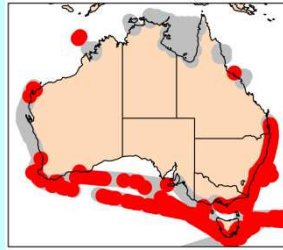
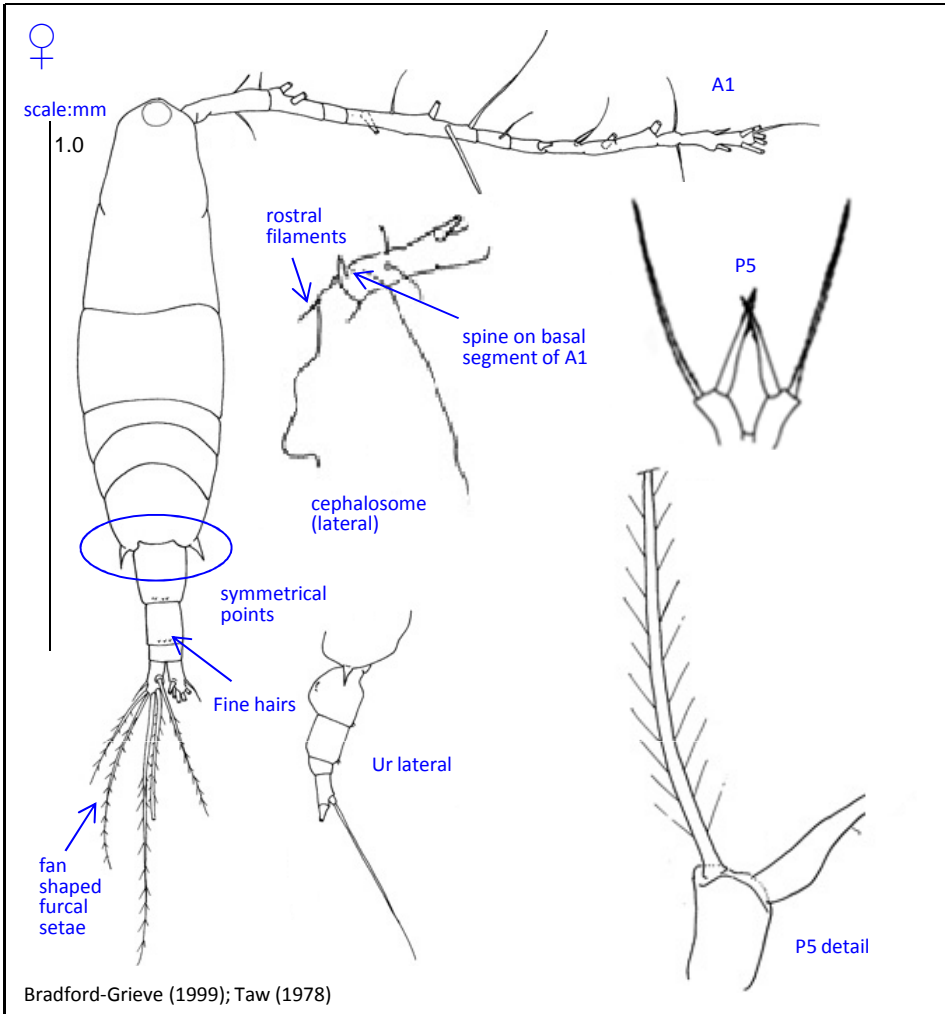


Acartia (Acartia) danae

Giesbrecht, 1889



Phylum Arthropoda
Order Calanoida
Family Acartiidae



Bradford-Grieve (1999); Taw (1978)

Synonyms

Acartia danae Giesbrecht, 1889

Size

Female: 1.00 - 1.30 mm

Genus notes

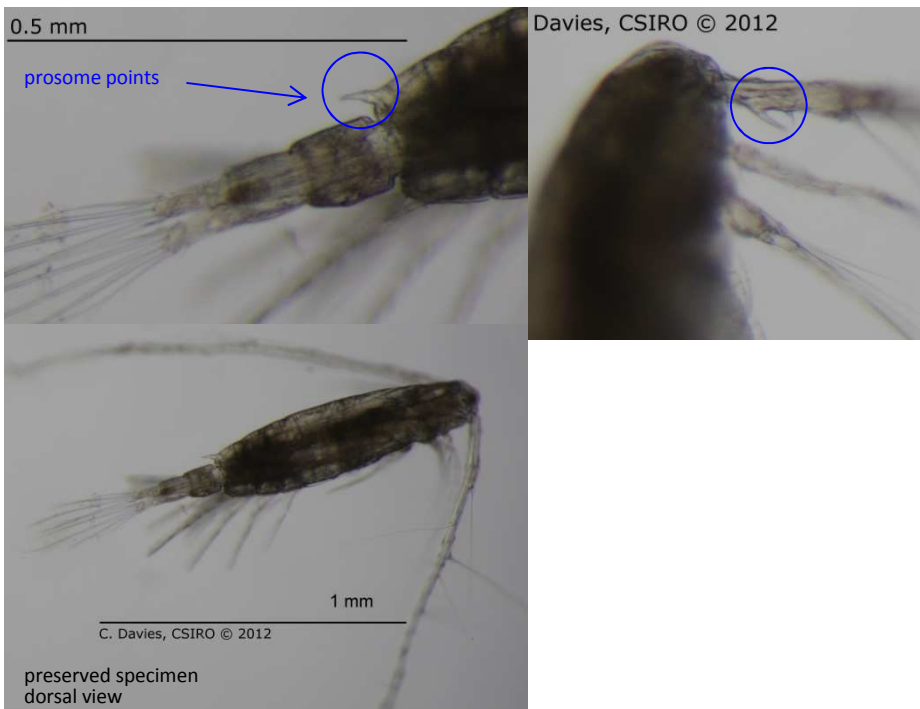
- Slender cigar-shaped body
- Single prominent naupliar eye
- The A1 setae are long. In males the A1 is geniculate on the right side only
- The cephalosome and pedigerous somite 1 are separate, pedigerous somites 4 and 5 fused
- Maxilla form are typically 'basket' like
- Female P5 uniramous, reduced, symmetrical, comprising basis bearing an inner spine and an outer seta
- Male P5 uniramous, asymmetrical, larger on right, exopod segment 2 with large inner lobe, segment 3 in form of clasper
- Female urosome 3 segmented, male 5 segmented
- Caudal rami short, often slightly asymmetrical, separated from anal somite, 6 setae
- Robust fan-shaped caudal rami setae

Subgenus notes

- Rostral filaments present
- Male P5 larger on right, exopod segment 2 with large inner lobe, segment 3 in form of clasper

Female

- A1 extends to the tip of the caudal rami
- Spine on basal segment of A1
- Prosome terminates in pair of symmetrical points
- P5 exopod is a modified spine, serrated on both sides
- Urosome has fine dorsal hairs on posterior border of first 2 somites
- Genital somite longer than the following somite



Davies, CSIRO © 2012

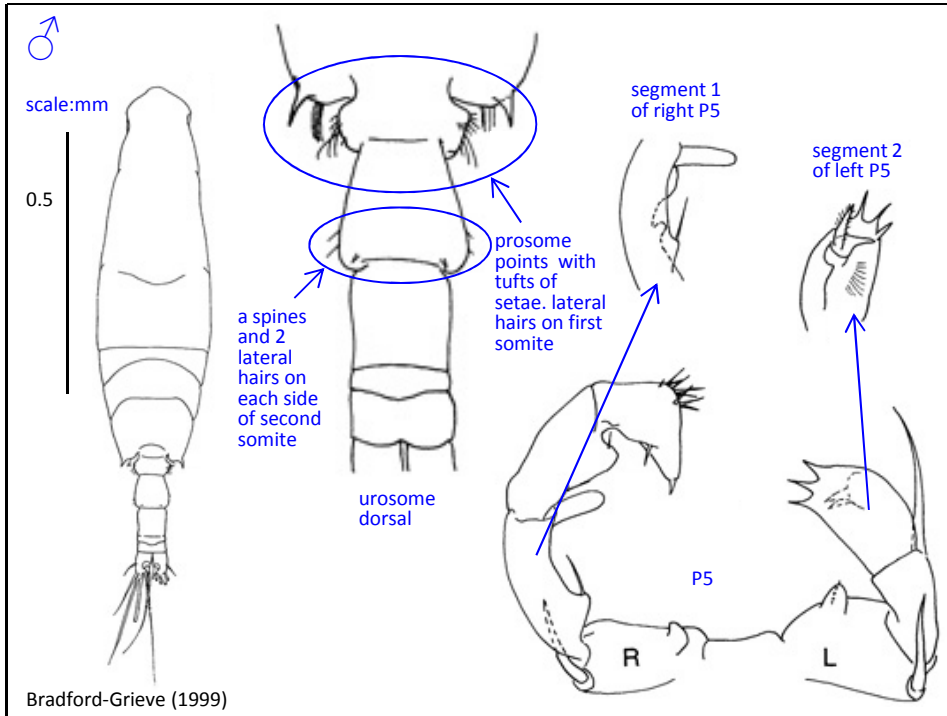
C. Davies, CSIRO © 2012

preserved specimen dorsal view

Acartia (Acartia) danae

Giesbrecht 1849

Phylum Arthropoda
Order Calanoida
Family Acartiidae



Size

Male: 0.70 - 0.90 mm

Male

- Right leg of P5, exopod segment 1 with distal process
- Prosoma terminates in pair of symmetrical points and tufts of setae
- Lateral hairs on urosome somite 1
- A spine and 2 lateral hairs on each side of urosome somite 2

Distribution

- Epipelagic
- Coastal and oceanic
- Australian distribution includes Moreton Bay, Western Port Bay, Swan River estuary, Melbourne, Port Hacking, Sydney, Tasmania
- Cosmopolitan species, found throughout tropical and subtropical regions of oceans world wide
- One of two species of *Acartia* that primarily inhabit oceanic waters

Ecology

- Generally found in oceanic waters between 40° N and 40° S except in areas in the extreme north and south Pacific, where warm equatorial waters extend beyond this range
- Most abundant off New South Wales coast from March to June
- Present December to June in Tasmania, most abundant from February to May
- *A. danae* is considered an indicator species for changing or moving water currents
- Related to warmer, less saline water in Mediterranean and Bay of Bengal
- Unusual amongst calanoids as it functions both as a suspension feeder and a raptorial carnivore

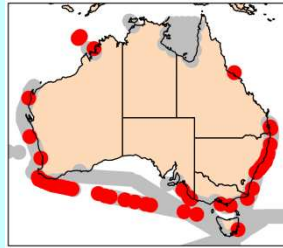
Source

Bradford-Grieve (1999)
 Dakin and Colefax (1940)
 Fernandez de Puelles et al (2009)
 Rakesh et al (2006)
 Razouls et al (2010)
 Taw (1978)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Acartia (Acartia) negligens

Dana, 1849



Phylum Arthropoda
Order Calanoida
Family Acartiidae

Synonym

Acartia negligens Dana, 1849

Size

Female: 1.04 – 1.27 mm

Genus notes

- Slender cigar-shaped body
- Single prominent naupliar eye
- The A1 setae are long. In males the A1 is geniculate on the right side only
- The cephalosome and pedigerous somite 1 are separate, pedigerous somites 4 and 5 fused
- Maxilla form are typically 'basket' like
- Female P5 uniramous, reduced, symmetrical, comprising basis bearing an inner spine and an outer seta
- Male P5 uniramous, asymmetrical, larger on right, exopod segment 2 with large inner lobe, segment 3 in form of clasper
- Female urosome 3 segmented, male 5 segmented
- Caudal rami short, often slightly asymmetrical, separated from anal somite, 6 setae
- Robust fan-shaped caudal rami setae

Subgenus notes

- Rostral filaments present
- Male P5 larger on right; exopod segment 2 with large inner lobe, segment 3 in form of clasper

Female

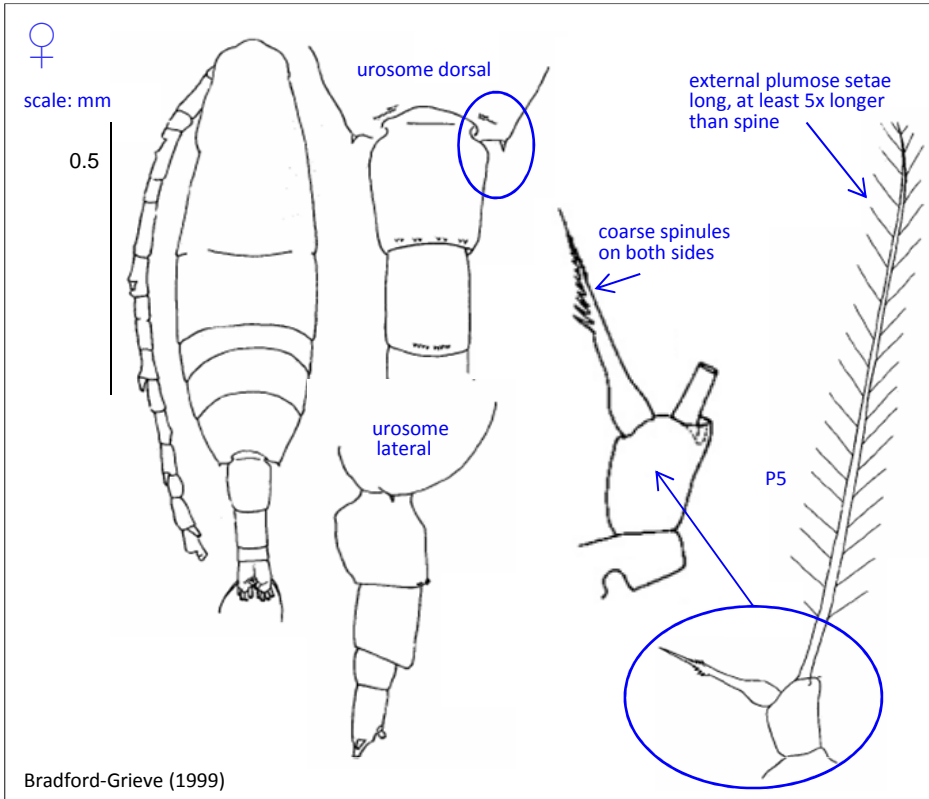
- A1 reaches to caudal rami, segment 1 with a small, slender spine
- Posterior corner of prosome with one or many very small spines and a range of dorsal fine hairs
- The first two segments of urosome with dorsal spinule on posterior border
- Outer distal plumose seta on P5, 5 times longer than terminal spine-like segment that has coarse spinules for short distance at about mid length
- Basis of P5 longer than wide, inner spine dentate

Distribution

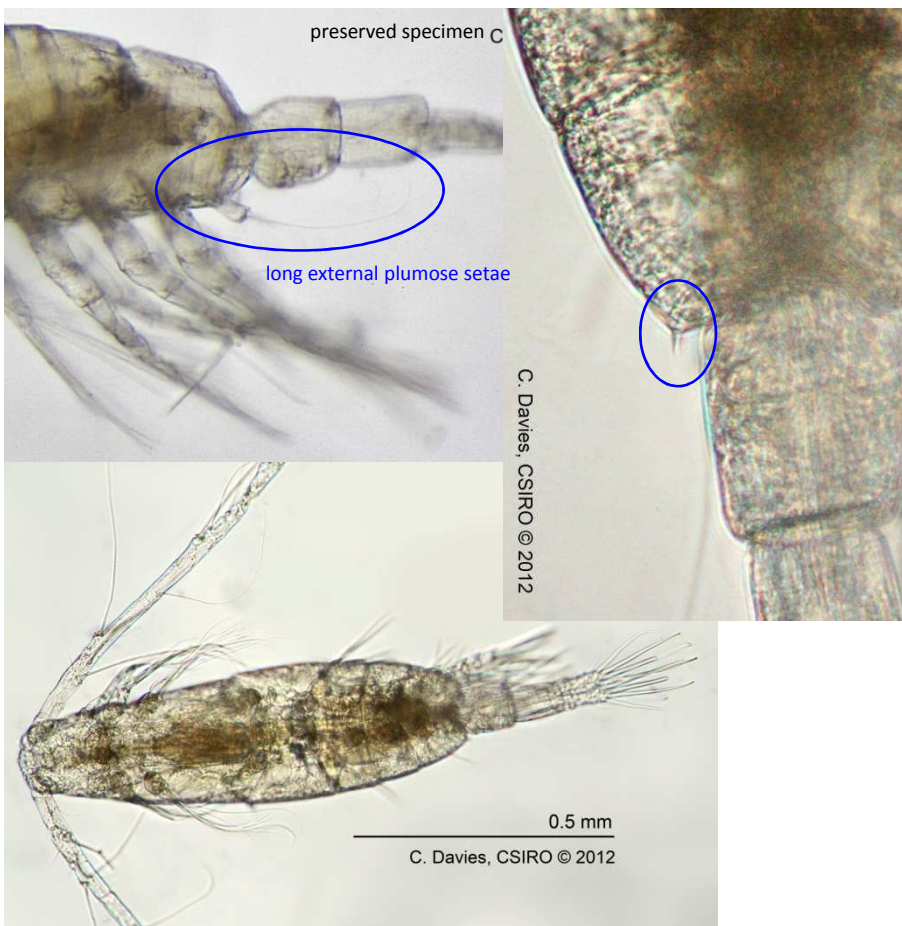
- One of two species of *Acartia* to primarily inhabit open ocean waters
- Epipelagic, mesopelagic
- Cosmopolitan
- Restricted to between latitudes 40°S and 40°N

Ecology

- Eggs released into water
- Omnivorous
- Indicator species of Kuroshio Current in winter when NE monsoon prevails



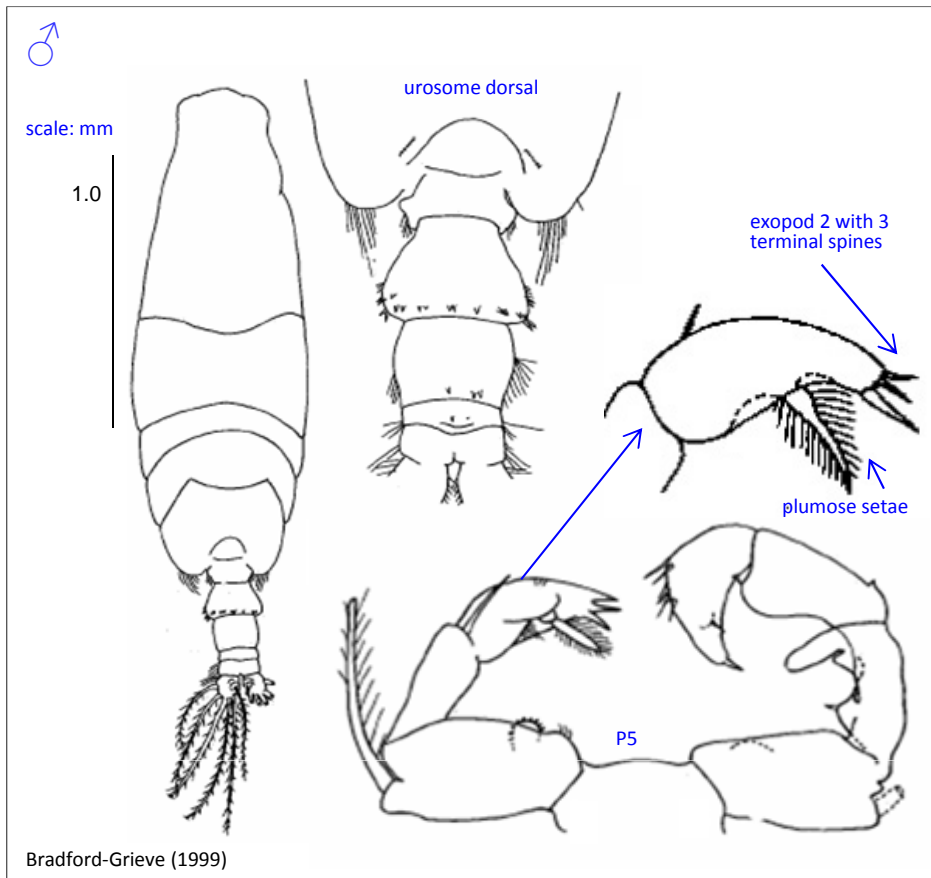
Bradford-Grieve (1999)



Acartia (Acartia) negligens

Dana, 1849

Phylum Arthropoda
Order Calanoida
Family Acartiidae



Size

Male: 0.8-1.02 mm

Male

- A1 shorter than body
- Posterior prosome rounded with setae
- The first 2 urosomal somites hairy laterally; somites 2, 3, 4 and anal somite all with tiny spinules
- Right P5 basipod 2 with rounded projection on internal border
- Left P5 exopod 2 with 3 terminal spines and a plumose spine at mid length

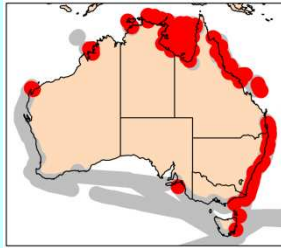
Source

Bradford-Grieve (1999)
 Greenwood (1978)
 Hsiao et al. (2011)
 Mauchline (1998)
 Razouls et al. (2010)

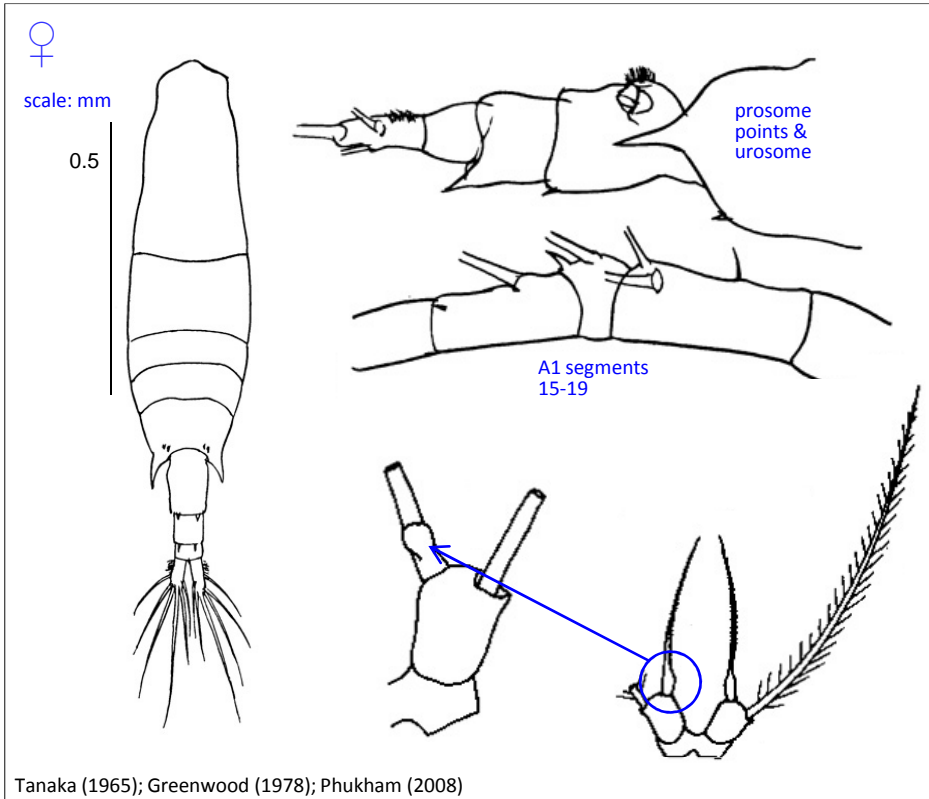
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Acartia (Odontacartia) pacifica

Steuer, 1915



Phylum Arthropoda
Order Calanoida
Family Acartiidae



Synonyms
None

Size
Female: 1.15 – 1.20 mm

Genus notes

- Slender cigar-shaped body
- Single prominent naupliar eye
- The A1 setae are long. In males the A1 is geniculate on the right side only
- The cephalosome and pedigerous somite 1 are separate, pedigerous somites 4 and 5 fused
- Maxilla form are typically 'basket' like
- Female P5 uniramous, reduced, symmetrical, comprising basis bearing an inner spine and an outer seta
- Male P5 uniramous, asymmetrical, larger on right, exopod segment 2 with large inner lobe, segment 3 in form of clasper
- Female urosome 3 segmented, male 5 segmented
- Caudal rami short, often slightly asymmetrical, separated from anal somite, 6 setae
- Robust fan-shaped caudal rami setae

Subgenus notes

- Rostral filaments present
- Posterior prosome drawn out into lateral spines, also spines on posterior borders of urosome somites, especially in male

Female

- Large spines on end of prosome, 2 smaller spines dorsally
- P5 basis short, terminal spine with proximal knob and distal half bordered with hairs
- Posterior border of genital somite with 2 small spines, urosome somite 2 with a pair of larger spines
- Caudal rami with patches of hairs anterior to lateral setae

Distribution

- Epipelagic coastal and brackish waters
- Pacific and Indian Oceans, not Atlantic

Ecology

- Resting eggs in sediments can be viable for up to 20 years
- Exposure to heavy metals and pesticides in sediments can reduce recruitment from sediments to plankton
- Can migrate horizontally to avoid UV-B harm

Tanaka (1965); Greenwood (1978); Phukham (2008)



C. Davies CSIRO © 2012

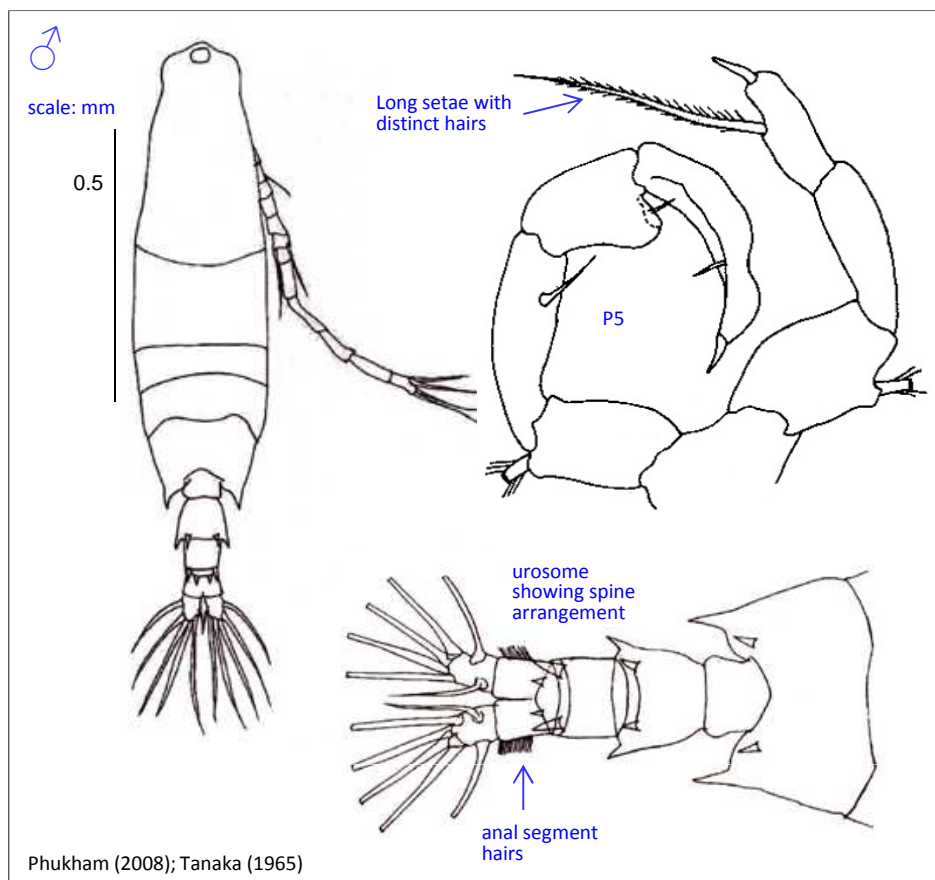


C. Davies @ CSIRO (2012)

Acartia (Odontacartia) pacifica

Steuer, 1915

Phylum Arthropoda
Order Calanoida
Family Acartiidae



Size

Male: 1.12 mm

Male

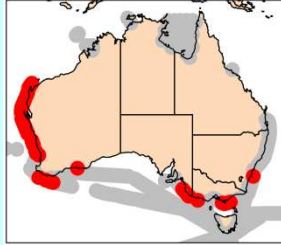
- Spines on end of prosome
- Inner edge setae of P5 left exopod long and with distinct hairs
- Urosome somite 1 naked
- Urosome somite 2 with a pair of spines
- Urosome somite 3 with a pair of spines
- Urosome somite 4 with a pair of smaller spines more towards midline
- Anal segment with large hairs
- Caudal rami with outer and inner edged hairs

Source

Bradford-Grieve (1999)
 Greenwood (1978)
 Jiang et al. (2004)
 Jiang et al. (2007)
 Phukham (2008)
 Razouls et al. (2010)
 Tanaka (1965)
 (Full reference available at
<http://www.imas.utas.edu.au/zooplankton/references>)

Acartia (Acanthacartia) tonsa

Dana, 1849



Phylum Arthropoda
Order Calanoida
Family Acartiidae

Synonyms

Acartia tonsa Dana 1849

Size

Female: 0.90-1.50 mm

Genus notes

- Slender, cigar-shaped body
- Single prominent naupliar eye
- A1 setae long and spaced out. In males A1 is usually geniculate on right side only
- Head and pedigerous somite 1 separate, pedigerous somite 4 and 5 always fused
- Female P5 uniramous, small, symmetrical, 3-segmented. Male P5 uniramous, asymmetrical
- Female urosome 3-segmented, male 5-segmented
- Caudal rami often slightly asymmetrical
- Robust fan-shaped caudal rami setae
- Maxilla form typically 'basket'-like

Subgenus notes

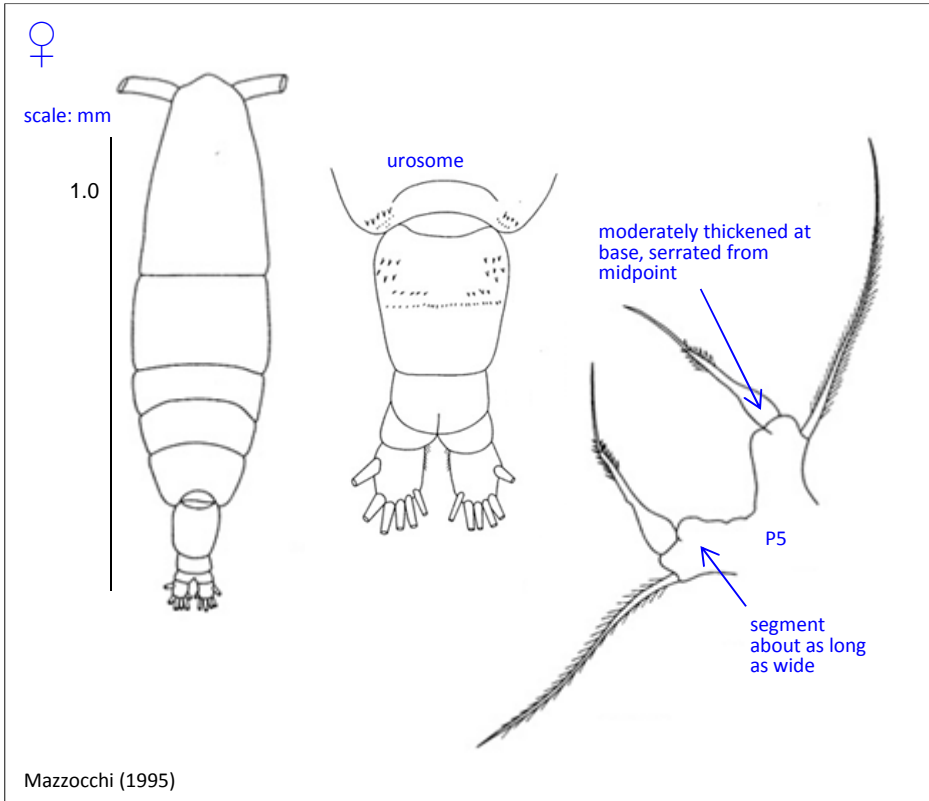
- Rostral filaments usually present
- Posterior prosome borders rounded
- Female P5 smooth terminal spine bearing some distal hairs on both sides, evenly bulbous base
- Male P5 left terminal exopod segment has one or more accessory spines arising from its base

Female

- A1 without spines
- Last pedigerous somite has a few hairs on the posterior margin
- P5 segment 1 only about as long as wide
- P5 inner spine, about as long as the outside setae, moderately thickened at its base, straight, last half of setae serrated

Distribution

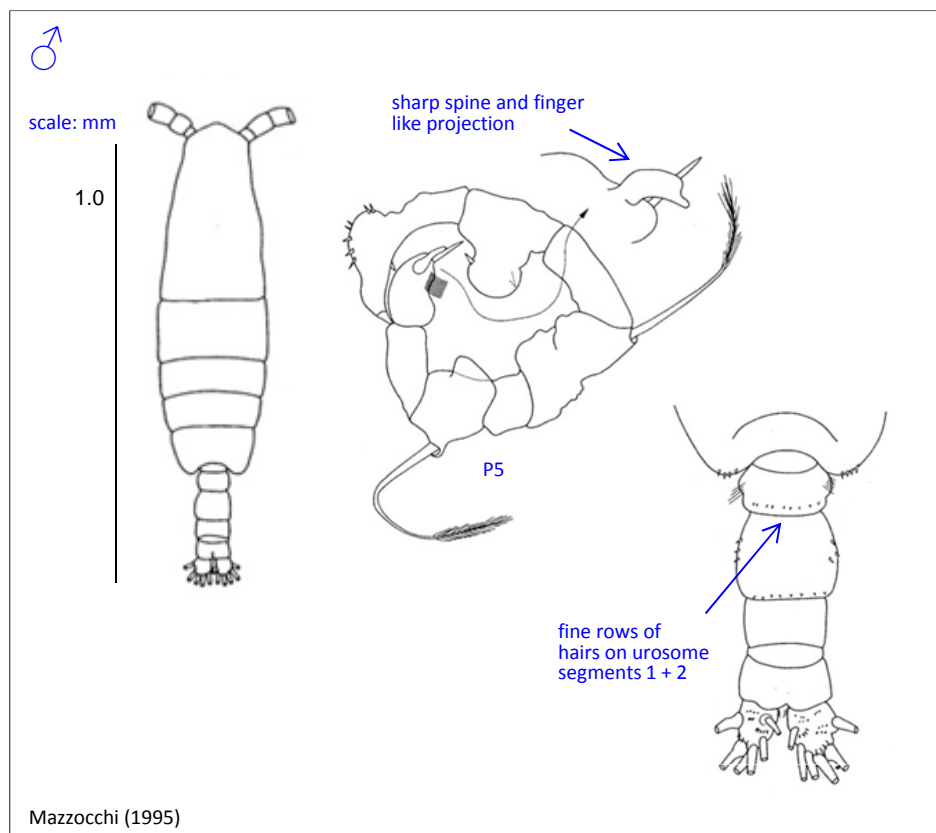
Ecology



Acartia (Acanthacartia) tonsa

Dana, 1849

Phylum Arthropoda
Order Calanoida
Family Acartiidae



Size

Male: 1.00-1.10 mm

Male

- Urosome somites 1 and 2 with rows of fine hairs
- Right P5 segment 1 narrow, without spines on inner margin
- Left P5 last segment with sharp spine and finger-like projection

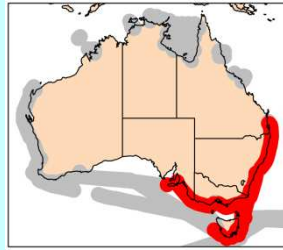
Source

Boltovskoy (1999)
Mazzocchi (1995)
Steuer (1915)

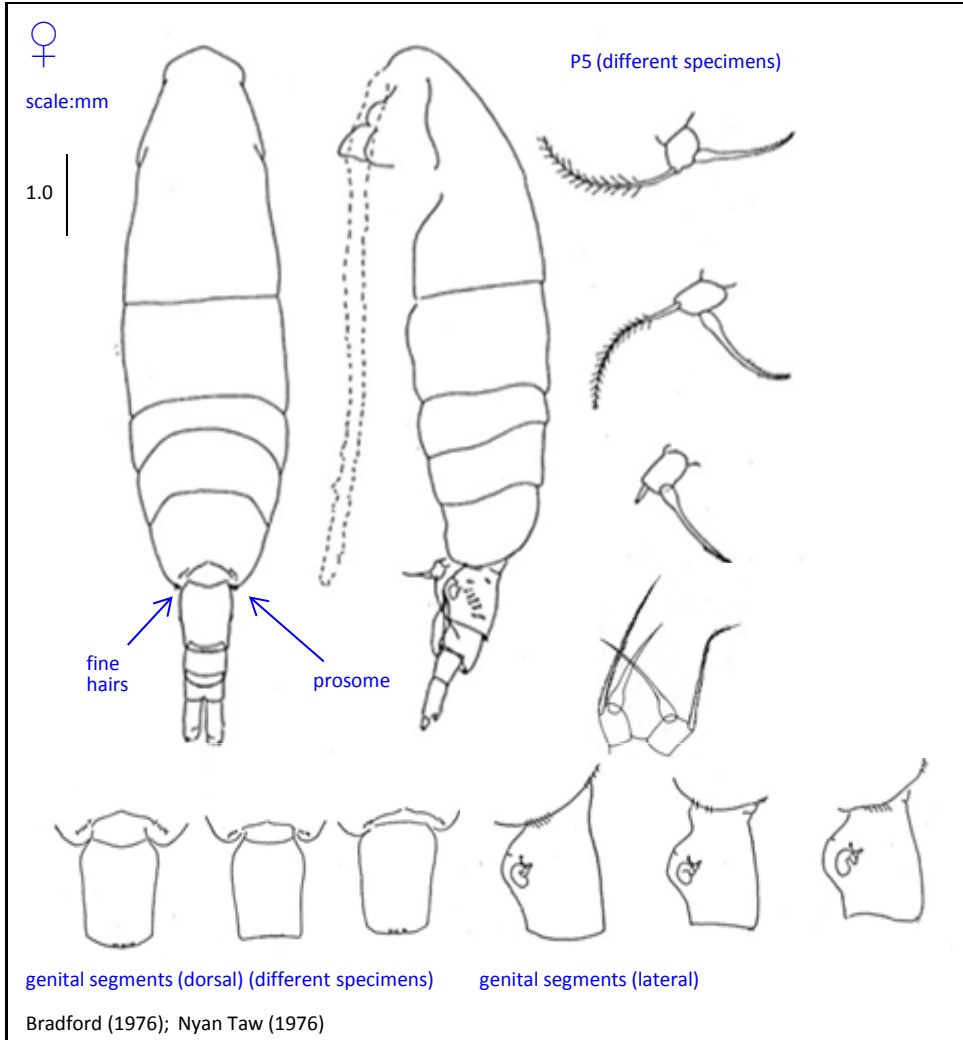
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Acartia (Acartiura) tranteri

