



Zooplankton

An introductory guide to some of the
common zooplankton species/ genus
around the British Isles

Calanus helgolandicus

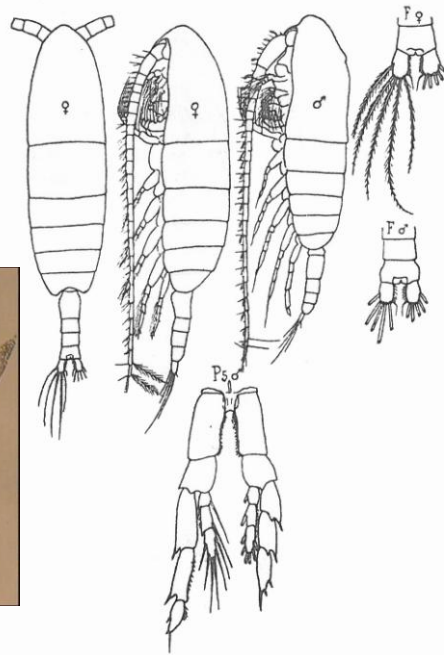
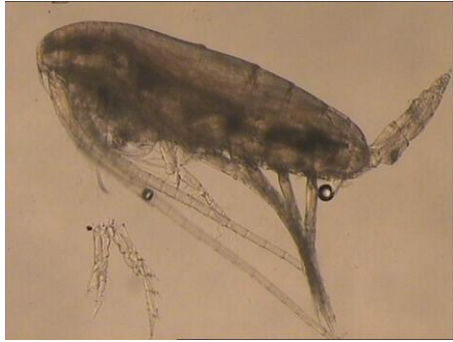


Fig. 8. — *Calanus helgolandicus* CLAUD, ♀♂; d'après SARS.

♀ 3mm ♂ 2.8mm
Calanoid copepod

Large concave /curved teeth on the female p5
Has a slightly pointed head
End of metasome is rounded
Female genital segment slightly swollen
Antennae reach 2 segments beyond the caudal rami

Calanus finmarchicus

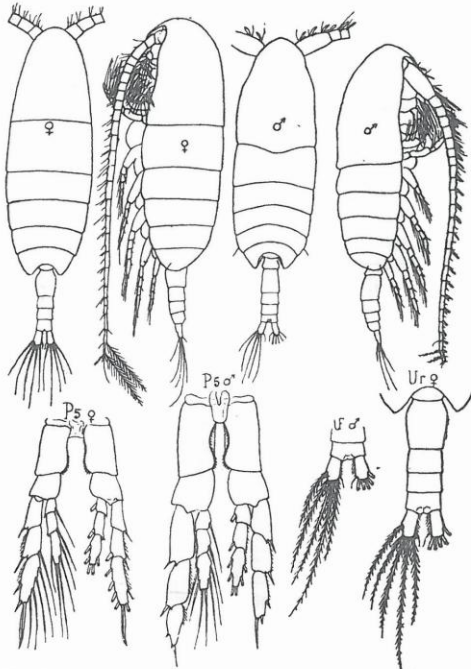


Fig. 7. — *Calanus finmarchicus* GUNNER, ♀♂; d'après SARS.

♀ 2.7 -5.4mm ♂ 2.35- 3.6mm
Calanoid copepod

Male has curved concave teeth on p5 (like Cal hel)
Female has small straight on the p5
Head more rounded than Cal hel
End of metasome is rounded
Female genital segment is slightly swollen
Antennae reach 3 segment beyond the caudal rami

Pseudocalanus elongatus

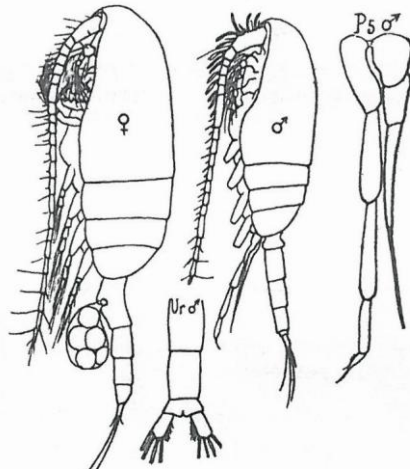
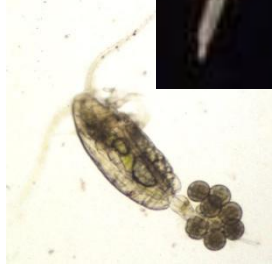


Fig. 34. — *Pseudocalanus elongatus* BOECK, ♀♂; d'après G. O. SARS.

♀ 1.2-1.6mm
Calanoid copepod

♂ 1.25- 1.36mm

Antennae are shorter than the body length reaching just past the end of the metasome
Male has a thin blade like p5
Female does not have a p5
Female genital segment slightly swollen and pointing downwards

Paracalanus parvus

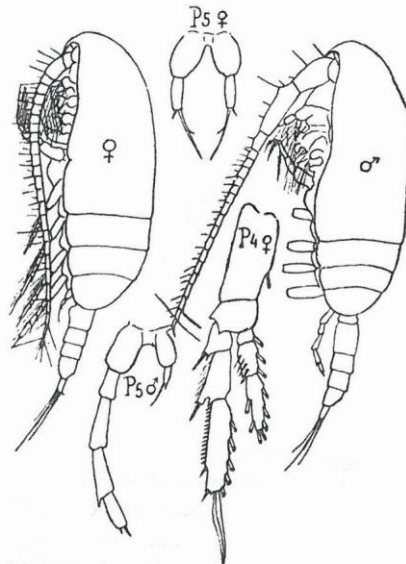


Fig. 25. — *Paracalanus parvus* CLAUS, ♀♂; d'après G. O. SARS.

