Key to the *Photis* (Amphipoda: Isaeidae) of the Southern California Bight

**MALES**

(Modified from J.L. Barnard, 1962 and K.E. Conlan, 1983)

1a. Articles 4 and 5 of pereopod 4 normal, slender .................................................. 2

1b. Articles 4 and 5 of pereopod 4 grossly enlarged .................................................. *Photis elephantis*

2a. Gnathopod 2, article 6 with defining tooth or process on posterior margin………………… 5

2b. Gnathopod 2, article 6 without defining tooth or process (though a spine may be present) ............................................................................................................................................. 3

3a. Gnathopod 1 convex (evenly curved) (?); coxae 2, 3, and 4 very long and strap-like; coxa 5 large and triangular; gnathopod 2 excavate, defining corner quadrate ........ *Photis* sp A

3b. Gnathopod 1, palm concave or excavate; coxae 2 through 5 of normal size and shape; gnathopod 2 not as above ................................................................................................................ 4

4a. Coxa 1 antero-distally produced into small knob, with a fan of long stiff setae; gnathopods 1 and 2 “stepped” (deeply excavate, palms vertical), each with large defining spine ........................................................................................................... *Photis* sp C

4b. Coxa 1 not produced and without fan of setae; gnathopod 1 concave; gnathopod 2, palm long, oblique, with two small, blunt palmar teeth (“protuberances”), and a small defining spine (*female unknown*) ........................................................................... *Photis linearmanus*

5a. Gnathopod 2, palm transverse (defining tooth extends to, or beyond, a line perpendicular to dactyl hinge) ...................................................................................................................... 6

5b. Gnathopod 2, palm oblique (defining tooth falls short of line perpendicular to dactyl hinge) ...................................................................................................................... 16

6a. Gnathopod 1, article 5 subequal to article 6; gnathopod 2, palm with single defining tooth (palmar tooth present or absent) ........................................................................................................... 7

6b. Gnathopod 1, article 5 longer than article 6; gnathopod 2, palm with double defining tooth mounted on a process that is cryptically separated from the hand, and produced medially (Note: in specimens < 2.5 mm, the palmar process may not be distinctly separate from the rest of the palm, though it will be produced medially) ........... *Photis bifurcata*

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7a. Gnathopod 2, inner margin of the dactyl sinuous or notched, but lacking a tooth or medial swelling (Note: the dactyl of *Photis* sp OCl and *P. californica* may appear thick throughout most of its length, narrowing distally, but it is not swollen medially) ............................... 10

7b. Gnathopod 2, inner margin of the dactyl with distinct tooth or medial swelling (the latter in specimens < 5.0 mm) ............................................................................................................. 8

8a. Gnathopod 2, dactyl with blunt median tooth and large, distally upturned palmar tooth (specimen > 5.0 mm), or dactyl clearly swollen medially, narrowed distally and palmar tooth anvil shaped (with raised, flat surface opposite defining tooth); antenna 2, article 3 strongly geniculate (permanently bent downward); distinct pigment spot present on coxa 5 and antero-distal margin of gnathopod 1, article 6, just below dactyl ..*Photis brevipes*

8b. Gnathopod 2, dactyl with small, square median tooth, rest of dactyl evenly tapering; palmar tooth tapered (without raised, flat surface); antenna 2, article 3 not geniculate; coxa 5 and gnathopod 1, article 6 without pigment spot! .......................... 9

9a. Gnathopod 1, palm excavate; coxa 1 ventral margin flat; gnathopod 2, article 2 broad ......................................................................................................................... *Photis parvidons*

9b. Gnathopod 1, palm convex; coxa 1 ventral margin rounded; gnathopod 2, article 2 narrow (female unknown) ................................................................................................................................. *Photis cf. parvidons*

10a. Gnathopod 1, palm concave or sinuous .............................................................................. 11

10b. Gnathopod 1, palm convex, or flat .................................................................................. 1514

11a. Gnathopod 1, article 5 subequal to article 6, posterior margin elongate (approximately one-half length of anterior margin) and unproduced; article 6 sinuous, defining corner rounded; gnathopod 2, article 6 broad (approximately 1.5 times longer than wide), palmar tooth not-square (rounded or tapered); head without anterior patch of pigment dorsally ........................................................................................................................................... 12

11b. Gnathopod 1, article 5 shorter than article 6, posterior margin narrow and produced (lobate); article 6 distinctly concave, defining corner acute or quadrate; gnathopod 2, article 6 elongate (approximately 2 times longer than wide), palmar tooth squared; head with distinct anterior and posterior pigment patches dorsally ........... *Photis macinerneyi*

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**MALES**

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12a. Gnathopod 1, anterior margin of article 5 bare or weakly setose (0-3 setae, except in specimens > 5.0 mm); article 2, posterior margin setose; gnathopod 2, inner margin of dactyl swollen, distinctly narrowed distally; palmar tooth tapered (but not anvil shaped) or broadly rounded; coxae densely setose (> 10 setae along ventral margin) .................. 13

