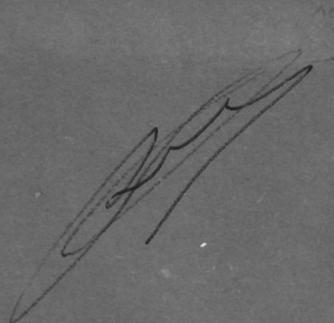


Torben Wolff

On the Rare Whale-Louse  
*Platycyamus thompsoni* (Gosse)  
(Amphipoda, Cyamidae)



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ON THE RARE WHALE-LOUSE  
*PLATYCYAMUS THOMPSONI* (GOSSE) (AMPHIPODA,  
CYAMIDAE)

By TORBEN WOLFF  
Zoological Museum, Copenhagen.

**Introduction.**

ON the 3rd of October 1957 two young Bottlenose Whales (*Hyperoodon ampullatus* Forster) were killed in the Sound at Klampenborg 10 km north of Copenhagen. Both whales measured 4.90 m in length and had been noticed in the Copenhagen Port the previous day. They were shot near the shore and before being hauled away LARS HØIAAS, B. Sc., secured from all over their body some whale-lice which he brought to me in the Museum. They were readily identified to *Platycyamus thompsoni* (Gosse) which—no more than any other species of whale-lice—had previously been recorded from Danish waters.

Since it was dark, when Mr. HØIAAS collected the animals I hoped for further material by investigating the whales carefully. The following day I therefore went to a fishery exhibition where the whales were on show, but found only a few more specimens. They were of course dead and dry, but still clinging to the whales' skin in spite of the transport and rough handling of the whales. Fig. A (Pl. I) shows a specimen still in situ. None of the specimens collected by me were sitting in a groove. Mr. HØIAAS has informed me that he found it rather difficult to remove the animals from the newly shot whales. The whale-lice were still alive at that time and must therefore have been able to stand at least 24 hours' stay in sea-water of a salinity of about 15 ‰.

This species is the only representative of *Platycyamus*. The genus is outstanding in having all seven peraeonites (peraeon segments) fully developed and the first pair of gnathopods almost as large as the second. The species is, however, only poorly known. I have therefore taken the opportunity to give below a redescription of the adult female and male,

including the hitherto neglected mouth-parts, and besides to consider the development and variation of the species, based on LÜTKEN's old material in this Museum and on a collection received from Tromsø Museum, Norway.

My thanks are due to Mr. LARS HØIAAS for collecting most of the Danish material, to Dr. J. P. HARDING of the British Museum (Natural History) for taking a photograph of the holotype, to Mr. BENGT CHRISTIANSEN for sending me the material in the Tromsø Museum on loan, and to Professor M. DEGERBØL and Dr. F. W. BRAESTRUP for information regarding the distribution and occurrence in Danish waters of the Bottlenose Whale. Figs. C and D (Pl. I) were drawn by Mr. POUL H. WINTHER.

### Previous literature.

The records of this species seem to be very scarce. It was described by GOSSE (1855 a and b) under the name *Cyamus Thompsoni*, and in the latter paper a very poor figure of a female from above is included. GOSSE (1855 b, p. 31) records the host as *Hyperoodon bidens* (= *H. ampullatus* Forster) which stranded the previous year at Portland Roads in Dorset, South England.

WHITE (1857, p. 219) only mentions the species and gives the host erroneously as "a dolphin". SPENCE BATE mentions it (1857 a, p. 152) as *Cyamus gracilis* Gosse, later (1857 b, p. 525) corrected to *Cyamus Thompsoni*. The same name is used in his Catalogue (1862, p. 358) with a citation of GOSSE's description and reproduction of his figure; also here "the dolphin" is recorded as host.

SPENCE BATE & WESTWOOD (1862, p. 96) give a somewhat better figure of the type specimen and are convinced that it is a juvenile specimen. They also include as a synonym *Cyamus delphinii*, described by GUÉRIN-MÉNEVILLE from a dolphin from the Antilles.

In his important monograph of the whale-lice LÜTKEN gives a rather extensive description (in Danish) of the species (1873, p. 279) which he refers to its own genus (*Platycyamus* Lütken, l. c., p. 250). Apart from a sketch of the maxillipeds neither the mouth-parts nor the sexual organs are considered. Rather schematic figures (pl. IV, 11) of a female and a male from above and below and of a female antennula and antenna are given. As hosts LÜTKEN records two species of *Hyperoodon* (*H. rostratus* and *latifrons*) which are now both considered as synonyms of the only Bottlenose species *H. ampullatus*<sup>1)</sup>. LÜTKEN claims that the type specimen,

<sup>1)</sup> LÜTKEN's material is treated later in this paper.

a 4,5–5 mm long male, is adult<sup>1</sup>) and not juvenile as supposed by SPENCE BATE & WESTWOOD (l. c.). Finally he also correctly rejects *Cyamus delphinii* Guérin-Méneville as a synonym, claiming that this is a “real *Cyamus*, not a *Platycyamus*” (p. 282). Already in 1859 GERVAIS & VAN BENEDEN had, however, proposed the name *Isocyamus*, and later BARNARD (1932, p. 313) gave a diagnosis of this genus which contains only the species *delphinii*.