♀ 0.8-1.0mm
Calanoid copepod

♂ 0.9mm

Antennae are shorter than the body length reaching just to the end of the urosome
Body is short and dumpy
Rounded head and slim urosome
Female genital segment points slightly upwards
Male and female p5 are small but quite distinctive
Male p5 is asymmetrical – one side much longer than the other

Clausocalanus spp

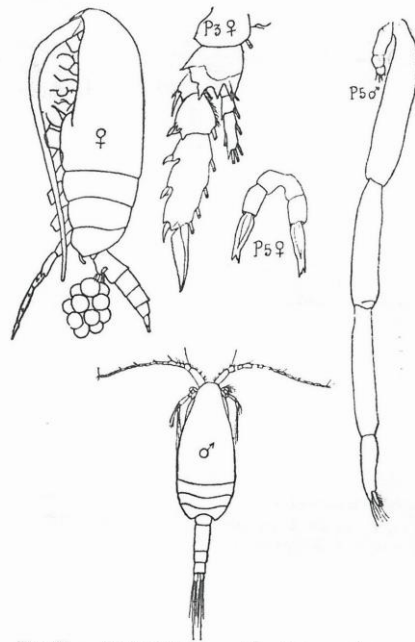
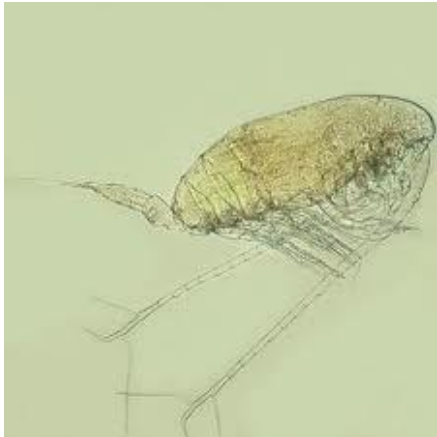


Fig. 37. — *Clausocalanus arcuicornis* DANA ♀♂;
d'après GIESBRECHT.

♀ 1.15mm
Calanoid copepod

♂ 1.12- 1.2mm

Body small round and dumpy
Urosome short and slim
Female genital segment slightly swollen and downward pointing
Female p5 bi furcate
Male p5 is asymmetrical with one side being much longer than the other.

Metridia lucens

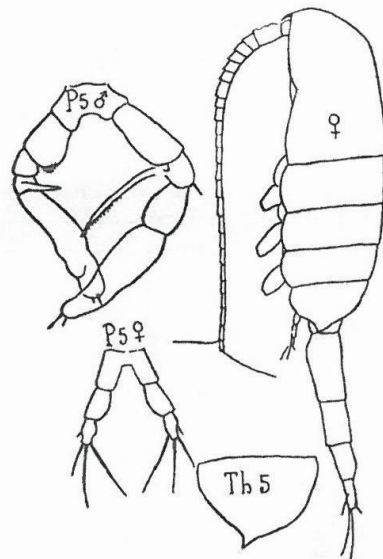


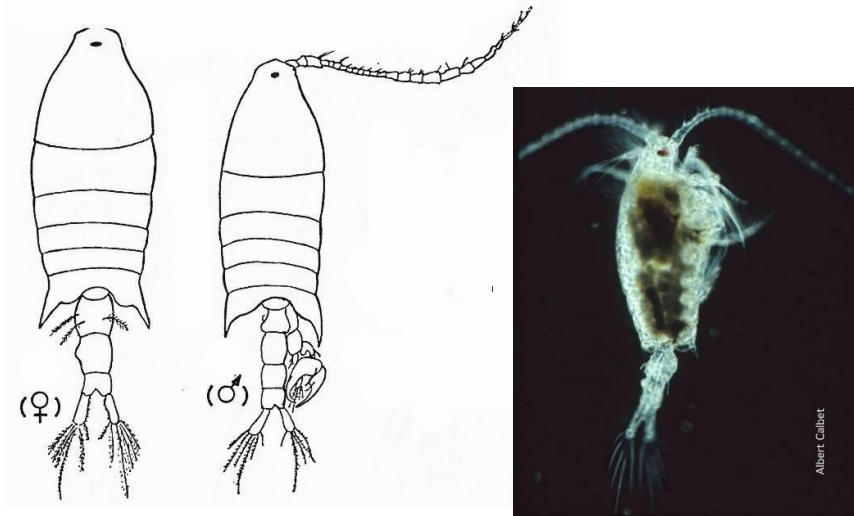
Fig. 203. — *Metridia lucens*
BOECK, ♀♂; d'après G. O. SANS.

♀ 2.5-2.9mm
Calanoid copepod

♂ 2.0-2.3mm

Body slender and elongated
Metasome comes to a point at the end – not a spine
Urosome is elongated
Female genital segment is longer than the other segments, slightly swollen and has a genital pore
Antennae have setae and look hairy
P5 of male and female are distinctive

Centropages typicus



♀ 1.6-2.0mm
Calanoid copepod

♂ 1.4-1.9mm

Red eye spot and red pigmentation often seen in fresh specimens

Large prominent points on the metasome

Female genital segment is swollen with 3 spines

Male p5 is chela shaped and very distinctive

Male antennae is geniculate

Acartia clausii

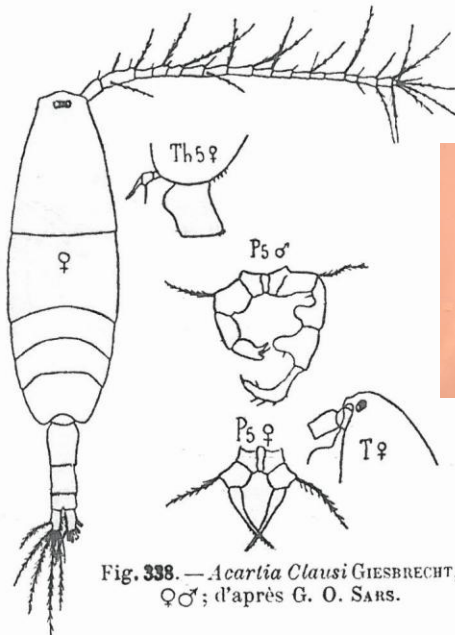


Fig. 338. — *Acartia Clausi* GIESBRECHT,
♀♂; d'après G. O. SARS.



