

Additional File

Host-driven adaptive radiation and host usage in sponge-associated barnacles

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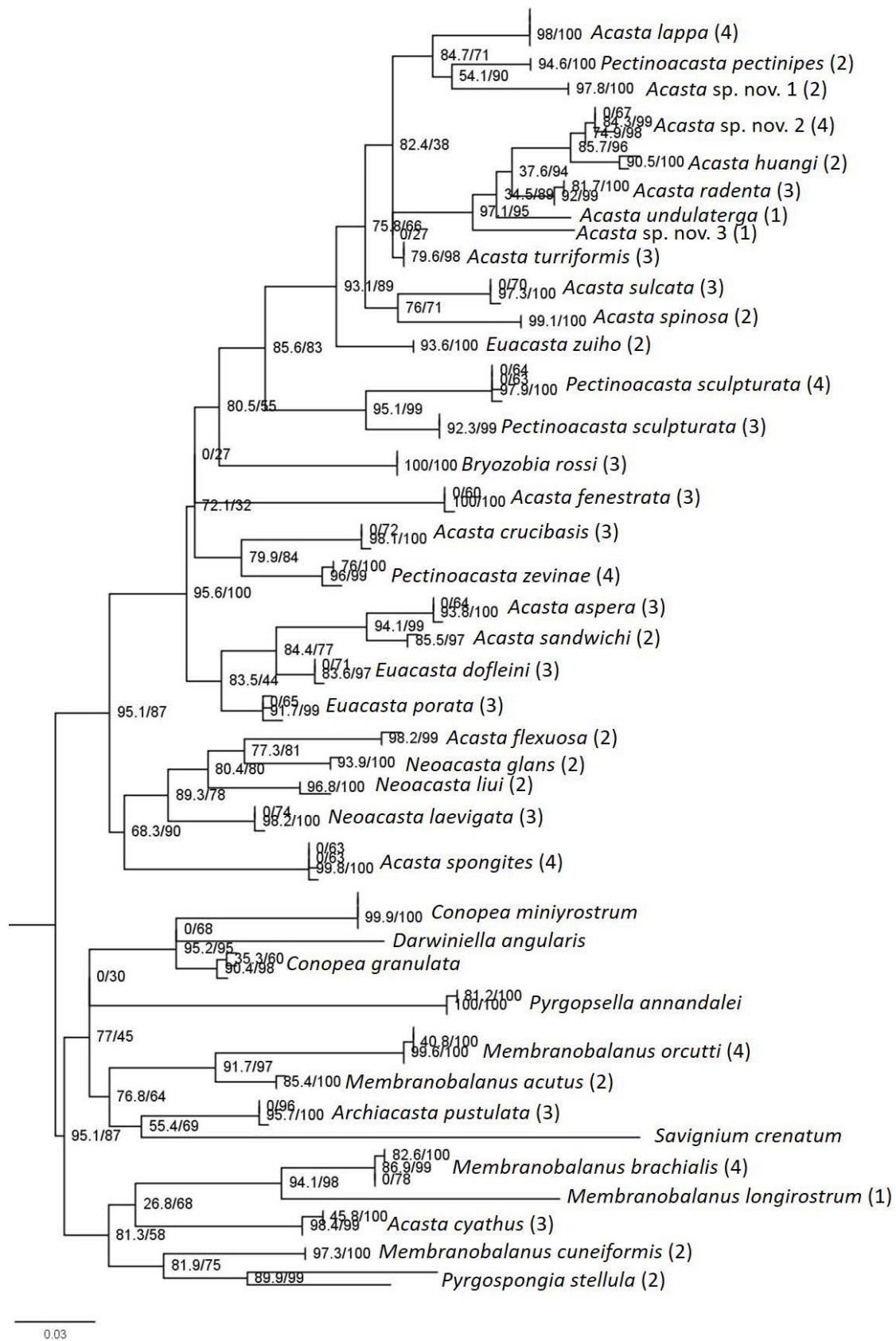
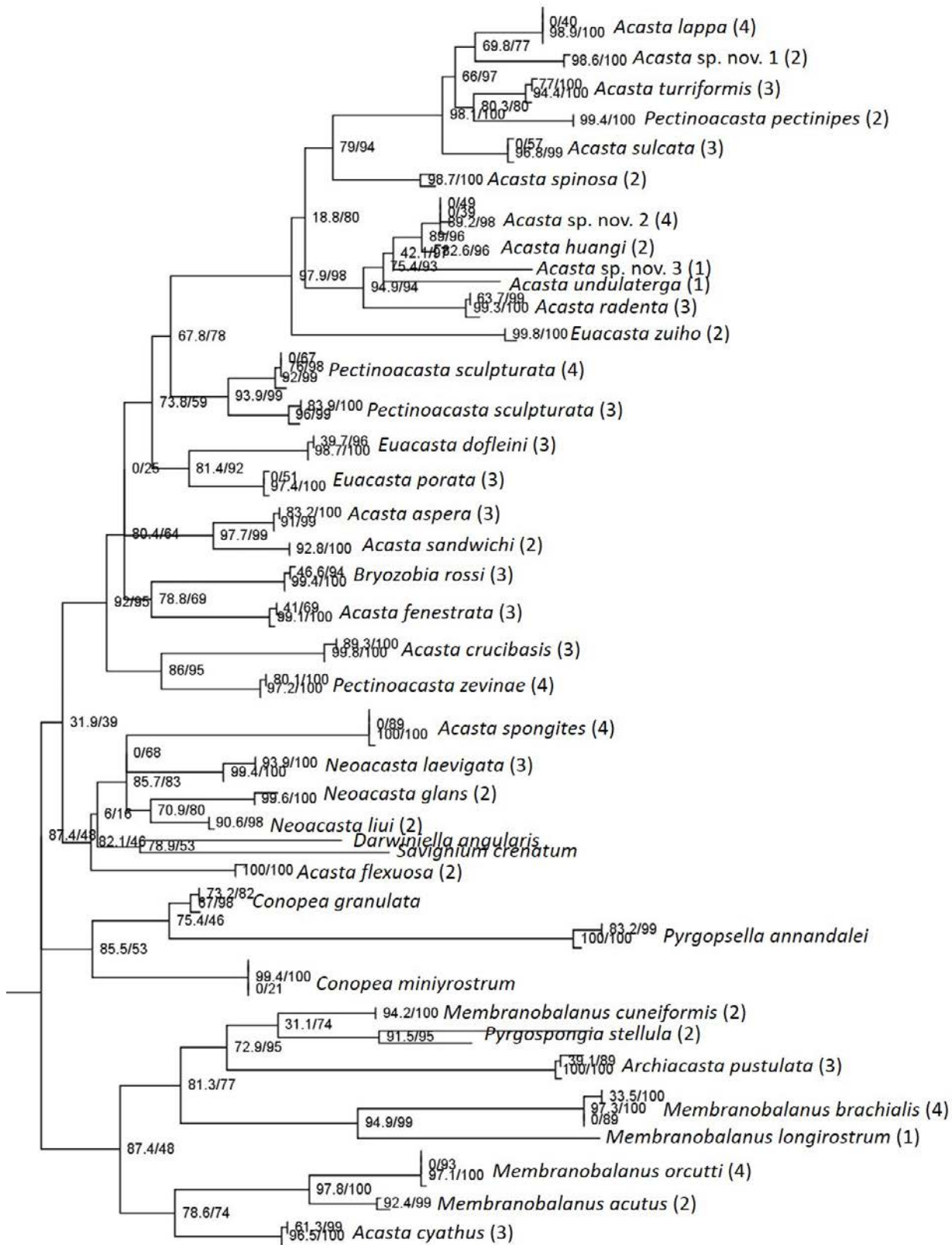


Figure S1. Topology inferred from individual molecular marker 12S based on maximum likelihood (ML).



0.03

Figure S2. Topology inferred from individual molecular marker 16S based on ML.

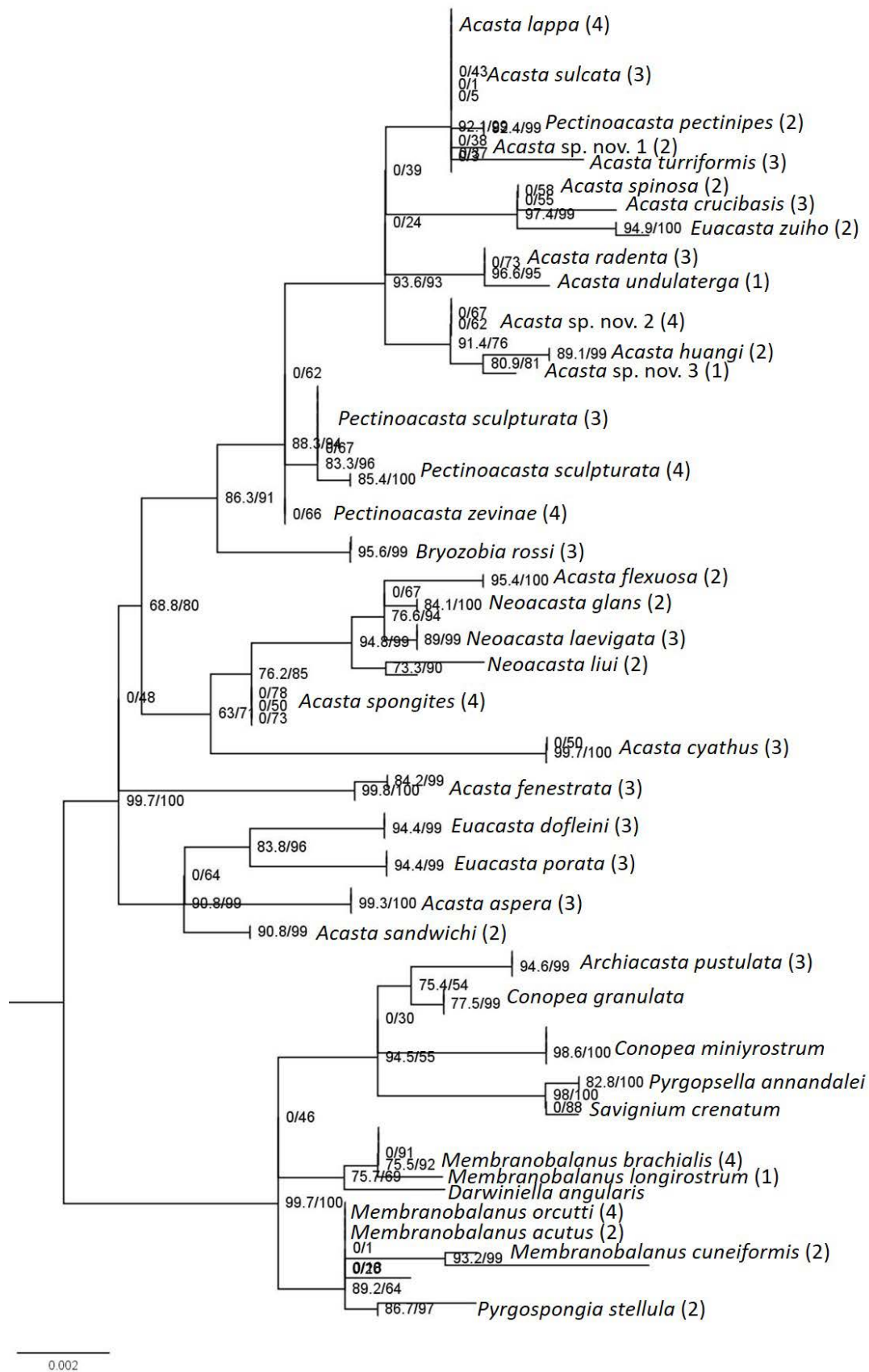


Figure S3. Topology inferred from individual molecular marker 18S based on ML.

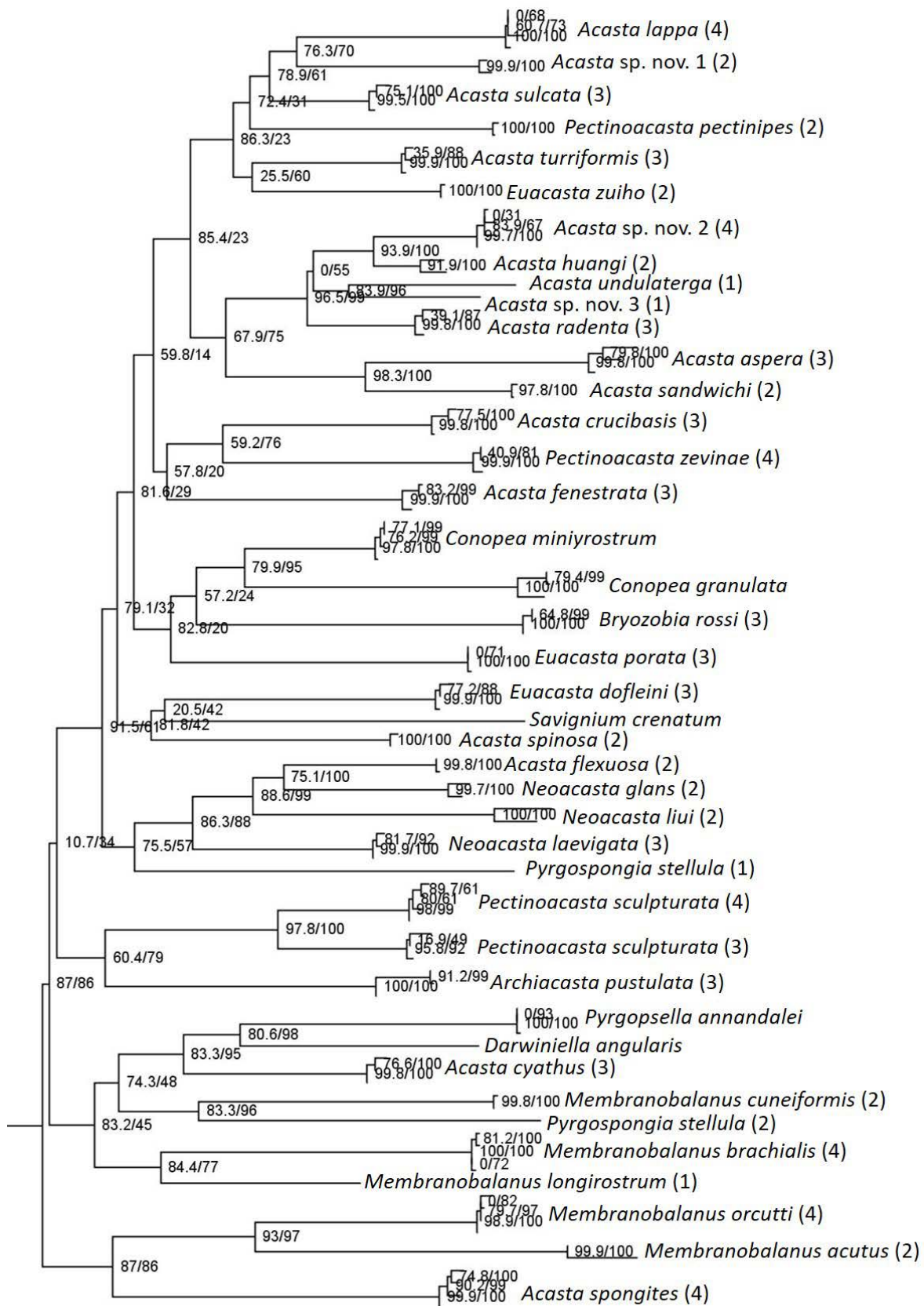


Figure S4. Topology inferred from individual molecular marker COI based on ML.

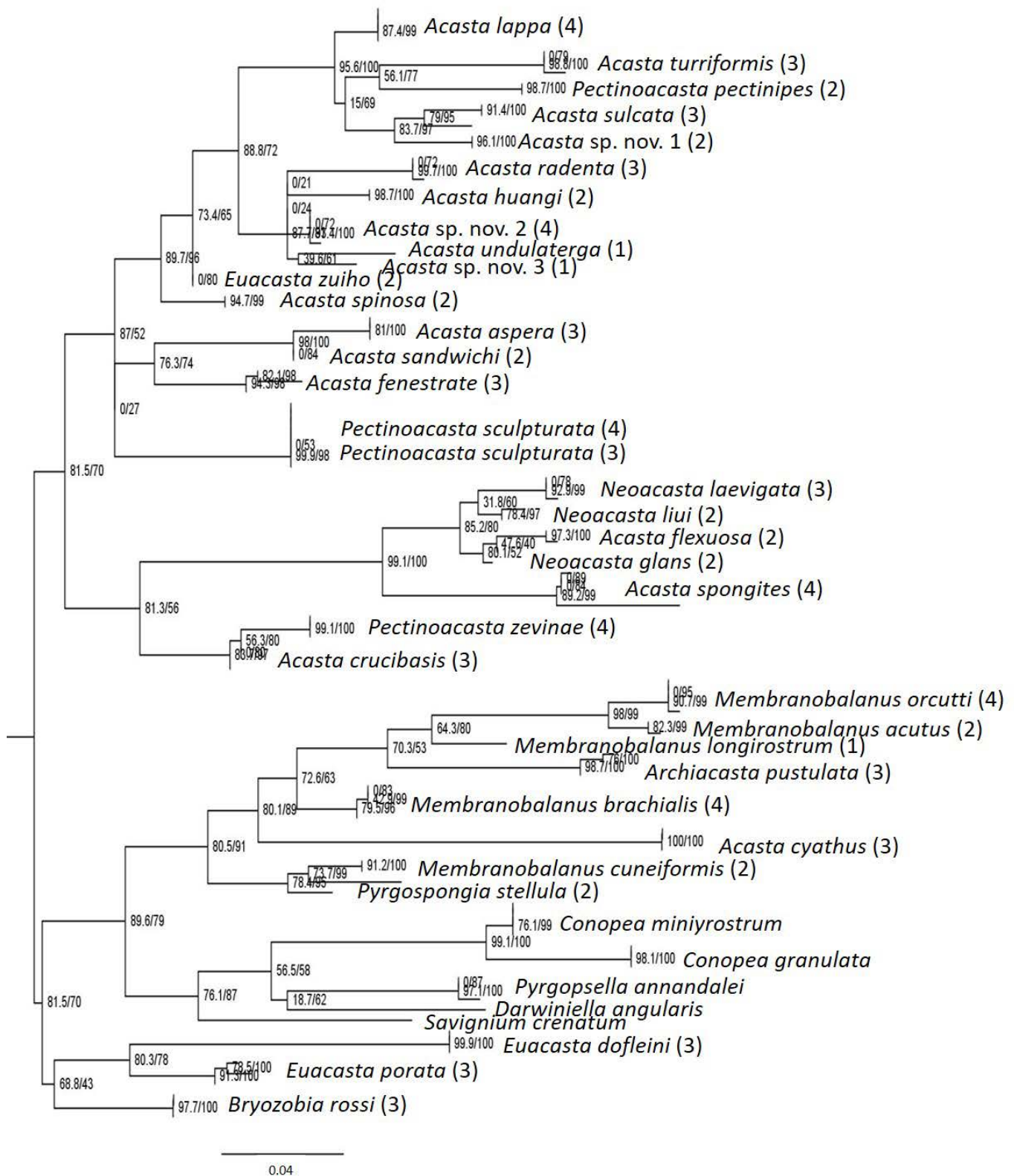


Figure S5. Topology inferred from individual molecular marker H3 based on ML.

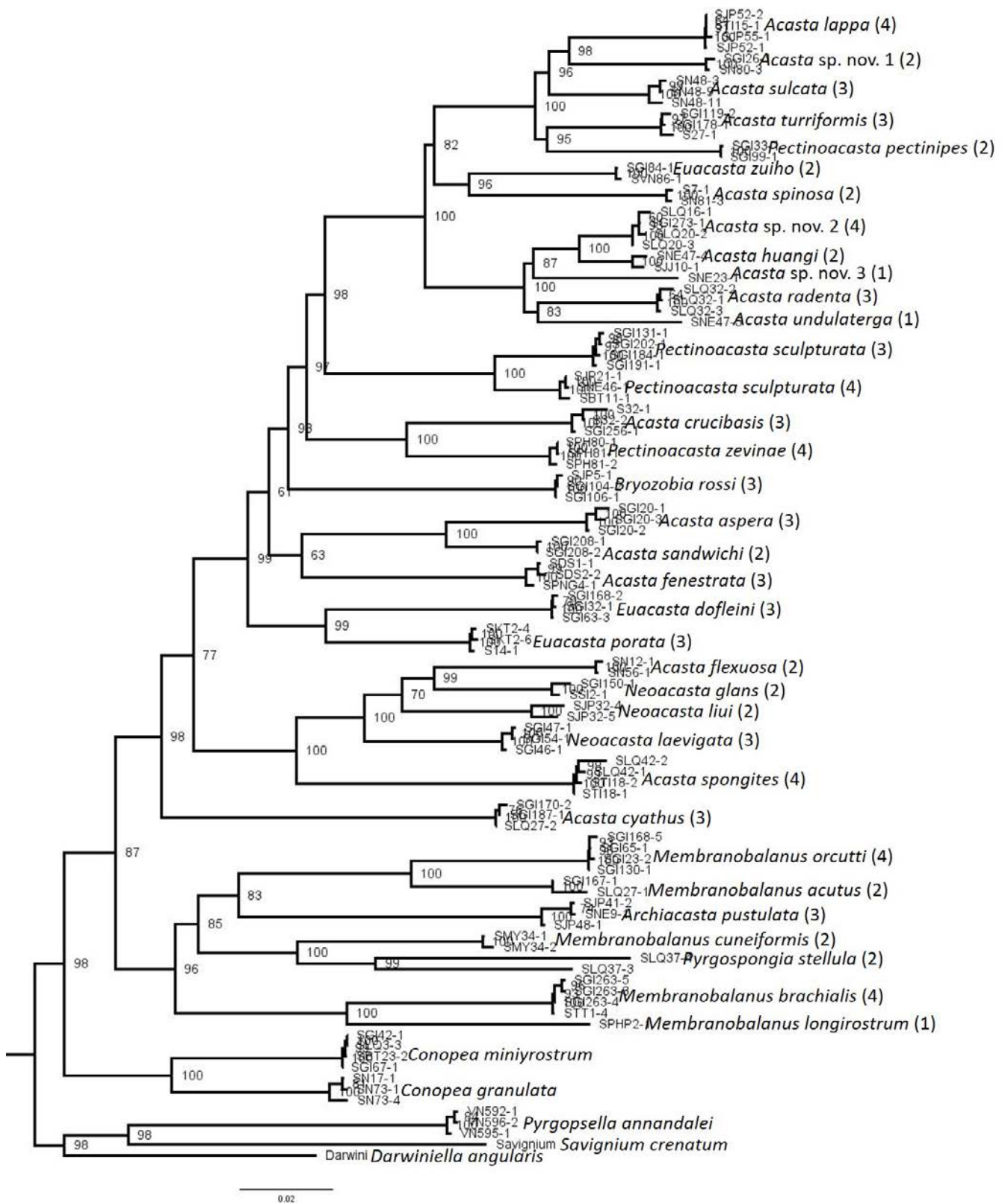


Figure S6. Phylogenetic tree of sponge barnacle resolved by ML based on all available sequences of the five markers (12S, 16S, 18S, COI and H3).

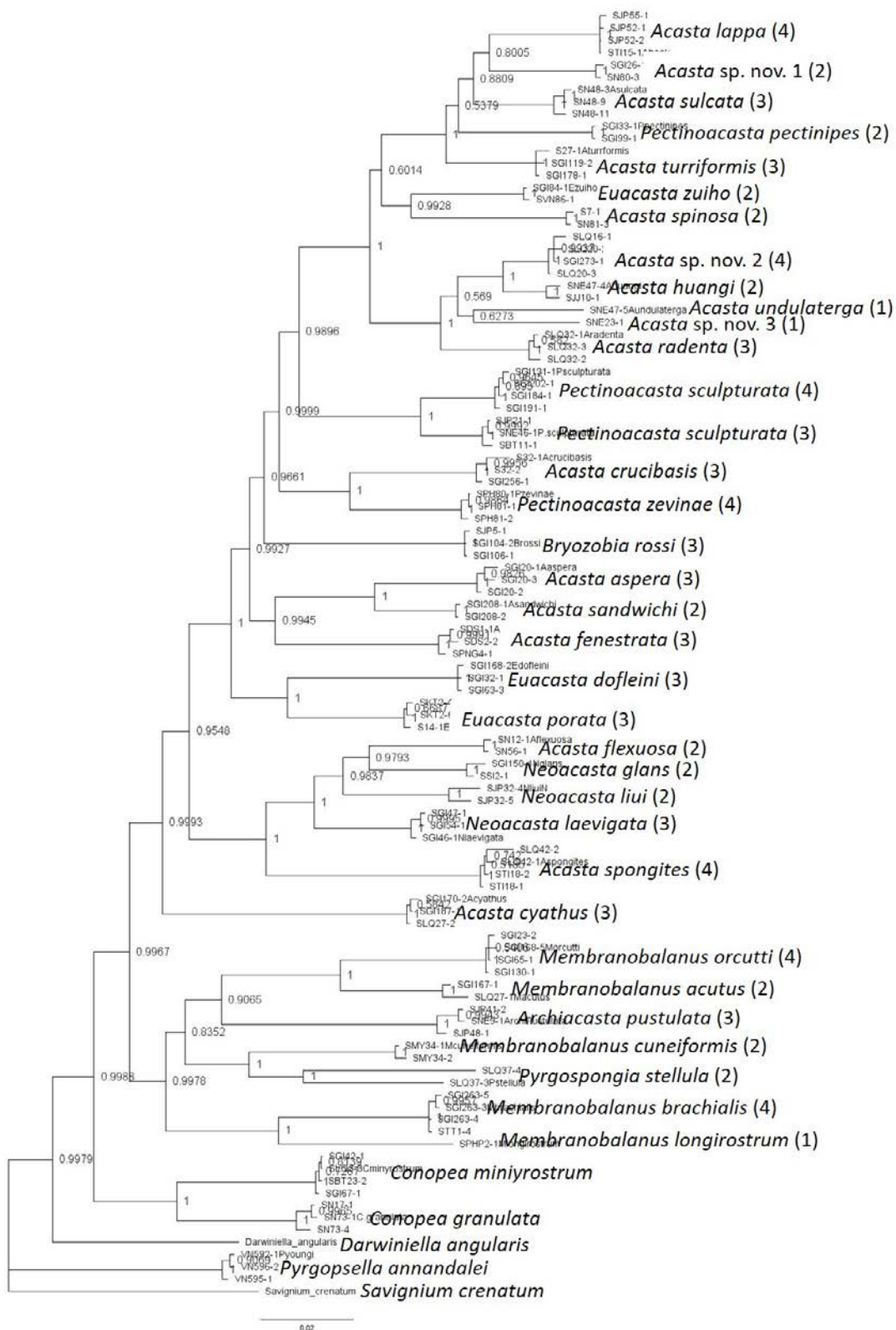


Figure S7. Phylogenetic tree of sponge barnacle resolved by Bayesian inference (BI) based on all available sequences of five markers (12S, 16S, 18S, COI and H3).

