



Chapter 7 Planktonic Crustacea

Part VI Euphausiacea

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References

- **Baker A de C, Boden B P, Brinton E, 1990. A practical guide to the euphausiids of the world. 96p**
- **Mauchline J, Fisher L R, 1969. The biology of euphausiids. Advances in Marine Biology, 7, 454p**
- **Mauchline J, 1980. The biology of mysids and euphausiids. Advances in Marine Biology, 18, 681p**

Features

- a complete carapace covering the entire cephalothorax
- complete similarity of all biramous thoracic limbs
- podobranchia
- Photophores
- Indirectly development

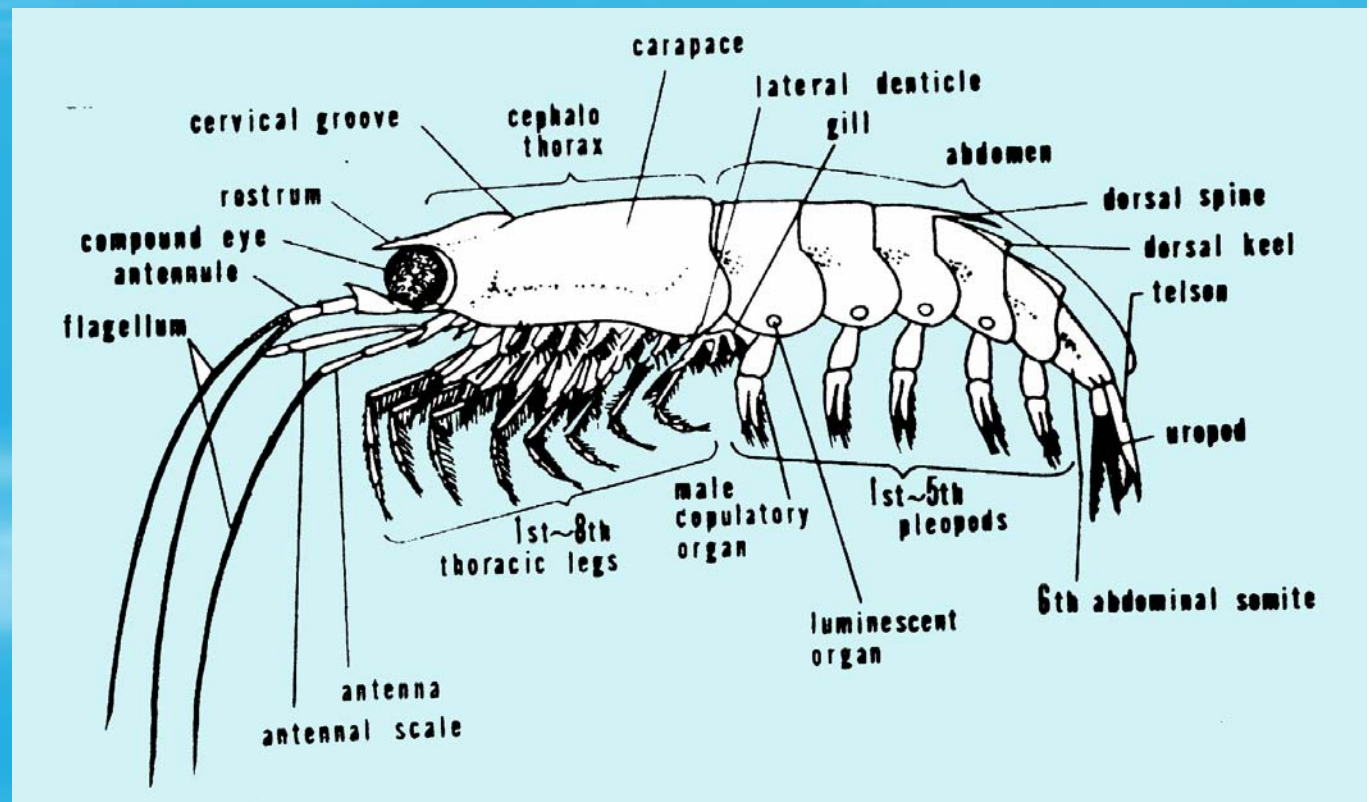


1 General morphology

1.1 External features

