Key to the Photidae Reported from the Southern California Bight, SCAMIT, Edition 14

Dean Pasko, 29-Feb-2016, Rev 27-Oct-2023

FAMILY PHOTIDAE

Ampelisciphotis podophthalma (J. L. Barnard 1958)
Gammaropsis effrena (J. L. Barnard 1964)
Gammaropsis martesia (J. L. Barnard 1964)
Gammaropsis ocellata Conlan 1994*
Gammaropsis shoemakeri Conlan 1983
Gammaropsis spinosa (Shoemaker 1942)
Gammaropsis thompsoni (Walker 1898)
Gammaropsis tonichi (J. L. Barnard 1969)
Megamphopus mamola J. L. Barnard 1962
Photis bifurcata J. L. Barnard 1962
Photis brevipes Shoemaker 1942
Photis californica Stout 1913
Photis chiconola J. L. Barnard 1964
Photis conchicola Alderman 1936
Photis lacia J. L. Barnard 1962
Photis linearmanus Conlan 1994
Photis macinerneyi Conlan 1983
Photis macrotica J. L. Barnard 1962
Photis parvidons Conlan 1983
Photis spinicarpa Shoemaker 1942*
Photis typhlops Conlan 1994*
Photis viuda J. L. Barnard 1962
Photis sp A MBC 1972 §
Photis sp B Paquette 1987 §
Photis sp C MEC 1988 §
Photis sp E SCAMIT 1995 §
Photis sp G SCAMIT 2023 §
Photis sp OC1 Diener 1992 §
Photis sp OC2 Pasko 2014 §
Photis sp SD9 Pasko 1999 §
Photis sp SD10 Pasko 2023 §
Podoceropsis chionoecetophila Conlan 1983*
Podoceropsis ociosa (J. L. Barnard 1962)

**Not yet reported by SCAMIT*

KEY TO THE SCB PHOTIDAE[1]

1. [***Note 3 choices***] Eyes distally placed on immense ocular (head) lobes that extend beyond first article of antenna 1 (best viewed dorsally); uropod 3 uniramus, peduncle short, only slightly longer than broad ..... *Ampelisciphotis podophthalma* (Photidae)

– Eyes situated on well-produced ocular lobes that extend one-half the length of first article of antenna1; uropod 3 biramus, peduncle very short, square, less than 1/2 as long as rami ..... *Amphideutopus oculatus* (Kamakidae)[i]

– Above characters not in combination: ocular (head) lobe weakly to moderately produced; uropod 3 peduncle parallel sided, long, more than 2x as long as broad 2

2. Uropod 3 with one ramus distinctly shortened ..... ***Photis***…12

– Uropod 3 with rami subequal 3

3. Coxa 2 prolonged postero-distally; accessory flagellum of 1-2 segments ..... *Megamphopus mamola*

– Coxa 2 not prolonged postero-distally; accessory flagellum a minute button or composed of 3+ segments 4