ML(IQ-USA)+BI tree
6M 289 seq

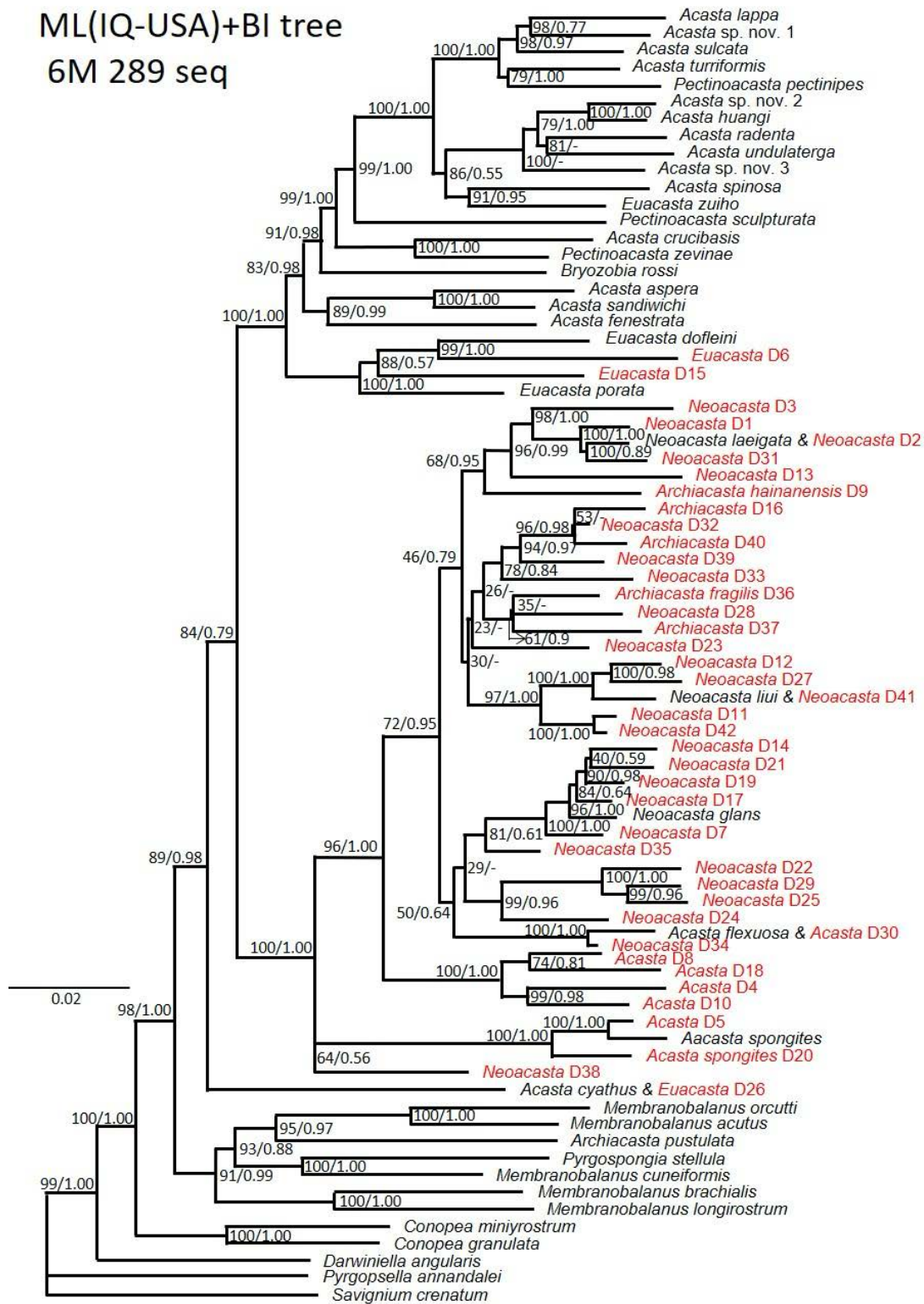


Figure S8. Phylogenetic tree of sponge barnacle resolved by ML based on the available sequences of the six markers (12S, 16S, 18S, 28S, COI and H3) from this study and Hosie et al., 2021. Numbers by the nodes are ML bootstrap/BI posterior probability.

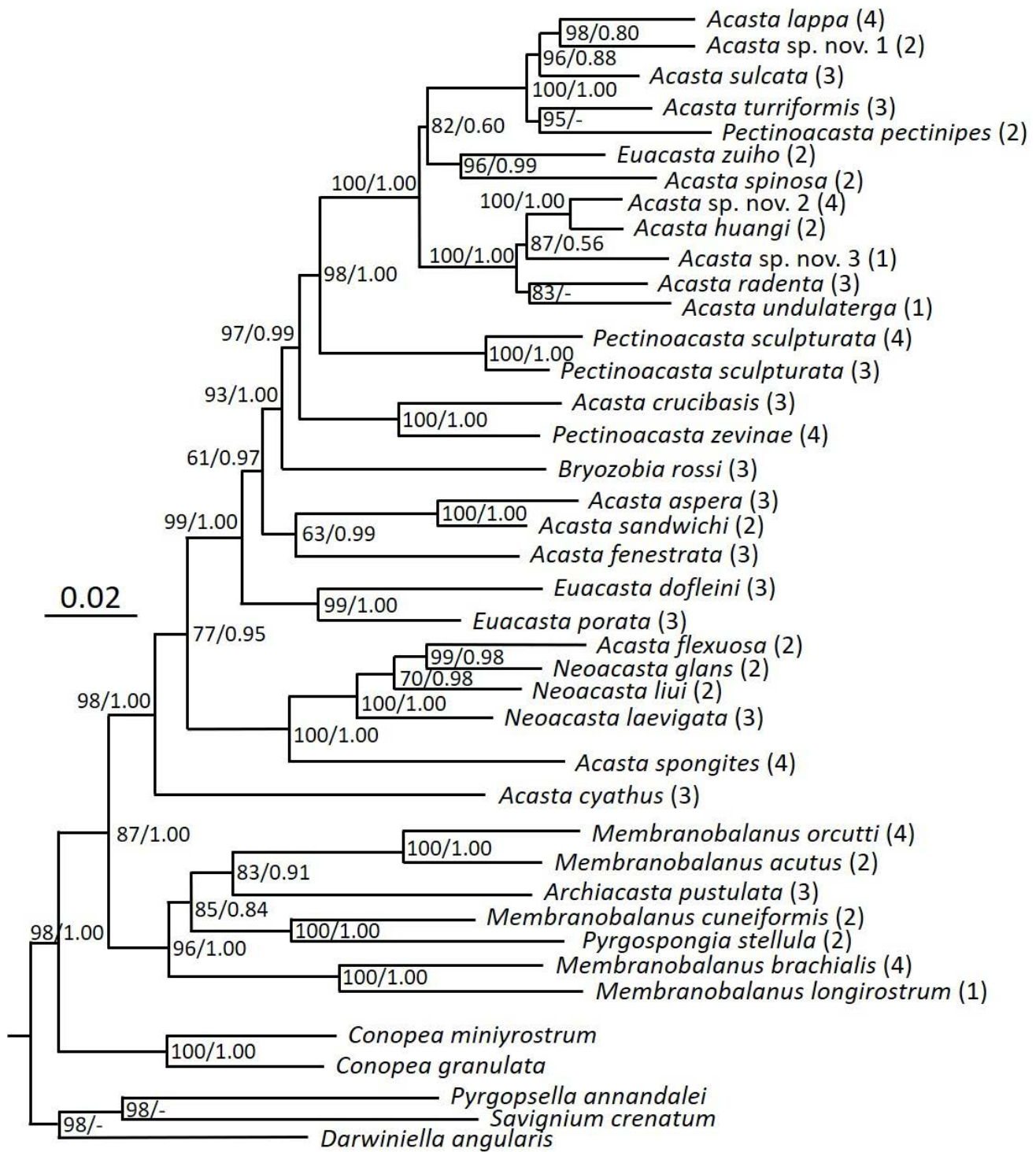


Figure S9. Bayesian topology inferred from a concatenated dataset analysis of phylogenetic relationships among sponge barnacle species. The Bayesian posterior probabilities and maximum likelihood bootstrap support measures are indicated at the corresponding nodes.

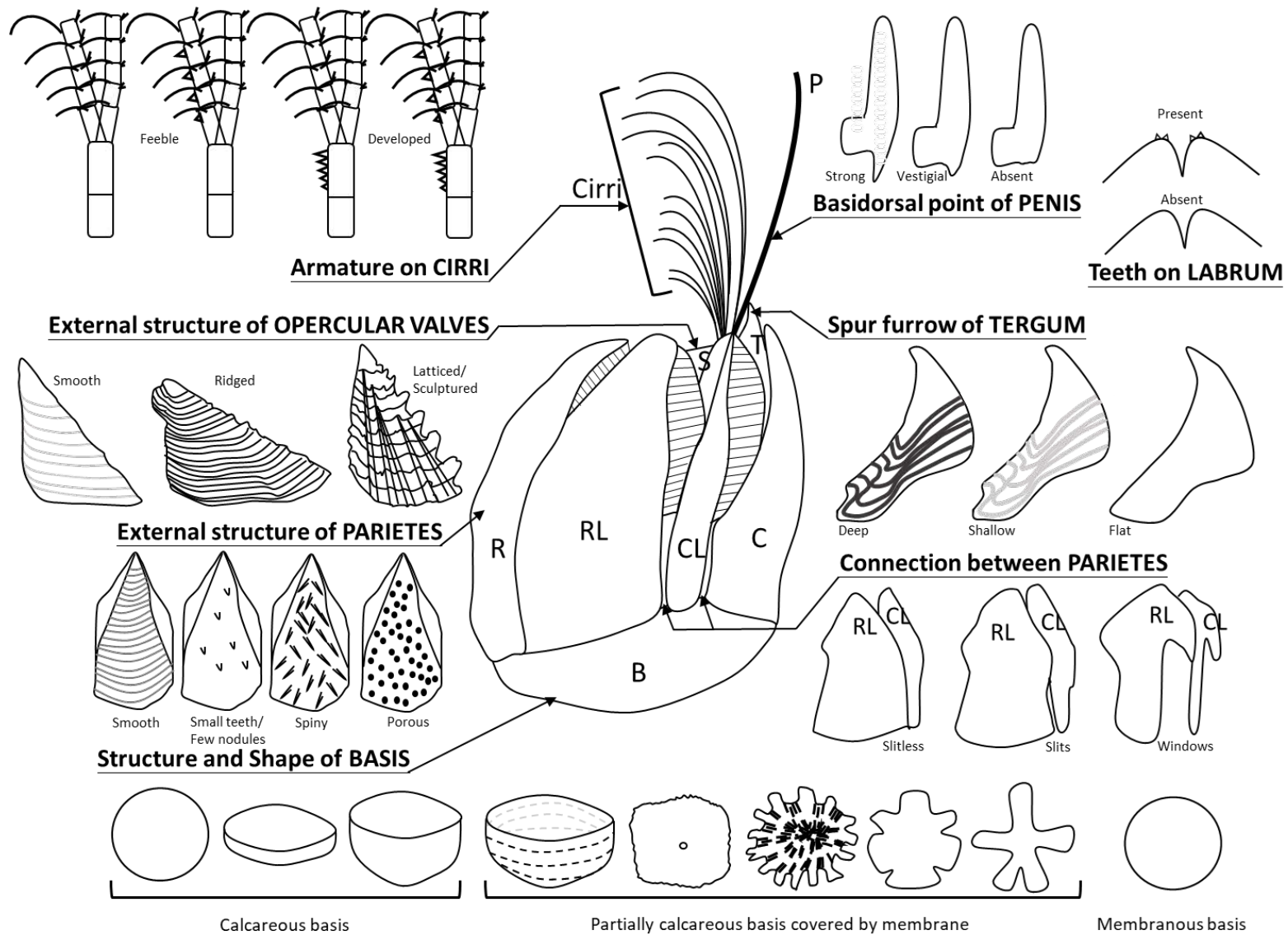


Figure S10. Ten morphological traits of sponge barnacle

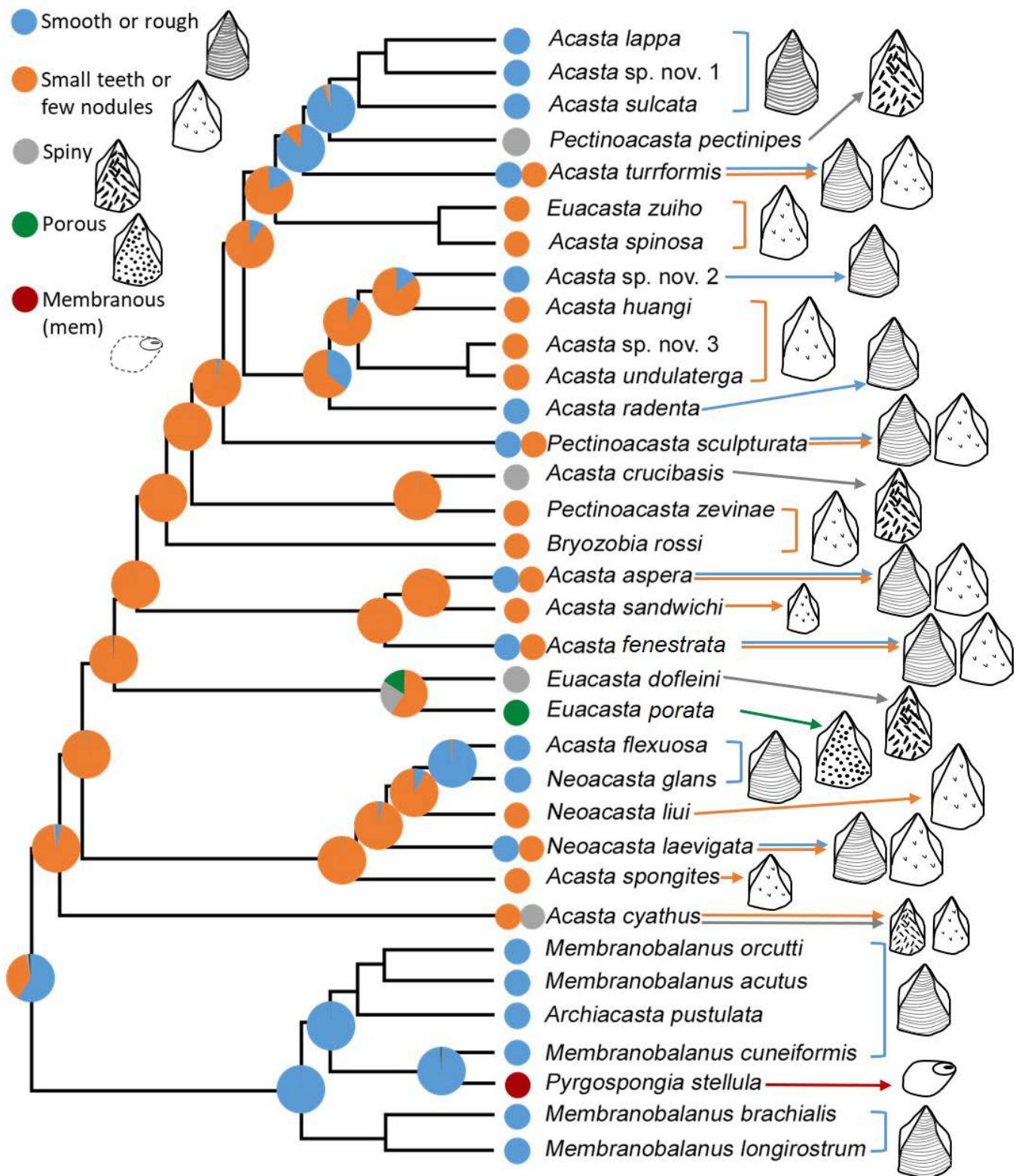


Figure S11. Reconstructed ancestral states of external structure on shell plates on BI tree.

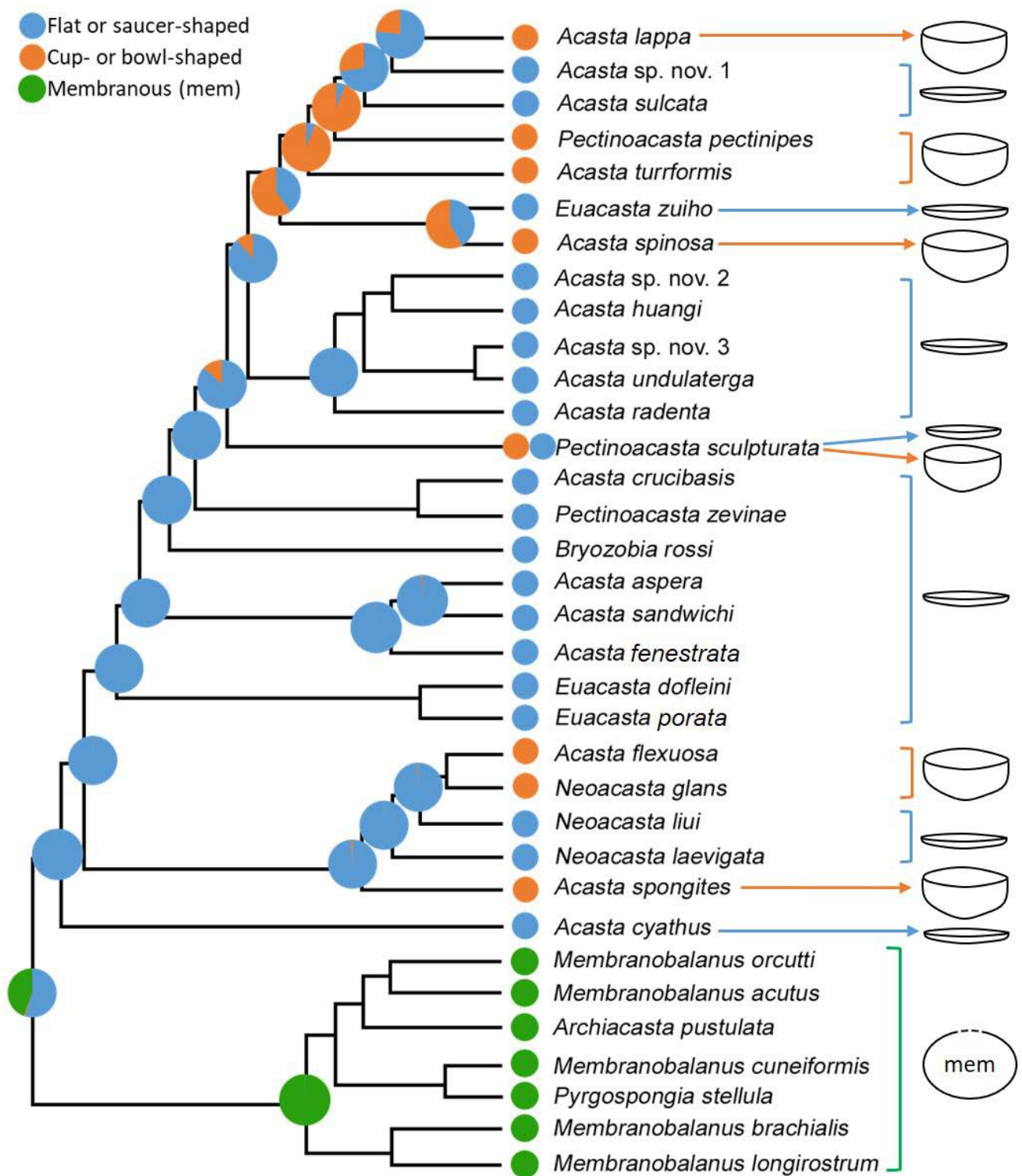


Figure S12. Reconstructed ancestral states of basis form on BI tree.

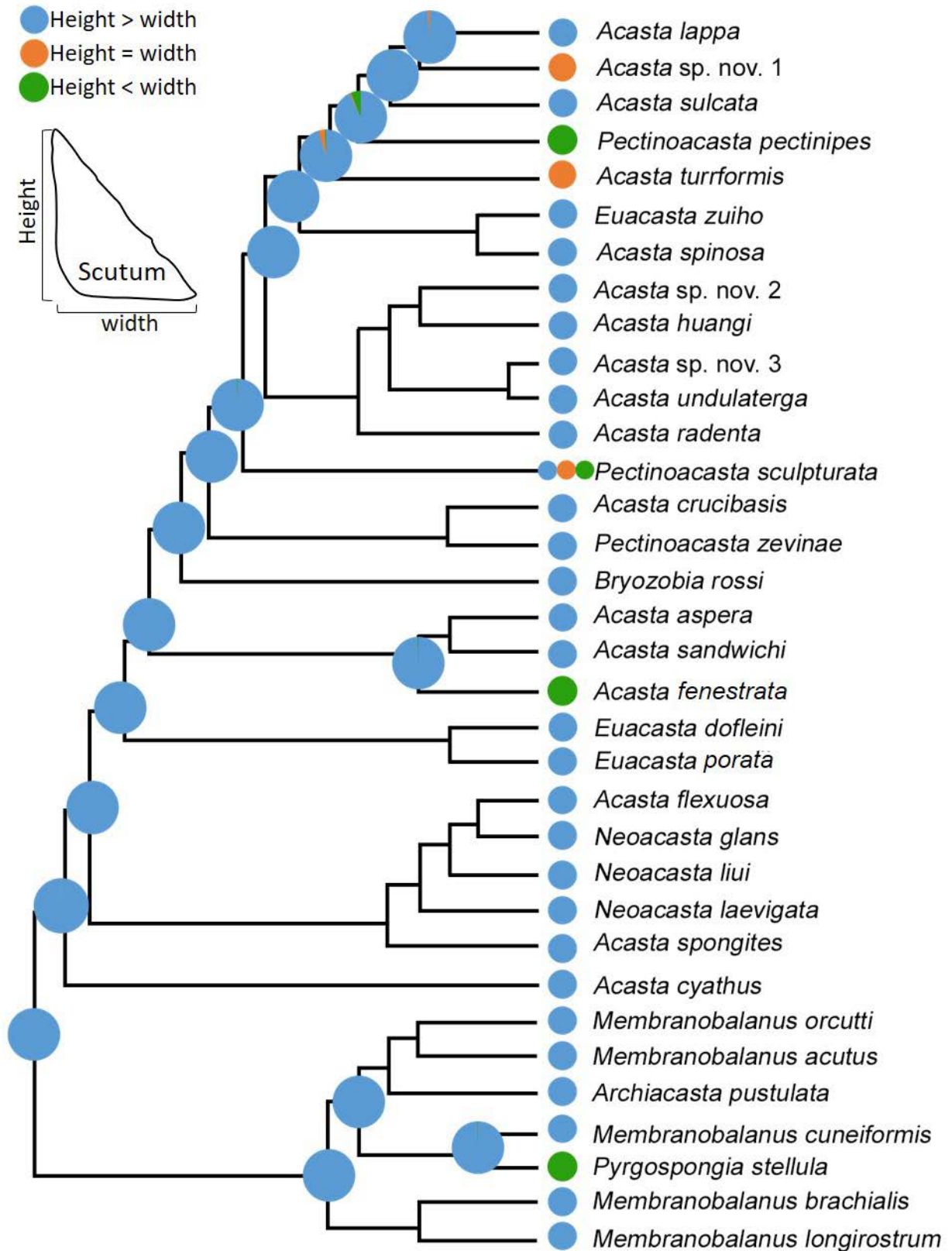


Figure S13. Reconstructed ancestral states of aspect ratio of scutum on BI tree.