BRANDT (1872, p. 700) points out that the adult *P. thompsoni* possesses many juvenile features.

In 1889 (p. 160) VOSSELER records *P. thompsoni* from Spitzbergen, found “in Menge” on the Bottlenose. VOSSELER was apparently not aware of SPENCE BATE’s later, more correct figure of the species, since he expresses doubt as to the identity of LÜTKEN’s and his own species on account of the pronounced disagreement of SPENCE BATE’s and LÜTKEN’s illustrations.

Finally, STEPHENSEN (1942, p. 455) gives an English translation of LÜTKEN’s diagnosis of the genus and description of the species and includes a re-drawing of some of LÜTKEN’s figures. In the Tromsø Museum collections are found “numerous specimens”, labelled “No. 5. L. M.” and “No. 6”, but with no localities given. This material is considered below.

### Description.

In the following only essential characters not mentioned by LÜTKEN 1873 (STEPHENSEN 1942) will be pointed out.

**Adult female** (the Faroes 1857, Copenhagen Museum), Pl. I, D.

*Body.* Head evenly vaulted above. The eyes which are hardly raised over the general surface are oval in outline and dark brown in fresh material. Peraeonites 5 and 6 have a similar round knot posteriorly as 3. The genital valves on peraeonite 5 have a short “neck” and an edged distal part, medianly meeting the opposite valve and furnished with short, thick bristles (Fig. 1). There is only one pair of accessory gills (on peraeonite 4). The oostegites are ciliated along the margin.

*Antennula* (Fig. 2 a) 4-jointed, rather stout and placed on a rise on the head. Joints 2 and 3 equally long, about  $\frac{2}{3}$  of joint 1 and  $\frac{2}{1}$  of joint 4, which has a close tuft of sensory hairs terminally. *Antenna* (Fig. 2 b), also placed on a rise, with four joints of which the third is the longest and is directed obliquely outwards. Joint 4 very short, with four minute setae.

<sup>1</sup>) Judging from the diagram (p. 10) the type is immature.

*Mouth-parts* rather different from those in all other Cyamidae in which they are described. *Labrum* (Fig. 3 a) evenly rounded, somewhat broader than long. *Mandibles* (Fig. 3 b and c) very short and thick, almost square

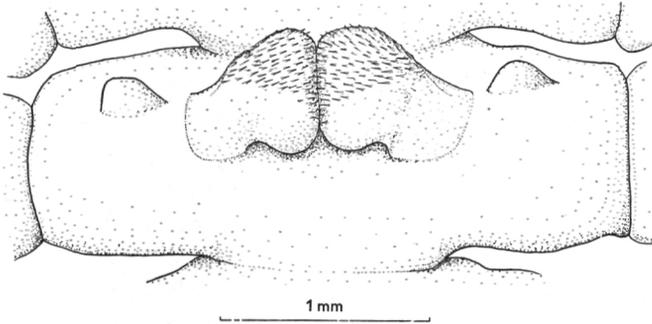


Fig. 1. Peraeonite 5 of *P. thompsoni* ♀ with genital valves. The oostegites on the preceding peraeonite have been omitted.

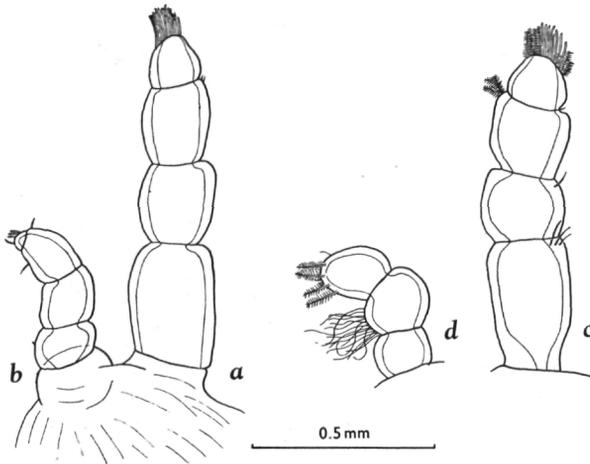


Fig. 2. Antennulae (a & c) and antennae (b & d) of *P. thompsoni*; female left, male right.

and without any armament except the toothed incisive parts and molar processes. *Labium* (3 d and e) remarkable in having the central part vaulted and unpaired without any trace of a median cleft. In general shape the lip resembles those of *Syncyamus pseudorcae* Bowman (1955, fig. 1 P), *Cyamus elongatus* Hiro (1938, fig. 4 A) and of *Cyamus ovalis* Roussel de Vauzème (IWASA 1934, pl. VI, d), but lacks the terminal median incision of the two latter species. The inner margins of the lobes are densely ciliated.

