CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton

Sheet 104

AMPHIPODA

SUB-ORDER: HYPERIIDEA

Family: Phronimidae

(By Chang-tai Shih
and
M. J. Dunbar)

1963


1a
1b
2a
2b
2c
2d
2e
2f
3a
3b
3c
3d
4a
4b
5
6
merus
carpus
1 mm
0.5 mm
2 mm


7a
7b
7c
7d
8a
8b
8c
8d
9a
9b
9c
9d
carpus
1 mm
0.5 mm
2 mm

Family Phronimidae

Key to the genera:—

Body elongate; peraeon segments 1 and 2 not coalesced; carpus of per. 5 more or less dilated, with a strong process at anterior distal end and forming together with the metacarpus (joint 6) a strong perfect subcheliform hand; uropod 2 well developed .... *Phronima* Latreille

Body very slender; peraeon segments 1 and 2 coalesced; carpus of per. 5 slender, with several strong spines at anterior edge, and forming with the metacarpus an imperfect folding hand; uropod 2 wanting in female and rudimentary in male..... *Phronimella* Claus

Key to the species of *Phronima* (adapted from Vosseler (1901) and Stephensen (1924), with additions):—

1. Male.....2
   Female.....7
2. Second antenna well developed.....3
   Second antenna rudimentary.....6
3. Peraeon shorter than pleon; last peraeon segment shorter than first pleon segment ..... *Phronima stebbingii* Vosseler (Fig. 8)
   Peraeon longer than pleon; last peraeon segment longer than or equal to first pleon segment.....4
4. Per. 5, merus wider than long; 3–4 separate teeth inside the carpal process ..... *Phronima colletti* Bovallius (Fig. 3)
   Per. 5, merus longer than wide; inside the carpal process a tooth and a separate projection with small excavations in the hind edge...5
5. Peraeon segments 1 and 2 together shorter than peraeon segment 3..... *Phronima atlantica* Guérin (Fig. 2)
   Peraeon segments 1 and 2 together longer than peraeon segment 3. ..... *Phronima gasti* Dudlich (Fig. 5)
6. Per. 1 and 2 with a strong anterior process at distal end of carpus (joint 5); inside the carpal process of per. 5, a tooth and a second projection with excavations at its hind edge..... *Phronima sedentaria* (Forskål) (Fig. 7)
   Per. 1 and 2 without process at distal end of carpus; carpus of per. 5 cut square (apart from the carpal process and the notch inside it) ..... *Phronima affinis* Vosseler (Fig. 1)
7. Pleon segment 1 longer than peraeon segment 7; size small, usually less than 7.5 mm..... *Phronima stebbingii* Vosseler (Fig. 8)
   Pleon segment 1 shorter than peraeon segment 7.....8
8. Femur of per. 5 strongly curved in a reversed "S"..... *Phronima curvipes* Vosseler (Fig. 4)
   Femur of per. 5 more or less straight.....9
9. Femur of per. 3 longer than femur of per. 5..... *Phronima colletti* Bovallius (Fig. 3)
   Femur of per. 3 much shorter than femur of per. 5.....10
10. Merus of per. 5 wider than long ..... *Phronima pacifica* Streets (Fig. 6)
    Merus of per. 5 much longer than wide 11
11. Per. 5, projection inside carpal process bifid and weak, no tubercle on inner edge of metacarpus..... *Phronima atlantica* Guérin (Fig. 2)
    Per. 5, projection inside carpal process single; a tubercle more or less developed on inner edge of metacarpus.....12
12. Per. 5, carpal process slightly stronger than or as strong as the projection inside it; tubercle on inner edge of metacarpus weak ..... *Phronima atlantica* var. *solitaria* Guérin (Fig. 2e)
    Per. 5, carpal process extremely produced downward, projection inside it moderate, tubercle on inner edge of metacarpus strong ..... *Phronima sedentaria* (Forskål) (Fig. 7)

The limbs of the peraeon, or peraeopods, are here numbered in series from 1 to 7, numbers 1 and 2 being also sometimes called "gnathopods" in other amphipod families; "per." = peraeopod.