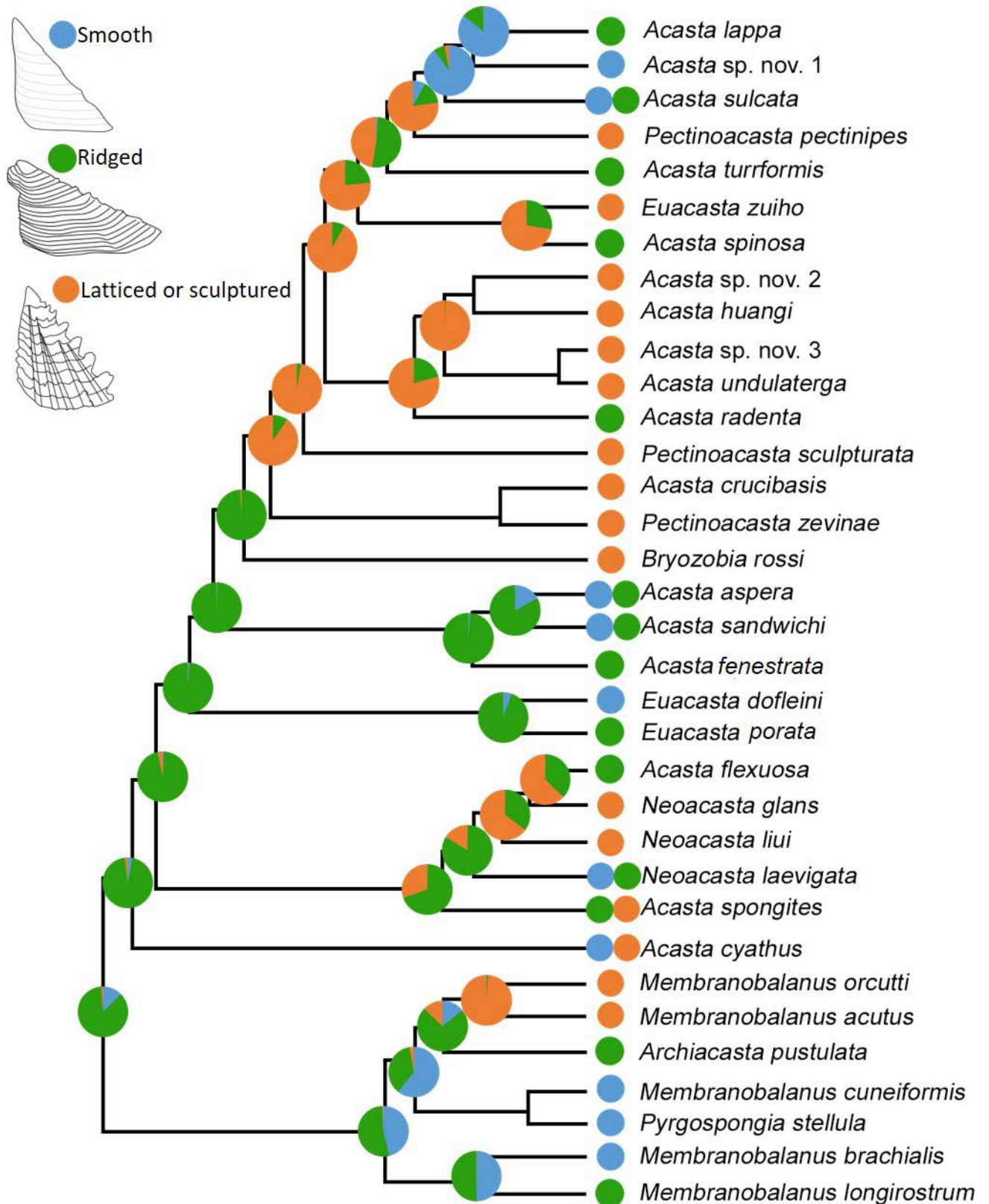


Figure S14. Reconstructed ancestral states of external structure on scutum on BI tree.

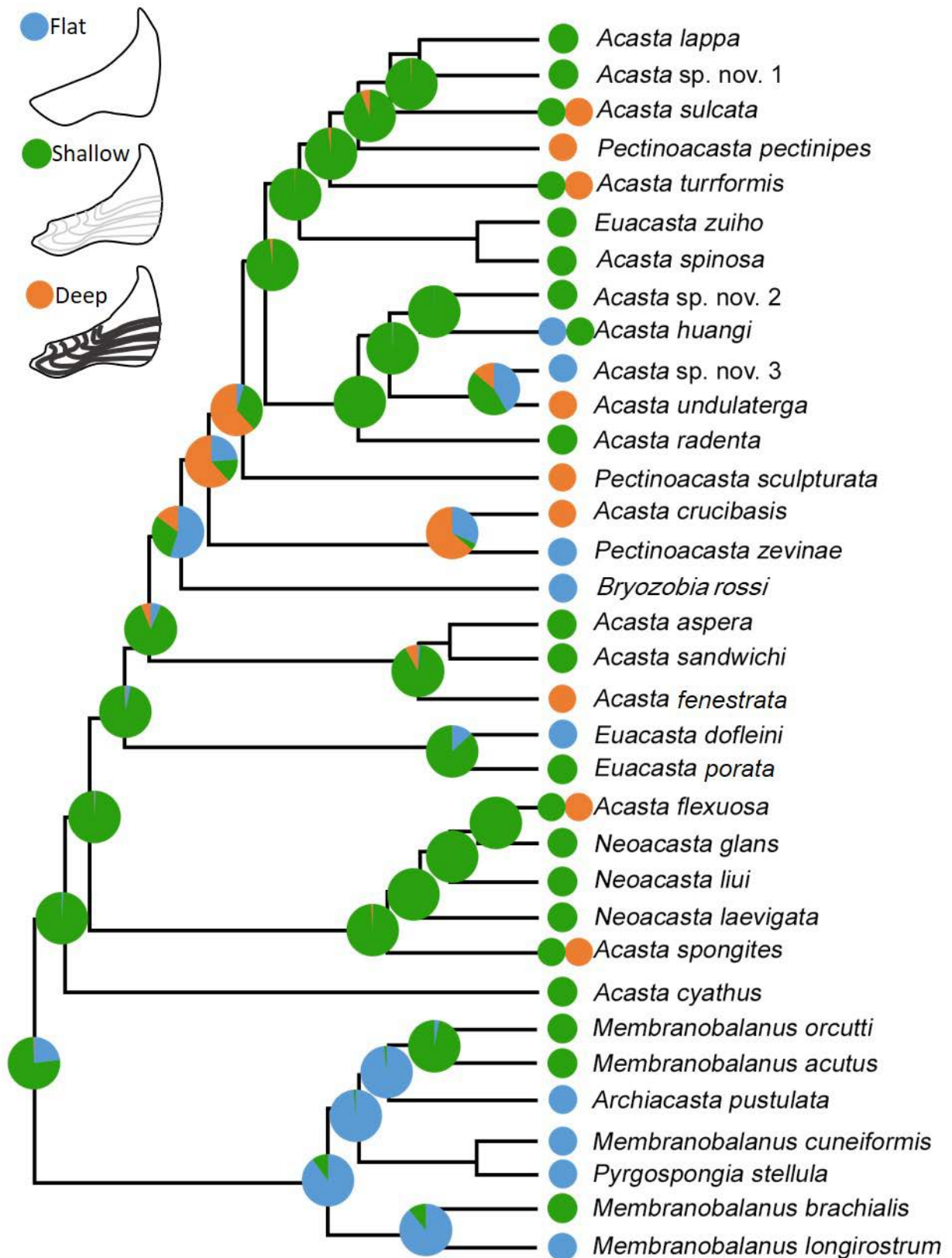


Figure S15. Reconstructed ancestral states of spur furrow of tergum on BI tree.

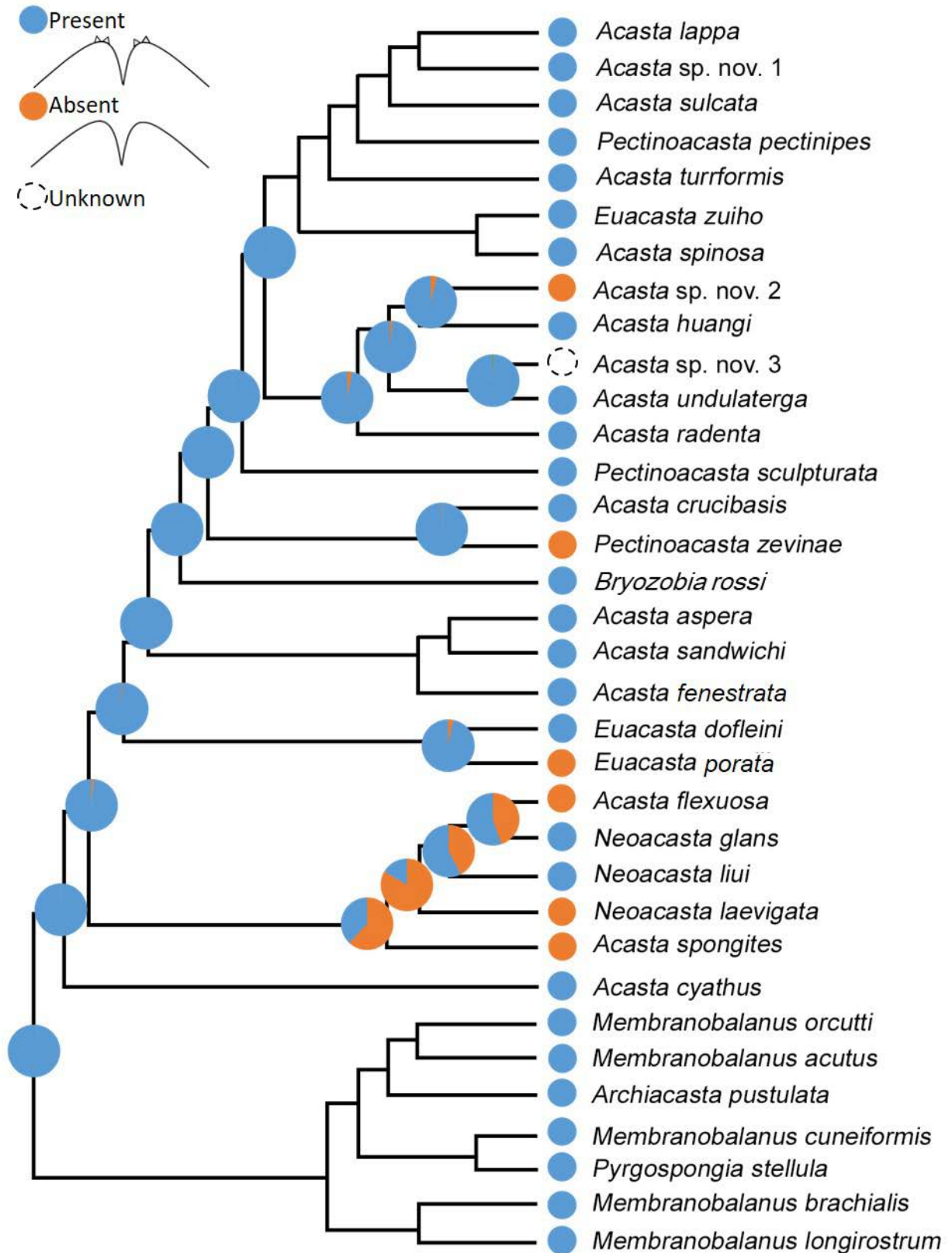


Figure S16. Reconstructed ancestral states of teeth on labrum on BI tree.

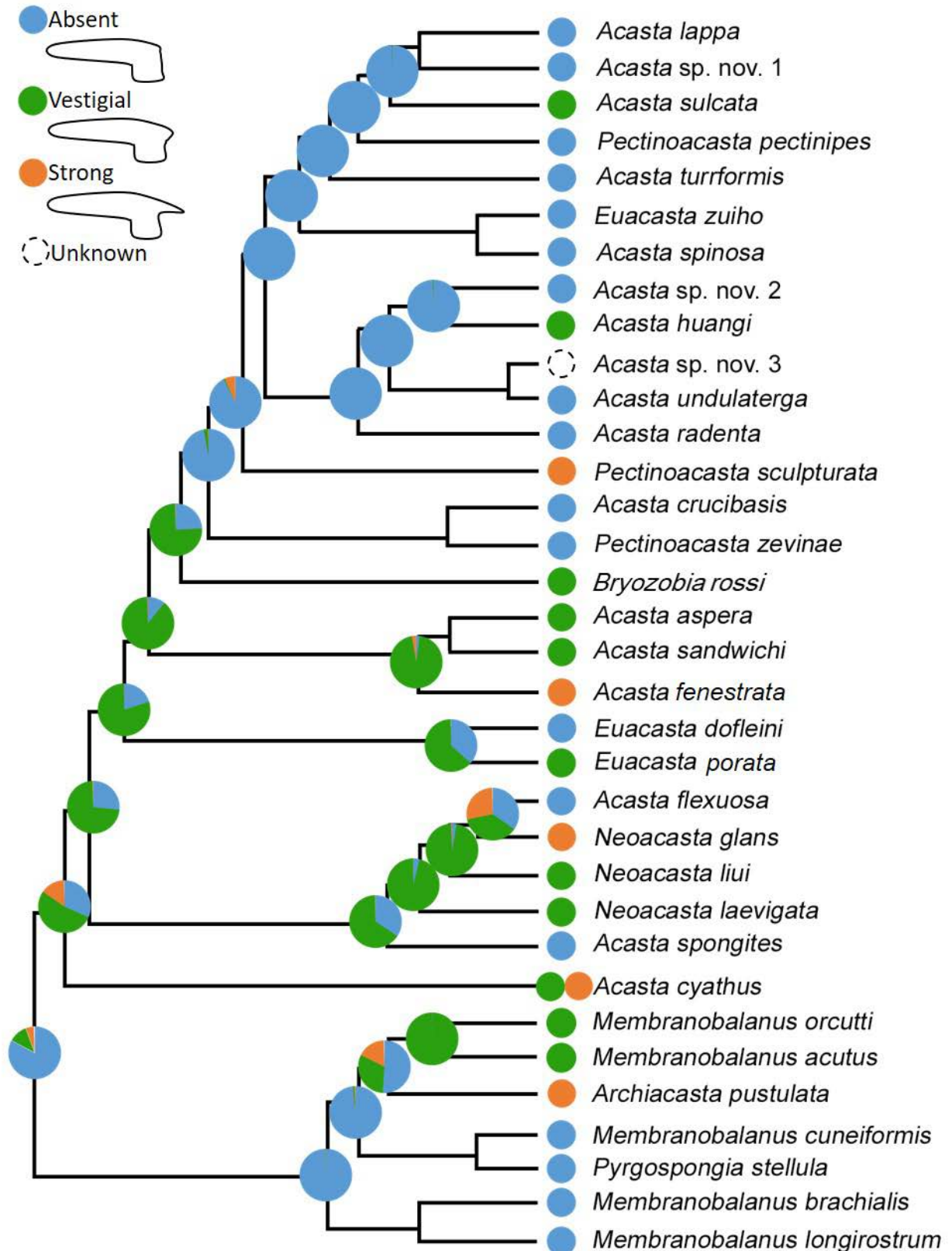


Figure S17. Reconstructed ancestral states of basidorsal point of penis on BI tree.

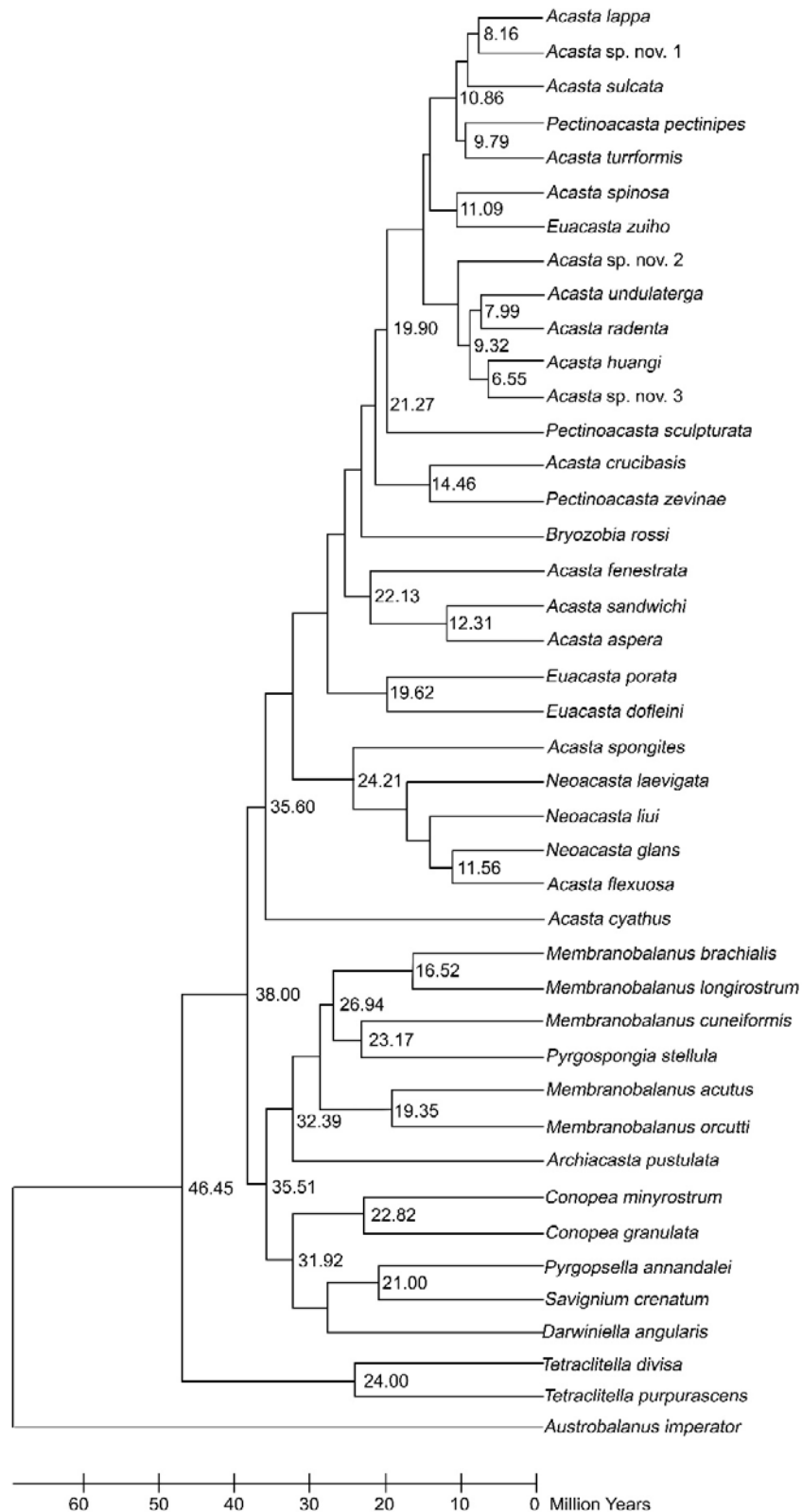
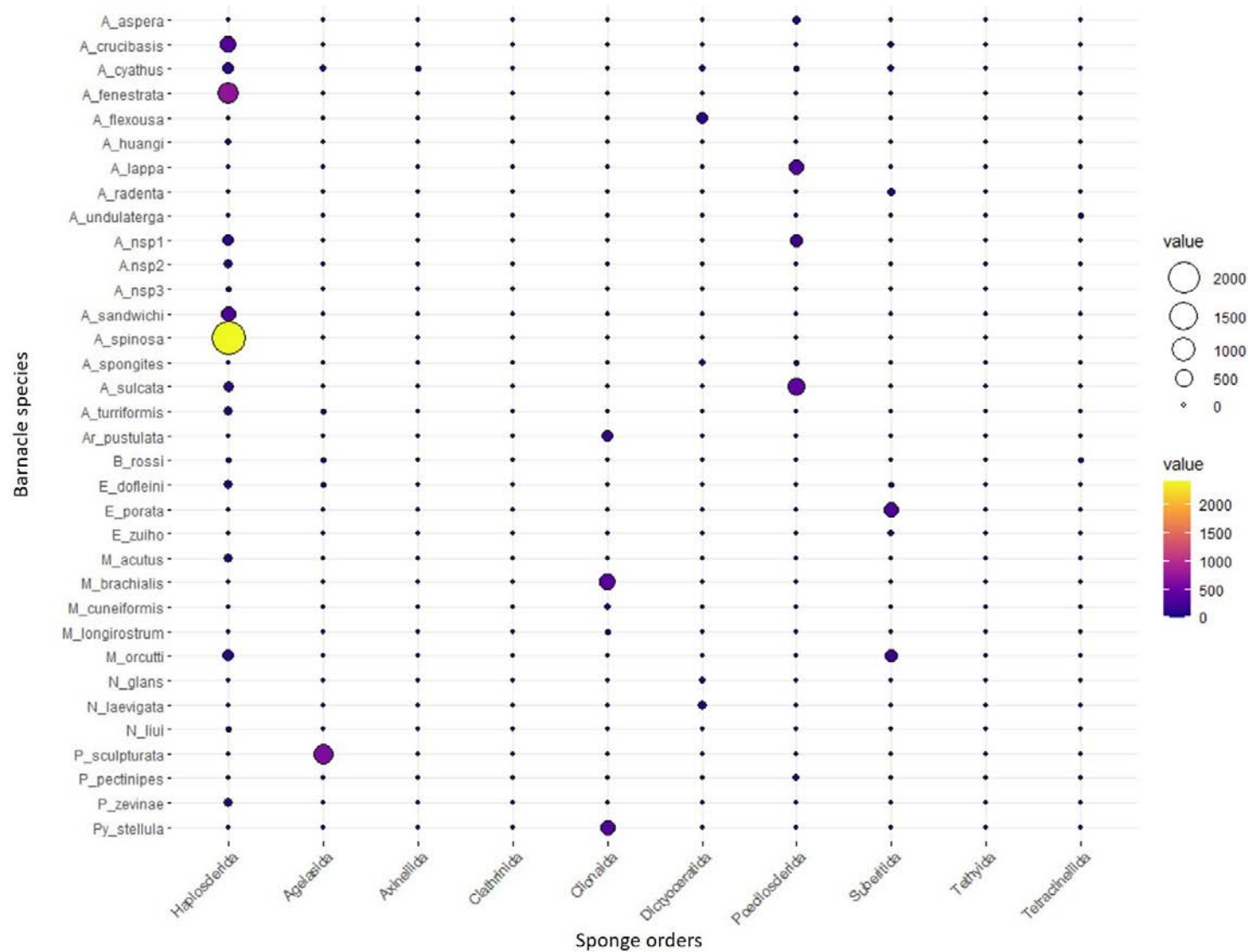


Figure S18. Sponge barnacle divergence time chronogram estimated using RelTime method.



Contingency tables of sponge orders and barnacle species

Figure S19. Balloon plot of contingency table of sponge and barnacle

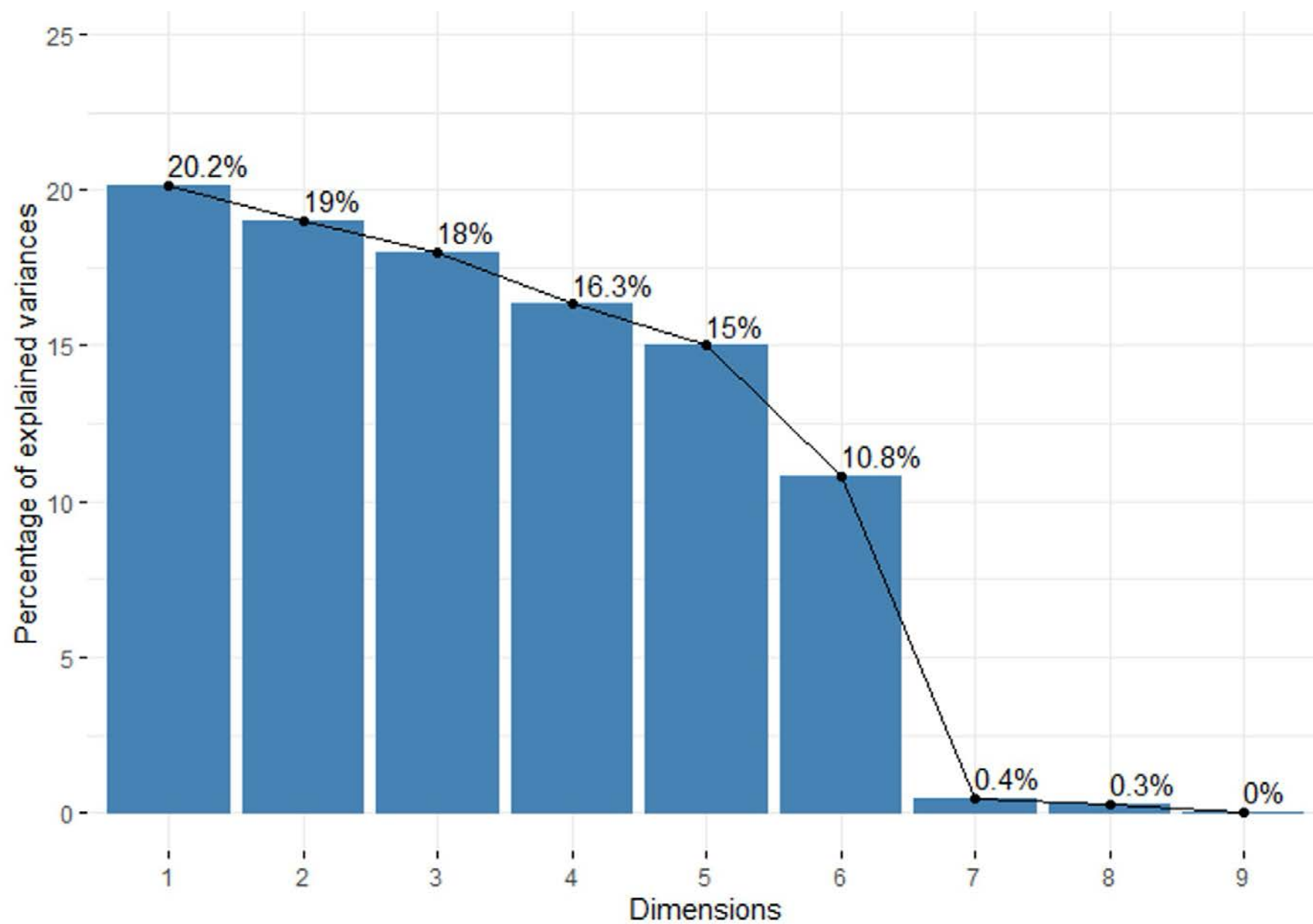


Figure S20. Percentage of explained variances of each dimension.