♀ 1.15-1.22mm
Calanoid copepod

♂ 1.0-1.10mm

Small red eye spot in head

Metasome is rounded (no points)

Long setae on antennae (look hairy)

Very short spinules along the edge of the genital segment

Female p5 has a distinctive blade and feather shape

Male p5 has a club and small chela

Temora longicornis

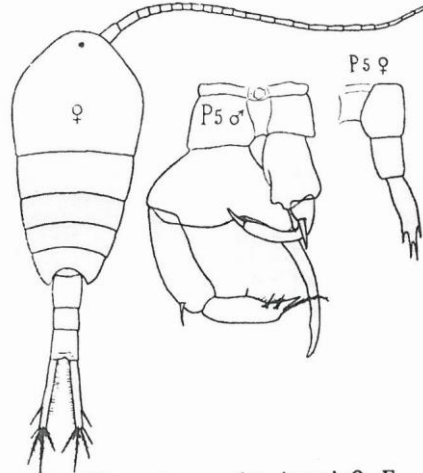


Fig. 492. — *Temora longicornis* O. F. MÜLLER, ♀♂; d'après G. O. SARS.

♀ 1.0-1.5mm
Calanoid copepod

♂ 1.0-1.35mm

Rounded obovate body
Red eye spot in the head
Short urosome ending in distinctive long slender caudal furca
No hooks or points on metasome
Male and female p5 are distinctive
Male antennae slightly geniculate

Candacia armata

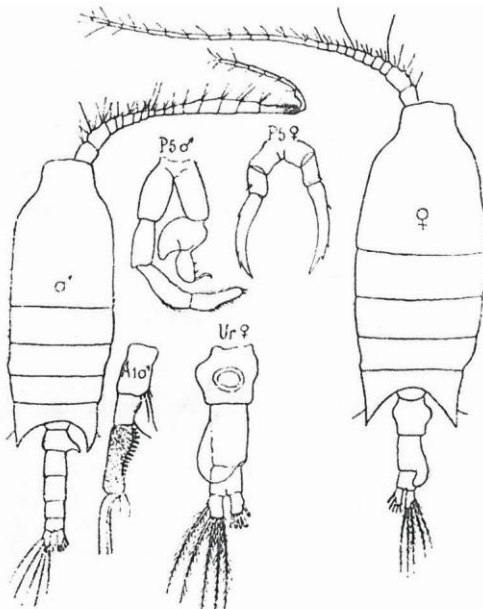


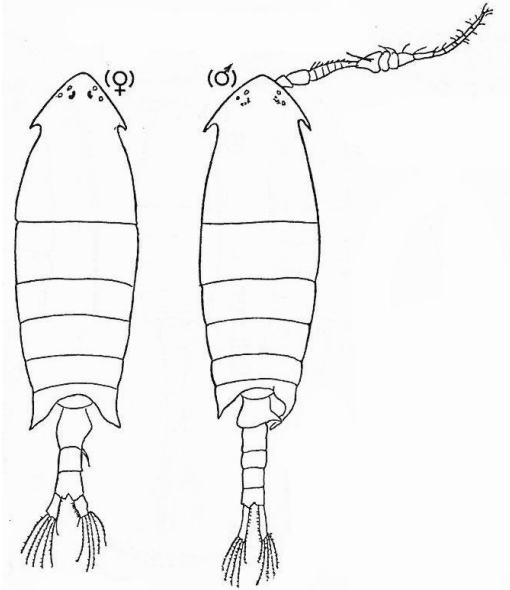
Fig. 349. — *Candacia armata* BOECK, ♀♂; d'après G. O. SARS.

♀ 1.95-2.7mm
Calanoid copepod

♂ 1.7-2.7mm

Square shaped head
Metasome ends in large hooked points or broad spines often come down over the 1st segment of the urosome
Female genital segment is rounded.
Female p5 is blade shaped with short serrations
Male urosome is assymetrical – spine on one side
Male p5 are usually club shaped, very distinctive and a diagnostic feature
Male antennae is geniculate

Anomalocera patersonii



♀ 3.2-4.1mm
Calanoid copepod

♂ 3.0-4.0mm

Body is arrow shaped

Usually has green/ blue pigments in it

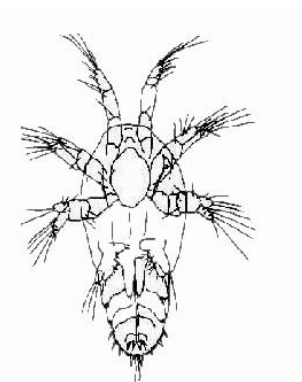
Eyespots are black and has two sets of large lenses in the head

Metasome ends in large hooked points that reach the 1st urosome segment.

Female genital segment has short spine

Male genital segment has a hooked spine

Male antennae is geniculate and distinctive



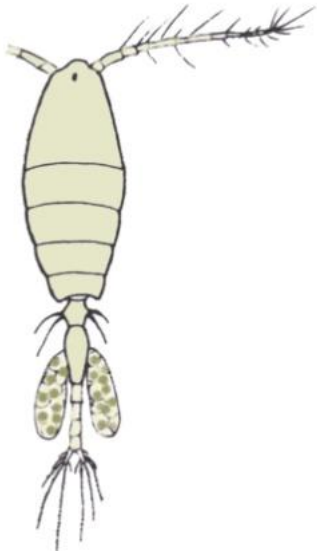
Copepod nauplii

Small round and dumpy

Nauplii of copepds

Oval body shape with 2 -3 pairs of rudimentary limbs

Oithona spp.