Bradford, 1976



Phylum Arthropoda
Order Calanoida
Family Acartiidae



Synonyms

Acartia tranteri Bradford, 1976

Size

Female: 0.97-1.11 mm

Genus notes

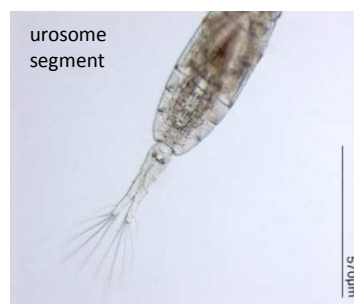
- Slender cigar-shaped body
- Single prominent naupliar eye
- The A1 setae are long. In males the A1 is geniculate on the right side only
- The cephalosome and pedigerous somite 1 are separate, pedigerous somites 4 and 5 fused
- Maxilla form are typically 'basket' like
- Female P5 uniramous, reduced, symmetrical, comprising basis bearing an inner spine and an outer seta
- Male P5 uniramous, asymmetrical, larger on right, exopod segment 2 with large inner lobe, segment 3 in form of clasper
- Female urosome 3 segmented, male 5 segmented
- Caudal rami short, often slightly asymmetrical, separated from anal somite, 6 setae
- Robust fan-shaped caudal rami setae

Subgenus notes

- Rostrum and rostral filaments absent
- Last prosome somite rounded but may bear spines
- Female P5 smooth terminal spine bearing some distal hairs on both sides, evenly bulbous base
- Caudal rami slightly asymmetrical, right side longer

Female

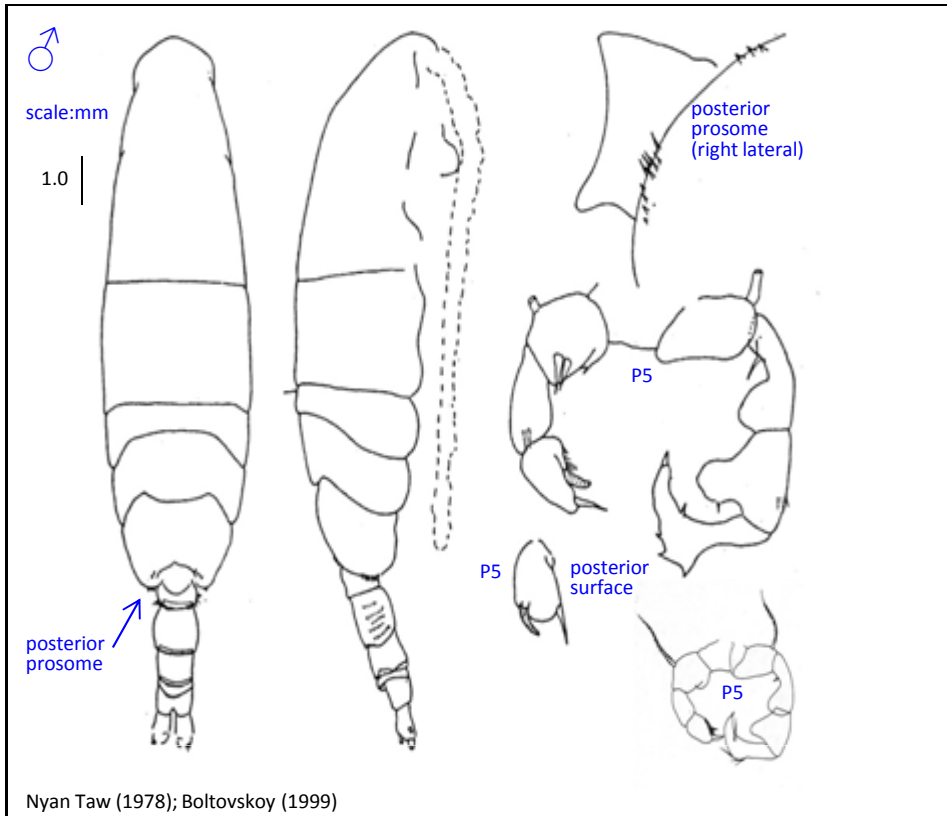
- Posterior prosome with 4-7 spines & with fine hairs on ventro-posterior margin
- Lateral faces of genital complex with rows of denticles, always extending on to posterior half of somite
- Length from anteroventral border of genital complex to apex of genital swelling about 0.28 length of genital complex
- Row of spinules usually on dorsoposterior margin of genital complex & 2nd urosome somite
- Mean length width ratio of caudal ramus 2.72



Acartia (Acartiura) tranteri

Bradford, 1976

Phylum Arthropoda
Order Calanoida
Family Arcartiidae



Size

Male: 0.90-1.00 mm

Male

- Posterior prosome with 3-6 dorsolateral spines
- P5 small, uniramous and asymmetric
- P5 left basis with 3 large spines and 1-2 small proximal spines, exopod segment 1 with anterior surface spinules, exopod segment 2-3 with anterior spine shorter than posterior spine, distal border of segment slightly convex
- P5 right exopod segment 2 with outer edge spines, inner lobe long, proximal part of tip slightly tapering, produced more than distal part
- Urosome somites 2- 4 with row of dorsoposterior denticles
- Mean length width ratio of caudal rami 1.66

Distribution

- Epipelagic
- Estuarine, inshore coastal, coastal and oceanic
- Australian distribution includes Moreton Bay, Western Port Bay, Swan River estuary, Melbourne, Port Hacking, Sydney and Tasmania
- World distribution includes Australia, Tasman Sea, New Zealand and New Caledonia

Ecology

- Very common in estuaries and nearshore plankton communities
- Strong tolerance for fluctuations in salinity and temperature
- Often dominates samples from regions with high particulate load
- Filter-feeders of phytoplankton and small zooplankton
- Known predator of *Paracalanus indicus* and *Gladioferens inermis* in Western Port Bay
- Reproduces year-round, with overlapping generations if sufficient food available
- Development is nearly constant throughout life
- Turnover rates from 3 – 30 days

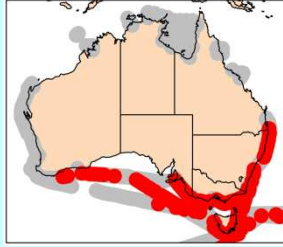
Source

Bradford-Grieve (1999)
 Conway (2003)
 Kimmerer & McKinnon (1985)
 Landry (1983)
 Miller (1977)
 McKinnon et al (1992)
 Nyan Taw (1978)
 Razouls et al 2010
 Swadling & Bayly (1997)

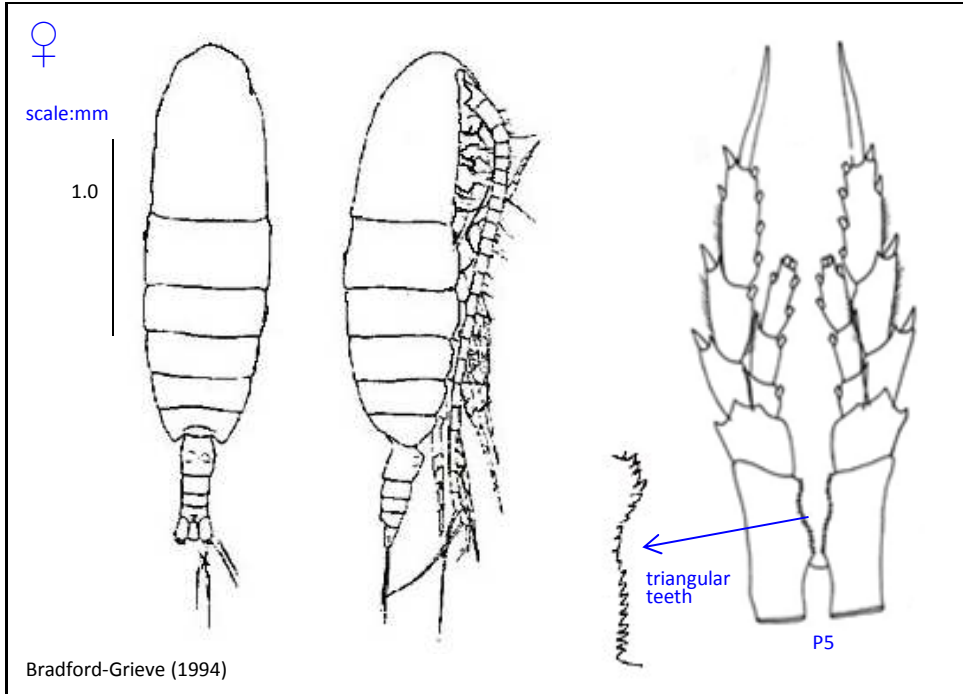
(Full reference available at <http://www.imas.utas.edu.au/zooplankton>)

Calanus australis

Brodsky, 1959



Phylum Arthropoda
Order Calanoida
Family Calanidae



Bradford-Grieve (1994)

Synonyms

Cetochilus australis Vauzeme, 1834

Size

Female: 2.7-3.2 mm

Genus notes

- Cephalosome and pedigerous somite 1 partly fused
- A1 exceeds the body length by a few segments
- Swimming legs without modification or ornamentation
- P5 inner margin of coxa serrated in both sexes
- P5 endopods have 8 setae in both sexes
- Male P5 endopod and exopod are 3 segmented

Female

- A1 just reaches the tip of the caudal rami
- P5 serrations curved, with relatively small number of triangular teeth
- Terminal spine of P5 right exopod segment 3 is shorter than the segment
- Similar to *Calanus agulhensis*
- Differs from *Nannocalanus minor* in that *N. minor* is smaller, has a more indented prosome over urosome somite 1 and has a 5-segmented prosome

Distribution

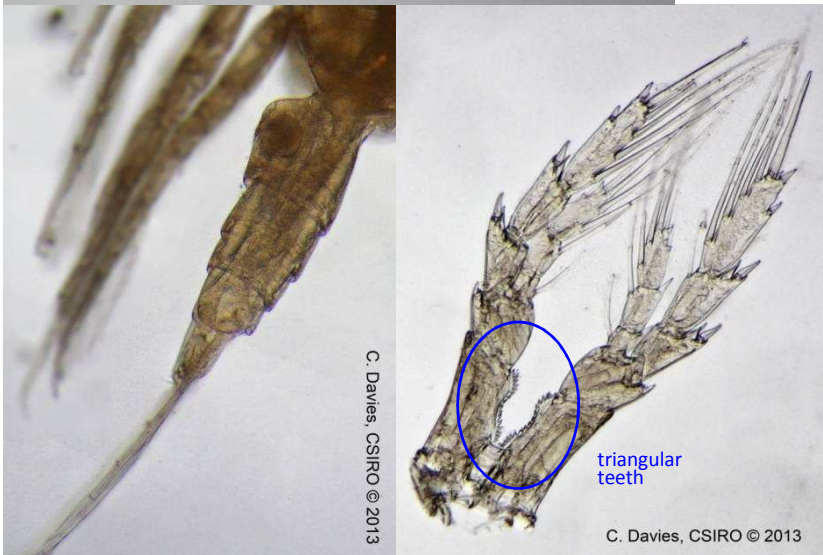
- Epipelagic
- Inshore, coastal and oceanic waters of southeastern Australia and New Zealand

Ecology

- Often dominates copepod biomass in nearshore, temperate waters
- Maximum abundance occurs in summer, with copepodite stage 5 outnumbering adults
- Undergoes diel vertical migration
- Prefers seasonally stratified coastal waters
- Abundance declines as stratification weakens
- Summer breeding coincides with phytoplankton blooms
- Copepodite stage 5 often carries large lipid stores



C. Davies, CSIRO © 2013



C. Davies, CSIRO © 2013

C. Davies, CSIRO © 2013

Calanus australis

Brodsky, 1959

Phylum Arthropoda
Order Calanoida
Family Calanidae

Size

Male: 2.5-3.3 mm

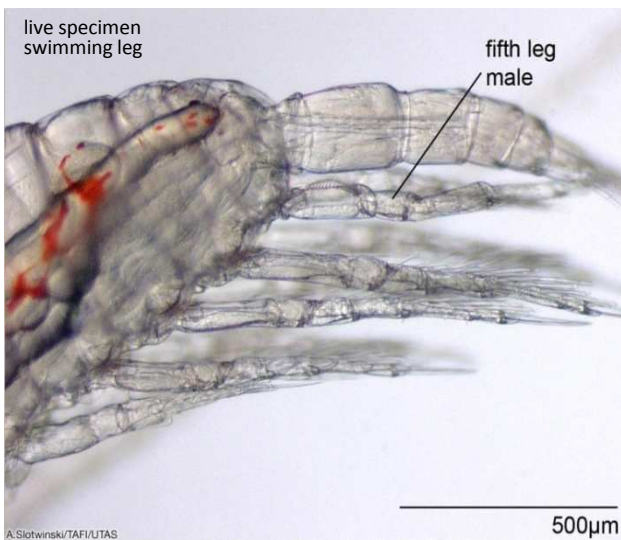
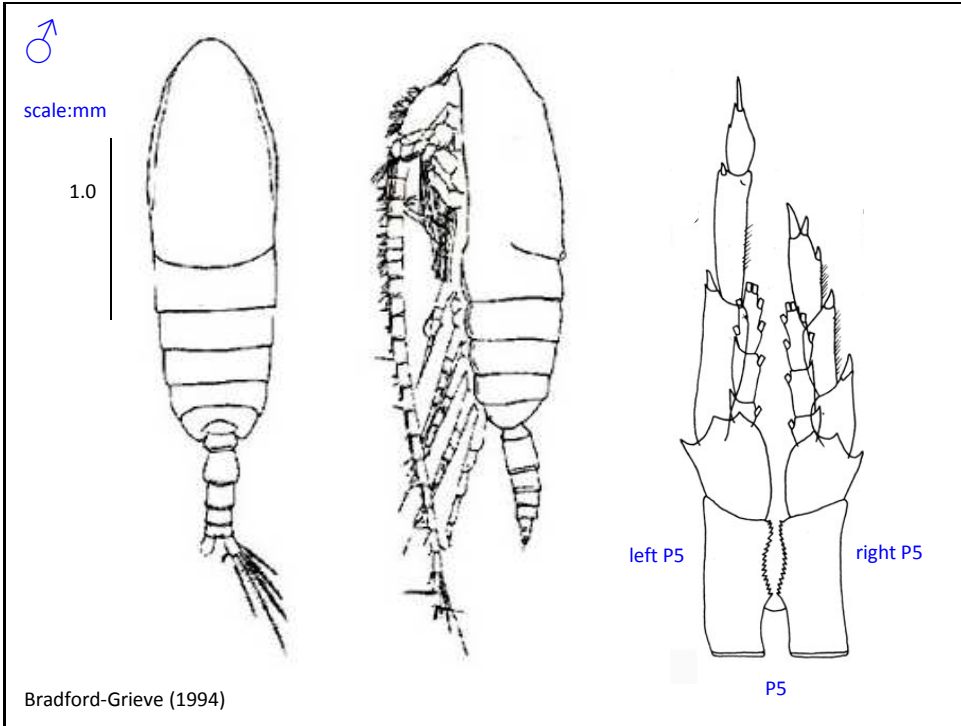
Male

- P5's are of unequal length, right P5 about 1.5 times shorter than left P5
- Right P5 exopod extends more than half way along left exopod segment 2
- Left P5 endopod extends only slightly beyond segment 1 of the left P5 exopod

Source

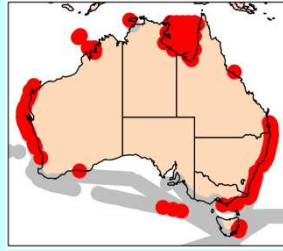
Bradford-Grieve (1994)
 Taw & Ritz (1979)
 Sabatini et al. (2000)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Canthocalanus pauper

(Giesbrecht, 1888)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Calanus pauper Giesbrecht, 1888

Size

Female: 1.30-1.60 mm

Genus Notes

- Cephalosome and 1st pedigerous somite fused
- P1 coxa anterior margin terminates in well defined projection; basis with a proximally thickened spine
- P2-4 no ornamentation
- No serrations on inner margin of coxa P5
- Female P5 endopod with 7 setae
- Male P5 both rami 3-segmented, right hardly modified, left endopod with only 2 terminal setae
- Female urosome 4-segmented; male 5-segmented
- Only one species in this genus

Female

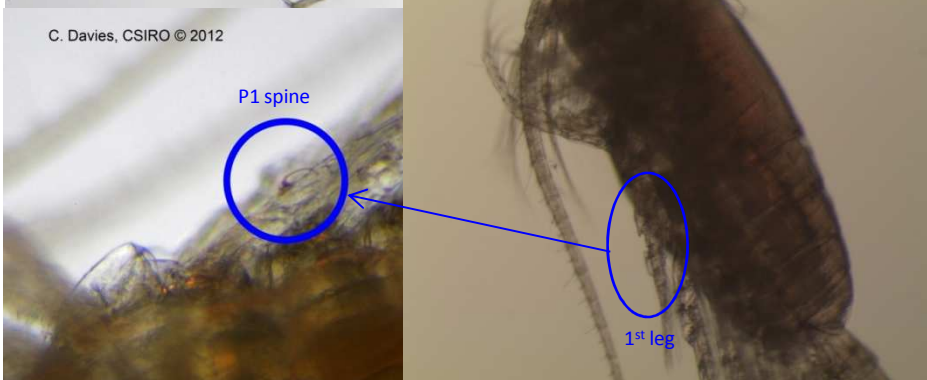
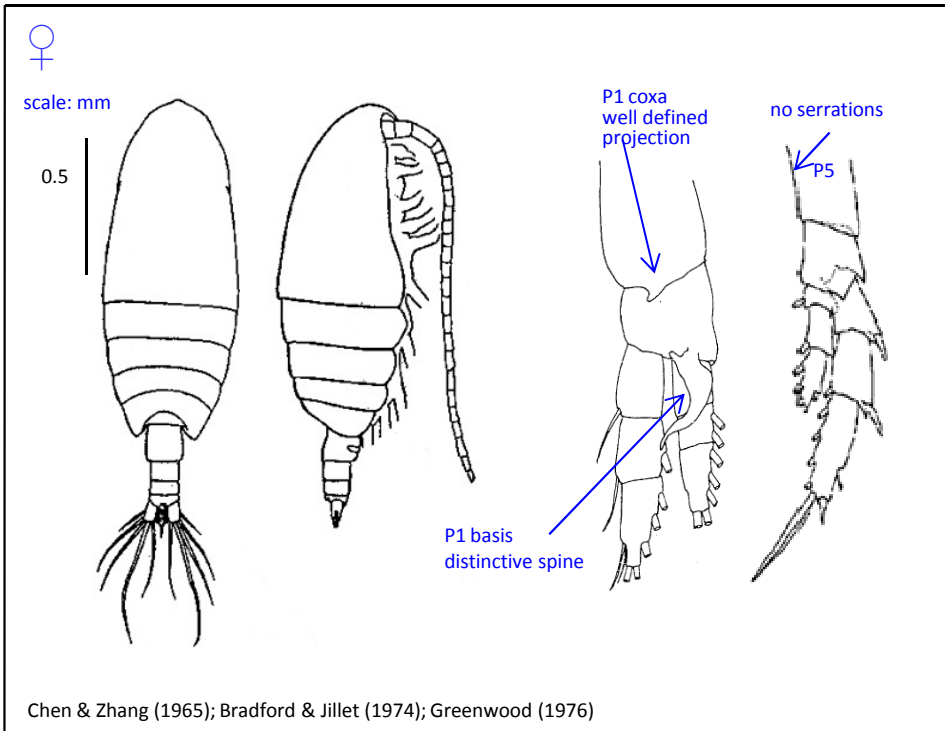
- Similar to *Nannocalanus minor* but urosome not as indented into prosome
- Anterior cephalosome and posterior prosome rounded, last prosome somite may be slightly asymmetrical
- P1 basis has a distinctive weakly prehensile spine on anterior, short extension at its base appears as a notch
- Strong setae on caudal rami

Distribution

- Epipelagic, coastal
- Indian and Pacific, but presence in Atlantic needs confirmation
- Tropical, subtropical
- Common in Kuroshio Current

Ecology

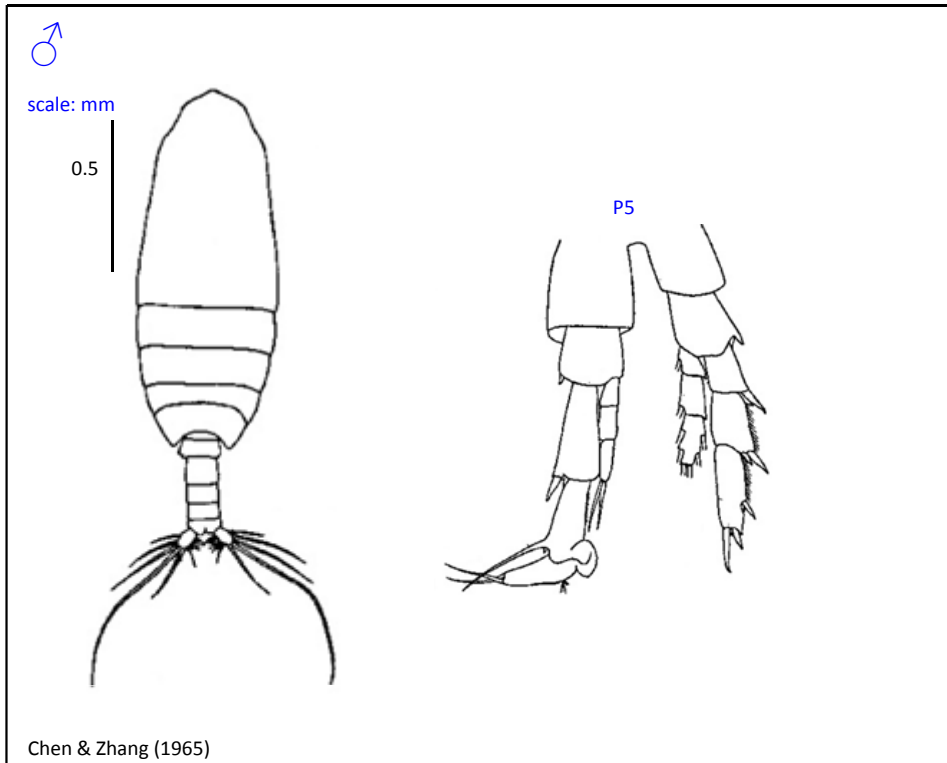
- Prefers salinity < 33
- Undertakes normal diel vertical migration
- Common intermediate host for parasitic isopods



Canthocalanus pauper

(Giesbrecht, 1888)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

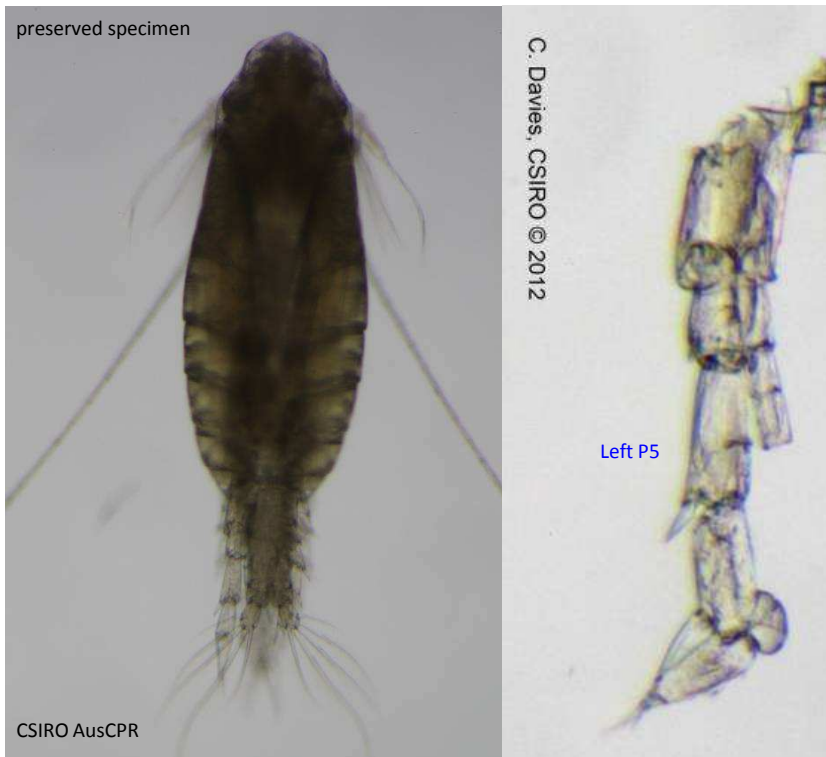
Male: 1.30-1.50 mm

Male

- Right P5 asymmetrical, exopod with no inner marginal spines, left endopod with two terminal setae, left exopodite with elongated segments, with long outer distal setae on segments 2 and 3

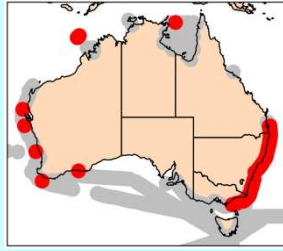
Source

Bradford-Grieve (1994)
Bradford & Jillet (1974)
Chen & Zhang (1965)
Conway (2003)
Greenwood (1976)
Lan et al. (2004)
Lo et al. (2004)
Owens & Rothlisberg (1995)
Razouls et al. (2010)
Xu & Gao (2011)
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Cosmocalanus darwinii

(Lubbock, 1860)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Undina darwinii Lubbock, 1860
Calanus darwinii (Lubbock, 1860)
Cosmocalanus darwini (Lubbock, 1860)

Size

Female: 1.6-2.58 mm

Genus notes

- Only 2 species
- Cephalosome and pedigerous somite 1 fused
- Spines on anterior surface of basis of P1, 3-5 in female and P1, 3-4 in male
- Inner margin of coxa of P5 finely serrated
- Posterior prosome corners drawn into points in female
- Caudal rami setae sometimes branch

Female

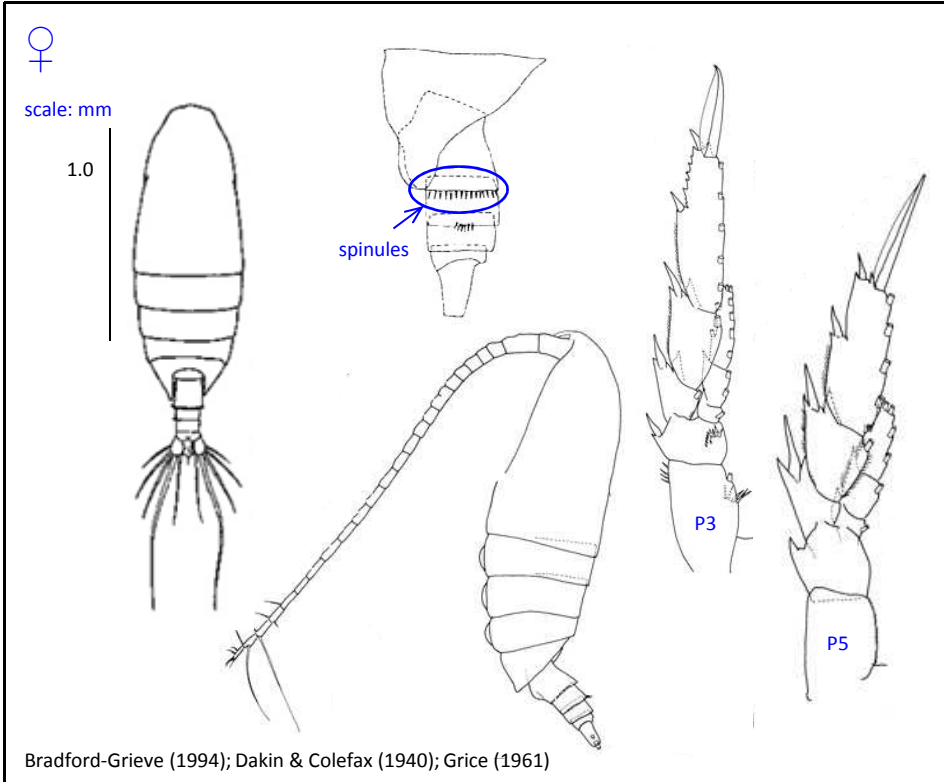
- A1 reaches almost to the end of urosome
- Spinules on posterior margin of genital and 2nd urosome somite
- Genital somite bulges quite strongly and comes to blunt point towards the anterior somite

Distribution

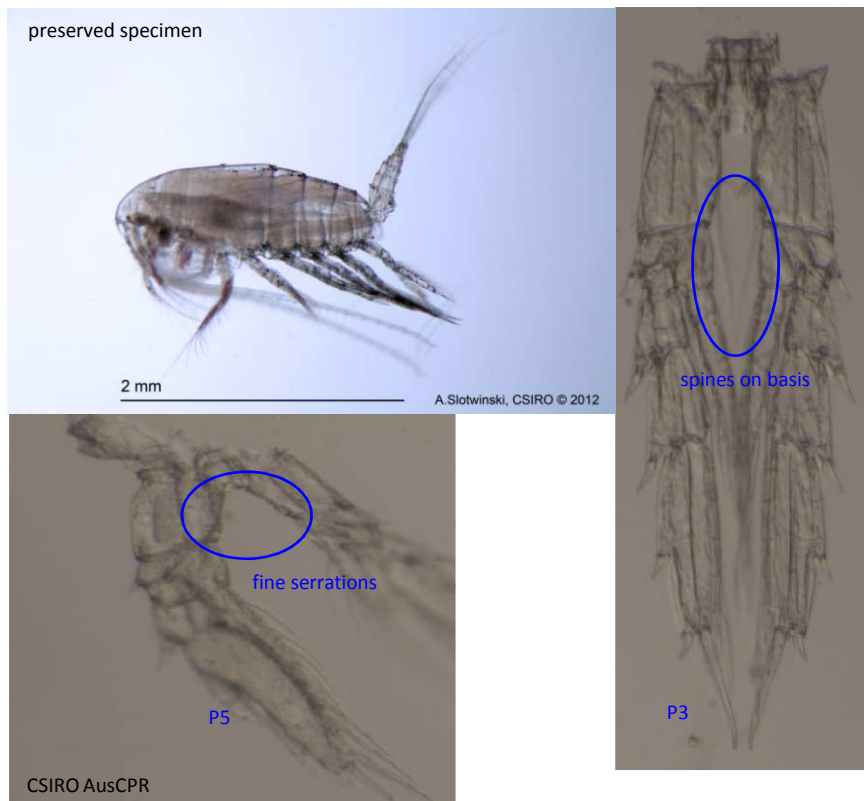
- Epipelagic
- Pacific, Indian and Atlantic
- Subtropical and tropical

Ecology

- Eggs released into water column
- Fine particle feeders, probably omnivorous
- Usually restricted to surface layers
- Females often found with 2 or more spermatophores



Bradford-Grieve (1994); Dakin & Colefax (1940); Grice (1961)



CSIRO AusCPR

Cosmocalanus darwinii

(Lubbock, 1860)

Phylum	Arthropoda
Order	Calanoida
Family	Calanidae

Size

Male: 1.6-2.35 mm

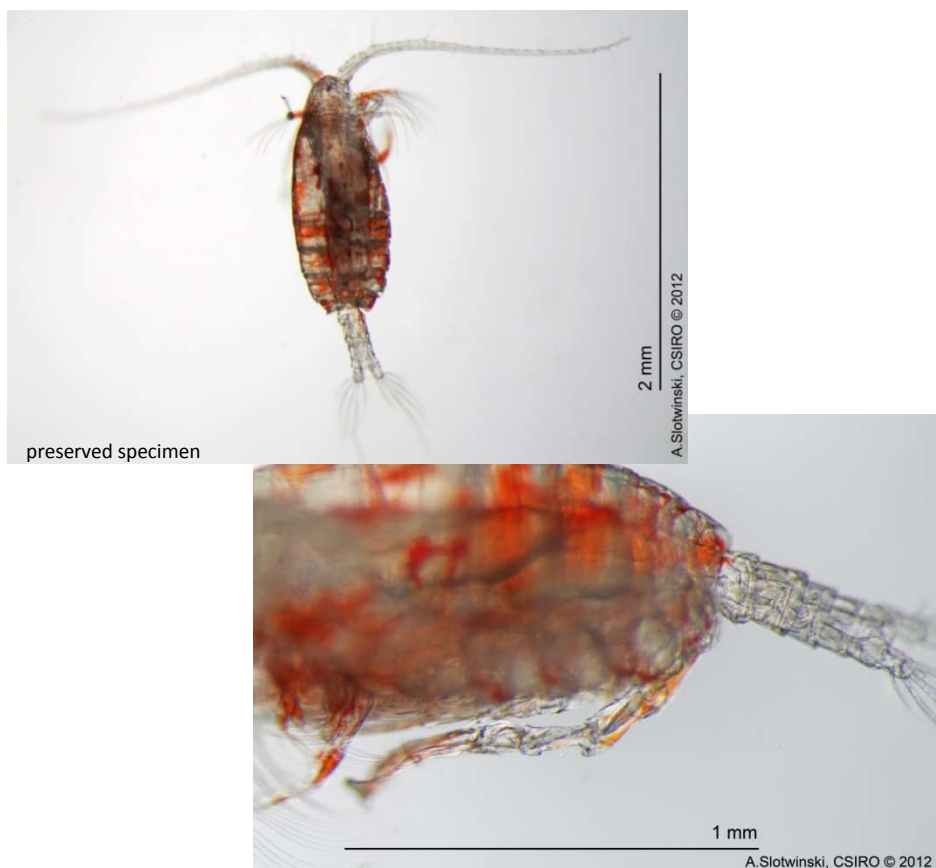
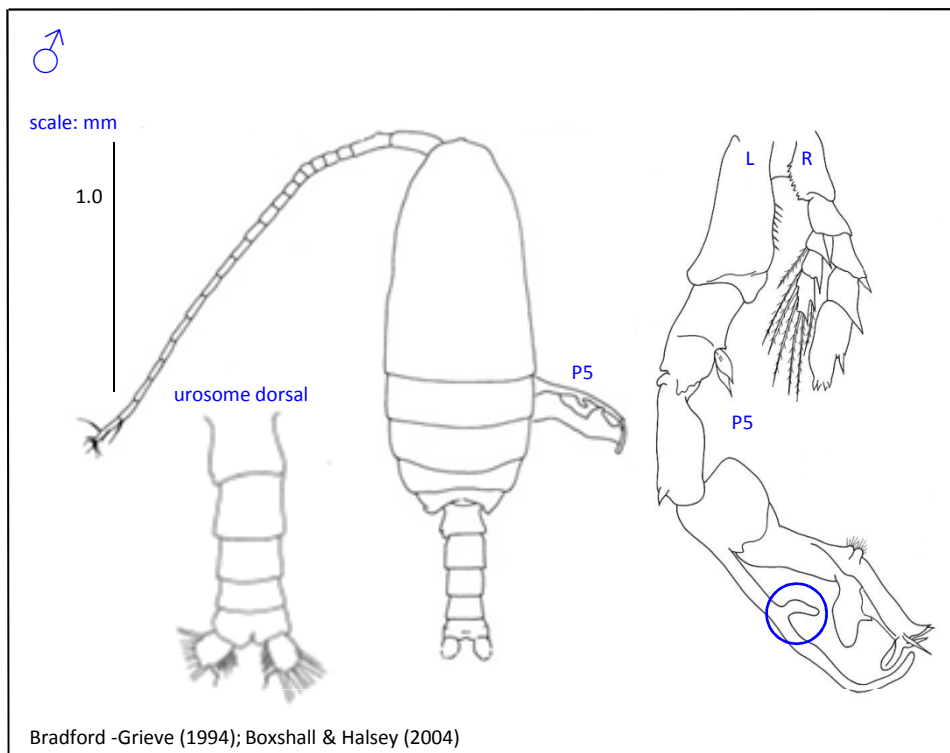
Male

- P5 extremely large and very asymmetrical, left exopod highly modified, right leg not modified
- Tooth on inner edge of external spine of left P5 is placed about 1/3 of length from the from base of the spine

Source

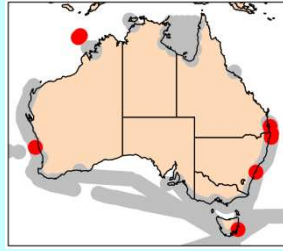
Boxshall & Halsey (2004)
 Bradford-Grieve (1994)
 Chiba (1953)
 Conway (2003)
 Dakin & Colefax (1940)
 Grice (1961)
 Razouls et al. (2012)

Full reference available at
<http://www.imas.utas.edu.au/zooplankton/reference>



Mesocalanus tenuicornis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Calanus tenuicornis Dana, 1849

Size

Female: 1.80-2.40 mm

Genus notes

- Cephalosome and pedigerous somite 1 separate
- A1 elongated
- Maxillae with 6 setae on inner lobe 1
- P1-P4 without modification or ornamentation
- Smooth inner margin of P5 coxa in both sexes
- Female P5 endopod with 7 setae
- Male P5 with both rami 3-segmented, endopods with 7 setae

Female

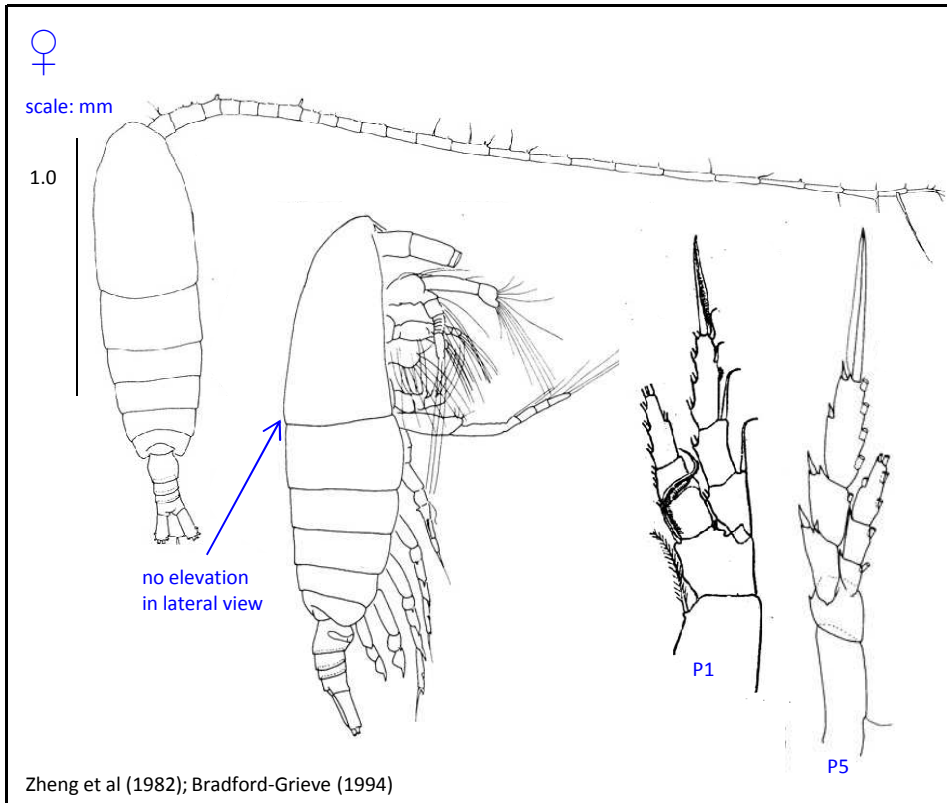
- A1 around twice length of prosome
- Width to length ratio of pedigerous somites is equal or greater than 0.3
- Posterior margin of cephalosome not elevated in lateral view
- Urosome somite 2 about 1.25 x longer than somite 3

