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
   - No longitudinal muscle bands

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

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

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

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

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

7. 2 retractor muscles
   - 4 retractor muscles

8. Hooks present an introvert
   - Hooks absent from introvert
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 mus 
m, mouth; md, mid-dorsal line; ms, mesentery; n, nephridium; 
nc, nerve cord; np, nephridiopore; 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.......................... *Golfingia minuta*
   - Introvert shorter than trunk; tentacles digitate..............10

10. Double circle of tentacles around mouth; introvert hooks slightly bent and awl like; yellow, wart-like papillae............................. *Golfingia pellucidum*
   - Single circle of tentacles around mouth, introvert hooks and papilla not as above.............................11

11. Retractors insert in posterior 1/2 of trunk, rectal caecum present; posterior end of trunk dark brown ........................................... *Golfingia sp. 2*
   - Retractors, insert in middle 1/3 of trunk; no rectal caecum................................. *Golfingia laetmophili*

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

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

14. Tentacles surround mouth; spindle muscle not attached to posterior end on trunk; paired, single lobed nephridia ........................................... *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...............15

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

16. Tentacles, hooks, papilla present............................. *A. misakiana*
   - Tentacles, hooks, papilla, absent...................... *A. trichocephala*