4. Urosomites with dorsal cusps 5

– Urosomites dorsally smooth, at most with dorsal setae, but no cusps 7

[1] *See figures starting on page 6*

5. Gnathopod 1 (male), basis postero-distally produced into densly setose lobe; uropod 3 peduncle with three dorso-distal thickened spines; telson with one thickened spine dorso-distally on each lobe; gnathopod 2 (female) palm short, one-quarter length of hind margin ..... *Gammaropsis shoemakeri*[ii]
– Gnathopod 1 (male), basis not postero-distally produced into lobe; uropod 3 peduncle with three single distal spine; telson with two or more slender spines dorso-distally on each lobe; gnathopod 2 (female) longer, one-third hind margin length 7
6. Gnathopod 2 (male) palm with both median and distal (defining) tooth; coxa 1 asetose or with spines/setae along ventral margin only ..... *Gammaropsis thompsoni*[ii]
– Gnathopod 2 (male) palm with medial tooth but no defining tooth; coxa 1 armed with spines/setae along anterior and ventral margins ..... *Gammaropsis tonichi*[ii]
7. Epistome produced 8
– Epistome unproduced 11
8. Telson cleft, lobate; accessory flagellum formed of one or more normal segments; all setae of inner plate of maxilla 1 short; with epimera 1–3 with small postero-distal notch and acute tooth ..... *Gammaropsis martesia*
– Telson terminally broad, lobes greatly reduced; distal seta of inner plate of maxilla 1 very long (subequal to inner plate); accessory flagellum a minute button or scale 9
9. Epimera 2–3 acuminate, distally subacute ..... *Podoceropsis chionoecetophila*
– Epimera 1–3 rounded 10
10. Eyes pigmented; telson broadly square, distal margin generally flat; posterior margin of epimera 2-3 bare ..... *Podoceropsis ociosa*
– Eyes lacking pigment; telson broadly rounded; epimera 2–3 minute posterodistal setae ..... *Gammaropsis ocellata*
11. Epimeron 3 rounded to gently quadrate; uropod 3 peduncle short, squat, nearly square, rami short, subequal to peduncle, outer ramus terminally spinose ..... *Gammaropsis effrena*
– Epimeron 3 produced to blunt tooth; uropod 3 peduncle elongated, distinctly longer than wide, rami shorted than peduncle, outer ramus not terminally spinose ..... *Gammaropsis spinosa*
12 Specimens blind (male and female); specimens from >150m ..... *Photis typhlops*[iii]
– Specimens with pigmented eyes 13
13. [Male specimens] Pereopods 2-5 without brood plates; sternite 7 with penial papilla 14
– [Female specimens] Pereopods 2-5 with brood plates; sternite 7 without penial papilla 34
14. Cx 1 and 2 antero-distally produced into knob, bearing fan of setae 15
– Cx 1 and 2 not produced antero-distally 16
15. Dorsal margin of carpus proximally bare, spines absent ..... *Photis* sp C
– Dorsal margin of carpus with row of 3-6 stout spines proximally ..... *Photis spinicarpa*[iv]
16. Gn 2 palm defined by tooth/process 17
– Gn 2 palm not defined by tooth 32
17. Gn 2 palm transverse 18
– Gn 2 palm oblique 25
18. Gn 2 with double defining tooth/process ..... *Photis bifurcata*
– Gn 2 with single defining tooth or process 19

19. Gn 2 dactyl with tooth or process along inner margin 20
– Gn 2 dactyl simple, without tooth or process along inner margin 22
20. Gn 2 palmar tooth blunt; Cx 2 with many (>20) ventral setae ..... *Photis brevipes*
– Gn 2 palmar tooth tapered; Cx 2 with few to moderate setae 21
21. Gn 2 defining tooth normal (not offset medially); offshore habitat ..... *Photis parvidons*
– Gn 2 defining tooth offset medially from palmar tooth; intertidal to 25m on hard, fouling substrates ..... *Photis* sp SD9
22. Cx3 broadly expanded, >>Cx4 23
– Cx3 subequal to Cx4 in depth & breadth 24
23. Gn 2 palmar tooth tapered; pigment mostly uniform ..... *Photis californica*
– Gn 2 palmar tooth blunt, square; body pigment very spotty ..... *Photis* sp OC1
24. Gn 1 palm concave/excavate; Ant1 flagellum 4-articles; subtidal ..... *Photis macinerneyi*
– Gn 1 palm scarcely excavate; Ant1 flagellum 6-9 articles; intertidal ..... *Photis conchicola*
25. Gn 1 palm convex 26
– Gn1 palm concave/excavate 28
26. Gn 2 palmar tooth blunt, squared ..... *Photis lacia*
– Gn 2 palmar tooth tapered 27
27. Eye lobe acute; Cx1 and Gn 2 basis without stridulation ridges ..... *Photis* sp B
– Eye lobe blunt; Cx 1 and Gn 2 basis with stridulation ridges ..... *Photis viuda*
28. Gn 2 palmar tooth bifid, squared ..... *Photis* sp G
– Gn 2 palmar tooth single, squared or tapered 29
29. Gn 2 palmar tooth tapered; eye large; Ep3 quadrate ..... *Photis macrotica*
– Gn 2 palmar tooth blunt, squared 30
30. Ep 3 rounded, subquadrate ..... *Photis macinerneyi*
– Ep 3 produced (blunt or semi-acute) 31
31. Eye lobe acute; Gn 1 with defining spine and small distal tooth; Gn 2 dactyl inner margin smooth; <250m ..... *Photis* sp SD10
– Eye lobe blunt; Gn 1 palm without distal tooth, defined by spine; Gn 2 dactyl inner margin serrate; >1,000m ..... *Photis chiconola*
32. Cx 2-5 enlarged, hiding pereopods; Cx 5 broadly triangular; Gn 2 palm excavate/concave ..... *Photis* sp A
– Cx 2-4 normal; Gn 2 palm convex and/or with palmar tooth 33
33. Gn 2 palmar tooth tapered (semi-acute) ..... *Photis* sp OC2[v]
– Gn 2 palm convex with two small bumps at mid-point of palm ..... *Photis linearmanus*[v]
34. Cx 1 and 2 antero-distally produced into knob, bearing fan of setae 35
– Cx 1 and 2 not produced antero-distally 36
35. Gnathopod 1 palm convex to flat; gnathopod 2 flat to weakly sinuous ..... *Photis* sp C
– Gnathopods 1 and 2 weakly to strongly sinuous to concave ..... *Photis spinicarpa*
36. Gn 2 palm slightly sinuous to concave 37
– Gn 2 palm convex to flat 47