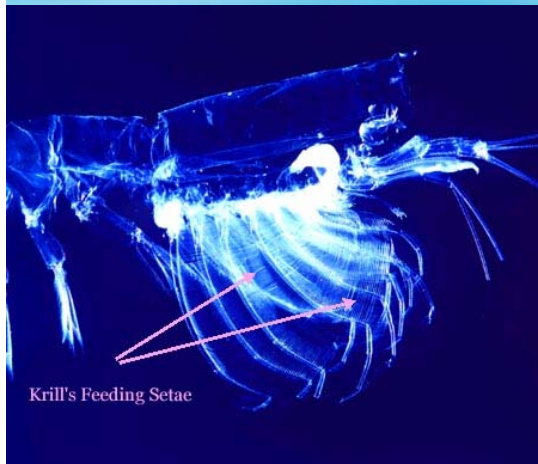
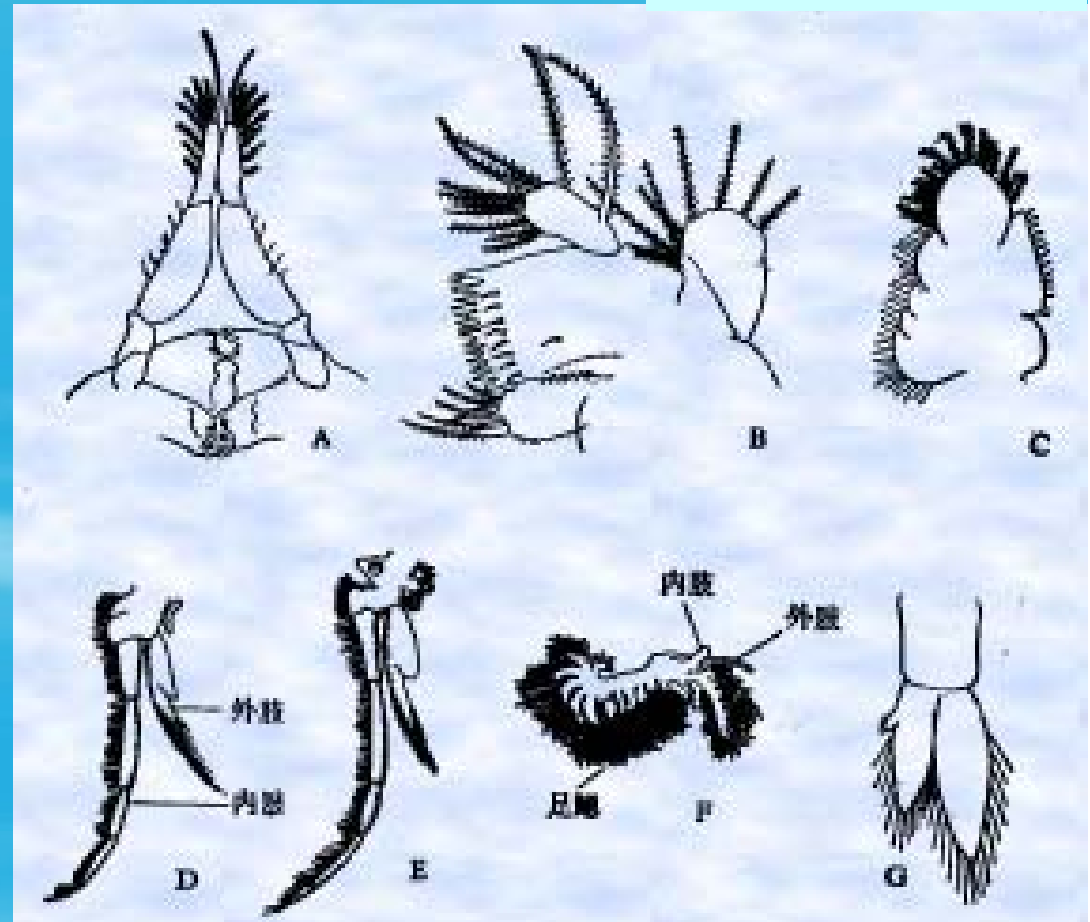
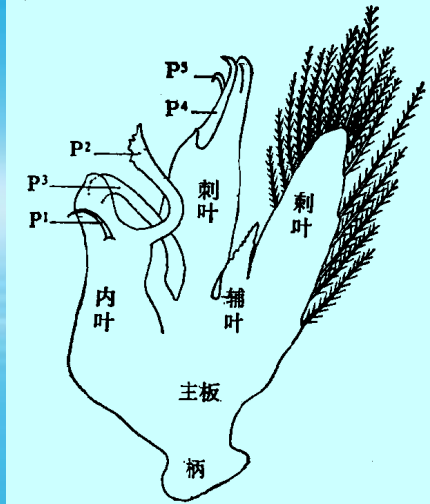
- cephalothorax
- abdomen

- rostrum
- cervical groove
- Lateral denticles
- dorsal spine
- dorsal keel
- preanal spine



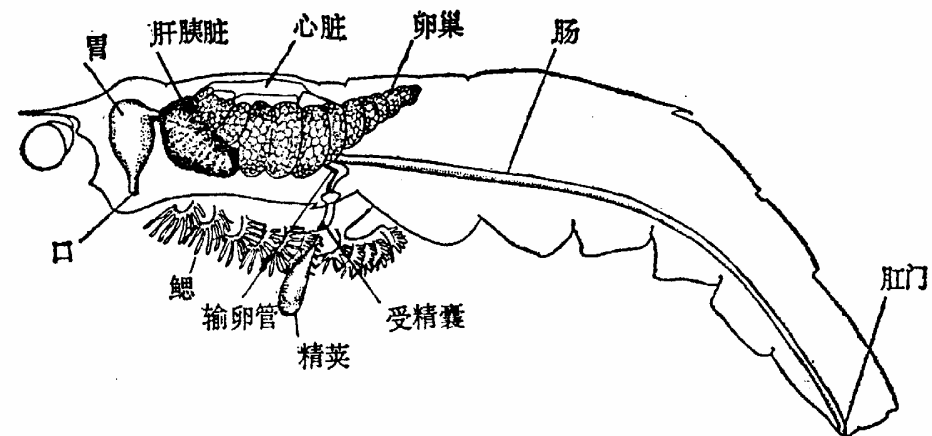
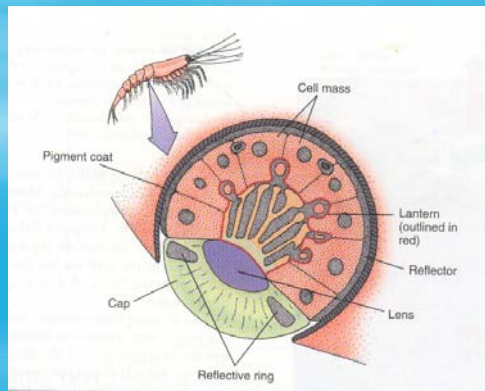
Appendages

- A_1
- A_2
- M ; M_1 ; M_2
- P_{1-8}
- Pl_{1-5}
- Up



1.2 Internal morphology

- 1.2.1 Digestive system:
mouth – esophagus – stomach – midgut – hindgut - anus
- 1.2.2 Circulation
- 1.2.3 Respiration system: podobrachiae
- 1.2.4 Excretory system: antennal glands
- 1.2.5 Reproductive system: ♀ ♂ dioecious
- 1.2.6 Nervous system and sensory organ: compound eyes
- 1.2.7 Photophores



