NOTES ON *CEPHALOPYGE TREMATOIDES* (CHUN) COLLECTED OFF THE CENTRAL AND NORTHERN CHILEAN COAST (NUDIBRANCHIA : PHYLLIRHOIDAE)[1]

TAKASI TOKIOKA

Seto Marine Biological Laboratory

With 6 Text-figures

In February to March 1958, an oceanic voyage of the raft Tahiti-Nui II was attempted to sail across the Pacific Ocean from Chile to Tahiti. Unfortunately the raft was wrecked and all the oceanographical data were lost but the plankton samples that were collected at regular intervals of 30 miles roughly along the line 150 miles off the Chilean coast and stretching north from the latitude through Valparaiso on which the first sample (No. 1) was taken. In all sixty-six specimens of the present pelagic nudibranch were found in the following five samples:

2 specimens in sample No. 7,
42 specimens in sample No. 22,
1 specimens in sample No. 23,
5 specimens in sample No. 25, and
16 specimens in sample No. 28.

All these specimens were sent to me for identification by Miss ELDA FAGETTI G. of the Marine Biological Station of the University of Chile at Viña del Mar, and after close examinations I have attained to the conclusion that these are *Cephalopyge trematoides* (CHUN), a cosmopolitan pelagic nudibranch belonging to the Family Phyllirhoidae.

Indeed, this species had been a rare one and only few more than thirty specimens in eleven collections had been referred by several authors under six different specific names: *C. trematoides* (CHUN), 1889; *C. picteti* (ANDRÉ), 1906; *C. michaelsarsi* (BONNEVIE), 1921; *C. mediterranea* (PIERANTONI), 1923; *C. orientalis* BABA, 1933 and *C. arabica* STUBBINGS, 1937. But, on the morning of October 27, 1955, many of these animals were observed by STEINBERG swimming together with large numbers of small salps near the end of a small wharf in Camp Cove

1) Contributions from the Seto Marine Biological Laboratory, No. 405.

Publ. Seto Mar. Biol. Lab., XI (2), 1963. (Article 21)

just inside Inner South Head, Port Jackson, New South Wales. She collected approximately one hundred specimens on this and the following day, made observations on living specimens as well as on a lot of preserved ones and published a paper in which is discussed the synonymy of this species comprehensively on the knowledge about intraspecific variations of the species gained by studying this surprisingly large material.

The results of my morphological observations conform well to those described by previous authors, especially by STEINBERG (1956), except for some slight differences. It is natural that my observations on sixty-six preserved specimens can not be compared to those made by STEINBERG on both living and preserved specimens up to one hundred in number, but actual modes of respective morphological variations found in the present preserved specimens may deserve to be published as they are not shown even in STEINBERG's paper and yet they must be very helpful at making a definite decision in identifying preserved specimens accessible most frequently. Thus, in the following, I am going to show ranges of some different variations found in the present specimens and give some morphological notes, trying, however, to avoid the repeat of descriptions made already by previous authors. The raw data are given in the appended table at the end of this paper. Before going further, I want to express here my hearty thanks to Miss FAGETTI for her kindness in giving me a chance to examine the specimens of this rare species.

The body length ranges from 4.3 mm to 12.0 mm in the present specimens, although 6.0 - 10.0 mm long individuals are most abundant (Table 1).

Table 1. Range of body length.

Body length	Number of specimen	
4.3 - 4.9 mm	3	11
5.1 - 6.0	8	
6.1 - 7.0	12	29
7.1 - 8.0	17	
8.1 - 8.9	9	19
9.1 - 10.0	10	
10.6	1	7
11.2 - 12.0	6	

The height of the animal, that is the largest distance between the dorsal and ventral edges of the body, shows a conspicuous fluctuation as shown in Table 2. This is quite natural to the animal furnished only with regularly

Table 2. Fluctuation of body height, shown as percent of body length.

Height	Number of specimen	
16.1 - 18.0 %	2	11
18.2 - 20.0	9	
20.2 - 21.7	14	27
22.1 - 24.0	13	
24.2 - 25.4	7	13
26.3 - 27.8	6	
28.8 - 29.2	4	7
30.1 - 31.0	3	
32.4 - 33.3	6	7
34.8	1	
39.5	1	1

stretching longitudinal muscles, and the height seems to show a positive correlation to the degree of contraction. In the present specimens, all fixed and preserved in formalin, the height ranges most frequently from 20 to 24% of the body length. The largest height is usually seen near the middle of the body.

The tail is most frequently truncate and with nearly straight edge (Type A on Table 3), sometimes a little concave (Type B), or rarely with a small prominence on the bottom of this concavity (Type C).

Table 3.

SHAPE OF THE TAIL EDGE		
A	B	C
36 inds.	26 inds.	4 inds.

Rhinophores are up to the length of the pharyngeal bulb at the maximum, often nearly completely contracted into pockets formed below the postero-lateral sides of the cephalic disc, and most frequently directed laterally.

