A Preliminary, Artificial Key to the Sipunculans of Southern California

by

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1. Musculature of the body wall organized into longitudinal bands.........................................................2
   - No longitudinal muscle bands.........................................................4

2. Tentacles do not surround mouth but are dorsal to it; introvert hooks present.........................Phascolosoma agassizii
   - Tentacles surround mouth; introvert hooks absent.........3

3. Introvert with sub-triangular scale-like papilla; skin on trunk organized into squares; tentacles on flaps of skin surrounding the mouth..........Sipunculus nudus
   - No scale-like papilla on introvert; tentacles are festooned in longitudinal rows............Siphonosoma ingens

4. Contractile vessel with tubules or villi...............5
   - Contractile vessel without tubules or villi............6

5. Villi on contractile vessel short; tentacles in longitudinal rows; no hooks........Thysanocardia nigra
   - Long tubules on contractile vessel; tentacles dichotomously branched..............................Themiste sp.

6. Single retractor muscle extends to posterior end of body; single nepbridium......................Onchnesoma sp. A
   - 2 or 4 retractor muscles; paired nephridia.........................Golfingia sp...7

7. 2 retractor muscles.................................................................8
   - 4 retractor muscles...............................................................14

8. Hooks present an introvert...............................9
   - Hooks absent from introvert..........................12
a, anus; as, anal shield; c, caecum; cs, caudal shields; 
cm, circular muscle; cv, contractile vessel; ct, contractile 
tubules; dr, dorsal retractor; f, fastening muscle; g, gonad 
h, hooks; i, introvert; in, intestine; lm, longitudinal muscle; 
m, mouth; md, mid-dorsal line; ms, mesentery; n, nephridium; 
nc, nerve cord; np, nephriodiopore; o, oesophagus; pp, papillae; 
sm, spindle muscle; t, tentacles; tp, triangular papillae; 
tr, trunk; vr, ventral retractor; w, wing muscle.
9. Introvert slightly longer than trunk; tentacles reduced to small lobes. \textit{Golfingia minuta}
   - Introvert shorter than trunk; tentacles digitate. \textbf{10}

10. Double circle of tentacles around mouth; introvert hooks slightly bent and awl like; yellow, wart-like papillae. \textit{Golfingia pellucida}
    - Single circle of tentacles around mouth, introvert hooks and papilla not as above. \textbf{11}

11. Retractors insert in posterior 1/2 of trunk, rectal caecum present; posterior end of trunk dark brown \textit{Golfingia sp. 2}
    - Retractors, insert in middle 1/3 of trunk; no rectal caecum. \textit{Golfingia laetmophilia}

12. Introvert shorter than trunk; posterior end of trunk extended to form a short "tail" \textit{Golfingia sp. 1}
    - Introvert longer than trunk; no posterior tail. \textbf{13}

13. Introvert up to 9x longer than trunk; a 4-6 digitate tentacles \textit{G. nicolasi}
    - Introvert less than 2x length of trunk; 20 digitate tentacles. \textit{G. eremita}

14. Tentacles surround mouth; spindle muscle not attached to posterior end on trunk; paired, single lobed nephridia \textit{G. marginatus}
    - Tentacles, if present, do not surround mouth but are dorsal to it; spindle muscle attached to posterior end of trunk, paired, bilobed nephridia. \textbf{15}

15. Introvert shorter than trunk; ventral retractors originate from the posterior 1/2 of the trunk \textit{G. capitata}
    - Introvert 5-10 times length of trunk. \textbf{16}

16. Tentacles, hooks, papilla present \textit{G. misakiana}
    - Tentacles, hooks, papilla, absent \textit{G. trichocephala}