磷虾的内部形态

2 Classification

Crustacea

Malacostraca

Eucarida

Euphausiacea (2 families, 11 genera, 87 species)

Family Bentheuphausiidae

Family Euphausiidae

Order Euphausiacea

1a Photophores present only on abdominal segment one

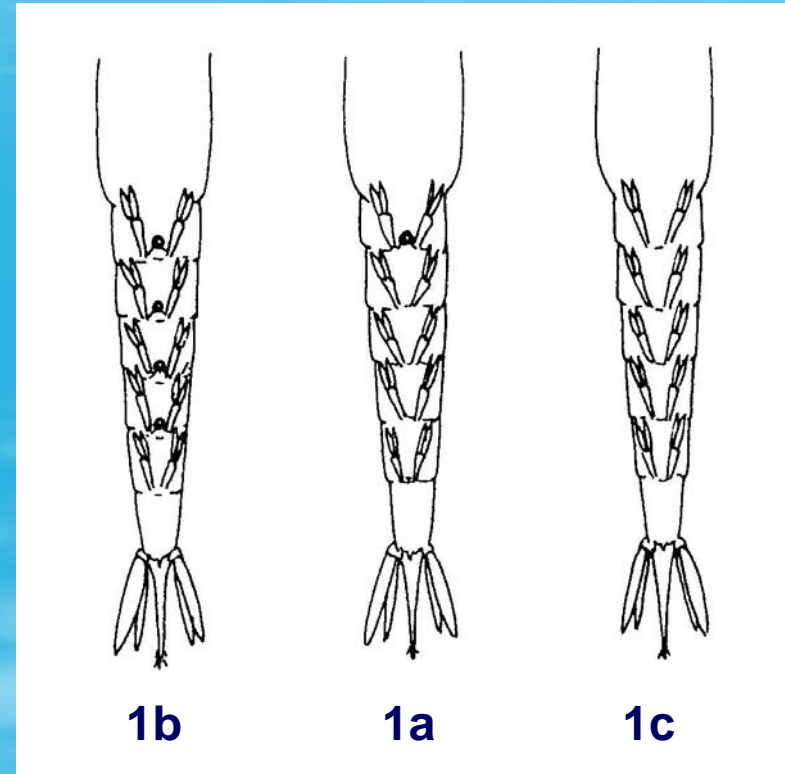
.....*Stylocheiron* 手磷虾属

1b Photophores present on abdominal segments one to four

.....2

1c No photophores on abdomen or thorax

..... 3

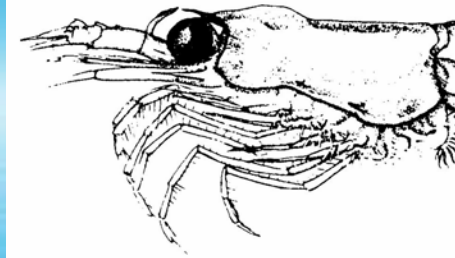


2a Eyes round, thoracic legs of approximately the same length

.....3

2b Eyes in two parts with a constriction between the lobes, one or two pair of thoracic legs very elongated

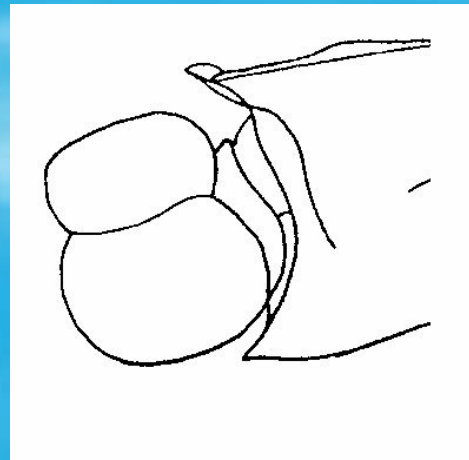
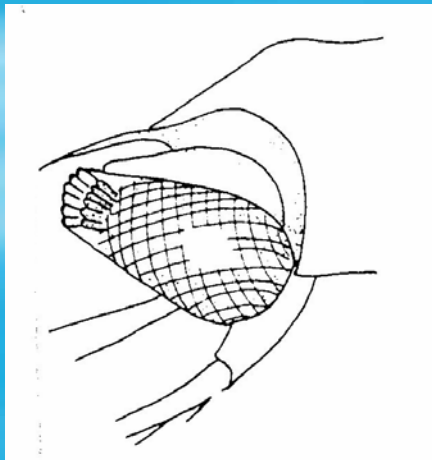
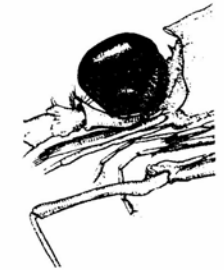
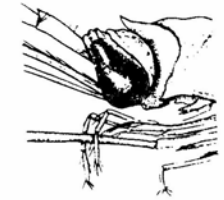
.....8