Lateral lips are very distinct and containing many gland cells.

The foot is contracted and quite inconspicuous in all specimens, although the portion near the posterior end of distinct pedal groove may be slightly elevated in some specimens. The length of the groove varies considerably according to the degree of contraction (Text-fig. 4).

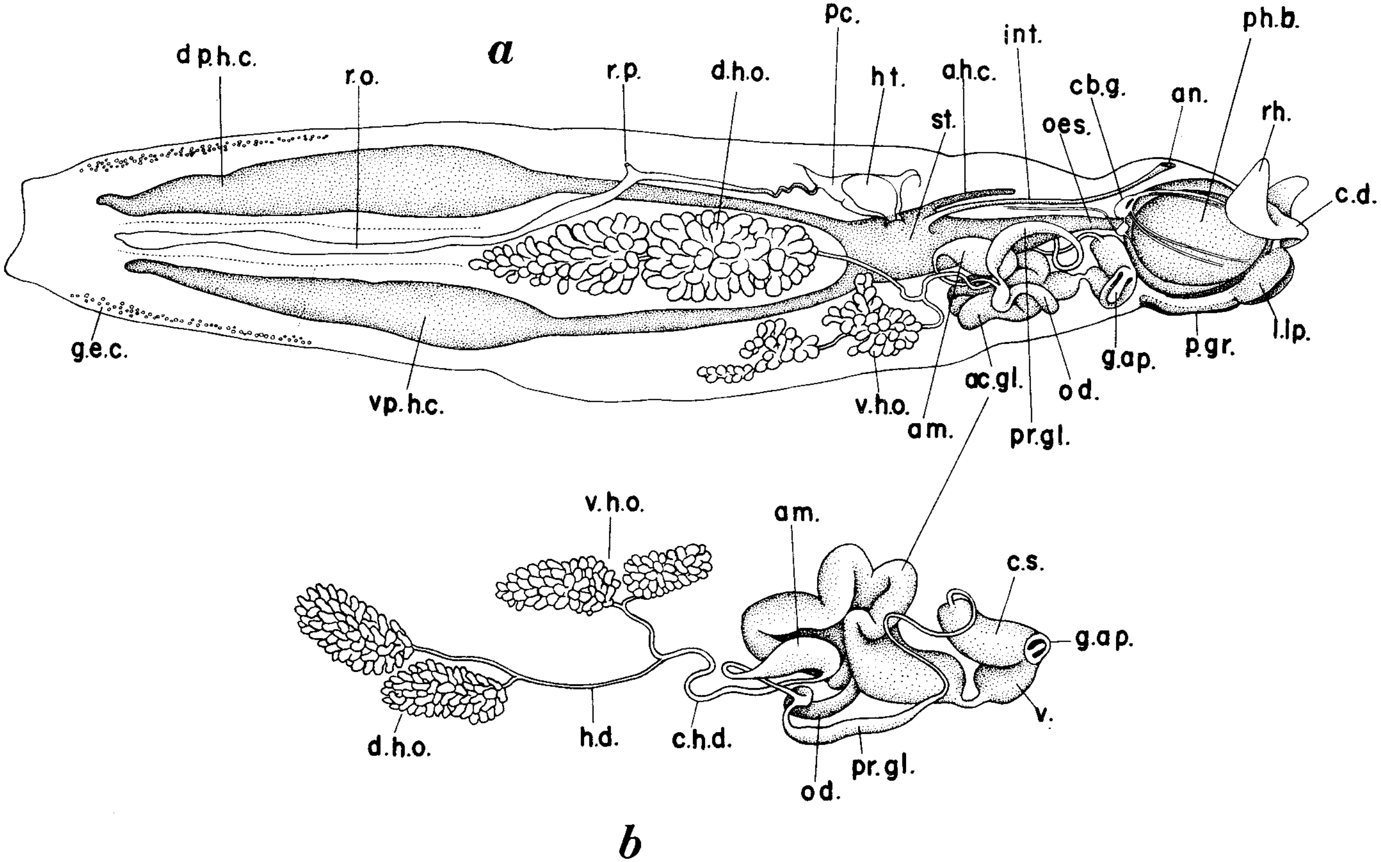
In the 11.8 mm long specimen, there are about thirty longitudinal muscles consisting each of up to half dozen fibres, besides several of fine single fibre in each of the dorsal and ventral marginal zones, the latter is slightly wider than the former. Glandular epithelial cells are concentrated along the dorsal and ventral margins most frequently in the posterior third of the body as seen in the description of *C. arabica* Stubbings (1937).

The head length, viz. the distance between the anterior edge of lateral lips and the posterior end of the pharyngeal bulb, ranges from 12.5 to 22.3% of the total body length, but it is most frequently 16-20% (Table 4).

Table 4. Fluctuation of head length, shown as percent of body length.