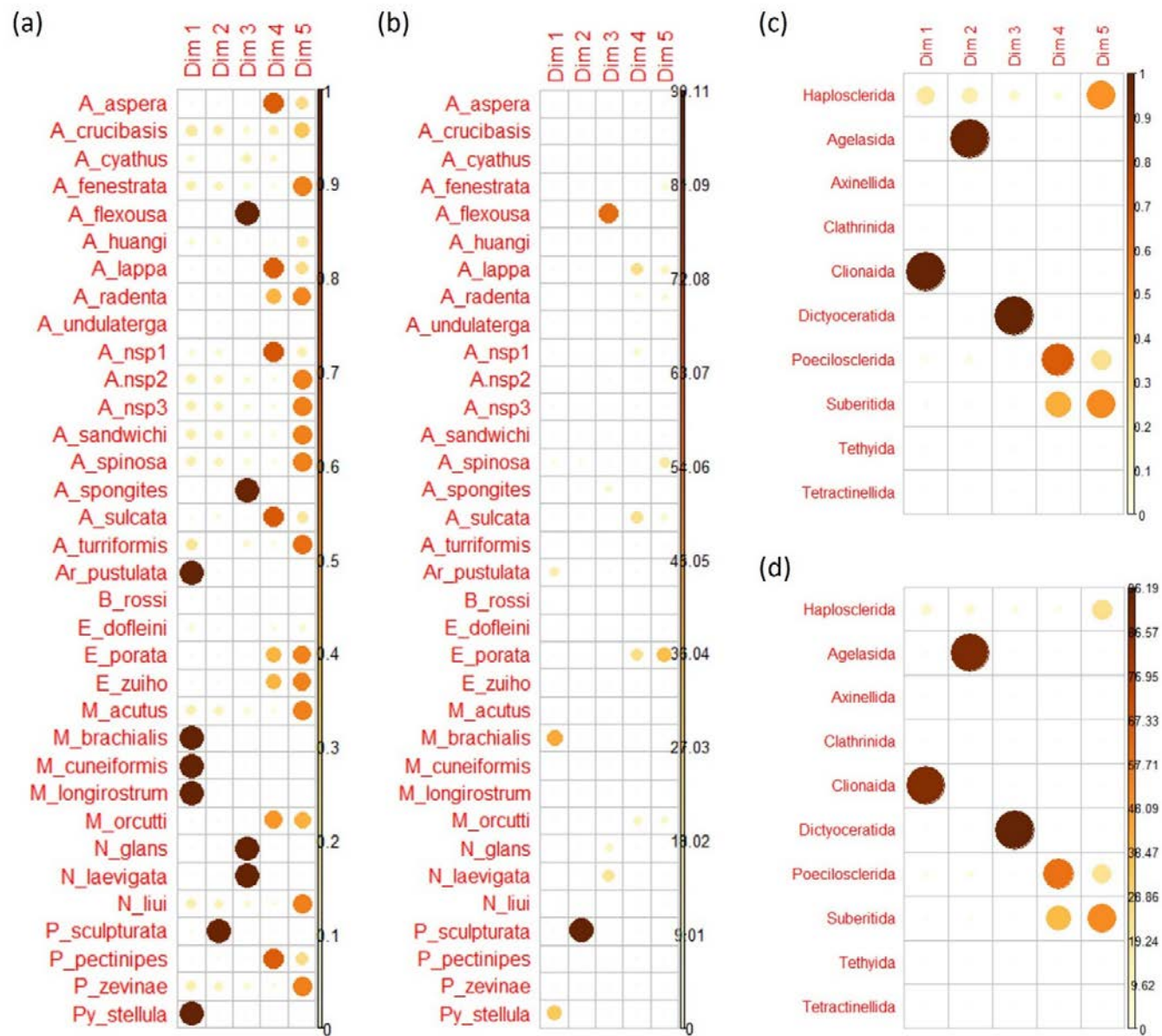


Figure S21. Quality of representation and contributions of barnacles and sponges.

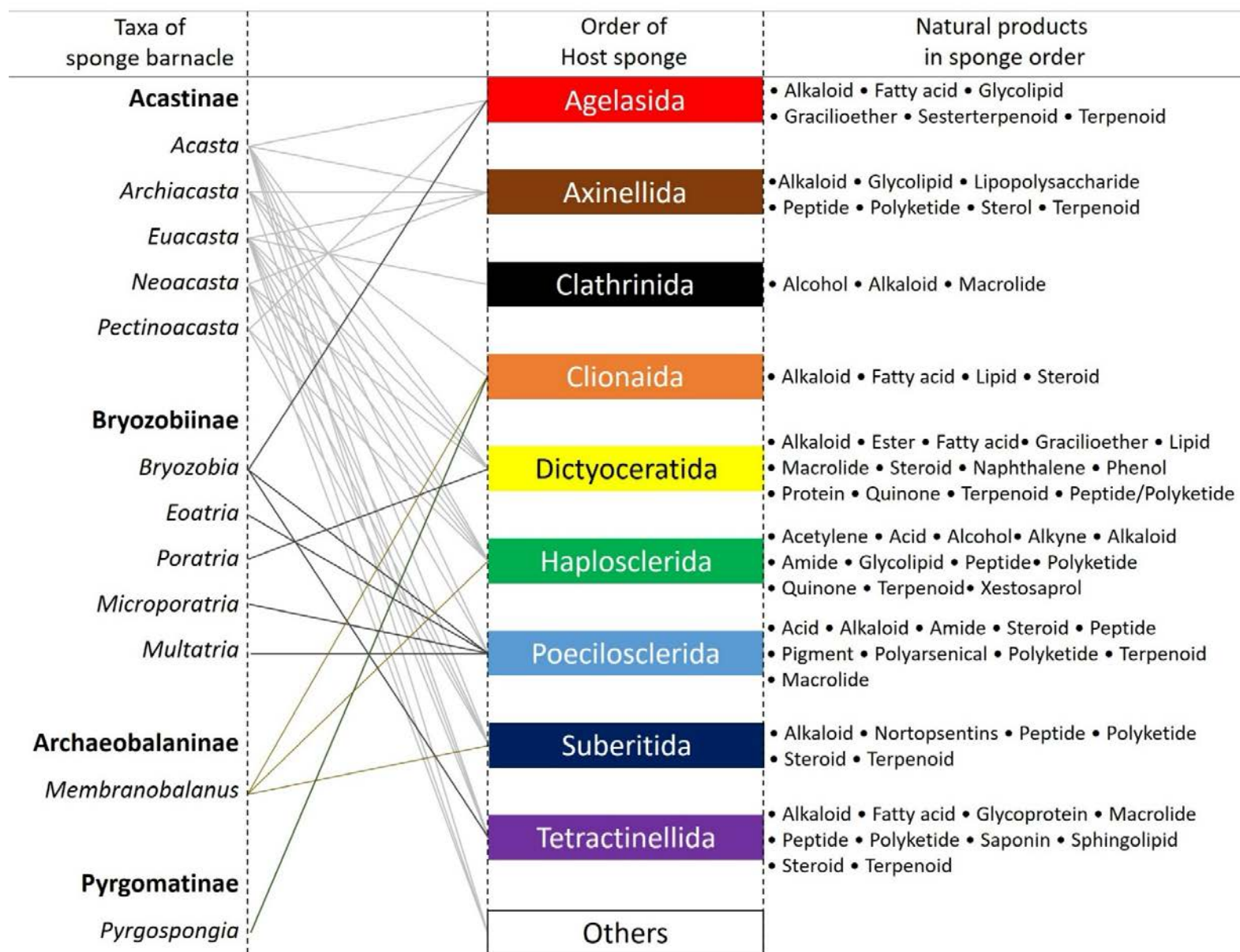


Figure S23. Literature review of natural products of marine sponges.

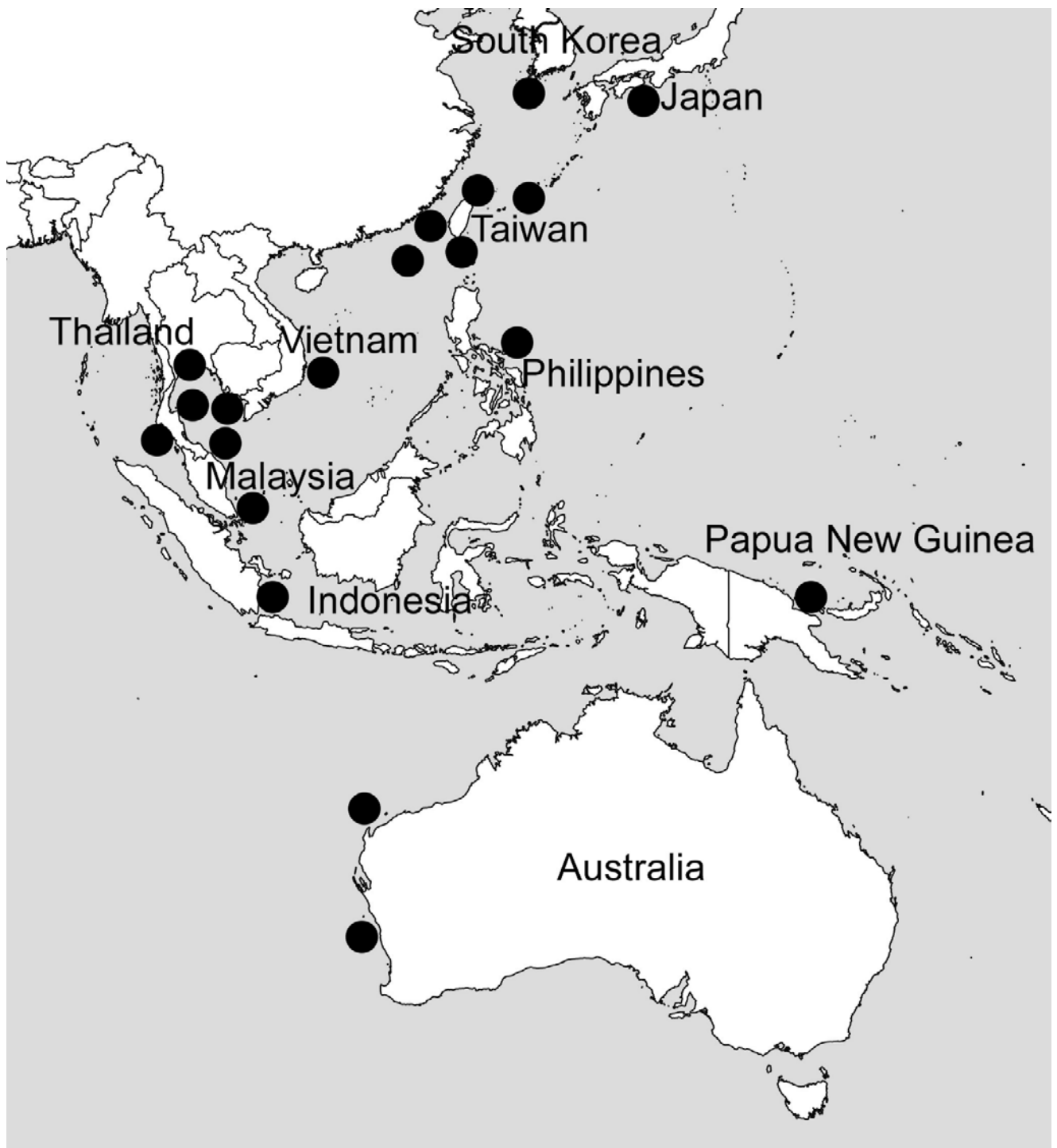
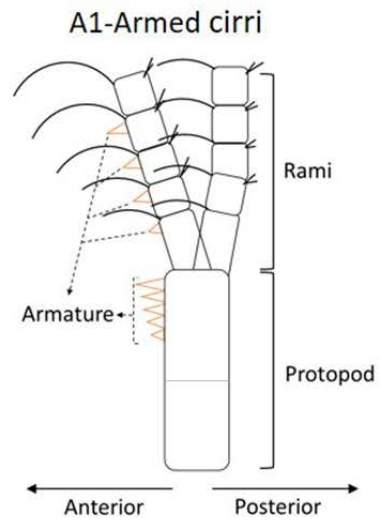
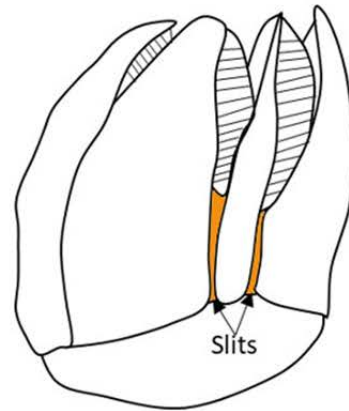


Figure S24. Map of sample collection sites.

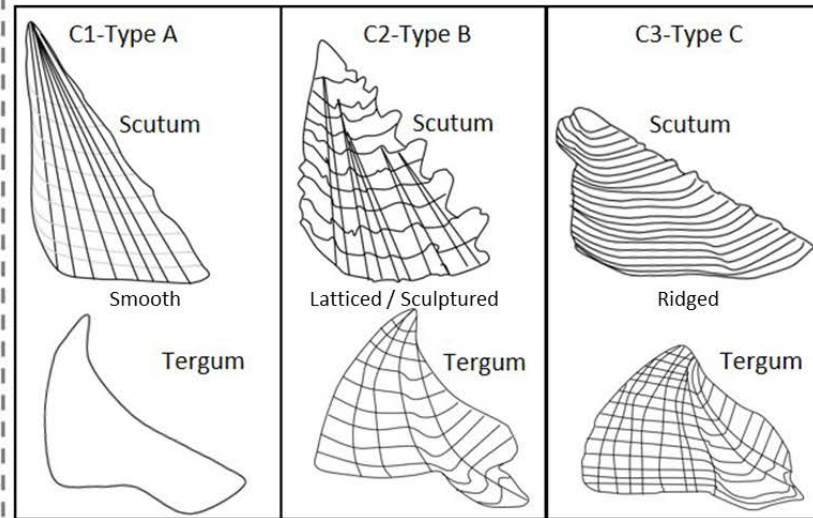
A. Darwin (1854a)



A2-Membranes covered slits between shell plates

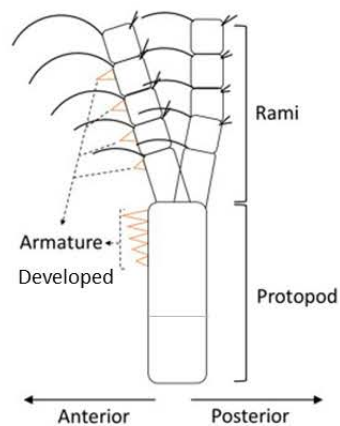


C. Hiro (1937a)

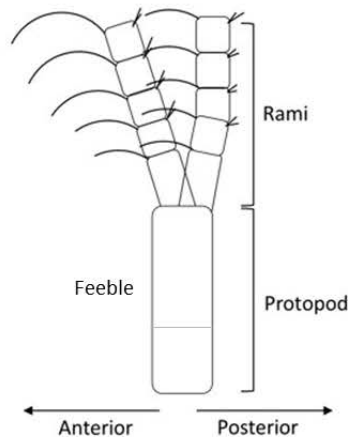


B. Broch (1931)

B1-Group Eu-Acasta



B2-Group Inarmata



D. Kolbasov (1993)

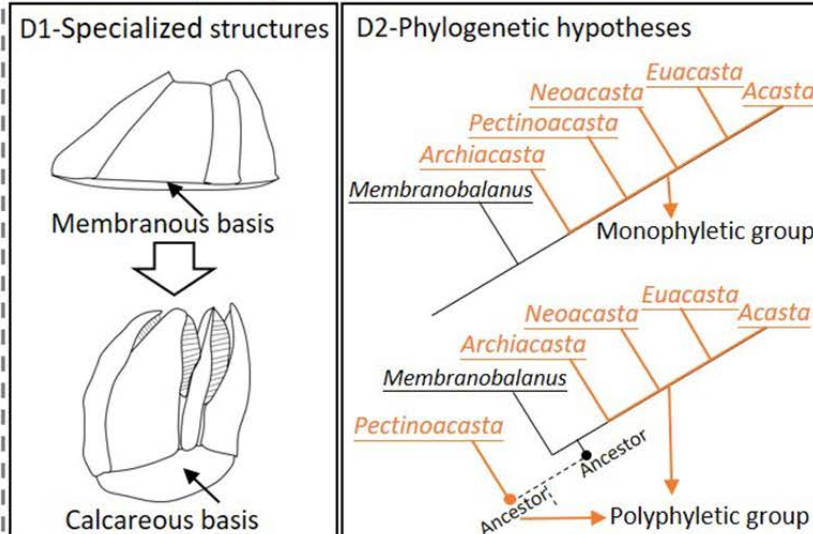


Figure S25. The main evolutionary hypotheses on the morphology and phylogeny of sponge barnacle

Table S1. Host affiliations, prevalence, distribution and specificity indices of sponge barnacle species analysed in this study. N/A and -, not applicable or no information.

Sponge associates	Host taxonomy					Prevalence	Basic specificity (No. of host)			Taxonomic specificity STD	Taxonomic specificity VarSTD	Taxonomic specificity STD*	Location	Sources
Barnacle species	Class	Subclass	Order	Family	Genus+Species		Family	Genus	Species					
<i>Acasta aspera</i>	Demospongiae	Heteroscleromorpha	Poecilosclerida	Iotrochotidae	<i>Iotrata</i> sp. Violet black	1.00	4	4	5	2.8	0.36	-	TW	Yu et al., 2017a; this study
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Coelosphaeridae	<i>Lissodendoryx</i> (<i>Acanthodoryx</i>)	-	-	-	-	-	-	-	AU	Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Hymedesmiidae	<i>Hamigera</i> PB1	-	-	-	-	-	-	-	AU	Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Hymedesmiidae	<i>Hamigera</i> sp.	-	-	-	-	-	-	-	AU	Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Crellidae	<i>Crella</i> (<i>Yvesia</i>) <i>spinulata</i>	-	-	-	-	-	-	-	AU	Hosie et al., 2021b
<i>Acasta crucibasis</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia</i> sp. Gray-white	0.96	2	3	4	2.83	1.47	2.88	TW, MY	Yu et al., 2017b; this study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia</i> sp. Lemon-yellow	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia vansoesti</i>	0.84							TW	This study
	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp.	1.00							TW	This study
<i>Acasta cyathus</i>	Demospongiae	Heteroscleromorpha	Suberitida	Suberitidae	<i>Aaptos suberitoides</i>	0.33	17	22	35	4.27	0.26	-	TW	This study
	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas memoechinata</i>	0.12							TW	This study
	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp. 1	0.10							TW	This study
	Demospongiae	Verongimorpha	Verongiida	Aplysinidae	<i>Aiolochoiria crassa</i>	-							North Carolina	Zullo & Standing, 1983
	Demospongiae	Verongimorpha	Verongiida	Aplysinidae	<i>Aplysina</i> sp.	-							Gulf of Mexico	Wells, 1966
	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Axinyssa</i> sp.	0.67							TW	This study

Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongia	<i>Callyspongia</i> (<i>Cladochalina</i>) <i>aculeata</i>	-	Gulf of Mexico	Van Syoc & Winther, 1999
Demospongiae	Heteroscleromorpha	Poecilosclerida	Microcionidae	<i>Clathria (Thalysias)</i> <i>reinwardti</i>	0.60	TW	This study
Demospongiae	Heteroscleromorpha	Tetractinellida	Spirophorina	<i>Cinachyrella</i> <i>kuekenthali</i>	-	North Carolina	Zullo & Standing, 1983
Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Dactylospongia elegans</i>	0.17	TW	This study
Demospongiae	Heteroscleromorpha	Axinellida	Axinellidae	<i>Dragmacidon sp.</i>	1.00	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> spp.	0.44	TW/Indian Ocean	This study; Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Axinellida	Raspailiidae	<i>Ectyoplasia ferox</i>	0.11	TW, TH	This study
Demospongiae	Heteroscleromorpha	Axinellida	Raspailiidae	<i>Ectyoplasia</i> sp.1	1.00	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp.	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona (Reniera)</i> <i>osiris</i>	0.18	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Hyrtios erectus</i>	-	Red Sea	Ilan et al.,1999
Demospongiae	Heteroscleromorpha	Poecilosclerida	Iotrochotidae	<i>Iotrata</i> sp. Violet black	0.50	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Irciniidae	<i>Ircinia campana</i>	-	North Carolina	Zullo & Standing, 1983
Demospongiae	Keratosa	Dictyoceratida	Irciniidae	<i>Ircinia ramosa</i>	1.00	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Irciniidae	<i>Ircinia felix</i>	-	Gulf of Mexico	Wells, 1966
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia exigua</i>	0.02	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia</i> sp. White	0.14	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Niphatidae	<i>Niphates</i> cf. <i>rowi</i>	1.00	JP	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Phloeodictyidae	<i>Oceanapia amboinensis</i>	1.00	VN	This study

Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ficiformis</i>	0.08	JP, TW, KR	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) sp. 1 Brown</i>	0.25	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) weinbergi</i>	0.25	MY	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Strongylophora) strongylata</i>	0.04	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp. Black	0.07	TW, MY	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp. Red	0.94	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp. White	0.03	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Spongiidae	<i>Spongia</i> sp. rust red, tufted surface	0.18	TW	This study
Demospongiae	Keratosa	Dictyoceratida	Spongiidae	<i>Spongia (Spongia) tubulifera</i>	-	West Indies	Darwin, 1854
Demospongiae	Heteroscleromorpha	Tethyida	Tethyidae	<i>Tethya</i> sp. Black with white veins	1.00	TW	This study
Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp.	0.10	JP, TW	This study
Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp. White and massive	0.29	TW	This study
Demospongiae	Heteroscleromorpha	Poecilosclerida	Mycalidae	Unknown	-	North Carolina	Zullo & Standing, 1983
Demospongiae	Heteroscleromorpha	Tetractinellida	Ancorinidae	Unknown	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia testudinaria</i>	0.22	TW	This study
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia vansoesti</i>	0.53	TW	This study
Unknown	Unknown	Unknown	Unknown	Unknown	-	AU	Jones, 1990

	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Broch, 1922
<i>Acasta fenestrata</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia exigua</i>	0.99	2	2	2	3	0	3	TW, MY, PNG, VN	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia chaliniformis</i>	-							AU	Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Discodermia japonica</i>	-							JP	Hiro, 1939
	Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Discodermia calyx</i>	-							JP	Hiro, 1939
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Darwin, 1854; Gruvel, 1905; Hoek, 1913
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP	Utinomi, 1958
<i>Acasta flexuosa</i>	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp.	0.98	2	2	5	2.6	3.84	2.29	TW, VN/Indian Ocean	This study; Kolbasov, 1993
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp. Dark green-gray	1.00							TW	This study
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp. Red-gray	1.00							TW	This study
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp. White-gray	0.98							TW	This study
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> P1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Lamellodysidea</i> KB1	-							AU	Hosie et al., 2021a
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp. Red	0.71							TW	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP	Nilsson-Cantell, 1931
<i>Acasta huangi</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ficiformis</i>	0.33	2	2	2	3	0	3	TW, KR	Yu et al., 2017a; this study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Ancorinidae	<i>Jaspis splendens</i>	0.20							TW	This study
<i>Acasta lappa</i>	Demospongiae	Heteroscleromorpha	Poecilosclerida	Mycalidae	<i>Mycale</i> sp. Orange	0.99	1	1	1	N/A	N/A	-	JP, TW, TH	This study
<i>Acasta radenta</i>	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Halichondria (Halichondria) sp.</i>	0.72	2	2	2	4	0	4	TW	Yu et al., 2017a; this study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Ancorinidae	<i>Jaspis splendens</i>	0.20							TW	This study

<i>Acasta sandwichi</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia testudinaria</i>	0.69	3	3	4	3.17	1.14	3.26	TW, AU	Yu et al., 2017b; this study; Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia</i> sp. pink-white thick encrusting	1.00							MY	This study
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Latrunculiidae	<i>Latrunculia</i> sp. orange, encrusting	1.00							TW	This study
	Demospongiae	Keratosa	Dictyoceratida	Spongiidae	<i>Spongia</i> sp. Orange, spherical	1.00							TW	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PNG HK, JP,	This study
<i>Acasta spinosa</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona cymaeformis</i>	0.87	1	1	6	1	0	1	TW, MY, VN	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> cf. <i>urcelous</i>	1.00							HK	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp. white	1.00							TW, HK	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp. yellowish	1.00							TW, JP	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp. gray blue	0.99							JP, HK, VN	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp. pink white	1.00							HK	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							TW	This study
<i>Acasta spongites</i>	Demospongiae	Heteroscleromorpha	Poecilosclerida	Microcionidae	<i>Clathria</i> sp.	1.00	3	3	3	4.33	0.89	-	TW	This study
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> cf. <i>granulosa</i>	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp.	-							Indian Ocean	Kolbasov, 1993
	Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Luffariella SS11?</i>	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Irciniidae	<i>Ircinia variabilis</i>	1.00							TW, VN	This study
	Demospongiae	Keratosa	Dictyoceratida	Irciniidae	<i>Ircinia</i> sp.	-							JP	Utinimi, 1958
	Unknown	Unknown	Unknown	Unknown	Unknown	-							AU	Jones, 1990
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Gruvel, 1905