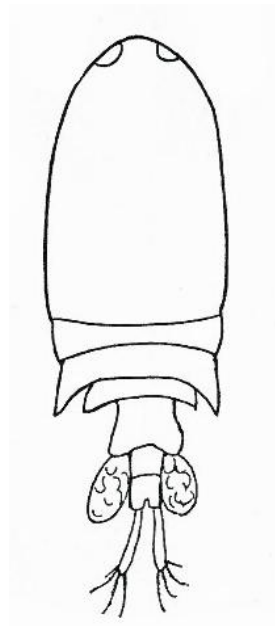


♀ 0.7mm
Cyclopoida copepod

♂ 0.45mm

Small slim copepod
Long slim urosome
Red eye spot in the head
Female often seen carrying eggs
Antennae have long setae (look hairy)
Male have a slightly geniculate antennae
No obvious p5 modifications

Corycaeus spp.



♀ 0.9-1.5mm
Cyclopoida copepod

♂ 0.8- 0.9mm

Often seen with green lenses in the head
Can have red pigmentation in the body
Very short antennae
Bullet shaped body
Metasome ends in distinctive points
Only 2 segments in the urosome
Rounded genital segments
Thin caudal furca

Microsetella spp

♀ 0.64- 0.85mm
Harpacticoid copepod

♂ unknown

Very small, slender, cylindrical body
Not much distinction between metasome and urosome
Often seen carrying egg sac in live samples
Very long caudal setae

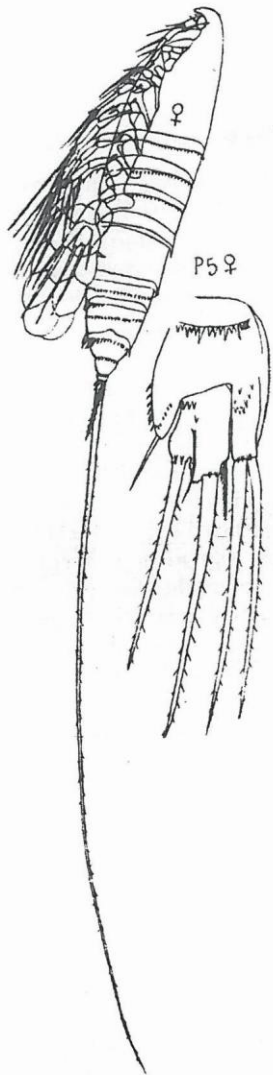
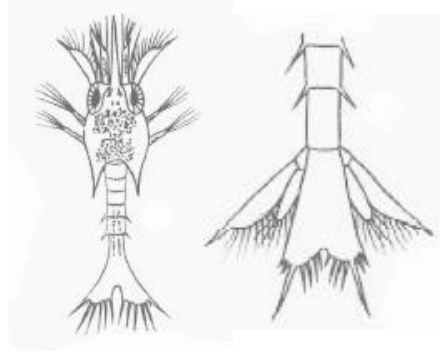


Fig. 365. — *Microsetella rosea* DANA, ♀; d'après GIESBRECHT.



Galathea spp

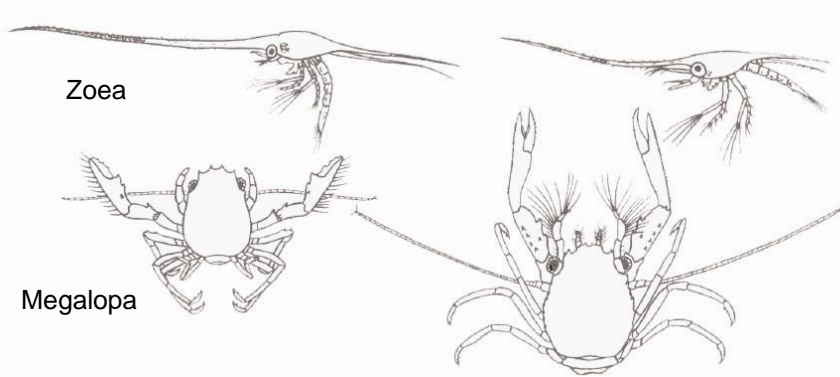


Size 3.5- 5.0mm
Anomuran decapod

Squat lobster

Long rostral spine on head
Antennular scales are long and reach the end of the rostrum
Carapace spines reach the abdomen segments (length of these spines is a diagnostic feature to take to species)
Fan shaped cleft telson in zoea I
Telson shape is squarer in later stages with two long spines
Abdomen segments have spines on the outer edge

Porcellana larvae



Zoea

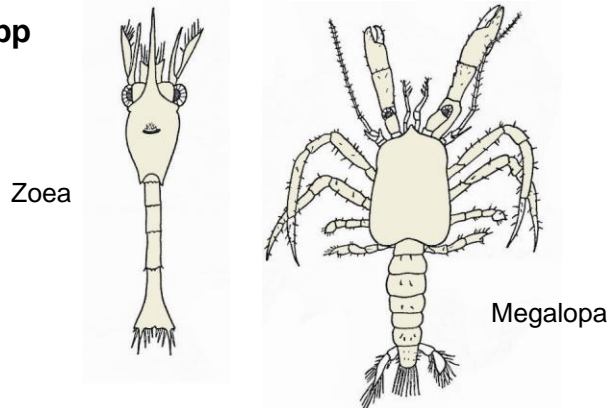
Megalopa

Size: 5.0 -6.5mm
Anomuran decapod

Squat lobster

Obvious very long spines on head
2 similar species:
Pisidia longicornis (right) has bands of pigment on the rostrum and tip of the posterior spines. Posterior spines are 1/3 length of rostral spine
Porcellana platycheles (left) has pigment on posterior spine and the half of the rostrum. The posterior spine are 1/2 length of rostral spine