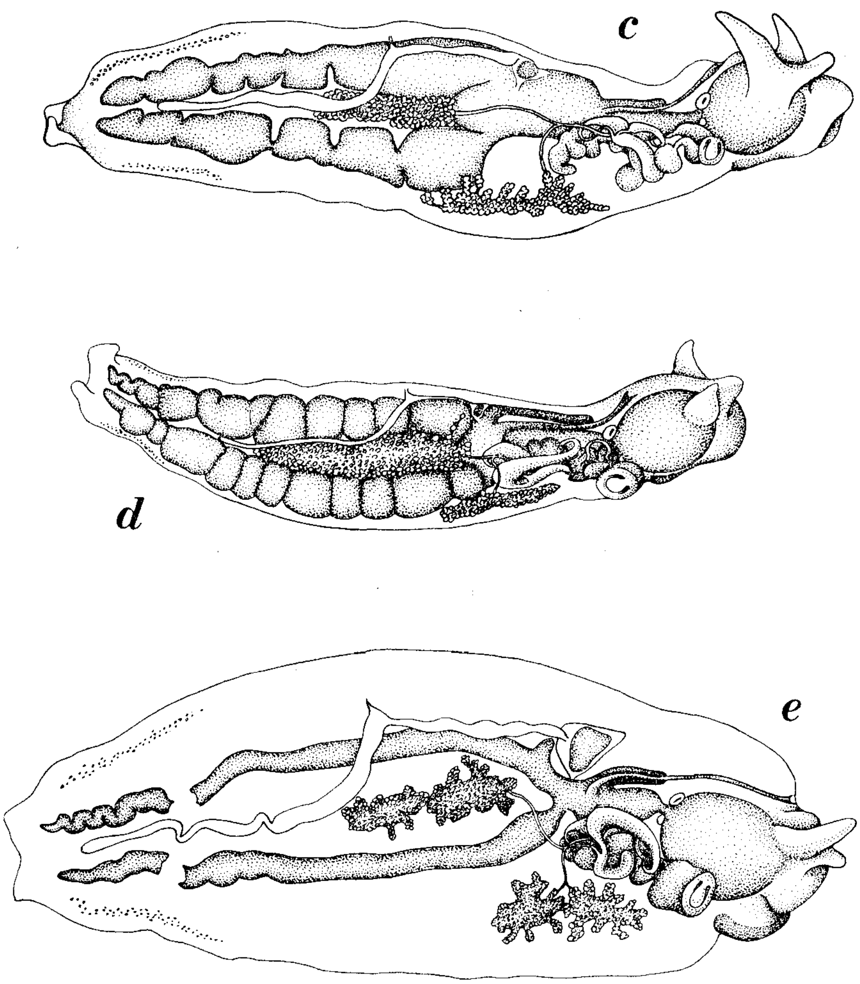
Head length	Number of specimen	
12.5 - 14.0 %	7	19
14.2 - 16.0	12	
16.3 - 18.0	21	35
18.3 - 20.0	14	
20.3 - 21.7	11	12
22.3	1	

Oesophagus is thin and short, increasing the thickness posteriorly without any distinct boundary between it and the stomach in some specimens (Text-figs. 1a, 2c and d), while it is clearly distinguishable from the bulky, roughly spherical stomach in others (Text-figs. 2e, 3). The shape of the posterior end of stomach differs individually, too. The posterior end may be truncate and bear the dorsal and ventral posterior hepatic caeca issued respectively from the dorsal and ventral edges (Type A on Table 5), diminish the thickness abruptly to the thickness of oesophagus and then be forked posteriorly into the posterior hepatic caeca (Type B), or be forked into thick posterior caeca without diminishing the thickness (Type C). All such variations found in the apparent shape of alimentary organs are attributable to the different states of contraction at fixation. The shape and thickness of the posterior hepatic caeca vary considerably, too. The posterior portion of caecum may be swollen (Text-fig. 1a), or on the contrary the proximal half may be much thicker than the distal

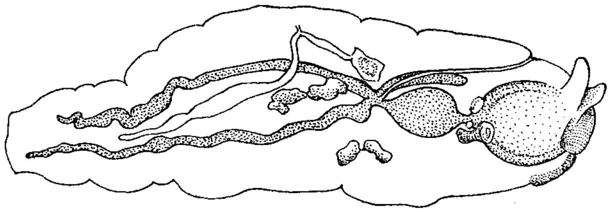


Text-fig. 1. *Cephalopyge trematoides* (CHUN). *a*···Right side of a 12 mm long individual (No. 65). The tail edge of Type B and the shape of the posterior portion of stomach of Type A. *b*···Reproductive system, enlarged.

ac.gl.—accessory glands, a.h.c.—anterior hepatic caecum, am.—ampulla, an.—anus, cb.g.—cerebro-pleural ganglion, c.d.—cephalic disc, c.h.d.—common hermaphroditic duct, c.s.—cirrus sac, d.h.o.—dorsal hermaphrodite organ, dp.h.c.—dorsoposterior hepatic caecum, g.ap.—genital aperture, g.e.c.—glandular epithelial cells, h.d.—hermaphroditic duct, ht.—heart, int.—intestine, l.lp.—lateral lip, od.—oviduct, oes.—oesophagus, pc.—pericardium, p.gr.—pedal groove, ph.b.—pharyngeal bulb, pr.gl.—prostate gland, rh.—rhinophore, r.o.—renal organ, r.p.—renal pore, st.—stomach, v.—vagina, v.h.o.—ventral hermaphrodite organ, vp.h.c.—ventroposterior hepatic caecum.



