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• = on SCAMIT SP. List 1996
Does not include the following: Agnesia septentralis
Microcosmos exasperatus
Molgula nagi formis ✓
Cnemidocarpa rhizopus ✓
✓ = collected off Pt Loma
* Halocynthia Records in Region igabaja 2006

A PRELIMINARY ARTIFICIAL KEY TO THE SOUTHERN CALIFORNIA ASCIDIANS

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1a. Simple ascidians.....32
1b. Colonial ascidians.....2

2a. Body entire, not divided into 2 or 3 regions.....26
2b. Body divided into 2 regions.....14
2c. Body divided into 3 regions.....3

3a. Atrial languet present.....7
3b. Atrial languet absent.....4

4a. Each zooid with its own test(although sharing a common base) 5
4b. Zooids embedded in a common test, colony composed of lobes or club shaped heads.....6

5a. Twelve or thirteen rows of stigmata, zooids up to 35 mm tall .....Euherdmania claviformis
5b. Seven rows of stigmata, zooids up to 30 mm tall..... .....Pycnoclavella stanleyi

6a. Lobes incrusted with sand, up to 2 cm tall..... .....Ritterella aequalisiphonis
6b. Lobes not incrusted with sand, up to 25 mm in height..... .....Ritterella pulchra

7a. Colony composed of distinct lobes or club shaped heads.....8
7b. Colony surface rather even, not composed of distinct lobes or club shaped heads.....11

8a. Branchial sac with 5 rows of stigmata, lobes of the colony up to 25 mm tall.....Aplidium arenatum
8b. Branchial sac with 8 or more rows of stigmata.....9

9a. Stomach smooth, without distinct longitudinal folds (except for typhlosole), lobes of the colony up to 11 cm tall..... .....Synoicum parfustis
9b. Stomach with 5 to about 20 distinct longitudinal folds....10

10a. Branchial sac with 8 to 13 rows of stigmata, lobes of the colony up to 35 mm tall.....Aplidium sp.*
10b. Branchial sac with 16 to 21 rows of stigmata, lobes of the colony up to 5 cm in height..... Aplidium propinquum

11a. Entire colony supported by a distinct peduncle, colony may be up to 10 cm tall.....Polyclinum planum
11b. Entire colony attached by a broad base, not supported by a distinct peduncle.....12

12a. Stomach wall with many (8-23) longitudinal folds.....13
12b. Stomach wall smooth, without many longitudinal folds, colony up to 8 cm across.....Polyclinum laxum

13a. Eight to twelve rows of stigmata, colony up to 20 cm across, 1/2 to 3 cm thick.....Aplidium californicum
13b. Thirteen to fifteen rows of stigmata, colony up to 16 cm across and 3 1/2 cm thick.....Aplidium solidum

14a. Each zooid with its own test(although sharing a common base) 15
14b. Zooids embedded in a common test.....16

15a. Zooids with about 80 rows of stigmata, zooids (including test) up to 35 mm tall.....Rhopalaea sp.*
15b. Zooids with 16 to 20 rows of stigmata, zooids (including test) up to 40 mm tall.....Clavelina huntsmani

16a. Atrial siphon present and tube like.....17
16b. Atrial siphon absent, atrial aperture an opening on the dorsal surface.....23

17a. Spicules present in the test.....18
17b. No spicules present in the test.....20

18a. Spicules disk shaped, or occasionally in the form of amorphous calcareous deposits, colony may be 25 cm or more across and up to 2 cm thick.....Cystodytes lobatus
18b. Spicules stellate.....19

19a. Surface of test completely opaque due to the abundance of spicules, zooids not visible through the test, colony up to 15 cm across and 4 mm thick.....Tridemnum opacum
19b. Surface of test translucent due to the scarcity of the spicules, zooids clearly visible through the test, colony up to 8 cm across and 3 mm thick.....Tridemnum sp.*

20a. Test tough and hard, upper surface even, without lobes, colony up to 15 mm thick.....Archidistoma psammion
20b. Test soft with even surface, or with projecting lobes....21