Distribution

- Epi-, meso- and bathypelagic
- Cosmopolitan
- Pacific, Indian and Atlantic
- Tropical, subtropical and temperate; possibly into subantarctic

Ecology

- Fine particle feeders, probably omnivorous
- Eggs released into water column
- Up to 3 generations per year
- Has been observed in Alaskan waters, so broad temperature (and possibly salinity) tolerance



Zheng et al (1982); Bradford-Grieve (1994)



preserved specimen

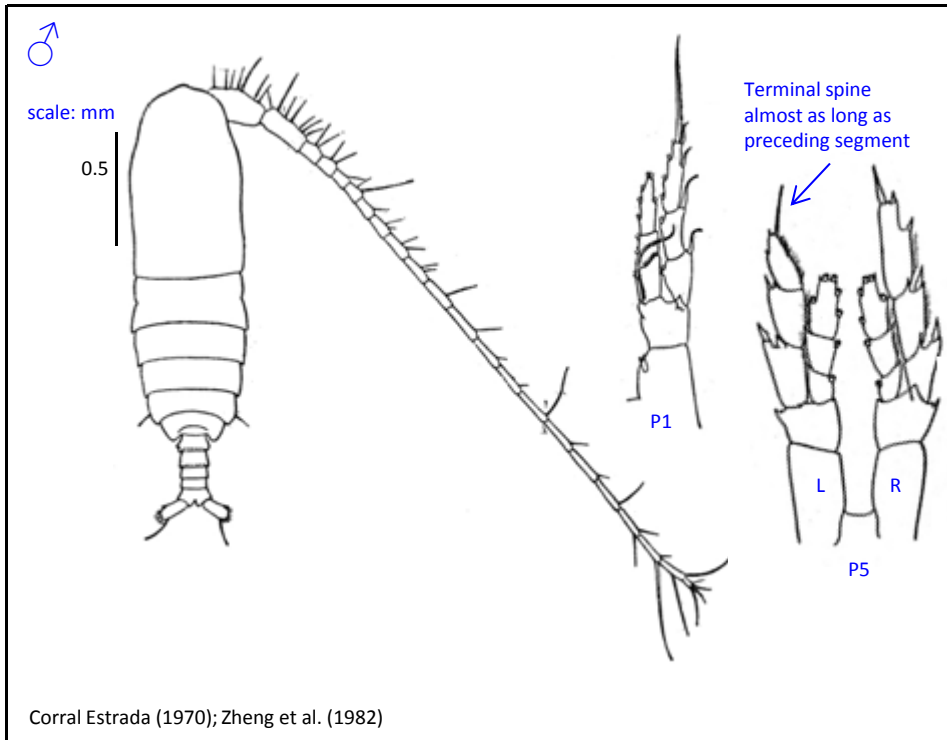
CSIRO AusCPR



Mesocalanus tenuicornis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 1.70-2.20mm

Male

- A1 around twice as long as prosome
- P5 only slightly asymmetric
- Left P5 terminal spine of exopod segment 3 almost as long as it's segment when measured along the outer border

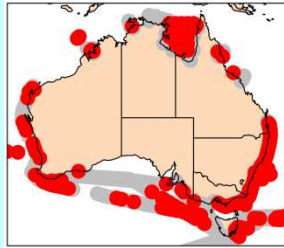
Source

Boxshall & Halsey (2004)
Bradford-Grieve (1994)
Bradford-Grieve & Markhaseva (1999)
Conway (2003)
Cooney & Coyle (1985)
Corral Estrada (1970)
Razouls et al. (2012)
Shmeleva & Kovalev (1974)
Zheng et al. (1982)

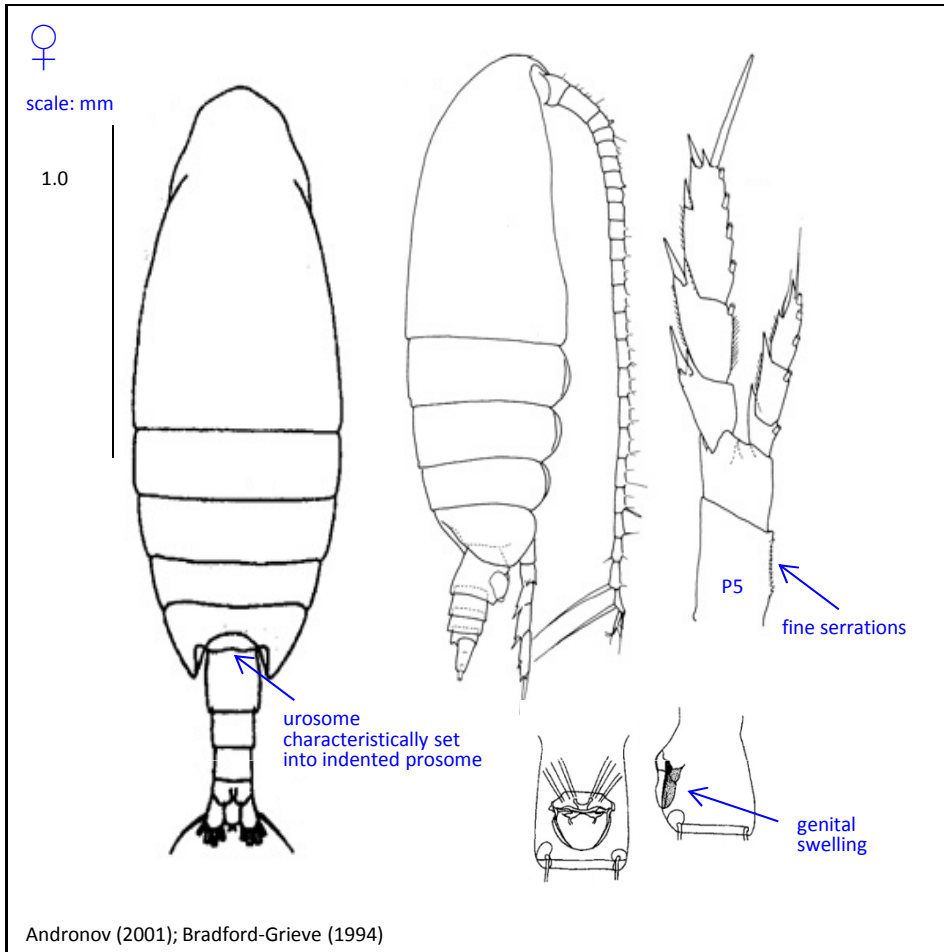
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Nannocalanus minor

(Claus, 1863)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Synonyms

Cetochilus minor Claus, 1863
Calanus minor (Claus, 1863)
Canthocalanus minor (Claus, 1863)
Canthocalanus minor minor (Claus, 1863)
Calanus valgus Brady, 1883
Calanus caroli Giesbrecht, 1888
Cosmocalanus caroli (Giesbrecht, 1888)
Undinula darwinii caroli Giesbrecht, 1888
Canthocalanus minor major Sewell, 1929
Nannocalanus minor major Sewell, 1929

Size

Female: 1.45-2.40 mm

Genus notes

- Cephalosome and pedigerous somite 1 fused
- In fresh specimens edges of prosome somites may be tinged red
- Fine serrations on inner margin of P5 coxa in both sexes
- Male right P5 like other swimming legs, setae on inner border of the exopod
- Male P5 left endopod without setae, left exopod with outer edge spines greatly elongated
- Right and left spermathecae fused on female

Female

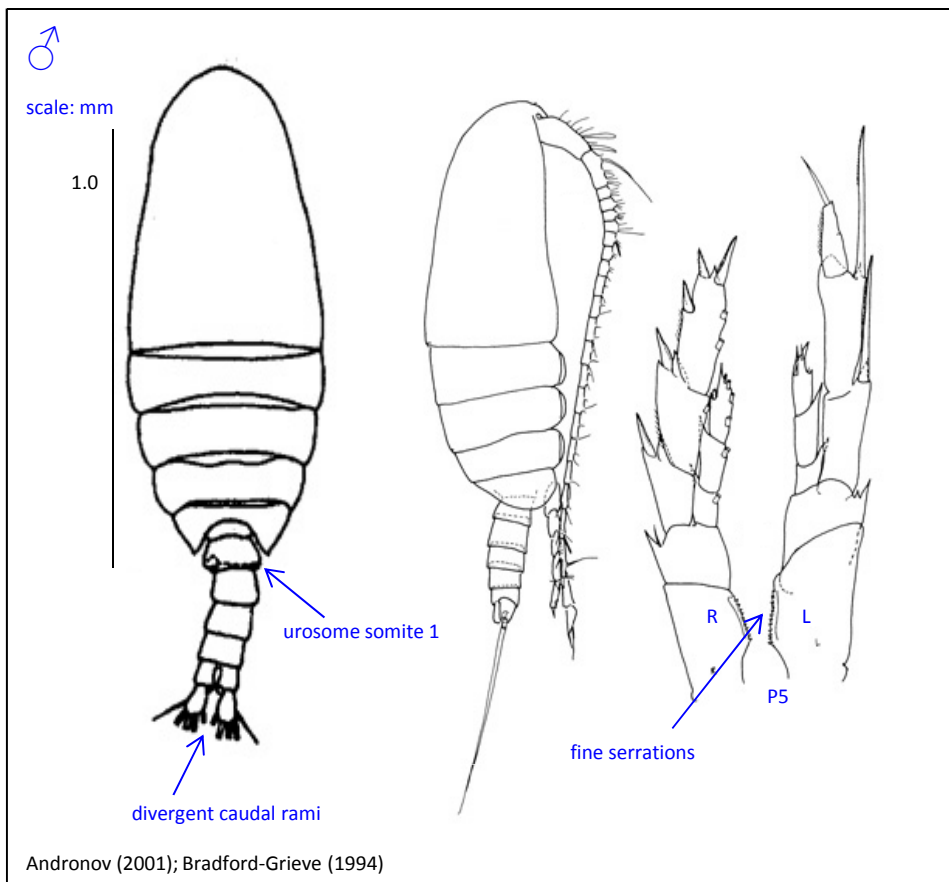
- A1 does not reach to end of urosome
- Rounded last prosome somite extending $\frac{1}{2}$ way down genital somite leaving short, stubby urosome characteristically inset into prosome
- Obvious genital swelling bulging when viewed from side, with small projection low on surface
- May be confused with *Calanus australis*. *C. australis* differs as it is bigger, has 5 prosome somites, and the prosome indent is not obvious
- May be confused with *Canthocalanus pauper*. *C. pauper* has no serrations on inner margin of P5 coxa



Nannocalanus minor

(Claus, 1863)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size
 Male: 1.17-2.01 mm

Male

- A1 reaches just past urosome
- P5 slightly asymmetric
- Asymmetrical urosome somite 1
- Caudal rami divergent in dorsal view

Distribution

- Epipelagic – mesopelagic
- Widespread oceanic
- Subtropical and tropical oceans
- Temperate coastal regions

Ecology

- Omnivorous, feeding on fine particles
- Capable of responding very quickly when productivity in coastal waters increases, and moves inshore and undergoes rapid population expansion
- Continuous reproduction, can produce 2 – 5 generations year⁻¹

Source

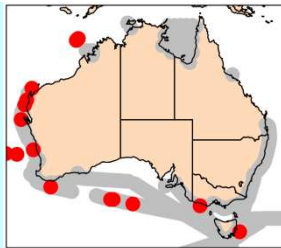
- Andronov (2001)
 Bradford-Grieve & Markhaseva (1999)
 Boxshall and Halsey (2004)
 Bradford-Grieve (1994)
 Conway *et al.* (2003)
 Mauchline (1998)
 Taw (1978)

(Full reference available at <http://www.imos.utas.edu.au/zooplankton/references>)

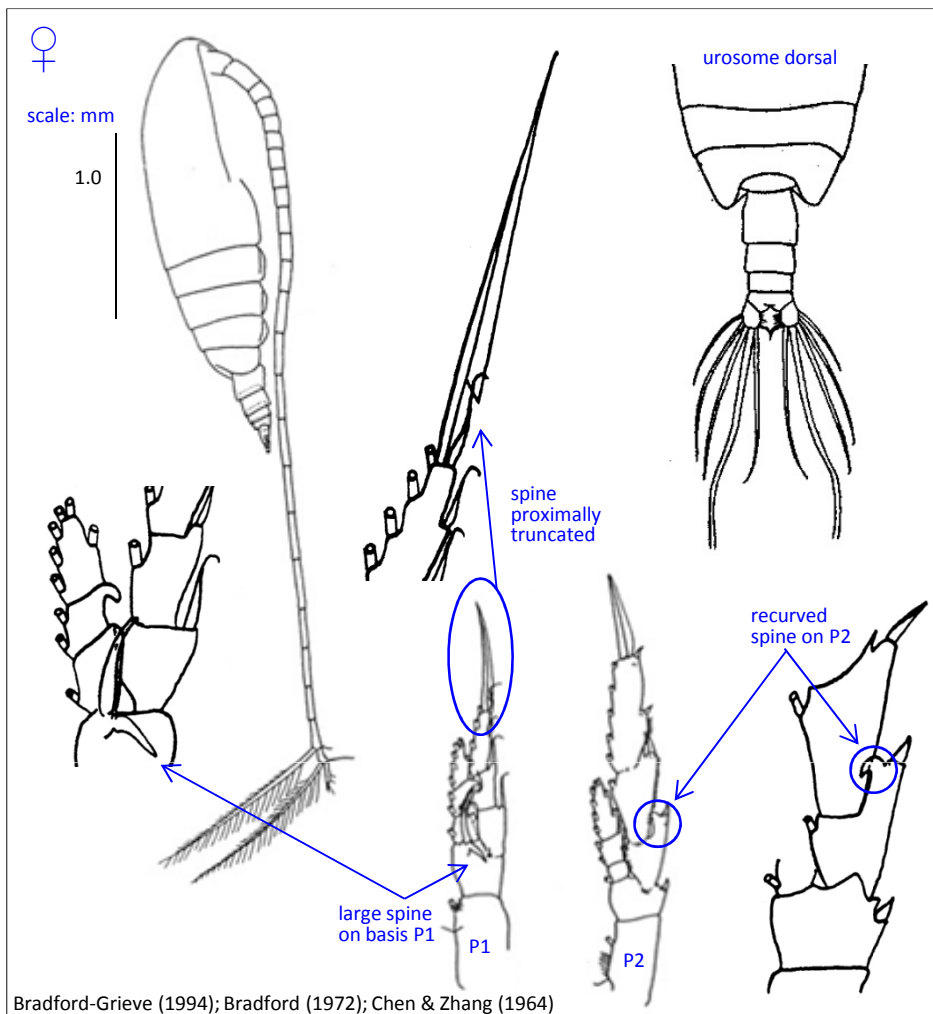


Neocalanus gracilis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Synonyms

Calanus gracilis Dana, 1849

Size

Female: 2.4-4.0 mm

Genus notes

- Cephalosome and pedigerous somite 1 usually fused in female, separate in male
- P2 in both sexes with a recurved spine at the outer distal border of exopodite segment 1
- Coxa of P5 inner border without serrations in both sexes
- Male leg 5 with both exopodite and endopodite 3-segmented; left leg modified, endopodite usually with 8 setae; right leg unmodified or with inner edge setae of exopodite absent

Female

- Cephalosome and pedigerous somite 1 fused
- Basis of P1 with large spine at base of inner setae
- P1 terminal exopod setae with a proximally truncate external blade

Distribution

- Epi-, meso- and bathypelagic
- Cosmopolitan in temperate, subtropical and tropical water

Ecology

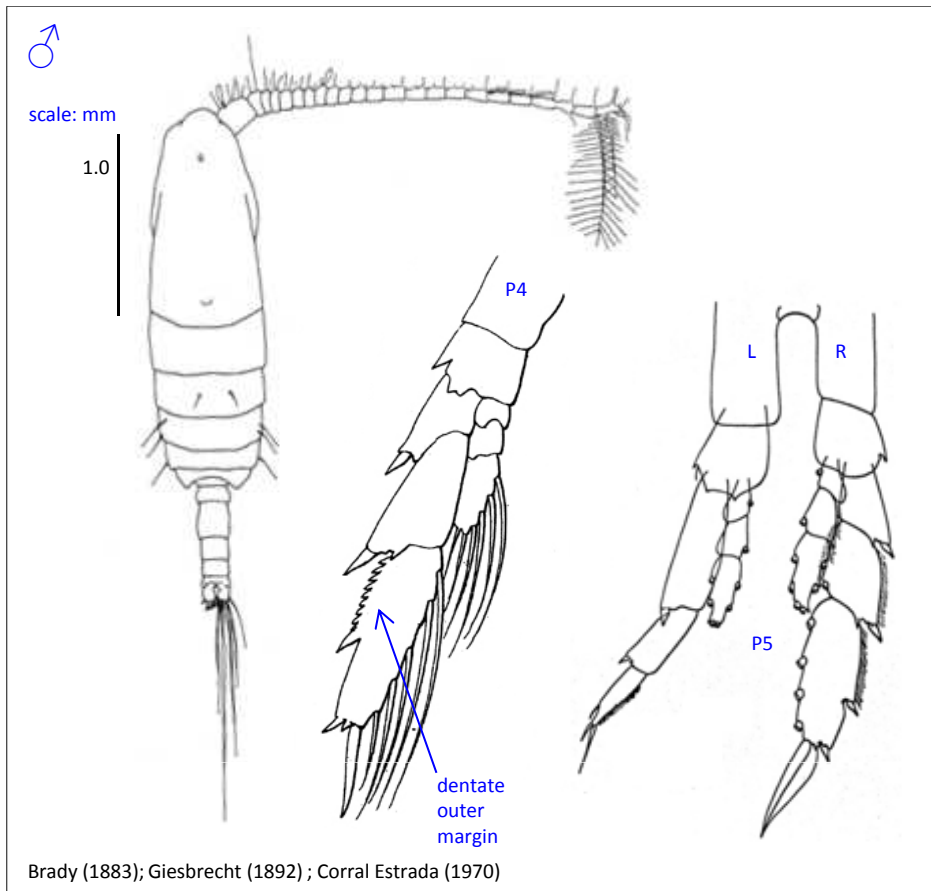
- Fine particle feeders, probably omnivorous
- Reproduction might occur at mesopelagic depths
- Multiple generations per year

Bradford-Grieve (1994); Bradford (1972); Chen & Zhang (1964)

Neocalanus gracilis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 2.3 – 3.1 mm

Male

- Cephalosome and pedigerous somite 1 fused
- P2-4 distal exopod segments with dentate outer margins
- P5 right distal exopod segment with setae on the inner border

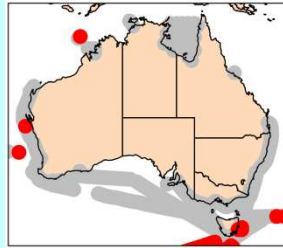
Source

Boxshall & Halsey (2004)
Bradford (1972)
Bradford-Grieve (1994)
Brady (1883)
Chen & Zhang (1964)
Corral Estrada (1970)
Giesbrecht (1892)
Razouls et al. (2012)
Shmeleva & Kovalev (1974)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Neocalanus tonsus

(Brady, 1883)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Calanus tonsus Brady, 1883

Size

Female: 3.3-4.1 mm

Genus notes

- Cephalosome and pedigerous somite 1 usually fused in female, separate in male
- Swimming leg 2 in both sexes with a recurved spine at the outer distal border or exopodite segment 1
- Coxa of P5 inner border without serrations in both sexes
- Male leg 5 with both exopodite and endopodite 3-segmented; left leg modified, endopodite usually with 8 setae; right leg unmodified or with inner edge setae of exopodite absent

Female

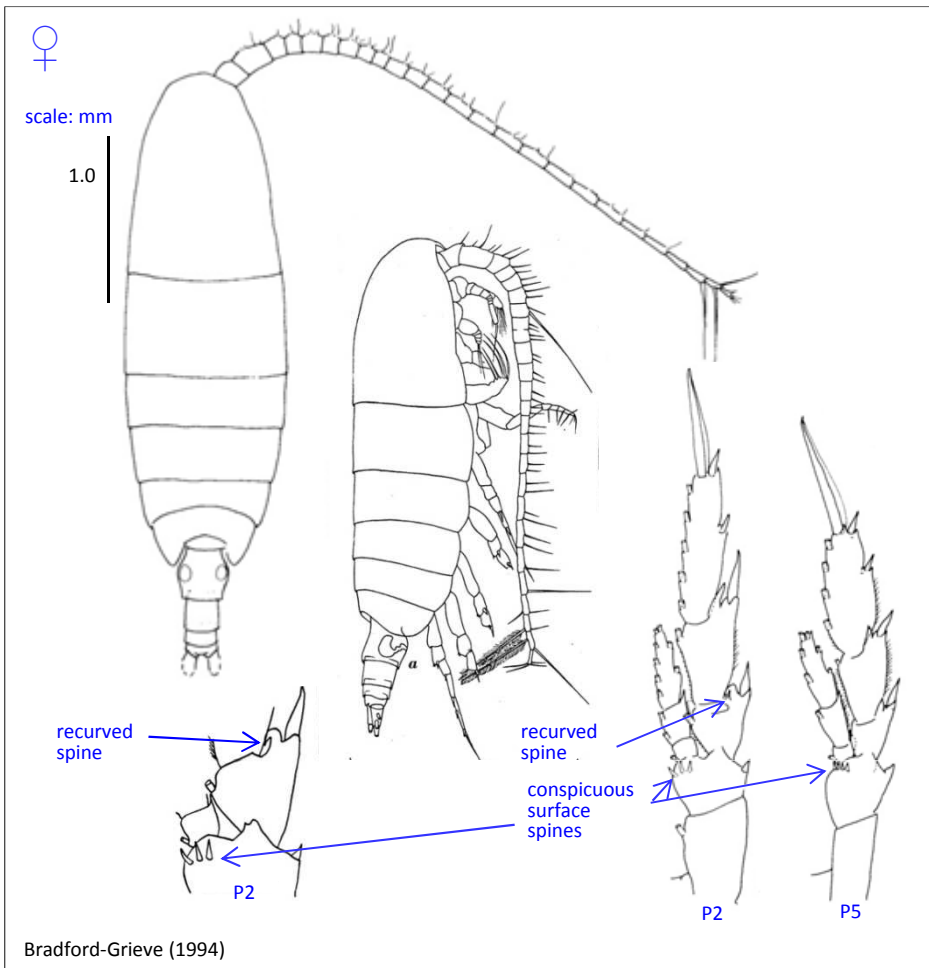
- Cephalosome and pedigerous somite 1 separate but not as distinctly as joints between other pedigerous somites
- Basis of P1 without large spine at base of inner setae
- Basis of P2 to P5 with conspicuous posterior surface spines on inner distal border of segment
- Genital segment bulbous at mid length in dorsal view

Distribution

- Subantarctic and Antarctic (but not coastal Antarctic)
- Indian, Pacific and Atlantic
- Occasionally take north of Sub Tropical Convergence in deep water

Ecology

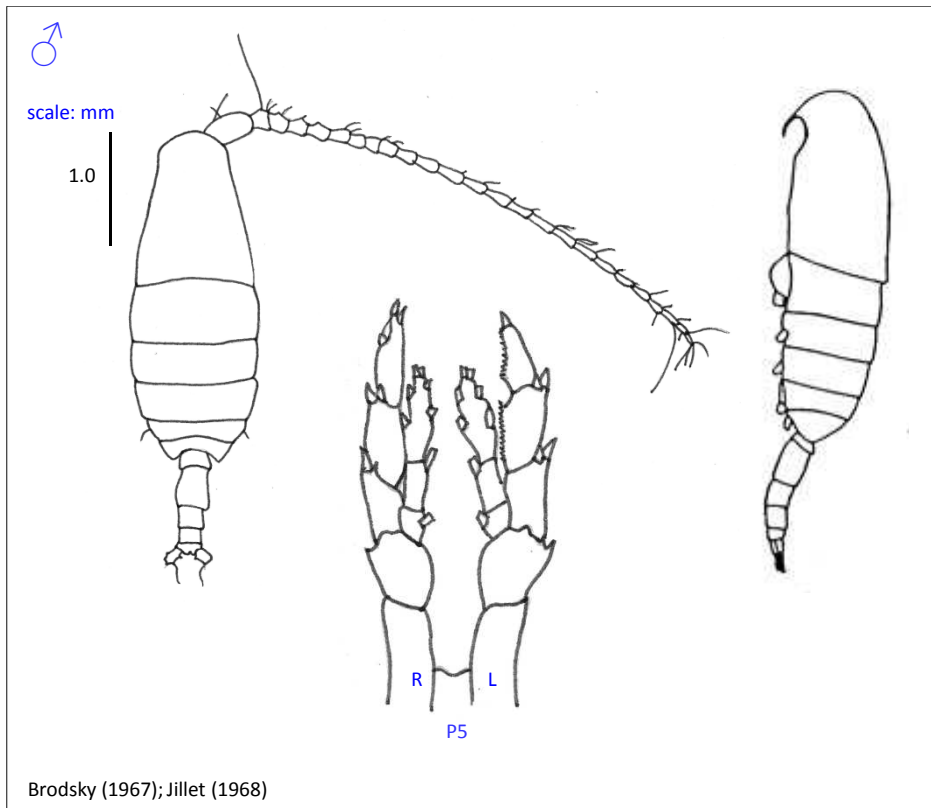
- Reproduction might occur at mesopelagic depths
- Fine particle feeder, probably omnivorous
- Ingests up to 3.8% of body carbon and 5.7% of nitrogen per day
- Can form surface aggregations up to several 100 metres in length
- Undertakes ontogenetic vertical migrations
- Eggs released into water column; produces up to 450 eggs per female
- Two egg production strategies: Mesopelagic-dwelling females use stored lipids for egg production in winter, and epipelagic dwelling females rely on ambient food supply for egg production in spring



Neocalanus tonsus

(Brady, 1883)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 3.3 – 4.4 mm

Male

- Cephalosome and pedigerous somite 1 separate
- 5th leg only slightly asymmetrical, exopods without inner edge setae

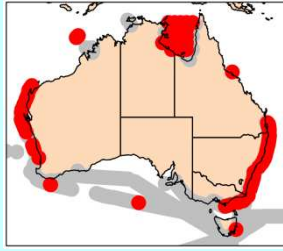
Source

Boxshall & Halsey (2004)
Bradford-Grieve & Markhaseva (1999)
Bradford-Grieve (1994)
Brodsky (1967)
Jillet (1968)
Kawamura (1974)
Ohman (1987)
Razouls et al. (2012)
Taw (1978)

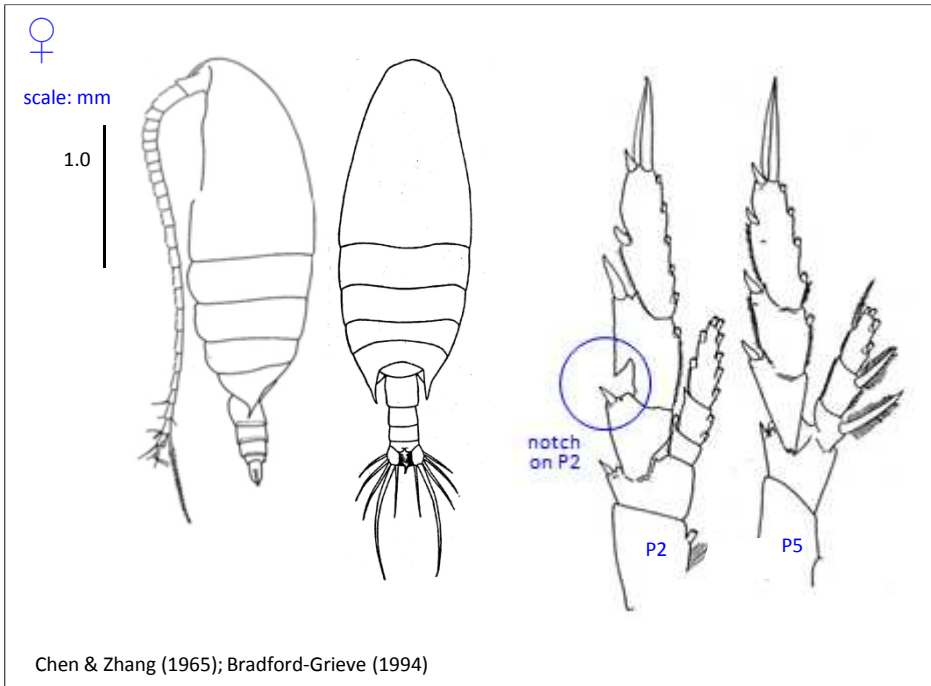
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Undinula vulgaris

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Chen & Zhang (1965); Bradford-Grieve (1994)

Synonyms

- Cleanups orientalis* Marukawa, 1908
- Calanus vulgaris* Dana, 1849
- Undinula vulgaris giesbrechti* Sewell, 1914
- Undinula vulgaris major* Wickstead, 1963
- Undinula vulgaris minor* Wickstead, 1963
- Undinula vulgaris typica* Sewell, 1929
- Undinula vulgaris zeylanica* Sewell, 1914

Size

Female: 2.25 – 3.25 mm

Genus notes

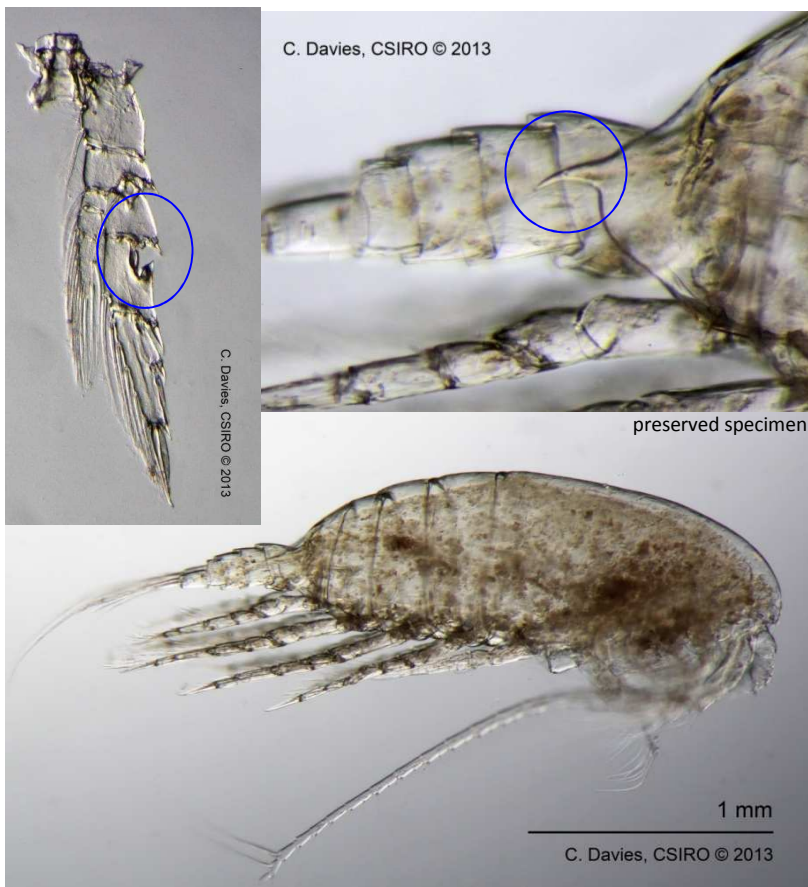
- Cephalosome and pedigerous somite 1 fused
- Posterior corners of pedigerous somite 5 extend into 1 or 2 points in female
- P2 has notch on external margin on 2nd segment of exopodite
- P5 B2 with inner border naked, no serrations
- Male left P5 highly modified; outer edge spines of exopod segments 1-2 very elongate and segment 3 very modified; endopod absent
- Male right P5 both rami 3 segmented, endopod with reduced setation, exopod segment 2 with outer distal border elongate extending as far as first outer spine of segment 3
- Genus is monotypic

Female

- Prosome corners are prolonged into a claw like spine (may have 2 spines on either side of prosome)
- 5 swimming legs, similar size and structure
- A1 reaches to end of urosome

Distribution

Ecology



C. Davies, CSIRO © 2013

preserved specimen

C. Davies, CSIRO © 2013

Undinula vulgaris

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae

Size

Male: 2.04 – 2.5 mm

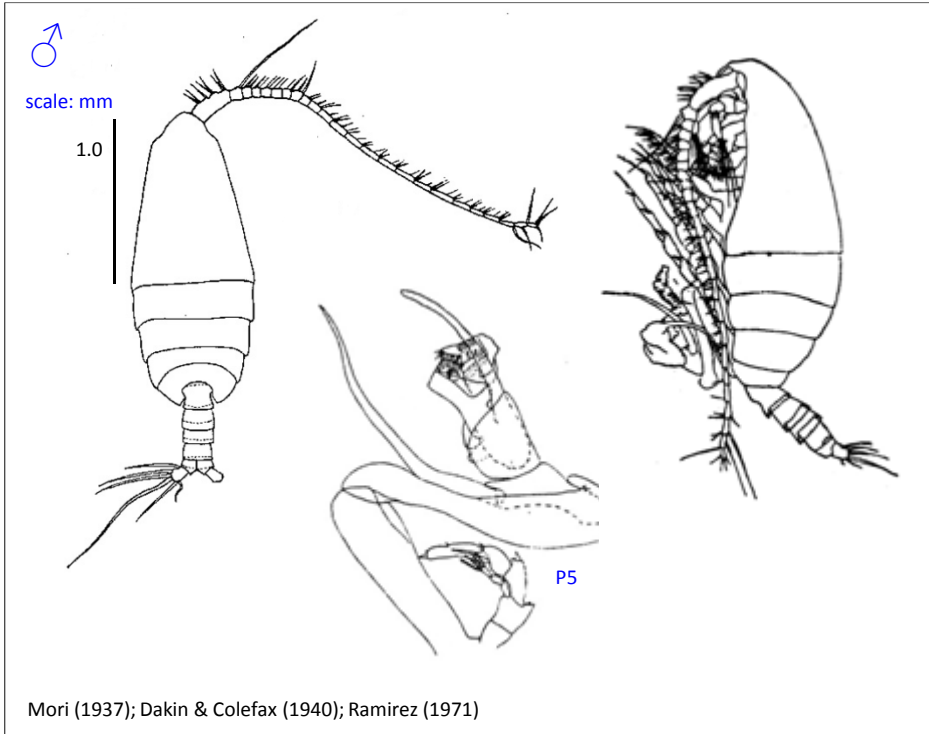
Male

- Large, left P5, extremely modified, very asymmetric, no serrations on internal margin of coxa, no endopodite and large spines on exopod segments 1 & 2 and a 'wrinkled trunk' structure on the end of the limb
- Right P5 tiny and with endopod

Source

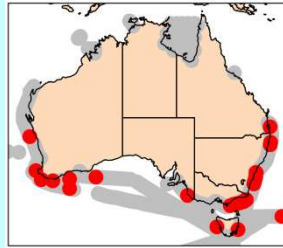
Bradford-Grieve (1994)
Conway (2003)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Candacia bipinnata

(Giesbrecht, 1889)



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

Candace bipinnata Giesbrecht, 1889

Size

Female: 2.35 - 2.50 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- Posterior prosome corners extended into symmetrical points
- Genital somite large with triangular lateral extension on each side
- Lamella on ventral surface of urosome somite 2
- P5 asymmetrical and terminated in obtuse point and some miniscule outer edge spines

Distribution

- Epipelagic; mesopelagic
- Mainly open ocean; occasionally coastal
- Widespread in tropical, subtropical and temperate waters
- Pacific and Indian Oceans and Atlantic Oceans

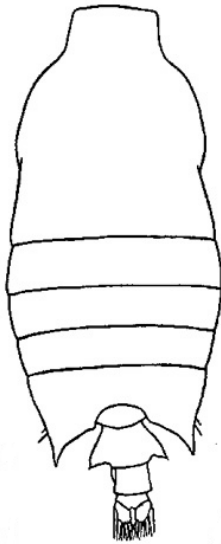
Ecology

- Can live in the neuston
- Maxillae suited to grasping and piercing prey
- Feed selectively on larvaceans and other gelatinous zooplankton



scale: mm

1.0



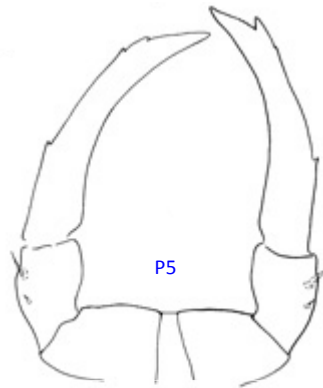
urosome dorsal



P5 & urosome lateral



P5



Bradford-Grieve (1999); Chen & Zhang (1965)

preserved specimen

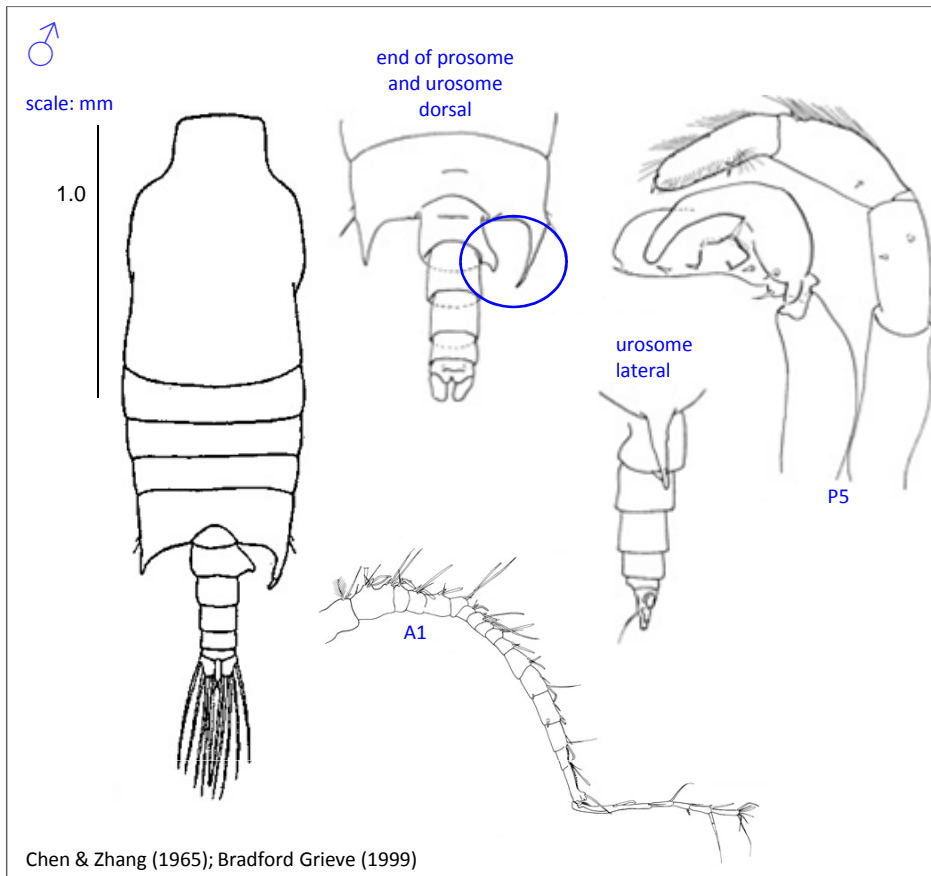


CSIRO AusCPR

Candacia bipinnata

(Giesbrecht, 1889)