Text-fig. 2. *Cephalopyge trematoides* (CHUN). Individuals showing various degrees of contraction. *c*···A 7.5 mm long specimen (No. 27), with the tail edge of Type B, the shape of the posterior portion of stomach of Type A and posterior hepatic caeca with irregularly formed constrictions. *d*···A 6.3 mm long specimen (No. 16), with the tail edge of Type B, the shape of the posterior portion of stomach of Type A and with posterior hepatic caeca showing superficially a septate appearance. *e*···A 7.6 mm long specimen (No. 33), with the tail edge of Type B, the shape of the posterior portion of stomach of Type B, and with unusually large height due to a strong contraction of body.



Text-fig. 3. *Cephalopyge trematoides* (CHUN). The 4.9 mm long specimen (No. 3), with the tail edge of Type A, the shape of the posterior portion of stomach of Type B and with the reproductive system quite rudimentary. Of the posterior hepatic caeca, the ventral is a little longer than the dorsal.

Table 5.

Shape of the Posterior Portion of Stomach			
A	B	C	mutil-ated
31 inds.	21 inds.	13 inds.	1 ind.

half in some rare cases. The caeca often show undulations, irregular or regular constrictions and in extreme condition they may show a superficially septate appearance (Text-fig. 2). Such modifications may be regarded as quite natural when STEINBERG's description—"peristaltic waves were seen to be almost continually passing down these diverticula in the living animals (p. 188)"—is referred to. Dorsal and ventral caeca are nearly of equal length in most specimens, but in seven the ventral diverticulum is a little shorter and in six it is slightly longer than the dorsal one. The distance from the tail end of the body to the posterior end of stomach is mostly 50 to 65% of the total body length, namely the stomach ends usually in the anterior half of the body (Table 6).

The anterior hepatic caecum is only 25% of the intestine length when it is short, but attains to 72% at the maximum in the present specimens; most frequently it ranges from 35 to 60% (Table 7). The intestine leaves the stomach approximately at the middle or in its posterior half, although in a few cases it starts just near the posterior end of the stomach (Table 8).

The posterior end of the renal organ falls in a short distance to the distal end of the hepatic caeca in most specimens. In four specimens, however, it

Table 6. Fluctuation of the distance between the tail edge and the posterior end of stomach, shown as percent of body length.

The distance	Number of specimen	
47.8 - 49.3 %	3	9
51.7 - 52.9	6	
53.8 - 55.9	9	23
56.1 - 58.7	14	
59.2 - 61.9	15	28
62.5 - 65.0	13	
65.8 - 67.7	5	5

Table 7. Fluctuation of the length of anterior hepatic caecum, shown as percent of the length of intestine.

Length of hepatic caecum	Number of specimen	
25 - 29 %	3	7
32 - 35	4	
36 - 40	12	22
42 - 45	10	
47 - 50	12	18
51 - 55	6	
56 - 60	9	13
62 - 63	4	
66 - 68	3	6
71 - 72	3	

Table 8. Position of the starting point of intestine.

Position	Number of specimen
Near the middle of stomach	24
In the posterior half of stomach	31
Near the posterior end of stomach	11

attains that level and in another specimen it reaches beyond the level very slightly. The renal pore is situated most frequently near the middle of the dorsal hermaphrodite organ (Table 9). This situation is roughly corresponding to the middle of the body, but usually tends a little to the posterior half of the body as shown in Table 10 in which the fluctuation of the ratio of the

Table 9. Situation of renal pore.

<table>
<tr><td>Near the anterior end</td><td rowspan="5">of the dorsal hermaphrodite organ</td><td>3</td></tr>
<tr><td>In the anterior half</td><td>14</td></tr>
<tr><td>Near the middle</td><td>32</td></tr>
<tr><td>In the posterior half</td><td>14</td></tr>
<tr><td>Near the posterior end</td><td>3</td></tr>
</table>

Table 10. Position of the renal pore, shown as the ratio A/P. A—length of the frontal half of body anterior to the renal pore, P—length of the rear half of body posterior to the renal pore.

