

## Key to the Genera of Phreatoicidea (Crustacea, Isopoda)

George D.F. Wilson, Saugatuck Natural History Laboratory (buzwilson@gmail.com)

### Introduction

This key is for freshwater isopod crustaceans of the suborder Phreatoicidea, which reaches its highest diversity in Australia. Phreatoicideans typically do not appear in samples obtained by typical limnological methods because they either are burrowing in the substrate of spring-fed surface streams or bogs, or are found in springs or in deep underground aquifers. As a result, they are not common in normal limnological surveys. Some groups, such as species in the genus *Paramphisopus*, are exceptions to this rule; these species occur among aquatic plants and rocks in the shallow sublittoral zone of spring-fed coastal lakes in Western Australia.

The group has 6 family-level taxa: Phreatoicidae, Amphisopidae, Phreatoicopsidae (sometimes considered a subfamily of the Amphisopidae), Hypsimetopidae, Ponderellidae and Mesamphisopidae. This key does not use the family classification because getting to the genus-level is quicker if done directly. The first couplet of this key uses the continent of occurrence, which immediately separates out several groups. Moreover, because Phreatoicideans are extremely narrow range endemics as species (Wilson et al., 2009) and the genera have highly restricted distributions, knowing the region where a specimen was collected will immediately restrict the number of potential taxa. Other couplets include the state within Australia owing to the limited distributions of most genera. Several monotypic genera are known from only single localities, such as *Peludo* from Cape le Grande National Park in Western Australia or *Ponderella* from artesian springs in southwest Queensland. At the moment, a key to species would be impractical and probably grossly incomplete because the species-level diversity in several genera like *Eophreatoicus* and *Colubotelson* is much greater than the current classification (Poore et al., 2002) recognises.

Several genera may be revised in the near future. For example, notice that the only differences separating the genera *Colubotelson* and *Metaphreatoicus* is a fairly minor shape variation in the first pleopod. The genus *Phreatoicoides* is well known from many species, but the genus *Hypsimetopus*, the name bearer of its family, remains uncollected, known only from a literature description and may only be another species of *Phreatoicoides*. The key also does not contain the genus *Colacanthotelson* Nicholls, 1944, which is currently unknown owing to the loss of the type specimens and our inability to find anything matching Nicholls' description in the field.

This key was derived from a species-level taxonomic database using the DELTA system (Dallwitz, 1980; Dallwitz et al., 2000), using the DELTA GEITEMS scripts, the KEY program and editing a generic database and the resulting output. Images explaining phreatoicidean morphology can be found at the end of this key.

1. Continent of occurrence
  - Australia..... 2
  - New Zealand..... 22
  - India..... 24
  - South Africa..... **Mesamphisopus Nicholls, 1943**
- 2(1). Eyes present..... 3
  - Eyes vestigial, or absent..... 13

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- 3(2). Pleotelson (in dorsal view) posterolateral margin-  
 -forming rounded process with dorsally projecting setae .....  
 ..... ***Synamphisopus* Nicholls, 1943** (Vic only)  
 -margin forming vertical plate..... 4  
 -forming rounded lobe..... 8  
 -projecting in lateral view but continuous with apex.....  
 ..... ***Ponderella* Wilson & Keable, 2004** (Qld only)  
 -unelaborated..... 10
- 4(3). Pleotelson dorsal surface in lateral view-  
 -evenly curving, not inflected ventrally, without strong bend at level of, or posterior to,  
 insertion of uropods..... 5  
 -inflected ventrally, posterior to insertion of uropods, distinct rounded angle in dorsal  
 surface ..... 6
- 5(4). Lateral tergal plates of pereonites 2-4 extending ventrally and laterally over basis;  
 Pleotelson dorsal surface without median ridge, without lateral ridges.....  
 ..... ***Phreatomerus* Sheppard, 1927** (SA only)  
 Lateral tergal plates of pereonites 2-4 not extended over basis; Pleotelson dorsal surface  
 with median ridge, with lateral ridges continuous with posterior apex.....  
 ..... ***Amphisopus* Nicholls, 1926** (WA only)
- 6(4). State of occurrence Northern Territory; Pereopod II basis dorsal ridge with proximal  
 projection or knob..... ***Eophreatoicus* Nicholls, 1926** (NT only)  
 State of occurrence Western Australia; Pereopod II basis dorsal ridge proximal projection  
 absent ..... 7
- 7(6). Body dorsal surfaces covered with dense fine setae and cuticular hair; Head Antennal notch  
 deep, with posterior extension; Pleotelson postanal ventral surface unelaborated; Pleopod  
 endopod I only with setae on margins in male. . . ***Peludo* Wilson & Keable, 2002a** (WA only)  
 Body dorsal surfaces with few setae; Head Antennal notch shallow, without posterior  
 extension; Pleotelson postanal ventral surface with fine setae on ridge; Pleopod endopods  
 I-V with setae on margins in male..... ***Eremisopus* Wilson & Keable, 2002a** (WA only)  
 Body dorsal surfaces with few setae; Head Antennal notch absent; Pleotelson postanal  
 ventral surface with robust setae (not on ridge); Pleopod endopods I-V without setae on  
 margins in male..... ***Paramphisopus* Nicholls, 1943a** (WA only)
- 8(3). Pleopod endopods I in male only with setae on margins; Pereopods II-III basis dorsal ridge  
 in cross-section rounded; Pereopods V-VII basis dorsal ridge distinctly separated from basis  
 shaft ..... ***Paraphreatoicus* Nicholls, 1944** (Tas only)  
 Pleopod endopods I-V in male without setae on margins; Pereopods II-III basis dorsal ridge  
 in cross-section angular and produced but not forming distinct plate; Pereopods V-VII basis  
 dorsal ridge not distinctly separated from basis shaft..... 9
- 9(8). Female pleopod I exopod lateral margin  
 -rounded..... ***Colubotelson* Nicholls, 1944** (NSW, Vic, Tas)  
 -angular..... ***Metaphreatoicus* Nicholls, 1944** (NSW, Vic, Tas)
- 10(3). Uropod protopod dorsomedial ridge plate-like, distally rounded, ventrolateral margin with  
 longitudinal row of setae; Pereopod I propodus dorsal margin proximal region in male  
 recurved and protruding to distodorsal margin of carpus..... 11