2a



2b



3a A full complement of eight thoracic legs

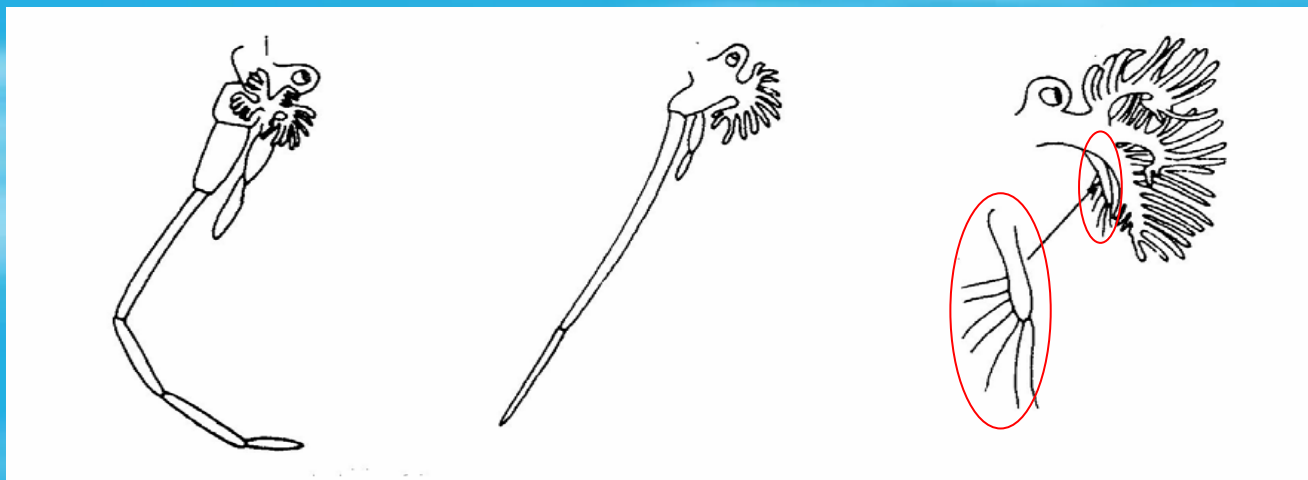
.....*Bentheuphausia amblyops*

3b Eight thoracic leg extremely minute. Seventh thoracic leg smaller than sixth but the same shape and with the number of segments (six)

.....*Thysanopoda* 櫻磷虾

3c Eight thoracic leg extremely minute and seventh thoracic leg with only two segments or reduced to a very small process

.....4



3b

3c

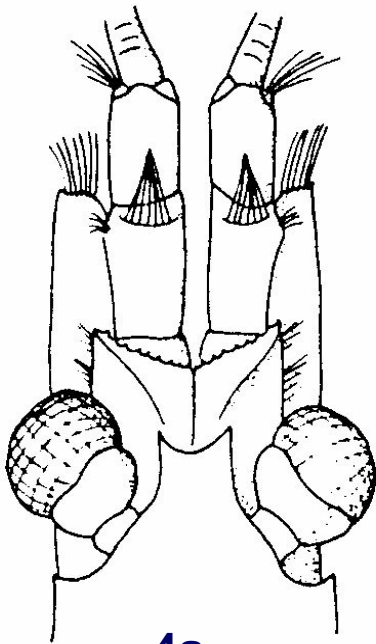
3c

4a Anterior margin of frontal plate concave

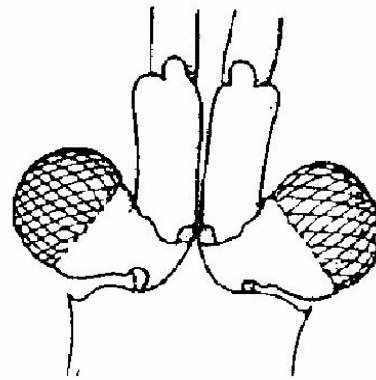
.....*Pseudeuphausia* 假磷虾属

4b Anterior margin of frontal plate produced to form a sharp or gently rounded rostrum