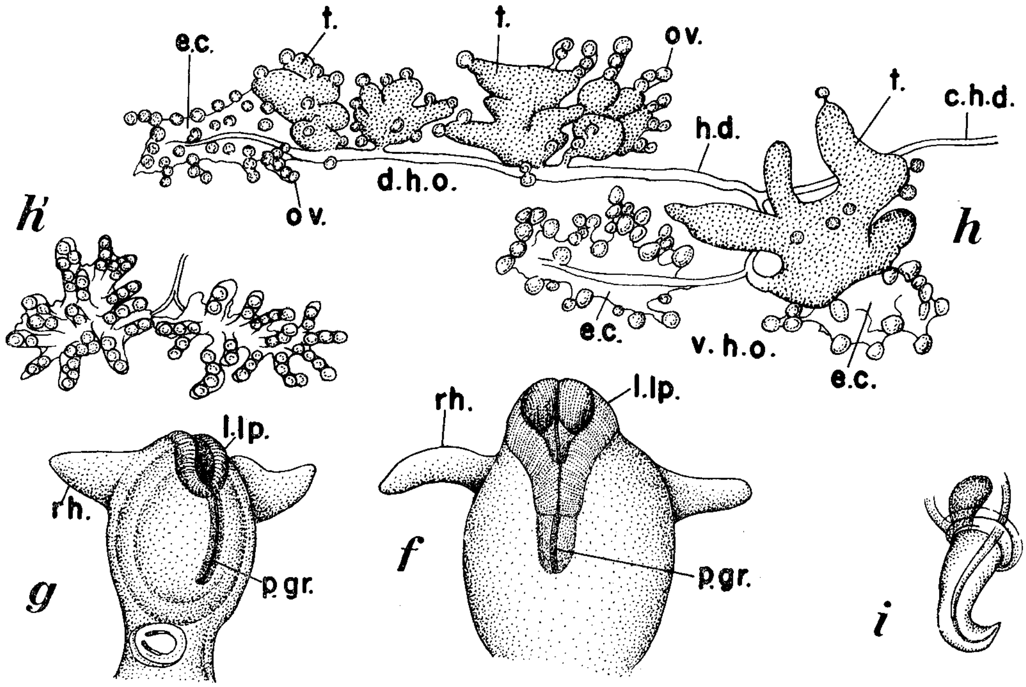
<table>
<tr><th>Ratio A/P</th><th colspan="2">Number of specimen</th></tr>
<tr><td>0.7</td><td>1</td><td>1</td></tr>
<tr><td>0.8</td><td>6</td><td rowspan="2">16</td></tr>
<tr><td>0.9</td><td>10</td></tr>
<tr><td>1.0</td><td>11</td><td>11</td></tr>
<tr><td>1.1</td><td>12</td><td rowspan="2">21</td></tr>
<tr><td>1.2</td><td>9</td></tr>
<tr><td>1.3</td><td>9</td><td rowspan="2">12</td></tr>
<tr><td>1.4</td><td>3</td></tr>
<tr><td>1.5</td><td>1</td><td rowspan="2">3</td></tr>
<tr><td>1.6</td><td>2</td></tr>
<tr><td>1.7</td><td>1</td><td rowspan="2">2</td></tr>
<tr><td>1.8</td><td>1</td></tr>
</table>

frontal half of the body anterior to the renal pore (A) to the rear half of the body posterior to the pore (P) is given. The heart is located along the dorsal side of the posterior half of the stomach in 30 specimens or dorsal to the posterior end of the stomach in 36 specimens.

It is very difficult to show the exact number of hermaphrodite gonad as

Table 11. Number of hermaphrodite gonad.

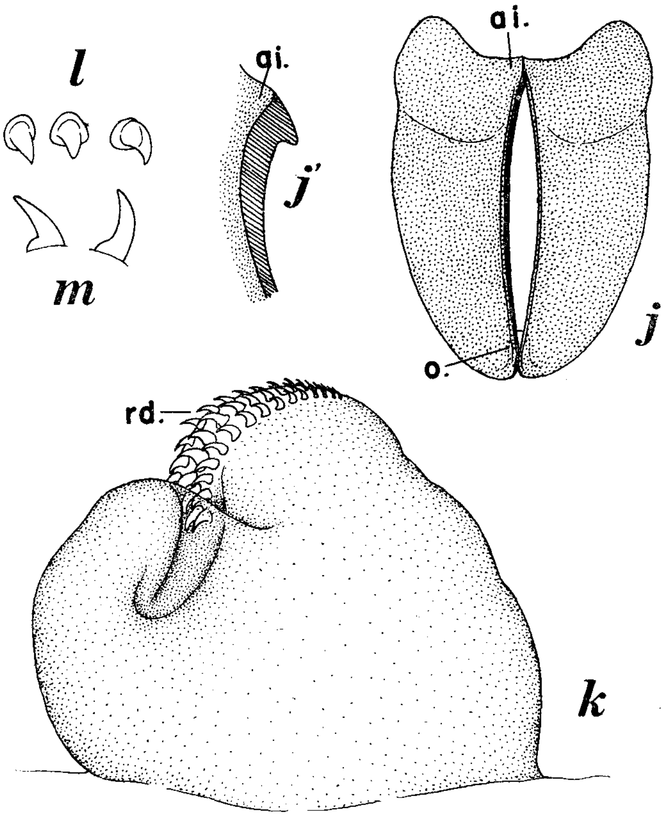
		Number of dorsal hermaphrodite gonad				
		one	two	three	four	
Number of ventral hermaphrodite gonad	none		2			2
	one	2	3	1		6
	two	3	51	3		57
	three				1	1
		5	56	4	1	66