21a. Colony soft, with an even surface, without projecting lobes 22
21b. Colony with projecting lobes or elongate heads, which may be up to 40 mm tall.....Archidistoma ritteri

22a. Zooids average about 3 mm long or less, colony about 1 cm thick.....Archidistoma diaphanes
22b. Zooids 5 to 8 mm long, colony about 2 cm thick..... .....Archidistoma molle

23a. Minute spicules present in the test.....24
23b. Minute spicules absent.....25

24a. Atrial aperture a plain round opening restricted to the dorsal surface, with no languet, colony up to 4 mm thick... .....Didemnum carnulentum
24b. Atrial aperture very large, extending around to the sides of the branchial sac, atrial languet present, colony about 3 mm thick.....Lissoclinum caulleryi

25a. Atrial aperture with a languet, each stigmata row crossed by a transverse vessel, colony flat and about 1 cm thick or club shaped and up to 3 1/2 cm tall..Distaplia occidentalis.
25b. Atrial aperture without a languet, the rows of stigmata not crossed by a transverse vessel, colony about 2 mm thick .....Diplosoma macdonaldi

26a. 4 to 8 rows of stigmata.....27
26b. 9 to 13 rows of stigmata.....29

27a. Each zooid with its own test or zooids fused, but not arranged in systems, atrial siphon tube like, and opening directly to the outside, maximum height (including test) about 3 mm. .....Perophora annectens
27b. Zooids arranged in systems, atrial aperture opening into a common cloaca.....28

28a. 4 rows of stigmata, colony up to 2 mm thick..... .....Botryllus tuberatus
28b. 8 rows of stigmata, colony up to about 2 mm thick..... ..... Botryllus sp.*

29a. Zooids in systems, atrial aperture provided with a languet and opening into a common cloaca, colony up to about 5 mm thick.....Botrylloides diegense*

29b. Zooids not in systems, atrial aperture without a languet, and opening directly to the outside.....30

30a. Branchial sac with 3 longitudinal vessels, zooids up to 6 mm in height.....Polyzoa translucida
30b. Branchial sac with 5 longitudinal vessels.....31

* a forms: Channel Is form has completely diff. Tadpole larva from mainland forms, though adults of both forms are identicle though habitats are different.

31a. Zooids close together in a common test, colony up to about 4 mm thick.....Metandrocarpa dura
31b. Zooids separated, each with its own test, but interconnected with at least a film of test, zooids up to 5 mm tall.....Metandrocarpa taylori

32a. Branchial sac with internal longitudinal folds.....39
32b. Branchial sac flat, without internal longitudinal folds..33

33a. Anterior end of the test a flattened disk provided with thin horny plates, reaches a maximum height of 50 mm.....Chelyosoma productum.
33b. Anterior end not flattened nor provided with thin horny plates.....34

34a. Ascidian resembling a ball of mud, stigmata arranged in perfect double spirals, maximum test diameter about 15 mm.....Eugyra arenosa. ✓ VN-437
34b. Ascidian not resembling a ball of mud, stigmata not arranged in perfect double spirals.....35

35a. Branchial sac extends posteriorly beyond the stomach in a long narrow pouch which is as long or longer than the distance from the stomach to the branchial siphon, maximum test length 14 cm.....Ascidia vermiformis
35b. Branchial sac does not extend posteriorly in a long narrow pouch.....36

36a. Stigmata spiral, stomach on the right side of the body, intestine curves ventrally under the stomach, maximum length of the test 45 mm.....Corella willmeriana. ✓ — could be Agnesia also.
36b. Stigmata straight, stomach on the left side of the body, intestine curves dorsally over the stomach.....37

37a. Atrial siphon located on the dorsal side near, or posterior to the middle of the body.....38
37b. Atrial siphon located near the anterior end of the body, maximum test length 25 cm, usually 10 cm or less.....Ciona intestinalis.