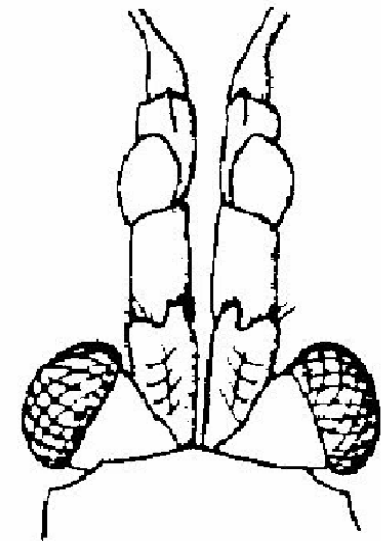
.....5



4a



4b



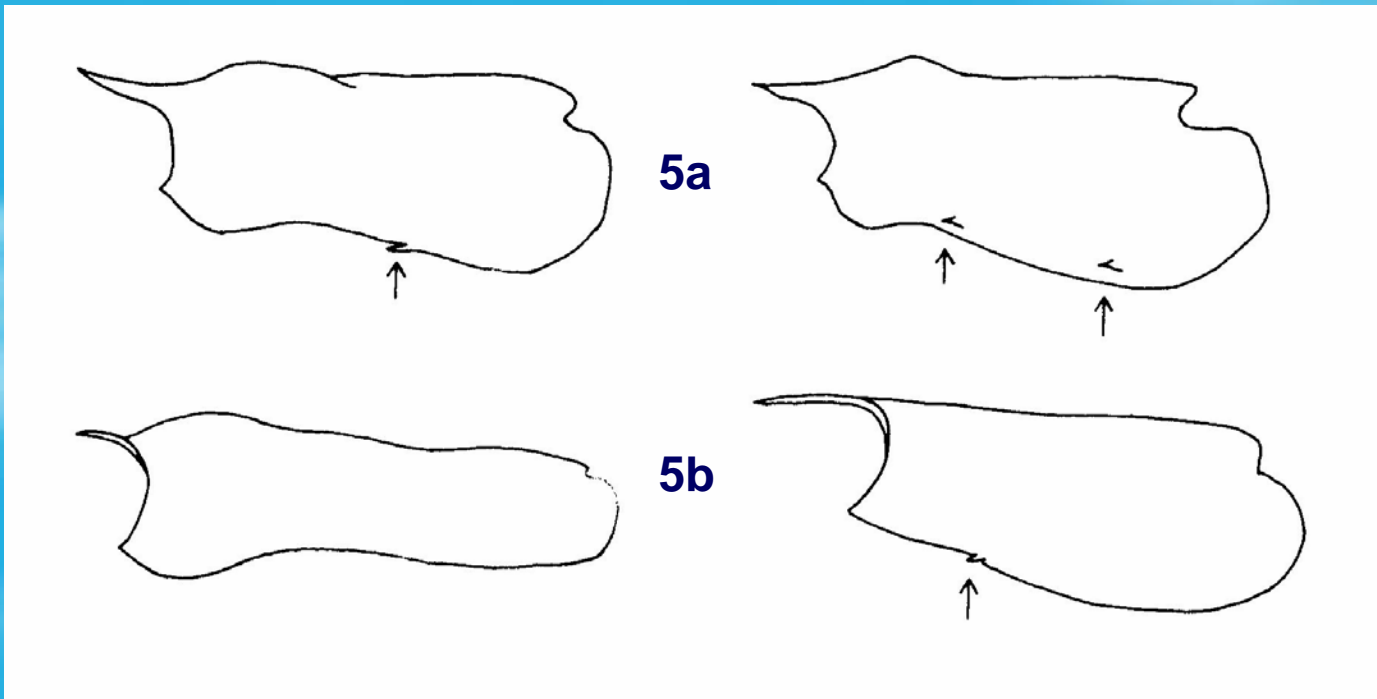
4b

5a A denticle at the mid-point or on the posterior half the lateral margin of the carapace. An anterior lateral denticle also may be present

.....6

5b There is either no lateral denticle or, if one is present, it is well anterior to the mid-point of the lateral margin of the carapace

.....7



6a Seventh thoracic leg consisting of two elongated joints and the seventh thoracic exopod present. Strong postocular spines and long recurved antennular lappets present

.....*Meganyctiphanes novegica*

6b Seventh thoracic leg consisting of only a minute process and seventh thoracic exopod absent

.....*Euphausia* 磷虾属

7a A strong recurved lappet on first segment of antennular peduncle

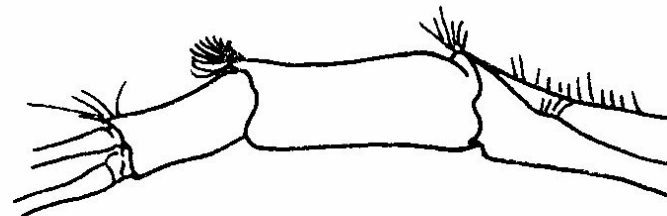
.....*Nyctiphanes*

7b The lappet, if present, is small and not recurved

.....*Thysanoessa*



7a



7b

8a Second and third thoracic legs elonged

.....*Tessarabrachion oculatum*

8b Second thoracic leg elongated.....9

8c Third thoracic leg elongated

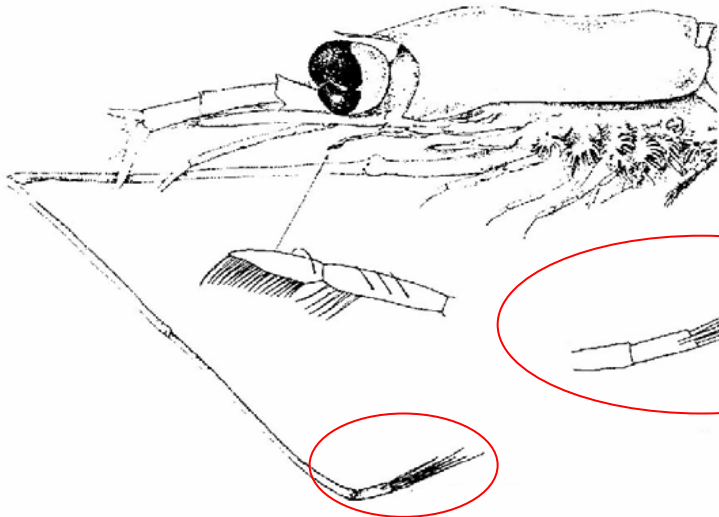
.....*Nematobrachion* 臂磷虾属

9a Second thoracic legs very slender and naked with only a tuft of terminal bristles. Terminal segment of first thoracic leg with short, robust comb-like spines

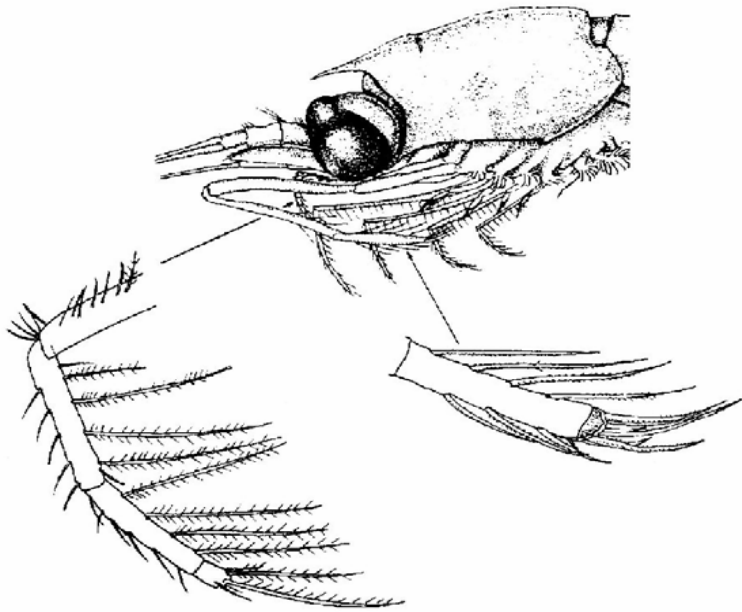
.....*Nematoscelis* 线脚磷虾属

9b Second thoracic legs rather strong, last two segments armed with spiniform bristles. Terminal segment of first thoracic leg hardly broader than penultimate segment and with only fine terminal setae