Pagurid spp



Zoea

Megalopa

Size 3-8mm
Anomuran decapod

Hermit Crab larvae

Zoea has a slim elongated body
Large sessile eyes
Rostrum is longer than the antennular scales
Short spines on the abdomen segments (diagnostic feature)
Long spines on the telson
Telson shape changes with stage
Megalopa and later stage zoea have uropods

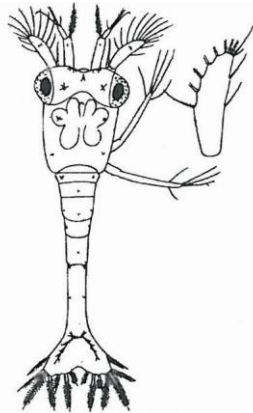
Pandalid spp



Caridean decapod (True Shrimps)

4th segment of the abdomen is larger than others giving a 'humped' appearance
Stalked eyes
Short rostrum
Carapace is toothed/ serrated in later zoea stages
No median spine on the telson

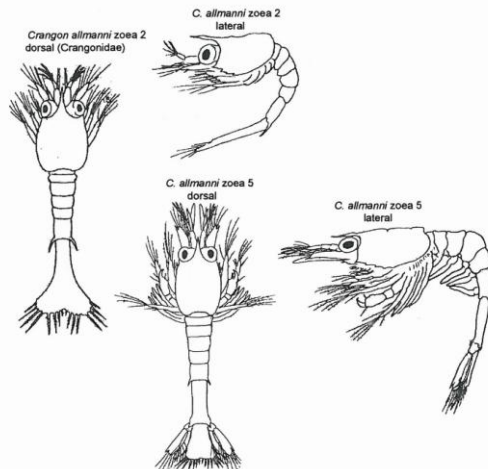
Processa spp



Caridean decapod (True Shrimps)

No rostrum
Distinctive antennal scales
Sessile eyes
Fan shaped telson in early zoea
Square shaped telson in later zoea
No median spine

Crangonid spp



Caridean decapod (True Shrimps)

Short rostrum
Antennal scales as long as rostrum
Eyes sessile
Cleft fan shaped telson in early zoeas
Square shaped telson in later zoea
Spines on the last abdomen segment as a distinctive feature

Upogebia spp

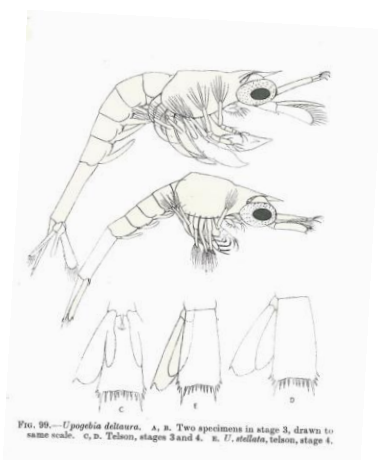
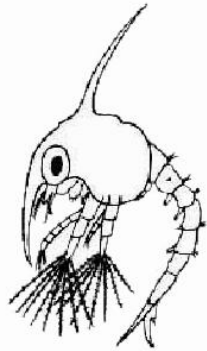


FIG. 96.—*Upogebia delaware*. A, B. Two specimens in stage 3, drawn to same scale. C, D. Telson, stages 3 and 4. E. *U. stellata*, telson, stage 4.

Thalassinidae decapod (Mud shrimp)

Rostrum not toothed and very short
Antennular scales are longer than the rostrum
Telson a short median spine and is square shape
Last abdomen segment longer than the other segments
Carapace has no spines
Early stages have a fan shaped telson

Brachyura zoea

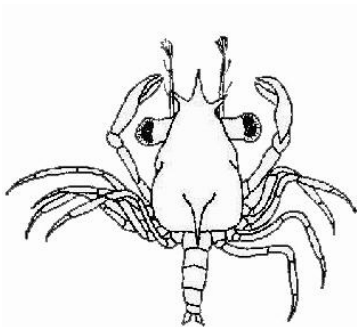


Brachyura (True crabs)

Many different species. 1- 5 zoea stages
Size range: 0.7 – 5.0mm depending on species

Very distinctive long spines on the carapace and a long rostrum.
Some have lateral spines on the carapace
Abdomens are long and segmented with spines.
Telson is forked and the shape and spine arrangement is a diagnostic feature.
Later stages of zoea have pleopods on the abdomen

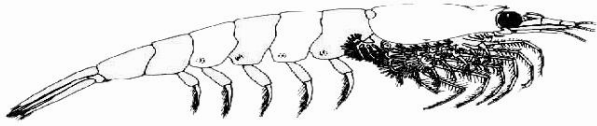
Brachyura megalopa



Brachyura (True crabs)

Many different species. 1 megalopa stage
Size range: 1.0 -4.0mm depending on species

Appears more like a juvenile crab
Developed chela on the 1st limb and spines on the carapace – a diagnostic feature
Pleopods well developed
Abdomen still present



Euphausiid



Shrimp like crustaceans

Size: juveniles 0.5mm – adults 60- 70 mm

Have 8 thoracic limbs

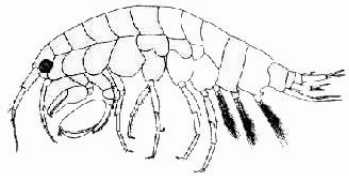
External gills

Light organs/ statocysts at the base of the pleopods (abdomen limbs)

Large compound eyes

Antennae have distinctive features

Common species around UK: *Meganyctiphanes*, *Nyctiphanes*, *Euphausia* and *Thysanoessa*



Gammarid



Amphipod

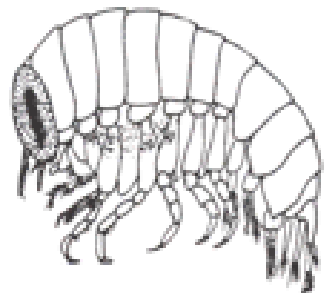
Size: 5 to 30 mm

The body is flattened from side to side

Seven pairs of thoracic walking legs (the first two pairs often enlarged)

Six pairs of abdominal limbs, of which the front three pairs are used for swimming and the back three for gliding locomotion on solid surfaces.

