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UNIVERSITETET I BERGEN  
ÅRBOK 1957  
Naturvitenskapelig rekke  
Nr. 6

FERDINANDO BOERO

PUBLICATIONS FROM THE BIOLOGICAL STATION, ESPEGREND  
EDITED BY HANS BRATTSTRÖM

19

*Branchiocerianthus norvegicus* n.sp.  
from the Hardangerfjord,  
Western Norway.

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Printed with grant from Birtha Marie Danielssens legat.

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Received for publication March 13th 1957.

A specimen of the remarkable hydroid genus *Branchiocerianthus* was found in the Hardangerfjord on July 6th 1956. This is the first record of a *Branchiocerianthus* from Norway and from the Eastern Atlantic as well. The internal anatomy of this single specimen has not been studied, but already the external morphological characters reveal that the specimen cannot be referred to any of the *Branchiocerianthus* species hitherto described, nor can it be identical with the undescribed Mediterranean *Br. italicus* STECHOW, which has a colouring different from that of our specimen. The Norwegian *Branchiocerianthus* thus undoubtedly belongs to a new species, which has been given the name *Branchiocerianthus norvegicus*.

The specimen was found hanging on the outside of the net of a triangular dredge. It was immediately transferred to a bowl with sea water, where all the different parts of the body expanded. The measurements were taken after the specimen had been fixed in 80 % alcohol, but as the animal apparently did not contract when alcohol was gradually added to the sea water, the measurements are probably valid also for the living animal. A preliminary description of the new species has been given in «Nature» (BRATTSTRÖM 1956) and a short note on it has been published in «Naturen» (BRATTSTRÖM 1957).

**M a t e r i a l.** One specimen (type), kept in the Zoological Museum of the University of Bergen.

**T y p e - l o c a l i t y.** Indre Samlenfjord (part of the Hardangerfjord), off Hesthammer, 60° 26' 05" N, 06° 33' 50" E, depth about 210—240 m, bottom muddy sand and stones. Depth and bottom varied much, and the contents of the dredge accordingly were a mixture of hard and soft bottom animals. The *Branchiocerianthus* specimen was no doubt from soft bottom. Typical of that bottom at this locality are *Munida* sp. and *Stichopus tremulus*.

**D i a g n o s i s.** Body pronouncedly bilateral. Hydrocaulus thin, longitudinally striate, ending below in a bulblike swelling with numerous thin filaments. Hydranth disciform of the shape of a tennis racket, attached to the hydrocaulus

with its pointed ventral margin. Along the margin a whorl of long, filiform proximal tentacles. A whorl of blastostyles between the proximal tentacles and the hypostome. Both the marginal tentacles and the blastostyles are arranged in horseshoe shape, the whorls being interrupted ventrally. Hypostome emerging from the distal  $1/3$  of the upper side of the hydranth, ending in several rows of short, finger-like distal tentacles round the transversally placed mouth opening. Unbranched radial canals in the disc between the blastostyles and the proximal tentacles. Colour during life a pale pink, the blastostyles being a pale salmon-red.

**Description** (cf. Plates I and II). The total length of the animal (hydrocaulus and hydranth) is about 120 mm. It cannot be stated with certainty whether this single specimen is juvenile or fullgrown, but as the blastostyles are fairly well developed the specimen is probably adult or at least almost adult.

The hydrocaulus is longitudinally striate. It is about 110 mm long and 2 mm thick, ending below in a bulblike swelling with numerous very thin filaments. The «bulb» is 8 mm long and 5 mm thick and no doubt acts as an anchor. Distally, below the point where the hydranth is attached to the hydrocaulus, the latter shows a constriction.

The hydranth has a pronouncedly bilateral organization. It is disciform and has the shape of a tennis racket. The longitudinal diameter is about 9 mm, the broadest part of the disc about 7.5 mm. The hydranth is attached to the hydrocaulus by means of the lower part of its pointed proximal (ventral) margin. Without access to living animals it cannot be decided whether the hydranth forms an angle to the hydrocaulus, but most probably it does.