*Maxillula* (3 f) without inner lobe. The outer lobe furnished with six strong spines in two rows. Palp reduced, one-jointed, not reaching the distal end of the outer lobe, and with three-four short bristles on the apex. *Maxillae* (3 g) with only one lobe developed as in *Cyamus globicipitis* Lütken (CHEVREUX & FAGE 1925, fig. 438) and *Syncyamus pseudorcae* (l. c.), but apparently with no common basal part. A faint incision distally

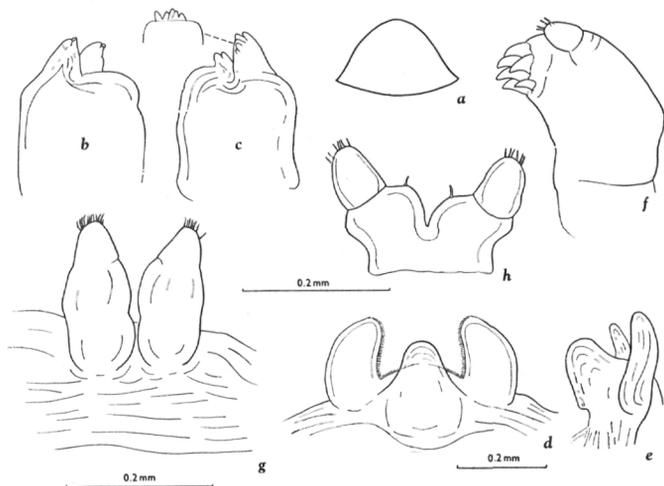


Fig. 3. Mouth-parts of *P. thompsoni* ♀.—a, labrum; b, right mandible; c, left mandible; d, labium in frontal view; e, in side view; f, maxillula; g, maxillae; h, maxillipeds.

on the inner side may indicate the location of the inner lobe. A varying number of short bristles on the apex. *Maxilliped* (3 h) has an almost square inner lobe with one seta and a somewhat ovoid outer lobe with about six short bristles on the apex. No palp is found.

*Pleon* (Fig. 4 b and c) oval, a little longer than broad, with a median triangular lobe dorsally and a pair of rounded processes on each side of apex.

*Size*: Largest known female (the Sound 1957) is 9,2 mm long and 4,0 mm across the broadest peraeonite (the fourth).

**Adult male** (the Faroes 1857, Copenhagen Museum), Pl. I, C and Fig. 7a.

Differs from the adult female in the following respects:

(1) The gill-bearing segments (3 and 4) both shorter and narrower than the other segments and not coalesced. On the ventral side a small conical spine with outwards turned apex is found on both segments at the base of the gills. No accessory gills are present.

- (2) The gills are comparatively shorter and thicker.  
 (3) No oostegites and genital valves present.  
 (4) Antennula (Fig. 2 c) comparatively broader and with three feathered setae on joint 3 and several ones on joint 4, besides the sensory hairs.

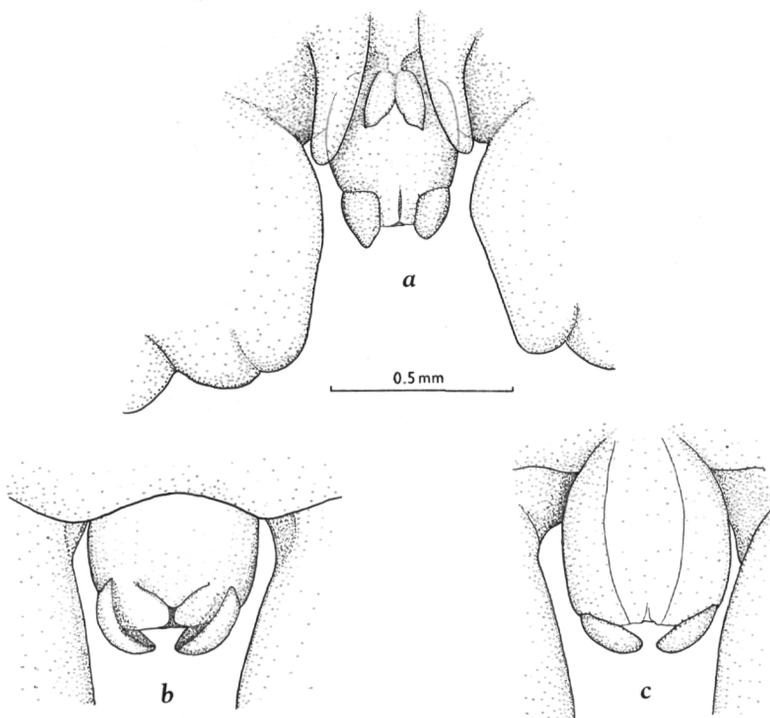


Fig. 4. Pleon of *P. thompsoni*.—a, of male from below; b, of female from above; c, from below.