.....*Thysanoessa*



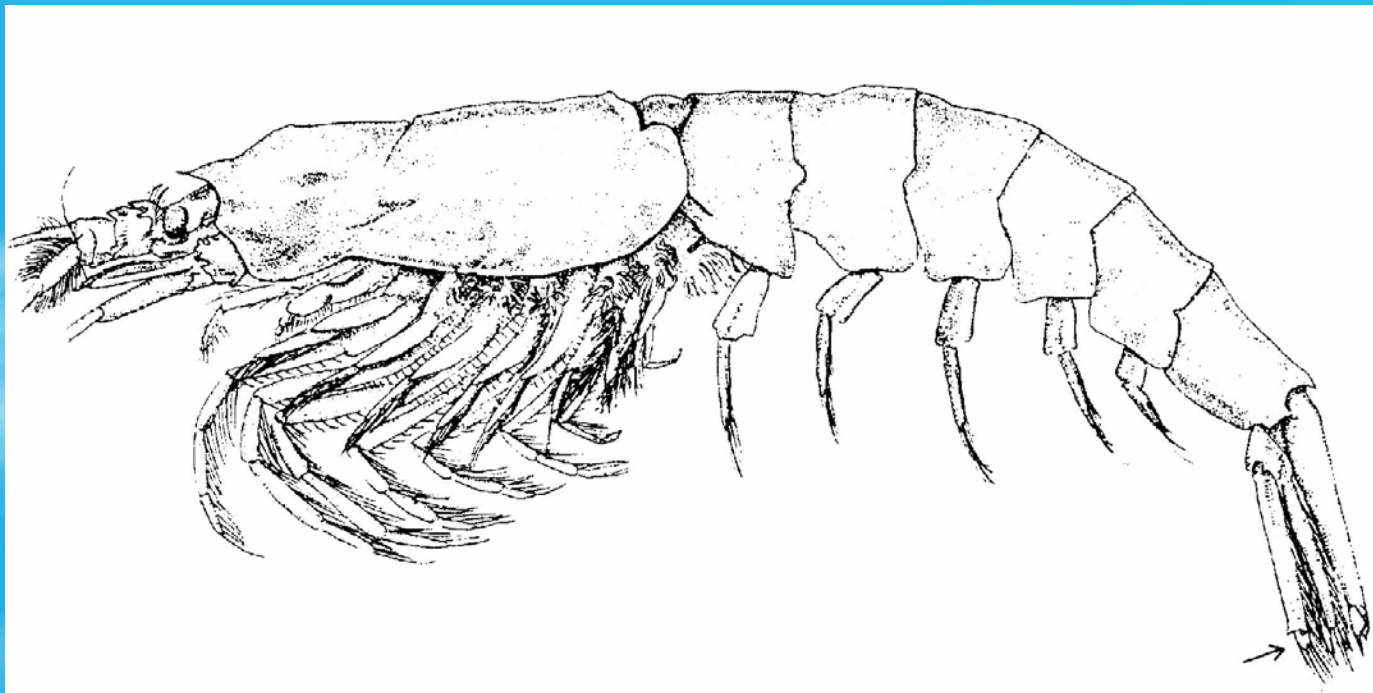
9a



9b

Bentheuphausia amblyops

- ♂ Pl_{1-2} not modified as petasma, the base of Pl_1 with 1-6 spines
- Up with a transverse suture near the distal end
- without photophores