PLATE

1. *Phronima affinis*, a, ♂; b, ♂, per 5. — 2. *Phronima atlantica*, a, ♀; b, ♀, per. 5; c, ♂; d, ♂, per. 5; e, var. *solitaria* ♀; f, var. *solitaria*, per. 5. — 3. *Phronima colletti*, a, ♀; b, ♀, per. 5; c, ♂; d, ♂, per 5. — 4. *Phronima curvipes*, a, ♀; b, ♀, per. 5. — 5. *Phronima gasti*, ♂, per. 5. — 6. *Phronima pacifica*, ♀. — 7. *Phronima sedentaria*, a, ♀; b, ♀, per. 5; c, ♂; d, ♂, per. 5. — 8. *Phronima stebbingii*, a, ♀; b, ♀, per. 5; c, ♂; d, ♂, per. 5. — 9. *Phronimella elongata*, a, ♀; b, ♀, per. 5; c, ♂; d, ♂, per. 5.

Figs. 1a, b; 2a, c, e; 3a, b, c; 4a; 6; 7a, c, d; 8a, c after Vosseler (1901); 5 after Dudlich (1925) remainder original (Shih).

Species	Sex	Largest size known (in mm)	Further Information on Identification				
			Height of head in first peraeon segment	Length of head in first peraeon segment	Length ratio of: Abdomen + uropod to head + peraeon	Length ratio of: Pleon segment 1 to peraeon segment 7	Length ratio of: Branchial pouch 3 to femur of per. 6
1. *Phronima affinis* Vosseler	♂	8	6	4	1	1	0.5
2. *Phronima atlantica* Guérin	♀	25	5½–6*	3–3½	0.92 ± 0.02	0.70 ± 0.04	1.03 ± 0.05
	♂	11**	5½–6	3–3½	1.14 ± 0.04	0.95 ± 0.04	0.92 ± 0.04
2a. *Phronima atlantica* var. *solitaria* Guérin	♀	23.5**	5½–6	3–3½	0.90 ± 0.03	0.66 ± 0.05	1.22 ± 0.08
3. *Phronima colletti* Bovallius	♀	18	6–6½	3½–4	0.96 ± 0.03	0.81 ± 0.03	1.25 ± 0.04
	♂	8.5	6–6½	3–4	1.11 ± 0.03	0.96 ± 0.04	1.14 ± 0.05
4. *Phronima curvipes* Vosseler	♀	17**	6–6⅓	3½–4	0.90 ± 0.02	0.71 ± 0.04	1.56 ± 0.13
5. *Phronima gasti* Dudlich	♂	8	5	3	0.85	0.83	?
6. *Phronima pacifica* Streets	♀	10.5	5⅔–6⅓	3–3½	0.89 ± 0.05	0.71 ± 0.03	1.27 ± 0.06
7. *Phronima sedentaria* (Forskål)	♀	40	6–6½	3½–4½	1.06 ± 0.02	0.84 ± 0.02	0.96 ± 0.04
	♂	10	5½–6	3½–4	1.13 ± 0.04	0.96 ± 0.03	0.82 ± 0.05
8. *Phronima stebbingii* Vosseler	♀	8**	6½–6¾	3¾–4¼	1.21 ± 0.05	1.15 ± 0.03	0.89 ± 0.03
	♂	7.6	6½–6⅔	3½–4	1.27 ± 0.06	1.25 ± 0.08	0.90 ± 0.05
9. *Phronimella elongata* Claus	♀	20	5	3	1.07	1	0.5
	♂	12	5	2½	1.11	1.15	0.67

* All measurement ratios, except those of spp. 1, 5 and 9 are based on part of the samples from the "Dana" Expeditions (1920, 1921, 1921-22 and 1928-30).

