



SIPUNCULA

by

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The sipunculan fauna of southern California is poorly known. The first report was that of Chamberlain (1918). Fisher's (1950a,b, 1952) work provides the only major reference for this group. He erected subgenera for the genus *Golfingia* and described nearly all of the intertidal sipunculans, but only a few of the species from offshore. Recently however, several large scale surveys of the intertidal and benthic habitats of the entire southern California borderland have collected many species not reported from this area, including several apparently new taxa. This listing includes all previously reported sipunculans and also includes species seen in collections from southern California. It includes species from intertidal to bathyal habitats.

The classification used is based upon the families of Stephen and Edmonds (1972), and the subgenera of Fisher (1952), as revised by Stephen and Edmonds (1972), Cutler and Murina (1977), and Cutler (1979).

Sipuncula Stephen, 1965
Sipunculoidea Sedgwick, 1898
Sipunculida Pickford, 1947

Sipunculidae Baird, 1868
Siphonosoma Spengel, 1912
Siphonosoma (*Siphonosoma*) Fisher, 1950
Siphonosoma (*Siphonosoma*) *ingens* Fisher, 1950
Sipunculus Linnaeus, 1766
Sipunculus nudus Linnaeus, 1766

Golfingiidae Stephen & Edmonds, 1972

Golfingia Lankester, 1885

Golfingia (*Apionsoma*) Sluiter, 1902, sensu Cutler

Golfingia (*Apionsoma*) *capitata* (Gerould, 1913)

Fisherana capitata (Gerould), 1913

Golfingia (*Apionsoma*) *misakiana* (Ikeda, 1904)

Golfingia hespera (Chamberlain, 1919)

Golfingia (*Apionsoma*) *trichocephala* (Sluiter, 1902)

Golfingia (*Golfingia*) Fisher, 1950

Golfingia (*Golfingia*) *margaritacea* (Sars, 1851)

Golfingia (*Nephasoma*) Pergament, 1940

Golfingia (*Nephasoma*) *eremita* (Sars, 1851)

Golfingia (*Nephasoma*) *laetmophilia* Fisher, 1952

Golfingia (*Nephasoma*) *minuta* (Keferstein, 1863)

Golfingia (*Nephasoma*) *nicolasi* Thompson (1980 -)

Golfingia (*Nephasoma*) *pellucida* (Keferstein, 1865)

Golfingia (*Thysanocardia*) Fisher, 1950

Golfingia (*Thysanocardia*) *catharinae* (Grube, 1868)

Golfingia procera (Möbius, 1875)

Golfingia (*Thysanocardia*) *macginitiei* Fisher, 1952

Onchnesoma Koren and Danielssen, 1875

Themiste Gray, 1828

Themiste dyscrita (Fisher, 1952)

Themiste perimeces (Fisher, 1928)

Themiste pyroides (Chamberlain, 1919)

Themiste zostericola (Chamberlain, 1919)