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- Uropod protopod dorsomedial ridge forming bump, or not produced, ventrolateral margin without longitudinal row of setae; Pereopod I propodus dorsal margin proximal region in male not protruding..... 12
11. State of occurrence, Victoria (semiterrestrial); Pleotelson dorsal surface in lateral view evenly curving, not inflected ventrally, without strong bend at level of or posterior to insertion of uropods, lateral uropodal ridge curving strongly and extending posteriorly from uropods on pleotelson margin..... ***Phreatoicopsis* Spencer & Hall, 1897** (Vic only)  
 State of occurrence Tasmania (aquatic, known only from Great Lake); Pleotelson dorsal surface in lateral view inflected ventrally, posterior to insertion of uropods - distinct rounded angle in dorsal surface, lateral uropodal ridge terminating at pleotelson margin above uropods.....***Uramphisopus* Nicholls, 1943** (Tas only, Gt Lake)
12. Antenna flagellum proximal articles with dense cover of cuticular hairs in female; Pleotelson lateral uropodal ridge with fine simple setae, posterior apex in lateral view distinctly broadening distally, proximally shallower than distal tip.....  
 .....***Onchotelson* Nicholls, 1944** (Tas only, Gt Lake)  
 Antenna flagellum proximal articles without dense cover of cuticular hairs in female; Pleotelson lateral uropodal ridge with row of robust setae; Pleotelson posterior apex in lateral view weakly narrowing distally, dorsal and ventral surfaces approximately parallel.....  
 .....***Mesacanthotelson* Nicholls, 1944** (Tas only, Gt Lake)
- 13(2). Pleotelson ventral surface anterior to uropods strongly concave; pleonites in lateral view depth of pleurae-epimera much deeper than pereonites, with large pleurae, basal region of pleopods not visible; pleonite 1 pleura distinctly shallower than pleurae of pleonites 2-5..... 14  
 .....  
 Pleotelson ventral surface anterior to uropods flattened, only slightly concave; pleonites in lateral view depth of pleurae-epimera having depth approximating depth of pereonites, with small pleurae, basal region of pleopods visible; pleonite 1 pleura near depth of pleurae of pleonites 2-5..... 18
14. Pleotelson dorsal surface in lateral view evenly curving, not inflected ventrally, without strong bend at level of or posterior to insertion of uropods, lateral uropodal ridge curving strongly and extending posteriorly from uropods on pleotelson margin; antennal notch absent ..... ***Crenisopus* Wilson & Keable, 1999** (WA only)  
 Pleotelson dorsal surface in lateral view inflected ventrally (with concavity) posterior to insertion of uropods, lateral uropodal ridge terminating at pleotelson margin above uropods; antennal notch shallow, without posterior extension..... 15
15. Antenna flagellum proximal articles with dense cover of cuticular hairs; Pereopod I dactylus shorter than palm in male..... ***Naiopegia* Wilson & Keable, 2002b** (Vic only)  
 Antenna flagellum proximal articles without dense cover of cuticular hairs; Pereopod I dactylus projecting beyond or length subequal to palm ..... 16
16. Pleotelson ventral margin anterior to uropods length less than, or subequal to width of uropodal insertion, lateral uropodal ridge setae lacking setae, posterolateral margin forming rounded process with dorsally projecting setae.....  
 ..... ***Platypyga* Wilson & Keable, 2002a** (WA only)  
 Pleotelson ventral margin anterior to uropods length greater than width of uropodal insertion, lateral uropodal ridge setae with fine simple setae, posterolateral margin forming rounded lobe..... 17