Normally a benthic bottom dweller, but can be found on coastal plankton samples.



Hyperiid



Amphipod

Size: 1 – 15mm

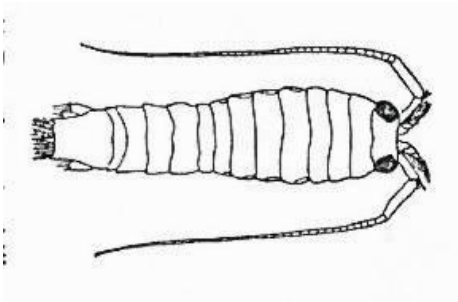
Short bodied amphipods

Large sessile eyes

No distinctive head

Often seen with a reddish pigment

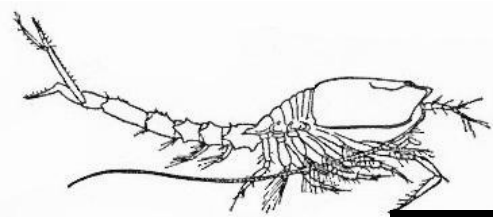
Rarely seen around UK unless in deep cold water



Isopod



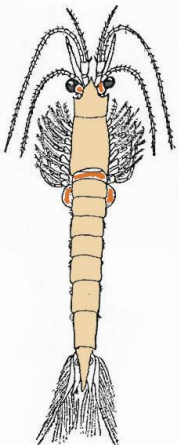
Peracaridians with no carapace
 Flattened bodies
 No distinctive thorax and abdomen
 Sessile/ fixed eyes
 Segmented body
 Length of antennae are a diagnostic feature
 Bottom dwellers – often swept into plankton samples



Cumacean



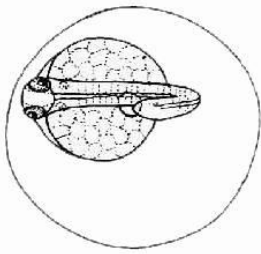
Peracaridian
 Carapace only covers the first 3-4 thoracic segments
 Eyes are fused in carapace
 Deeply forked telson
 Long slim abdomen
 Very short antennae
 Male has a long 2nd antennae
 Usually bottom dwellers but can be swept up into plankton samples



Mysiid



Opposum shrimp
 Shrimp like peracaridian
 Shield like carapace which covers most of the thorax
 Stalked eyes
 Swimming thoracic limbs are often seen carrying brood pouches
 Statocysts (light organs) at the base of the telson
 Most live near or on the bottom are very abundant inshore and in estuaries. Often come to the surface at night



Fish egg



Fish eggs are often 0.5 – 2.0mm

Spherical in shape

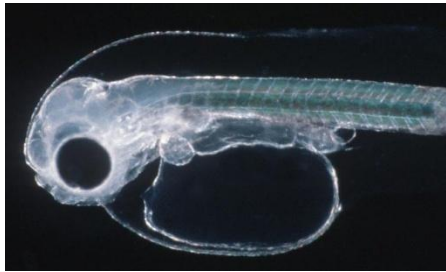
Can often see the developing embryo inside

Some have an oil globule inside to help them stay buoyant

In fresh plankton samples they will appear quite transparent



Fish larvae



Size range: 0.9 – 30mm

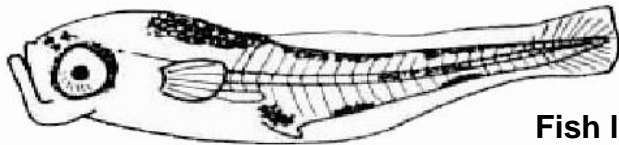
Long slim body

Later larvae have well developed eyes

Young larvae have no mouth and rely on their yolk sac for food

Scales and markings can often be seen

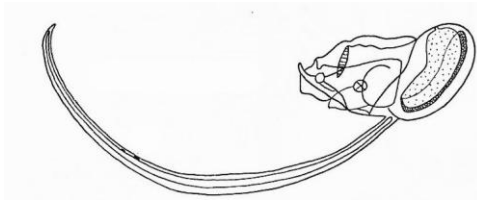
Size and markings depend on the species and are often used as diagnostic features



Fish larvae (older)



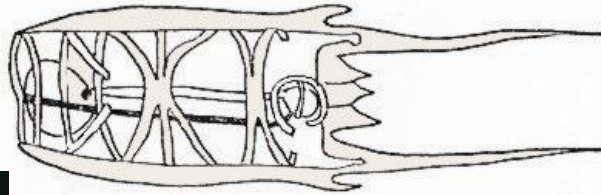
Appendicularia (Oikopleura spp)



2 – 4mm
Pelagic tunicate

Head has a distinctive shape
Tail is transparent but often has a notochord running the length
Often surrounded by a secreted transparent house which it uses to filter sea water.
These are very delicate and almost always lost in sampling