37. Gn 2 palm distally rounded, oblique 38
– Gn 2 palm distally produced, nearly transverse 45
38. Gn 1 palm slightly sinuous to concave 39
– Gn 1 palm convex to flat (not concave) 42
39. Ep 3 produced; specimen from >1000m ..... *Photis chiconola*
– Ep 3 rounded; specimen from shelf depths (<500m) 40
40. Gn 2 basis strongly produced distally; Gn 1 basis broad, with convex posterior margin ..... *Photis californica*[vi]
– Gn 1 & 2 basis narrow, posterior margin parallels anterior margin 41
41. Eye large; Gn 2 basis produced distally; Gn 1 palm concave/excavate ..... *Photis macrotica*
– Eye not enlarged; Gn 1 palm slightly sinuous or weakly excavate; Gn 2 basis weakly produced ..... *Photis parvidons*
42. Specimens from >10m depth 43
– Specimens from intertidal, on hard, fouling substrates 44
43. Gn 1 Art 5 > 6, posterior margin elongate (> ó of anterior margin) ..... *Photis bifurcate*
– Gn 1 Art 5 < 6, posterior margin short (< 1/3 of anterior margin) ..... *Photis viuda*
44. Gn 1 & 2, bases narrow; Cx 2 weakly setose, setae short, sparse ..... *Photis* sp SD9
– Gn 1 & 2, bases broad; Cx 2 moderately setose, setae long ..... *Photis conchicola*
45. Coxae weakly setose; eye lobe distinctly tapered; Ep 3 produced ..... *Photis* sp G
– Coxae moderately to strongly setose; eye lobe blunt; Ep 3 not produced 46
46. Gn 1 palm convex to slightly sinuous (mature), dactyl strongly serrate along inner margin; Cx 1 setose along entire ventral margin, all equally long; Ant 2 distinctly geniculate; Gn 1 & 2 article 6 with distal pigment spot ..... *Photis brevipes*
– Gn 1 palm concave to excavate, dactyl not serrate; Cx 1 setose on anterior half of ventral margin, posterior setae decreasing in size; Ant 2 not to weakly geniculate ..... *Photis* sp OC1
47. Ep 3 rounded or subquadrate; Cx 1-4 normal 48
– Ep 3 produced; Cx 1-4 long strap-like 50
48. Eye lobe acute; Gn 1 basis broad, posterior margin convex; brood plate narrow ..... *Photis* sp B
– Eye lobe blunt; Gn 1 basis narrow, anterior & posterior margins parallel 49
50. Gn 1, article 5 > 6, posterior lobe elongate; Gn 2 palm oblique, nearly flat, defined by change in angle ..... *Photis lacia*
– Gn 1, article 5 < 6, posterior lobe short; Gn 2 palm oblique, convex, rounded distally, defined by spine ..... *Photis macinerneyi*
51. Cx 2-5 enlarged, hiding pereopods; Cx 5 broadly triangular; Gn1 basis anterior margin with few long setae ..... *Photis* sp A
– Cx 2-4 elongate, narrow; Cx 5 not triangular; Gn1 basis anterior margin with 10+ short, evenly spaced setae ..... *Photis* sp SD10

ENDNOTES

[i] *Amphideutopus oculatus,* although not a member of the Photidae, is included here because it is sometimes confused with members of *Gammaropsis*.