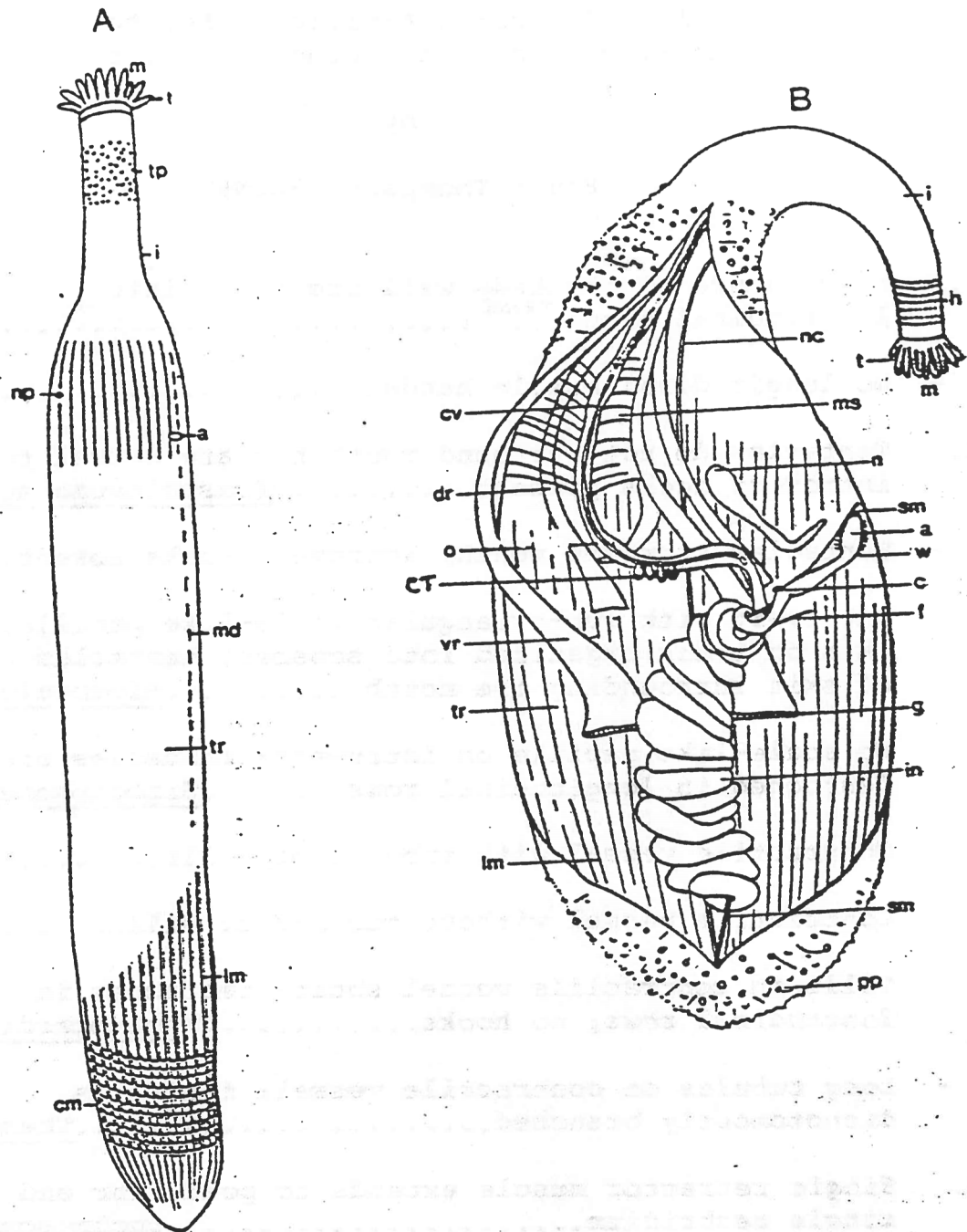
T. nigra

Phascolosomatidae Stephen & Edmonds, 1972

Phascolosoma Leuckart, 1828

Phascolosoma (*Phascolosoma*) Stephen & Edmonds, 1972

Phascolosoma (*Phascolosoma*) *agassizii* Keferstein, 1867



Diagrams of Sipunculan anatomy (after Stephen and Edmonds 1972). A. Entire organism; B. Internal structure. 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, nephridiopore; o, oesophagus; pp, papillae; sm, spindle muscle; t, tentacles; tp, triangular papillae; tr, trunk; vr, ventral retractor; w, wing muscle.

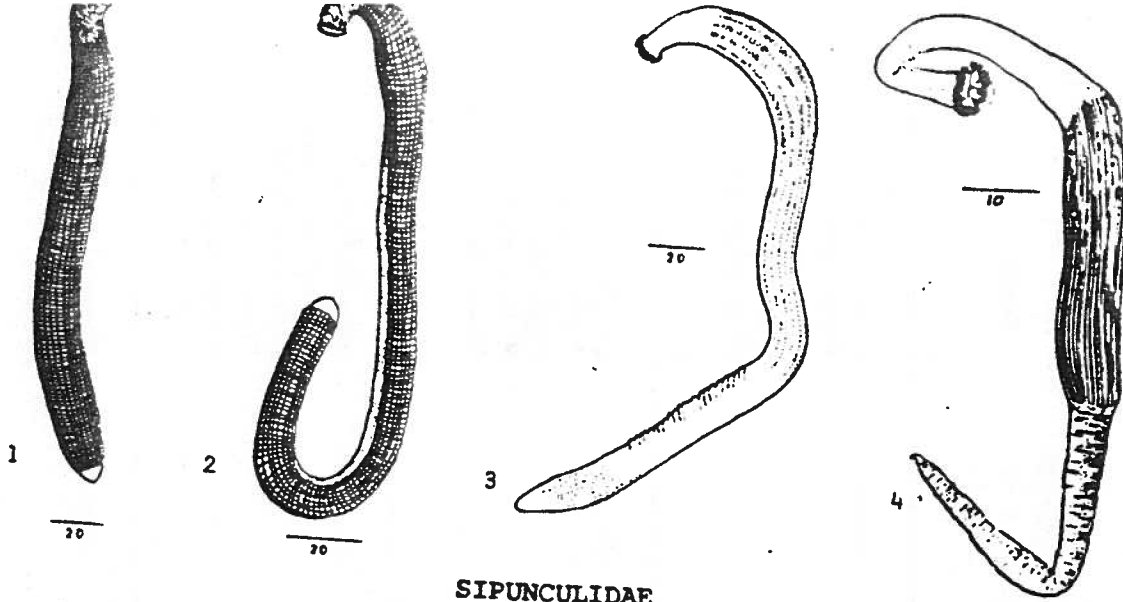
A Preliminary, Artificial Key to
the Sipunculans of Southern California