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size
 Male: 2.35 mm

Male

- Rostrum platelike and strong with rounded points
- Right A1 geniculate, with serrations on section 18, segments 2-3 fused, segments 17-18 separate, segments 19-20 fused
- In lateral view distal end of posterior prosome is truncate, tip of process reaches beyond posterior end of genital somite
- Posterior prosome and genital somite asymmetrical with pointed extensions on the right, both extending posteriorly
- Right P5 chelate, left with hairs and a single, tiny terminal spine

Source

- Bradford-Grieve & Markhaseva (1999)
- Boxshall & Halsey (2004)
- Bradford-Grieve (1999)
- Chen and Zhang (1965)
- Hattori et al. (1983)
- Ohtsuka & Onbé (1989)
- Razouls et al. (2010)

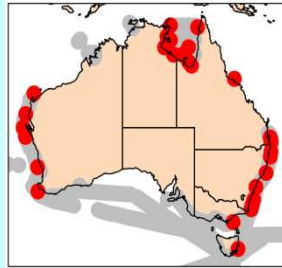
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Chen & Zhang (1965); Bradford Grieve (1999)



Candacia bradyi

Scott A., 1902



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

None

Size

Female: 1.4 - 2.1 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

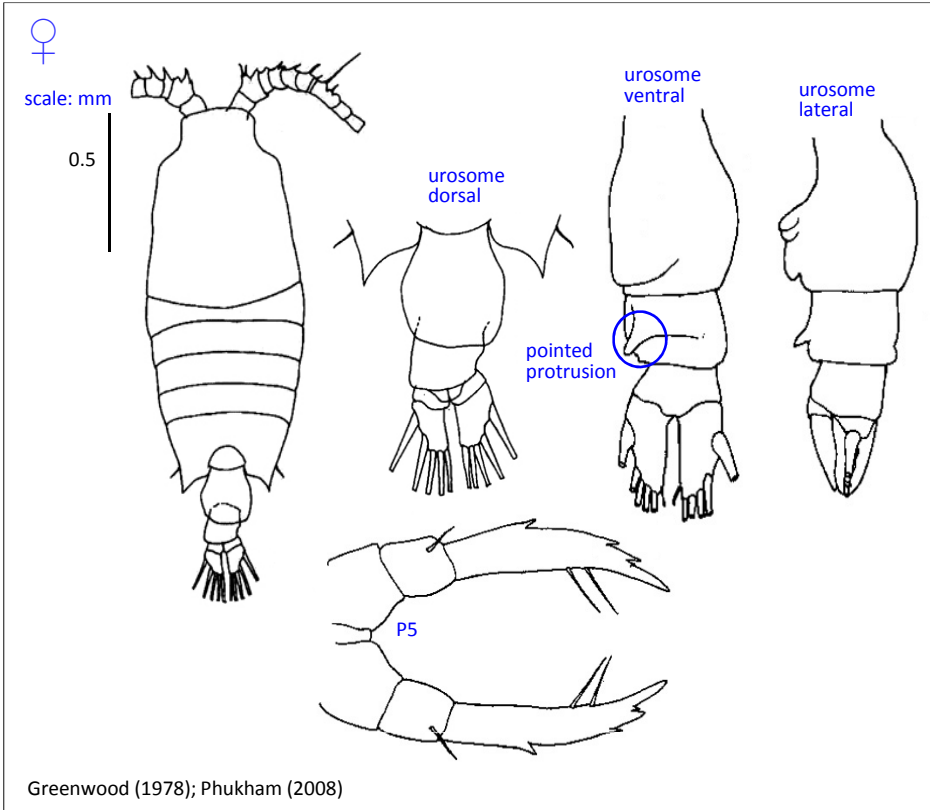
- Posterior prosome somite corners each end in a short spine
- P1 with 1-segmented endopod
- P5 segment 3 curved slightly inwards, with 2 setae on inner margin and three spines on distal outer edge. These spines are blunt and pigmented on the left and sharp and non-pigmented on the right
- Genital somite broad and almost symmetrical in dorsal view, with slight protrusion on right side
- Urosome somite 2 has a pointed protrusion, half the length of genital somite, on the mid ventral surface
- Caudal rami twice as long as wide, slightly asymmetrical, the right wider than the left

Distribution

- Epipelagic; open ocean
- Temperate, tropical and subtropical
- Indian and Pacific Oceans; not Atlantic

Ecology

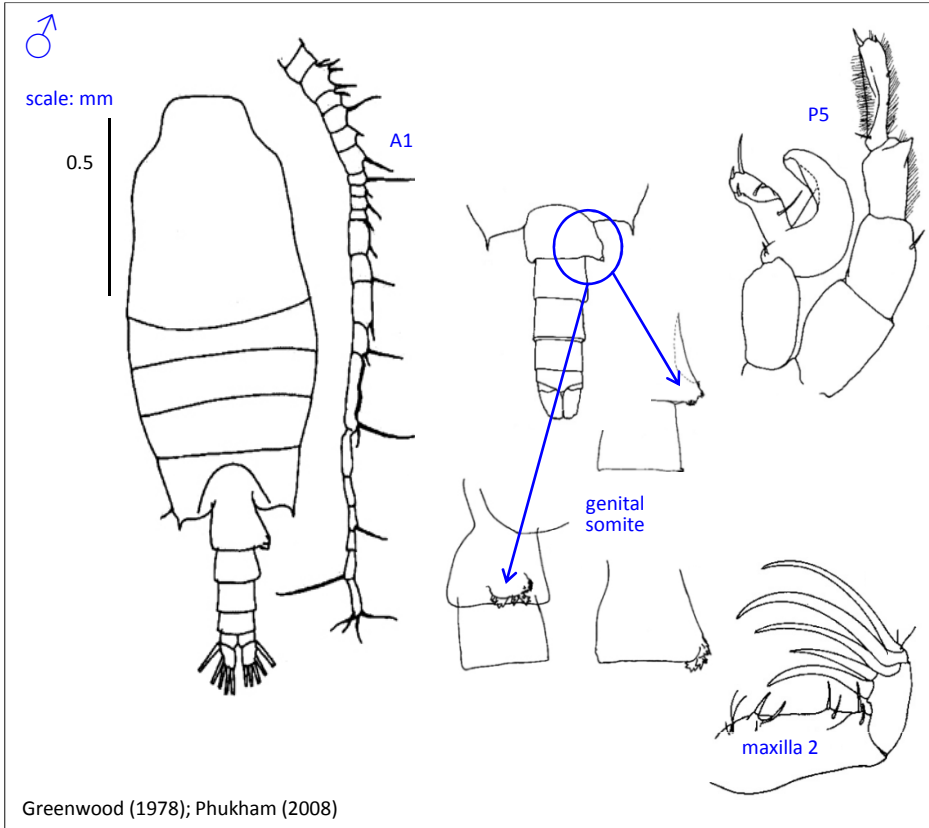
- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item
- Has been observed feeding on *Sagitta*



Candacia bradyi

Scott A., 1902

Phylum	Arthropoda
Order	Calanoida
Family	Candaciidae



Size

Male: 1.4 - 1.8 mm

Male

- A1 23-segmented, extends to posterior border of prosome
- Posterior prosome symmetrical, tip of right process does not reach beyond mid point of genital somite
- P2-4 terminal spines are more than half the length of its segment
- Left P5 segment 3 is produced at outer distal angle into a short, stout, pigmented tooth-like process, which is divided into 3 blunt points, segment 4 is elongated and narrow with 3 small terminal spines
- Genital somite produced into a small toothed process on right side
- Urosome somite 2 with patch of small spines near posterior end

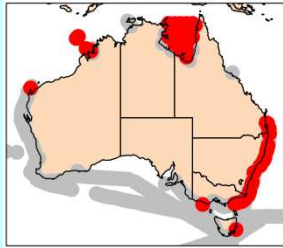
Source

Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Conway (2003)
 Greenwood (1978)
 Phukham (2008)
 Razouls et al. (2010)
 Wickstead (1959)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia catula

(Giesbrecht, 1889)



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

Candace catula Giesbrecht, 1889

Size

Female: 1.4 - 1.67 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

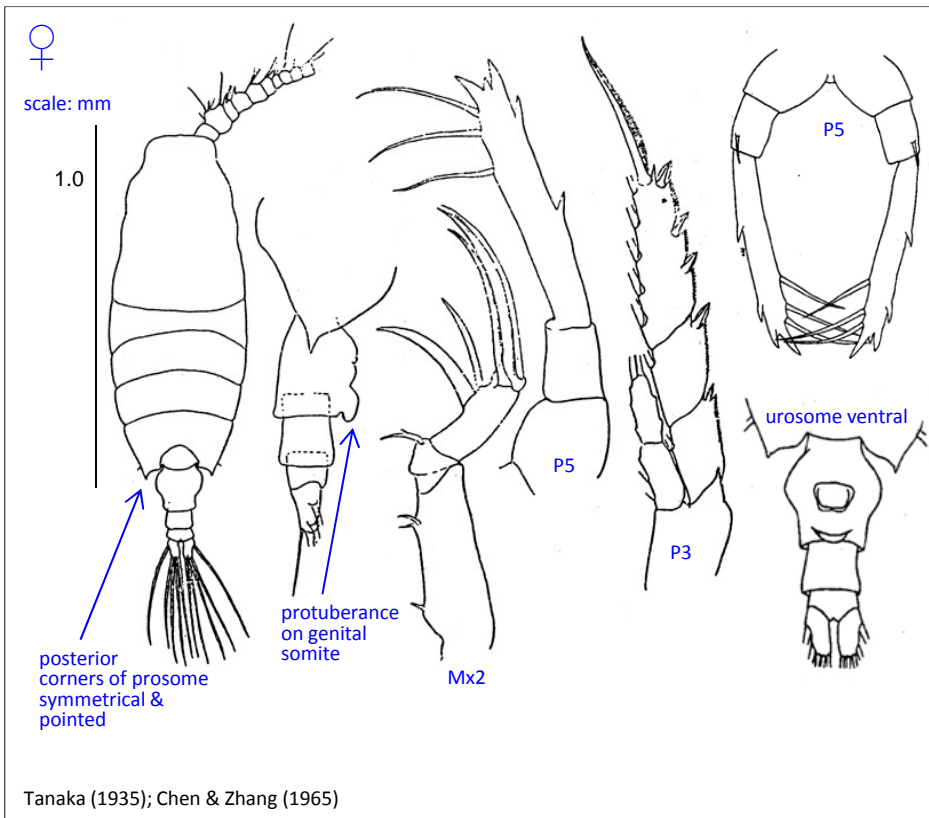
- A1 23-segmented, with proximal 6 segments swollen
- Posterior prosome symmetrical and pointed
- P2-4 exopod terminal spine more than half the length of the segment
- P5 symmetrical, segment 3 long with 2 outer marginal spines and 3 inner marginal setae; apex with 3 teeth
- Genital somite symmetrical with both sides swollen, no spines or processes but with a backward projecting protuberance on the ventral surface
- Caudal rami nearly twice as long as wide

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; more recently recorded from the Atlantic

Ecology

- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item



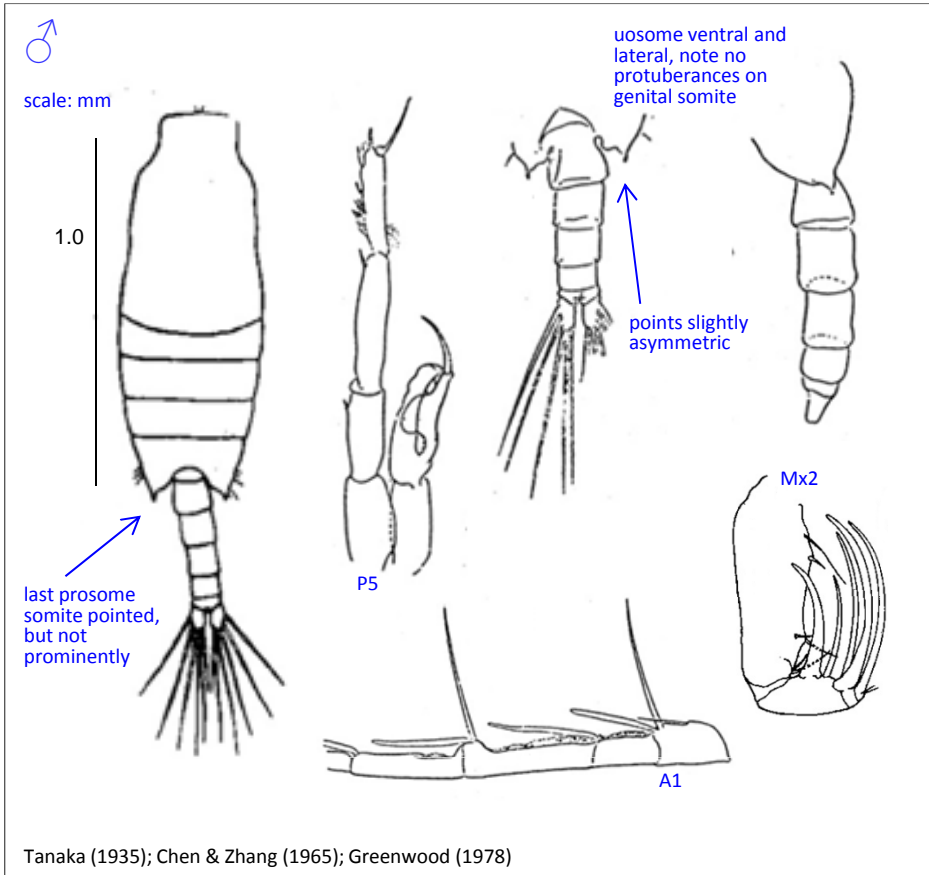
Tanaka (1935); Chen & Zhang (1965)



Candacia catula

(Giesbrecht, 1889)

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size

Male: 1.3 - 1.62 mm

Male

- Right A1 geniculate with 6 terminal segments
- Last prosome somite pointed, but not prominently
- Points are slightly asymmetrical
- P5 chelate on left, segment 3 terminal spine long and curved
- Unusual among *Candacia* males in having no processes or protuberances on the genital somite
- Urosome somite 2 symmetrical

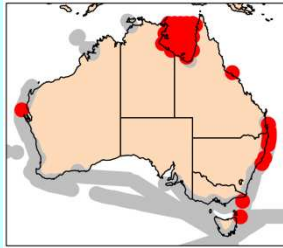
Source

Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen & Zhang (1965)
 Conway (2003)
 Greenwood (1978)
 Razouls et al. (2010)
 Tanaka (1935)

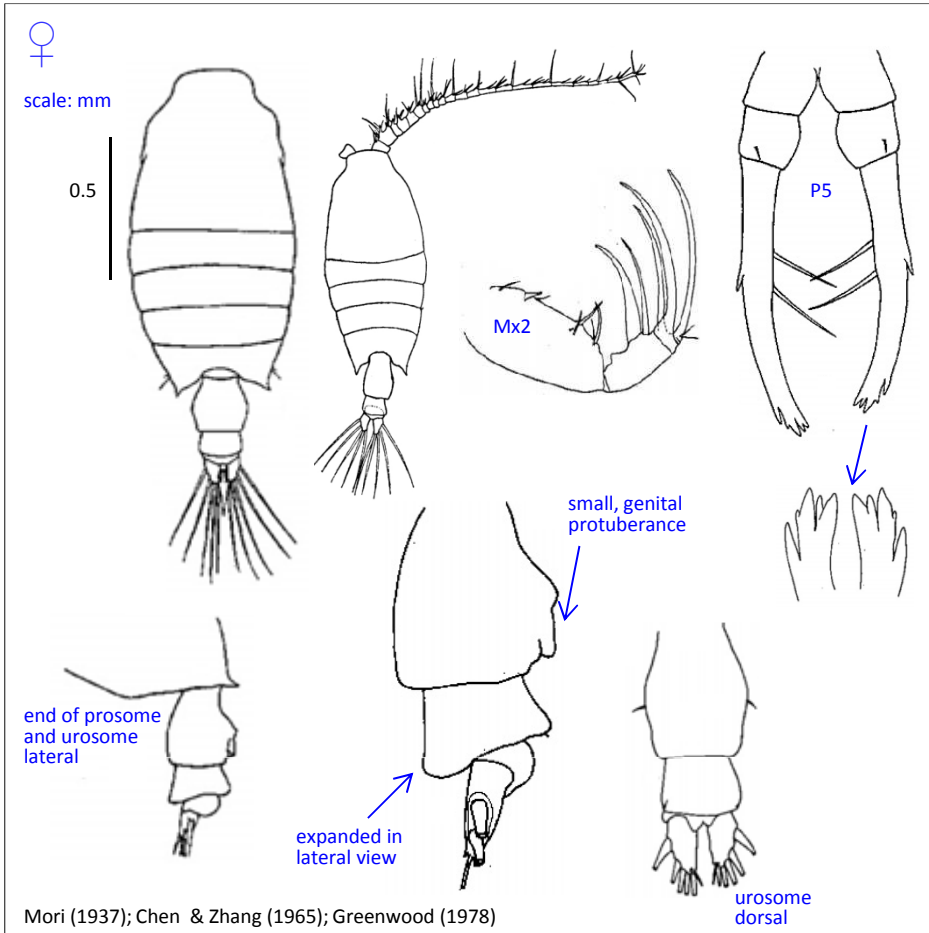
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia discaudata

Scott A., 1909



Phylum Arthropoda
Order Calanioda
Family Candaciidae



Mori (1937); Chen & Zhang (1965); Greenwood (1978)

Synonyms
None

Size
Female: 1.55 – 1.94 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- A1 23-segmented and extends to middle of genital somite
- Posterior prosome points symmetrical, projected slightly forward
- P2-4 exopod segment 3 spines more than half length of terminal segment
- P5 asymmetrical, apex of segment 3 produced into 3 closely set teeth, outer margin with 2 small spines, 2 moderately long setae on inner margin
- Genital somite slightly asymmetrical dorsally, no lateral protrusions, short setae on each side; small protuberance on the front
- Second urosome somite is expanded in lateral view
- Anal somite short and asymmetrical

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; probably not Atlantic

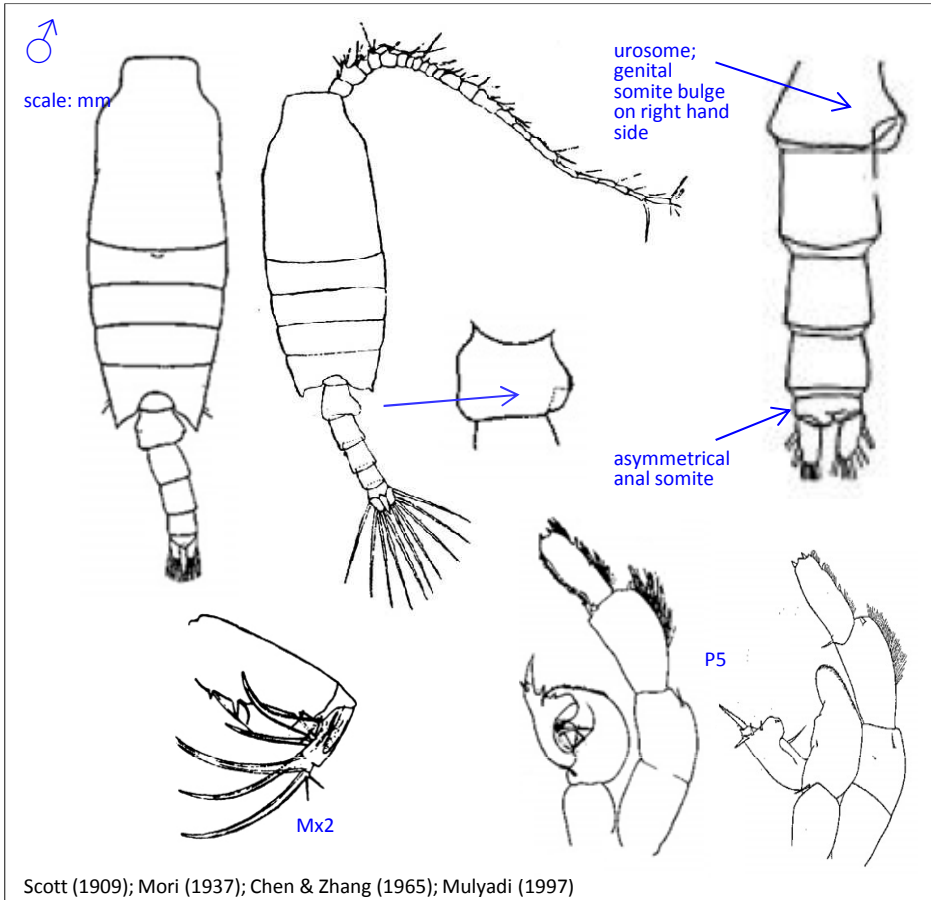
Ecology

- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item

Candacia discaudata

Scott A., 1909

Phylum Arthropoda
Order Calanioda
Family Candaciidae



Scott (1909); Mori (1937); Chen & Zhang (1965); Mulyadi (1997)

Size

Male: 1.48 – 1.82 mm

Male

- Right A1 geniculate, outer margin of segments 16-18 with pigmented teeth
- P5 left segments moderately long and broad, segment 4 with 2 small outer edge spines and 2 small apical spines
- P5 right segment 3 has a large projection near distal end of inner margin
- Genital somite asymmetrical, with bulges on right hand side
- Viewed from the right the inflated region bears a small tooth at each end
- Anal somite is asymmetrical

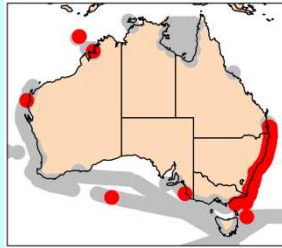
Source

Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen and Zhang (1965)
 Conway (2003)
 Mori (1937)
 Mulyadi (1997)
 Razouls et al. (2010)
 Scott (1909)

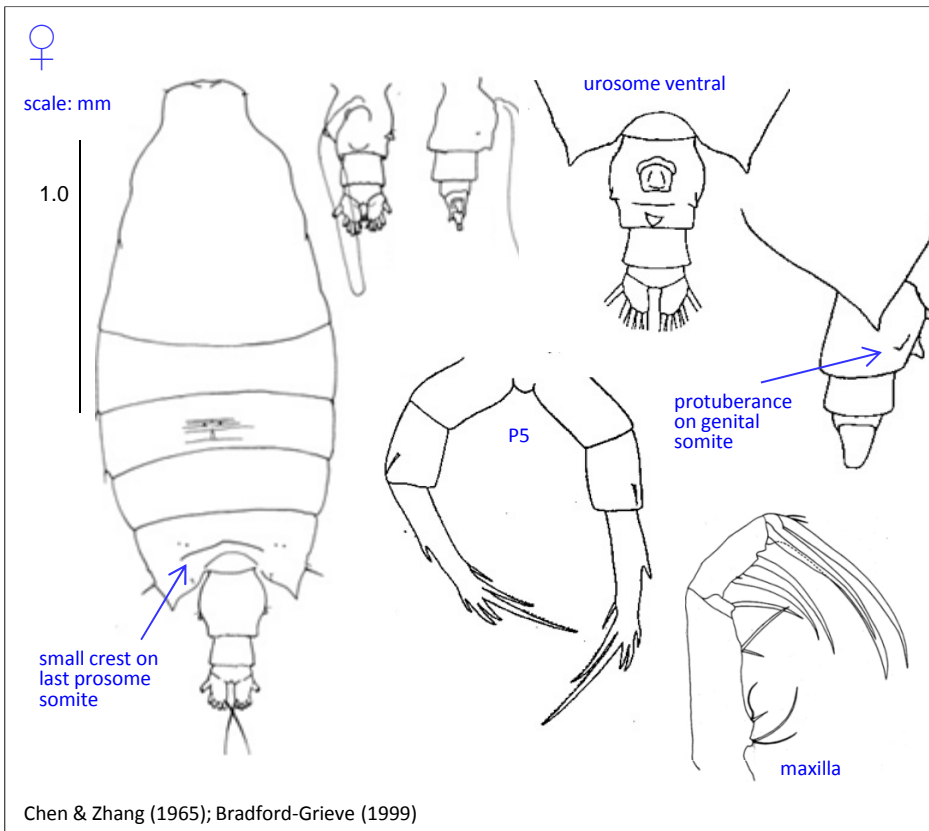
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia ethiopica

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Candaciidae



Synonyms

Candace aethiopica Dana, 1849
Candace ethiopica Dana, 1849
Candacia aethiopica (Dana, 1849)

Size

Female: 1.97-3.03 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- Prosome can be darkly pigmented
- Posterior prosome corners point
- Small crest on last prosome somite (also in other *Candacia* spp.)
- P5 segment 3 with 3 inner edge setae; distal 2 setae are coarse and of unequal length; segment 3 with 7 spines in total
- Genital somite asymmetrical, prolonged on left
- In lateral view genital somite has a small ventral spiny protuberance

Distribution

- Epipelagic; mesopelagic
- Mainly open ocean
- Widespread in tropical, subtropical and temperate waters
- Pacific and Indian Oceans and Atlantic Oceans

Ecology

- Can live in the neuston
- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item
- Swimming speeds up to 7 mm s⁻¹

Candacia ethiopica

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Candaciidae

Size

Male: 2.00 – 2.93 mm

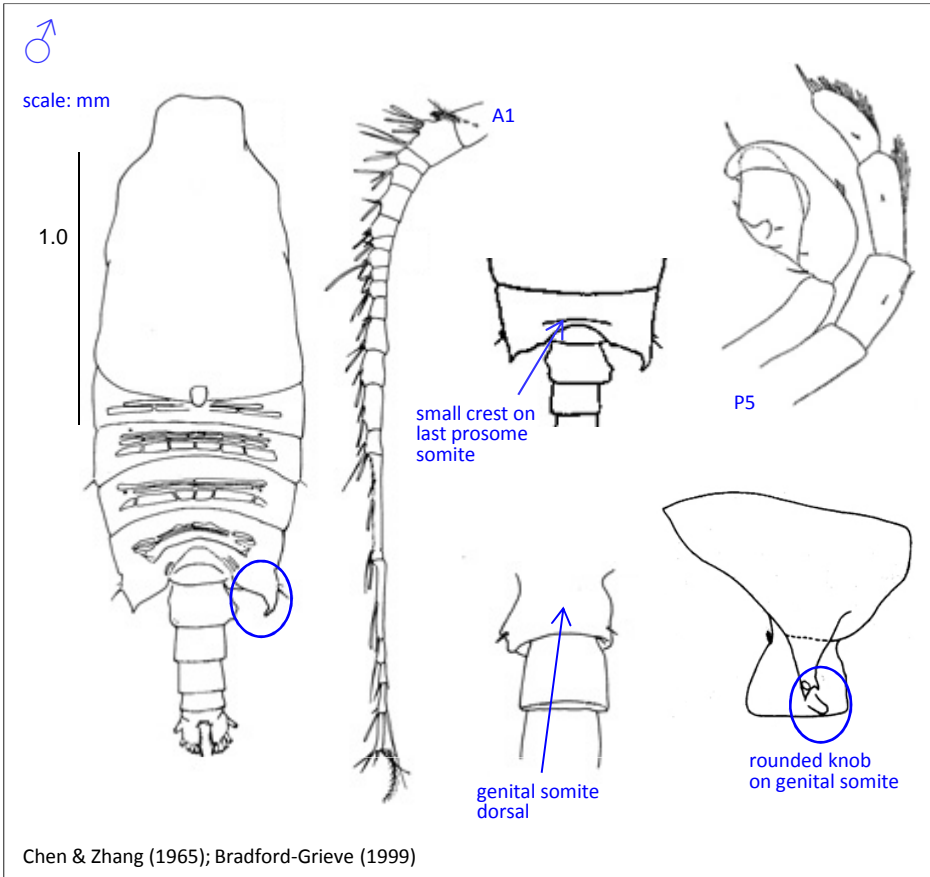
Male

- Posterior prosome asymmetrical with curved spiny projection on the right side
- Genital somite with 2 triangular processes on right margin, protuberances on one side (a rounded knob and a pointed projection)
- Small crest on last prosome somite (also in other *Candacia spp.*)

Source

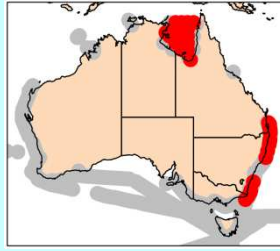
Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen & Zhang (1965)
 Conway (2003)
 Hattori et al. (1983)
 Razouls et al. (2010)
 Woodson et al. (2005)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

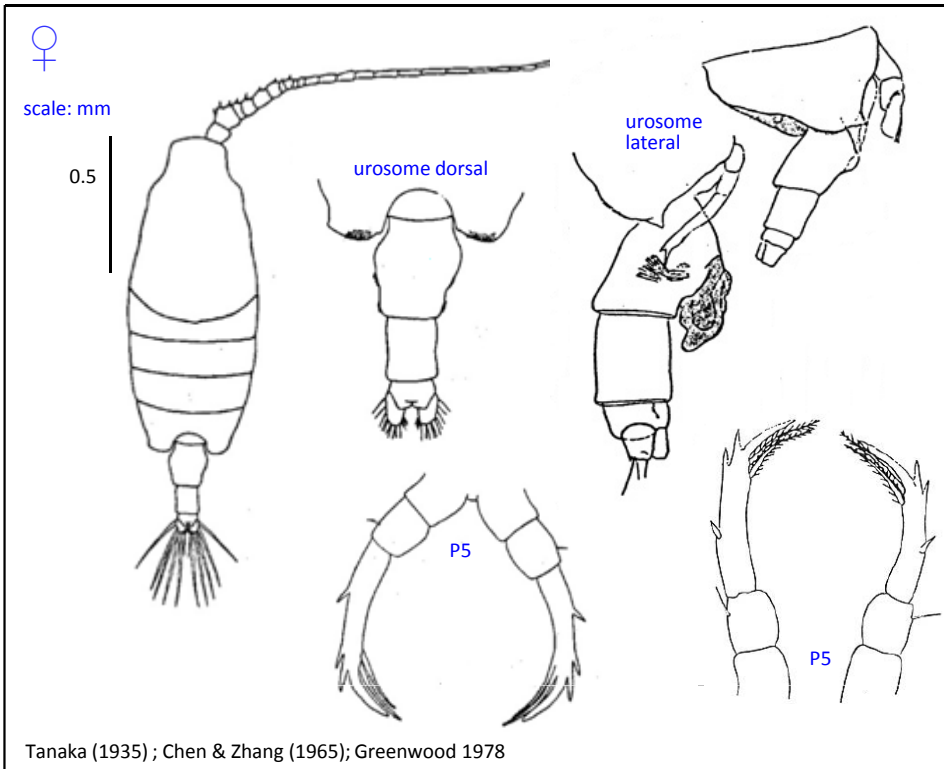


Candacia truncata

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Candaciidae



Synonyms

Candace truncata Dana, 1849
Candacia turgida Wilson C.B., 1950
Paracandacia truncata (Dana, 1849)

Size

Female: 1.84 - 2.10 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- A1 23-segmented, proximal 8 segments thickened
- A characteristic square end to the last prosome somite when viewed laterally
- Corners of prosome are pointed & directed forwards, so points not visible in dorsal view
- P5 segment 3 with terminal finger-like processes finely serrated distally; inner margin setae subequal, distal most seta slightly longer than proximal seta
- Urosome symmetrical with no protuberances
- Anal somite short and often fused with caudal rami

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; probably not Atlantic

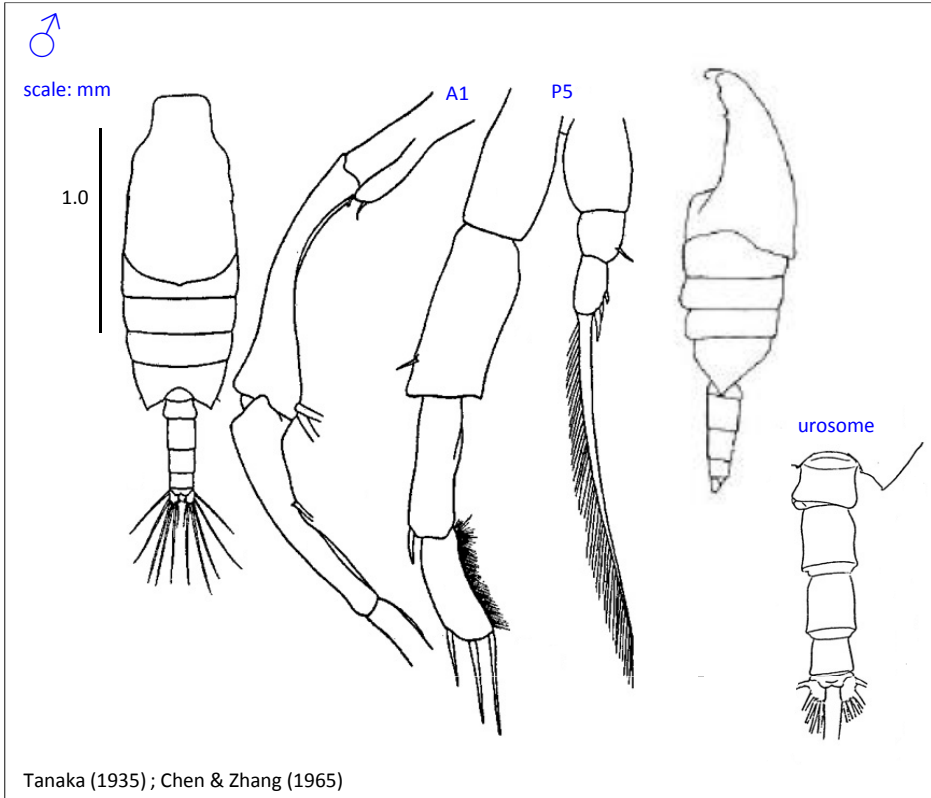
Compiled: C. H. Davies & A. S. Slotwinski 2012
 Verified: K. M. Swadling 2013



Candacia truncata

Dana, 1849

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size

Male: 1.87 – 2.11 mm

Male

- Geniculate right A1 has a series of stout proximal segments followed by a thin section, then a broad club section, beyond club section, segment 16 has a finger-like protrusion which is difficult to observe clearly; fused segments 17 and 18 are characteristically curved
- Last prosome somite symmetrical with sharp points
- P5 left segment 4 with 3 setae; right P5 not chelate and segment 3 terminates in long plumose setae
- Urosome and caudal rami symmetrical with no projections

Ecology

- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item

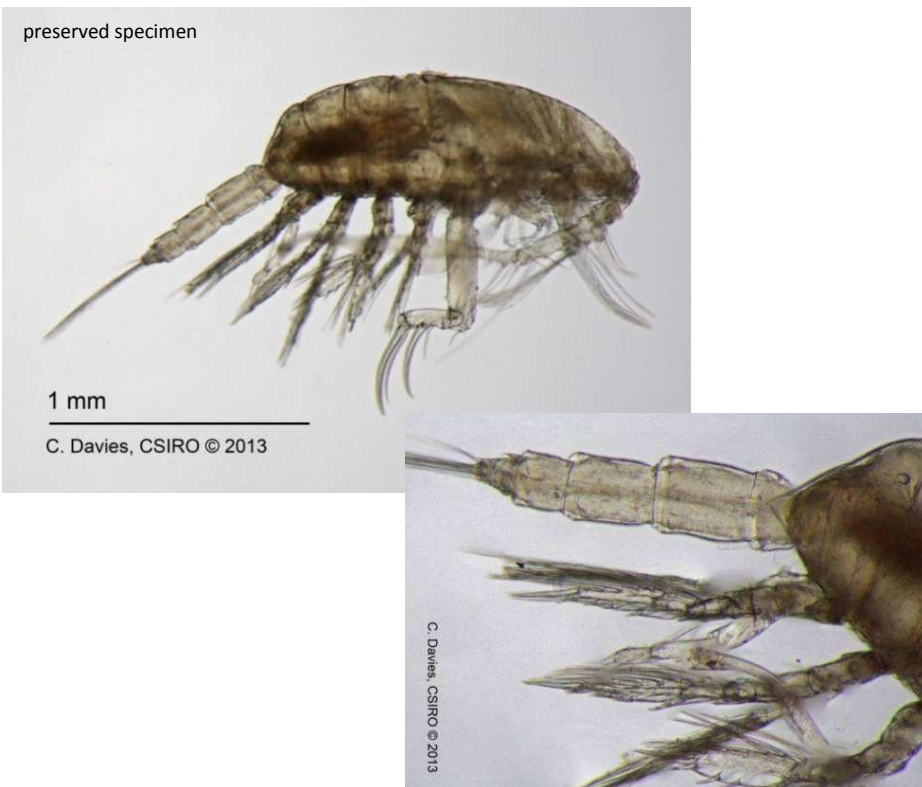
Source

Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen and Zhang (1965)
 Conway (2003)
 Greenwood (1978)
 Razouls et al. (2010)
 Tanaka (1935)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Tanaka (1935) ; Chen & Zhang (1965)

preserved specimen



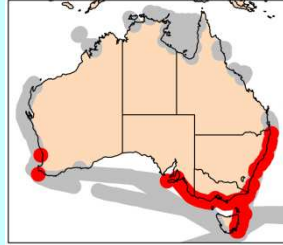
1 mm

C. Davies, CSIRO © 2013

C. Davies, CSIRO © 2013

Centropages australiensis

Fairbridge, 1944



Phylum Arthropoda
Order Calanoida
Family Centropagidae

Synonyms

None

Size

Female: 1.43 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

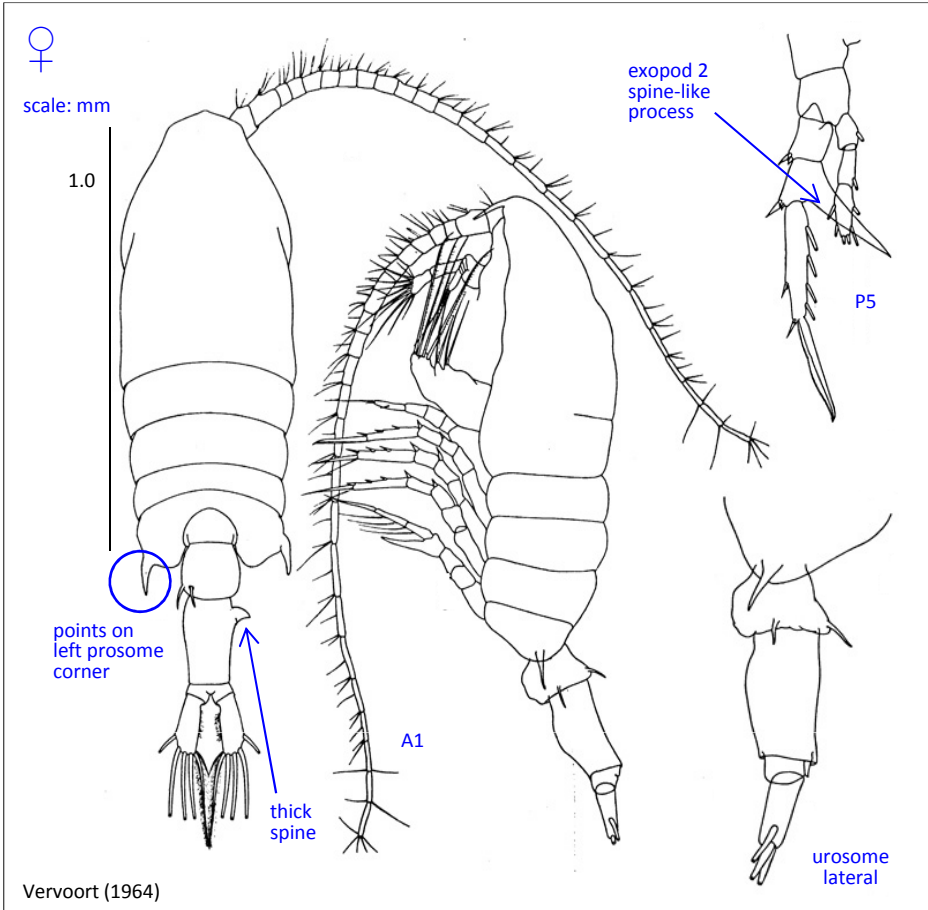
- A1 exceeds caudal rami by 2 segments
- Point on left prosome corner reaches to end of genital somite, point on right side reaches to middle of genital somite
- Genital somite almost symmetrical, with 2 small spines
- Urosomal somite 2 asymmetrical; left side slightly swollen, right side with thick spine
- Caudal rami symmetrical, twice as long as wide