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17. Head Mandibular (genal or cheek) groove smoothly indented, or with acute indentation, clypeal notch absent; Female Pleopod I exopod lateral margin rounded.....  
 ..... **Gariwerdeus Wilson & Keable, 2002b** (Vic only)  
 Head Mandibular (genal or cheek) groove not indented, clypeal notch present; Female Pleopod I exopod lateral margin angular..... **Crenoicus Nicholls, 1944** (NSW, Vic)
18. Uropod protopod dorsomedial ridge produced, spur-like..... 19  
 Uropod protopod dorsomedial ridge produced, forming bump, or not produced..... 20
19. Pleotelson posterolateral margin crenate, posterior apex in dorsal view concave; Pereopod I subchelate..... **Hyperoedesipus Nicholls & Milner, 1923** (WA only)  
 Pleotelson posterolateral margin unelaborated, posterior apex in dorsal view transverse or weakly projecting; Pereopod I simple..... **Phreatoicoides Sayce, 1900** (Vic, Tas)
20. Head Clypeal notch present; Pleotelson posterolateral margin unelaborated, posterior apex setose with tubercle ..... 21  
 Head Clypeal notch absent; Pleotelson posterolateral margin crenate, posterior apex without setose tubercle ..... **Pilbarophreatoicus Knott & Halse, 1999** (WA only)
21. Pereopod I subchelate; Pereopod IV propodus with articular plate on posterior side of limb...  
 ..... **Hypsimetopus Sayce, 1902** (Tas only)  
 Pereopod I simple; Pereopod IV propodus without articular plate on posterior side of limb....  
**Phreatoicoides Sayce, 1900** (Vic, Tas)
- 22(1). Pleotelson dorsal surface in lateral view evenly curving, not inflected ventrally, without strong bend at level of or posterior to insertion of uropods; Pleopod protopods medial margin without setose projections; pleonites 1-4 relative lengths subequal.....  
 ..... **Neophreatoicus Nicholls, 1944**  
 Pleotelson dorsal surface in lateral view inflected ventrally, posterior to insertion of uropods - distinct rounded angle in dorsal surface; Pleopod protopods medial margin with setose projections; pleonites 1-4 relative lengths unequal, pleonite 4 greater than pleonites 1-3.....  
 length ..... 23
23. Pleotelson posterolateral margin forming rounded lobe; Pereopods II-III basis dorsal ridge in cross-section rounded; head clypeal notch present..... **Notamphisopus Nicholls, 1944**  
 Pleotelson posterolateral margin unelaborated; Pereopods II-III basis dorsal ridge in cross-section angular; head clypeal notch absent..... **Phreatoicus Chilton, 1883**
- 24(1). Head mandibular (genal or cheek) groove smoothly indented, or with acute indentation; pereonite 1 in dorsal view medial length subequal to width; Pleotelson vaulted (lateral fields vertical)..... **Nichollisia Chopra & Tiwari, 1950**  
 Head mandibular (genal or cheek) groove not indented; pereonite 1 in dorsal view wider than medial length; Pleotelson shallow (lateral fields sloping).....  
 ..... **Andhracooides Wilson & Ranga Reddy, 2011**