** Largest size known in the collections of the "Dana" Expeditions.

Distribution (Position points represent the most northern or southern stations in the literature)	References for Identification and Biology
So far only one male specimen known, in the collection of Plankton-Expedition from 31.3° N, 47.7° W, North Atlantic.	Vosseler (1901)
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 52°27′36″ N, 15°40′ W; south: 34°5′ S, 16° E. Pacific: temperate, subtropical and tropical regions of northern and southern open ocean and east coast; north: 35°41′ N, 157°4′ E; south: 52°11′ S, 167°25′ E. Indian Ocean: Arabian Sea and open ocean. Southern Ocean: 65°57′ S, 88°58′ E. Mediterranean and Red Sea.	Bovallius (1889), Chun (1895), Claus (1872), Guérin (1836), Mogk (1926), Vosseler (1901).
Atlantic: same as *Phronima atlantica*; north: 39°57′ N, 24°59′ W; south: 13°52′ S, 6°4′ E. Pacific: subtropical and tropical northern open ocean; north: 26°29′ N, 137°57′ E. Indian Ocean: Arabian Sea and open ocean; south: 26°50′ S, 50°27′ E. Mediterranean and Red Sea.	Bovallius (1889), Guérin (1836), Mogk (1926), Vosseler (1901).
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 43°39′ N, 24°04′ W; south: 35°15′ S, 19°45′ E. Pacific: tropical region. Indian Ocean: North Arabian Sea, Bay of Bengal and open ocean. Mediterranean.	Bovallius (1887), Chun (1895), Vosseler (1901).
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 41°55′ N, 32°22′ W; south: 32°45′ S, 8°47′ W. Pacific: tropical regions: South China Sea and west coast of northern South America. Indian Ocean: tropical regions. Mediterranean.	Barnard (1932), Stephensen (1924), Vosseler (1901).
So far only one male specimen known from Gulf of Naples, Mediterranean.	Dudlich (1925).
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 41°55′ N, 32°22′ W; south: 33°53′ S, 9°26′ E. Pacific: temperate, subtropical and tropical regions of northern and southern open sea. Tropical Indian Ocean. Mediterranean.	Barnard (1930), Streets (1877), Vosseler (1901).
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 61°20′ N, 11° W; south: 48°58′ S, 64°45′ W. Pacific: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 36°23′ N, 174°31′ E; south: Macquarie Island (55° S, 159° E). Indian Ocean: Arabian Sea and tropical open ocean. Mediterranean and Red Sea.	Bovallius (1889), Chun (1889, 1895), Claus (1862, 1872, 1879), Forskål (1775), Miniewicz (1910), Mogk (1926, 1927a), Vosseler (1901).
Atlantic: temperate, tropical and subtropical regions of northern and southern ocean and east northern coast; north: 41°55′ N, 32°22′ W; south: 32°8′ S, 8°28′ W. Mediterranean.	Vosseler (1901).
Atlantic: temperate, subtropical and tropical regions of northern and southern open ocean and east and west coasts; north: 42°50′26″ N, 45°25′ W; south: 36°52′ S, 47° W. Pacific: subtropical and tropical regions of northern open ocean and South China Sea and Celebes Sea; north: 26°29′ N, 137°57′ E. Indian Ocean: North Arabian Sea, Bay of Bengal, and open ocean. Southern Ocean: 63°42′ S, 82° E. Mediterranean.	Barnard (1932), Bovallius (1889), Claus (1862, 1872, 1879), Vosseler (1901).

Recorded Distribution in I.C.E.S. Area	
Gulf of Bothnia	—
Gulf of Finland	—
Baltic proper	—
Belt Sea	—
Kattegat	—
Skagerak	—
Northern North Sea	7
Southern North Sea	—
English Channel (E)	—
English Channel (W)	—
Bristol Channel and Irish Sea	—
South and West Ireland and Atlantic	2, 7
Faroe-Shetland Channel	7
Norwegian Sea	—
Barents Sea	—
Bay of Biscay	2, 4, 7, 9
Coast of Portugal	2, 3, 7, 9

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