Distribution

- Epipelagic
- Inshore coastal and coastal waters
- Southern Australian distribution, particularly along eastern seaboard

Ecology

- Produces distinctive spiny eggs
- Eggs can diapause in sediments to avoid unfavourable conditions
- Females often observed with 2 or more spermatophores attached
- Omnivorous



Vervoort (1964)



C. Davies, CSIRO © 2013



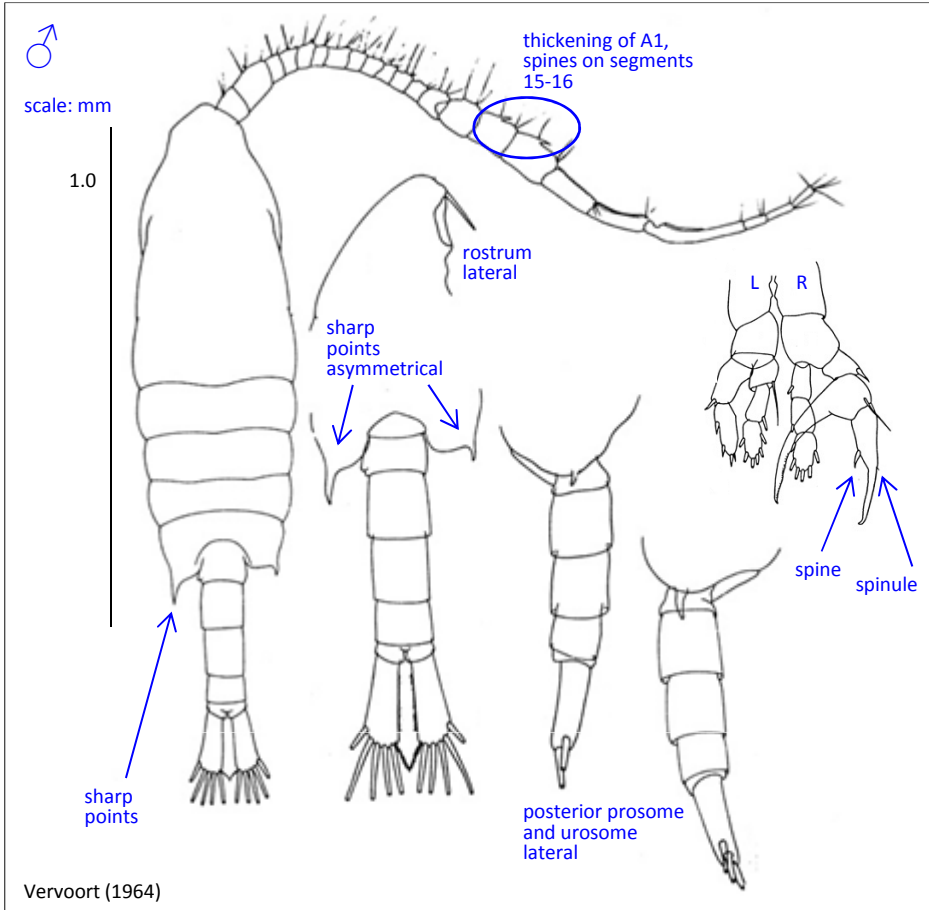
urosome, P5, genital somite

C. Davies, CSIRO © 2013

Centropages australiensis

Fairbridge, 1944

Phylum Arthropoda
Order Calanoida
Family Centropagidae



Size
 Male: 1.32 mm

Male

- One side of right A1 typically thickened along part of length; spines on segments 15-16 at thickening of A1
- Sharp points on posterior of prosome asymmetrical
- Right P5 with large, slightly curved spur forming a claw on inner margin of exopod segment 2, outer apical margin furrowed
- Right P5 exopod segment 3 is pointed with furrowed inner margin, distinct spine on inner margin and minute spinule on outer margin
- Caudal rami twice as long as wide

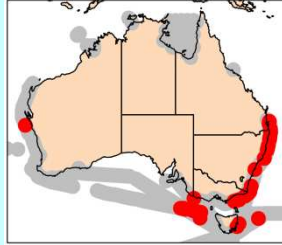
Source

Boxshall and Halsey (2004)
 Bradford-Grieve (1994)
 Conway et al. (2003)
 Vervoort (1964)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Centropages bradyi

Wheeler, 1900



Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae

Synonyms
None

Size
Female: 1.91-2.50 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

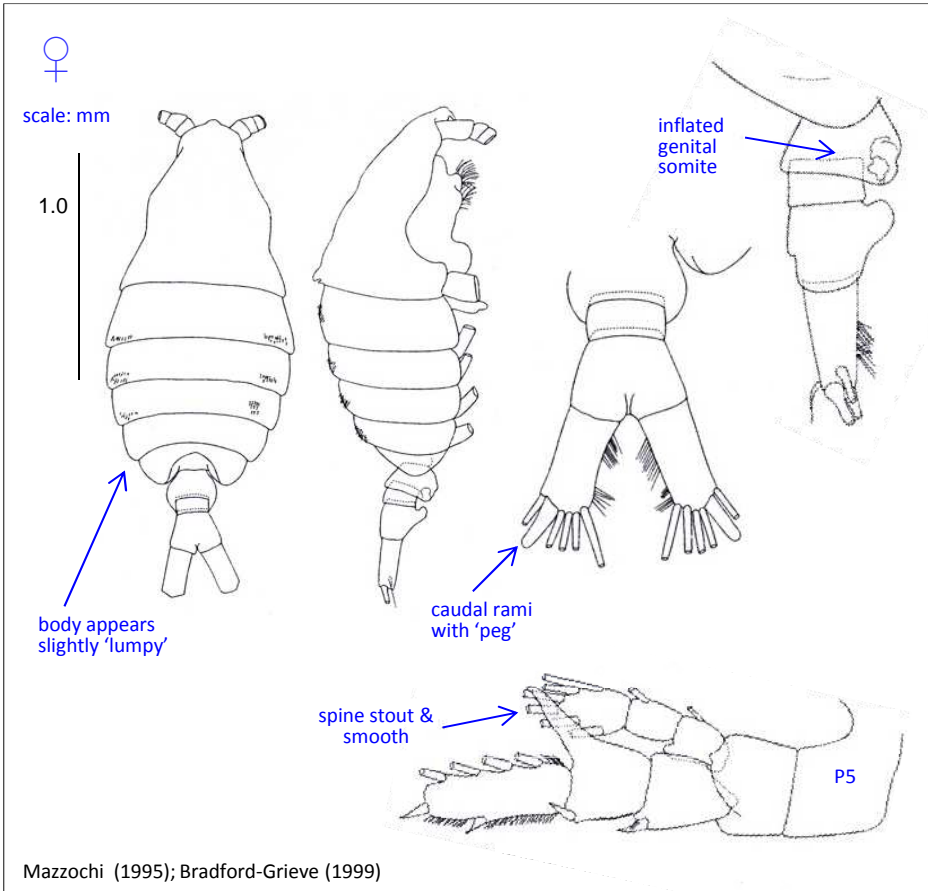
- A1 extends beyond caudal rami by 3-4 segments
- May have a blunt dorsal projection at bottom of cephalosome
- Body inflated, appears slightly 'lumpy', widest at pedigerous somites 1-2
- Posterior prosome corners rounded
- Genital somite inflated but without protrusions
- Caudal rami large, symmetrical with 'peg'-like projection between 2 outer terminal setae
- P5 exopodal segment 2 inner edge spine stout and smooth

Distribution

- Epi-, meso- and bathypelagic
- Cosmopolitan
- Generally found more abundantly in warm (> 25 °C) waters

Ecology

- Found further north in Northern Hemisphere during El Niño years, associated with warm water



Mazzochi (1995); Bradford-Grieve (1999)



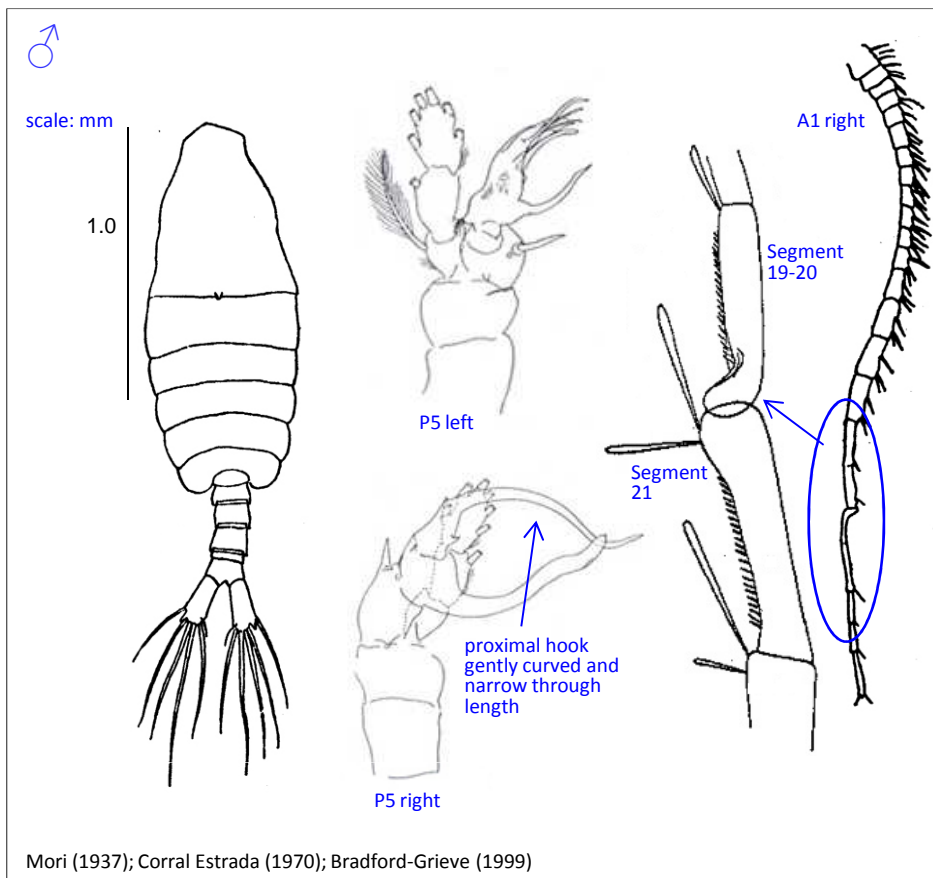
CSIRO AusCPR

Centropages bradyi

Wheeler, 1900

Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae



Size

Male: 1.90-2.40 mm

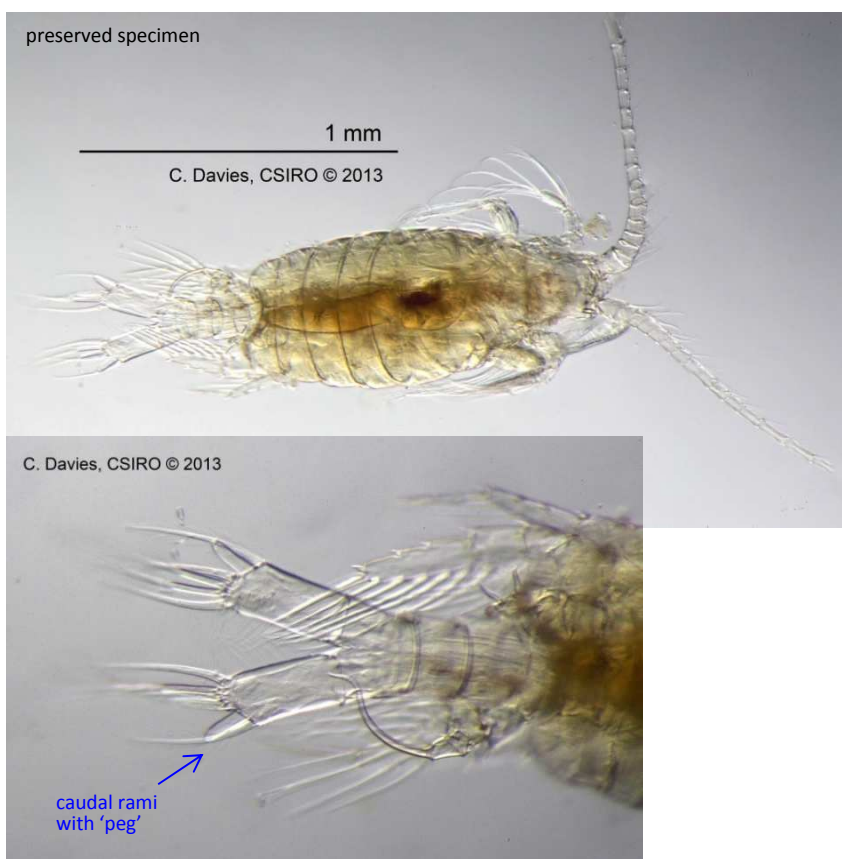
Male

- A1 extends beyond caudal rami by 3-4 segments, right A1 geniculate
- Caudal rami large, symmetrical with 'peg' like projection between 2 outer terminal setae
- P5 right; chela projections of almost equal length, the proximal projection gently curved and narrow through length
- P5 left: exopodal segments 2-3 tapering and with 4 long spines

Source

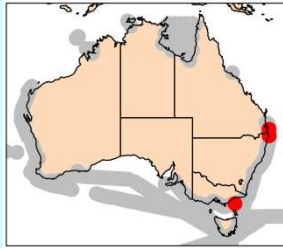
Boxshall & Halsey (2004)
Bradford-Grieve (1999)
Conway (2003)
Corral Estrada (1970)
Keister et al. (2005)
Mazzochi (1995)
Mori (1937)
Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

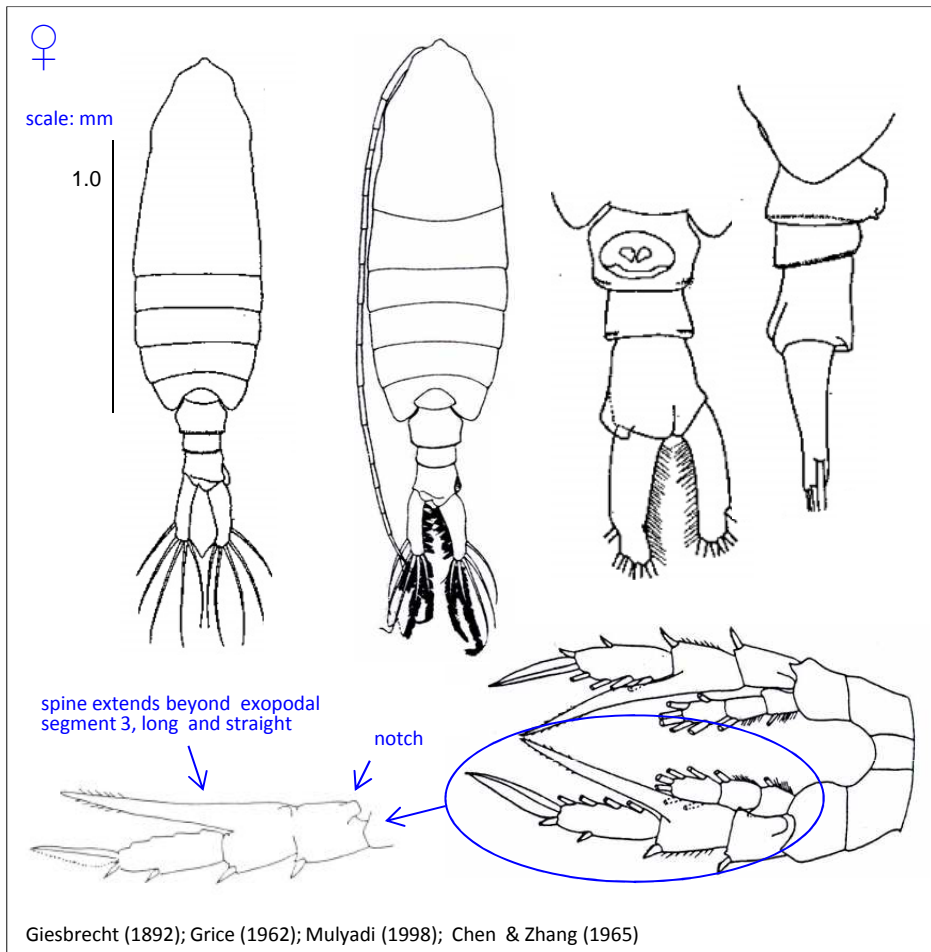


Centropages calaninus

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Centropagidae



Synonyms

Cyclopsina calanina Dana, 1849
Hemicalanus calaninus Dana, 1852
Hemicalanus tenuicornis Dana, 1849

Size

Female: 1.72 – 2.18 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

- Last prosome somite rounded in dorsal view
- Genital somite symmetrical with lateral swellings
- Anal somite almost 2x as long as urosome somite 2
- Caudal rami large and asymmetrical
- A1 extends beyond caudal rami by last 2 segments
- P5 exopodal segment 2 inner edge spine is straight and longer than exopodal segment 3
- Notch on the proximal inner margin of exopodal segment 1

Distribution

- Epipelagic, coastal
- Tropical, subtropical, cold temperate
- Indian and Pacific, Atlantic uncertain

Ecology

- Little is known about the ecology of this species

Giesbrecht (1892); Grice (1962); Mulyadi (1998); Chen & Zhang (1965)

Centropages calaninus

(Dana, 1849)

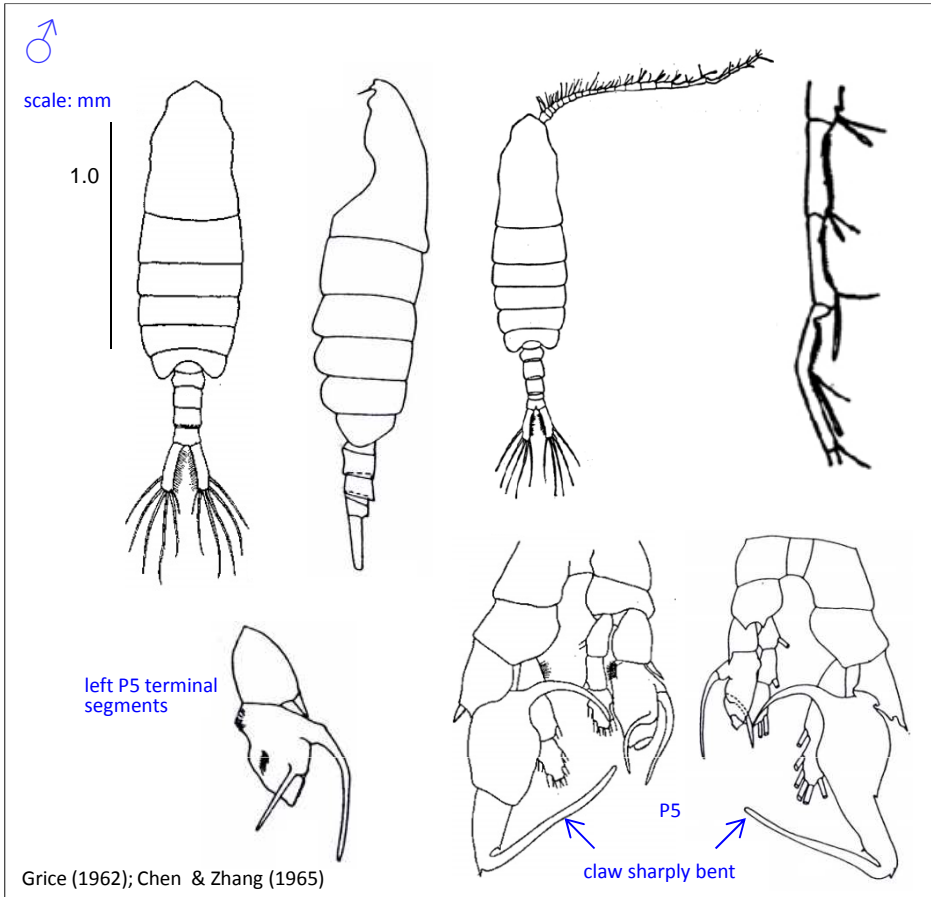
Phylum Arthropoda
Order Calanoida
Family Centropagidae

Size
 Male: 1.80 – 2.06 mm

- Male**
- Last prosome somite rounded
 - Right P5 exopodite segment 3 claw is longer than the inner extension of exopodite segment 2 and is sharply bent

Source
 Bradford-Grieve (1999)
 Chen & Zhang (1965)
 Conway (2003)
 Giesbrecht (1892)
 Grice (1962)
 Mulyadi (1998)
 Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Grice (1962); Chen & Zhang (1965)



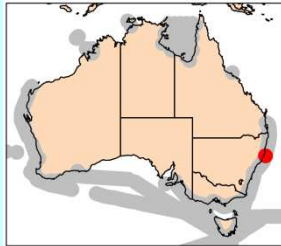
1 mm
 C. Davies, CSIRO © 2013



C. Davies, CSIRO © 2013

Centropages elegans

Giesbrecht 1895



Phylum Arthropoda
Order Calanoida
Family Centropagidae

Synonyms
 None

Size
 Female: 1.86 – 2.14 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

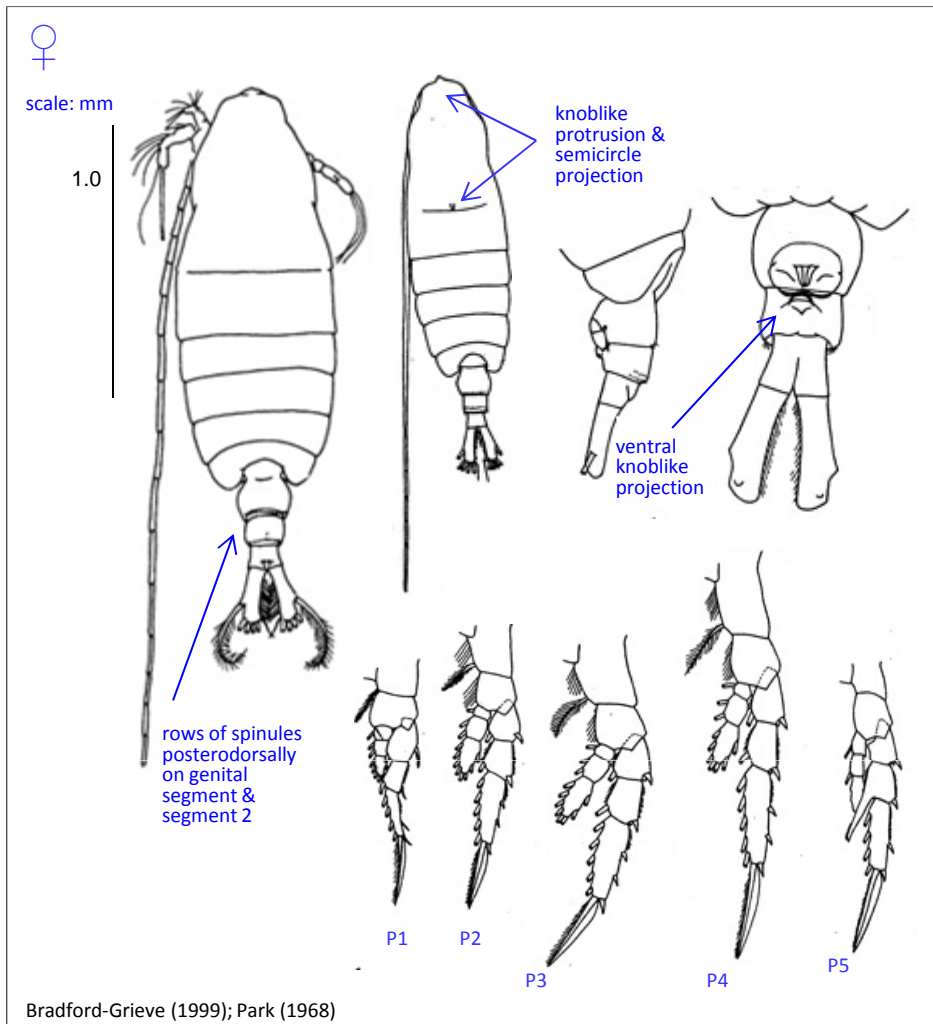
- Small semicircle projection on anterior cephalosome
- Knoblike protrusion at the posterodorsal margin
- Cephalosome and prosome somite 1 incompletely separated
- A1 extends beyond caudal rami by last 5 segments
- Posterior margins of prosome rounded
- P5 exopod segment 1 has a round projection on inner margin, exopod segment 2 with a strong spiniform projection directed distally, with distal inner margin hairs
- Genital somite symmetrical, wider than long with a posterodorsal row of spinules
- Urosome somite 2 has a ventral knoblike projection and 2 posterodorsal rows of spinules
- Caudal rami long and symmetrical

Distribution

- Epipelagic
- Coastal
- Tropical
- Pacific Ocean

Ecology

- Little is known about the ecology of this species

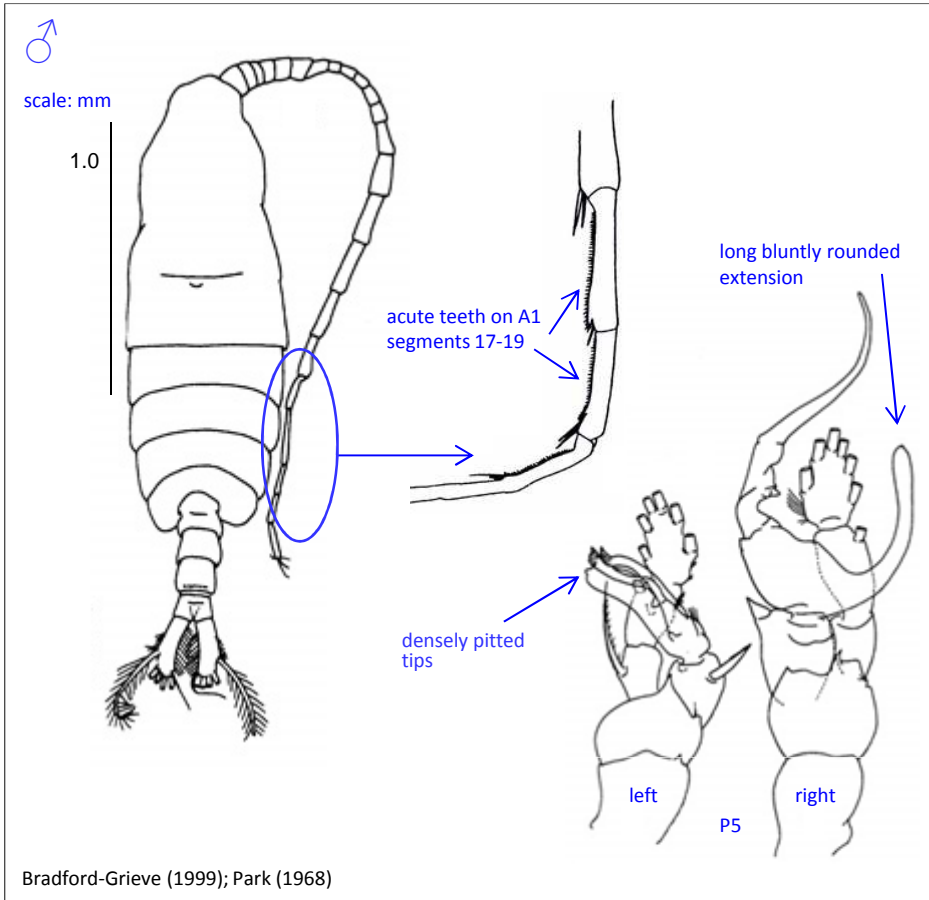


Bradford-Grieve (1999); Park (1968)

Centropages elegans

Giesbrecht 1895

Phylum Arthropoda
Order Calanoida
Family Centropagidae



Size
 Male: 1.84 – 2.05 mm

- Male**
- Cephalosome and prosome somite 1 incompletely separated
 - Left A1 extends past caudal rami by last 2 segments
 - Right A1 geniculate at segments 18 & 19, acute teeth on segments 17 – 19
 - P5 right exopod, segment 2 extends internally into a long bluntly rounded extension, exopod segment 3 in the form of a much longer tapering spine.
 - P5 left exopod, 2 segmented, exopod segments 2 & 3 bearing 2 spines which do not taper much and densely pitted tips

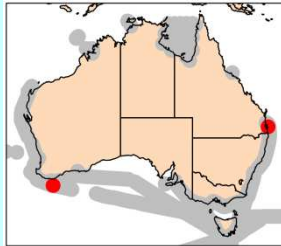
Source
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Conway (2003)
 Park (1968)
 Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

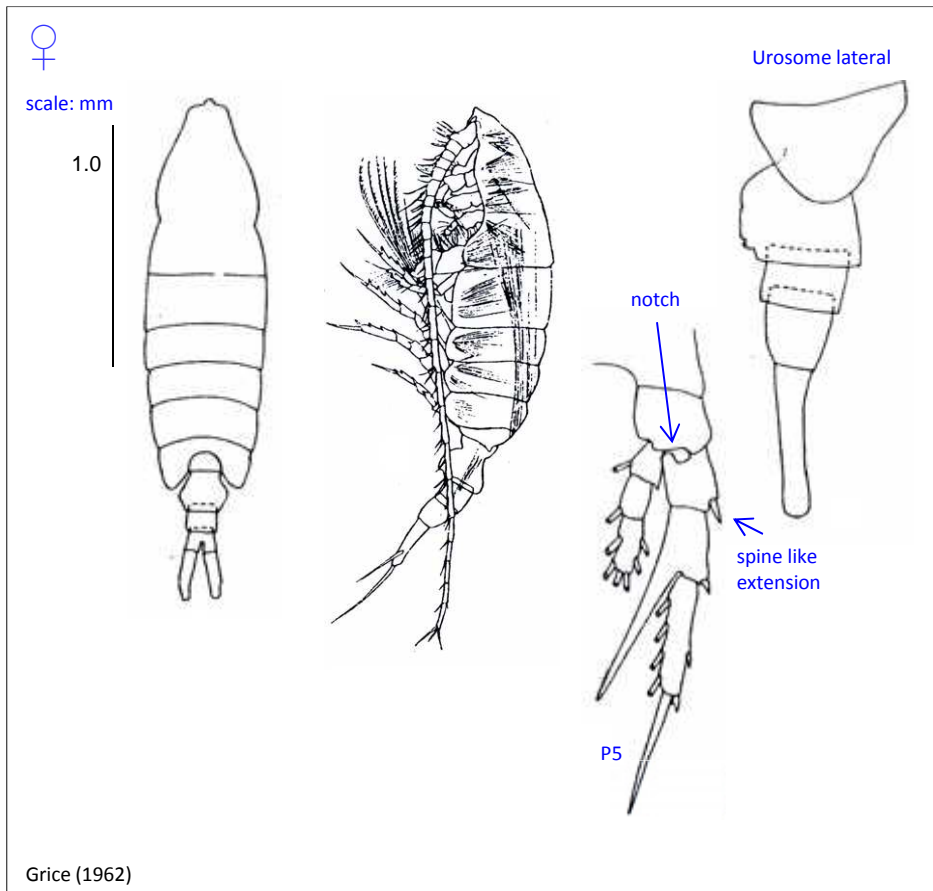
Bradford-Grieve (1999); Park (1968)

Centropages elongatus

Giesbrecht, 1896



Phylum Arthropoda
Order Calanoida
Family Centropagidae



Synonyms

Centropages pacificus Chiba, 1956

Size

Female: 1.50 – 1.90 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

- A1 passes the caudal rami by the last 2 segments
- Last prosome somite quite rounded
- Spine-like extension on exopodal segment 2 of P5 reaches or just exceeds the distal end of exopodal segment 3
- Notch in proximal internal part of exopodal segment 1 of P5
- No spines on urosome
- Genital somite almost symmetrical
- Caudal rami as long as 2 preceding somites

Distribution

- Epipelagic, coastal
- Indian and Pacific, not Atlantic
- Tropical, subtropical

Ecology

- Little is known about the ecology of this species

Grice (1962)



C. Davies, CSIRO © 2013

preserved specimen



1 mm

C. Davies, CSIRO © 2013

Centropages elongatus

Giesbrecht, 1896

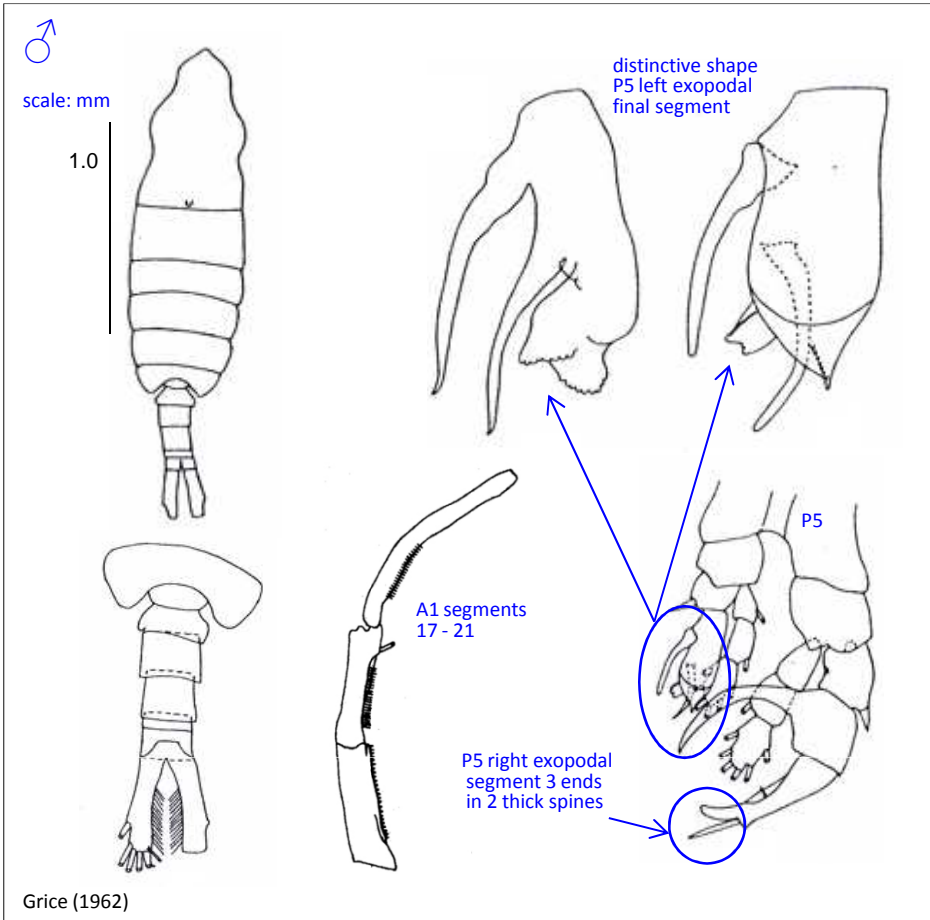
Phylum Arthropoda
Order Calanoida
Family Centropagidae

Size
 Male: 1.74 – 2.00 mm

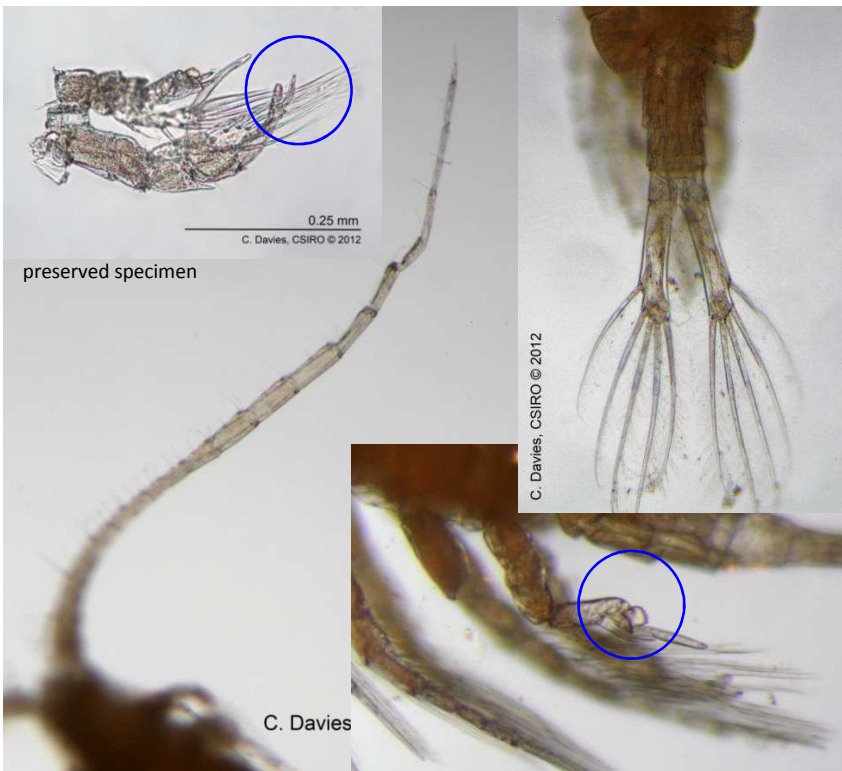
- Male**
- Last prosome somite quite rounded
 - Right P5 exopodal segment 3 terminated by 2 thick spine like extensions
 - Distinctive shape to end exopodal segment of left P5

Source
 Conway (2003)
 Grice (1962)
 Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

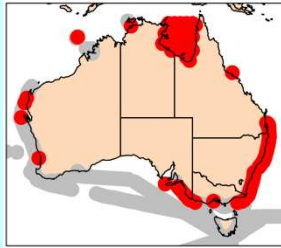


Grice (1962)



