Honshu. In Akkeshi Bay the medusa often harbours numerous specimens of *Hyperia galba*.

Distribution. Northern regions of the Pacific. In Japan; Kurile Islands, Saghalien and Hokkaido.

Ctenophora
Tentaculata

32. *Hormiphora palmata* CHUN

Hormiphora palmata: UCHIDA, 1938, p. 45.

This ctenophore is often obtained in this bay in summer.

Distribution. Temperate regions both in the Pacific and the Atlantic. In Japan Honshu and Hokkaido.

Lobata

33. *Bolinopsis mikado* (MOSER)

Bolinopsis mikado: KOMAI, 1920, pp. 454-455.

Several specimens were caught in this bay on July 5, 1937.

Distribution. Only in Japan: Honshu and Hokkaido.

Beroida

34. *Beroë cucumis* FABRICIUS

Beroë cucumis: UCHIDA, 1933, p. 132.

This ctenophore is most common and often collected in this bay.

Distribution. Atlantic and Pacific. In Japan: Honshu and Hokkaido.

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