(5) Antenna (Fig. 2 d) with three joints only. The shape of the joints somewhat different. The second joint with many long and very thin hairs and the third with five or six feathered setae. Neither the antenna nor the antennula is placed on a rise.

(6) Pleon (Fig. 4 a) of the same relative length, but the two terminal processes are not so distinctly set off from the pleon as in the female. On the ventral side a pair of low, rounded, basally coalesced processes are found near the base of pleon; they probably represent the vestigial pleopods which are present in several species, for instance *Cyamus catodontis* Margolis (1954, pl. I, C). The two sexual appendages which issue

from the last peraeonite are slightly diverging and reach half-way the length of pleon.

(7) Size of largest male 6,7 mm in length, 2,4 mm across peraeonite 5 which is the broadest.

#### Existing material of *Platycyamus thompsoni*.

1. Portland Roads, England, 2. October 1854. 1 ♂. British Museum (Nat. Hist.), London. The holotype and probably only existing specimen. Through the courtesy of Dr. I. GORDON and Dr. J. P. HARDING I received a photograph (Pl. I, B) of the type which is dry and "not in good condition". It is about 4,5 mm long (immature).

2. The Faroes 1857 (MÜLLER). 57 ♀♀, 59 ♂♂ (see p. 8). Copenhagen Mus. LÜTKEN determ. (7 specimens in Leningrad Museum (BRANDT 1872)).

3. Skaalefjord, the Faroes, 29. June 1861 (MÜLLER). 3 ♂♂ (see p. 9). Copenhagen Mus. LÜTKEN determ.

4. North Atlantic (?), "No. 5. L. M.". 61 ♀♀, 87 ♂♂. Tromsø Mus. STEPHENSEN determ.

5. North Atlantic (?), "No. 6". 74 ♀♀, 91 ♂♂ (see p. 8). Tromsø Mus. STEPHENSEN determ.

6. The Sound at Klampenborg, Denmark, 3. October 1957. 15 ♀♀, 5 ♂♂. Copenhagen Mus. (see p. 8).

The collection mentioned by VOSSELER (1889) could not be traced in German Museums.

#### Development.

The development of the whale-lice is almost unknown. R. DE VAUZÈME (1834, p. 262) gave some information on the biology of juvenile *Cyamus ovalis*, *C. gracilis* and *C. erraticus*. BRANDT (1872, p. 684) described young ones of *C. Kessleri*, POUCHET (1892, pls. 7 & 8) and LÜTKEN (1893, pl. 1) gave figures of juvenile specimens of *C. globicipitis*, *C. boopis*, and *Neocyamus physteris*, and HURLEY (1952, p. 65) of the variation in maxillipeds.

Since I had many individuals of *P. thompsoni* at hand I have measured all those from four localities (after having stretched each specimen). For convenience the unite on the measuring ocular has been retained below in my attempt of distinguishing among the various developmental stages.

Unfortunately, none of the females had eggs or embryos in the brood-pouch, nor were any ♀ and ♂ smaller than 2,7 and 2,4 mm, respectively.

### 1. Females.

Morphologically it is only possible to distinguish among four stages. If growth from one stage to the next one is characterized not only by increase of size but also by traceable morphological changes it means that the material comprises four stages only and that the range of size within each stage is considerable (Fig. 6). In consideration of the large difference in size of adult females with fully developed oostegites (which

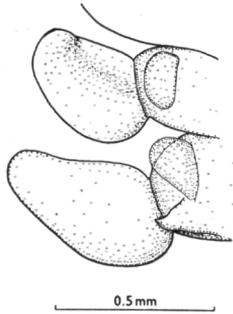


Fig. 5. Stage I. Gills and rudiments of oostegites on pereonites 3 and 4; process on pereonite 4.

range between 7,0 and 8,7 mm in the same population (from the Faroes)), it seems probable that also the younger stages do have a wide range in size. The stages differ from each other as follows (Faroe material):

*Stage I* (Pl. II, a, b, g). Size: 40–53 = 2,7–3,6 mm. The oostegites are present only as inconspicuous knots (Fig. 5). There is yet no trace of genital valves on pereonite 5. Dorsally pereonites 3 and 4 are widely separated and evenly rounded laterally, i. e. shaped as in the males (Fig. 7 a).

*Stage II* (Pl. II, c, h, j). Size: 74–87 (Faroes) and 59–87 = 4,0–6,0 mm (Tromsø). Oostegites small, triangular. Gills somewhat longer and narrower than in stage I, but rather variable. Rudiments of genital valves present, but still widely apart. Pereonites 3 and 4 laterally shaped as in the adult ♀, but not coalesced dorsally.