Along the margin of the hydranth a whorl of filiform and sticky proximal (marginal) tentacles is found. Scars at the margin show that some few tentacles must have been lost. The total number has been 54. The tentacles are arranged in horseshoe shape, the whorl being interrupted ventrally where the hydranth is attached to the hydrocaulus. They stand close to each other and are laterally flattened at their bases except the youngest ones. The tentacles vary much in length. The shortest ones are found nearest to the hydrocaulus. The first tentacle of the one side is almost microscopical, that of the opposite side is 3 mm long. From here the length increases rapidly, already the 5th and 6th tentacles having a length of 30—40 mm. The longest tentacles measure about 65 mm and are found at the broadest part of the hydranth. Then the length decreases though not so much as ventrally. The dorsal tentacles thus are about 30—35 mm long. It is very probable that new tentacles are generated ventrally, the shortest ones being the youngest. Older specimens may thus be expected to have more than 54 marginal tentacles.

From the distal  $1/3$  of the upper side of the hydranth the hypostome emerges, forming a very pointed angle to the disc, thus being almost parallel to this. It

is broader transversally than longitudinally. The side facing the hydrocaulus is about 9 mm high, the distal tentacles included, the opposite side shorter. The mouth opening is transversally lengthened and surrounded by the distal tentacles. These are fingerlike and about 4 mm long. They are arranged in several rows and are so crowded that it is impossible to count them without destroying the animal, but their number has been estimated at at least 40—60.

Medially of the proximal tentacles and at the same distance from the latter and from the hypostome a whorl of blastostyles is found on the upper side of the disc. Like the proximal tentacles the blastostyles are arranged in horseshoe shape with an interruption ventrally. Their number is 31, but one of them seems to consist of four more or less coalesced blastostyles, the total number thus being 34. The smallest and youngest blastostyles are found ventrally, the broadest and longest laterally and dorsally, where they reach a length of about 4—5 mm. The blastostyles are dichotomously branched. The smallest ones branch near the base, the longest ones branch higher up. It is thus the proximal part which grows when the blastostyles become older. Each end branch has the shape of a cluster of grapes. The lateral blastostyles have more branches than the ventral and dorsal ones and are thus much broader than these, and as mentioned some of them have partly grown together. Ventrally the blastostyles are arranged in one row only, laterally and dorsally they are so crowded that they form two rows, and those of the one row are shorter than those of the other.

As I did not wish to dissect this single specimen the internal anatomy is not known. However, as the disc is fairly transparent it is possible to observe, through its thin wall, that a series of unbranched radial canals extend in the disc between the blastostyles and the proximal tentacles. They come to an end at the margin of the disc between the bases of the proximal tentacles. The canals thus do not continue into the tentacles.

**Other species.** Four other species of *Branchiocerianthus* are known, viz. *Br. imperator* (ALLMAN), *Br. urceolus* MARK, *Br. reniformis* BROCH, and *Br. italicus* STECHOW.

*Branchiocerianthus imperator* is the giant among hydroids. It was discovered by the «Challenger» expedition in the Sagami Bay in Japan and in the Northern Pacific and it was first given the name *Monocaulus imperator* (ALLMAN 1885, 1888). Another specimen from the Sagami Bay was described by MIYAJIMA (1900), who referred it to the genus *Branchiocerianthus*. The German «Valdivia» expedition found new specimens at three localities off North-east Africa (CHUN 1900) thereby extending the area of distribution to the Indian Ocean. DOFLEIN (1906) mentions new specimens from the Sagami Bay and LLOYD (1907) from the coasts of Oman and Baluchistan. The last-named specimens were treated by STECHOW (1909 b), who has also described the material collected by DOFLEIN