<i>Acasta sulcata</i>	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp.	0.03	4	4	4	3.83	0.14	-	TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Xestospongia</i> sp.	0.60							TW	This study
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Microcionidae	Unknown	0.99							TW/Indian Ocean	This study; Kolbasov, 1993
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Myxillidae	Unknown	-							Indian Ocean	Kolbasov, 1993
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP, HK, MY, VN, PNG	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							AU	Darwin, 1854; Jones, 1990
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Gruvel, 1905; Hoek, 1913
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP, TH	Ren, 1984
<i>Acasta turrisformis</i>	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp. Orange	0.88	2	2	2	3	0	3	TW	Yu et al., 2017b; this study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona (Reniera) osiris</i>	0.90							TW	This study
<i>Acasta undulaterga</i>	Demospongiae	Heteroscleromorpha	Tetractinellida	Ancorinidae	<i>Jaspis splendens</i>	0.40	1	1	1	N/A	N/A	-	TW	Yu et al., 2017a; this study
<i>Acasta nsp1</i>	Demospongiae	Heteroscleromorpha	Poecilosclerida	Microcionidae	<i>Clathria (Thalysias) reinwardti</i>	0.26	2	2	5	2.7	2.61	2.86	JP, TW, VN	This study
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Microcionidae	<i>Clathria</i> sp.	0.83							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> cf. <i>diffusa</i>	0.86							TH	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> sp.	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> sp. Orange	0.92							TW	This study
<i>Acasta nsp2</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp.	1.00	1	1	3	1	0	1	TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) weinbergi</i>	0.80							TW, MY	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ficiformis</i>	0.36							TW	This study

<i>Acasta nsp3</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Niphatidae	<i>Amphimedon viridis</i>	0.50	1	1	2	1	0	1	TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Niphatidae	<i>Amphimedon</i> sp. Green	1.00							TW	This study
<i>Archiacasta pustulata</i>	Demospongiae	Heteroscleromorpha	Clionaida	Spirastrellidae	<i>Spirastrella</i> spp.	1.00	1	1	3	1	0	1	TW/Indian Ocean	This study; Kolbasov, 1993
	Demospongiae	Heteroscleromorpha	Clionaida	Spirastrellidae	<i>Spirastrella</i> sp. Gray	0.95							VN	This study
	Demospongiae	Heteroscleromorpha	Clionaida	Spirastrellidae	<i>Spirastrella</i> sp. Orange encrusting	0.32							JP	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							TW	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							TW	This study
<i>Bryozobia rossi</i>	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas nakamurai</i>	1.00	3	3	5	3.1	1.89	3.57	TW	Yu et al., 2016;this study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Niphatidae	<i>Amphimedon viridis</i>	0.50							TW	This study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Theonella</i> aff. <i>Conica</i> (dark green)	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Theonella mirabilis</i>	0.11							JP	This study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Theonella</i> sp.	0.29							TW	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							TW	This study
<i>Euacasta dofleini</i>	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas memoechinata</i>	0.36	14	16	22	3.62	0.72	-	TW	This study
	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp.	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Tetractinellida	Geodiidae	<i>Geodia</i> sp.	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp.	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Neopetrosia proxima</i>	1.00							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp. Red	0.24							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ficiformis</i>	0.38							TW, KR	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ushitsuensis</i>	0.28							TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) weinbergi</i>	0.50							TW	This study

Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> (<i>Strongylophora</i>)	0.50	TW	This study
				<i>strongylata</i>			
Demospongiae	Heteroscleromorpha	Suberitida	Suberitidae	<i>Psedospongosorites</i> sp.	1.00	TW	This study
				<i>Topsentia</i>			
Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>ophiraphidites</i>	1.00	TW	This study
				<i>Xestospongia</i>			
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>testudinaria</i>	0.10	TW	This study
				<i>Xestospongia vansoesti</i>			
Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae		0.12	TW	This study
Demospongiae	Heteroscleromorpha	Axinellida	Axinellidae	Unknown	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Clathrinida	Leucettidae	<i>Leucetta</i> sp.	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> sp.	-	Rea Sea	Ilan et al.,1999
Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp.	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona (Gellius)</i>	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Poecilosclerida	Crellidae	<i>Crella</i>	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Poecilosclerida	Desmacididae	Unknown	-	Rea Sea	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Poecilosclerida	Myxillidae	Unknown	-	PNG	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Tetractinellida	Pachastrellidae	<i>Pachastrella</i>	-	Indian Ocean	Kolbasov, 1993
Demospongiae	Heteroscleromorpha	Tetractinellida	Theonellidae	<i>Theonella conica</i>	-	Rea Sea	Ilan et al.,1999
Unknown	Unknown	Unknown	Unknown	Unknown	-	JP, HK, TW, VN, TH, MY	This study
Unknown	Unknown	Unknown	Unknown	Unknown	-	AU	Jones, 1990

	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Broch, 1922
<i>Euacasta zuiho</i>	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp.	0.94	1	1	2	1	0	1	HK, TW	This study
	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp. 2 Yellow-purple-white encrusting	0.45							VN	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							AU	Jones, 1990
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP, TW	This study
<i>Euacasta porata</i>	Demospongiae	Heteroscleromorpha	Suberitida	Suberitidae	<i>Aaptos suberitoides</i>	0.95	1	1	1	N/A	N/A	-	TW, MY, VN	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							JP	This study
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Darwin, 1854
<i>Neoacasta glans</i>	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i> sp. 1	0.80	3	3	3	4.67	0.22	-	TW	This study
	Demospongiae	Heteroscleromorpha	Axinellida	Axinellidae	<i>Axinella</i>	-							Indian Ocean	Kolbasov, 1993
	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	Unknown	-							Indian Ocean	Kolbasov, 1993
	Unknown	Unknown	Unknown	Unknown	Unknown	-							AU	Darwin, 1854; Jones, 1990
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Gruvel, 1905
<i>Neoacasta laevigata</i>	Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Phyllospongia foliascens</i>	1.00	3	3	3	3	0	-	TW/Rea Sea	This study; Ilan et al., 1999
	Demospongiae	Keratosa	Dictyoceratida	Dysideidae	<i>Dysidea</i>	-							Indian Ocean, PNG	Kolbasov, 1993
	Demospongiae	Keratosa	Dictyoceratida	Spongiidae	Unknown	-							Indian Ocean	Kolbasov, 1993
	Demospongiae	Keratosa	Dictyoceratida	Spongiidae	<i>Spongia</i> CERF1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Spongiidae	<i>Spongia</i> (Heterofibria) SS1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Cacospongia</i> P1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratosa	Dictyoceratida	Thorectidae	<i>Luffariella</i> PB1	-							AU	Hosie et al., 2021a

	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Luffariella</i> SS11	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Luffariella</i> SS10	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Luffariella</i> cf. SS10	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Strepsichordaia lendenfeldi</i>	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	? <i>Cacospongia</i> DA1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Cacospongia</i> NG1	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Cacospongia</i> PB2	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Fascaplysinopsis reticulata</i>	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Hyrtios</i> SS2	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Hyrtios</i> SS4	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Polyfibrospongia flabellifera</i>	-							AU	Hosie et al., 2021a
	Demospongiae	Keratos	Dictyoceratida	Thorectidae	<i>Polyfibrospongia kulit</i>	-							AU	Hosie et al., 2021a
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Darwin, 1854; Gruvel, 1905; Hoek, 1913
	Unknown	Unknown	Unknown	Unknown	Unknown	-							TW	This study
<i>Neoacasta liui</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Callyspongiidae	<i>Callispongia</i> sp.	0.10	1	1	1	N/A	N/A	-	JP	Yu et al., 2020;this study
<i>Pectinoacasta pectinipes</i>	Demospongiae	Heteroscleromorpha	Poecilosclerida	Tedaniidae	<i>Tedania</i> sp.	1.00	2	2	3	3	2	-	TW	This study
	Demospongiae	Heteroscleromorpha	Poecilosclerida	Tedaniidae	<i>Tedania (Trachytodania)</i>	-							AU	Hosie et al., 2021b
	Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	Unknown	-							Indian Ocean	Kolbasov, 1993
	Unknown	Unknown	Unknown	Unknown	Unknown	-							PHP	Broch, 1922
<i>Pectinoacasta sculpturata</i>	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas memoechinata</i>	0.89	1	2	4	1.5	0.25	-	TW, JP	This study

	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp.	0.72								TW, JP, MY	This study
	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Agelas</i> sp. White-gray	1.00								TW	This study
	Demospongiae	Heteroscleromorpha	Agelasida	Agelasidae	<i>Amphinomia sulphurea</i>	-								AU	Hosie et al., 2021b
	Unknown	Unknown	Unknown	Unknown	Unknown	-								TW	This study
<i>Pectinoacasta zeviniae</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Niphatidae	<i>Dasychalina fragilis</i>	1.00	2	2	2	3	0	-		TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Chalinidae	<i>Haliclona</i> sp.	-								PNG	Kolbasov, 1993
<i>Pyrgospongia stellula</i>	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Spheciospongia</i> cf. <i>vagabunda</i>	0.95	1	1	1	N/A	N/A	-		HK, JP, TW, VN	This study
					<i>Petrosia</i>										
<i>Membranobalanus acutus</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>(Strongylophora) strongylata</i>	0.85	1	1	1	N/A	N/A	-		TW	This study
<i>Membranobalanus brachialis</i>	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Spheciospongia</i> cf. <i>confoederata</i>	0.95	1	2	2	1.5	0	-		TW, PHP	This study
	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Cliona</i> sp.	-								PHP	Rosell, 1972
<i>Membranobalanus cuneiformis</i>	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Cliona</i> sponge black-gray	1.00	1	1	2	1	0	-		MY	This study
	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Cliona</i> sp.	-								JP	Hiro, 1936
	Unknown	Unknown	Unknown	Unknown	Unknown	-								AU	Jones, 1990
<i>Membranobalanus longirostrum</i>	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Spheciospongia</i> sp. Yellow	1.00	2	2	3	3	2	-		PHP	This study
	Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Spheciospongia purpurea</i>	-								Indonesia	Hoek, 1913
	Demospongiae	Heteroscleromorpha	Suberitida	Suberitidae	<i>Suberites</i> cf. <i>clavatus</i>	-								Red Sea	Ilan et al.,1999
<i>Membranobalanus orcutti</i>	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ficiformis</i>	0.67	3	4	6	3.27	1.53	-		TW	This study
	Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia (Petrosia) ushitsuensis</i>	0.47								TW	This study

Demospongiae	Heteroscleromorpha	Haplosclerida	Petrosiidae	<i>Petrosia</i> sp.	0.69	TW	This study
Demospongiae	Heteroscleromorpha	Suberitida	Halichondriidae	<i>Topsentia</i> sp.	0.81	JP	This study
Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Cliona californiana</i>	-	Southern California	Jones, 1978
Demospongiae	Heteroscleromorpha	Clionaida	Clionaidae	<i>Spheciospongia confoederata</i>	-	Southern California KR, PHP,	Jones, 1978
Demospongiae	Heteroscleromorpha	Unknown	Unknown	Unknown	-	VN, TH, MY	This study

Abbreviation: KR, South Korea; JP, Japan; TW, Taiwan; HK, Hong Kong; PHP, Philippines; VN, Viet Nam; TH, Thailand; MY, Malaysia; PNG, Papua New Guinea; AU, Australia.

Table S2. Demosponges usage of sponge-associated barnacle species.

Barnacle species	Host sponge orders									
	Agelasida	Axinellida	Clathrinida	Clionaida	Dictyoceratida	Haplosclerida	Poecilosclerida	Suberitida	Tethyida	Tetractinellida
<i>Acasta aspera</i>							V			
<i>Acasta crucibasis</i>						V		V		
<i>Acasta cyathus</i>	V	V			V	V	V	V	V	V
<i>Acasta fenestrata</i>						V				V
<i>Acasta flexuosa</i>					V	V				
<i>Acasta huangi</i>						V				V
<i>Acasta lappa</i>							V			
<i>Acasta nsp1</i>						V	V			
<i>Acasta nsp2</i>						V				
<i>Acasta nsp3</i>						V				
<i>Acasta radenta</i>								V		V
<i>Acasta sandwichi</i>					V	V	V			
<i>Acasta spinosa</i>						V				
<i>Acasta spongites</i>					V		V			
<i>Acasta sulcata</i>	V					V	V			
<i>Acasta turriiformis</i>	V					V				
<i>Acasta undulaterga</i>										V
<i>Archiacasta pustulata</i>				V						
<i>Bryozobia rossi</i>	V					V				V
<i>Euacasta dofleini</i>	V	V	V			V	V	V		V
<i>Euacasta porata</i>								V		
<i>Euacasta zuiho</i>								V		
<i>Membranobalanus acutus</i>						V				

<i>Membranobalanus</i> <i>brachialis</i>				V							
<i>Membranobalanus</i> <i>cuneiformis</i>				V							
<i>Membranobalanus</i> <i>longirostrum</i>				V					V		
<i>Membranobalanus</i> <i>orcutti</i>				V		V			V		
<i>Neoacasta glans</i>		V			V				V		
<i>Neoacasta laevigata</i>					V						
<i>Neoacasta liui</i>						V					
<i>Pectinoacasta</i> <i>pectinipes</i>							V		V		
<i>Pectinoacasta</i> <i>sculpturata</i>	V										
<i>Pectinoacasta zeviniae</i>						V					
<i>Pyrgospongia stellula</i>				V							
Total species number	6	3	1	6	6	18	9		10	1	7

Table S3. beta diversity of sponge barnacle along the latitudinal gradients.

beta.SIM	0.5163043
beta.SNE	0.2485569
beta.SOR	0.7648613

Table S4. beta diversity of sponge barnacle in collecting country.

Country	beta.SIM	beta.SNE	beta.SOR
KR	0.6756757	0.07942637	0.755102
JP	0.9612	0.01162913	0.9728291
TW	0.9954548	0.001109384	0.9965642
HK	0.7539267	0.04942058	0.8033473
VN	0.972725	0.005429393	0.9781543
TH	0.921839	0.01787723	0.9397163
MY	0.9662118	0.004442802	0.9706546
PHP	0.8333333	0	0.8333333
PNG	0.8157895	0.05213505	0.8679245

Table S5. beta diversity of singel and multiple sponge barnacle species in collecting country.

Country	beta.SIM		beta.SIM		beta.SOR	
	Single	Multiple	Single	Multiple	Single	Multiple
KR	0.66667	0.5	0	0	0.66667	0.5
JP	0.96621	0.90359	0	0.01783	0.96621	0.921418
TW	0.99561	0.98253	0	0.00298	0.99561	0.985519
HK	0.66667	1	0	0	0.66667	1
VN	0.97534	0.87594	0	0.01143	0.97534	0.887372
TH	0.93227	0.7963	0	0.01405	0.93227	0.810345
MY	0.96691	0.86538	0	0.00849	0.96691	0.873874
PNG	0.77778	0.66667	0	0.04762	0.77778	0.714286

Table S6. A literature review of the biochemical compounds identified in marine sponges has been conducted.

Compound category	Compound name	Order	Family	Genus (subgenus)	Species (subspecies)	Refs
Fatty acid	-	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017
Terpenoid	-	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017
Alkaloid	(-)-Agelasidine C	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Agelasine B (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Agelasine J (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Agelasine J (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Agelastatin A	Agelasida	Agelasidae	<i>Agelas</i>	<i>dendromorpha</i>	McClary et al., 2018; Carroll et al., 2020
Alkaloid	Ageliferin	Agelasida	-	-	-	Ding et al., 2018; Carroll et al., 2020
Alkaloid	Ageloxime B	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Ageloxime D (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid (Bromopyrrole)	Bromopyrrole derivatives	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017
Terpenoid	Carotenoids	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017
Glycolipid	Clarhamnoside (Rhamnosylated R-Galactosylceramide)	Agelasida	Agelasida	<i>Agelas</i>	<i>clathrodes</i>	Mehbub et al., 2014
Glycolipid	Glycosphingolipid	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017
Gracilioether	Gracilioethers B and C	Agelasida	Agelasidae	<i>Agelas</i>	<i>gracilis</i>	Alcock et al., 2018; Carroll et al., 2020
Alkaloid+Terpene	Hypotaurocyamines	Agelasida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Iso-Agelasidine B	Agelasida	Agelasidae	<i>Agelas</i>	<i>mauritiana</i>	Choudhary et al., 2017
Alkaloid	Iso-Agelasidine C	Agelasida	Agelasidae	<i>Agelas</i>	-	Choudhary et al., 2017
Sesterterpenoid	Merosesquiterpenoids	Agelasida	Agelasidae	<i>Agelas</i>	-	Carroll et al., 2020
Terpenoid	Meroterpenoid	Agelasida	Agelasidae	<i>Agelas</i>	-	Zhang et al., 2017

Alkaloid (Bromopyrrole)	Mukanadins B, D and F(C-9 substituted “linear”)	Agelasida	-	-	-	Rensburg et al., 2018; Carroll et al., 2020
Alkaloid (Bromopyrrole)	Nagelamide X (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	-	Choudhary et al., 2017
Alkaloid (Bromopyrrole)	Nagelamide Y (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	-	Choudhary et al., 2017
Alkaloid	Nagelamide Z (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	-	Choudhary et al., 2017
Alkaloid (Bromopyrrole)	Nagelamide Z (Halogenated Compounds)	Agelasida	Agelasidae	<i>Agelas</i>	-	Choudhary et al., 2017
Alkaloid (Pyrrole)	Oroidin-type metabolites	Agelasida	Agelasidae	<i>Agelas</i>	-	Carroll et al., 2020
Alkaloid	Pyrrole-2-carboxylic derivatives	Agelasida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid (Indole)	(+)-Trans-herbindole-A & trikentrarnides E–I	Axinellida	Raspailiidae(Cyamoninae)	<i>Trikentrion</i>	<i>flabelliforme</i>	Carroll et al., 2020
Alkaloid	5-Fluorouracil alkaloid	Axinellida	Axinellidae	<i>Phakellia</i>	<i>fusca</i>	Mehbub et al., 2014
Lipopolysaccharide (Sulfated)	Axinelloside A	Axinellida	Axinellidae	<i>Axinella</i>	<i>infundibuliformis</i>	Mehbub et al., 2014
Terpenoid	Diterpene isocyanide	Axinellida	-	-	-	Erpenbeck & van Soest, 2006
Galactofuranosylceramide (GSL)	Ectyoceramide (Galactofuranosylceramide (GSL))	Axinellida	Raspailiidae	<i>Ectyoplasia</i>	<i>ferox</i>	Mehbub et al., 2014
Sterol (Terpene)	Hydroxy-nor-sterols	Axinellida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid (Indole)	Indole alkaloids	Axinellida	Axinellidae	<i>Dragmacidon</i>	-	Carroll et al., 2020
Terpenoid	Linear diterpenes	Axinellida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid (Bromopyrrole)	Mukanadins B, D and F(C-10 substituted “linear”)	Axinellida	-	-	-	Rensburg et al., 2018; Carroll et al., 2020
Sesquiterpenes	Parahigginols A-D and parahigginic acid	Axinellida	Heteroxyidae	<i>Parahigginsia</i>	-	Chen et al., 1999
Peptide	Phakellistatins 17 and 18	Axinellida	Axinellidae	<i>Phakellia</i>	<i>fusca</i>	Wu et al., 2018; Carroll et al., 2020
Polyketide	PM050489, PM060184	Axinellida	Raspailiidae (Plocamioninae)	<i>Lithoplocamia</i>	<i>lithistoides</i>	Calcabruini et al., 2017
Alkaloid (Pyrrole)	Pyrrole-2-carboxylic derivatives	Axinellida	-	-	-	Erpenbeck & van Soest, 2006

Peptide	Reniochalistatins A–D	Axinellida	Axinellidae	<i>Reniochalina</i>	<i>stalagmitis</i>	Zhou et al., 2018; Carroll et al., 2020
Terpenoid	Sesqui- and diterpene isocyanides	Axinellida	-	-	-	Erpenbeck & van Soest, 2006
Sesterterpenoid	Sesterterpenoids-Variabilin-type furans, butenolides and g-lactams	Biemnida	Biemnidae	<i>Biemna</i>	-	Carroll et al., 2020
Steroid	4-Methyl seco-sterol	Bubarida	Dictyonellidae	<i>Dictyonella</i>	-	Carroll et al., 2020
Lipid	Halistanol sulfate A	Bubarida	Desmanthidae	<i>Petromica</i> (<i>Chaladesma</i>)	<i>ciocalyptoides</i>	Choudhary et al., 2017
Alkaloid (Pyrrole)	Oroidin-type metabolites	Bubarida	Dictyonellidae	<i>Dictyonella</i>	-	Carroll et al., 2020
Macrolide	(19Z)-Halichondramide	Chondrosiida	Chondrosiidae	<i>Chondrosia</i>	<i>corticata</i>	Calcabruini et al., 2017
Polyketide	Peroxy-polyketides	Chondrosiida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid (Imidazole)	bis(naamidine J)zinc	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Alkaloid (Imidazole)	Chagosendines A–C/zinc and copper complexes of pyronaamidine and naamidine J	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Macrolide	Chagosensine	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Heinrich et al., 2018; Carroll et al., 2020
Alkaloid	Guanidine imidazoles	Clathrinida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid (Imidazole)	Imidazole alkaloid complexes	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Alkaloid (Imidazole)	Imidazoles leuchagodine A & B	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Alkaloid	Kealiinine analogues	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Li et al., 2018; Carroll et al., 2020
Alkaloid	Kealinine D	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Alkaloid	Leuchagodine A	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Carroll et al., 2020
Alcohol	Long-chain aminoalcohols	Clathrinida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Naamidine A	Clathrinida	Leucettidae	<i>Leucetta</i>	<i>chagosensis</i>	Calcabruini et al., 2017
Fatty acid	4,8,12-Trimethyltridecanoic acid	Clionaida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	Norisoprenoids	Clionaida		Spheciospongia sp.		Liu et al., 2009

methoxylated FA	Δ6 monoenoic methoxylated FA (6Z)-2-methoxy-6-heptadecenoic acid and (6Z)-2-methoxy-6-octadecenoic acid			<i>Spheciospongia cuspidifera</i>		
Diterpenoid	Cheloviolene B	Dendroceratida	Darwinellidae	<i>Chelonaplysilla</i>	<i>violacea</i>	Garnsey et al., 2018; Carroll et al., 2020
Diterpenoid	Dendrillolide C	Dendroceratida	Darwinellidae	<i>Dendrilla</i>	-	Garnsey et al., 2018; Carroll et al., 2020
Alkaloid	Denigrins A and B	Dendroceratida	Dictyodendrillidae	<i>Spongionella</i>	<i>nigra</i>	Karak et al., 2018; Carroll et al., 2020
Terpenoid	Furano/lactone terpenes	Dendroceratida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	-	Dictyoceratida	-	-	-	Abdelaleem et al., 2020
Steroid	-	Dictyoceratida	Irciniidae	<i>Ircinia</i>	<i>echinata</i>	Carroll et al., 2020
Terpenoid	-	Dictyoceratida	Irciniidae	<i>Ircinia</i>	-	Su et al., 2011
Diterpenoid	(-)-Sponalisolide B	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Terpenoid	(8E,13Z,20Z)-strobilin/(7E,13Z,20Z)-felixinin 1:1	Dictyoceratida	Irciniidae	<i>Psammocinia</i>	-	Calcabruini et al., 2017
Naphthalene	(S)-2,2'-Dimethoxy-1, 1'-binaphthyl-5,5',6,6'- tetraol (Naphthalene dimer)	Dictyoceratida	Thorectidae	<i>Lendenfeldia</i>	-	Mehbub et al., 2014
Terpenoid	12β-(3'β-hydroxypentanoyloxy)-20,24-dimethyl-24-oxo-scalara-16-en-25-al	Dictyoceratida	Thorectidae	<i>Phyllospongia</i>	-	Lai et al., 2016
Diterpenoid	17-dehydroxysponalactone	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Diterpenoid	18-nor- 3,17-dihydroxy-spongia-3,13	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Diterpenoid	18-nor- 3,17-dihydroxy-spongia-3,14-trien-2-one	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Phenol	2-(2 ,4 -dibromophenoxy)- 3,4,5-tribromophenol	Dictyoceratida	Dysideidae	<i>Dysidea</i>	<i>granulosa</i>	Choudhary et al., 2017
Phenol	2-(2 ,4 -dibromophenoxy)- 3,5-dibromophenol	Dictyoceratida	Dysideidae	<i>Dysidea</i>	<i>granulosa</i>	Choudhary et al., 2017