12b. Gnathopod 1, anterior margin of article 5 densely setose (> 6 setae or setal bundles in specimens ≤ 3.0 mm); article 2, posterior margin bare; gnathopod 2, inner margin of dactyl evenly curved, not narrowed distally; palmar tooth anvil shaped; coxae weakly setose (< 10 setae along ventral margin) .................................. *Photis* sp SD7

13a. Gnathopod 2, palmar tooth large, distally upturned or broadly rounded (in specimens < 3.0 mm); body often covered with many pigment spots (blotchy), head with distinct pigment patch dorsally along posterior margin, antenna 1 without line of pigment in peduncular articles; gnathopod 1, article 5, anterior margin weakly setose (may be dense in specimens > 5.0 mm) .................................................. *Photis* sp OC1

13b. Gnathopod 2, palmar tooth tapered; body without numerous pigment spots, head without pigment patch dorsally, antenna 1 with line of pigment in peduncular articles; gnathopod 1, article 5, anterior margin bare .................................. *Photis californica*

14a. Gnathopod 1, palm convex; gnathopod 2 weakly excavate, palmar tooth extremely reduced, tapered, and blunt, not extending beyond dactyl hinge; coxa 5 with pigment spot (specimens < 3.0 mm) .................................................. *Photis brevipes* (immature)

14b. Gnathopod 1, palm flat (to minutely excavate); gnathopod 2 deeply excavate, palmar process tapered, extending beyond dactyl hinge; coxa 5 without pigment spot ..................

15a. Gnathopod 2, palm broad, nearly vertical, excavation shallow, its margin sinuous, the defining tooth poorly developed, the defining corner acutely produced; antero-distal margin of gnathopod 1, article 6, with pigment spot just below dactyl) .................................................. *Photis californica* (immature)

15b. Gnathopod 2, palm distinctly excavate, excavation"V" shaped, defining tooth well developed; antenna 1, peduncular articles with line of pigment ..............................................

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MALES
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16a. Gnathopod 1 convex; eye "normal" sized .................................................. 19

16b. Gnathopod 1 scarcely sinuous to distinctly concave; eye large for the genus .......... 17

17a. Gnathopod 1, palm scarcely sinuous; gnathopod 2, dactyl inner margin without tooth; palmar excavation narrow (i.e., distance between defining tooth and opposing margin of palmar process is less than one-third the width of article 6) .................................................. 18

17b. Gnathopod 1 palm distinctly excavate; gnathopod 2, dactyl with small, proximal tooth on inner margin; palmar excavation wide (i.e., distance between defining tooth and opposing margin of palmar process is approximately one-half the width of article 6) .................................................. *Photis macrotica*

18a. Palmar tooth poorly produced, not extending beyond dactyl hinge; specimen from depths \( \leq 100 \text{ m} \), length \( \leq 2.5 \text{ mm} \) .................................................. *Photis macrotica* (immature)

18b. Palmar tooth produced beyond dactyl hinge; specimen from depths \( \geq 300 \text{ m} \) ...........

.................................................. *Photis chiconola*

19a. Gnathopod 2, palm not noticeably long, nor strongly oblique, bearing only one palmar tooth, in addition to the defining tooth .................................................. 20

19b. Gnathopod 2, palm long and strongly oblique, bearing two teeth: a large tooth near the dactyl hinge, and smaller, median tooth, in addition to the defining tooth... *Photis viuda*

20a. Gnathopod 2, palmar tooth tapered, or blunt and barely visible; gnathopod 1, article 5 sub-equal to article 6, posterior margin less than or equal to one-half the length of anterior margin .................................................. 21

20b. Gnathopod 2, palmar tooth square or blunt; gnathopod 1, article 5, longer than article 6, posterior margin greater than one-half the length of anterior margin .......... *Photis lacia*

21a. Eye lobe, blunt and triangular (dorsal and ventral margin straight or nearly so); ventral margin of coxa 1 not scalloped; gnathopod 2, palmar tooth poorly developed (blunt or absent); specimen \(< 2.0 \text{ mm} \) .................................................. 22

21b. Eye lobe distinctly acute (dorsal and ventral margins concave); ventral margin of coxa 1 scalloped; gnathopod 2, palmar tooth tapered .................................................. *Photis* sp B

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MALES
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22a. Antenna 2, article 3 geniculate; coxa 5 with pigment spot and peduncular articles of antenna 1 often with line of pigment ......................... *Photis californica* (immature)

22b. Antenna 2, article 3 not geniculate; body pigment, diffuse, coxa 5 without pigment spot and peduncular articles of antenna 1 unpigmented .......... *Photis parvidons* (immature)

Note: Male of *Photis* sp E SCAMIT are undescribed.