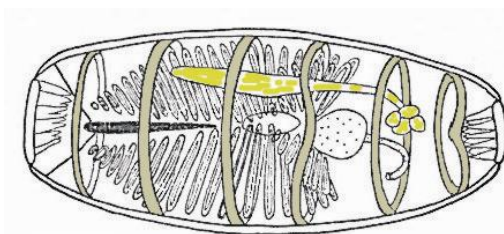
Salp



9 -15mm

Cylindrical tunicate with 2 tentacles
Has a colonial form which can mass together in large chains (sexual) and a solitary form (asexual) with no gonads
6 muscle bands – some fused around the middle
Widespread and common around the UK but more offshore species

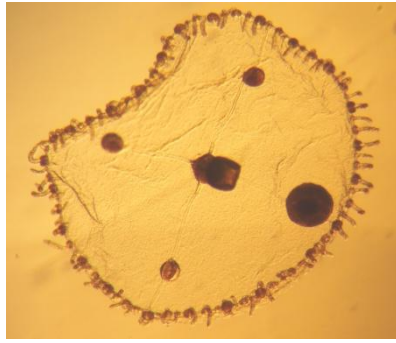
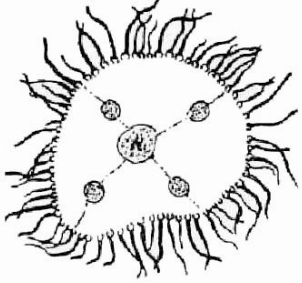
Doliolid



8- 17mm

Cylindrical tunicate, no tentacles
Barrel shaped
Have 8 muscle bands that encircle the whole body
Very transparent, muscle bands appear whiter
Free living rarely forming colonies
Sexual phase is seen in the plankton

Obelia spp.



Medusae of *Obelia* hydroid

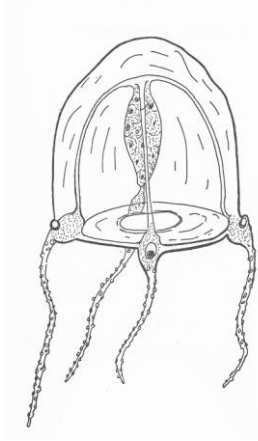
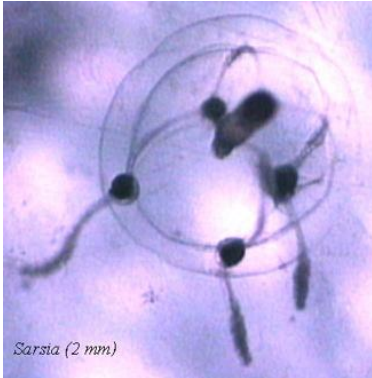
Very flat bell

Fringed appearance

4 round gonads on radial canals

Common around British Isle spring to autumn

Medusa



Medusae of hydroid *Syncoryne eximia*

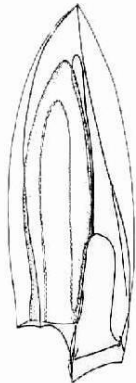
Very rounded bell

4 gonads at the base of 4 tentacles

Coastal waters around British Isles

Can grow to 4mm in length

Siphonophore



Holoplanktonic hydrozoans

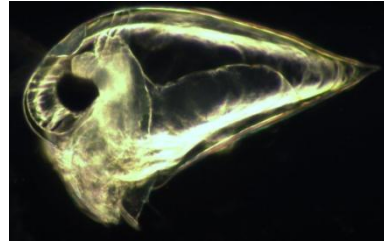
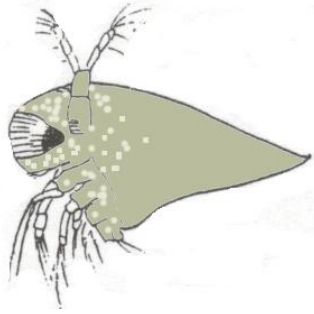
Oval shaped bell

Quite transparent in appearance

Can be very numerous in the waters around SW especially in the summer

Oceanic and not very common around the rest of the UK

Evadne spp.



Cladoceran

Oval body shape

Head and body appear to be well fused

Large sessile eyes

Points on the abdomen

Can be seen brooding young

Mainly warm water species

Most abundant around the UK March - October

Podon spp.



Cladoceran

Rounded body

Large eyes

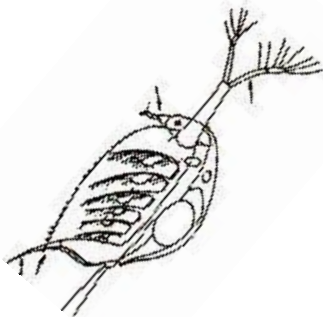
Head appears more distinct than in Evadne

Common in British waters

Spring – summer

Often seen in spring and summer

Penillia



Cladoceran

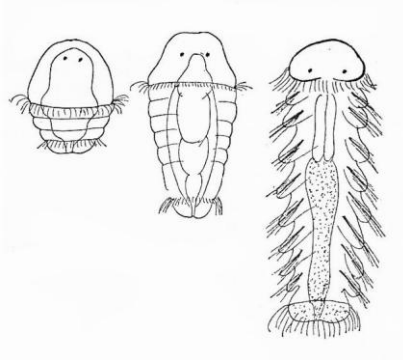
Oval body shape

Very small sessile eyes

Looks very similar to fresh water Daphnia spp

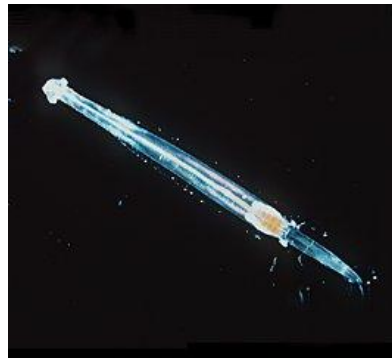
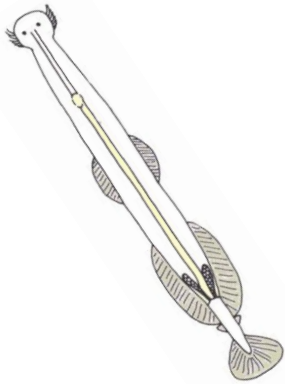
Has 2 spines on the end of body and the carapace has a serrated edge