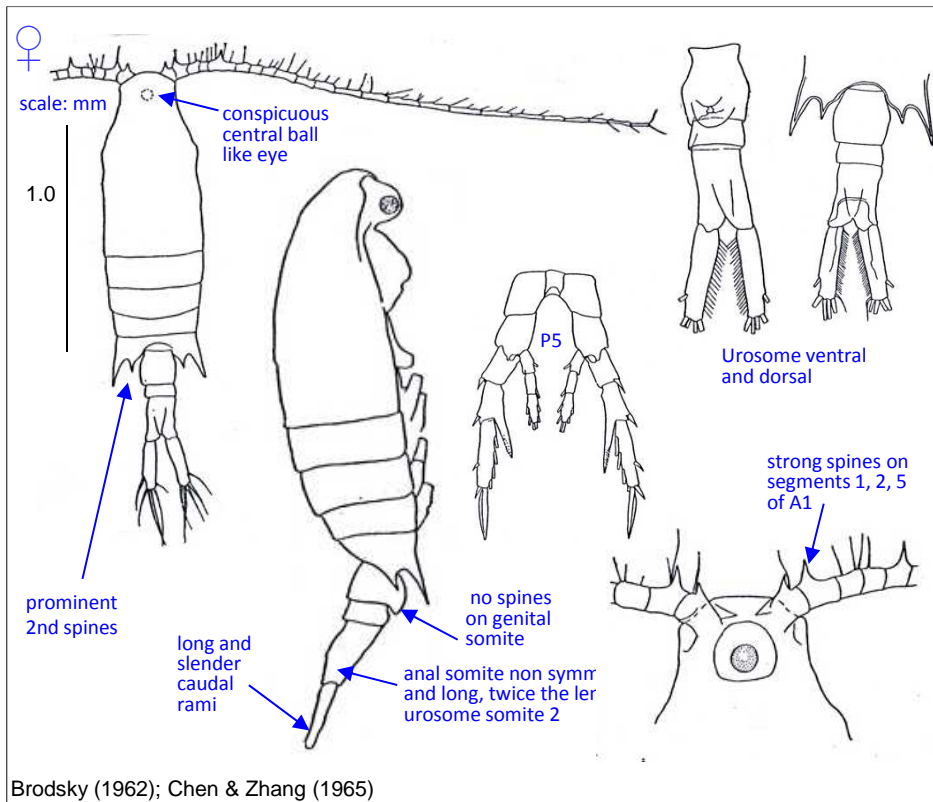
Centropages furcatus

(Dana, 1849)



Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae



Synonyms

Catopia furcata Dana, 1849
Centropages lenuculari Oliveira, 1946

Size

Female: 1.38 – 1.90 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

- Conspicuous central ball-like eye
- May be quite transparent
- Strong spines on segments 1, 2, 5 of A1
- Prominent second spines between the lateral spines on the last prosome somite and the urosome
- P5 exopodal segment 2 inner edge spine does not reach distal border of exopodal segment 3
- No spines on genital somite
- Anal somite asymmetrical and long, twice the length of urosome somite 2
- Long and slender caudal rami

Distribution

- Epipelagic, coastal, cosmopolitan
- Most widely distributed species within the genus
- As far south as subantarctic

Ecology

- Cannibalistic feeding has been observed
- Preys on nauplii of other coastal calanoids
- Spawns at night
- Produces resting eggs

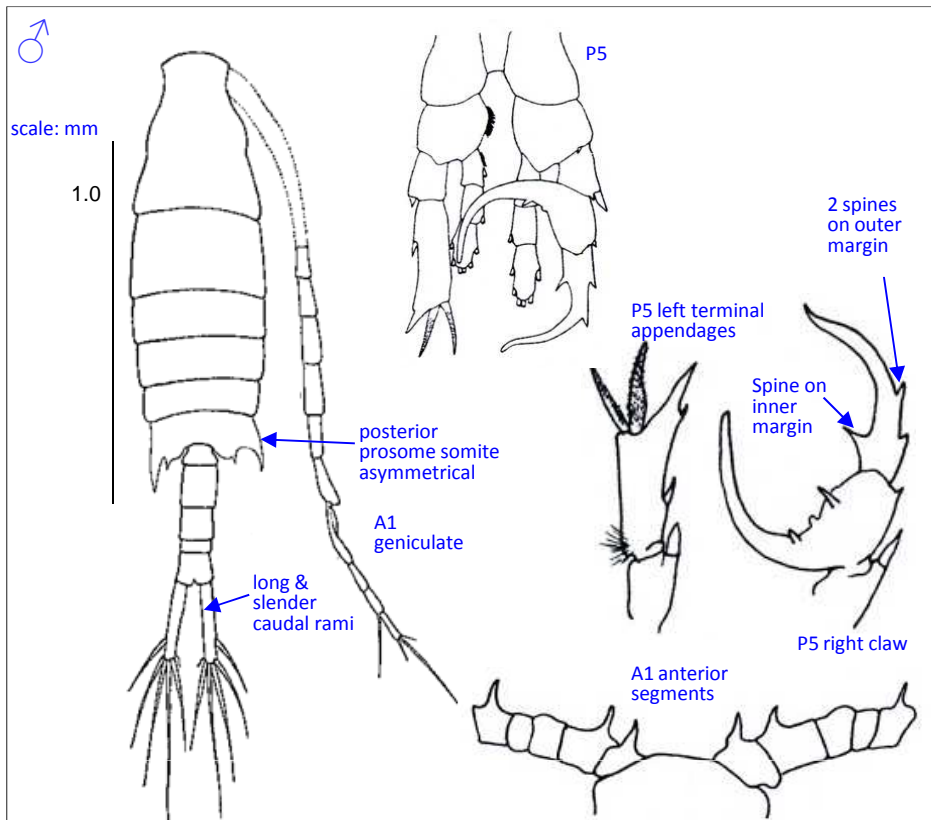


Centropages furcatus

(Dana, 1849)

Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae



Size

Male: 1.40 – 1.75 mm

Male

- Right A1 geniculate
- May be quite transparent
- Posterior prosome somite slightly asymmetrical, left side protrudes further than right
- Prominent second spines between the lateral spines on the last prosome somite and the urosome
- Right P5 extension on exopodal segment 2 has a rounded protrusion on the proximal portion; exopodal segment 3 claw is stout and has a spine on the inner margin and 2 spines on outer margin
- Left P5 exopodal segments 2-3 with long terminal fixed appendages
- Long and slender caudal rami

Source

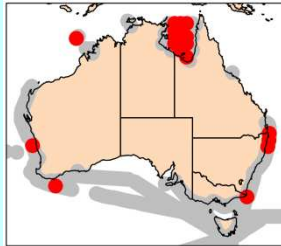
Al-Yamani & Prusova (2003)
Bradford Grieve (1999)
Brodsky (1962)
Checkley et al. (1992)
Chen & Zhang (1965)
Conway (2003)
Daan et al. (1988)
Marcus (1989)
Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Brodsky (1962), Al-Yamani & Prusova (2003), Chen & Zhang (1965)

Centropages gracilis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Centropagidae

Synonym

Cyclopsina gracilis Dana, 1849

Hemicalanus gracilis Dana, 1852

Size

Female: 1.85 – 2.00 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

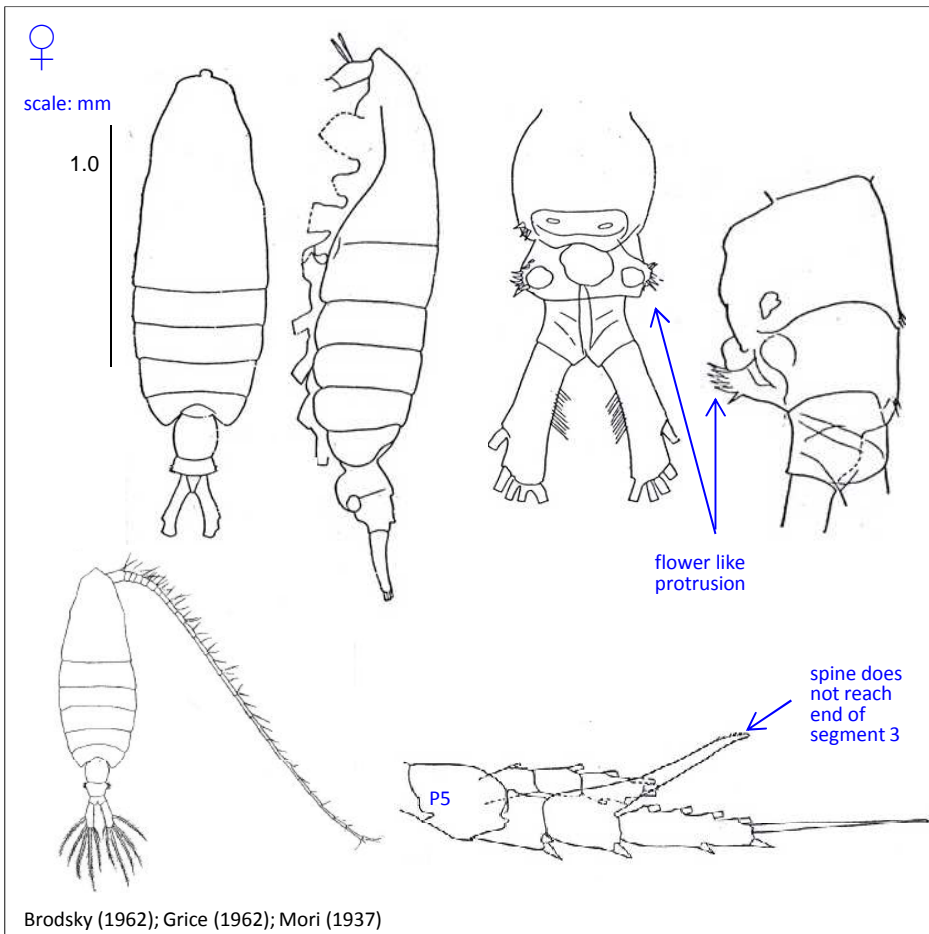
- Lateral angles of the last prosome somite are rounded
- A1 extends beyond caudal rami by last 5 segments
- Inner marginal spine on exopodite segment 2 of P5 does not reach the end of segment 3
- Genital somite with naked lateral borders
- Urosome somite 2 has lateral knobs covered in small spines (flower like)
- Caudal rami are symmetrical

Distribution

- Epipelagic
- Coastal and offshore
- Tropical
- Indian, Pacific and Atlantic

Ecology

- Little is known about the ecology of this species



Brodsky (1962); Grice (1962); Mori (1937)

Centropages gracilis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Centropagidae

Size
 Male: 1.80 – 2.04 mm

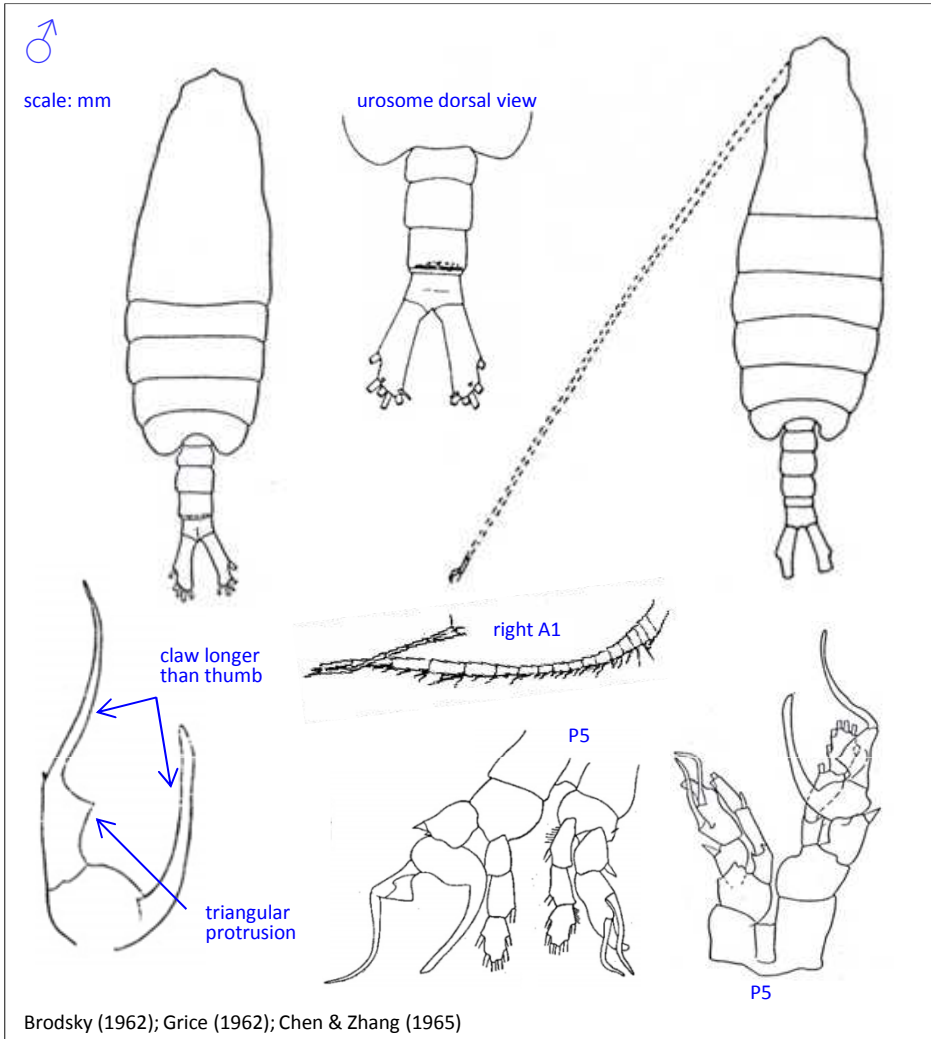
Male

- Posterior corners of prosome rounded
- Right P5 terminal claw is longer than the appendage on exopod 2 (thumb) and has a pronounced triangular protrusion, absent in other species in the genus

Source

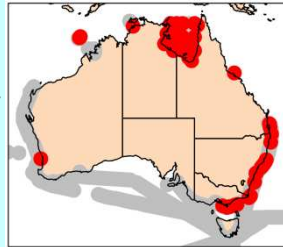
Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Brodsky (1962)
 Chen & Zhang (1965)
 Conway (2003)
 Grice (1962)
 Mori (1937)
 Razouls et al. (2012)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Centropages orsinii

Giesbrecht, 1889



Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae

Synonyms
none

Size
Female: 1.40 - 1.60 mm

Genus notes

- Small to medium size
- Cephalosome and pedigerous somite 1 are fused (fusion lines visible on sides)
- Single naupliar eye
- Lateral corners of posterior prosome often end in asymmetrical points
- Characteristic undulating edge on last prosomal somite between spine and urosome
- Female P5 biramous, exopod segment 2 with a strong, inner spine-like process
- Male P5 complex, right leg chelate
- Urosome usually 3-segmented, often with spines, without seminal receptacles

Female

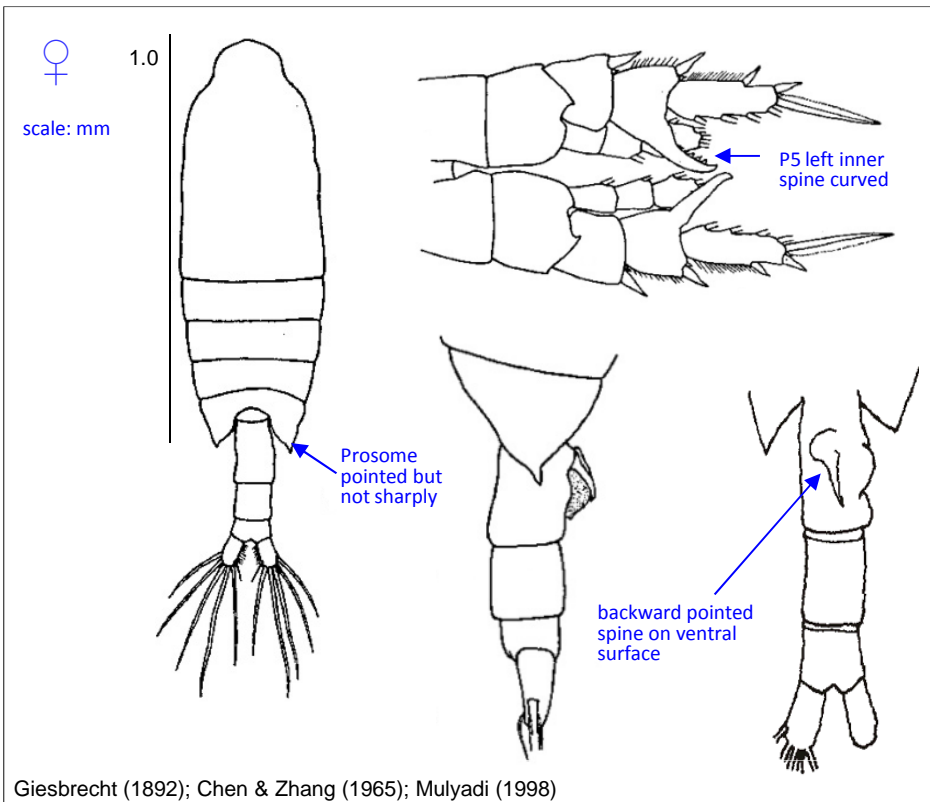
- A1 reaches to end of caudal rami, no spines on segments 1, 2, 5
- Posterior borders of prosome are weakly pointed
- P5 nearly symmetrical
- Left P5 exopodal segment 2 inner spine curved, usually bordered by small spines
- Genital somite symmetrical, offset, backward pointed spine on ventral surface
- Caudal rami are twice as long as wide

Distribution

- Epipelagic
- Coastal, oceanic
- Indian and Pacific, not Atlantic
- Tropical, subtropical

Ecology

- Forms swarms, sometimes as part of a multi-species assemblage
- Herbivorous, feeding on mixed phytoplankton species
- Little is known about the ecology of this species



Giesbrecht (1892); Chen & Zhang (1965); Mulyadi (1998)



C. Davies @ CSIRO 2012

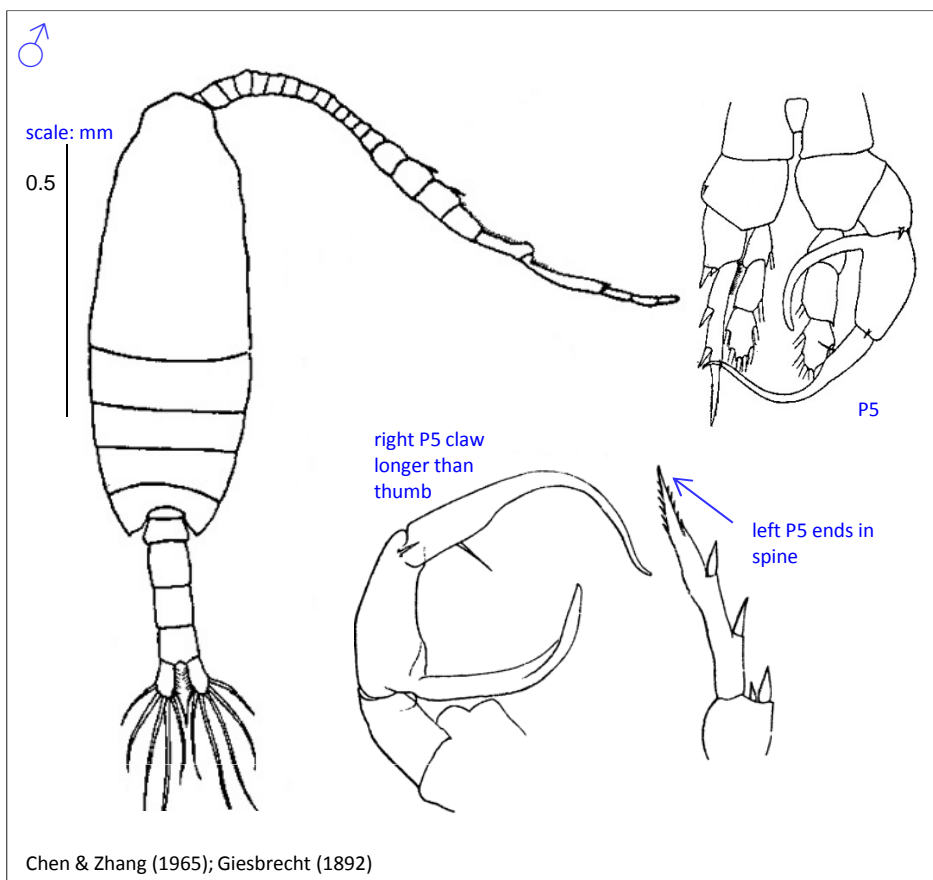
C. Davies @ CSIRO 2012

Centropages orsinii

Giesbrecht, 1889

Phylum
Order
Family

Arthropoda
Calanoida
Centropagidae



Size

Male: 1.25 - 1.30 mm

Male

- Posterior corners of prosome hardly pointed
- Terminal claw on right P5 longer than the appendage on exopodal segment 2 (thumb)
- Terminal exopodal segment of left P5 ends in a spine

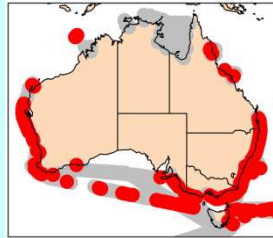
Source

Bradford-Grieve (1999)
Chen & Zhang (1965)
Giesbrecht (1892)
Mulyadi (1998)
Razouls et al. (2012)
Shek & Liu (2010)

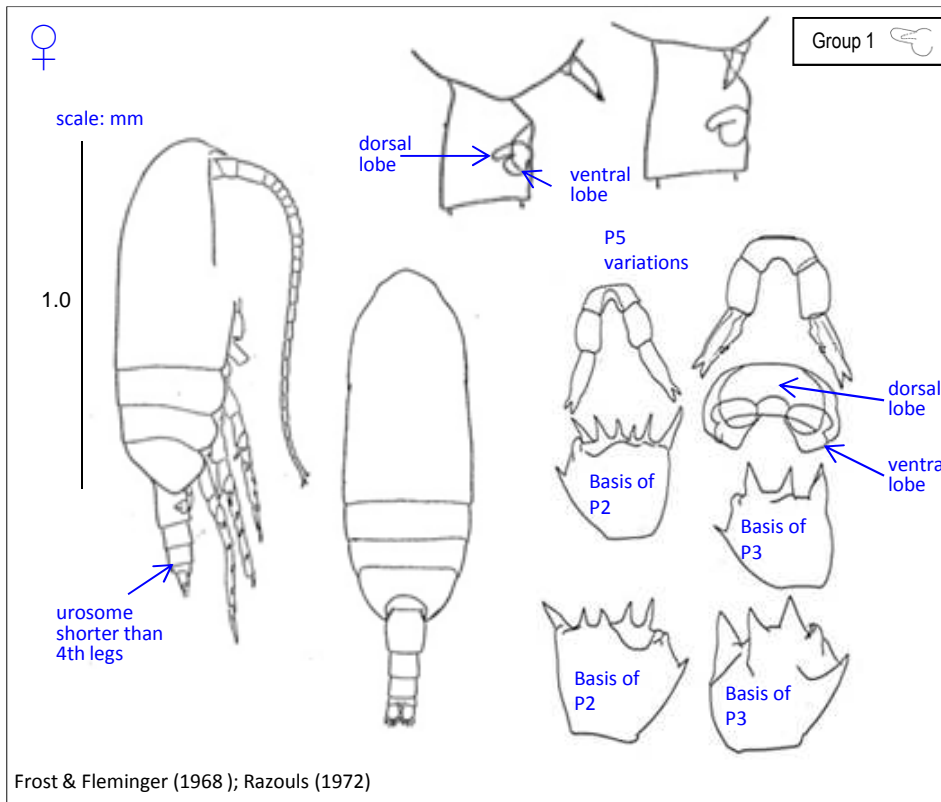
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Clausocalanus arcuicornis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Clausocalanidae



Synonyms

Calanus arcuicornis Dana, 1849
Calanus mastigophorus Claus, 1863
Clausocalanus mastigophorus (Claus, 1863)
Eucalanus mastigophorus (Claus, 1866)

Size

Female: 1.15-1.62 mm

Genus notes

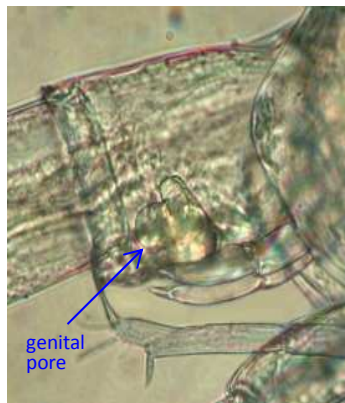
- Small to medium sized copepods
- Female rostrum bifurcated
- Male rostrum reduced to a knob
- Anterior cephalosome & posterior prosome segments are rounded
- Cephalosome fused to pedigerous somite 1
- Female P5 is uniramous, symmetrical and 3-segmented
- Male P5 uniramous, legs of unequal length, longer leg nearly always on left, 5-segmented with segment 5 short & attached sub-apically to the previous segment, shorter leg 3-segmented, less than half of the length of segment 1 of the other leg
- Female urosome 4-segmented
- Can be confused with *Paracalanus* but P5 is a different form

Female

- A1 as long or slightly longer than prosome
- Rostrum in lateral view is short, bifurcated, thick at base, usually straight or slightly curved and directed ventrally
- The 3rd segment of P5 as long as the preceding 2 segments together; segment 3 bifurcated, sometimes with tiny spinules on inner and outer margins
- Prosome : Urosome ratio 2.65-3.22:1
- Urosome shorter than 4th legs
- Genital somite in lateral view straight, or slightly concave, in region of seminal receptacle
- Genital somite 1.5 times as long as urosome somite 3
- Caudal rami about as long as broad

Distribution

- Epipelagic
- Inshore coastal, coastal and oceanic
- Australian distribution includes Tasmania, North West Cape, New South Wales and Great Barrier Reef
- World distribution: widespread in tropical and subtropical waters of the Pacific, Indian and Atlantic Oceans



CSIRO AusCPR

North Stradbroke Island Queensland

A. Slotwinski, CSIRO © 2012

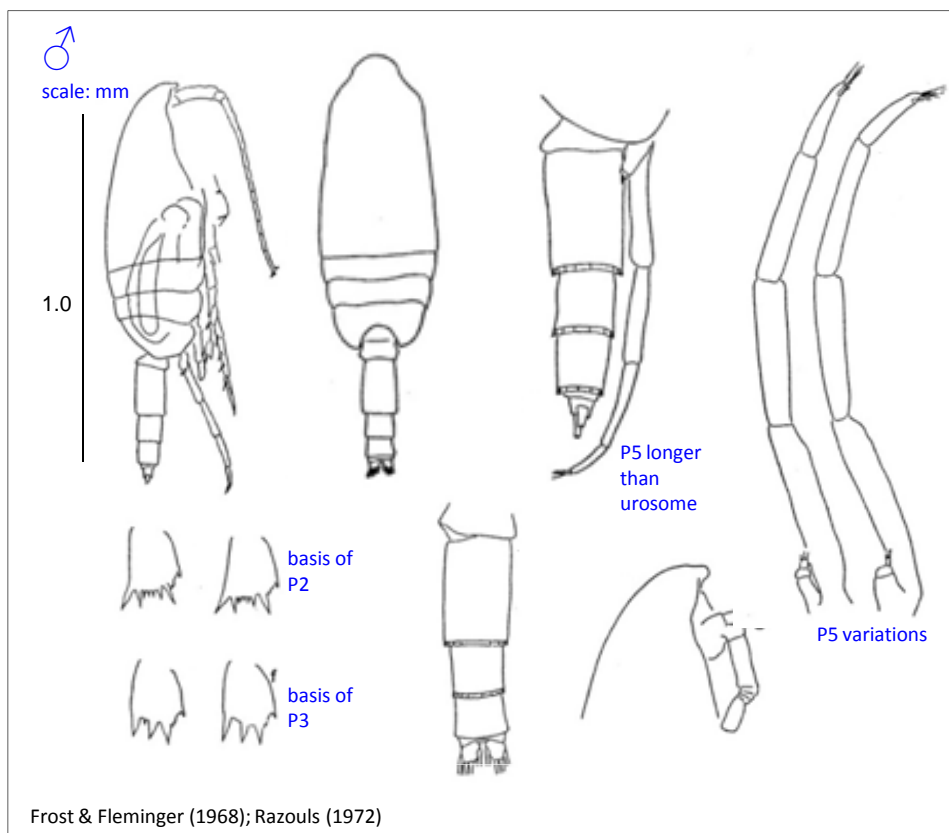
Compiled: C. H. Davies & A. S. Slotwinski 2011
 Verified: K. M. Swadling 2013



Clausocalanus arcuicornis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Clausocalanidae



Size

Male: 0.97-1.17 mm

Male

- Rostrum in lateral view knoblike and protruding ventrally
- P5 right, short, 3 segmented
- P5 left leg is longer than urosome, robust, with long, slender, straight setae distally
- Prosome urosome ratio 1.9—2.51:1
- 2nd urosome somite as long as the following 2 somites together

Ecology

- Tropical-subtropical, circumglobal
- Can be transported into temperate regions with warm currents
- Most abundant off New South Wales during April and May; 17 – 19° sea surface temperatures
- Carries eggs in a single, fragile sac
- Herbivorous

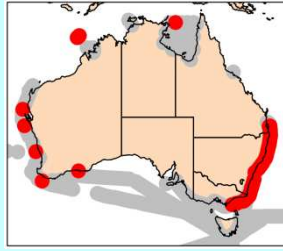
Source

Boltovskoy (1999)
 Conway (2003)
 Dakin and Colefax (1940)
 Razouls et al (2010)
 Saiz & Calbert (1999)
 (Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Frost & Fleminger (1968); Razouls (1972)

Cosmocalanus darwinii

(Lubbock, 1860)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Undina darwinii Lubbock, 1860
Calanus darwinii (Lubbock, 1860)
Cosmocalanus darwini (Lubbock, 1860)

Size

Female: 1.6-2.58 mm

Genus notes

- Only 2 species
- Cephalosome and pedigerous somite 1 fused
- Spines on anterior surface of basis of P1, 3-5 in female and P1, 3-4 in male
- Inner margin of coxa of P5 finely serrated
- Posterior prosome corners drawn into points in female
- Caudal rami setae sometimes branch

Female

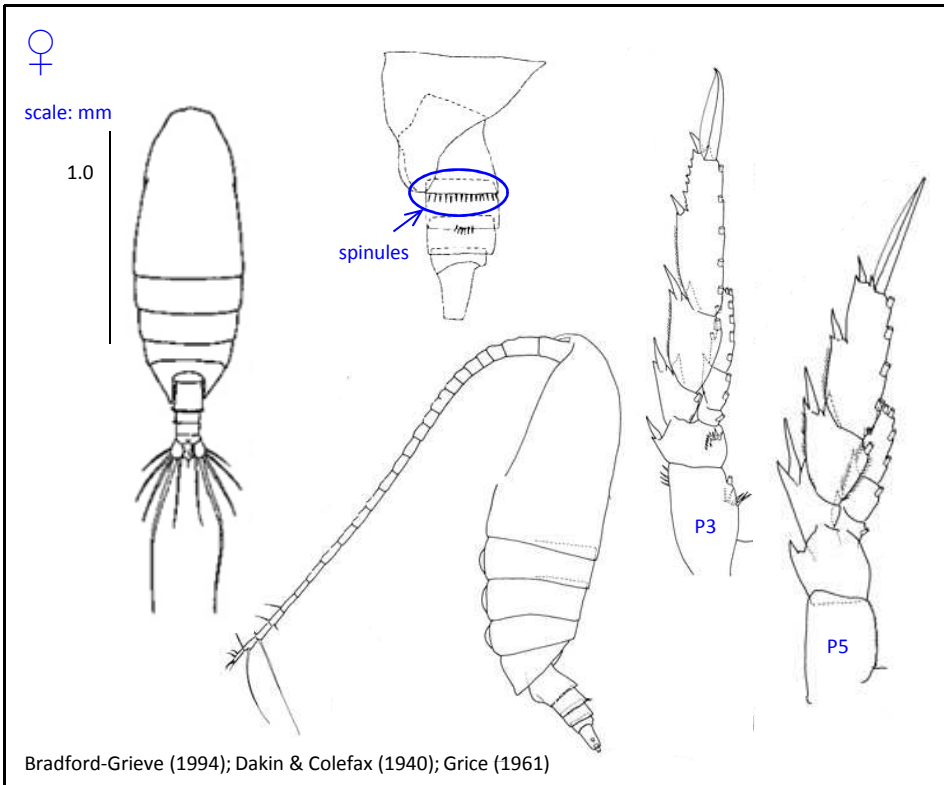
- A1 reaches almost to the end of urosome
- Spinules on posterior margin of genital and 2nd urosome somite
- Genital somite bulges quite strongly and comes to blunt point towards the anterior somite

Distribution

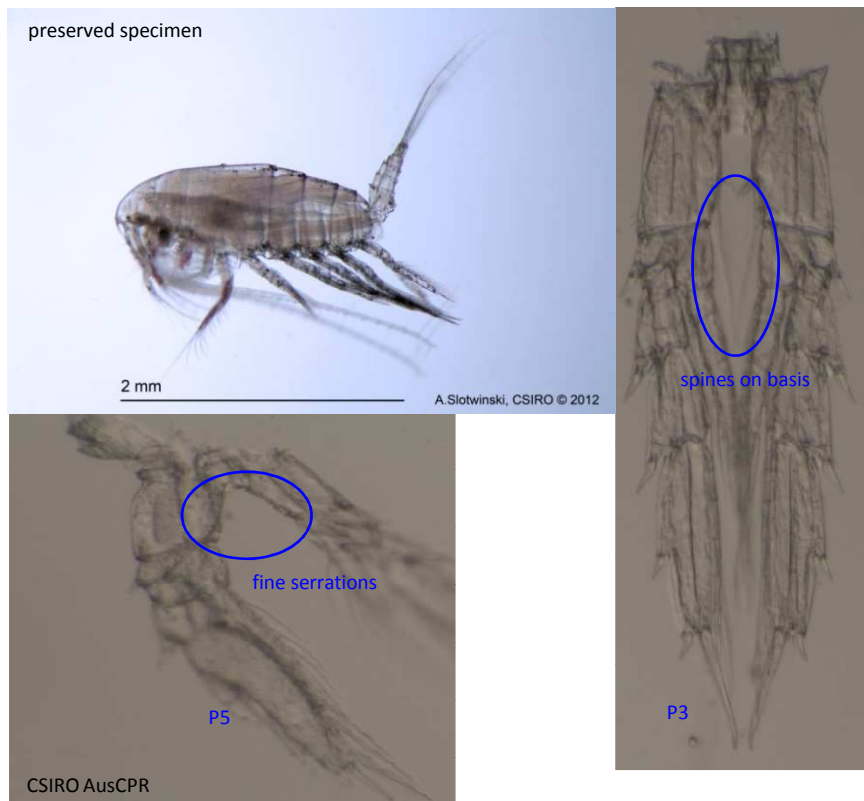
- Epipelagic
- Pacific, Indian and Atlantic
- Subtropical and tropical

Ecology

- Eggs released into water column
- Fine particle feeders, probably omnivorous
- Usually restricted to surface layers
- Females often found with 2 or more spermatophores



Bradford-Grieve (1994); Dakin & Colefax (1940); Grice (1961)



CSIRO AusCPR

Cosmocalanus darwinii

(Lubbock, 1860)

Phylum	Arthropoda
Order	Calanoida
Family	Calanidae

Size
Male: 1.6-2.35 mm

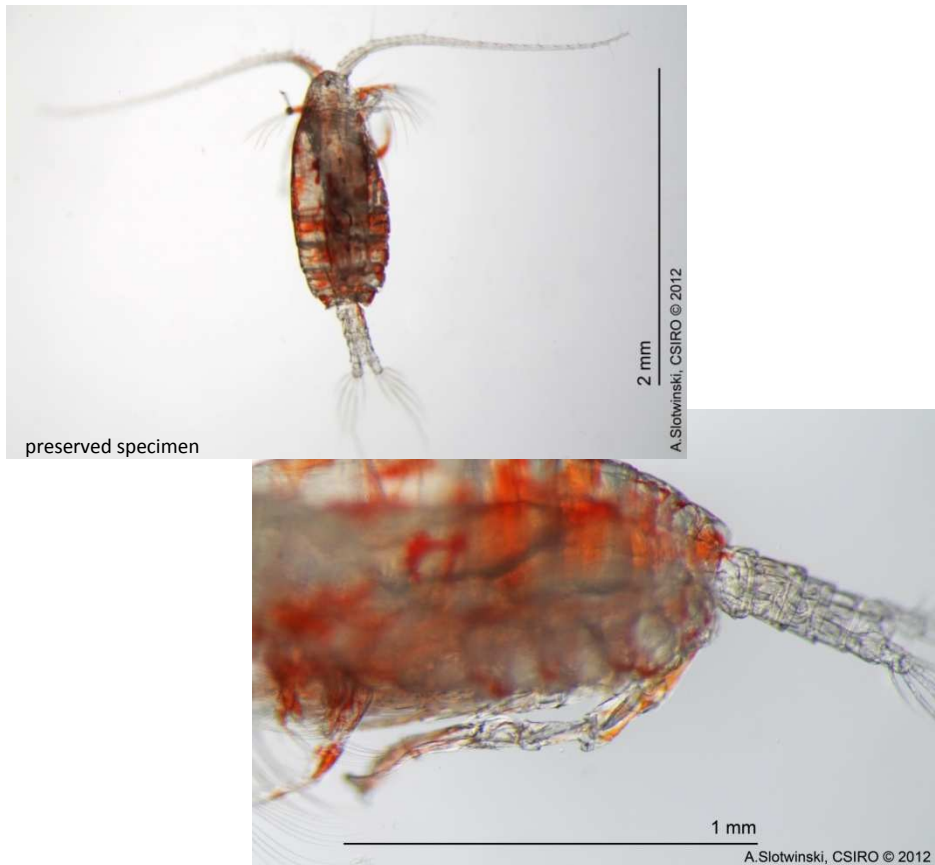
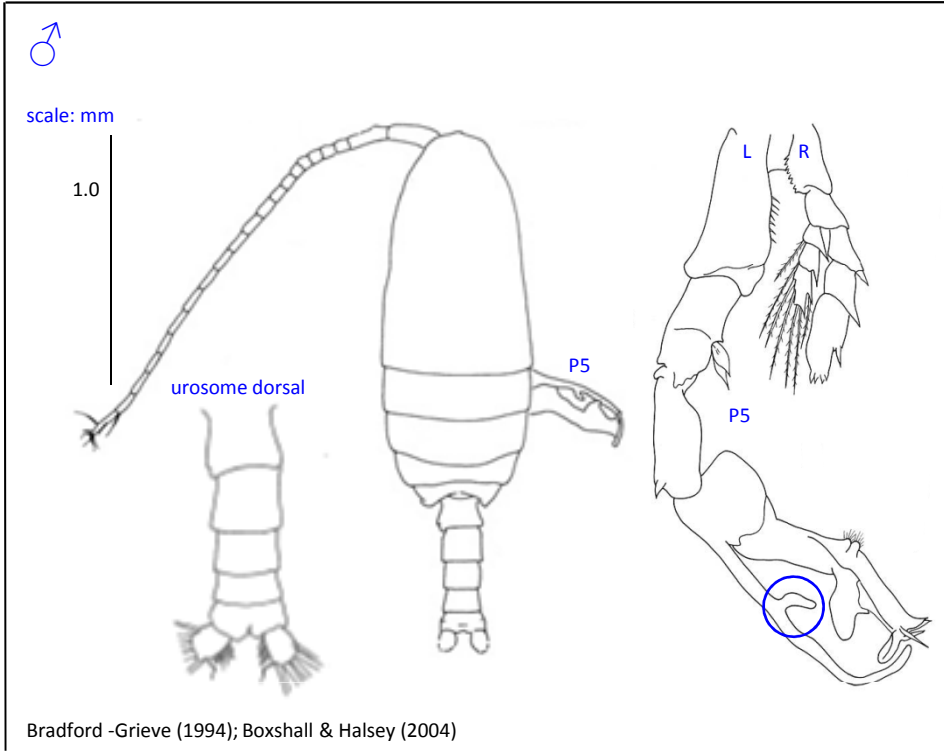
Male