Phenol	2-(2 ,4 -dibromophenoxy)- 4,6-dibromophenol	Dictyoceratida	Dysideidae	<i>Dysidea</i>	-	Choudhary et al., 2017
Probing scalarane derivatives	24-homoscalaranes	Dictyoceratida	Thorectidae	<i>Lendenfeldia</i>	-	Peng et al., 2020a
Sesquiterpenoid	5-Epi-nakijinol D	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	<i>metachromia</i>	Takeda et al., 2018; Carroll et al., 2020
Macrolide	Arenolide	Dictyoceratida	Dysideidae	<i>Dysidea</i>	-	Liu et al., 2018; Carroll et al., 2020
Terpenoid	Cacospongionolide	Dictyoceratida	Thorectidae	<i>Fasciospongia</i>	<i>cavernosa</i>	Calcabruini et al., 2017
Macrolide	Candidaspongiolide	Dictyoceratida	Dysideidae	<i>Candidaspongia</i>	-	Calcabruini et al., 2017
Diterpenoid	Cholesta-7-ene-3,5-diol-6-one	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Alkaloid (Thiopyrone)	CTP-431	Dictyoceratida	Thorectidae	<i>Cacospongia</i>	<i>mycofijiensis</i>	Mehbub et al., 2014
Polyketide (Macrolide)	Dactylolide	Dictyoceratida	Thorectidae(Thorectinae)	<i>Cacospongia</i>	<i>mycofijiensis</i>	Carroll et al., 2020
Sesterterpenoid	Dimers(Merosesquiterpenoids?)	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	-	Carroll et al., 2020
Terpenoid	Dysiarenone	Dictyoceratida	Dysideidae	<i>Dysidea</i>	<i>arenaria</i>	Carroll et al., 2020
Lipid	Dysiroid A (Halogenated Compounds)	Dictyoceratida	Dysideidae	<i>Dysidea</i>	-	Choudhary et al., 2017
Lipid	Dysiroid B (Halogenated Compounds)	Dictyoceratida	Dysideidae	<i>Dysidea</i>	-	Choudhary et al., 2017
Sesquiterpenoid quinone	Epi-Ilimaquinone	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	-	Choudhary et al., 2017
Terpenoid	Furano/lactone diterpenes	Dictyoceratida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	Furano/lactone sesterterpenes	Dictyoceratida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	Furano/lactone terpenes	Dictyoceratida	-	-	-	Erpenbeck & van Soest, 2006
Diterpenoid	Furanyl trinorsesterpenoid 16-epi-irciformonin G	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Gracilioether	Gracilioether A	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	<i>lachne</i>	Carroll et al., 2020

Fatty acid	Heterofibrin A1–A3 and B1–B3	Dictyoceratida	Spongiidae	<i>Spongia (Heterofibria)</i>	-	Mehbub et al., 2014
Terpenoid	Heteronemin	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Calcabruini et al., 2017
Sesterterpenoid	Hippospongide A	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	-	Chang et al., 2012
Sesterterpenoid	Hippospongide B	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	-	Chang et al., 2012
Sesterterpenoid	Hippospongide C	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	-	Fuh et al., 2013
Alkaloid	Hyrtioerectine D	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Choudhary et al., 2017
Alkaloid	Hyrtioerectine E	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Choudhary et al., 2017
Alkaloid	Hyrtioerectine F	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Choudhary et al., 2017
Quinone	Ilimaquinone	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	<i>metachromia</i>	Calcabruini et al., 2017
Alkaloid (Imidazole)	Imidazole	Dictyoceratida	Irciniidae	<i>Ircinia</i>	-	Carroll et al., 2020
Alkaloid (Indole)	Indole alkaloids	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Carroll et al., 2020
Alkaloid	Irciniastatin A	Dictyoceratida	Irciniidae	<i>Ircinia</i>	<i>ramose</i>	Calcabruini et al., 2017
Alkaloid	Irciniastatin A	Dictyoceratida	Irciniidae	<i>Psammocinia</i>	-	Calcabruini et al., 2017
Fatty acid	Irciniasulfonic acid B (taurine conjugated)	Dictyoceratida	Irciniidae	<i>Ircinia</i>	-	Mehbub et al., 2014
Lipid	Ircinin-1	Dictyoceratida	Irciniidae	<i>Sarcotragus</i>	-	Calcabruini et al., 2017
Macrolide	Latrunculin A.	Dictyoceratida	Thorectidae	<i>Cacospongia</i>	<i>mycofijiensis</i>	Przeslak et al., 2018; Carroll et al., 2020
Macrolide	Laulimalide	Dictyoceratida	Thorectidae	<i>Cacospongia</i>	<i>mycofijiensis</i>	Calcabruini et al., 2017
Probing scalarane derivatives	Lendenfeldaranes A–D	Dictyoceratida	Thorectidae	<i>Lendenfeldia</i>	-	Peng et al., 2020a
Scalarane-type sesterterpenoid	Lendenfeldaranes E–J	Dictyoceratida	Thorectidae	<i>Lendenfeldia</i>	-	Peng et al., 2020b
Sesterterpenoid	Merosesquiterpenoids	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	-	Carroll et al., 2020
Sesterterpenoid	Merosesquiterpenoids	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Carroll et al., 2020

Polyketide	Methylated polyketides	Dictyoceratida	Thorectinae	<i>Smenospongia</i>	<i>aurea</i>	Carroll et al., 2020
Polyketide	Methylated polyketides	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	<i>erectus</i>	Carroll et al., 2020
Sesquiterpenoid	Nakijinols B	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	<i>elegans</i>	Takeda et al., 2018; Carroll et al., 2020
Sesquiterpenoid	Nakijinols E	Dictyoceratida	Thorectidae	<i>Smenospongia</i>	-	Takeda et al., 2018; Carroll et al., 2020
Sesquiterpenoid	Nakijinols F and G	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Takeda et al., 2018; Carroll et al., 2020
Alkaloid	Nitrogenous compound	Dictyoceratida	-	-	-	Abdelaleem et al., 2020
Protein	PHC-1	Dictyoceratida	Thorectidae	<i>Phyllospongia</i>	-	Calcabruini et al., 2017
Ester	Phenyl ester	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	<i>erectus</i>	Carroll et al., 2020
Alkaloid	Psymberin	Dictyoceratida	Irciniidae	<i>Psammocinia</i>	<i>Psammocinia aff. Bulbosa</i>	McCauley et al., 2020
Alkaloid	Psymberin	Dictyoceratida	Irciniidae	<i>Ircinia</i>	<i>ramose</i>	McCauley et al., 2020
Alkaloid	Psymberin (distantly related to the Pederin family)	Dictyoceratida	Irciniidae	<i>Psammocinia</i>	-	Mehbub et al., 2014
Terpenoid	Puupehenol (Halogenated Compounds)	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	-	Choudhary et al., 2017
Terpenoid	Puupehenone (Halogenated Compounds)	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	-	Choudhary et al., 2017
Norsesterterpene Peroxide	Rhopaloic acid H	Dictyoceratida	Spongiidae	<i>Hippospongia</i>	-	Su et al., 2016
Macrolide	Salarin C	Dictyoceratida	Thorectidae	<i>Fascaplysinopsis</i>	-	Calcabruini et al., 2017
Terpenoid	Sarcotragin A & B (Trisnorsesterterpenoid lactam)	Dictyoceratida	Irciniidae	<i>Sarcotragus</i>	-	Mehbub et al., 2014
Terpenoid	Scalaradial	Dictyoceratida	Thorectidae (Thorectinae)	<i>Scalarispongia</i>	<i>scalaris</i>	Calcabruini et al., 2017
Terpenoid	Scalarane sesterterpenes	Dictyoceratida	-	-	-	Erpenbeck & van Soest, 2006

Terpenoid	scalarane sesterterpenoids, 12 β -(3' β -hydroxybutanoyloxy)-20,24-dimethyl-24-oxo-scalarane-16-en-25-al	Dictyoceratida	Thorectidae	<i>Phyllospongia</i>	-	Lai et al., 2016
Sesquiterpenoid	Sesquiterpenoid benzoxazole,2 nakijinol A	Dictyoceratida	Spongiidae	-	-	Takeda et al., 2018; Carroll et al., 2020
Terpenoid	Sesquiterpenoids	Dictyoceratida	Dysideidae	<i>Lamellodysidea</i>	<i>herbacea</i>	Carroll et al., 2020
Sesterterpenoid	Sesterterpenoids-Variabilin-type furans, butenolides and g-lactams	Dictyoceratida	Thorectidae (Thorectinae)	<i>Cacospongia</i>	-	Carroll et al., 2020
Sesterterpenoid	Sesterterpenoids-Variabilin-type furans, butenolides and g-lactams	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Carroll et al., 2020
Sesterterpenoid	Sesterterpenoids-Variabilin-type furans, butenolides and g-lactams	Dictyoceratida	Irciniidae	<i>Psammocinia</i>	-	Carroll et al., 2020
Peptide/Polyketide hybrids	Smenamides A and B	Dictyoceratida	Thorectinae	<i>Smenospongia</i>	<i>aurea</i>	Calcabruini et al., 2017
Sesquiterpene aminoquinone	Smenospongine	Dictyoceratida	Thorectidae (Thorectinae)	<i>Dactylospongia</i>	<i>elegans</i>	Calcabruini et al., 2017
Diterpenoid	Spongiafuranic acid A	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Diterpenoid	Spongiafuranohydroxamic acid A	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Tai et al., 2021
Diterpenoid	Spongian	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Carroll et al., 2020
Terpenoid	Spongiatriol	Dictyoceratida	Spongiidae	<i>spongia</i>	-	Calcabruini et al., 2017
Macrolide	Spongistatin 1	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	<i>erectus</i>	Calcabruini et al., 2017
Sesterterpenoid	Suberitine- and scalarane-type sesterterpenoids	Dictyoceratida	Thorectidae	<i>Hyrtios</i>	-	Carroll et al., 2020
Sesterterpenoid	Suberitine- and scalarane-type sesterterpenoids	Dictyoceratida	Spongiidae	<i>Spongia</i>	-	Carroll et al., 2020
Terpenoid	tetraprenyltoluquinol-related metabolite	Dictyoceratida	Thorectidae	<i>Phyllospongia</i>	-	Lai et al., 2016
Polyketide (Macrolide)	Zampanolides B–E	Dictyoceratida	Thorectidae(Thorectinae)	<i>Cacospongia</i>	<i>mycofijiensis</i>	Carroll et al., 2020

Norterpene	-	Haplosclerida	Chalinidae	<i>Haliclona (Reniera)</i>	-	Chao et al., 2010
Polyacetylenic alcohol	(-)-Mucosin and both strongylodiols H and I	Haplosclerida	Petrosiidae	<i>Petrosia (Strongylophora)</i>	-	Carroll et al., 2020
Polyacetylenic alcohol	(-)-Mucosin and both strongylodiols H and I	Haplosclerida	Chalinidae	<i>Haliclona (Soestella)</i>	<i>mucosa</i>	Carroll et al., 2020
Terpenoid	(3R,3'R,5S)-3,3',5,19'-tetrahydroxy-7',8'-didehydro- γ , ϵ -carotene- 8-one (Acetylenic carotenoid)	Haplosclerida	Chalinidae	<i>Haliclona (Reniera)</i>	<i>osiris</i>	Mehbub et al., 2014
Alkaloid	3-Alkylpiperidine derivatives	Haplosclerida	-	-	-	Erpenbeck & van Soest, 2006
Amide	Amides	Haplosclerida	Chalinidae	<i>Haliclona</i>	-	Carroll et al., 2020
Sterol	Aragusterol A	Haplosclerida	Petrosiidae	<i>Xestospongia</i>	-	Calcabruini et al., 2017
Alkyne	Brominated acetylenes	Haplosclerida	-	-	-	Erpenbeck & van Soest, 2006
Peptide	Callyaerin A	Haplosclerida	Callyspongiidae	<i>Callyspongia (Cladochalina)</i>	<i>aerizusa</i>	Zhang et al., 2018; Carroll et al., 2020
Peptide	Callynormine A	Haplosclerida	Callyspongiidae	<i>Callyspongia (Euplacella)</i>	<i>abnormis</i>	Mehbub et al., 2014
Acetylene	Callyspongiol	Haplosclerida	Callyspongiidae	<i>Callyspongia</i>	-	Calcabruini et al., 2017
Alkaloid (Ceramide)	Ceramides	Haplosclerida	Callyspongiidae	<i>Callyspongia (Callyspongia)</i>	<i>californica</i>	Carroll et al., 2020
Peptide	Cyclo-(S-Pro-R-Leu) (Halogenated Compounds)	Haplosclerida	Chalinidae	<i>Haliclona (Haliclona)</i>	<i>oculata</i>	Choudhary et al., 2017
Acetylene	Dideoxypetrosynol A	Haplosclerida	Petrosiidae	<i>Petrosia</i>	-	Calcabruini et al., 2017
Alkaloid	Epimeric alkaloids	Haplosclerida	Chalinidae	<i>Haliclona</i>	-	Carroll et al., 2020
Terpenoid	Halioxepines A, B & C	Haplosclerida	Chalinidae	<i>Haliclona (Reniera)</i>	-	Carroll et al., 2020
Alkaloid (Indole)	Indole alkaloids	Haplosclerida	Petrosiidae	<i>Acanthostrongylophora</i>	-	Carroll et al., 2020
Alkaloid (Indole)	Indole alkaloids	Haplosclerida	Phloeodictyidae	<i>Oceanapia</i>	-	Carroll et al., 2020
Peptide	Kapakahine E	Haplosclerida	Niphatidae	<i>Niphates</i>	<i>olemda</i>	Mehbub et al., 2014

Alkaloid	Kuanoniamines A	Haplosclerida	Phloeodictyidae	<i>Oceanapia</i>	<i>sagittaria</i>	Calcabruini et al., 2017
Alkaloid	Kuanoniamines C	Haplosclerida	Phloeodictyidae	<i>Oceanapia</i>	<i>sagittaria</i>	Calcabruini et al., 2017
Polyacetylenic alcohol	Melyne A	Haplosclerida	Niphatidae	<i>Niphates</i>	-	Wang et al., 2018; Carroll et al., 2020
Polyacetylenic alcohol	Melyne B	Haplosclerida	Niphatidae	<i>Niphates</i>	-	Wang et al., 2018; Carroll et al., 2020
Peptide	Neopetrosiamide A, B	Haplosclerida	Petrosiidae	<i>Neopetrosia</i>	-	Mehbub et al., 2014
Alkaloid	Neopetrosiamine A (tetracyclic bis-piperidine)	Haplosclerida	Petrosiidae	<i>Neopetrosia</i>	<i>proxima</i>	Mehbub et al., 2014
Amide	Oxidised lipid amides	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> (<i>Callyspongia</i>)	<i>californica</i>	Carroll et al., 2020
Polyacetylenes	petrosianynes A and B	Haplosclerida	Petrosiidae	<i>Petrosia</i>	-	Juan et al., 2014
Acid	Phenol-containing dicarboxylic acids	Haplosclerida	Callyspongiidae	<i>Callyspongia</i> (<i>Callyspongia</i>)	<i>californica</i>	Carroll et al., 2020
Alkyne	Polyhydroxylated acetylenes	Haplosclerida	-	-	-	Erpenbeck & van Soest, 2006
Polyacetylenic alcohol	Polynols M-O	Haplosclerida	Niphatidae	<i>Niphates</i>	-	Wang et al., 2018; Carroll et al., 2020
Alkaloid (Pyridine)	Pyridine-containing compounds	Haplosclerida	Chalinidae	<i>Haliclona</i>	-	Carroll et al., 2020
Alkaloid (Pyridine)	Pyridine-containing compounds	Haplosclerida	Callyspongiidae	<i>Callyspongia</i>	<i>crassa</i>	Carroll et al., 2020
Polyketide (Isoquinolinequinone)	Renieramycin M	Haplosclerida	Petrosiidae	<i>Xestospongia</i>	-	Calcabruini et al., 2017
Glycolipid	Rhizocalinin (Glycosphingolipid)	Haplosclerida	Phloeodictyidae	<i>Oceanapia</i>	<i>incrustedata</i>	Calcabruini et al., 2017
Glycolipid	Rhizocalinin (Glycosphingolipid)	Haplosclerida	Phloeodictyidae	<i>Oceanapia</i>	<i>incrustedata</i>	Calcabruini et al., 2017
Triterpenoid	Sipholane triterpenoids	Haplosclerida	Callyspongiidae	<i>Siphonochalina</i>	-	Carroll et al., 2020
Terpenoid	Sipholenol A	Haplosclerida	Callyspongiidae	<i>Siphonochalina</i>	-	Calcabruini et al., 2017
Terpenoid	Sipholenol L	Haplosclerida	Callyspongiidae	<i>Siphonochalina</i>	-	Calcabruini et al., 2017
Peptide	Sponge-derived peptides	Haplosclerida	Callyspongiidae	<i>Callyspongia</i>	-	Carroll et al., 2020

Alkyne	Straight-chain acetylenes	Haplosclerida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Viscosamine (Trimeric 3-alkyl pyridinium alkaloid)	Haplosclerida	Chalinidae	<i>Haliclona (Rhizoniera) viscosa</i>		Mehbub et al., 2014
Xestosaprol	Xestosaprol F–M (Pentacyclic compound)	Haplosclerida	Petrosiidae	<i>Xestospongia</i>	-	Mehbub et al., 2014
Quinone	Xestosaprols N and O	Haplosclerida	Petrosiidae	<i>Xestospongia</i>	-	Shi et al., 2018; Carroll et al., 2020
Alkaloid	Halitoxins	Haplosclerida	Niphatidae	<i>Amphimedon</i>	<i>chloros</i>	Carroll et al., 2020
Macrocyclic peptide	Microsclerodermin A	Haplosclerida	Niphatidae	<i>Amphibleptula</i>	-	Calcabruini et al., 2017
Alkaloid	Zamamidine D (Halogenated Compounds)	Haplosclerida	Niphatidae	<i>Amphimedon</i>	-	Choudhary et al., 2017
Alkaloid	4,5-Dihydrofuranylidene compounds	Homosclerophorida	Plakinidae	<i>Plakortis</i>	<i>simplex</i>	Alcock et al., 2018; Carroll et al., 2020
Sterol (Terpene)	Aminosterols	Homosclerophorida	-	-	-	Erpenbeck & van Soest, 2006
Polyketide	Manadodioxan D	Homosclerophorida	Plakinidae	<i>Plakortis</i>	<i>bergquistae</i>	Choudhary et al., 2017
Polyketide	Manadodioxan E	Homosclerophorida	Plakinidae	<i>Plakortis</i>	<i>bergquistae</i>	Choudhary et al., 2017
Ester	Methyl ester 3	Homosclerophorida	Plakinidae	<i>Plakortis</i>	<i>halichondrioides</i>	Alcock et al., 2018; Carroll et al., 2020
Polyketide	Spongisoritin A	Homosclerophorida	Plakinidae	<i>Plakortis</i>	<i>angulospiculatus</i>	Alcock et al., 2018; Carroll et al., 2020
Steroid	-	Poecilosclerida	Coelosphaeridae	<i>Inflatella</i>	-	Carroll et al., 2020
Norterpene	-	Poecilosclerida	Podospongiidae	<i>Sigmosceptrella</i>	-	Chao et al., 2010
Norterpene	-	Poecilosclerida	Latrunculiidae	<i>Latrunculia</i>	-	Chao et al., 2010
Norterpene	-	Poecilosclerida	Mycalidae	<i>Mycale</i>	-	Chao et al., 2010
Norterpene	-	Poecilosclerida	Podospongiidae	<i>Diacarnus</i>	-	Chao et al., 2010
Norterpenes	(+)-Aikupikoxide C	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Norterpenes	(+)-Nuapapu B	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Norterpenes	(+)-Nuapapu B methyl ester	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010

Amide	Amides	Poecilosclerida	Hymedesmiidae	<i>Hemimycale</i>	-	Carroll et al., 2020
Alkaloid	Baculiferins A–O (O-sulfated pyrrole alkaloids)	Poecilosclerida	Iotrochotidae	<i>Iotrochota</i>	<i>baculifera</i>	Mehbub et al., 2014
Alkaloid	Batzelline A and B	Poecilosclerida	Chondropsidae	<i>Batzella</i>	-	Calcabruini et al., 2017
Pigment	Benzylthiocrellidone (Bis-dimedone thioether)	Poecilosclerida	Crellidae	<i>Crella (Yvesia)</i>	<i>spinulata</i>	Mehbub et al., 2014
Peptide	Callipeltins	Poecilosclerida	Latrunculidae	-	-	Li et al., 2021
Alkaloid (Ceramide)	Ceramides	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>clathrata</i>	Carroll et al., 2020
Alkaloid (Ceramide)	Ceramides	Poecilosclerida	Myxillidae	<i>Melonanchora</i>	<i>kobjakovae</i>	Carroll et al., 2020
Diterpenoid	Coelodiol and Coelic acid (ent-isocopalane)	Poecilosclerida	Isodictyidae	<i>Coelocarteria</i>	<i>cf. singaporensis</i>	Mehbub et al., 2014
Alkaloid	Crambescidin 800	Poecilosclerida	Microcionidae (Microcioninae)	<i>Clathria (Thalysias)</i>	<i>cervicornis</i>	Choudhary et al., 2017
Alkaloid	Crambescidin 800	Poecilosclerida	Crambeidae	<i>Crambe</i>	<i>crambe</i>	Calcabruini et al., 2017
Alkaloid	Crambescidin 800	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>ungiculata</i>	Calcabruini et al., 2017
Alkaloid	Crambescidin 816	Poecilosclerida	Crambeidae	<i>Crambe</i>	<i>crambe</i>	Calcabruini et al., 2017
Alkaloid	Crambescidin 830	Poecilosclerida	Crambeidae	<i>Crambe</i>	<i>crambe</i>	Calcabruini et al., 2017
Alkaloid	Crambescidin congeners	Poecilosclerida	Microcionidae	<i>Clathria (Microciona)</i>	<i>bulbotoxa</i>	Carroll et al., 2020
Polyketide	Halichondrin B (Polyether macrolide)	Poecilosclerida	Coelosphaeridae	<i>Lissodendoryx</i>	-	McCauley et al., 2020
Diterpenoid	Hamigeran	Poecilosclerida	Hymedesmiidae	<i>Hamigera</i>	-	Carroll et al., 2020
Polyketide	Hemicalide analogue	Poecilosclerida	Hymedesmiidae	<i>Hemimycale</i>	-	Han et al., 2018; Carroll et al., 2020
Alkaloid (Indole)	Indole metabolites	Poecilosclerida	Microcionidae	<i>Microcioninae</i>	<i>Clathria</i>	Carroll et al., 2020
Norterpenes	Inseparable epimers negombatoperoxides C and D	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Alkaloid	Isobatzelline A, C, D and E	Poecilosclerida	Chondropsidae	<i>Batzella</i>	-	Calcabruini et al., 2017
Macrolide	Lasonolide A	Poecilosclerida	Coelosphaeridae	<i>Forcepia</i>	-	Calcabruini et al., 2017

Macrolide	Latrunculin A	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>magnifica</i>	Calcabruini et al., 2017
Macrolide	Latrunculins	Poecilosclerida	Latrunculidae	-	-	Li et al., 2021
Alkaloid	Makaluvamine G	Poecilosclerida	Acanthaceae	<i>Zyzya</i>	<i>fuliginosa</i>	Kudryavtsev et al., 2018; Carroll et al., 2020
Polyketide (Macrolide)	Miuramide A	Poecilosclerida	Mycalidae	<i>Mycale</i>	-	Carroll et al., 2020
Alkaloid	Monanchocidin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid	Monanchocidin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Shubina et al., 2018; Carroll et al., 2020
Alkaloid	Monanchocidin B	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid	Monanchocidin C	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid	Monanchomycalin B	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid (Guanidine)	Monanchomycalin B, monanchocidin A and normonanchocidin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Carroll et al., 2020
Alkaloid	Mycalamide A	Poecilosclerida	Mycalidae	<i>Mycale (Naviculina)</i>	<i>chungae</i>	McCauley et al., 2020
Alkaloid	Mycalamide A	Poecilosclerida	Mycalidae	<i>Mycale</i>	-	Calcabruini et al., 2017
Norterpenes	Negombatodiol	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Norterpenes	Negombatolactone	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Norterpenes	Negombatoperoxides A and B	Poecilosclerida	Podospongiidae	<i>Negombata</i>	<i>corticata</i>	Chao et al., 2010
Terpenoid	Norditerpenes	Poecilosclerida	Latrunculidae	-	-	Li et al., 2021
Alkaloid	Normonanchocidin D	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid (Pyrrole)	Oroidin-type metabolites	Poecilosclerida	Tedaniidae	<i>Tedania (Tedania)</i>	-	Carroll et al., 2020
Amide	Oxidised lipid amides	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>clathrata</i>	Carroll et al., 2020
Amide	Oxidised lipid amides	Poecilosclerida	Myxillidae	<i>Melonanchora</i>	<i>kobjakovae</i>	Carroll et al., 2020
Macrolide	Pateamine	Poecilosclerida	Mycalidae	<i>Mycale</i>	-	Calcabruini et al., 2017
Polyketide (Macrolide)	Peloruside A	Poecilosclerida	Mycalidae	<i>Mycale (Carmia)</i>	<i>hentscheli</i>	Calcabruini et al., 2017
Polyketide (Macrolide)	Peloruside E	Poecilosclerida	Mycalidae	<i>Mycale (Naviculina)</i>	<i>chungae</i>	Carroll et al., 2020