[ii] Females of *Gammaropsis shoemakeri*, *G. thompsoni*, and *G. tonichi* are poorly distinguished in the literature; however, the characters listed herein were developed from comparisons of female *G. shoemakeri* and *G. thompsoni* encountered from shallow waters in Santa Monica Bay, off El Segundo, CA.

[iii] *Photis typhlops* has not been reported in the SCB agencies, but it's reported distribution is down to Santa Barbara, California, and is therefore should be considered a possible migrant to our area.

[iv] *Photis spinicarpa* has not been reported in the SCB agencies, but it's reported distribution is down to the west coast of Baja California, Mexico, and is therefore should be considered a possible migrant to our area. *Photis* sp C is closely related and the characters used here should distinguish the two.

[v] Females of *Photis* sp OC2 and *P. linearmanus* are unknown.

[vi] Mature female *Photis californica* can have scarcely sinuous gnathopod 1 palm. It is recommended that you check all characters carefully when in doubt.

REFERENCES

Cadien, DB. 2004. Amphipoda of the Northeast Pacific (Equator to Aleutians, intertidal to abyss): IX. Photoidea - a review Donald B. Cadien, LACSD 22 July 2004 (revised 21 May 2015)

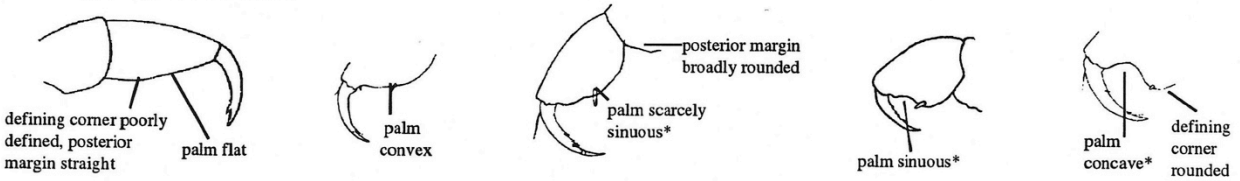
Conlan, KE. 1983. "The amphipod superfamily Corophioidea in the northeastern Pacific region. 3. Family Isaeidae: systematics and distributional ecology." National Museums of Canada Publications in Natural Sciences(4): 1-75.

Conlan, KE. 1994. New species of the amphipod crustacean genera Photis and Gammaropsis (Corophioidea: Isaeidae) from California. Amphipacifica 1(3): 67-73.

Shoemaker, CR. 1942. Amphipod crustaceans collected on the Presidential Cruise of 1938. Smithsonian Miscellaneous Collections 101(11): 1-52.