- P5 extremely large and very asymmetrical, left exopod highly modified, right leg not modified
- Tooth on inner edge of external spine of left P5 is placed about 1/3 of length from the from base of the spine

Source

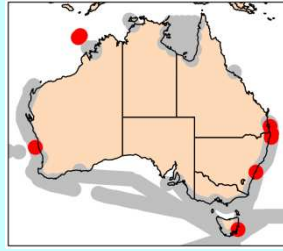
Boxshall & Halsey (2004)
Bradford-Grieve (1994)
Chiba (1953)
Conway (2003)
Dakin & Colefax (1940)
Grice (1961)
Razouls et al. (2012)

Full reference available at
<http://www.imas.utas.edu.au/zooplankton/reference>



Mesocalanus tenuicornis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Calanus tenuicornis Dana, 1849

Size

Female: 1.80-2.40 mm

Genus notes

- Cephalosome and pedigerous somite 1 separate
- A1 elongated
- Maxillae with 6 setae on inner lobe 1
- P1-P4 without modification or ornamentation
- Smooth inner margin of P5 coxa in both sexes
- Female P5 endopod with 7 setae
- Male P5 with both rami 3-segmented, endopods with 7 setae

Female

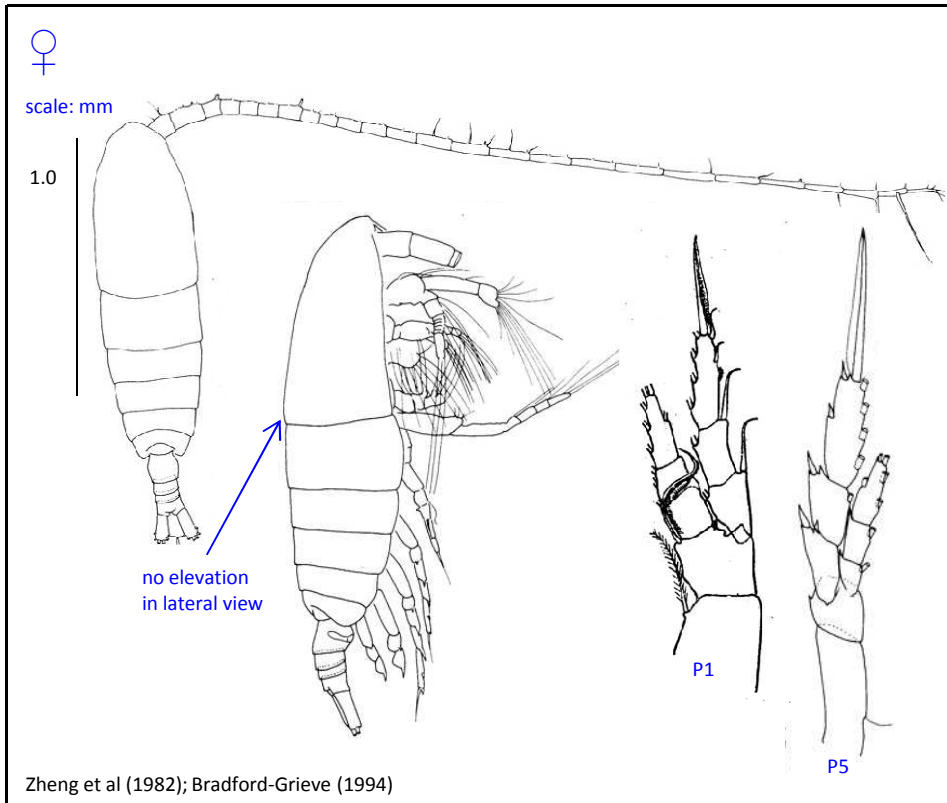
- A1 around twice length of prosome
- Width to length ratio of pedigerous somites is equal or greater than 0.3
- Posterior margin of cephalosome not elevated in lateral view
- Urosome somite 2 about 1.25 x longer than somite 3

Distribution

- Epi-, meso- and bathypelagic
- Cosmopolitan
- Pacific, Indian and Atlantic
- Tropical, subtropical and temperate; possibly into subantarctic

Ecology

- Fine particle feeders, probably omnivorous
- Eggs released into water column
- Up to 3 generations per year
- Has been observed in Alaskan waters, so broad temperature (and possibly salinity) tolerance



Zheng et al (1982); Bradford-Grieve (1994)



preserved specimen

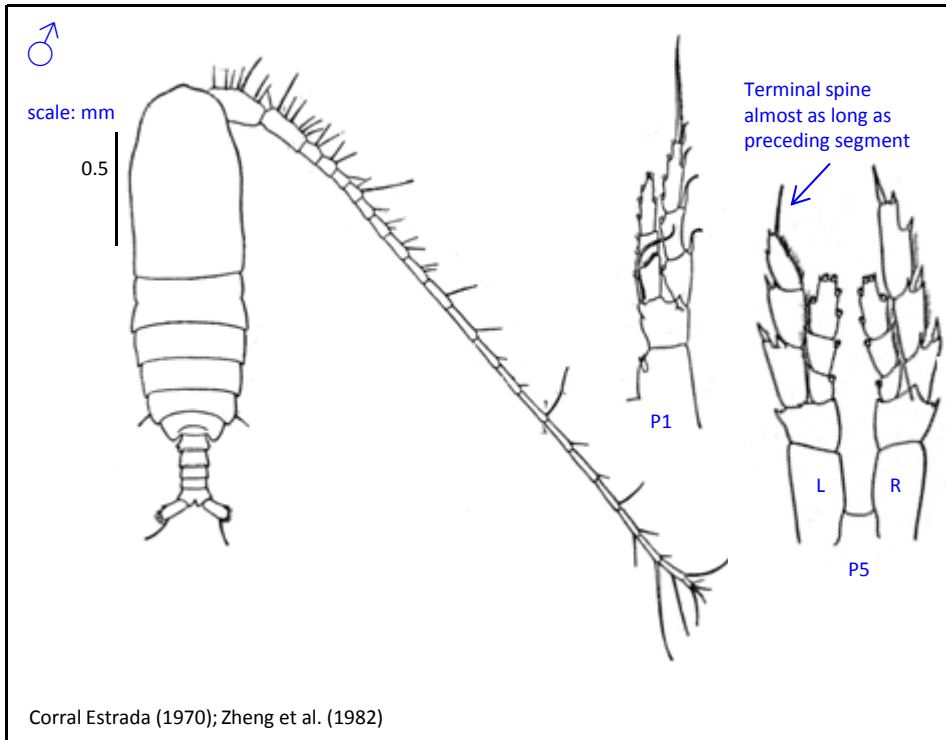
CSIRO AusCPR



Mesocalanus tenuicornis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 1.70-2.20mm

Male

- A1 around twice as long as prosome
- P5 only slightly asymmetric
- Left P5 terminal spine of exopod segment 3 almost as long as it's segment when measured along the outer border

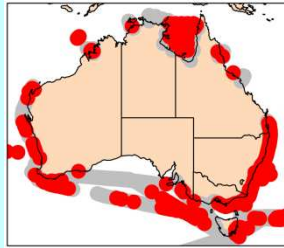
Source

Boxshall & Halsey (2004)
Bradford-Grieve (1994)
Bradford-Grieve & Markhaseva (1999)
Conway (2003)
Cooney & Coyle (1985)
Corral Estrada (1970)
Razouls et al. (2012)
Shmeleva & Kovalev (1974)
Zheng et al. (1982)

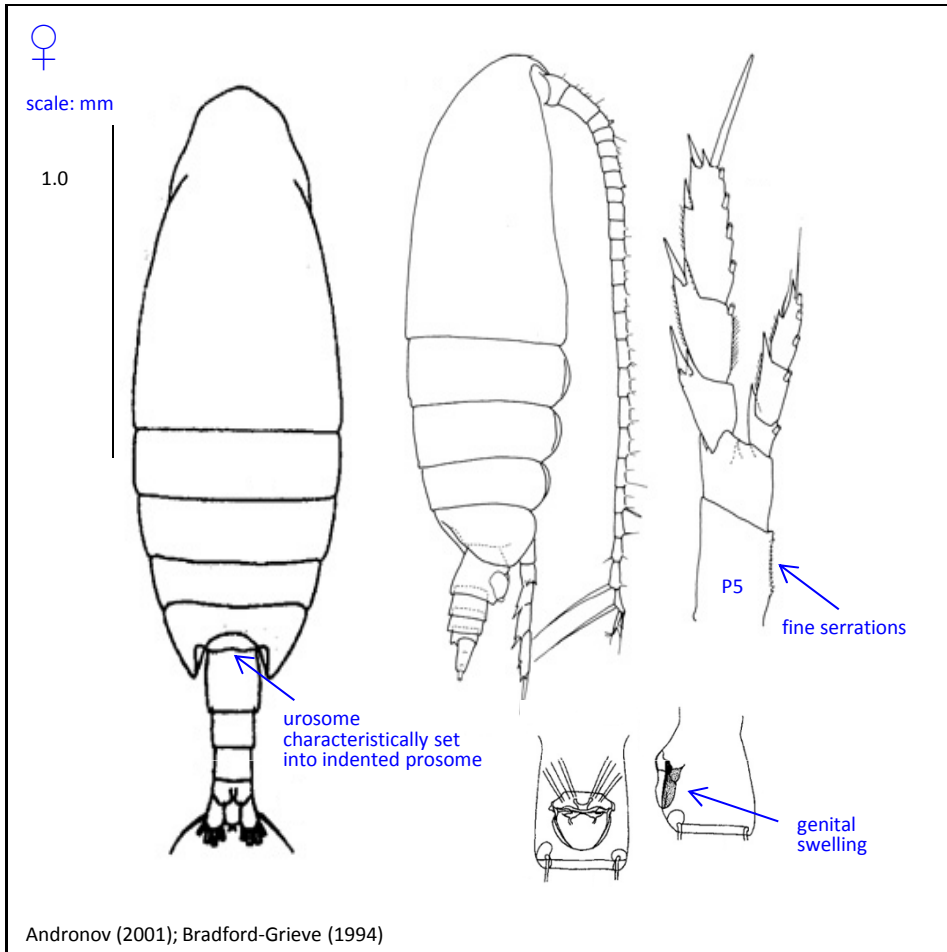
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Nannocalanus minor

(Claus, 1863)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Synonyms

- Cetochilus minor* Claus, 1863
- Calanus minor* (Claus, 1863)
- Canthocalanus minor* (Claus, 1863)
- Canthocalanus minor minor* (Claus, 1863)
- Calanus valgus* Brady, 1883
- Calanus caroli* Giesbrecht, 1888
- Cosmocalanus caroli* (Giesbrecht, 1888)
- Undinula darwinii caroli* Giesbrecht, 1888
- Canthocalanus minor major* Sewell, 1929
- Nannocalanus minor major* Sewell, 1929

Size

Female: 1.45-2.40 mm

Genus notes

- Cephalosome and pedigerous somite 1 fused
- In fresh specimens edges of prosome somites may be tinged red
- Fine serrations on inner margin of P5 coxa in both sexes
- Male right P5 like other swimming legs, setae on inner border of the exopod
- Male P5 left endopod without setae, left exopod with outer edge spines greatly elongated
- Right and left spermathecae fused on female

Female

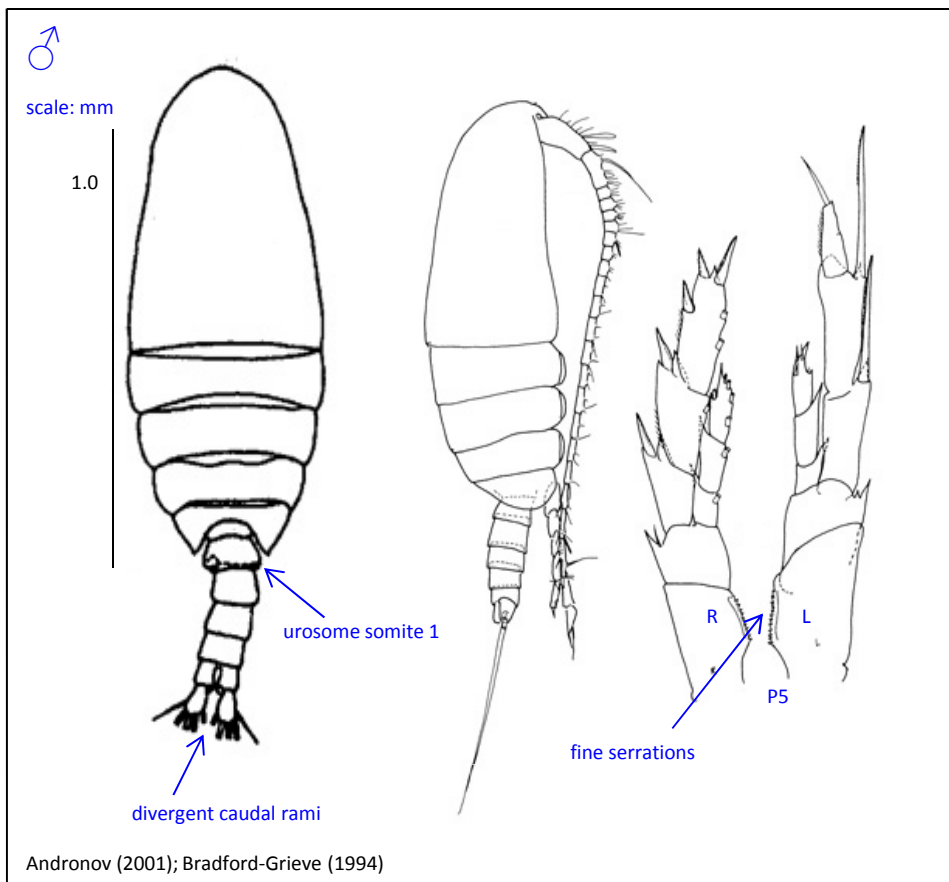
- A1 does not reach to end of urosome
- Rounded last prosome somite extending ½ way down genital somite leaving short, stubby urosome characteristically inset into prosome
- Obvious genital swelling bulging when viewed from side, with small projection low on surface
- May be confused with *Calanus australis*. *C. australis* differs as it is bigger, has 5 prosome somites, and the prosome indent is not obvious
- May be confused with *Canthocalanus pauper*. *C. pauper* has no serrations on inner margin of P5 coxa



Nannocalanus minor

(Claus, 1863)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size
 Male: 1.17-2.01 mm

Male

- A1 reaches just past urosome
- P5 slightly asymmetric
- Asymmetrical urosome somite 1
- Caudal rami divergent in dorsal view

Distribution

- Epipelagic – mesopelagic
- Widespread oceanic
- Subtropical and tropical oceans
- Temperate coastal regions

Ecology

- Omnivorous, feeding on fine particles
- Capable of responding very quickly when productivity in coastal waters increases, and moves inshore and undergoes rapid population expansion
- Continuous reproduction, can produce 2 – 5 generations year⁻¹

Source

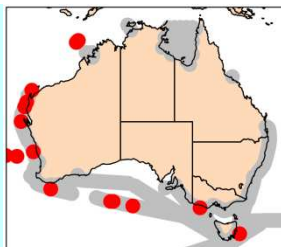
- Andronov (2001)
 Bradford-Grieve & Markhaseva (1999)
 Boxshall and Halsey (2004)
 Bradford-Grieve (1994)
 Conway *et al.* (2003)
 Mauchline (1998)
 Taw (1978)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

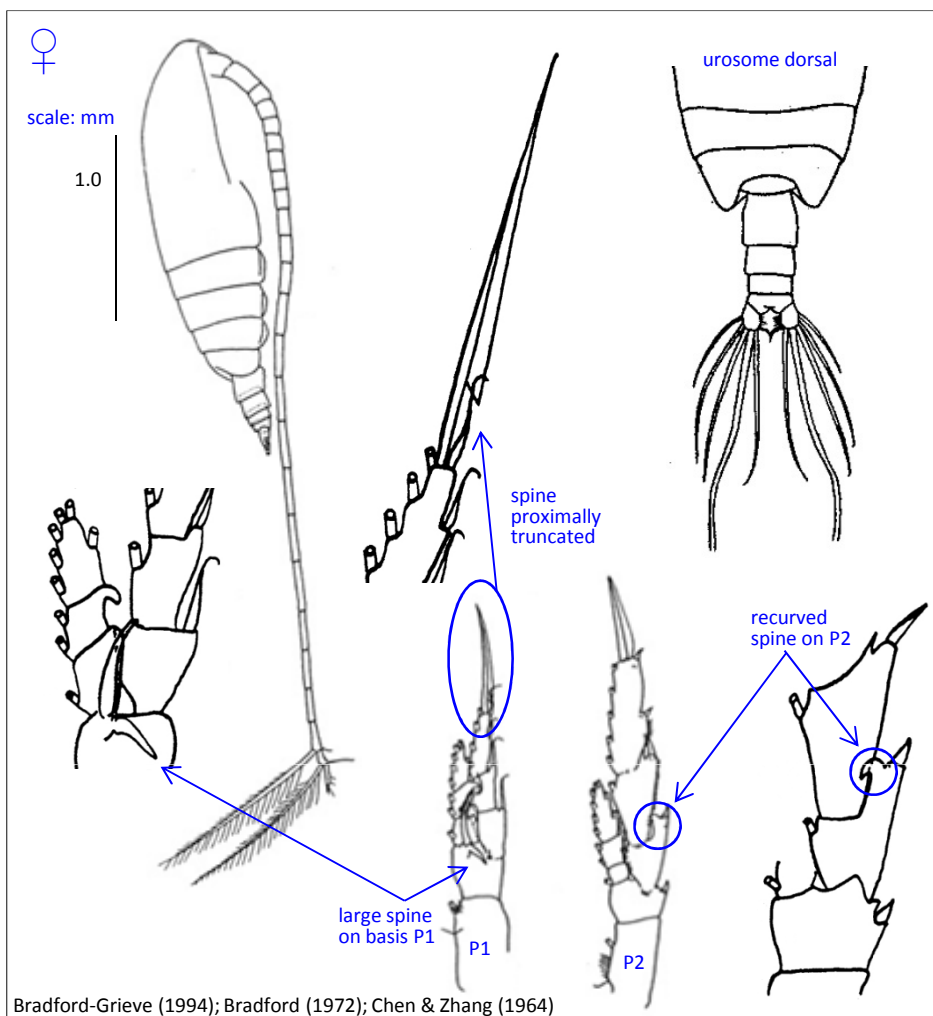


Neocalanus gracilis

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Bradford-Grieve (1994); Bradford (1972); Chen & Zhang (1964)

Synonyms

Calanus gracilis Dana, 1849

Size

Female: 2.4-4.0 mm

Genus notes

- Cephalosome and pedigerous somite 1 usually fused in female, separate in male
- P2 in both sexes with a recurved spine at the outer distal border of exopodite segment 1
- Coxa of P5 inner border without serrations in both sexes
- Male leg 5 with both exopodite and endopodite 3-segmented; left leg modified, endopodite usually with 8 setae; right leg unmodified or with inner edge setae of exopodite absent

Female

- Cephalosome and pedigerous somite 1 fused
- Basis of P1 with large spine at base of inner setae
- P1 terminal exopod setae with a proximally truncate external blade

Distribution

- Epi-, meso- and bathypelagic
- Cosmopolitan in temperate, subtropical and tropical water

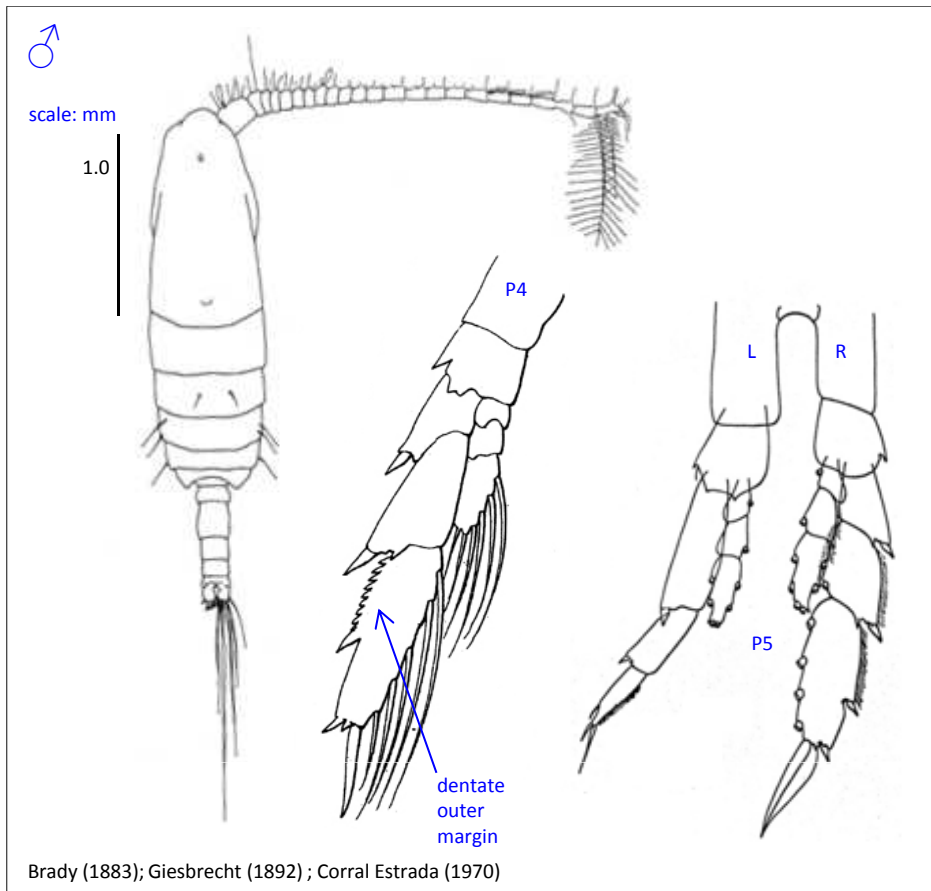
Ecology

- Fine particle feeders, probably omnivorous
- Reproduction might occur at mesopelagic depths
- Multiple generations per year

Neocalanus gracilis

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 2.3 – 3.1 mm

Male

- Cephalosome and pedigerous somite 1 fused
- P2-4 distal exopod segments with dentate outer margins
- P5 right distal exopod segment with setae on the inner border

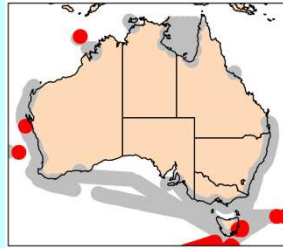
Source

Boxshall & Halsey (2004)
Bradford (1972)
Bradford-Grieve (1994)
Brady (1883)
Chen & Zhang (1964)
Corral Estrada (1970)
Giesbrecht (1892)
Razouls et al. (2012)
Shmeleva & Kovalev (1974)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Neocalanus tonsus

(Brady, 1883)



Phylum Arthropoda
Order Calanoida
Family Calanidae

Synonyms

Calanus tonsus Brady, 1883

Size

Female: 3.3-4.1 mm

Genus notes

- Cephalosome and pedigerous somite 1 usually fused in female, separate in male
- Swimming leg 2 in both sexes with a recurved spine at the outer distal border or exopodite segment 1
- Coxa of P5 inner border without serrations in both sexes
- Male leg 5 with both exopodite and endopodite 3-segmented; left leg modified, endopodite usually with 8 setae; right leg unmodified or with inner edge setae of exopodite absent

Female

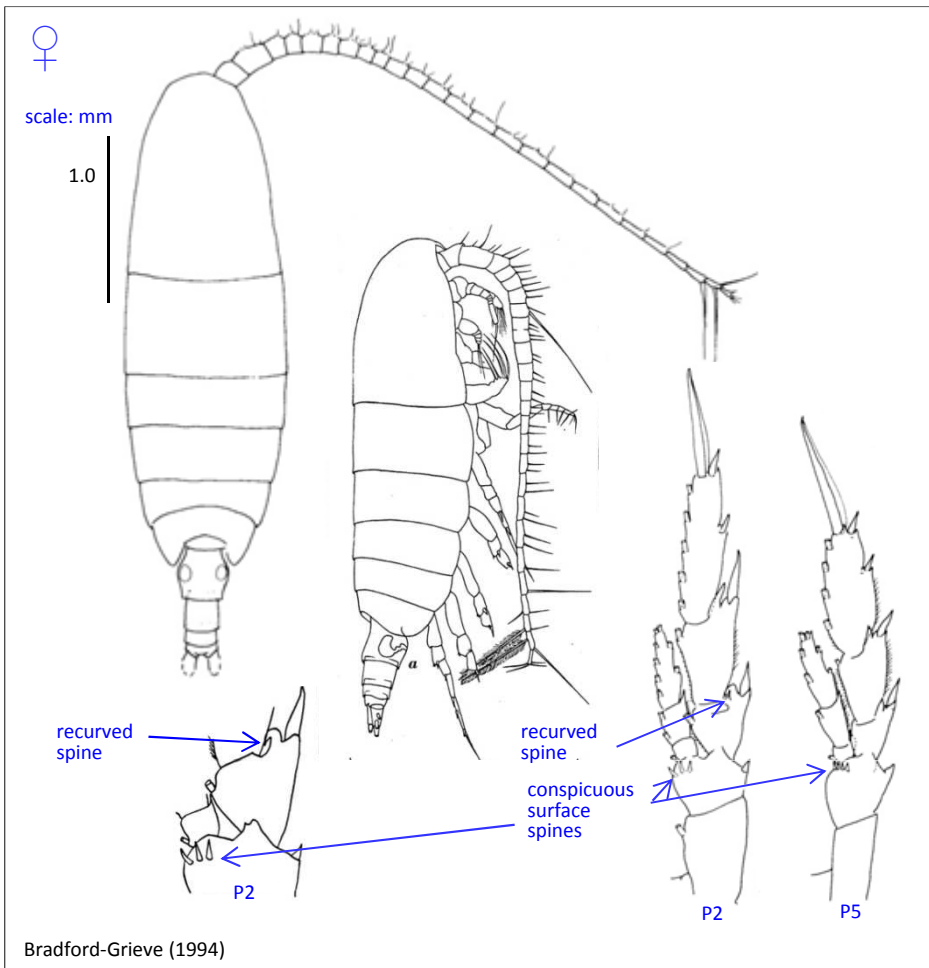
- Cephalosome and pedigerous somite 1 separate but not as distinctly as joints between other pedigerous somites
- Basis of P1 without large spine at base of inner setae
- Basis of P2 to P5 with conspicuous posterior surface spines on inner distal border of segment
- Genital segment bulbous at mid length in dorsal view

Distribution

- Subantarctic and Antarctic (but not coastal Antarctic)
- Indian, Pacific and Atlantic
- Occasionally take north of Sub Tropical Convergence in deep water

Ecology

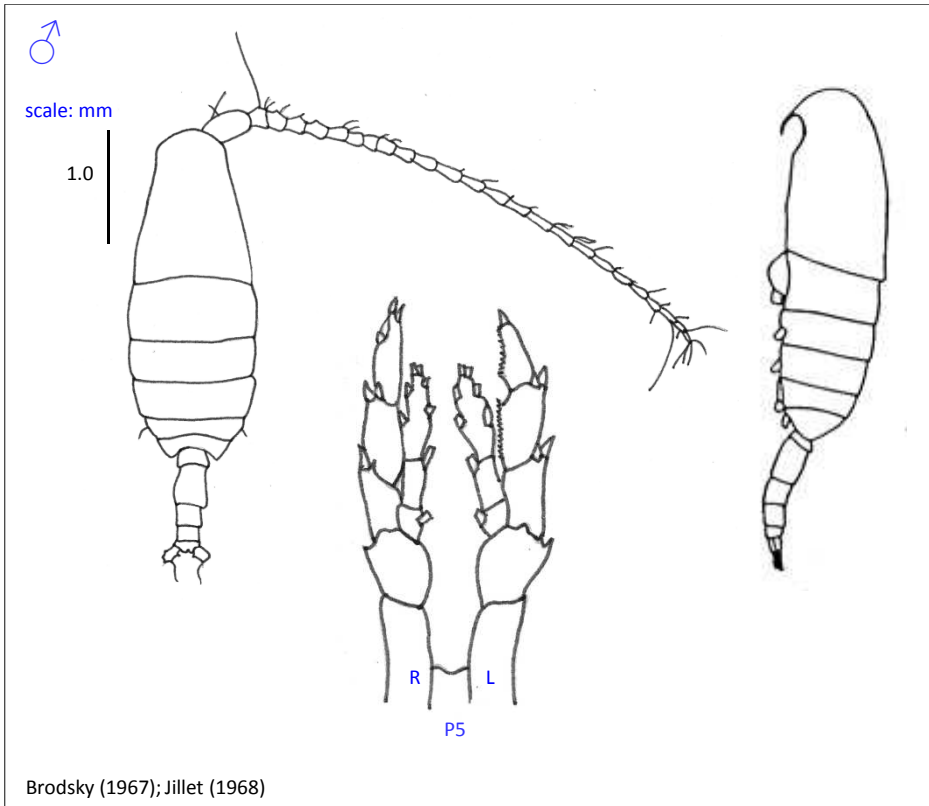
- Reproduction might occur at mesopelagic depths
- Fine particle feeder, probably omnivorous
- Ingests up to 3.8% of body carbon and 5.7% of nitrogen per day
- Can form surface aggregations up to several 100 metres in length
- Undertakes ontogenetic vertical migrations
- Eggs released into water column; produces up to 450 eggs per female
- Two egg production strategies: Mesopelagic-dwelling females use stored lipids for egg production in winter, and epipelagic dwelling females rely on ambient food supply for egg production in spring



Neocalanus tonsus

(Brady, 1883)

Phylum Arthropoda
Order Calanoida
Family Calanidae



Size

Male: 3.3 – 4.4 mm

Male

- Cephalosome and pedigerous somite 1 separate
- 5th leg only slightly asymmetrical, exopods without inner edge setae

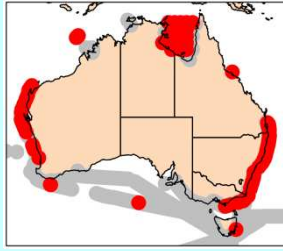
Source

Boxshall & Halsey (2004)
Bradford-Grieve & Markhaseva (1999)
Bradford-Grieve (1994)
Brodsky (1967)
Jillet (1968)
Kawamura (1974)
Ohman (1987)
Razouls et al. (2012)
Taw (1978)

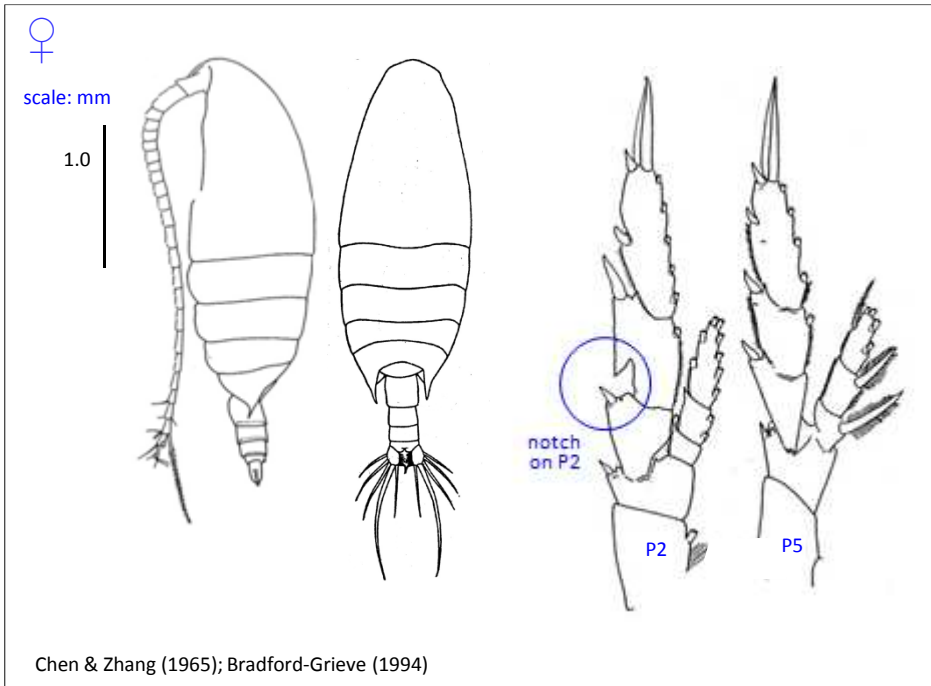
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Undinula vulgaris

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Calanidae



Chen & Zhang (1965); Bradford-Grieve (1994)

Synonyms

- Cleanups orientalis* Marukawa, 1908
- Calanus vulgaris* Dana, 1849
- Undinula vulgaris giesbrechti* Sewell, 1914
- Undinula vulgaris major* Wickstead, 1963
- Undinula vulgaris minor* Wickstead, 1963
- Undinula vulgaris typica* Sewell, 1929
- Undinula vulgaris zeylanica* Sewell, 1914

Size

Female: 2.25 – 3.25 mm

Genus notes

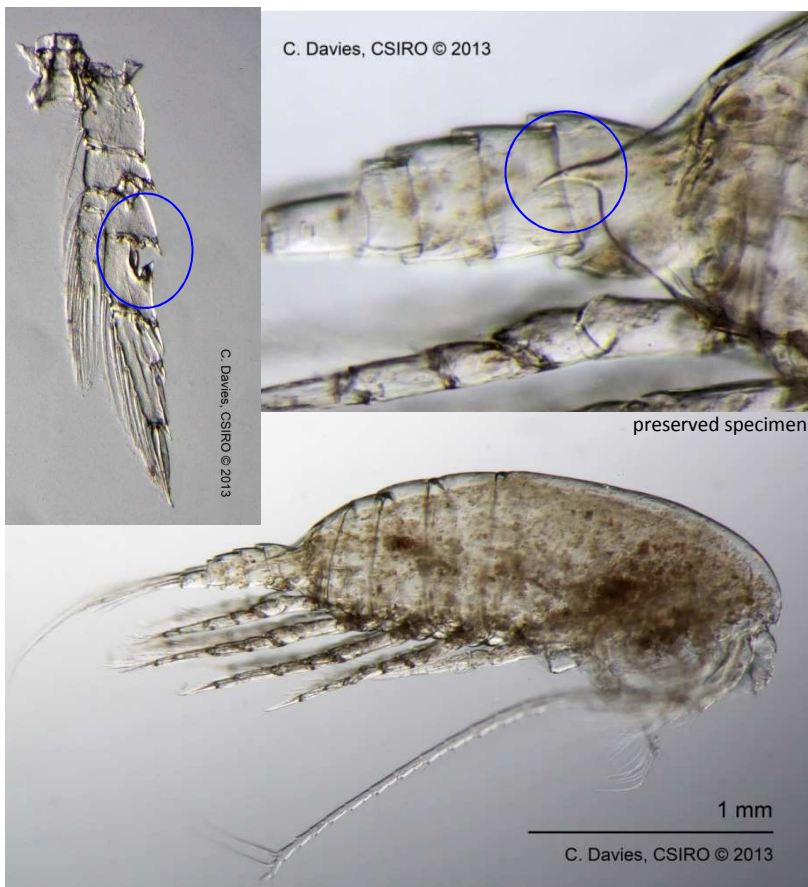
- Cephalosome and pedigerous somite 1 fused
- Posterior corners of pedigerous somite 5 extend into 1 or 2 points in female
- P2 has notch on external margin on 2nd segment of exopodite
- P5 B2 with inner border naked, no serrations
- Male left P5 highly modified; outer edge spines of exopod segments 1-2 very elongate and segment 3 very modified; endopod absent
- Male right P5 both rami 3 segmented, endopod with reduced setation, exopod segment 2 with outer distal border elongate extending as far as first outer spine of segment 3
- Genus is monotypic

Female

- Prosome corners are prolonged into a claw like spine (may have 2 spines on either side of prosome)
- 5 swimming legs, similar size and structure
- A1 reaches to end of urosome

Distribution

Ecology



C. Davies, CSIRO © 2013

preserved specimen

C. Davies, CSIRO © 2013

Undinula vulgaris

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Calanidae

Size

Male: 2.04 – 2.5 mm

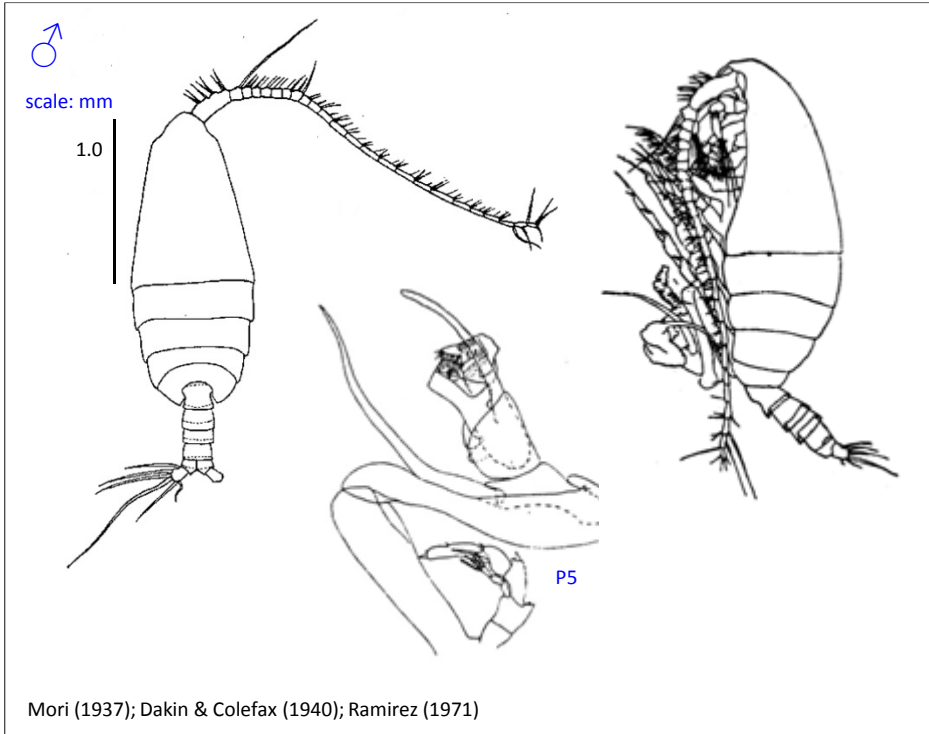
Male

- Large, left P5, extremely modified, very asymmetric, no serrations on internal margin of coxa, no endopodite and large spines on exopod segments 1 & 2 and a 'wrinkled trunk' structure on the end of the limb
- Right P5 tiny and with endopod