*Stage III* (Pl. II, d). Size: 90–100 = 6,2–6,9 mm (Faroes). Oostegites and genital valves somewhat larger. A narrow bridge connects pereonites 3 and 4 half way between the median line of the body and the distal end of the segments, thus resulting in a depression as that found in the adult (Pl. I, D).

*Stage IV* (Pl. II, e, f). Size: 101–125 = 7,0–8,7 mm (Faroes) and 9,2 mm (the Sound). Oostegites fully developed. Gills long and slender. Genital valves touching each other (Fig. 1). Peraeonites 3 and 4 totally coalesced (Pl. I, D). The rather torn state of the oostegites may indicate that the young have recently left the brood-pouch of these adult females.

## 2. Males.

It is still more difficult to find morphological features with which the developmental stages in males can be separated. Actually I have been able to distinguish clearly the two following stages only:

(1) 42–49 (the Sound) and 36–52 = 2,4–3,5 mm (the Faroes 1857): Gills short and thick, sexual appendages not fully developed. In the Faroe material it is, however, possible to find the following differences: (a) Specimens 36–47 = 2,4–3,2 mm: Gills less than twice as long as broad; sexual app. bud-like, not much longer than broad; no trace of pleopods. (b) Specimens 48–52 = 3,2–3,5 mm and ♂♂ from the Sound: Gills twice as long as broad; sexual app. 2–3 times longer than broad; rudiments of pleopods. However, this slight difference can hardly be a result of a moult since all Faroe males between 2,4 and 3,5 mm form one top only in the diagram in Fig. 6.

(2) 64–89 = 4,4–6,2 mm (the Faroes 1857); 78–97 = 5,4–6,7 mm (the Faroes 1861); 54–79 = 3,6–5,5 mm (Tromsø): Gills a little longer than broad; sexual app. and pleopods fully developed. It seems unlikely that males which differ so much in size are all fully mature, but no external morphological features could be found to separate immature and adult males.

This problem might perhaps be explained by presuming that mature males of this species are still unknown, because they may die and fall off the whale as soon as the copulation has taken place. This theory could also serve as an explanation of the fact that *P. thompsoni* is the only species of whale-lice in which the males are known to be smaller than the females. On the other hand it is hard to see why the males in the other species remain on the whales after maturity has been reached.

Fig. 6 discloses another remarkable thing. The material from the Faroes 1857 (B in Fig. 6) contains females and males of all sizes from about 2,5 mm and upwards, but curiously enough no specimens in the (yet unknown) early postmarsupial stage(s) between about 1 mm and 2,5 mm. But in the material from Tromsø (A) the lack of males and especially females, representing several developmental stages, is still more striking.

In Fig. 6 only one of the two lots borrowed from the Tromsø Museum is considered. A study of the other lot ("No. 5") showed a similar lack of adult females and large (adult?) males as well as of specimens smaller than 3,5–4 mm., i. e. the size of the animals from "No. 5" was almost exactly as in "No. 6".

The only explanation I have been able to find assumes that both whales from which the two Tromsø materials originate had recently been exposed

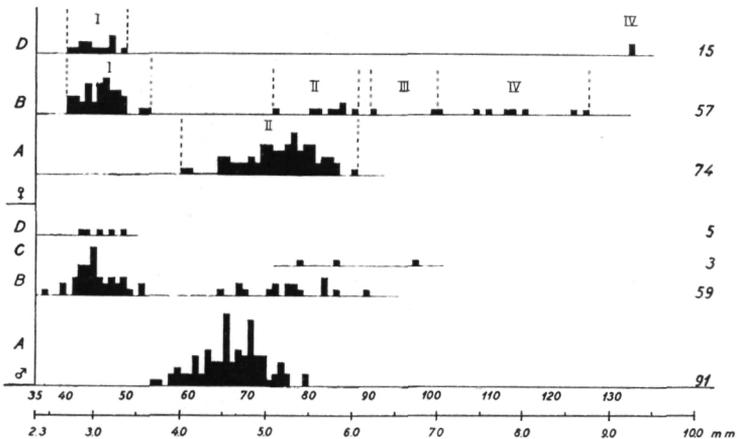


Fig. 6. Distribution in size (total length) of all specimens from four localities (A: Tromsø Mus. ("No. 6"); B: the Faroes 1857; C: the Faroes 1861; D: the Sound 1957). Ordinate: number of specimens; abscissa: length, given both in unites of measuring ocular and in mm. The four stages (I-IV) of females are also indicated. The ciphers on the right give the total number of specimens in each row.

to some environmental factor which killed all parasiting whale-lice on them except those of the most tolerable age-group. These may very well have been the newly hatched specimens which have then later grown to the stage represented in the material. In view of the fact that living *P. thompsoni* have been collected at Spitzbergen at low surface temperatures and in the Sound at a moderate salinity it occurs to me that this hypothetical environmental factor might most likely be too high surface temperatures, encountered during migration to the subtropical part of the Atlantic, such as Bottlenose Whales are known to do in winter.