Photis Terminology and Representative Figures

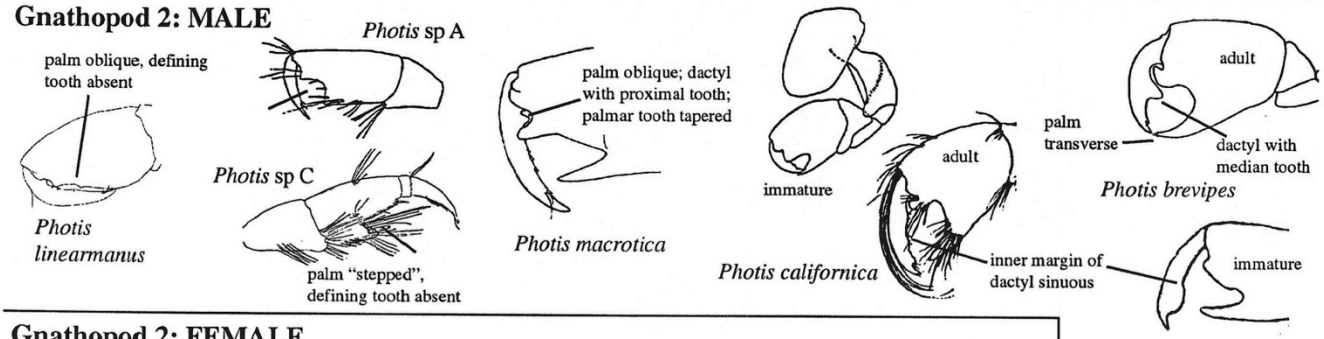
Gnathopod 1: GENERIC



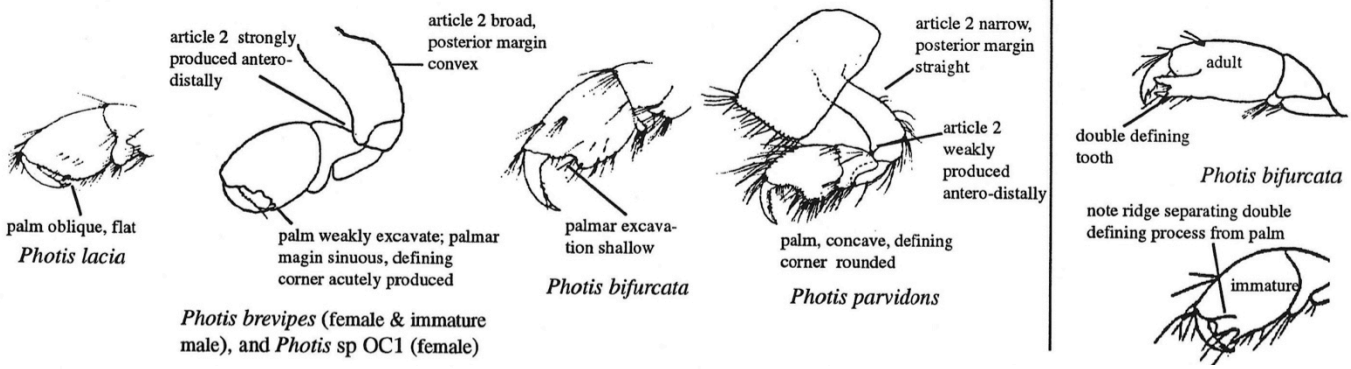
Photis sp SD9

***Concave & sinuous are adjectives which describe degree of excavation of a palm**

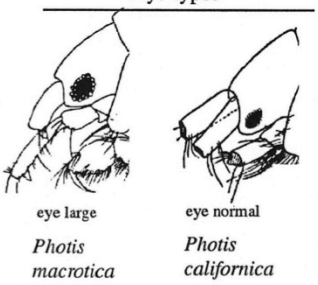
Gnathopod 2: MALE



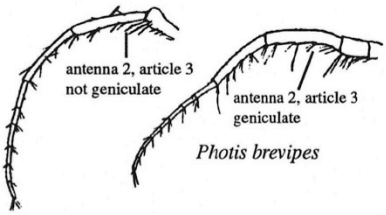
Gnathopod 2: FEMALE



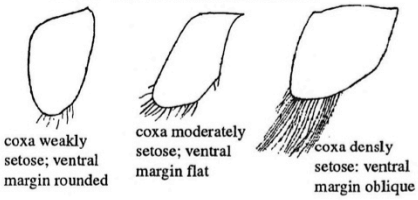
Eye types



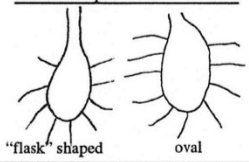
Antenna types