Warm water species from Mediterranean, but now quite common in English Channel and southern North Sea



Polychaeta

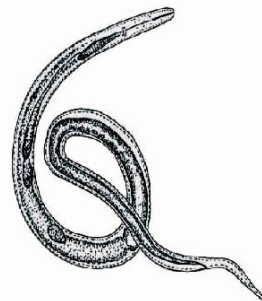
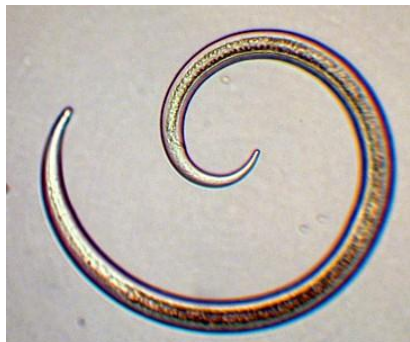
Short segmented body
Segments can have short bristly hairs
Rudimentary eyes in the head
Many species: larvae are very difficult to speciate
Common species include: *Nereid*, *Phyllodocid*, *Spinoid*



Chaetognatha

Arrow worms are active planktonic predators
Very common in oceanic and inshore areas
Can grow quite large
Elongated, transparent body
Distinctive head with large rasping jaws/ maxillipeds
The shape and portion of the body as well as the position of the gonads and anus are diagnostic features

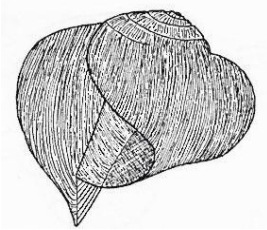
Common UK species is *Sagitta spp*



Nematode

Round worms
There are thousands of species some are free living but some a parasitic
They have a simple tube like digestive tract
They are very common in the marine environment

Limacina retroversa



A winged mollusc (Thecosome)

Probably one of the most the smallest and most abundant planktonic gastropods

The shell is sinistrally spiralled and made up of 5 whorls

Approximately: 2mm

Clione limacina



Gymnosomata (shell less mollusc)

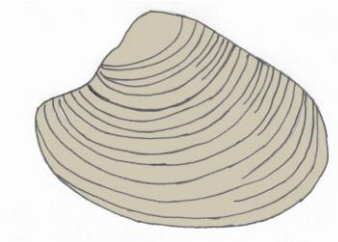
One of the most abundant winged molluscs found mainly in deep colder waters around the UK

The body is cylindrical/ barrel shaped

Fresh specimens can have red pigment in the body

Approximately: 4-5mm

Bivalve larvae



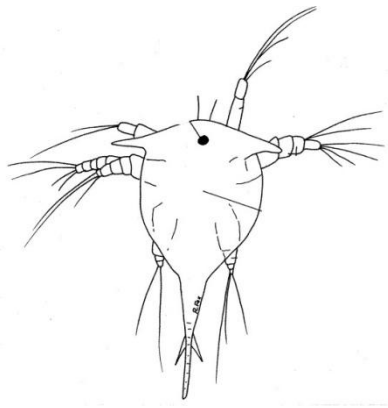
Filter feeding mollusc

Bivalves have a shell consisting of two asymmetrically rounded halves called valves that are mirror images of each other, joined at one edge by a flexible ligament called the hinge. The shell is typically bilaterally symmetrical.

Often found living on sediments, in sediments or attached to surfaces.

Includes the larvae of: scallops, clams, oysters and mussels

Barnacle nauplii



Very widely distributed in coastal waters in early spring
Very quick moving in a live plankton sample

Body outline is triangular

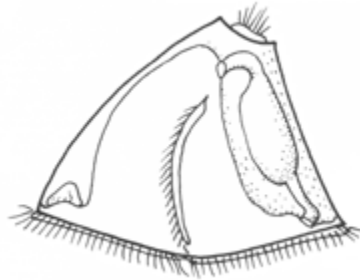
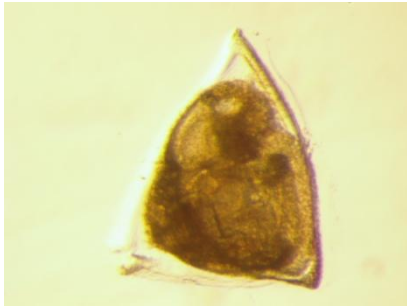
Eye spot

Short protrusions on the anterior edge of the head

The tail often ends in bifurcated spines

Approximately: 0.3 -0.9mm

Cyphonautes larvae



The ciliated larvae of an Ectoprocta

Flattened triangular shaped body

One edge is ciliated

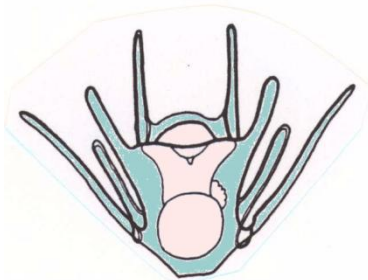
Simple calcareous bivalved shell

A 'U' shaped ciliated gut can be seen in some species

Common species around the British Isles include:

Membranipora membranacea and *Electra pilosa*

Echinoderm larvae



Almost all echinoderms have a planktonic larval stage
Includes: starfish, sea urchins, sea cucumbers, bristle stars
etc

All have different types of larvae and go through several
stages before they become post larval

The post larvae often look more like their adult form

They drop out of the plankton at this stage and become
benthic