Acid	Phenol-containing dicarboxylic acids	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>clathrata</i>	Carroll et al., 2020
Acid	Phenol-containing dicarboxylic acids	Poecilosclerida	Myxillidae	<i>Melonanchora</i>	<i>kobjakovae</i>	Carroll et al., 2020
Polyketide (Macrolide)	Poecillastrins E–H	Poecilosclerida	Mycalidae	<i>Mycale (Naviculina)</i>	<i>chungae</i>	Carroll et al., 2020
Polyarsenical	Polyarsenic arsenicin B and C	Poecilosclerida	Microcionidae	<i>Echinochalina (Protophlitaspongia)</i>	<i>bargibanti</i>	Tähtinen et al., 2018; Carroll et al., 2020
Alkaloid	Ptilomycalin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid	Pulchranin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Alkaloid	Pyrroloiminoquinone alkaloids	Poecilosclerida	Latrunculidae	-	-	Li et al., 2021
Alkaloid	Pyrroloquinolines	Poecilosclerida	Acanthidae	<i>Zyzzya</i>	<i>fuliginosa</i>	Kudryavtsev et al., 2018; Carroll et al., 2020
Alkaloid	Secobatzelline A and B	Poecilosclerida	Chondropsidae	<i>Batzella</i>	-	Calcabruini et al., 2017
Sesterterpenoid	Suberitine- and scalarane-type sesterterpenoids	Poecilosclerida	Hymedesmiidae	<i>Phorbac</i>	-	Carroll et al., 2020
Terpenoid	Trunculins (Norditerpenes)	Poecilosclerida	Latrunculidae	-	-	Li et al., 2021
Alkaloid	Tsitsikammamine	Poecilosclerida	Latrunculiidae	<i>Latrunculia (Latrunculia)</i>	<i>biformis</i>	Carroll et al., 2020
Alkaloid	Urupocidin A	Poecilosclerida	Crambeidae	<i>Monanchora</i>	<i>pulchra</i>	Calcabruini et al., 2017
Terpenoid	Cyclic diterpenes	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Sterol (Terpene)	Cyclopropene sterols	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	Peroxy-sesterterpenoids	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Polycyclic guanidine alkaloids	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Pyrroloquinoline alkaloids	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Tetrahydropyrans	Poecilosclerida	-	-	-	Erpenbeck & van Soest, 2006
Sterol	5 α ,6 α -Epoxy-24R*-ethylcholest-8(14)-en- 3 β ,7 α -diol and 5 α ,6 α - epoxy-24R*-ethylcholest-8-en-3 β ,7 α -diol	Polymastiida	Polymastiidae	<i>Polymastia</i>	<i>tenax</i>	Mehbub et al., 2014

Alkaloid	Aphrocallistin	Sceptrulophora	Aphrocallistidae	<i>Aphrocallistes</i>	<i>beatrice beatrice</i>	Calcabruini et al., 2017
Peptide	Carteritins A, B	Scopalinida	Scopalinidae	<i>Stylissa</i>	<i>carteri</i>	Li et al., 2018; Carroll et al., 2020
Peptide	Hymenamide D	Scopalinida	Scopalinidae	<i>Stylissa</i>	<i>carteri</i>	Li et al., 2018; Carroll et al., 2020
Terpenoid	Sesqui- and diterpene isocyanides	Scopalinida	-	-	-	Erpenbeck & van Soest, 2006
Peptide	Sponge-derived peptides	Scopalinida	Scopalinidae	<i>Stylissa</i>	-	Carroll et al., 2020
Sterol	5 α ,8 α -epidioxysterol, 3-acetylxinysterol	Suberitida	-	<i>Axinyssa</i>	-	Su et al., 2013a
Sesquiterpene	Axinyssalines A and B	Suberitida	-	<i>Axinyssa</i>	-	Liu et al., 2014
Sterol	Axinysterol	Suberitida	-	<i>Axinyssa</i>	-	Su et al., 2013a
Steroid	-	Suberitida	Halichondriidae	<i>Halichondria</i>	-	Carroll et al., 2020
Steroid	-	Suberitida	Halichondriidae	<i>Topsentia</i>	-	Carroll et al., 2020
Ilimaquinone	-	Suberitida	Halichondriidae	<i>Halichondria</i>	-	Do et al., 2014
Sulfated sterol	29-Demethylgeodisterol-3-O-sulfite	Suberitida	Halichondriidae	<i>Topsentia</i>	-	Choudhary et al., 2017
Alkaloid	Aaptamine	Suberitida	Suberitidae	<i>Aaptos</i>	-	Calcabruini et al., 2017
Alkaloid	Aaptamine	Suberitida	Suberitidae	<i>Aaptos</i>	<i>suberitoides</i>	Calcabruini et al., 2017
Alkaloid	Aaptamines	Suberitida	-	-	-	Erpenbeck & van Soest, 2006
Alkaloid	Aaptic acid	Suberitida	Suberitidae	<i>Aaptos</i>	<i>lobata</i>	Carroll et al., 2020
Nortopsentins	bis(indolyl)imidazole alkaloid	Suberitida	Halichondriidae	<i>Spongisorites</i>	<i>ruetzleri</i>	Sakemi & Sun, 1991; Ji et al., 2018; Carroll et al., 2020
Sesquiterpene hydrocarbons	Curcuphenols	Suberitida	Halichondriidae	<i>Epipolasis</i>	-	Chen et al., 1999
Alkaloid	Demethyl(oxy)aaptamine	Suberitida	Suberitidae	<i>Aaptos</i>	-	Calcabruini et al., 2017
Sulfated sterol	Geodisterol-3-O-sulfite (Halogenated Compounds)	Suberitida	Halichondriidae	<i>Topsentia</i>	-	Choudhary et al., 2017
Sterol (sulphated)	Geodisterol-3-O-sulfite and 29-demethylgeodisterol-3- O-sulfite	Suberitida	Halichondriidae	<i>Topsentia</i>	-	Mehub et al., 2014
Polyketide	Halichondrin B (Polyether macrolide)	Suberitida	Halichondriidae	<i>Halichondria</i>	<i>okadai</i>	McCauley et al., 2020

Alkaloid	Isoaaptamine	Suberitida	Suberitidae	<i>Aaptos</i>	-	Calcabruini et al., 2017
Peptide	Seragamide A–F (Depsipeptide-actin targeting)	Suberitida	Suberitidae	<i>Suberites</i>	<i>japonicus</i>	Mehbub et al., 2014
Polyketide	Spongosoritin A	Suberitida	Halichondriidae	<i>Spongosorites</i>	-	Alcock et al., 2018; Carroll et al., 2020
Terpenoid	Suberitane-derived sesterterpenes	Suberitida	-	-	-	Erpenbeck & van Soest, 2006
Peptide	Hemiasterlin, Hemiasterlin A and B	Tethyida	Hemiasterellidae	<i>Hemiasterella</i>	<i>vasiformis</i> var. <i>minor</i>	Calcabruini et al., 2017
Sterol (Terpene)	Hydroxyimminosteroids	Tetractinellida	-	-	-	Erpenbeck & van Soest, 2006
Terpenoid	Isomalabaricane triterpenes	Tetractinellida	-	-	-	Erpenbeck & van Soest, 2006
Macrolide	Leiodermatolide	Tetractinellida	Spirophorina	<i>Leiodermatium</i>	-	Calcabruini et al., 2017
Alkaloid	Penaresidins	Tetractinellida	-	-	-	Erpenbeck & van Soest, 2006
Saponin (Sterol+Glycoside)	Saponins	Tetractinellida	-	-	-	Erpenbeck & van Soest, 2006
Sterol (Terpene)	Sulfated sterols	Tetractinellida	-	-	-	Erpenbeck & van Soest, 2006
Polyketide	(+)-Discodermolide	Tetractinellida (Astrophorina)	Theonellidae	<i>Discodermia</i>	<i>dissoluta</i>	Calcabruini et al., 2017
Acetylenic acid	(Z)-stellettac acid C	Tetractinellida (Astrophorina)	Ancorinidae	<i>Stelletta</i>	-	Calcabruini et al., 2017
Steroid	4-Methylidene-sterols	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Carroll et al., 2020
Sterol	Acetyldehydroconicasterol	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Guo et al., 2012
Sterol	Acetyltheonellasterol	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Guo et al., 2012
Fatty acid linked to two γ -amino acids and esterified with phosphate	Calyculin A	Tetractinellida (Astrophorina)	Theonellidae	<i>Discodermia</i>	<i>calyx</i>	Calcabruini et al., 2017

Macrolide	Dictyostatin-1	Tetractinellida (Astrophorina)	Corallistidae	-	-	Calcabruini et al., 2017
Polyketide+Terpenoid	Discodermolide-taxol hybrid compounds	Tetractinellida (Astrophorina)	Theonellidae	<i>Discodermia</i>	<i>dissoluta</i>	Nadaradjane et al., 2018; Carroll et al., 2020
Cyclic peptide	Geodiamolide A, B, H and I	Tetractinellida (Astrophorina)	Geodiidae	<i>Geodia</i>	<i>corticostylifera</i>	Calcabruini et al., 2017
Terpenoid	Geoditin A	Tetractinellida (Astrophorina)	Geodiidae	<i>Geodia</i>	<i>japonica</i>	Calcabruini et al., 2017
Triterpenes	Isomalabaricane triterpenes	Tetractinellida (Astrophorina)	Geodiidae	<i>Geodia</i>	-	Lai et al., 2021
Triterpenes	Isomalabaricane triterpenes	Tetractinellida (Astrophorina)	Ancorinidae	<i>Jaspis</i>	-	Lai et al., 2021
Triterpenes	Isomalabaricane triterpenes	Tetractinellida (Astrophorina)	Ancorinidae	<i>Stelletta</i>	-	Lai et al., 2021
Cyclic anhydrophytosphingosine (Sphingolipid)	Jaspine B	Tetractinellida (Astrophorina)	Calthropellidae	<i>Calthropella</i> (<i>Calthropella</i>)	-	Calcabruini et al., 2017
Cyclic anhydrophytosphingosine (Sphingolipid)	Jaspine B	Tetractinellida (Astrophorina)	Ancorinidae	<i>Jaspis</i>	-	Calcabruini et al., 2017
Terpenoid	Jaspolide B	Tetractinellida (Astrophorina)	Ancorinidae	<i>Jaspis</i>	-	Calcabruini et al., 2017
Peptide	keramamides A and L	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	-	Junk and Kazmaier, 2018; Carroll et al., 2020
Polyketide (Macrolide)	Macrolides	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Carroll et al., 2020
Anhydrophytosphingosine	Pachastrissamine	Tetractinellida (Astrophorina)	Calthropellidae	<i>Calthropella</i> (<i>Calthropella</i>)	-	Calcabruini et al., 2017

Anhydrophytosphingosine	Pachastrissamine	Tetractinellida (Astrophorina)	Ancorinidae	<i>Jaspis</i>	-	Calcabruini et al., 2017
Glycoprotein	Pachymatismin	Tetractinellida (Astrophorina)	Geodiidae	<i>Pachymatisma</i>	<i>johnstonii</i>	Calcabruini et al., 2017
Polyketide (Macrolide)	Peloruside E	Tetractinellida (Astrophorina)	Vulcanellidae	<i>Characella</i>	-	Carroll et al., 2020
Polyketide (Macrolide)	Peloruside E	Tetractinellida (Astrophorina)	Vulcanellidae	<i>Poecillastra</i>	-	Carroll et al., 2020
Polyketide (Macrolide)	Poecillastrins E–H	Tetractinellida (Astrophorina)	Vulcanellidae	<i>Characella</i>	-	Carroll et al., 2020
Polyketide (Macrolide)	Poecillastrins E–H	Tetractinellida (Astrophorina)	Vulcanellidae	<i>Poecillastra</i>	-	Carroll et al., 2020
Peptide	Solomonamide A	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Jachak et al., 2018; Carroll et al., 2020
Peptide	Sponge-derived peptides	Tetractinellida (Astrophorina)	Theonellidae	<i>Discodermia</i>	-	Carroll et al., 2020
Peptide	Sponge-derived peptides	Tetractinellida (Astrophorina)	Geodiidae	<i>Geodia</i>	-	Carroll et al., 2020
Peptide	Sponge-derived peptides	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	-	Carroll et al., 2020
Terpenoid	Stellettin A	Tetractinellida (Astrophorina)	Geodiidae	<i>Geodia</i>	<i>japonica</i>	Calcabruini et al., 2017
Terpenoid	Stellettin B	Tetractinellida (Astrophorina)	Ancorinidae	<i>Jaspis</i>	<i>stellifera</i>	Calcabruini et al., 2017
Peptide	Theonellamide	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Carroll et al., 2020
Sterol	Theonellasterol	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Guo et al., 2012

Sterol	Theonellasterol K	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Guo et al., 2012
Sterol	Theonellasterone	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Guo et al., 2012
Terpenoid	13E,17E-globostellatic acid X methyl ester	Tetractinellida (Astrophorina)	Ancorinidae	<i>Rhabdastrella</i>	<i>globostellata</i>	Calcabruini et al., 2017
Peptide	Cyclotheonamide (Macrocyclic peptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Triterpene glycoside	Eryloside F1–F4	Tetractinellida (Astrophorina)	Geodiidae	<i>Erylus</i>	<i>formosus</i>	Mehbub et al., 2014
Triterpene glycoside	Eryloside M–Q	Tetractinellida (Astrophorina)	Geodiidae	<i>Erylus</i>	<i>formosus</i>	Mehbub et al., 2014
Peptide	Homophymine A (Cyclodepsipeptide)	Tetractinellida (Astrophorina)	Neopeltidae	<i>Homophymia</i>	-	Mehbub et al., 2014
Macrolide	Hurghadolide A	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Mehbub et al., 2014
Peptide	keramamide (Macrocyclic peptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Polyketide	Misakinolide (Macrocyclic peptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Peptide	Nazumamide A	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Triterpenoid	Nortriterpenoids	Tetractinellida (Astrophorina)	Ancorinidae	<i>Rhabdastrella</i>	<i>providentiae</i>	Carroll et al., 2020
Alkaloid	Onnamide A	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Peptide	Paltolides A–C (Anabaenopeptin like)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Mehbub et al., 2014

Peptide	Plytheonamide A, B (Polypeptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Mehbub et al., 2014
Peptide	Pseudotheonamide (Pentapeptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Triterpenes	Rhabdastin H	Tetractinellida (Astrophorina)	Ancorinidae	<i>Rhabdastrella</i>	-	Lai et al., 2021
Triterpenes	Rhabdastin I	Tetractinellida (Astrophorina)	Ancorinidae	<i>Rhabdastrella</i>	-	Lai et al., 2021
Terpenoid	Rhabdastrellic acid-A	Tetractinellida (Astrophorina)	Ancorinidae	<i>Rhabdastrella</i>	<i>globostellata</i>	Calcabruini et al., 2017
Polyketide	Swinholide (Dimeric42carbon- ring polyketides)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Macrolide	Swinholide I	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	Mehbub et al., 2014
Alkaloid	Theonamide	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Polyketide	Theonellamides (Macrocyclic peptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Polyketide	Theopalauamide (Macrocyclic peptide)	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Alkaloid	Theopederin	Tetractinellida (Astrophorina)	Theonellidae	<i>Theonella</i>	<i>swinhoei</i>	McCauley et al., 2020
Macrolide	Spongistatin 1	Trachycladida	Trachycladidae	<i>Trachycladus</i>	<i>spinispirulifer</i>	Calcabruini et al., 2017
Dibromotyrosine derivative	(1'R,5'S,6'S)-2-(3',5'-dibromo-1',6'- dihydroxy-4'-oxocyclohex-2'-enyl) acetonitrile (DT)	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	-	Su et al., 2013b
Alkaloid	(1'R,5'S,6'S)-2-(3',5'-dibromo-1',6'- dihydroxy-4'-oxocyclohex-2'-enyl) acetonitrile	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	-	Calcabruini et al., 2017

Sterol	5 α ,6 α -epoxy-petrosterol	Verongiida	Ianthellidae	<i>Ianthella</i>	-	Calcabruini et al., 2017
Alkaloid	Aplysamine 8 (Halogenated Compounds)	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	<i>purpurea</i>	Choudhary et al., 2017
Peptide	Bastadin 6	Verongiida	Ianthellidae	<i>Ianthella</i>	-	Calcabruini et al., 2017
Amino acid derivative	Bromotyrosine derivatives	Verongiida	-	-	-	Erpenbeck & van Soest, 2006
Amino acid derivative	Bromotyrosine-derived metabolites	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	-	Carroll et al., 2020
Amino acid derivative	Bromotyrosine-derived metabolites	Verongiida	Ianthellidae	<i>Ianthella</i>	<i>basta</i>	Carroll et al., 2020
Amino acid derivative	Bromotyrosine-derived metabolites	Verongiida	Aplysinellidae	<i>Suberea</i>	<i>ianthelliformis</i>	Carroll et al., 2020
Alkaloid	Ianthelliformisamine A	Verongiida	Aplysinellidae	<i>Suberea</i>	<i>ianthelliformis</i>	Choudhary et al., 2017
Alkaloid	Ianthelliformisamine B	Verongiida	Aplysinellidae	<i>Suberea</i>	<i>ianthelliformis</i>	Choudhary et al., 2017
Alkaloid	Ianthelliformisamine C	Verongiida	Aplysinellidae	<i>Suberea</i>	<i>ianthelliformis</i>	Choudhary et al., 2017
Brominated alkaloid	Isofistularin-3	Verongiida	Aplysinidae	<i>Aplysina</i>	<i>aerophoba</i>	Calcabruini et al., 2017
Sterol	Petrosterol	Verongiida	Ianthellidae	<i>Ianthella</i>	-	Calcabruini et al., 2017
Sterol	Petrosterol-3,6-dione	Verongiida	Ianthellidae	<i>Ianthella</i>	-	Calcabruini et al., 2017
Sterol	Petrosterol-3,6-dione and 5 α ,6 α -epoxy-petrosterol (C29 sterol)	Verongiida	Ianthellidae	<i>Ianthella</i>	-	Mehbub et al., 2014
Alkaloid	Psammaplin A	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	-	Calcabruini et al., 2017
Alkaloid	Psammaplysene A	Verongiida	Pseudoceratinidae	<i>Pseudoceratina</i>	-	Calcabruini et al., 2017

Table S7. Reference list of the literature review (Table S6) on biochemical compounds identified in marine sponges

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Table S8. Literature review of primers used on barnacle phylogenetic studies.

References	Year	Genetic markers		Taxa
		Mitochondria	Nuclear	
Folmer et al.	1994	COI	none	metazoan
Spear et al.	1994	none	18S	Thecostraca
Mizrahi et al.	1998	none	18S	<i>Ibla</i>
Mokady et al.	1999	12S	none	Pyrgomatinae
Gibert et al.	2000	none	Engrailed gene (en. a/ en. b)	<i>Sacclina carcini</i>
Harris et al.	2000	none	18S	Thoracican
Glenner et al.	2003	18S, COI	none	<i>Polysacus</i>
Begum et al.	2004	COI, 12S	none	Thoracican
Fisher et al.	2004	16S, COI	none	Chthamalidae
Pérez-Losada et al.	2004	12S, 16S	H3, 18S, 28S	Thoracican
Glenner and Hebsgaard	2006	none	18S	Rhizocephala
Simon-Blecher et al.	2007	12S, 16S	18S	Pyrgomatidae
Glenner et al.	2008	16S, 18S	none	<i>Heterosaccus</i>
Pérez-Losada et al.	2008	none	H3, 18S, 28S	Thoracican
Chan et al.	2009	COI, 12S	none	<i>Heteralepas</i>
Pérez-Losada et al.	2009	none	H3, 18S, 28S	Thecostraca
Tsang et al.	2009	COI, 12S, 16S	none	W. milleporae
Wares et al.	2009	COI, 16S,	EF1, LTRS, NAKAS, 18S	<i>Chthamalus</i>
Glenner et al.	2010	18S, 28S	none	Akentrogonida
Van Syoc et al.	2010	COI, 16S	H3	<i>Pollicipes</i>
Wu	2011	COI, 12S	EF1, H3	Chthamalidae
Yusa et al.	2012	none	18S	Thoracica
Carrison-Stone et al.	2013	COI, H3	none	<i>Conopea</i>
Chan et al.	2013	16S, COI	none	Lithoglyptida
Hayashi et al.	2013	12S, 16S	H3, 18S, 28S	Coronuloidea

Linse et al.	2013	COI	18S, 28S	<i>Scalpelliformes</i>
Malay and Michonneau	2014	COI, 12S, 16S	H3, 18S	Pyrgomatidae
Pérez-Losada et al.	2014	COI, 12S, 16S	18S, 28S	Balanomorpha
Petrunina et al.	2014	none	18S	Thecostraca
Rees et al.	2014	16S, 18S, 28S	none	Thoracica
Tsang et al.	2014	12S, 16S	EF1, H3, RPII	Pyrgomatidae
Herrera et al.	2015	28S, COI, H3	none	Thoracica
Lin et al.	2015	COI, 12S	H3, 18S	Thoracican
Tsang et al.	2015	COI, 12S, 16S	EF1, H3, RPII, 18S	Tetraclitidae
Van Syoc et al.	2015	COI	H3	Sponge barnacles
Lin et al.	2016	COI, 16S	H3, 18S	Acrothoracica
Chan et al.	2017	12S, 16S	EF1, H3, RPII, 18S	Acorn barnacles
Watanabe et al.	2018	COI	none	Hydrothermal vent stalked barnacles
Høeg et al.	2019	16S	18S, 28S	Rhizocephala
Høeg et al.	2020	none	18S	Rhizocephala
Yu et al.	2020b	COI, 12S, 16S	H3, 18S	Sponge barnacles
Glenner et al.	2021	16S	18S, 28S	Freshwater Barnacles
Hosie et al.	2021	COI, 12S	H3, 28S	Sponge barnacles
Jung et al.	2021	COI, 16S	18S	Rhizocephala

Table S9. Information of the analysed specimens and sequences used to reconstruct phylogeny. Specimen were used in molecular and morphological analyses are marked by *. Newly generated sequences are highlighted in bold.

Specimen no.							Specimen information					
Sponge no.	Barnacle no.	GenBank accession no.					Locality			Depth (m)	Date	Collector
		12S	16S	COI	18S	H3	Site	District/Island	Country			
<i>Acasta aspera</i>												
* SGI20	SGI20-1	KY581602	OP104551	KY581615	OP089122	OP116029	Dabaisha	Green Island	Taiwan	8	2011/5/14	J.H.Y. Yu
*	SGI20-2	KY581603	OP104552	KY581616	OP089123	OP116030						
*	SGI20-3	OP104474	OP104553	OP071105	OP089124	OP116031						
	WAM C58741						Ningaloo Homestead Beach	Ningaloo Reef	Australia		2010/5/-	A.M. Hosie
	WAM C58742						Ningaloo Homestead Beach	Ningaloo Reef	Australia		2010/5/-	A.M. Hosie
	WAM C58743						Ningaloo Homestead Beach	Ningaloo Reef	Australia		2010/5/-	A.M. Hosie
	WAM C55057						Roe Reef	Rottnest Island	Australia	14	2014/02/-	A.M. Hosie, A. Hara
<i>Acasta cyathus</i>												
* SLQ27	SLQ27-2	OP104506	OP104586	OP071134	OP089117	OP116063	Shanban Bay	Liuqiu	Taiwan	20-35	2016/12/1	M.C. Yu
GI17	SGI17-1						Gongguan	Green Island	Taiwan	9	2011/5/16	J.H.Y. Yu
S10	S10-2						Gongguan	Green Island	Taiwan		2009/7/22	B.K.K. Chan
												P.C. Tsai,
SDS2	SDS2-1							Dongsha islands	Taiwan	11.3	2015/6/1	Y.F. Tsao, Y.W. Chang
SGI123	SGI123-1						Gongguan	Green Island	Taiwan	15	2014/3/29	B.K.K. Chan
SGI138	SGI138-2						Gongguan	Green Island	Taiwan	15	2014/3/29	G.A. Kolbasov
	SGI138-3											

SGI15	SGI15-1						Dabaisha	Green Island	Taiwan	9	2011/5/17	J.H.Y. Yu
SGI161	SGI161-1						Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
* SGI170	SGI170-2	OP104469	OP104546	OP071100	OP089115	OP116024	Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	H.N. Chen
* SGI187	SGI187-1	OP104472	OP104549	OP071103	OP089116	OP116027	Gongguan	Green Island	Taiwan	15	2014/3/29	B.K.K. Chan
SGI193	SGI193-3						Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
SGI255	SGI255-3						Ziping	Green Island	Taiwan	10	2016/5/20	M.C. Yu
SGI265	SGI265-1						General Rock	Green Island	Taiwan	8	2016/7/27	M.C. Yu
	SGI265-2											
SGI266	SGI266-1						General Rock	Green Island	Taiwan	8	2016/7/29	M.C. Yu
SGI267	SGI267-1						General Rock	Green Island	Taiwan	8	2016/7/30	M.C. Yu
SN29	SN29-1						Daping, Yehliu	North coast,	Taiwan	12-25	2011/8/23	B.K.K. Chan
SN36	SN36-1						Daping, Yehliu	North coast,	Taiwan	12-25	2011/8/23	B.K.K. Chan
SN37	SN37-1						Daping, Yehliu	North coast,	Taiwan	12-25	2011/8/23	B.K.K. Chan
SN7	SN7-1						Keelung Islet	North coast,	Taiwan	12	2011/6/17	J.H.Y. Yu
SN8	SN8-1						Daping, Yehliu	North coast,	Taiwan	18	2011/6/17	J.H.Y. Yu
<i>Acasta crucibasis</i>												
	Mg-1226						Dabaisha	Green Island	Taiwan	9	2011/5/17	J.H.Y. Yu
	Mg-1227						Dabaisha	Green Island	Taiwan	9	2011/5/17	J.H.Y. Yu
	RMNH.CRUS.C											
	.10243						Kepulauan Seribu	Damar Kecil Island	Indonesia	20	2005/09/-	
* S32	S32-1	MN842067	MN842092	MN842021	MN842046	MN842115	General Rock	Green Island	Taiwan		2010/8/26	B.K.K. Chan
*	S32-2	OP104457	OP104534	OP071089	OP089167	OP116012						
SGI6	SGI6-1						Dabaisha	Green Island	Taiwan	9	2011/5/17	J.H.Y. Yu
* SGI256	SGI256-1	MF796667	OP104557	MF796673	OP089166	OP116035	Ziping	Green Island	Taiwan		2016/5/20	M.C. Yu
	SGI256-2											
SGI265	SGI265-3						General Rock	Green Island	Taiwan	8	2016/7/27	M.C. Yu
SLQ17	SLQ17-1						Lobster Cave	Liuqiu	Taiwan	20-30	2016/11/30	M.C. Yu
	SLQ17-2											
<i>Acasta fenestrata</i>												