Text-fig. 4. *Cephalopyge trematoides* (CHUN). *f*···The ventral side of head of a 7.5 mm long specimen (No. 27), with a short contracted pedal area, ×15. *g*···The same of the 11.8 mm long specimen (No. 64), with a long extended pedal area, ×15. *h*···Hermaphrodite organs of the 11.8 mm long specimen (No. 64). The dorsal hermaphrodite organ consists of two groups comprising respectively two and three irregularly lobed genital capsules, one of which is empty. The ventral organ is also constituted of two groups, one of which comprises two capsules ; here only one of the three capsules is full of male germ cells. Ovaries are rather few and small. *h'*···hermaphrodite organ with small empty capsules, but with elongate finger-shaped ovaries. *i*···Cirrus everted out from the genital aperture, a 7.5 mm long specimen (No. 32), enlarged.

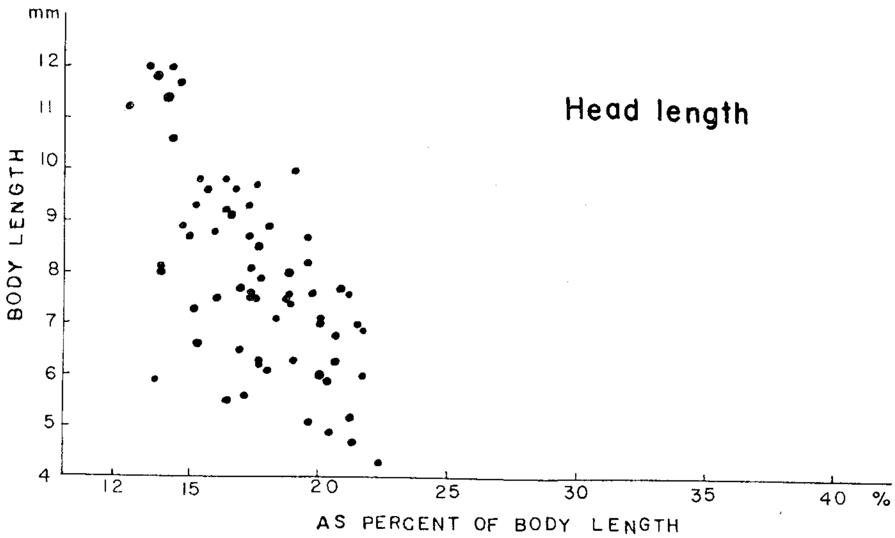
c.h.d.—common hermaphroditic duct, d.h.o.—dorsal hermaphrodite organ, e.c.—empty capsule, h.d.—hermaphroditic duct, l.lp.—lateral lip, ov.—ovary, p.gr.—pedal groove, rh.—rhinophore, t.—testis, v.h.o.—ventral hermaphrodite organ.

stated by previous authors. My observations on the present specimens under the binocular seem to reveal that each hermaphrodite organ consists most frequently of two gonads as shown in Table 11. One to four gonads were found in the dorsal hermaphrodite organ, none to three gonads in the ventral organ, and the total number of gonad ranges from two to seven. Then each gonad may be divided into two or three capsules in some specimens (Text-fig. 4 h).



Text-fig. 5. *Cephalopyge trematoides* (CHUN). *j*···Jaw plates from the outer side, ×73. *j'*···The antero-inner angle (ai.) of the right plate, showing the prominent thickening projecting out inward. *k*···Left side of odontophore, ×440. *l*···A tooth-row near the anterior end, ×1200. *m*···Lateral side of teeth, ×1200. o—odontophore, rd.—radula.

If each of such capsules is regarded as a gonad, then the number of gonad should increase remarkably. The general shape of each gonad is rather irregular. The capsule is irregularly lobated and full of male germ cells, while eggs develop in a number of small protuberances issued from the capsule surface. When the capsule is not full of male germ cells and surface protuberances are rather few and containing each several eggs roughly arranged in a row, then the gonad looks like a cluster of finger-shaped lobes (Text-fig. 4 h′). However, when the capsule is fully expanded by male germ cells and surface protuberances are dense and containing fewer, one to three, eggs, then the gonad shows a folliculate appearance. The structure of the reproductive organs (Text-fig. 1 b) agrees exactly with that given by STEINBERG (1956). The cirrus (Text-fig. 4 i) is nearly half as long as the pharyngeal bulb, unarmed and the tip is pointed and curved rather sharply. The so-called accessory glands are very fragile in consistency and moreover complicated haemal caeca are developed nearby, thus these are very easily torn and their exact shape is discernible with difficulty. In the 4.3, 4.7, 4.9 and a 5.9 mm long specimens the reproductive organs were quite rudimentary (Text-fig. 3), while in others the organs were more or less developed even in small individuals.