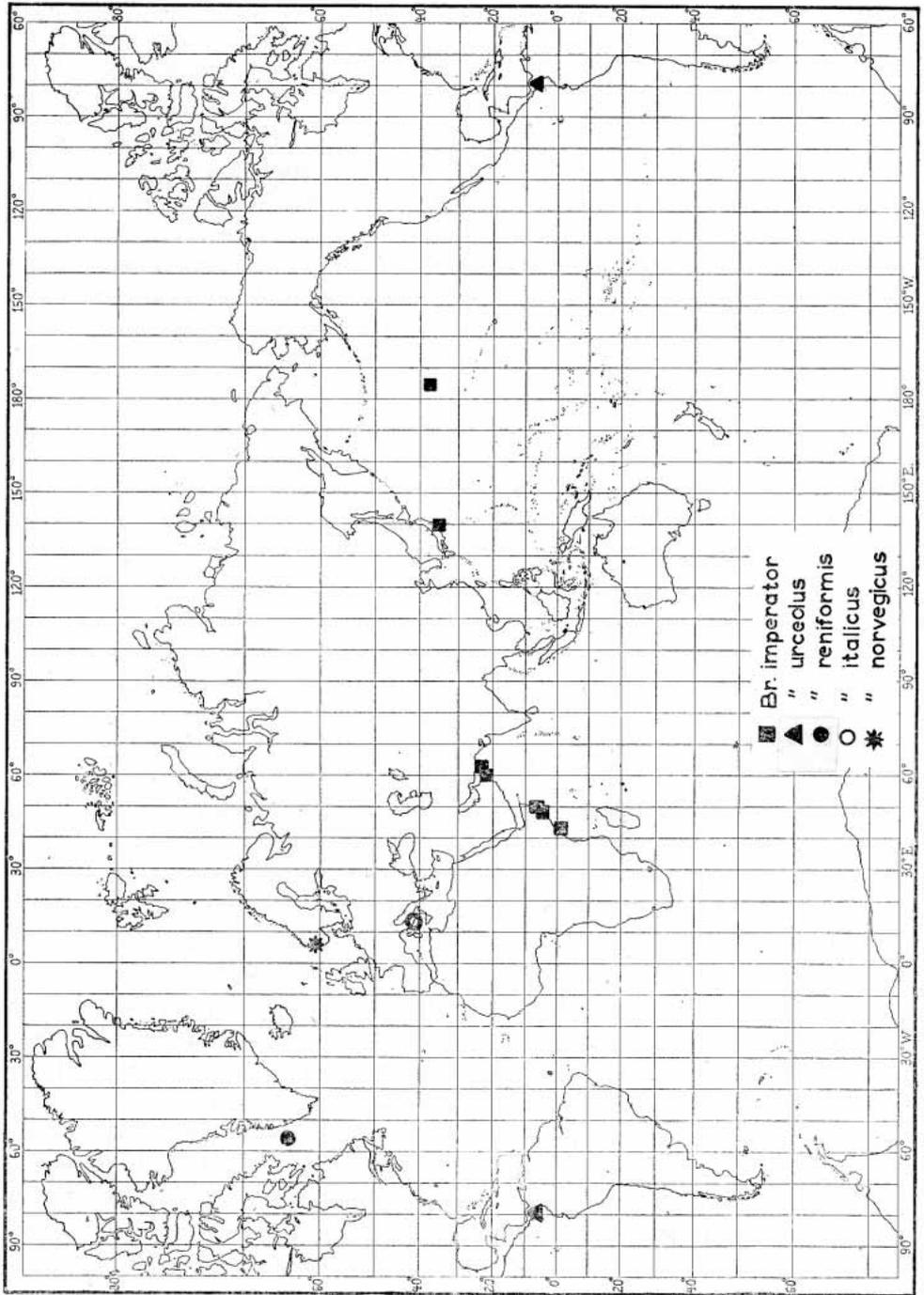


Fig. 1. Distribution of the genus *Branchiocerianthus*.

Measurements in mm	<i>imperator</i> (STECHOW, MIYAJIMA)	<i>urceolus</i> (MARK)	<i>reniformis</i> (BROCH)	<i>italicus</i> (Lo BIANCO)	<i>norvegicus</i>
Total length . . . . .	230—2235	130—238	120	100	120
Length of hydrocaulus .	195—2200	105—200	110	—	110
Width of hydrocaulus below hydranth . . . . .	4—15	} 3—5	3	—	2
Width of hydrocaulus above «bulb» . . . . .	—		7	—	2
Dimensions of «bulb» . . .	17—80 <sup>1</sup>	> 6—8	—	—	8 × 5
Length of hydranth . . . .	23—80	25—38	9 <sup>2</sup>	—	9
Breadth of hydranth . . .	23—90	15—30	12	—	7.5
No. of marginal tentacles . . . . .	100—250	85—97	85	numerous	54
Length of longest marginal tentacles . . .	70—300	125	56	—	65
No. of distal ten- tacles . . . . .	48—> 18 <sup>1</sup>	c. 130	80—90	—	at least 40—60
Length of distal ten- tacles . . . . .	12—55	30—35	5	—	4
No. of blastostyles . . . .	96—c. 16 <sup>1</sup>	21—37	70—80	—	34
Length of longest blastostyles . . . . .	8—63	4—8	4	—	c. 4

<sup>1</sup> Widest part of bulb <sup>2</sup> From the «hilus» of the disc

and others (STECHOW 1908, 1909 a, 1910—13). Later STECHOW (1921 b, 1925) also described the «Valdivia» specimens.