Euphausia pacifica

- length

E. pacifica 20-25 mm

E. nana 7.3-8.3 mm

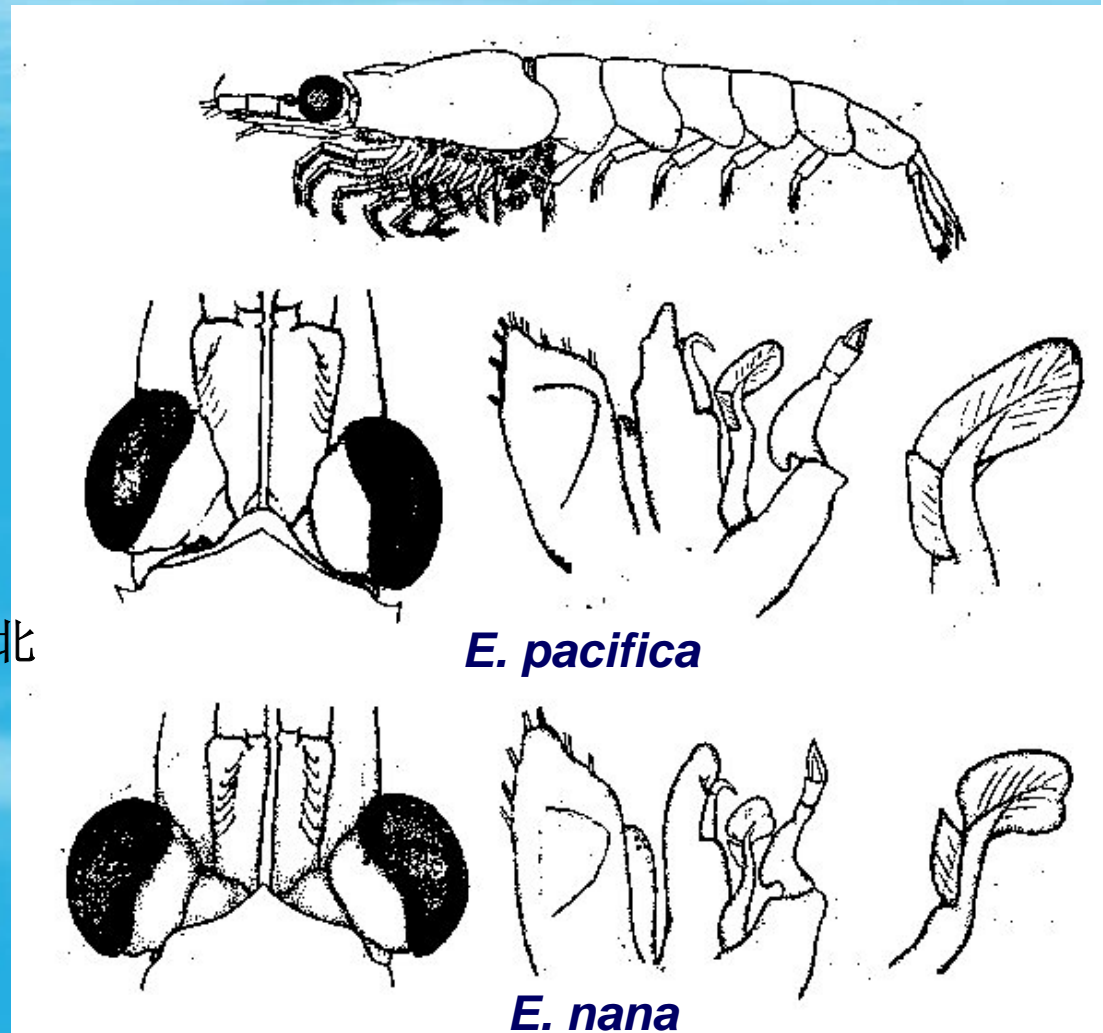
- distribution

E. pacifica

南黄海，冬春季可达长江以北

E. nana

东海，夏季可达南黄海



Pseudeuphausia sinica

- **Madible**

P. sinica without palp

P. latifrons with a well-developed palp

- **Maxillule**

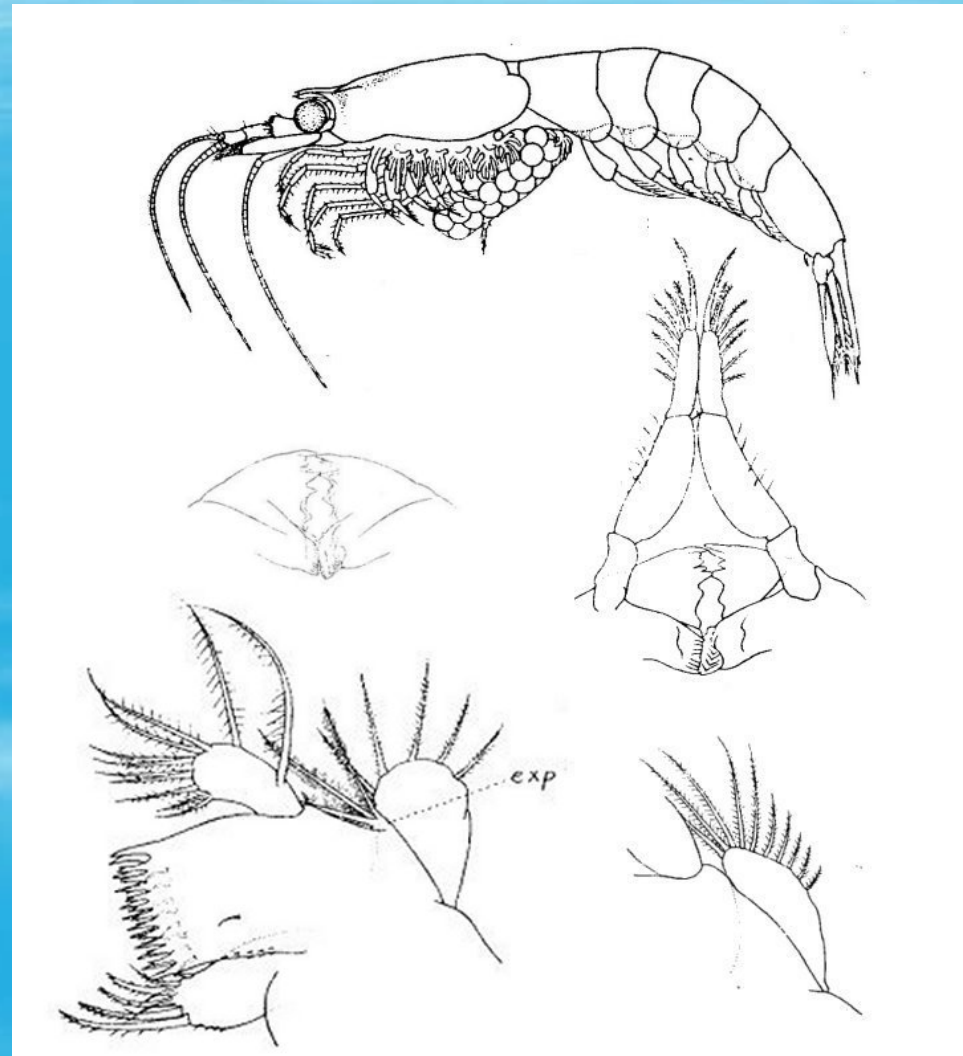
P. sinica with exopod

P. latifrons without exopod

- **Distribution**

P. sinica 东海和南黄海近岸低盐水
我国地方种

P. latifrons 南海，东海外海
太平洋和印度洋的热带海区



P. sinica

P. latifrons