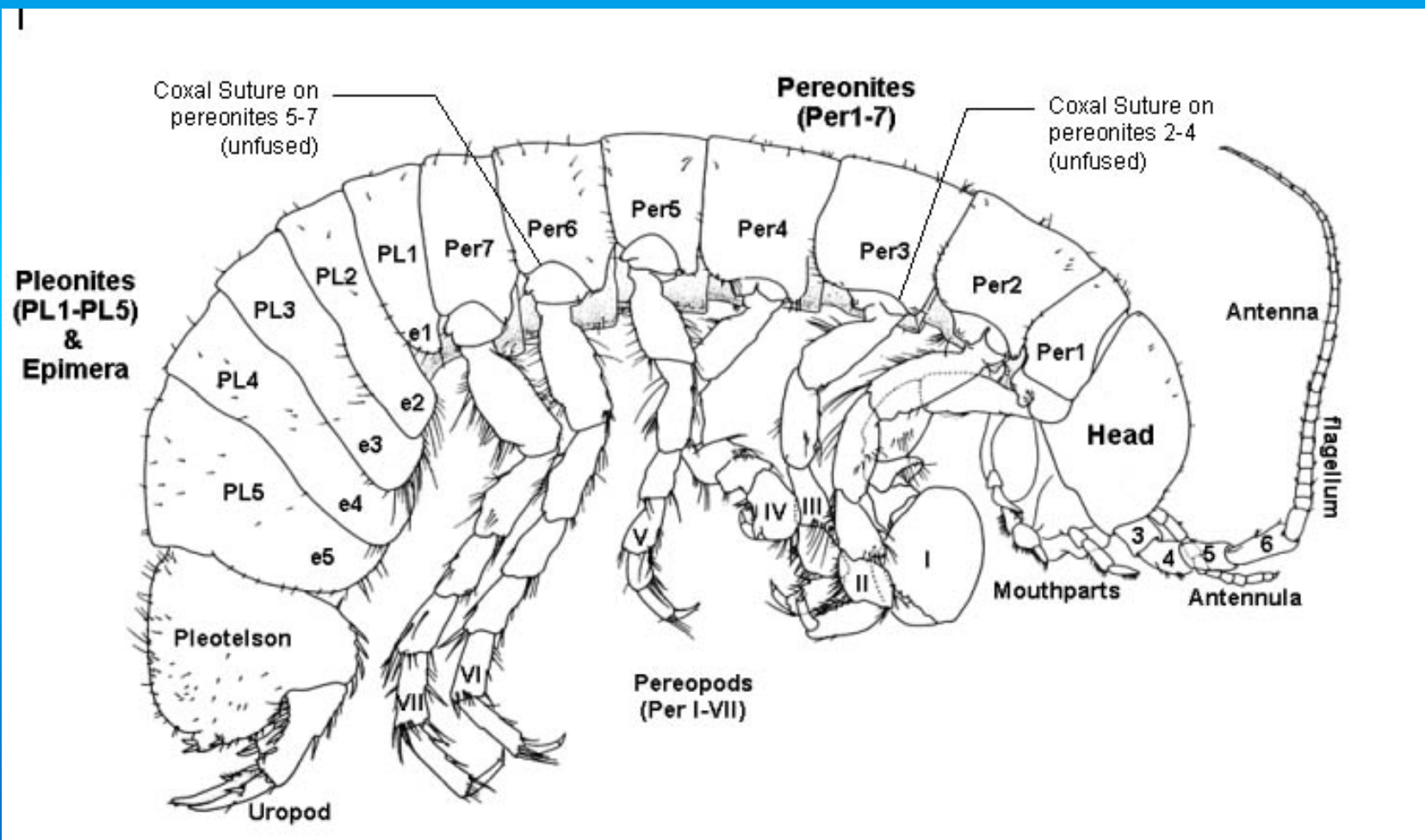
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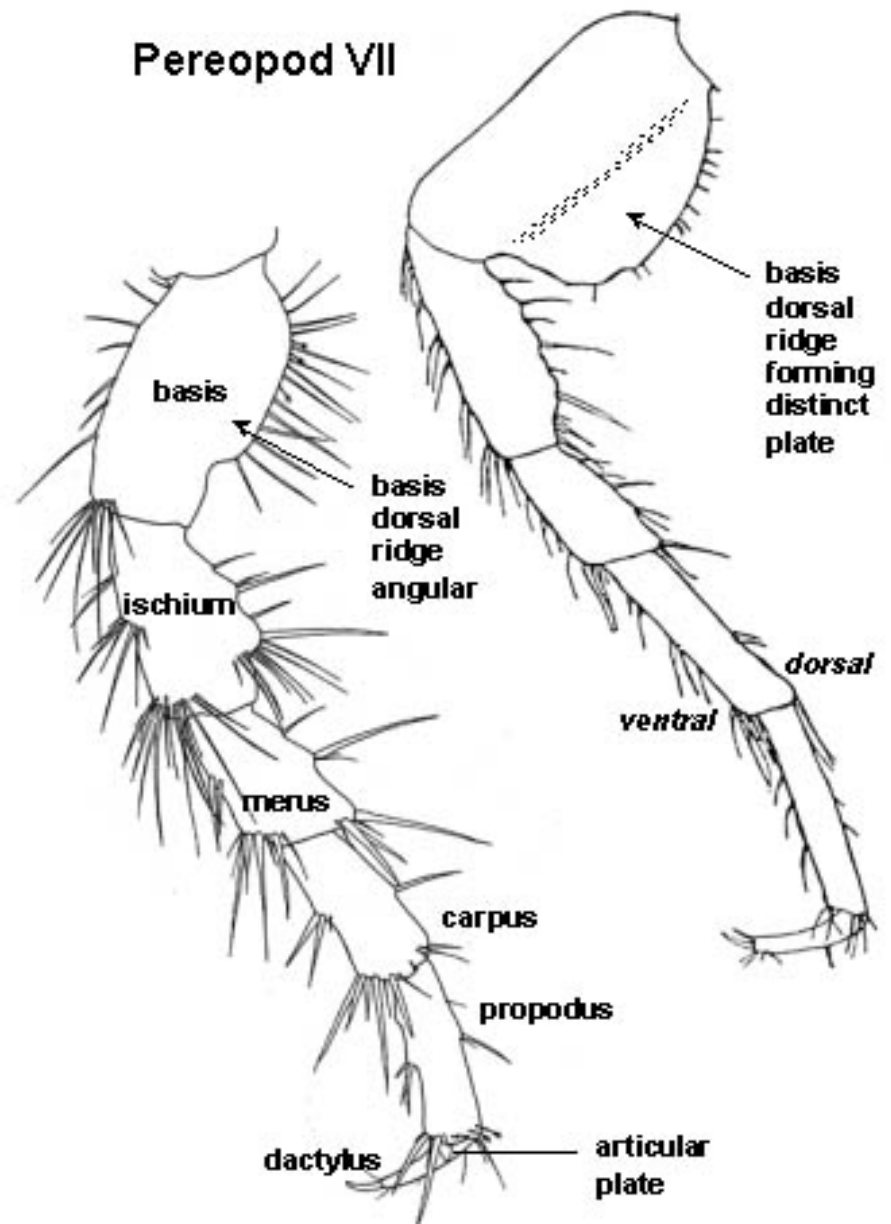
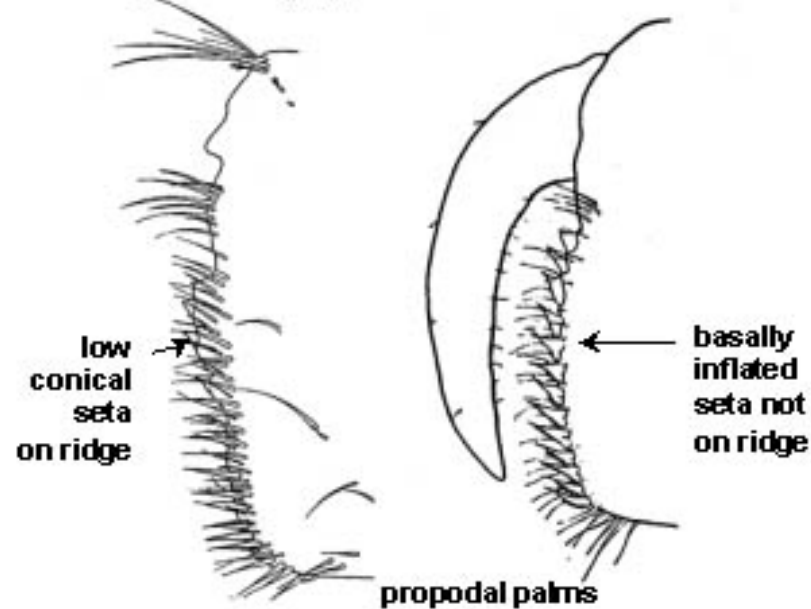
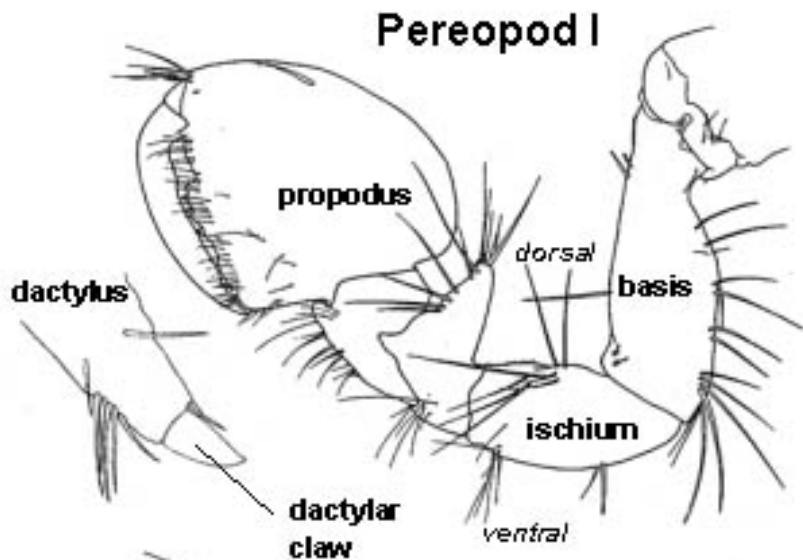
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# General body features