*Branchiocerianthus urceolus* was found by A. AGASSIZ in the Gulf of Panama (A. AGASSIZ 1891) and it was described by MARK (1898, 1899 a). The species has never been re-found.

*Branchiocerianthus reniformis* was described by BROCH (1918) from one single specimen taken by the Danish «Ingolf» expedition in the Davis Strait.

*Branchiocerianthus italicus* was first mentioned by LO BIANCO (1909). This author had found one specimen, 10 cm high, in the Gulf of Naples, but he did not describe it or give it a name. The name *italicus* was suggested by STECHOW (1921 a, 1924), but the single specimen is still undescribed.

**Geographical distribution.** On the map fig 1, all known records of *Branchiocerianthus* are marked. As seen from this map the genus has been recorded from the Pacific (*Br. imperator* and *urceolus*), the Indian Ocean (*Br. imperator*), the Mediterranean (*Br. italicus*), and from the Atlantic (*Br. reniformis* and *norvegicus*). BROCH (1923—25) gives a map, in which also one

makes it evident that the number is not fixed. New tentacles are generated (proximally) as the specimens grow older. The numbers found in the two known specimens of *Br. reniformis* and *norvegicus* may thus be different in other specimens. It is therefore not possible, at least not for the present, to separate the species by means of the number of marginal tentacles alone. Even as to the distal tentacles *Br. norvegicus* seems to have fewer than the other species, but as already mentioned it is impossible to count the exact number, these tentacles being small and very crowded. The blastostyles, finally, are most numerous in *Br. imperator* and *reniformis* (96—160 and 70—80 respectively), 21—37 in *Br. urceolus* and 34 in *Br. norvegicus*. But even the blastostyles no doubt grow more numerous as the specimens grow older, and the numbers hitherto observed must not be taken as typical of the respective species.

It seems as if the shape of the hydranth is the best and most typical feature of the different species, more or less circular in *Br. imperator*, vase-shaped in *Br. urceolus*, reniform in *Br. reniformis* and shaped like a tennis-racket in *Br. norvegicus*. As even the colouring seems to be quite different in all the species it is likely that also *Br. italicus* is a distinct species, its colouring being different from that of the other species.

All characters taken into consideration it seems as if *Br. imperator* is the most primitive of the species described. Its hydrocaulus is still fixed to the underside of the hydranth though near the margin. As to the other species these seem to be more closely related inter se than with *Br. imperator*. Thus e. g. MARK's description of the organization and arrangement of the marginal tentacles of *Br. urceolus* might as well be a description of *Br. norvegicus*, but the differences between the three distinctly bilateral species nevertheless are too great to permit one to suppose a too close relationship.

**S y s t e m a t i c p o s i t i o n .** A. AGASSIZ (1891) first mentioned *Branchiocerianthus urceolus* as «a most remarkable deep-sea Actinian, closely allied to *Cerianthus*», and the generic name given to it by MARK (1898, 1899 a) alludes to this supposed relationship and to the branched blastostyles, which were considered «gills». The mistake was corrected by CARLGREN (1899) who found it likely that *Branchiocerianthus* «eine *Corymorpha* oder wenigstens eine *Corymorpha* nahestehende Gattung ist» and that the gills were «Geschlechtsknospen». Without knowing CARLGREN's paper MARK (1899 b) himself corrected his mistake and compared *Br. urceolus* with ALLMAN's *Monocaulus imperator*. STECHOW (1909 a) referred the genus *Branchiocerianthus* to the family Tubulariidae, and later (1924) he created for it the subfamily Branchiocerianthinae. Recently REES (1957) has proved that *Branchiocerianthus* is more closely allied to *Corymorpha* than to *Tubularia* (cf. CARLGREN) and he places the Branchiocerianthinae as a subfamily of the family Corymorphidae.