3 Biology and Significance

- **3.1 Biology**

 - 3.1.1 Distribution**

 - vertical distribution**

 - 3.1.2 Feeding habits**

 - 3.1.3 Growth and development**

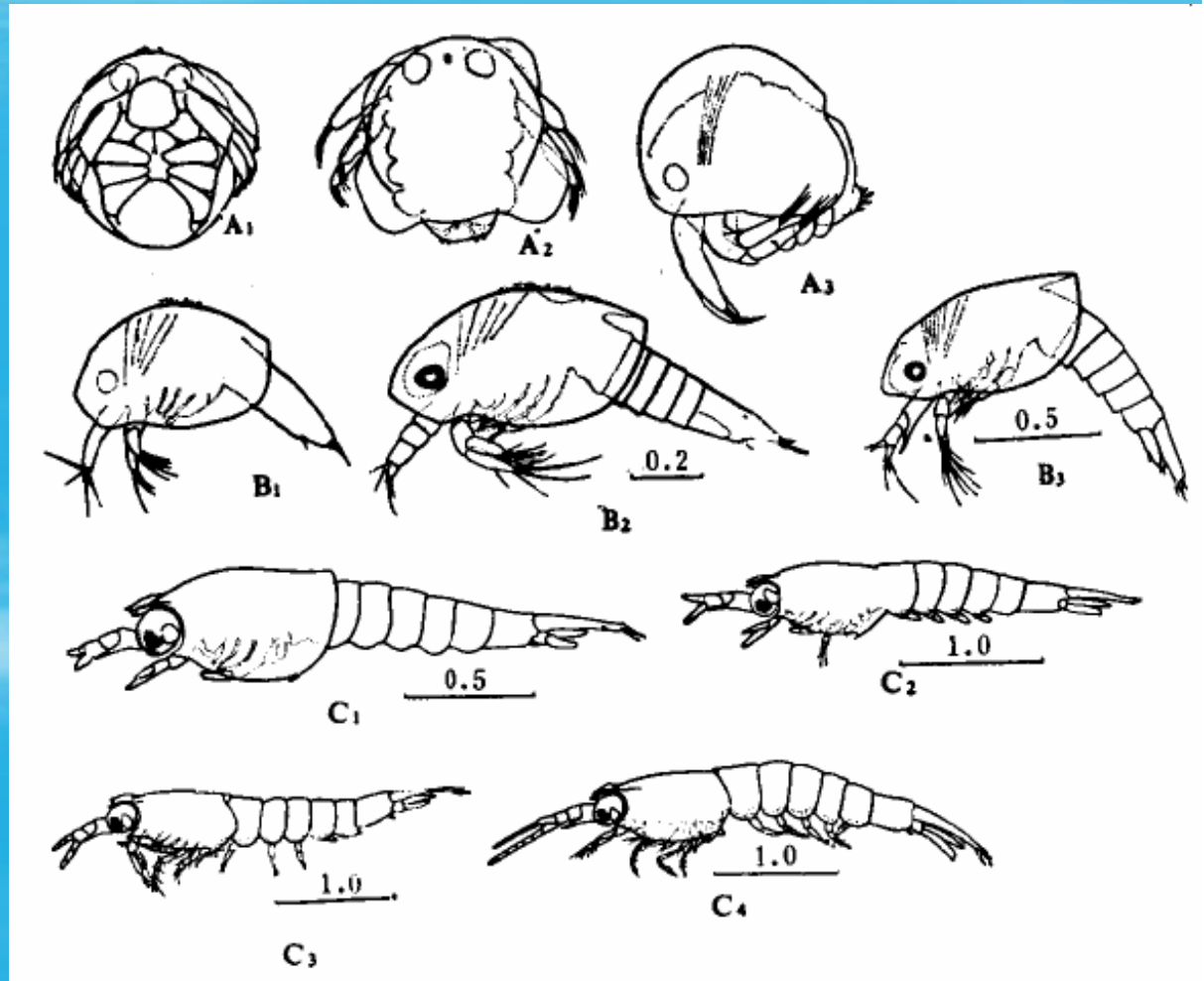
 - 3.1.4 Swarming and Bioluminescence**

 - sound scattering layer**

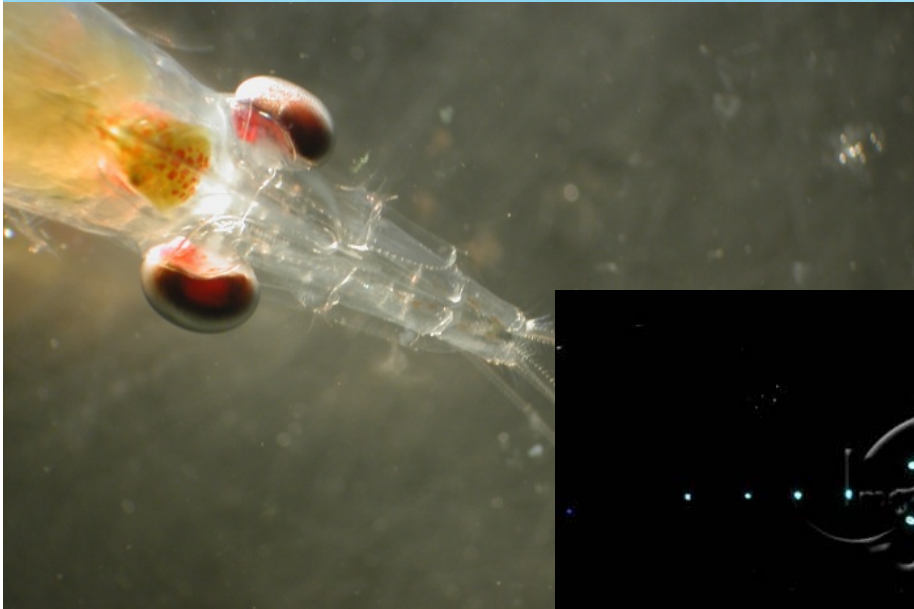
- **3.2 Euphausiid fishery**

Development

- nauplii 无节
- calyptopis 节胸
- furcilia 带叉
- cyrtopia 节鞭



Bioluminescence





Krill fishery
BIOMASS: $6.5\sim 10 \times 10^9$ tons
Max Catch: 7×10^6 tons