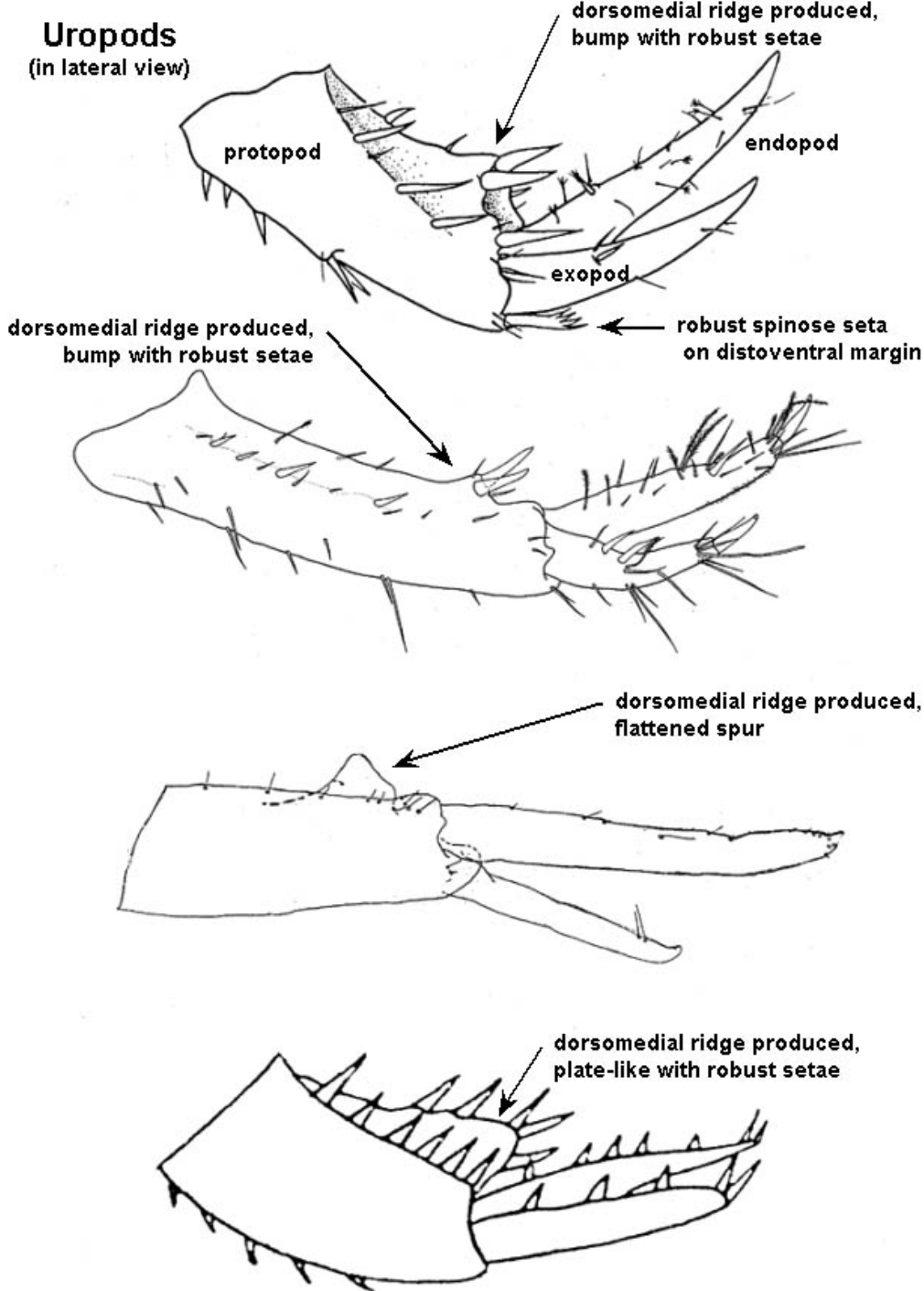


# Pereopods



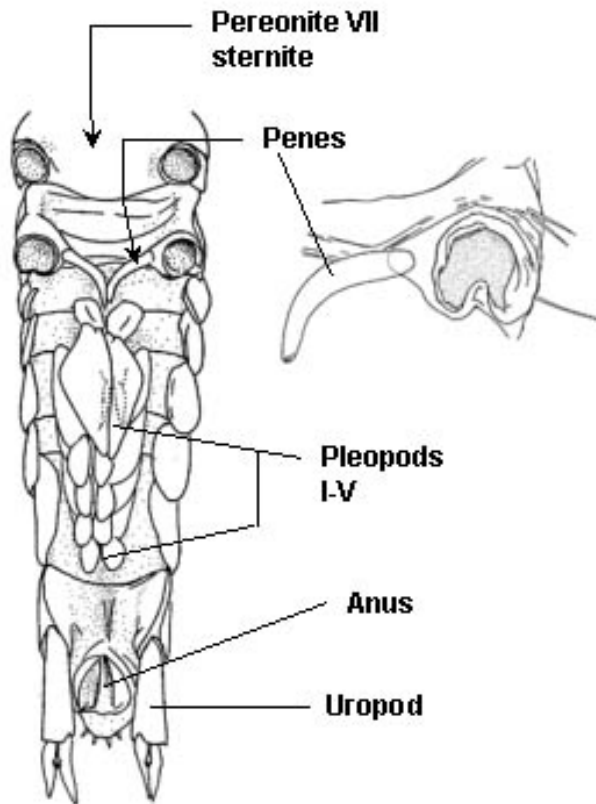
# Uropods

## Uropods (in lateral view)

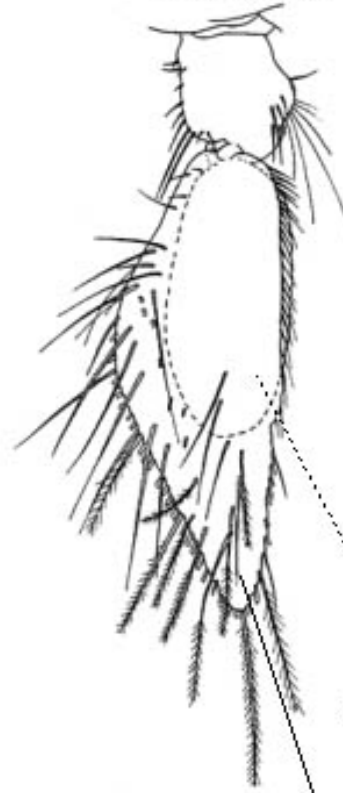


# Pleopods

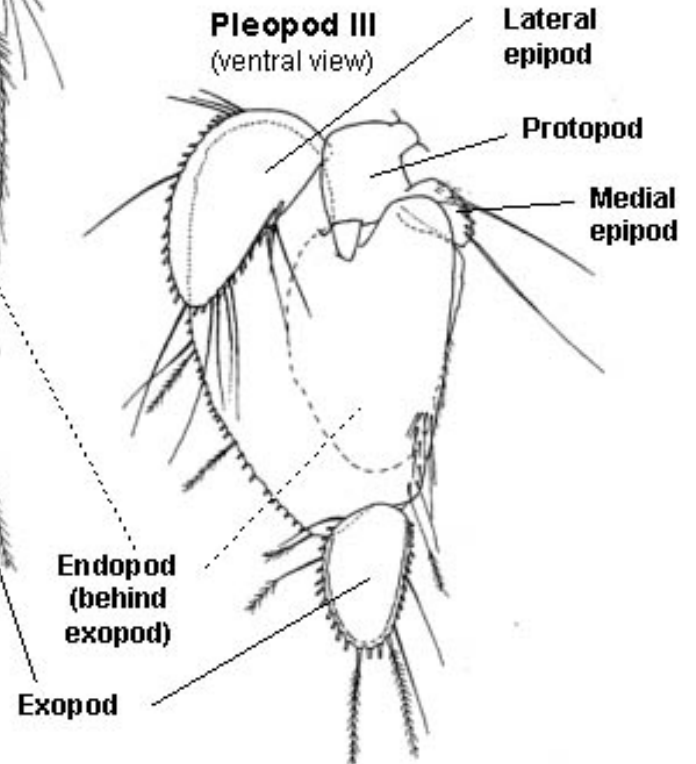