by

Bruce Thompson, SCCWRP

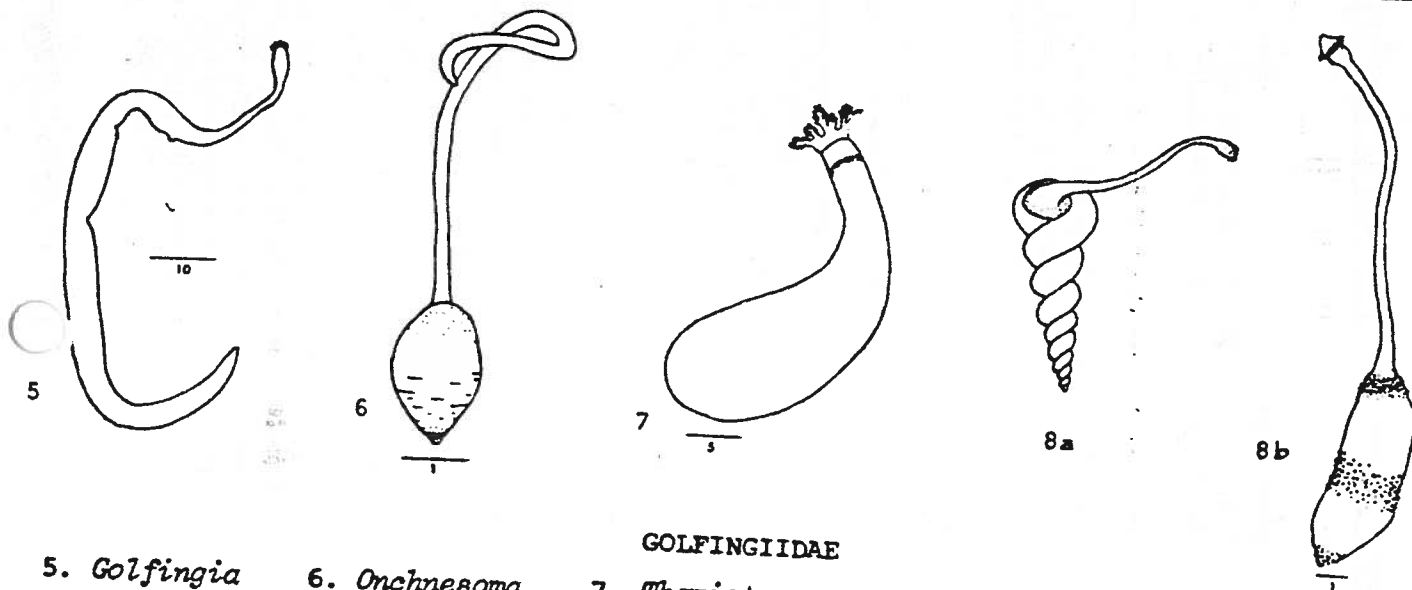
1. Musculature of the ~~body~~^{TRUNK} wall organized into longitudinal bands.....2
 - No longitudinal muscle bands.....4
2. Tentacles do not surround mouth but are dorsal to it; introvert hooks present.....Phascolosoma agassizii
 - Tentacles surround mouth; introvert hooks absent.....3
3. Introvert 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
↳ forms chains
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 nephridium.....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