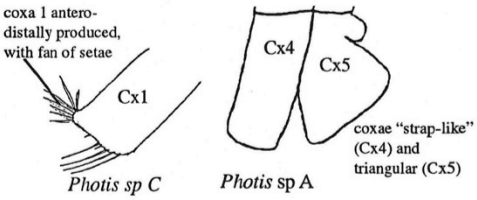


Coxae shapes and setation

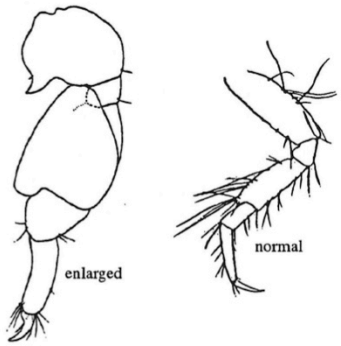


Brood plates - female



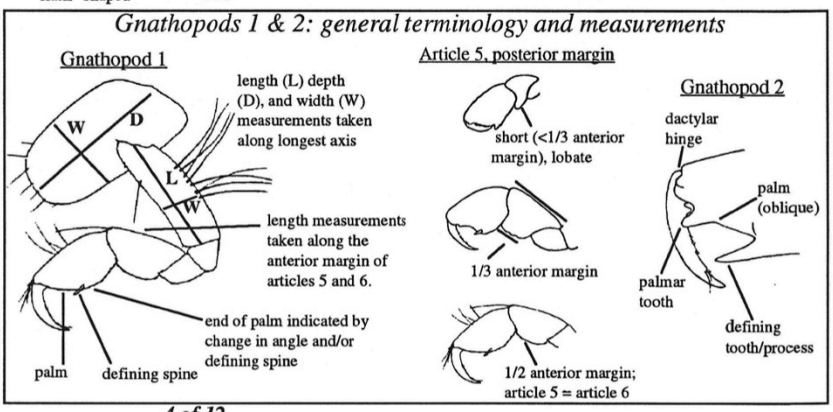


Pereopod 4

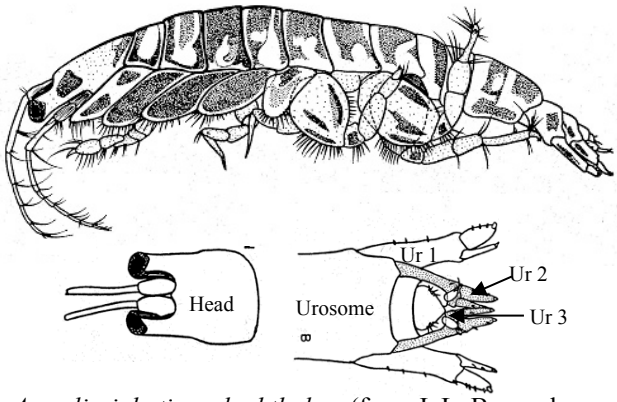


Photis elephantis

Gnathopods 1 & 2: general terminology and measurements

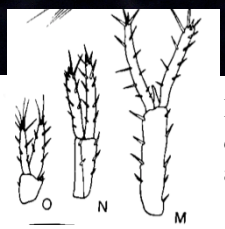


Representative Photidae

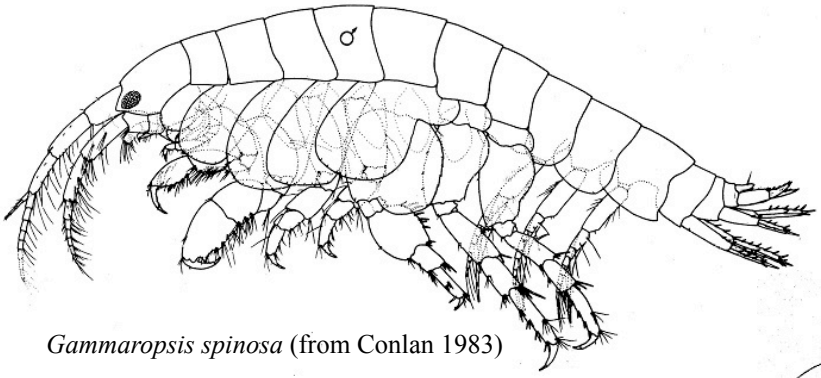


Ampelisciphotis podophthalma (from J. L. Barnard 1958)