* SDS1	SDS1-1	OP104460	OP104537	OP071092	OP089112	OP116015		Dongsha Island	Taiwan	11	2015/6/1	P.C. Tsai, Y.F. Tsao, Y.W. Chang
* SDS2	SDS2-2	OP104461	OP104538	OP071093	OP089113	OP116016						
* SPNG4	SPNG4-1	OP104526	OP104609	OP071155	OP089114	OP116086	Madang		Papua New Guinea		2012/11/15	B.K.K. Chan
<i>Acasta flexuosa</i>												
* SN12	SN12-1	OP104515	OP104595	OP071143	OP089131	OP116072		Keelung Islet	Taiwan	11.3	2011/6/17	J.H.Y. Yu
* SN56	SN56-1	OP104518	OP104599	OP071146	OP089132	OP116076	Daping	Yehliu	Taiwan	12-25	2011/8/23	B.K.K. Chan
<i>Acasta huangi</i>												
* SJJ10	SJJ10-1	OP104491	OP104571	OP071121	OP089168	OP116048	West Marodo	JeJu Island	South Korea	22	2016/8/9	M.C. Yu
SLQ22	SLQ22-3						Shuiguan	Liuqiu	Taiwan	12	2016/11/30	M.C. Yu
* SNE47	SNE47-4	KY581608	OP104602	KY581621	OP089169	OP116079	Longdong	New Taipei City	Taiwan	17	2011/7/27	J.H.Y. Yu
<i>Acasta lappa</i>												
* SJP52	SJP52-1	OP104498	OP104578	OP071126	OP089146	OP116055	Tsutomezaki	Kochi	Japan	13	2016/9/28	M.C. Yu
*	SJP52-2	OP104499	OP104579	OP071127	OP089147	OP116056						
* SJP55	SJP55-1	OP104500	OP104580	OP071128	OP089145	OP116057	Tsutomezaki	Kochi	Japan	13	2016/9/28	M.C. Yu
	SJP55-2											
	SJP55-CYP											
STH10	STH10-2						Koh Khangkhao	Koh Sichang	Thailand	5	2018/12/14	M.C. Yu
STH11	STH11-1						Koh Khangkhao	Koh Sichang	Thailand	5	2018/12/15	M.C. Yu
	STH11-2											
	STH11-3											
	STH11-4											
	STH11-5											
* STI15	STI15-1	OP104528	OP104611	OP071156	OP089156	OP116088		Guishan Island	Taiwan	25	2018/9/19	M.C. Yu
	STI15-2											
	STI15-3											

<i>Acasta radenta</i>												
* SLQ32	SLQ32-1	MN842070	MN842095	MN842024	MN842049	MN842118	Duoziping	Liuqiu	Taiwan	18	2016/12/1	M.C. Yu
*	SLQ32-2	OP104507	OP104587	OP071135	OP089175	OP116064						
*	SLQ32-3	OP104508	OP104588	OP071136	OP089176	OP116065						
	SLQ32-4											
SNE47	SNE47-1						Longdong	New Taipei City	Taiwan	17	2011/7/27	J.H.Y. Yu
<i>Acasta sandwichi</i>												
	Mg-1228						Daping	Yehliu	Taiwan	18	2011/6/17	J.H.Y. Yu
* SGI208	SGI208-1	MN842071	MN842096	MN842025	MN842050	MN842119	Gongguan	Green Island	Taiwan	15	2014/3/29	G.A. Kolbasov
*	SGI208-2	OP104476	OP104555	OP071107	OP089125	OP116033						
SLQ31	SLQ31-1						Shanban Bay	Liuqiu	Taiwan	20-35	2016/12/1	M.C. Yu
SLQ34	SLQ34-1						Duoziping	Liuqiu	Taiwan	18	2016/12/1	M.C. Yu
SLQ38	SLQ38-1						Lobster Cave	Liuqiu	Taiwan	20	2016/11/30	M.C. Yu
SN8	SN8-2						Daping	Yehliu	Taiwan	18	2011/6/17	J.H.Y. Yu
SN29	SN29-2						Daping	Yehliu	Taiwan	12-25	2011/8/23	B.K.K. Chan
SN77	SN77-1						Dong-au Fish Port	Yehliu	Taiwan	20	2016/8/4	M.C. Yu
	SN77-2											
<i>Acasta spinosa</i>												
* S7	S7-1	OP104458	OP104535	OP071090	OP089138	OP116013		Heping Island	Taiwan		2010/5/24	B.K.K. Chan
	S7-2											
SHK1	SHK1-1							Nai Chung	Hong Kong		2009/8/13	L.M. Tsang
SHK2	SHK2-1							Nai Chung	Hong Kong		2009/8/14	L.M. Tsang
SHK7	SHK7-1							Sharp Island	Hong Kong	3	2016/12/12	B.K.K. Chan
	SHK7-2											
SHK9	SHK9-1							Sharp Island	Hong Kong	3	2016/12/12	M.C. Yu

	SHK9-2																			
SHK10	SHK10-1							Sharp Island	Hong Kong	3	2016/12/12	M.C. Yu								
	SHK10-2																			
SHK12	SHK12-2							Sharp Island	Hong Kong	3	2016/12/12	B.K.K. Chan								
SHK14	SHK14-1							Sharp Island	Hong Kong	3	2016/12/12	B.K.K. Chan								
SHK23	SHK23-2							Shelter Island	Hong Kong	3	2016/12/13	M.C. Yu								
SHK25	SHK25-2							Bluff Island	Hong Kong	3	2016/12/13	M.C. Yu								
SJP33	SJP33-1						Kashiwa Island	Kochi	Japan	5	2016/9/27	M.C. Yu								
SJP35	SJP35-1						Kashiwa Island	Kochi	Japan	5	2016/9/27	B.K.K. Chan								
	SJP35-2																			
SJP36	SJP36-1						Kashiwa Island	Kochi	Japan	5	2016/9/27	M.C. Yu								
SJP37	SJP37-1						Kashiwa Island	Kochi	Japan	5	2016/9/27	M.C. Yu								
	SJP37-2																			
	SJP37-3																			
SJP51	SJP51-1						Issai	Kochi	Japan	13	2016/9/28	M.C. Yu								
SJP53	SJP53-1						Tatsukushi	Kochi	Japan	6	2016/9/29	M.C. Yu								
SMY2	SMY2-1							Port Dickson	Malaysia		2009/3/16	B.K.K. Chan								
SN75	SN75-1						Dong-au Fish Port	Yehliu	Taiwan	20	2016/8/4	M.C. Yu								
	SN75-2																			
	SN75-3																			
	SN75-4																			
	SN75-5																			
* SN81	SN81-3	MN842074	MN842099	MN842028	MN842053	MN842122	Dong-au Fish Port	Yehliu	Taiwan	20	2016/8/4	M.C. Yu								
SSI5	SSI5-1						Shanfu Fishing Port	Yehliu	Taiwan		2010/8/17	B.K.K. Chan								

STI1	STI1-1						Guishan Island	Taiwan	2010/10/25 B.K.K. Chan		
	STI1-3										
	STI1-12										
	STI1-14										
	STI1-15										
SVN7	SVN7-1						Mot Island	Nhatrang	Vietnam	5	2016/11/13 M.C. Yu
	SVN7-2										
<i>Acasta spongites</i>											
* SLQ42	SLQ42-1	OP104511	OP104591	OP071139	OP089126	OP116068	Beauty Cave	Liuqiu	Taiwan	24	2017/7/18 M.C. Yu
*	SLQ42-2	OP104512	OP104592	OP071140	OP089128	OP116069					
* STI18	STI18-1	MN842076	MN842101	MN842030	MN842055	MN842124		Guishan Island	Taiwan	25	2018/9/19 M.C. Yu
*	STI18-2	OP104529	OP104612	OP071157	OP089127	OP116089					
<i>Acasta sulcata</i>											
* SN48	SN48-3	KY581605	OP104597	KY581618	OP089152	OP116074	Daping	Yehliu	Taiwan	12-25	2011/8/23 B.K.K. Chan
*	SN48-9	OP104517	OP104598	OP071145	OP089153	OP116075					
*	SN48-11	OP104516	OP104596	OP071144	OP089154	OP116073					
<i>Acasta turrisformis</i>											
	Mg-1230						Gongguan	Green Island	Taiwan	15	2014/3/29 G.A. Kolbasov
	Mg-1231						Gongguan	Green Island	Taiwan	15	2014/3/29 G.A. Kolbasov
* S27	S27-1	OP104456	OP104533	OP071088	OP089144	OP116011	Gongguan	Green Island	Taiwan	2009/7/22	
* SGI119	SGI119-2	OP104464	OP104541	OP071096	OP089150	OP116019	General Rock	Green Island	Taiwan	15	2014/3/29 B.K.K. Chan
* SGI178	SGI178-1	OP104470	OP104547	OP071101	OP089151	OP116025	Gongguan	Green Island	Taiwan	15	2014/3/29 G.A. Kolbasov
	SGI178-2	MF796666		MF796672							
<i>Acasta undulaterga</i>											
SNE47	SNE47-3						Longdong	New Taipei City	Taiwan	17	2011/7/27 J.H.Y. Yu
*	SNE47-5	KY581609	OP104603	KY581622	OP089174	OP116080	Longdong	New Taipei City	Taiwan	17	2011/7/27 J.H.Y. Yu
<i>Acasta</i> sp. nov. 1											
* SGI26	SGI26-1	MN842066	MN842091	MN842020	MN842045	MN842114	Gongguan	Green Island	Taiwan	9	2011/5/16 J.H.Y. Yu
* SN80	SN80-3	OP104519	OP104600	OP071147	OP089155	OP116077	Dong-au Fish Port	Yehliu	Taiwan	20	2016/8/4 M.C. Yu

<i>Acasta</i> sp. nov. 2												
* SGI273	SGI273-1	OP104481	OP104561	OP071111	OP089170	OP116038	Gongguan	Green Island	Taiwan	10	2016/7/27	M.C. Yu
* SLQ16	SLQ16-1	OP104503	OP104583	OP071131	OP089171	OP116060	Shuiguan	Liuqiu	Taiwan	20-30	2016/11/30	M.C. Yu
* SLQ20	SLQ20-2	MN842073	MN842098	MN842027	MN842052	MN842121		Liuqiu	Taiwan	20-30	2016/11/30	M.C. Yu
*	SLQ20-3	OP104504	OP104584	OP071132	OP089172	OP116061						
<i>Acasta</i> sp. nov. 3												
* SNE23	SNE23-1	OP104455	OP104532	OP071148	OP089173	OP116010	Longdong	New Taipei City	Taiwan		2011/7/27	J.H.Y. Yu
<i>Archiacasta pustulata</i>												
* SNE9	SNE9-1	OP104521	OP104604	OP071150	OP089097	OP116081	Northeast coast	New Taipei City	Taiwan		2011/5/6	J.H.Y. Yu
* SJP41	SJP41-2	OP104495	OP104575	OP071123	OP089095	OP116052	Otsuki	Kochi	Japan		2016/9/27	M.C. Yu
* SJP48	SJP48-1	OP104496	OP104576	OP071124	OP089096	OP116053	Otsuki	Kochi	Japan		2016/9/27	B.K.K. Chan
<i>Bryozobia rossi</i>												
	Mg-1222						Ziping	Green Island	Taiwan	12	2011/11/15	J.H.Y. Yu
SGI104	SGI104-1						Ziping	Green Island	Taiwan	12	2011/11/15	J.H.Y. Yu
*	SGI104-2	OP104462	OP104539	OP071094	OP089141	OP116017						
* SGI106	SGI106-1	OP104463	OP104540	OP071095	OP089142	OP116018	Ziping	Green Island	Taiwan	12	2011/11/15	J.H.Y. Yu
	SGI106-2											
	SGI106-3											
* SJP5	SJP5-1	OP104497	OP104577	OP071125	OP089143	OP116054	Kochi	Nishidomari	Japan	5	2011/7/22	J.H.Y. Yu
SOI33	SOI33-1						Shuangshihyen	Orchid Island	Taiwan	8-12	2011/6/11	J.H.Y. Yu
<i>Euacasta dofleini</i>												
* SGI32	SGI32-1	OP104482	OP104562	OP071112	OP089120	OP116039	Gongguan	Green Island	Taiwan	9	2011/5/16	J.H.Y. Yu
SGI34	SGI34-2						Gongguan	Green Island	Taiwan	9	2011/5/16	J.H.Y. Yu
SGI63	SGI63-1						Sleeping Beauty Rock	Green Island	Taiwan	26.3	2011/6/5	J.H.Y. Yu
*	SGI63-3	OP104487	OP104567	OP071117	OP089121	OP116044						
* SGI168	SGI168-2	MN842083	MN842106	MN842036	MN842058	MN842127	Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	B.K.K. Chan
SGI169	SGI169-4						Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	B.K.K. Chan
SGI199	SGI199-7						Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov

SGI255	SGI255-1						Ziping	Green Island	Taiwan		2016/5/20	M.C. Yu
SGI262	SGI262-1						Gui Bay	Green Island	Taiwan	11.8	2016/5/21	M.C. Yu
SGI273	SGI273-1						Gongguan	Green Island	Taiwan	10	2016/7/27	M.C. Yu
SSU1	SSU1-1						Neipi Bay	Suao	Taiwan		2010/8/23	B.K.K. Chan
<i>Euacasta porata</i>												
* S14	S14-1	MN842085	MN842108	MN842038	MN842060	MN842129	General Rock	Green Island	Taiwan		2010/8/26	B.K.K. Chan
SKT2	SKT2-2						South Bay	Kenting	Taiwan		2010/11/5	B.K.K. Chan
*	SKT2-4	OP104501	OP104581	OP071129	OP089118	OP116058						
*	SKT2-6	OP104502	OP104582	OP071130	OP089119	OP116059						
SKT3	SKT3-2						South Bay	Kenting	Taiwan		2010/11/5	B.K.K. Chan
SVN1	SVN1-1						Mun Island	Nhatrang	Vietnam	7	2016/11/13	M.C. Yu
SVN14	SVN11-1						Mot Island	Nhatrang	Vietnam	5	2016/11/13	M.C. Yu
	SVN14-1											
SVN37	SVN37-1						Mieu Island	Nhatrang	Vietnam	3	2016/11/15	B.K.K. Chan
SVN38	SVN38-1						Mieu Island	Nhatrang	Vietnam	3	2016/11/15	M.C. Yu
SVN46	SVN46-1						Tam Island	Nhatrang	Vietnam	3	2016/11/16	M.C. Yu
SVN53	SVN53-1						Mun Island	Nhatrang	Vietnam	10	2016/11/17	M.C. Yu
<i>Euacsta zuiho</i>												
* SGI84	SGI84-1	OP104489	OP104569	OP071119	OP089139	OP116046	Dabaisha	Green Island	Taiwan	25	2011/11/14	J.H.Y. Yu
* SVN86	SVN86-1	OP104531	OP104614	OP071159	OP089140	OP116091		PhuQuoc	Vietnam	4	2017/11/29	M.C. Yu
<i>Neoacasta glans</i>												
* SGI150	SGI150-1	OP104466	OP104543	MN653641	OP089136	OP116021	Gongguan	Green Island	Taiwan	15	2014/3/29	B.K.K. Chan
* SSI2	SSI2-1	OP104527	OP104610	MN653645	OP089137	OP116087	Shanfu Fishing Port	Liuqiu	Taiwan		2010/8/17	B.K.K. Chan
<i>Neoacasta laevigata</i>												
* SGI46	CGI46-1	OP104484	OP104564	OP071114	OP089133	OP116041	Gongguan	Green Island	Taiwan	19	2011/6/6	J.H.Y. Yu
* SGI47	CGI47-1	OP104485	OP104565	OP071115	OP089134	OP116042	Gongguan	Green Island	Taiwan	19	2011/6/6	J.H.Y. Yu
* SGI54	CGI54-1	OP104486	OP104566	OP071116	OP089135	OP116043	Gongguan	Green Island	Taiwan	19	2011/6/6	J.H.Y. Yu
SOI2	SOI2-1						Shuangshihyen	Orchid Island	Taiwan	8-12	2011/6/11	J.H.Y. Yu
SOI3	SOI3-1						Shuangshihyen	Orchid Island	Taiwan	8-12	2011/6/11	J.H.Y. Yu

<i>Neocasta liui</i>												
* SJP32	SJP32-4	OP104493	OP104573	MN653643	OP089129	OP116050	Kastuma, Shikanoshima	Fukuoka	Japan	0-1	2013/11/5	B.K.K. Chan
*	SJP32-5	OP104494	OP104574	MN653644	OP089130	OP116051						
<i>Pectinoacasta pectinipes</i>												
* SGI33	SGI33-1	OP104483	OP104563	OP071113	OP089148	OP116040	Shihlang	Green Island	Taiwan	12	2011/11/15	J.H.Y. Yu
* SGI99	SGI99-1	OP104490	OP104570	OP071120	OP089149	OP116047	Steel Reef	Green Island	Taiwan	30	2011/11/15	J.H.Y. Yu
<i>Pectinoacasta sculpturata</i>												
S26	S26-1						Gongguan	Green Island	Taiwan		2009/7/22	B.K.K. Chan
S35	S35-1						Gongguan	Green Island	Taiwan		2009/7/22	B.K.K. Chan
* SGI131	SGI131-1	MN842089	MN842111	MN842042	MN842064	MN842132	Horseshoe Bridge	Green Island	Taiwan	15	2014.03.30	B.K.K. Chan
* SGI184	SGI184-1	OP104471	OP104548	OP071102	OP089161	OP116026	Gongguan	Green Island	Taiwan	15	2014.03.29	B.K.K. Chan
	SGI184-2											
SGI185	SGI185-1						Gongguan	Green Island	Taiwan	15	2014.03.29	B.K.K. Chan
* SGI191	SGI191-1	OP104473	OP104550	OP071104	OP089162	OP116028	Gongguan	Green Island	Taiwan	15	2014.03.29	B.K.K. Chan
SGI199	SGI199-1						Horseshoe Bridge	Green Island	Taiwan	15	2014.03.30	G.A. Kolbasov
* SGI202	SGI202-1	OP104475	OP104554	OP071106	OP089163	OP116032	Gongguan	Green Island	Taiwan	15	2014.03.29	B.K.K. Chan
SGI203	SGI203-1						Gongguan	Green Island	Taiwan	15	2014.03.29	G.A. Kolbasov
SGI258	SGI258-2						Dabaisha	Green Island	Taiwan	20	2016.05.20	M.C. Yu
SN69	SN69-1							Yehliu	Taiwan	20	2016/8/4	M.C. Yu
	SN69-2											
SN70	SN70-1							Yehliu	Taiwan	20	2016/8/4	M.C. Yu
* SNE46	SNE46-1	OP104520	OP104601	OP071149	OP089165	OP116078	Longdong Bay	New Taipei City	Taiwan	17	2011/7/27	J.H.Y. Yu
	SNE46-2											
	SNE46-3											
* SJP21	SJP21-1	OP104492	OP104572	OP071122	OP089164	OP116049	Nishidomari	Kochi	Japan	3-5	2011/7/23	J.H.Y. Yu
SJP34	SJP34-1						Kashiwa Island	Kochi	Japan	5	2016/9/27	B.K.K. Chan

* SBT11	SBT11-1	OP104459	OP104536	OP071091	OP089160	OP116014	Kavieng	New Ireland	Papua New Guinea	2012/11/15	B.K.K. Chan
<i>Pectinoacasta zevinae</i>											
* SB-PH80	SPH80-1	OP104522	OP104605	OP071151	OP089157	OP116082		Penghu	Taiwan	2014/9/-	M.Y. Huang
* SB-PH81	SPH81-1	OP104523	OP104606	OP071152	OP089158	OP116083		Penghu	Taiwan	2014/9/-	M.Y. Huang
*	SPH81-2	OP104524	OP104607	OP071153	OP089159	OP116084					
<i>Membranobalanus acutus</i>											
* SGI167	SGI167-1	OP104467	OP104544	OP071098	OP089109	OP116022	Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30 B.K.K. Chan
	SGI34						Gongguan	Green Island	Taiwan	9	2011/5/16 J.H.Y. Yu
* SLQ27	SLQ27-1	OP104505	OP104585	OP071133	OP089111	OP116062	Shanban Bay	Liuqiu	Taiwan	20-35	2016/12/1 M.C. Yu
<i>Membranobalanus brachialis</i>											
	SGI263						Zhongliao Fishing Harbor	Green Island	Taiwan	3	2016/5/19 M.C. Yu
*	SGI263-3	OP104478	OP104558	MN842040	OP089098	OP116036					
*	SGI263-4	OP104479	OP104559	OP071109	OP089099	OP116037					
*	SGI263-5	OP104480	OP104560	OP071110	OP089100	MN842130					
* STT1	STT1-4	OP104530	OP104613	OP071158	OP089101	OP116090	Xiaogang	Taitung	Taiwan	2011/7/5	H.N. Chen
<i>Membranobalanus cuneiformis</i>											
* SMY34	SMY34-1	OP104513	OP104593	OP071141	OP089103	OP116070	Terengganu	Pulau Geluk East	Malaysia	12	2017/9/23 M.C. Yu
*	SMY34-2	OP104514	OP104594	OP071142	OP089094	OP116071					
<i>Membranobalanus longirostrum</i>											
* SPHP2	SPHP2-1	OP104525	OP104608	OP071154	OP089102	OP116085	Twin Rock Beach Virac	Catanduanes	Philippin es	0-1	2011/5/22 B.K.K. Chan
<i>Membranobalanus orcutti</i>											
* SGI23	SGI23-2	OP104477	OP104556	OP071108	OP089106	OP116034	Shihlang	Green Island	Taiwan	12	2011/5/15 J.H.Y. Yu
	SGI29						Shihlang	Green Island	Taiwan	12	2011/5/15 J.H.Y. Yu
* SGI65	SGI65-1	OP104488	OP104568	OP071118	OP089107	OP116045	Gongguan	Green Island	Taiwan	19	2011/6/6 J.H.Y. Yu
* SGI130	SGI130-1	OP104465	OP104542	OP071097	OP089108	OP116020	Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30 B.K.K. Chan

* SGI168	SGI168-5	OP104468 OP104545 OP071099 OP089110 OP116023	Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	B.K.K Chan
SGI182	SGI182-1		General Rock	Green Island	Taiwan	15	2014/3/28	G.A. Kolbasov
SGI193	SGI193-6		Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
SGI193	SGI193-7		Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
SGI196	SGI196-3		Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
SGI196	SGI196-4		Horseshoe Bridge	Green Island	Taiwan	15	2014/3/30	G.A. Kolbasov
SGI212	SGI212-3		General Rock	Green Island	Taiwan		2009/7/22	B.K.K Chan
SGI255	SGI255-4		Ziping	Green Island	Taiwan		2016/5/20	M.C. Yu
SGI268	SGI268-1		Dabaisha	Green Island	Taiwan	12	2016/7/27	M.C. Yu
	SGI268-2							
SGI270	SGI270-1		Dabaisha	Green Island	Taiwan	12	2016/7/27	M.C. Yu
	SGI270-2							
SLQ29	SLQ29-1		Shanban Bay	Liuqiu	Taiwan	20-35	2016/12/1	M.C. Yu
SKMJ3	SKMJ3-1			Kumejima	Japan		2009/11/-	B.K.K Chan
SKMJ7	SB-KMJ7-2			Kumejima	Japan		2009/11/-	B.K.K Chan
	SB-KMJ7-3							
SKMJ8	SB-KMJ8-1			Kumejima	Japan		2009/11/-	B.K.K Chan
SKMJ13	SB-KMJ13-1			Kumejima	Japan		2009/11/-	B.K.K Chan
	SB-KMJ13-2							
<i>Pyrgospongia stellula</i>								
SHK59	SHK59-1		Sunshine Island	Sunshine Island	Hong Kong	3	2018/11/14	M.C. Yu
SJP69	SJP69-1		Ginama Fish Harbor	Okinawa	Japan	18	2018/7/5	M.C. Yu
SNE57	SNE57-1			Fulong	Taiwan	28	2018/9/20	M.C. Yu
* SLQ37	SLQ37-3	OP104509 OP104589 OP071137 OP089104 OP116066	Duoziping	Liuqiu	Taiwan	18	2016/12/1	M.C. Yu
*	SLQ37-4	OP104510 OP104590 OP071138 OP089105 OP116067						
STH68	STH68-1		Koh Kye	Chumphon	Thailand	3	2019/7/7	M.C. Yu

Table S10. Species and ages of fossils used as calibrations for divergence time estimations. Calibrated nodes are indicated and numbered after Pérez-Losada et al. (2014).

Species	Reference	Geologic age (Mya)	Node
<i>Tetracitella</i> sp. cf. <i>purpurascens</i>	Buckeridge (1983)	Neogene–Lower Miocene (Aquitania) (20.4–23.0)	C11
<i>Palaeobalanus lindsayi</i>	Buckeridge (1983)	Paleogene–Middle Eocene (38.0–47.8)	C12
<i>Austrobalanus antarcticus</i>	Buckeridge and Newman (2010) and Buckeridge (1983)	Neogene–Middle Eocene (38.0–47.8)	C14