#### Variation in males.

When studying carefully the material from the Faroes and the Sound (Copenhagen Mus.) and from Tromsø Museum I found variation in two respects, and in these only.

1. *Shape of peraeonites.* Pl. I C and Fig. 7 a show the body of two Faroe males. The lateral incisions between all the peraeonites (except 6 and 7) are deep, the median furrow separating all peraeonites is inconspicuous or lacking, all peraeonites are considerably vaulted (especially laterally) in longitudinal direction, peraeonites 1, 2, 5 and 6 are rather short, and the lateral parts of 3 and 4 are rounded.—The great majority of males from Tromsø have a much differing body shape (Fig. 7 c): There

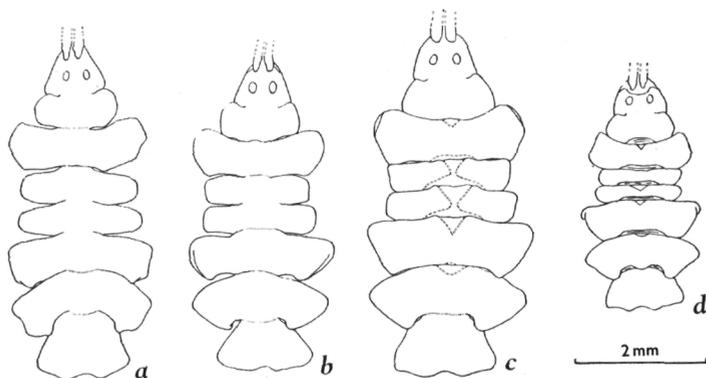


Fig. 7. Variation in shape of body of males of *P. thompsoni*.—a, from the Faroes 1857; b & c, from Tromsø Museum ("No. 6"); d, from the Sound 1957. The separation between the peraeonites medianly is indicated with a full line where the furrow is conspicuous, a dotted line where it is hard to see, and no line where it is impossible or almost impossible to trace. The dot-and-dash lines in c indicate limitation of uncalcified median areas (see the text).

are hardly any incisions, the median furrows are distinct, each peraeonite is flattened, and the first, second, fifth and sixth ones are proportionately very long, while the third and the fourth ones are short and with straightly cut lateral parts. Moreover, the calcified surface of especially peraeonites 3 and 4 (but also of 2, 5 and 6) is replaced medianly by patches of an uncalcified, somewhat depressed surface. However, a few males of all sizes in the Tromsø material showed transitional features. The most differing Tromsø male is illustrated in Fig. 7 b; it is evident that in all the features mentioned above (except uncalcified patches) it stands between the Faroe males and the typical Tromsø males. Finally the males from the Sound (Fig. 7 d) are closest to the typical Tromsø males, but peraeonites 3 and 4 are still shorter and much narrower, the uncalcified areas are different and there is a shallow excavation on the anterior part of the head.

I have not been able to find any explanation of this rather great variation. It is impossible that two different species are involved: Male b and c (in Fig. 7) are from the same whale and in the same material there are all

transitions between the two forms. All three types (a, b and c) are found in all sizes in the large materials; it is therefore not a developmental feature. Total lack of type c in the Faroe material finally shows that neither is the variation explained by a possible difference in shape between recently moulted specimens and animals with an older integument.

2. *Pleon and sexual appendages.* In one of the males from the Faroes 1861 the two ventral, vestigial pleopods are totally free of each other. In the Tromsø males the pleon proper appears shorter and is shaped almost as in the females, while the sexual appendages are considerably longer than in the Faroe males and reach backwards nearly to the distal end of pleon.

#### **Variation in females.**

A similar close study of the material of females as that of males disclosed no differences in the specimens from the Faroes and from Tromsø, except that in most (but not all) of the latter the same pattern of uncalcified areas as in the males (Fig. 7 c) was found. The females from the Sound had the same shallow excavation on the anterior part of the head as the males from this locality.

One immature female from Tromsø ("No. 5") was besides all the usual female features furnished with a single, partly developed male character, namely one distinct sexual appendage (the left).

#### **Distribution.**

So far *Platycyamus thompsoni* has been secured only from Bottlenose Whales captured or stranded at England, Denmark, the Faroes, Spitzbergen, and ? the North Atlantic (Tromsø Museum collection). The distribution of *Hyperoodon ampullatus* Forster is according to ELLERMAN & MORRISON-SCOTT (1951, p. 722) circumpolar (Bering Sea, Eastern Siberia, Murman coast, Novaya Zemlya, the White Sea, east and west coast of Greenland and Eastern Canada. In winter they sometimes go as far south as the Mediterranean Sea. Localities include British Isles, France, Holland, Norway, the Baltic (Kiel Bay and Stockholm), and Eastern U. S. A. From Danish waters the whale has been recorded five times.

The species from the southern hemisphere, *H. planifrons* Flower is much more rarely recorded and no whale-lice are known from this species.