## Pleon and Pleopods



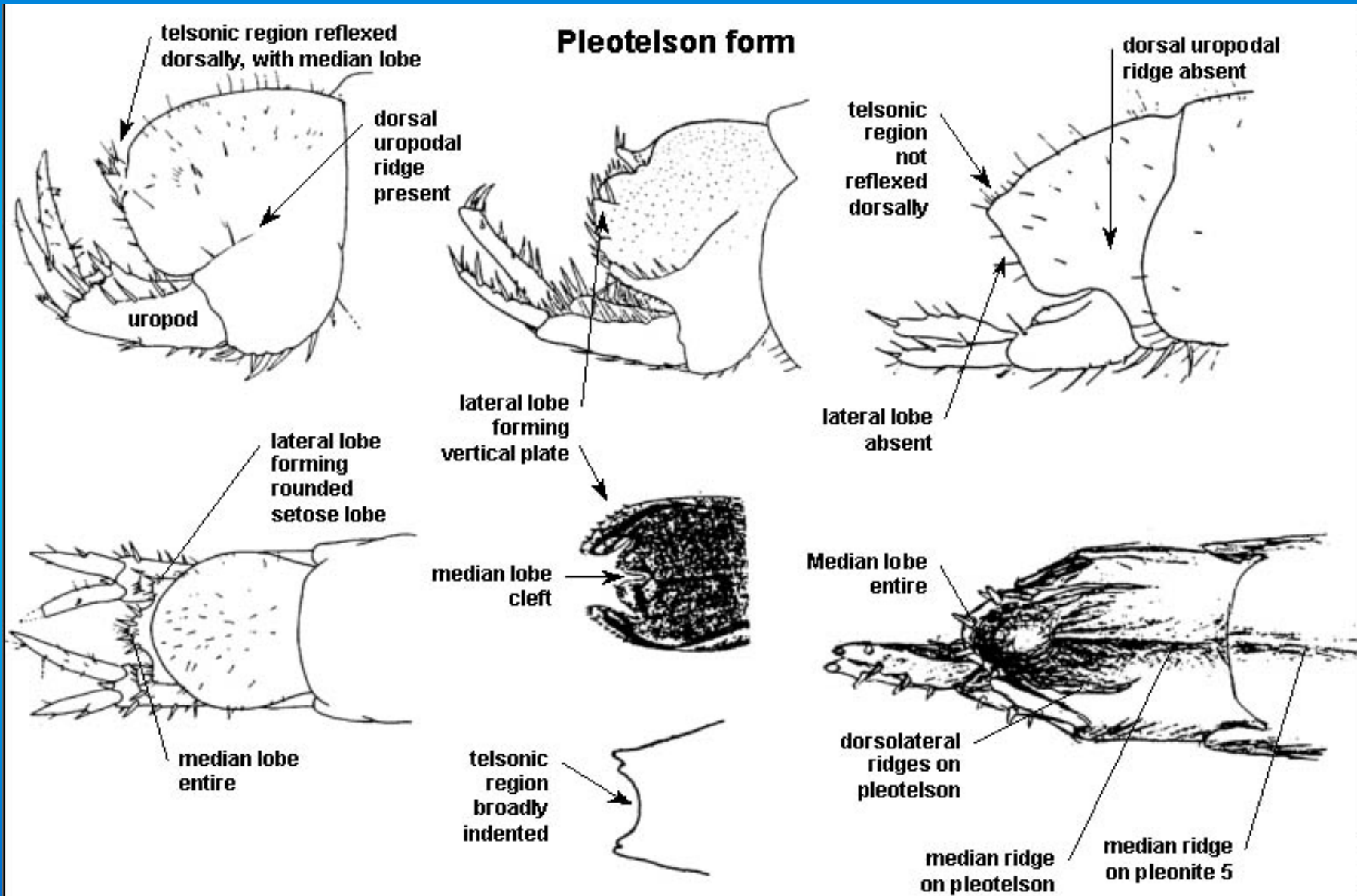
## Pleopod I (ventral view)



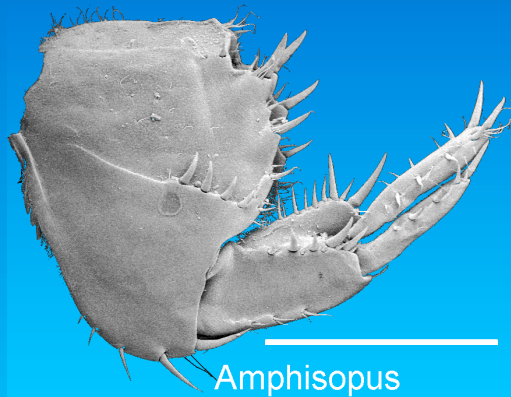
## Pleopod III (ventral view)



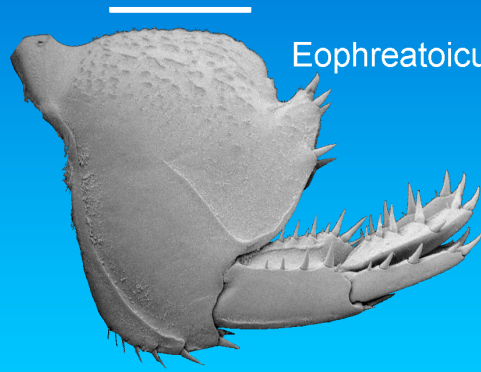