Text-fig. 6. *Cephalopyge trematoides* (CHUN). Fluctuation of head length.

The odontophore is very distinct, though it is a small, about $120\,\mu \times 140\,\mu$, oval prominence. On a medium-sized specimen, the radula consisting of about fifteen rows of three teeth was observed clearly along the antero-distal margin of this prominence (Text-fig. 5 k). Three teeth are nearly of the same shape, hooked forwards, each with a broadened base and about $7-8\,\mu$ in length (Text-fig. 5 l, m). No denticulation was observed at the base of any tooth. Either I failed to find "a membranous strip containing many small spicules arranged vertically in irregular rows" which was found by STEINBERG at the cutting edge of the jaw plate (Text-fig. 3 in her paper).

All the values of various measurements given on the appended table at the end of this paper were plotted on graphs to learn if the fluctuations show any correlation with the body length. In most cases, however, the values show a quite random distribution, only the head length seems to range in an inverse correlation with the body length. As to other characters, it is not impossible that the values vary regularly with the developmental stages, but this is completely made obscure behind so great effects of contraction occurring on individuals quite randomly.

Summing up the results of my observations on so remarkable variations about this animal, I am inclined to admit the opinion that all the species of *Cephalopyge*, hitherto be known, might belong to but a single cosmopolitan species as stated already by STEINBERG (1956), although the differences found in the structure of radular teeth among these species seem to be rather striking.

A small part of the present specimens are deposited at the Ôsaka Museum of Natural History for future studies in Japan, while the others are kept at the museum of the University of Chile.

REFERENCES

ANDRÉ, E. (1906): Supplément aux mollusques d'Amboine et description d'un nouveau genre de la famille. Rev. Suisse d. Zool., Tom. 14, pp. 71–80, Pl. I.

BABA, K. (1933): A pelagic nudibranch *Cephalopyge orientalis*, nov. sp. from Japan. Annot. Zool. Japon., Vol. 14, No. 1, pp. 157–162, Pl. 7.

BERTOLINI, F. (1935): Note sulla sistematica dei Phylliroidae. Pubbl. Staz. Zool. Napoli, Vol. 15, pp. 60–70, 4 text-figs.

BONNEVIE, K. (1921): *Dactylopus michaelsarsii*, nov. gen. et sp. Vertreter einer neuen Familie pelagischer Nudibranchia. Zool. Anz., Bd. 53, Nr. 7/8, pp. 145–152, 5 text-figs.

CHUN, C. (1889): Bericht über eine nach den Canaren in Winter 1887/88 ausgeführte Reise. SB. Akad. Wiss. Berlin, p. 28. Through HANEL (1905), pp. 451–452.

HANEL, E. (1905): *Cephalopyge trematoides* (CHUN). Eine neue Mollusken-Gattung. Zool. Jahrb., Bd. 21, Abt. F Syst., pp. 451–466, Pls. 23 & 24.

PALOMBI, A. (1939): *Boopsis mediterranea* PIERANTONI = *Cephalopyge trematoides* (CHUN). Contributo allo studio della morfologia, sistematica e biologia del genere *Cephalopyge* (Gastropoda: Fam. Phyllirhoidae). Boll. Zool. Union. Zool. Italiana, Anno X, N. 1–2, pp. 65–73, 3 text-figs.

PRUVOT, A. (1929): Note sur un rare mollusque pélagique de la Méditerranée, *Boopsis mediterranea* PIERANTONI, 1924. Bull. Soc. Zool. France, Tom. 54, pp. 467–476, 5 text-figs.

PRUVOT, A. (1929): Appendice a l'article de Mme A. PRUVOT-FOL. Sur *Boopsis mediterranea*. Bull. Soc. Zool. France, Tom. 54, pp. 570–571.

PROUVOT-FOL, A. (1946): Revision de la Famille des Phylliroidae (Phyllirhoidae) BERG. Bull. Mus. Nat. H. N., 2 Ser., Tom. 18, No. 2, p. 175.

STEINBERG, J. E. (1956): The pelagic nudibranch, *Cephalopyge trematoides* (CHUN, 1889), in New South Wales with a note on other species in this genus. Proc. Linnean Soc. New South Wales, Vol. 81, Part 2, pp. 184–192, 1 pl., 8 text-figs.

STUBBINGS, H. G. (1937): Phyllirhoidae. JOHN MURRAY Expedition 1933–34, Sci. Rep., Vol. 5, No. 1, pp. 1–14, 5 text-figs.