### Summary.

From two specimens of the Bottlenose Whale (*Hyperoodon ampullatus* Forster), shot 3. October 1957 in the Sound 10 km north of Copenhagen, Denmark, 5 ♂♂ and 15 ♀♀ (2 adult) of *Platycyamus thompsoni* (Gosse) were secured. The species is redescribed and the previous literature and existing material (including the holotype) is reviewed. Based on large materials from the Copenhagen and Tromsø Museums a study of the development is undertaken which shows a considerable range of size within each moulting stage. A pronounced variation in body shape of males from various localities and within material from one whale is described and discussed. The distribution of the Bottlenose is given.

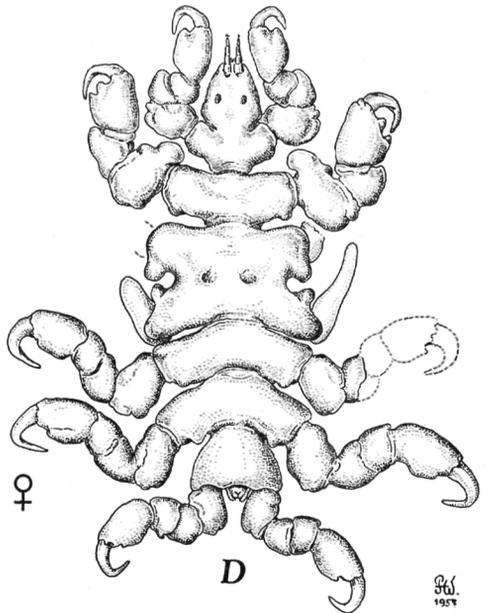