Source

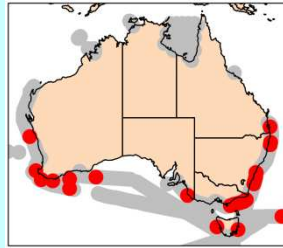
Bradford-Grieve (1994)
Conway (2003)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Candacia bipinnata

(Giesbrecht, 1889)



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

Candace bipinnata Giesbrecht, 1889

Size

Female: 2.35 - 2.50 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

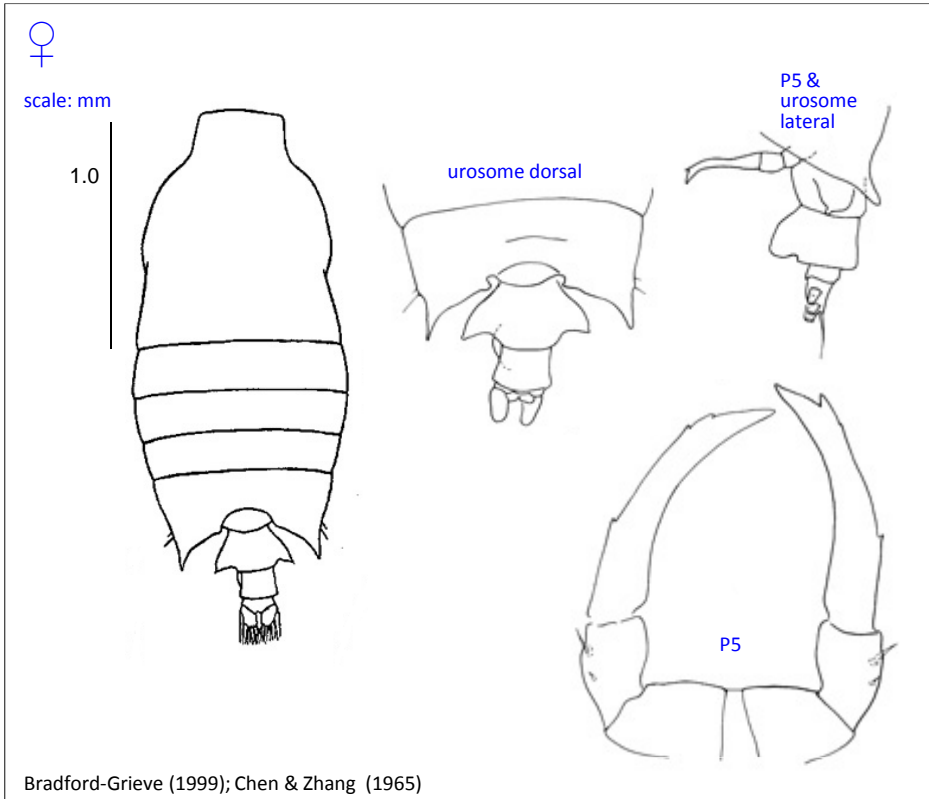
- Posterior prosome corners extended into symmetrical points
- Genital somite large with triangular lateral extension on each side
- Lamella on ventral surface of urosome somite 2
- P5 asymmetrical and terminated in obtuse point and some miniscule outer edge spines

Distribution

- Epipelagic; mesopelagic
- Mainly open ocean; occasionally coastal
- Widespread in tropical, subtropical and temperate waters
- Pacific and Indian Oceans and Atlantic Oceans

Ecology

- Can live in the neuston
- Maxillae suited to grasping and piercing prey
- Feed selectively on larvaceans and other gelatinous zooplankton



Bradford-Grieve (1999); Chen & Zhang (1965)



CSIRO AusCPR

Candacia bipinnata

(Giesbrecht, 1889)

Phylum Arthropoda
Order Calanoida
Family Candaciidae

Size

Male: 2.35 mm

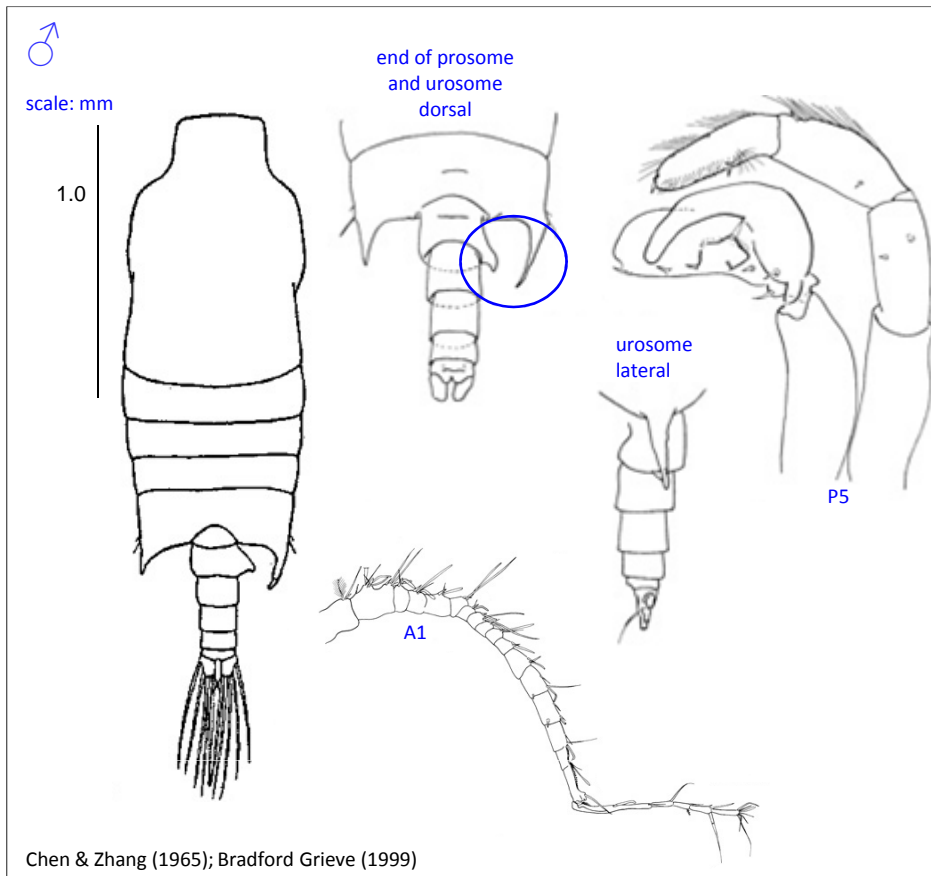
Male

- Rostrum platelike and strong with rounded points
- Right A1 geniculate, with serrations on section 18, segments 2-3 fused, segments 17-18 separate, segments 19-20 fused
- In lateral view distal end of posterior prosome is truncate, tip of process reaches beyond posterior end of genital somite
- Posterior prosome and genital somite asymmetrical with pointed extensions on the right, both extending posteriorly
- Right P5 chelate, left with hairs and a single, tiny terminal spine

Source

Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen and Zhang (1965)
 Hattori et al. (1983)
 Ohtsuka & Onbé (1989)
 Razouls et al. (2010)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)



Chen & Zhang (1965); Bradford Grieve (1999)

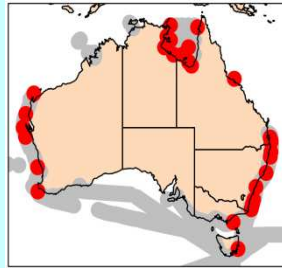
preserved specimen



CSIRO AusCPR

Candacia bradyi

Scott A., 1902



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

None

Size

Female: 1.4 - 2.1 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

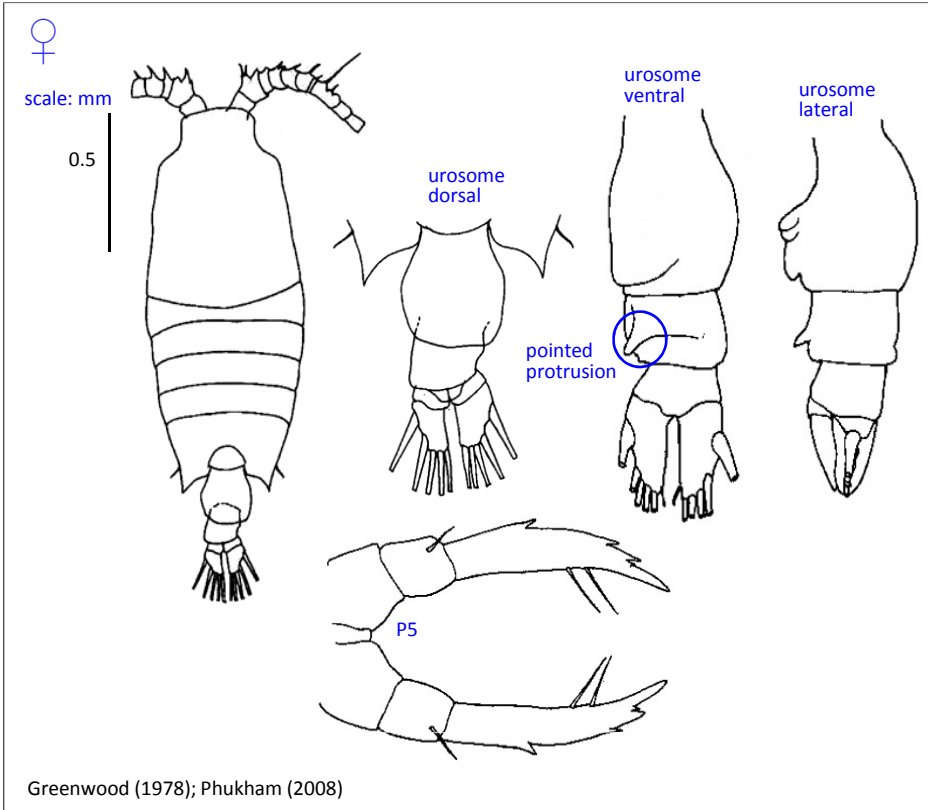
- Posterior prosome somite corners each end in a short spine
- P1 with 1-segmented endopod
- P5 segment 3 curved slightly inwards, with 2 setae on inner margin and three spines on distal outer edge. These spines are blunt and pigmented on the left and sharp and non-pigmented on the right
- Genital somite broad and almost symmetrical in dorsal view, with slight protrusion on right side
- Urosome somite 2 has a pointed protrusion, half the length of genital somite, on the mid ventral surface
- Caudal rami twice as long as wide, slightly asymmetrical, the right wider than the left

Distribution

- Epipelagic; open ocean
- Temperate, tropical and subtropical
- Indian and Pacific Oceans; not Atlantic

Ecology

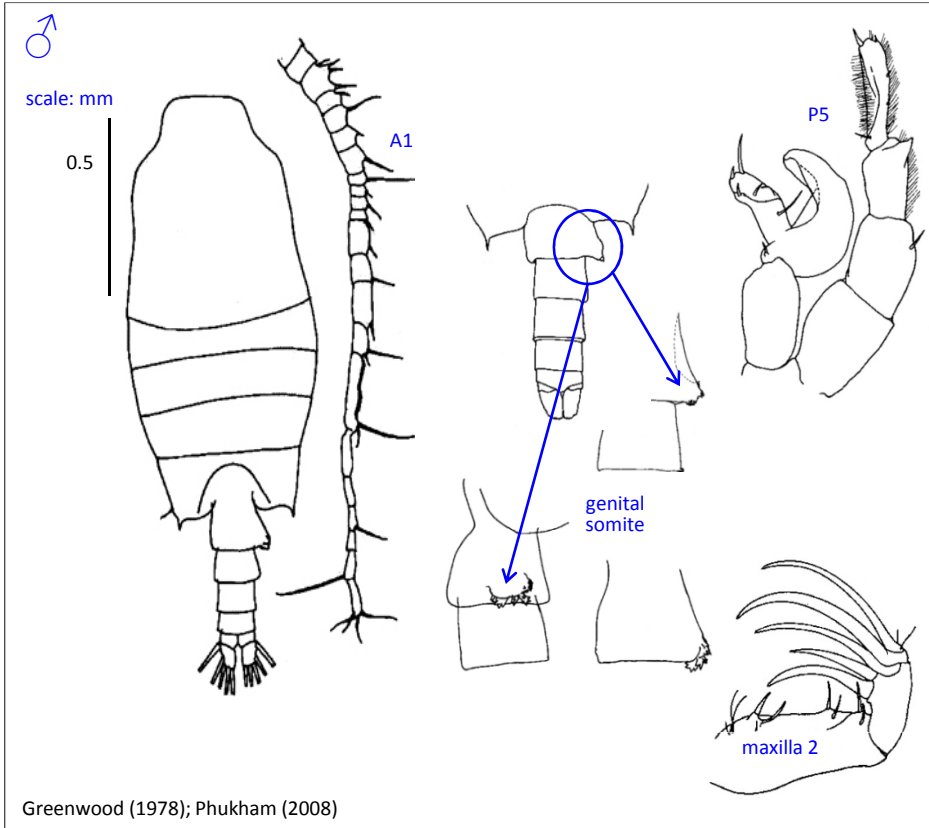
- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item
- Has been observed feeding on *Sagitta*



Candacia bradyi

Scott A., 1902

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size

Male: 1.4 - 1.8 mm

Male

- A1 23-segmented, extends to posterior border of prosome
- Posterior prosome symmetrical, tip of right process does not reach beyond mid point of genital somite
- P2-4 terminal spines are more than half the length of its segment
- Left P5 segment 3 is produced at outer distal angle into a short, stout, pigmented tooth-like process, which is divided into 3 blunt points, segment 4 is elongated and narrow with 3 small terminal spines
- Genital somite produced into a small toothed process on right side
- Urosome somite 2 with patch of small spines near posterior end

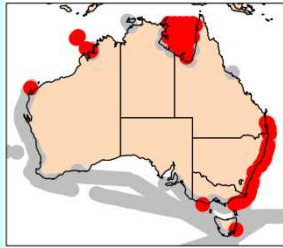
Source

Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Conway (2003)
 Greenwood (1978)
 Phukham (2008)
 Razouls et al. (2010)
 Wickstead (1959)

(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia catula

(Giesbrecht, 1889)



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

Candace catula Giesbrecht, 1889

Size

Female: 1.4 - 1.67 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

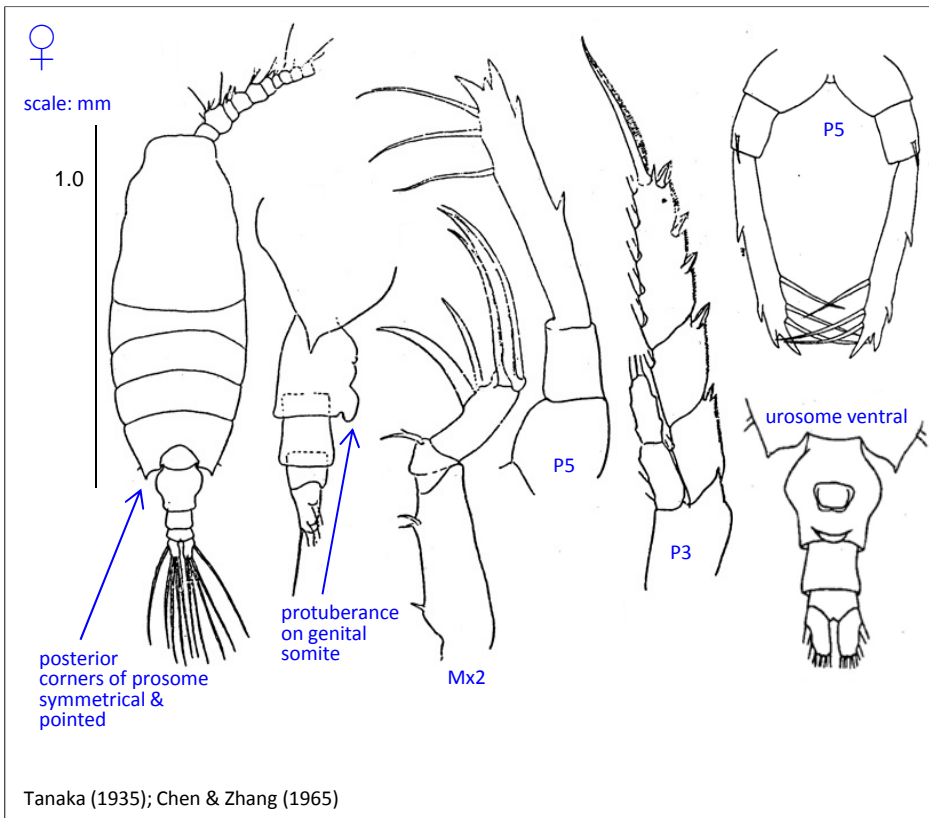
- A1 23-segmented, with proximal 6 segments swollen
- Posterior prosome symmetrical and pointed
- P2-4 exopod terminal spine more than half the length of the segment
- P5 symmetrical, segment 3 long with 2 outer marginal spines and 3 inner marginal setae; apex with 3 teeth
- Genital somite symmetrical with both sides swollen, no spines or processes but with a backward projecting protuberance on the ventral surface
- Caudal rami nearly twice as long as wide

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; more recently recorded from the Atlantic

Ecology

- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item



Tanaka (1935); Chen & Zhang (1965)

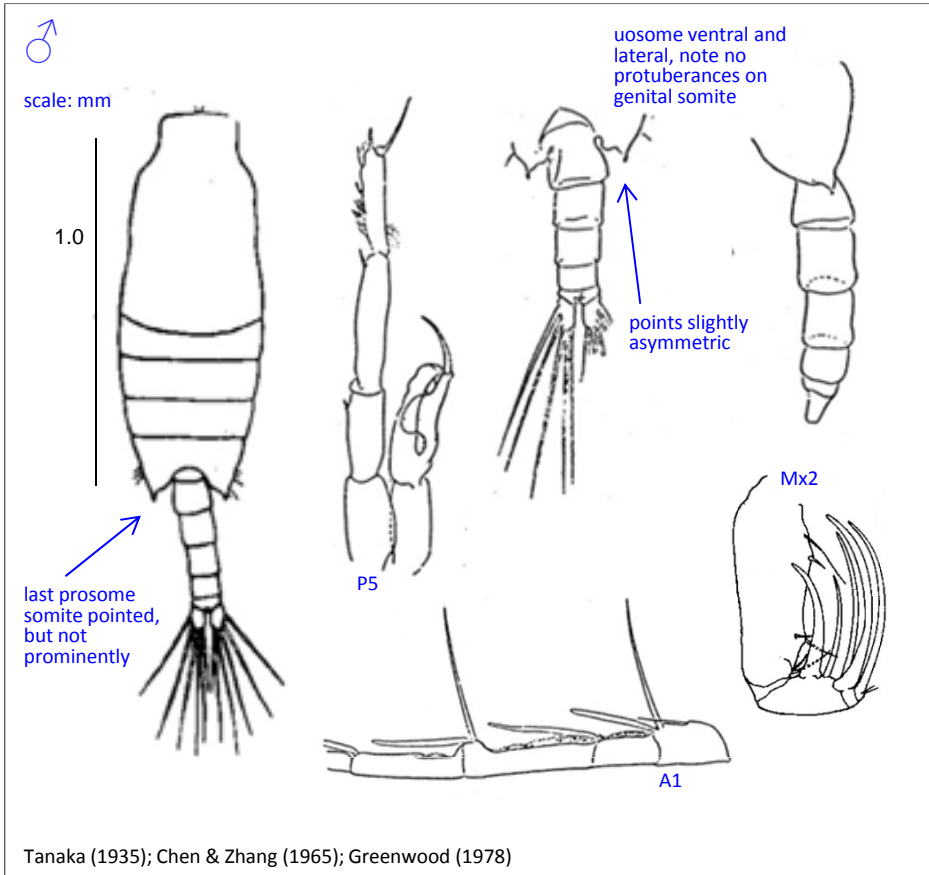


CSIRO AusCPR

Candacia catula

(Giesbrecht, 1889)

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size

Male: 1.3 - 1.62 mm

Male

- Right A1 geniculate with 6 terminal segments
- Last prosome somite pointed, but not prominently
- Points are slightly asymmetrical
- P5 chelate on left, segment 3 terminal spine long and curved
- Unusual among *Candacia* males in having no processes or protuberances on the genital somite
- Urosome somite 2 symmetrical

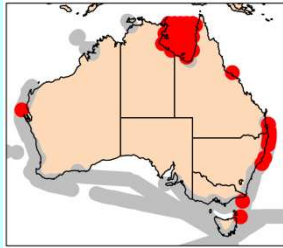
Source

Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen & Zhang (1965)
 Conway (2003)
 Greenwood (1978)
 Razouls et al. (2010)
 Tanaka (1935)

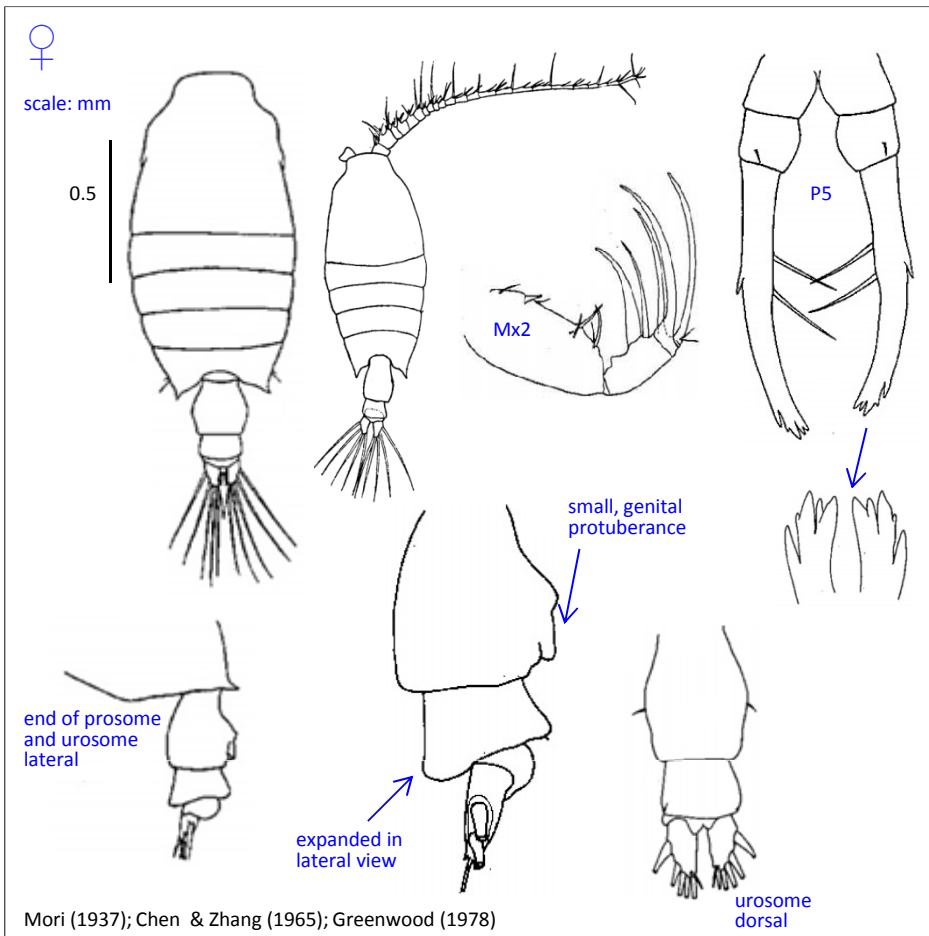
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia discaudata

Scott A., 1909



Phylum Arthropoda
Order Calanioda
Family Candaciidae



Mori (1937); Chen & Zhang (1965); Greenwood (1978)

Synonyms
None

Size
Female: 1.55 – 1.94 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- A1 23-segmented and extends to middle of genital somite
- Posterior prosome points symmetrical, projected slightly forward
- P2-4 exopod segment 3 spines more than half length of terminal segment
- P5 asymmetrical, apex of segment 3 produced into 3 closely set teeth, outer margin with 2 small spines, 2 moderately long setae on inner margin
- Genital somite slightly asymmetrical dorsally, no lateral protrusions, short setae on each side; small protuberance on the front
- Second urosome somite is expanded in lateral view
- Anal somite short and asymmetrical

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; probably not Atlantic

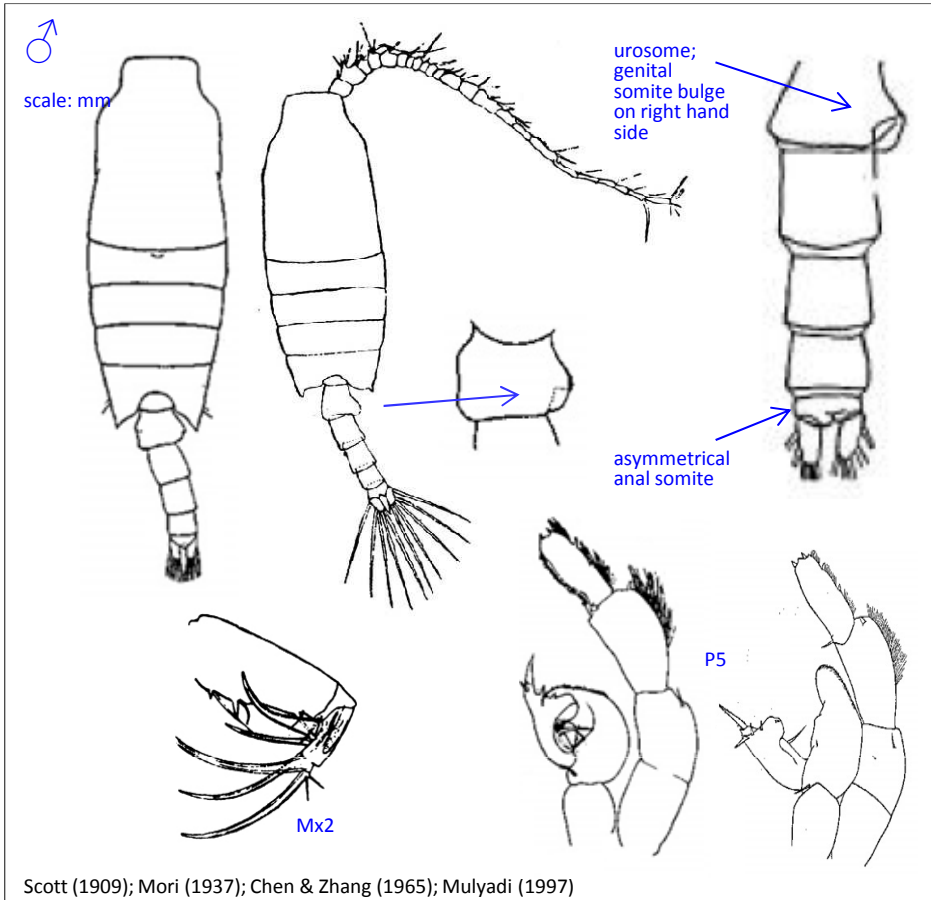
Ecology

- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item

Candacia discaudata

Scott A., 1909

Phylum Arthropoda
Order Calanioda
Family Candaciidae



Size
 Male: 1.48 – 1.82 mm

Male

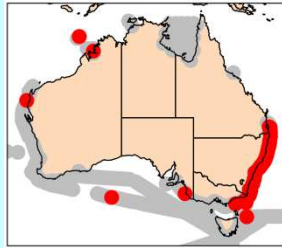
- Right A1 geniculate, outer margin of segments 16-18 with pigmented teeth
- P5 left segments moderately long and broad, segment 4 with 2 small outer edge spines and 2 small apical spines
- P5 right segment 3 has a large projection near distal end of inner margin
- Genital somite asymmetrical, with bulges on right hand side
- Viewed from the right the inflated region bears a small tooth at each end
- Anal somite is asymmetrical

Source

Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen and Zhang (1965)
 Conway (2003)
 Mori (1937)
 Mulyadi (1997)
 Razouls et al. (2010)
 Scott (1909)
 (Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia ethiopica

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Candaciidae

Synonyms

Candace ethiopica Dana, 1849
Candace ethiopica Dana, 1849
Candacia ethiopica (Dana, 1849)

Size

Female: 1.97-3.03 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

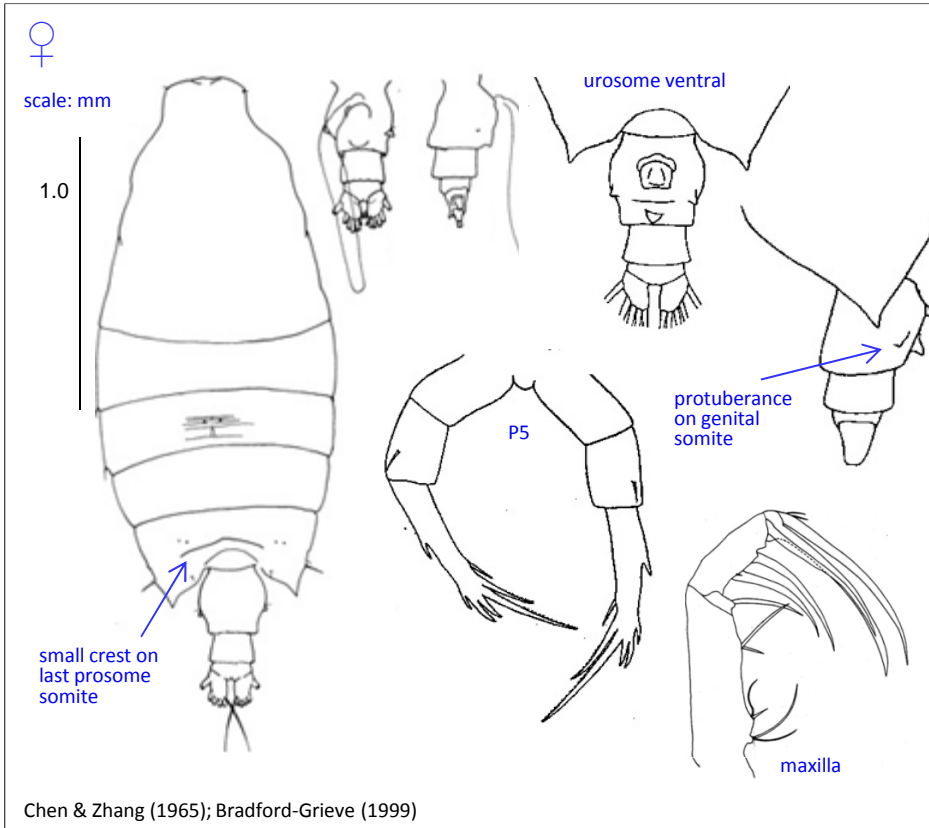
- Prosome can be darkly pigmented
- Posterior prosome corners point
- Small crest on last prosome somite (also in other *Candacia* spp.)
- P5 segment 3 with 3 inner edge setae; distal 2 setae are coarse and of unequal length; segment 3 with 7 spines in total
- Genital somite asymmetrical, prolonged on left
- In lateral view genital somite has a small ventral spiny protuberance

Distribution

- Epipelagic; mesopelagic
- Mainly open ocean
- Widespread in tropical, subtropical and temperate waters
- Pacific and Indian Oceans and Atlantic Oceans

Ecology

- Can live in the neuston
- Specialised predator, grasping prey with large and robust maxillae
- Larvaceans are major prey item
- Swimming speeds up to 7 mm s⁻¹

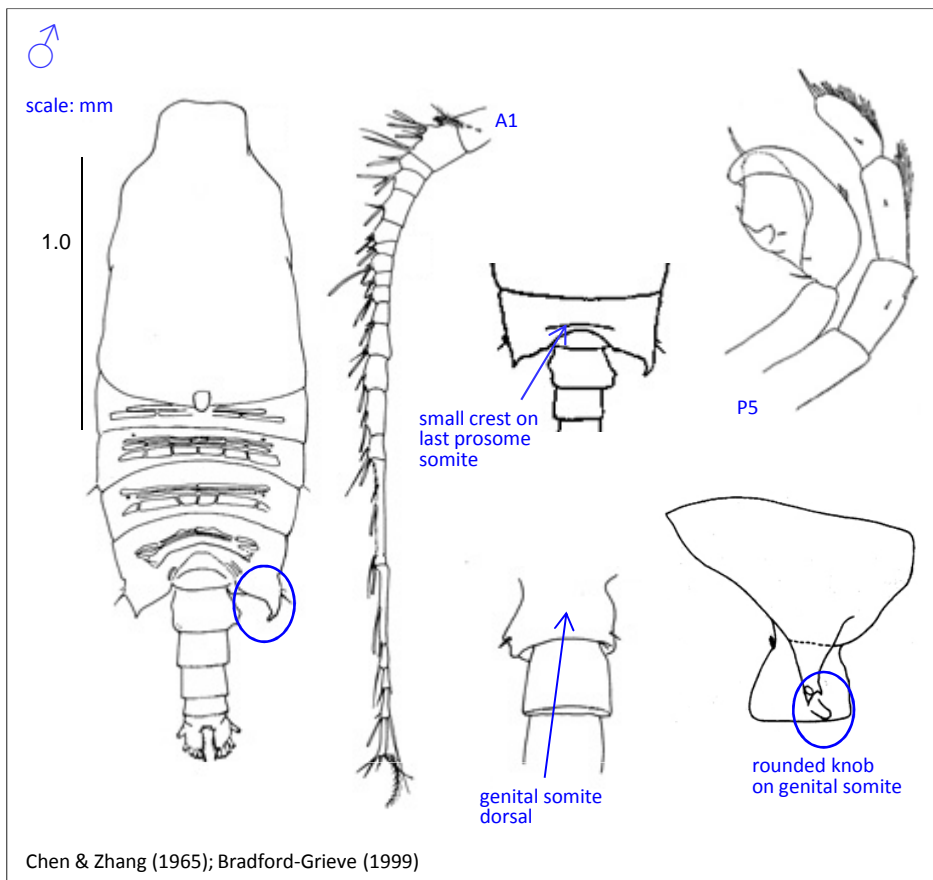


Chen & Zhang (1965); Bradford-Grieve (1999)

Candacia ethiopica

(Dana, 1849)

Phylum Arthropoda
Order Calanoida
Family Candaciidae



Size

Male: 2.00 – 2.93 mm

Male

- Posterior prosome asymmetrical with curved spiny projection on the right side
- Genital somite with 2 triangular processes on right margin, protuberances on one side (a rounded knob and a pointed projection)
- Small crest on last prosome somite (also in other *Candacia* spp.)

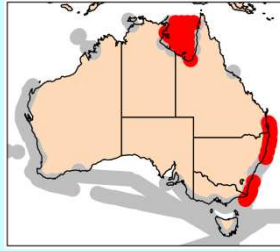
Source

Bradford-Grieve & Markhaseva (1999)
 Boxshall & Halsey (2004)
 Bradford-Grieve (1999)
 Chen & Zhang (1965)
 Conway (2003)
 Hattori et al. (1983)
 Razouls et al. (2010)
 Woodson et al. (2005)

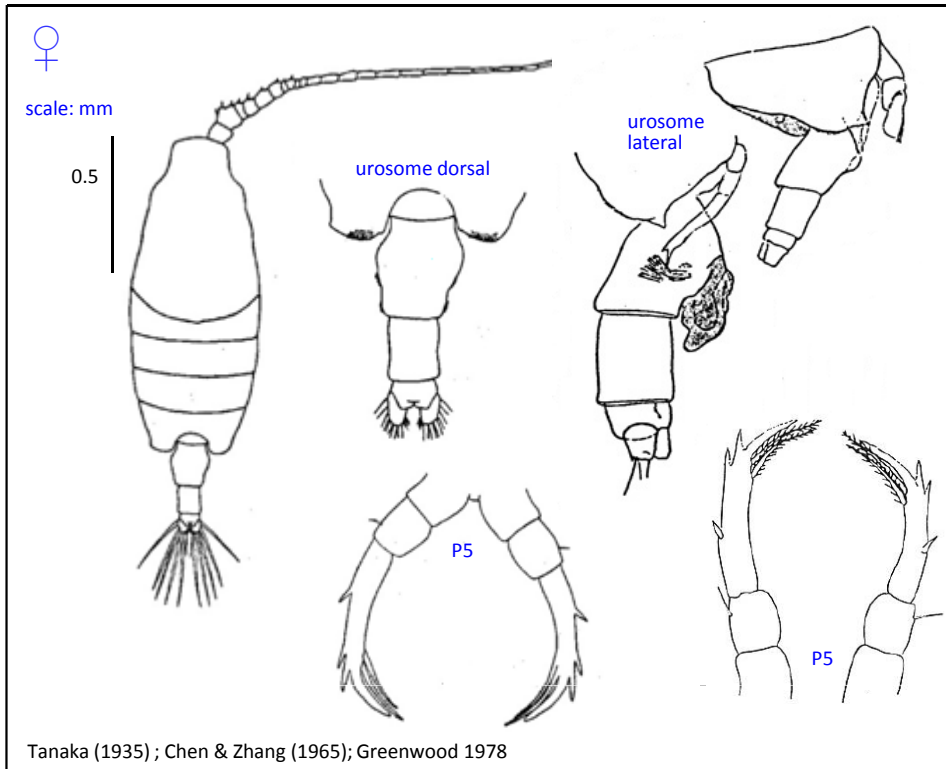
(Full reference available at <http://www.imas.utas.edu.au/zooplankton/references>)

Candacia truncata

(Dana, 1849)



Phylum Arthropoda
Order Calanoida
Family Candaciidae



Synonyms

Candace truncata Dana, 1849
Candacia turgida Wilson C.B., 1950
Paracandacia truncata (Dana, 1849)

Size

Female: 1.84 - 2.10 mm

Genus notes

- Body relatively robust, cephalosome rectangular in dorsal view, gives appearance of 'shoulders'
- May be darkly pigmented
- Cephalosome and pedigerous somite 1 separated, pedigerous somites 4-5 fused and extended into pointed, often asymmetrical processes; rarely rounded
- Right A1 of male with teeth present on one or more segments at the bend in the geniculate region
- Rostrum atrophied
- Female P5 terminal segments with one or more spine processes, a finger-like process or a single long setae; setae may or may not be present on the inner lateral margins
- Male right P5 is chelate or ends in a long feather like seta
- Female urosome 3-segmented, genital somite often spinose or asymmetrical, without seminal receptacles, somite 2 often asymmetrical; male 5-segmented
- Caudal rami short with 6 setae

Female

- A1 23-segmented, proximal 8 segments thickened
- A characteristic square end to the last prosome somite when viewed laterally
- Corners of prosome are pointed & directed forwards, so points not visible in dorsal view
- P5 segment 3 with terminal finger-like processes finely serrated distally; inner margin setae subequal, distal most seta slightly longer than proximal seta
- Urosome symmetrical with no protuberances
- Anal somite short and often fused with caudal rami

Distribution

- Epipelagic; open ocean
- Tropical and subtropical
- Pacific and Indian Oceans; probably not Atlantic

Compiled: C. H. Davies & A. S. Slotwinski 2012
 Verified: K. M. Swadling 2013