THIELE, J. (1931): Handbuch der systematischen Weichtierkunde. Jena, Bd. 1, pp. 445–447.

VESSICHELLI, N. (1906): Contribuzioni allo studio della *Phylliroë bucephala* PÉRON & LESUEUR. Mitt. Zool. Stat. Neapel, Bd. 18, pp. 105–135, Pls. V & VI.

Appended table : Measurements on sixty-six specimens.

Cep.—Head length, H.—Height, L.—Body length, T-S.—Distance between the tail edge and the posterior end of stomach, A/P—Length before renal pore / Length behind renal pore, H.C./Int.—Length of anterior hepatic caecum as percent of intestine. Cep., H. and T-S. are represented as percent of L.

Specimen number	L.	H.	Cep.	T-S.	A/P	H.C./Int.
1	4.3 mm	22.3 %	22.3 %	55.8 %	1.5	45 %
2	4.7	21.3	21.3	61.7	1.0	44
3	4.9	32.7	20.4	61.2	1.0	57
4	5.1	23.5	19.6	56.9	1.0	62
5	5.2	26.9	21.2	57.7	1.4	63
6	5.5	20.0	16.4	56.4	0.8	72
7	5.6	23.2	17.1	64.3	1.3	60
8	5.9	28.8	20.3	55.9	1.0	48
9	5.9	25.4	13.6	62.7	1.2	57
10	6.0	20.0	20.0	48.3	1.6	68
11	6.0	26.7	21.7	55.0	1.3	43
12	6.1	21.3	18.0	60.7	1.3	49
13	6.2	16.1	17.7	56.5	1.2	53
14	6.2	21.0	17.7	61.3	0.7	62
15	6.3	23.8	19.0	52.4	1.1	39
16	6.3	22.2	20.6	58.7	1.0	71
17	6.5	29.2	16.9	60.0	1.4	47
18	6.6	21.2	15.2	54.5	0.9	47
19	6.8	32.4	20.6	63.2	1.1	36
20	6.9	34.8	21.7	47.8	1.2	49
21	7.0	24.3	21.4	52.9	1.1	42
22	7.0	32.9	20.0	52.9	1.3	25
23	7.0	21.4	20.0	54.3	1.3	36
24	7.1	31.0	18.3	59.2	1.2	29
25	7.3	19.2	15.1	54.8	1.1	66
26	7.4	23.0	18.9	—	1.8	60
27	7.5	25.3	17.3	49.3	1.3	48
28	7.5	22.7	18.7	62.5	0.9	49
29	7.5	25.3	16.0	62.7	0.9	36
30	7.5	21.3	17.3	58.7	1.1	56
31	7.5	33.3	18.7	62.7	1.3	40
32	7.5	24.0	17.3	60.0	1.0	56
33	7.6	39.5	21.1	65.8	1.3	36
34	7.6	26.3	19.7	59.2	1.0	34
35	7.7	18.2	16.9	57.1	1.2	52
36	7.7	22.1	20.8	57.1	1.1	32
37	7.9	27.8	17.7	58.2	1.3	47
38	8.0	21.3	13.8	52.5	1.6	53

Specimen number	L.	H.	Cep.	T-S.	A/P	H.C./Int.
39	8.0 mm	22.5 %	13.8 %	66.3 %	1.0	59 %
40	8.0	22.5	18.8	53.8	1.1	38
41	8.1	22.2	17.3	67.7	0.9	57
42	8.2	23.2	19.5	59.8	1.0	38
43	8.5	21.2	17.6	61.2	0.8	28
44	8.7	25.3	14.9	64.4	0.9	68
45	8.7	33.3	19.5	51.7	1.1	59
46	8.7	20.7	17.2	58.6	1.4	42
47	8.8	33.0	15.9	62.5	0.8	51
48	8.9	29.1	18.0	55.1	1.2	55
49	8.9	18.0	14.6	59.6	1.1	49
50	9.1	25.3	16.5	58.2	1.7	45
51	9.2	21.7	16.3	58.7	1.2	45
52	9.3	19.4	15.1	58.1	1.2	50
53	9.3	30.1	17.2	60.2	0.9	35
54	9.6	27.1	16.7	55.2	1.1	45
55	9.6	30.2	15.6	63.5	0.8	40
56	9.7	20.6	17.5	62.9	0.9	40
57	9.8	26.5	16.3	64.3	1.0	47
58	9.8	19.4	15.3	56.1	0.9	63
59	10.0	29.0	19.0	63.0	0.9	43
60	10.6	18.9	14.2	59.4	0.8	71
61	11.2	19.6	12.5	59.8	1.2	51
62	11.4	20.2	14.0	67.5	0.8	37
63	11.7	19.7	14.5	67.5	0.9	40
64	11.8	21.2	13.6	61.9	1.1	43
65	12.0	21.7	13.3	65.0	1.1	32
66	12.0	24.2	14.2	52.5	1.0	50