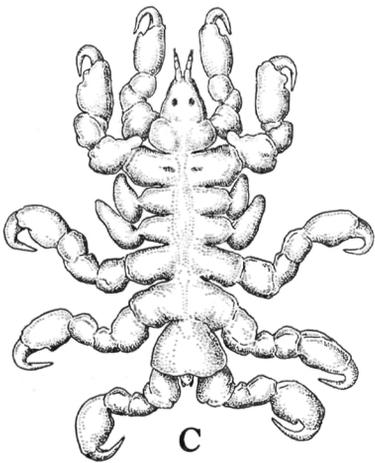
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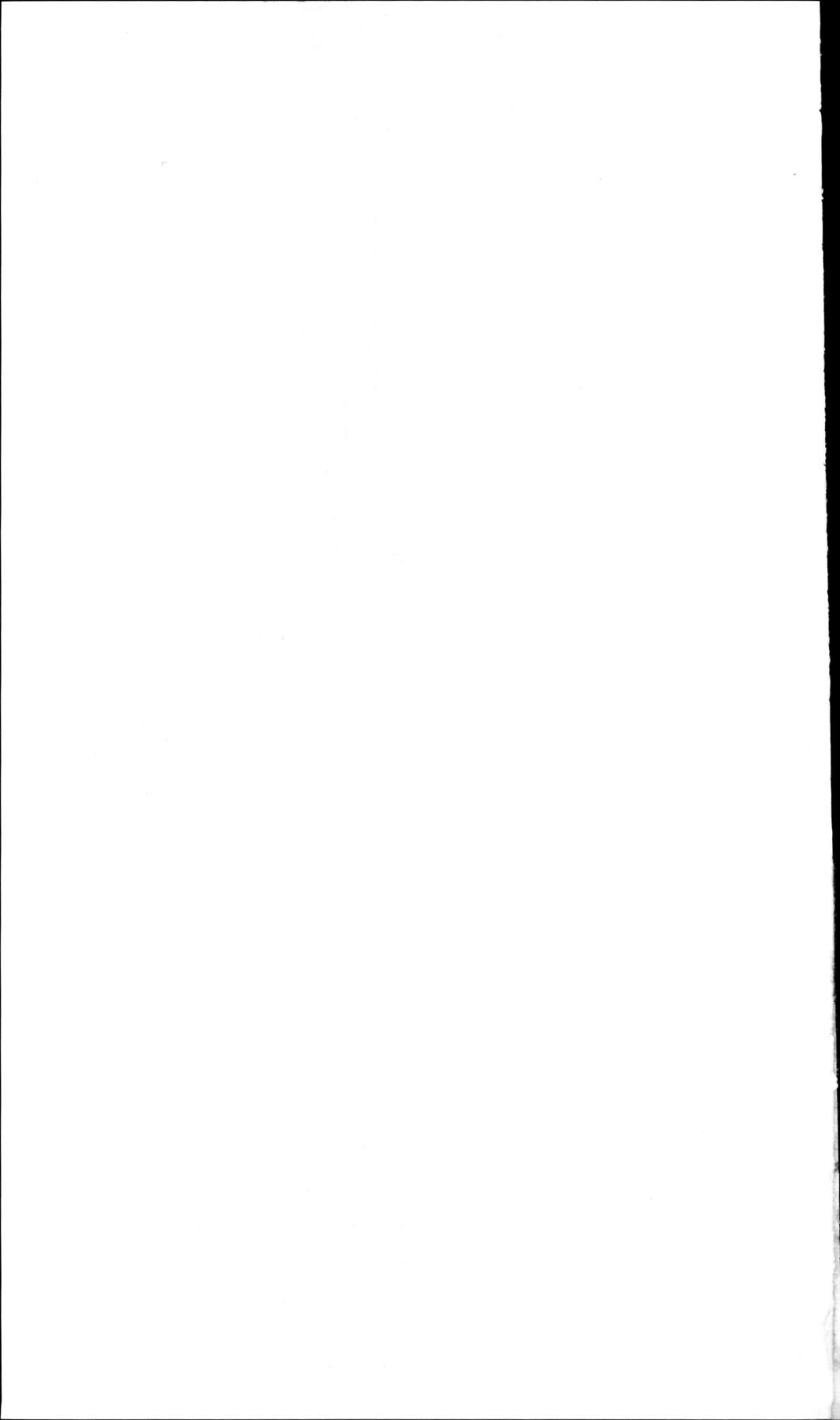
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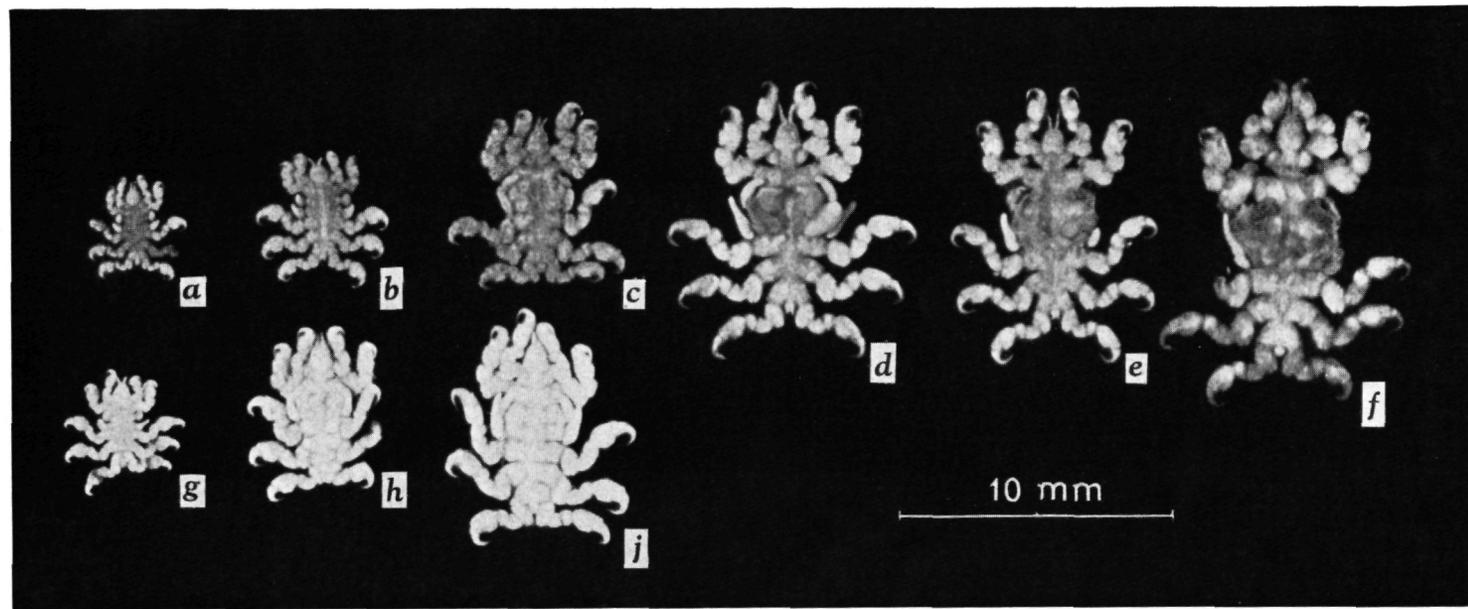


♂  
5mm

1957

A. Juvenile *P. thompsoni* still attached to the skin of the Bottlenose Whale.—H. V. CHRISTENSEN phot.  
 B. Holotype of *P. thompsoni* (♀) from above. × 10.—Dr. J. P. HARDING phot. C. Male from above.  
 D. Mature female from above. Both specimens from the Faroes 1857.—POUL H. WINTHER del.





Developmental stages of *P. thompsoni* ♀ seen from below. a-f, the Faroes 1857; g, the Sound 1957; h-j, Tromsø Mus. ("No. 6"). Stage I: a, b, g; stage II: c, h, j; stage III: d; stage IV: e, f.—H. V. CHRISTENSEN phot.