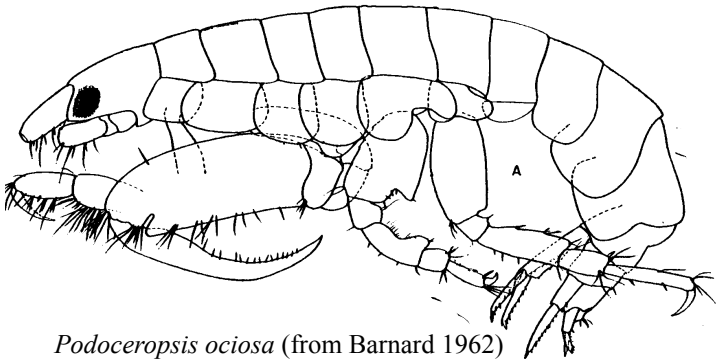
Amphideutopus oculatus (photo: SCCWRP from www.boldsystems.org)



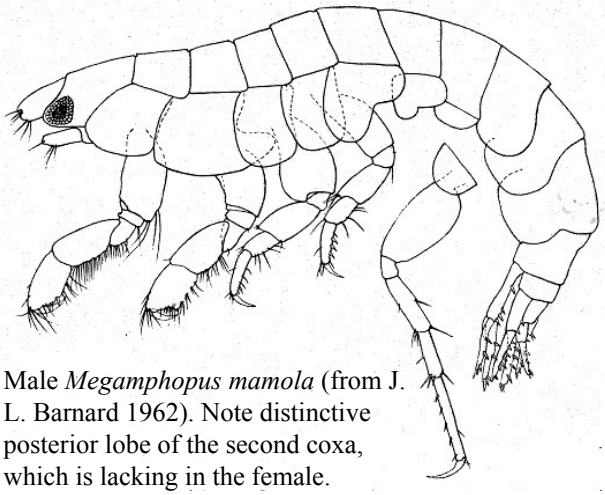
Kamakidae: *Amphideutopus oculatus*: Uropods 1 (M), 2(N), and 3(O)



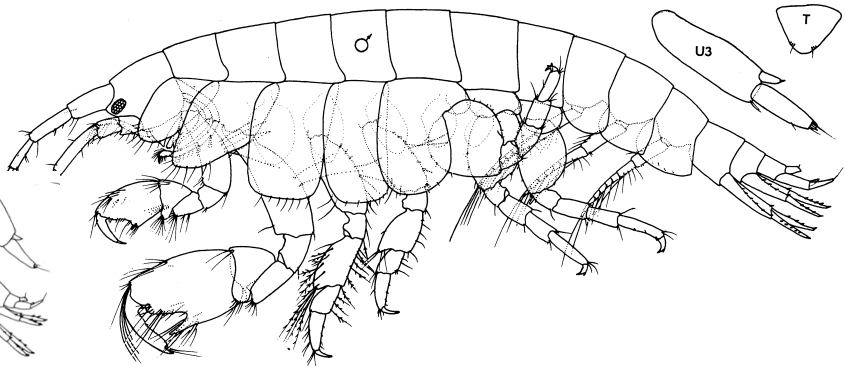
Gammaropsis spinosa (from Conlan 1983)



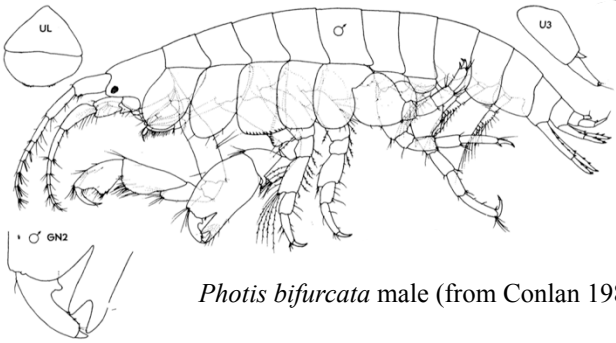
Podoceropsis ociosa (from Barnard 1962)



Male *Megamphopus mamola* (from J. L. Barnard 1962). Note distinctive posterior lobe of the second coxa, which is lacking in the female.



Photis macinerneyi male (from Conlan 1983)



Photis bifurcata male (from Conlan 1983)