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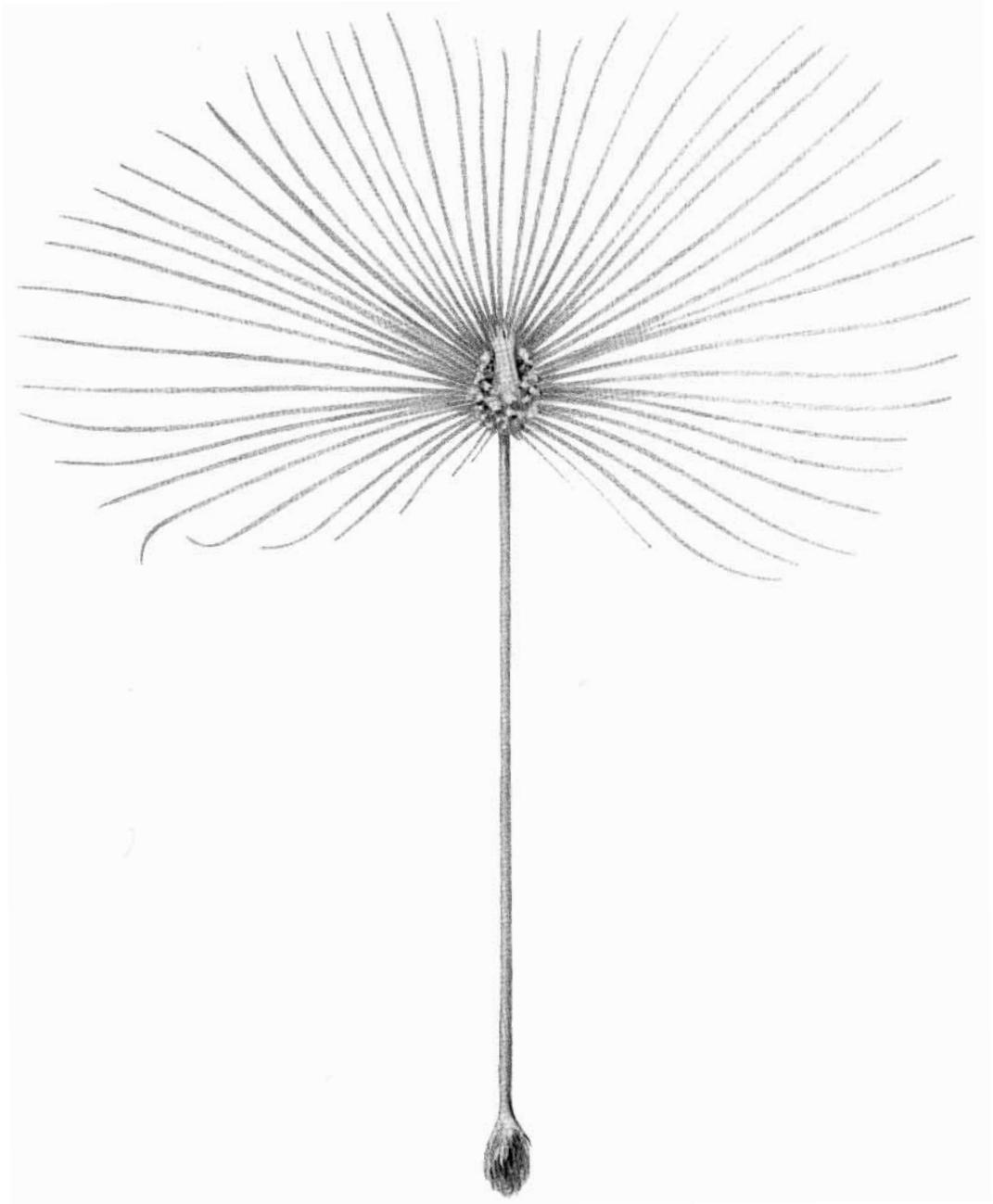


Plate I. *Branchiocerianthus norvegicus* BRATTSTRÖM. Natural size. TH. RASMUSSEN del.