38a. Test transparent or translucent, flexible, laterally flattened, test up to 50 mm long.....Ascidia ceratodes
38b. Test opaque, rigid, cartilaginous, not laterally flattened, up to 45 mm long.....Ascidia sp.*

39a. Large tentacles branched.....40
39b. Tentacles always simple.....46

40a. A closed renal sac on the right side of the body.....41
40b. No renal sac present on the right side of the body.....42

41a. An S shaped ovary on each side of the body, maximum test diameter 4 cm, usually 15 mm or less.....Mogula regularis
41b. An oblong ovary on each side of the body, maximum test length 15 mm.....Mogula pugetiensis

42a. Test provided with precisely intersecting rows of small papillae, maximum diameter 4 cm, usually 2 cm or less.....Bathypura ovoida
42b. Test not provided with precisely intersecting rows of small papillae (but may be provided with spines exhibiting no precise pattern).....43

43a. Body of test provided with spines, and usually relatively free of incrusting debris or organisms.....44
43b. Body of test lacking spines (although minute spines may be present on the siphons), test may or may not be covered with debris or incrusting organisms.....45

44a. Body supported by a stalk, total length of the test up to 9 cm.....Boltenia villosa
44b. Body attached directly by the posterior end, no stalk present, up to 10 cm in diameter, but usually 3 cm or less.....Halocynthia igaboja

45a. Siphons located at opposite ends of an elongate body and directed in nearly opposite directions, test free of incrusting debris or organisms, up to 65 mm long.....Pyura mirabilis
45b. Both siphons directed upwards, test usually incrusted with debris or organisms, up to 120 mm long.....Pyura haustor

46a. Body supported by a narrow stalk, the upper part of which is hollow and contains a tubular prolongation of the mantle.....47
46b. Body attached directly by the posterior end, no hollow narrow stalk present.....48

*47a. Conspicuous tubercles anteriorly, longitudinal folds of the test restricted to the posterior body and stalk, 4 or more ovaries on the right side of the body, test up to 20 cm tall.....Styela clava = S. plicata = S. barnharti Ritter & Forsythe
47b. Tubercles few and inconspicuous, longitudinal folds extend anteriorly nearly to the siphons, 3 or fewer ovaries on the right side of the body, test up to 30 cm tall.....Styela montereyensis

48a. Branchial sac with only one internal longitudinal vessel between the branchial folds, test up to 30 mm tall.....Styela truncata
48b. Branchial sac with 2 or more internal longitudinal vessels between the branchial folds.....49

* SEE Styela sp SD 2 = Cnemidocarpa rhizopus

49a. 2 ovaries on each side of the body.....50
49b. Other than 2 ovaries on each side of the body.....53

50a. Ovaries clearly sinuously curved.....51
50b. Ovaries only slightly sinuously curved, nearly straight..52

51a. Posterior region of the test provided with slender branching papillae which are usually obscured by silt, test up to 25 mm in height.....Styela sp.*
51b. Test not provided with such papillae, test up to 30 mm tall .....Styela sp. (probably partita)*

52a. Test tough, leathery, opaque, usually with longitudinal ridges, up to 40 mm tall.....Styela gibbsii
52b. Test delicate, film like, translucent, without longitudinal ridges, up to 30 mm in height.....Styela sp.*

53a. One ovary on the right side of the body, test up to 20 mm long.....Styela coriacea
53b. At least three ovaries on the right side of the body, test up to 10 cm tall.....Styela plicata — BAY 98 STA. 2233

* These species are probably new and undescribed. Please send any specimens you find to Dr. Vallee.

Supplementary notes to Southern California Ascidians:

3 groups in sampling--

1) 25-60 fathoms, all solitary
2) protected waters; Ciona, Styela,,Botrylloides
3) surge, exposed, water exchange very dynamic

will enter protected as long as there is great tidal change

Bathypura ovoida--40-100 fathoms, on rocks or shells, white, solitary
Pyura sp.--deep water up to intertidal, variation in siphons
Bocryllus and Botryoides--protected waters, bays, not brackish
Polyzoa translucida--may be extinct
Styela gibbsii--extended siphons(up to 2 cm.),protected and exposed
Styela clava--introduced from Japan
Distaplia occidentalis--both exposed and protected,color varies, encrusting, colonial
Synoicum sp.--club shpaed, colonial
Aplidium sp.--color varies, white predominant, encrusting, colonial