# Pleotelson anatomy



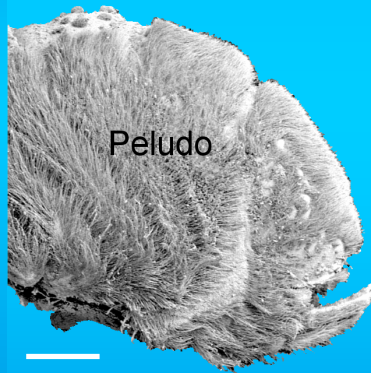
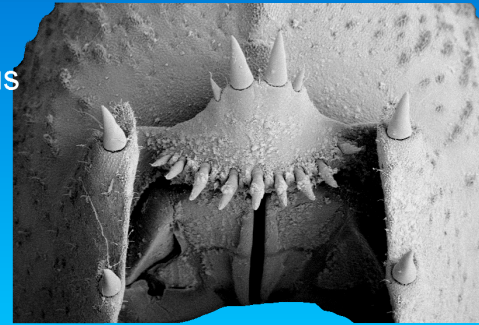
# Pleotelson, Amphisopidae et al.



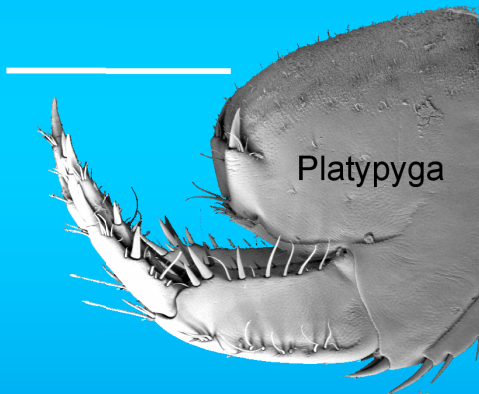
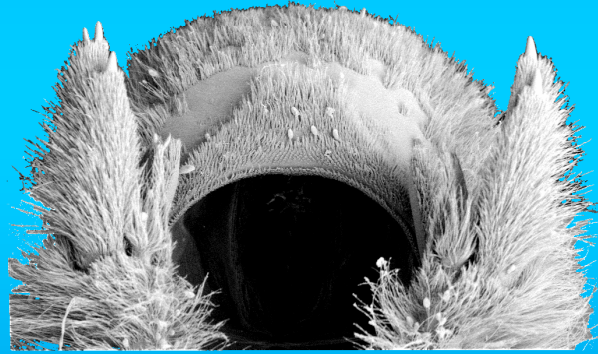
Amphisopus