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 pellucida
- 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 brownGolfingia sp. 2
- Retractors, insert in middle 1/3 of trunk; no rectal caecum.....Golfingia laetmophilia
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.subgenus Golfingia.....G. marginatus
margaritaceu
- Tentacles, if present, do not surround mouth, but are dorsal to it; spindle muscle attached to posterior end of trunk, paired, bilobed nephridia. subgenus Apomysma.....15
15. Introvert shorter than trunk; ventral retractors originate from the posterior 1/2 of the trunkG. capitata
- Introvert 5-10 times length of trunk.....16
16. Tentacles, hooks, papilla present.....G. misakiana
- Tentacles, hooks, papilla, absent.....G. trichocephala



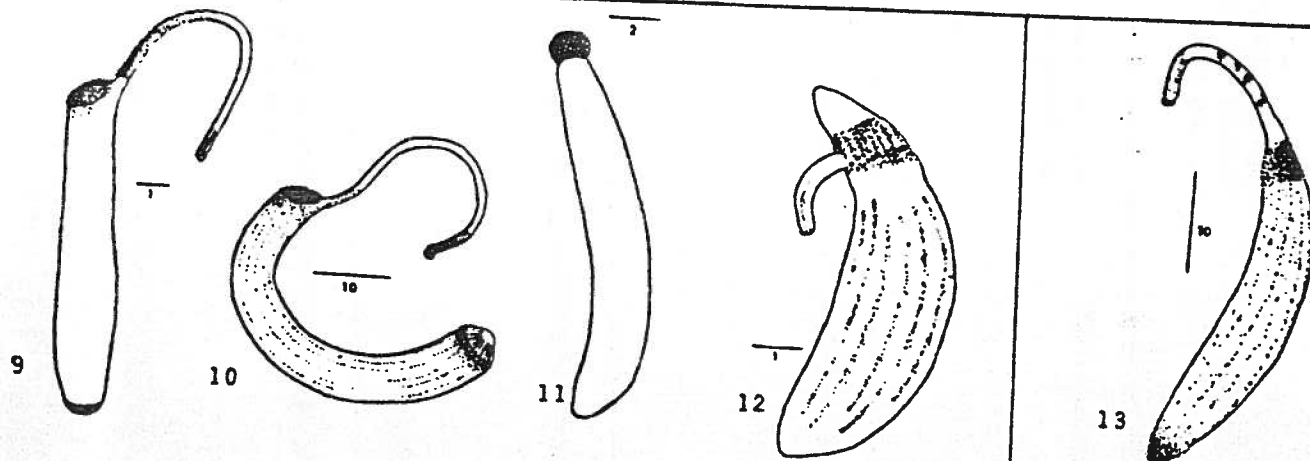
SIPUNCULIDAE

1. *Sipunculus* 2. *Xenosiphon* 3. *Siphonosoma* 4. *Phascolopsis*



GOLFINGIIDAE

5. *Golfingia* 6. *Onchnesoma* 7. *Themiste* 8. *Phascolion* (a. in shell, b. removed)



ASPIDOSIPHONIDAE

9. *Idosiphon* 10. *Paraspidosiphon* 11. *Cloeosiphon* 12. *Lithacrosiphon*

PHASCOLOSOMATIDAE

13. *Phascoloboma*

(From Edmonds, 1980; Stephen and Edmonds, 1972)

scale in mm

Characteristic Features of Families of the Phylum Sipuncula

Family	Integumentary canals or sacs in the body wall	Longitudinal musculature of the body wall	Arrangement of the tentacles	Anterior cap or shield	Genera
Sipunculidae	present (except in <i>Phascolopsis</i>)	grouped into bundles	numerous tentacles or a tentacular fold surround the mouth	absent	<i>Sipunculus</i> <i>Xenosiphon</i> <i>Siphonosoma</i> <i>Siphonomecus</i> <i>Phascolopsis</i>
Golfingiidae	absent	continuous	tentacles surround the mouth; may be in groups, be dendritic or reduced to a few lobes; may be absent in two genera	absent	<i>Golfingia</i> <i>Onchnesoma</i> <i>Nephasoma</i> <i>Phascolion</i> <i>Themiste</i>
Aspidosiphonidae	absent	either continuous or in bundles	surround or partly sur- round the mouth or in a ring dorsal to the mouth	present	<i>Aspidosiphon</i> <i>Paraspidosiphon</i> <i>Lithacrosiphon</i> <i>Cloeosiphon</i> <i>Centrosiphon</i>
Phascolosomatidae	absent (except in one species)	either continuous or in bundles	always in a horseshoe- shaped ring that is dorsal to the mouth; tentacles always en- close the nuchal organ,	absent	<i>Phascolosoma</i> <i>Fisherana</i>

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