Eophreatoicus



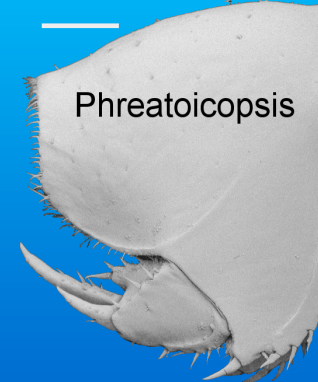
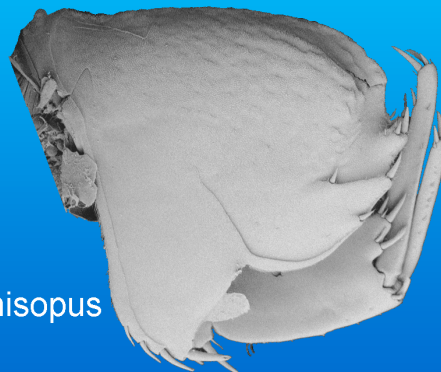
Peludo



Platypyga

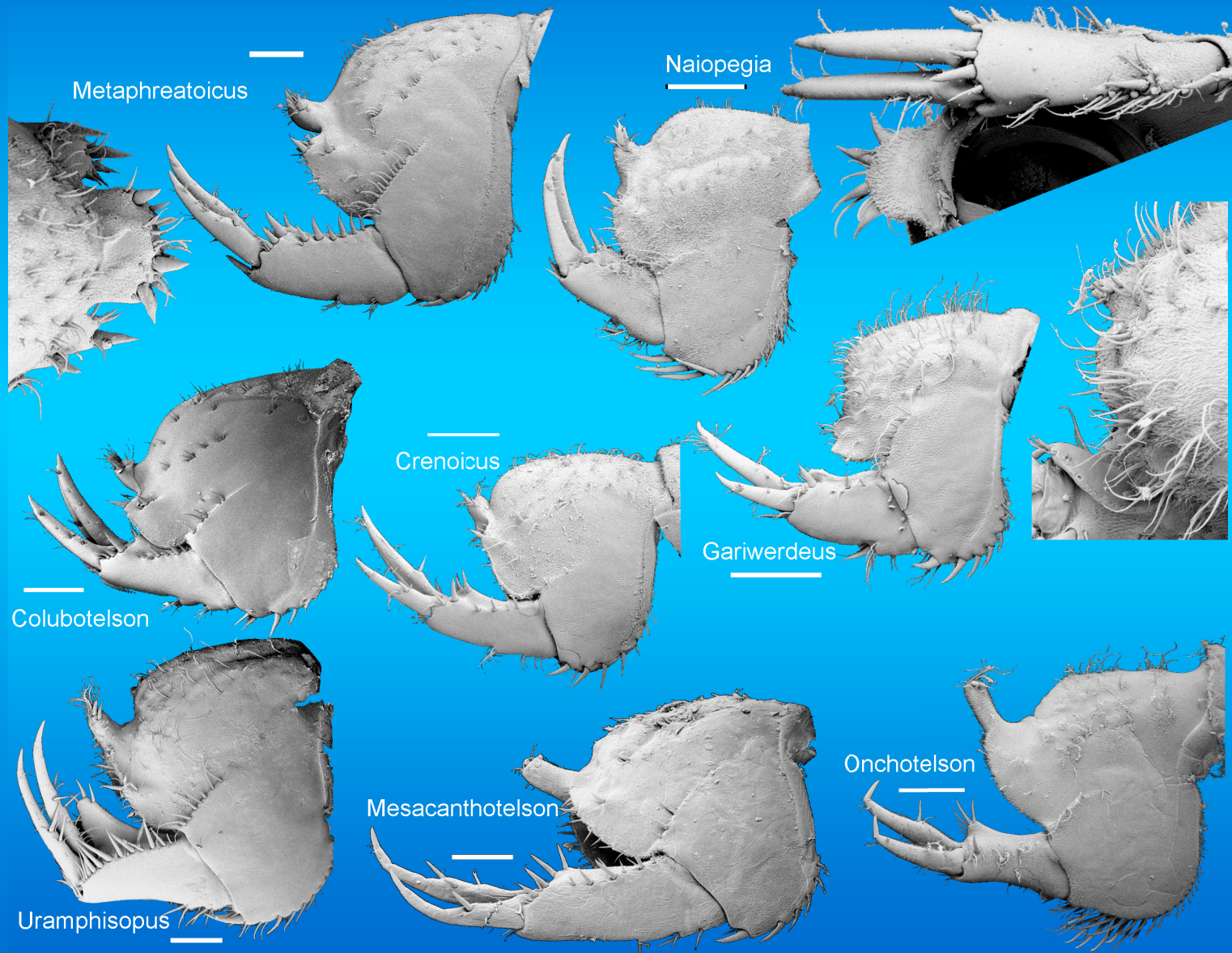


Synamphisopus



Phreatoicopsis

# Pleotelsons, Phreatoicidae



# Pleotelsons, Hypsimetopidae et al.

