



Biodiversity spongia in the marine waters from Hon Me (Thanh Hoa) to Hai Van - Son Tra (Thua Thien Hue)

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ABSTRACT

The study of Sponge biodiversity in the waters from Hon Me (Thanh Hoa) to Hai Van - Son Tra (Thua Thien Hue) was conducted in 2017, 2018, and 2022 in 5 regions with 43 sampling points. Seventy-four Sponge species belonging to 44 genera, 31 families, 15 orders were identified. Con Co island sampling point offshore Quang Tri is the place where the Sponge species are most diversified and abundant (54 out of 74 species), followed by Hai Van - Son Tra (26 species), rock reefs near Nhat Le, Quang Binh, with 25 species, Hon Me (Thanh Hoa) with 24 species and the lowest species range in the reef area near Vinh Moc, Quang Tri, with 22 species. The Sponges occur at a depth of 3–10 m, with maximum concentration at 5 m depth. The distribution varies based on the nature of the substrate: coral-reef bedrock displays the highest number of species (55); on the original reef-rock substrate 35 species have been counted; on sandy bottom with coral debris, the number of detected species decreases to 23 species. On the dead-coral substrate, there were 20 species detected; on the mixed and rocky bottom the sponge assemblage is represented by only 12 species, and on mud, sandy mud and fine sand, the species range from from 0 to 4. The biomass varies from 0.9 kg/m² to 2.5 kg/m², the highest being on Con Co island, with an average of 2.5 kg/m² and the lowest in Vinh Moc, Quang Tri Province with 0.9 kg/m². Sponges proved to be the source of several medicinal components. It is possible to forecast three areas that are likely to become the potential source of medicinal products from sponges in our country: the Con Co medicinal yard, the Hai Van - Son Cha medicinal yard, and the third important marine medicinal yard in the Hon Me archipelago, Thanh Hoa.

Keywords: Biodiversity, Sponge distribution, biomass, medicinal yard.

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INTRODUCTION

The Sponge is a group of organisms with a primitive multicellular structure. The body structure is quite simple; they can live in freshwater, but most species live in the sea [1]. It is estimated that there are about 9,000 species worldwide [2]. Sponges nourish by filtering seawater; they can purify seawater through their living activities [1]. During the nutritional process, Sponges receive many toxic substances secreted by animals and plants they live on (e.g., corals primarily). Through complex biological processes, these substances are absorbed and used as “chemical depots” for various purposes (e.g., to fight predators and parasites, etc.), for their reproduction, and to inhibit the establishment of other organisms competing for food and space.

Sponges are currently subjected to revived interest, targeted for searching for natural sources of medicinal products. Organic compounds against cancer and some other diseases [3, 4] were discovered, and some countries, such as New Zealand, have successfully cultivated some valuable sponge species for commercial purposes, further studies, and for extracting biologically active substances from the organisms [5].

In Vietnam, the research on Sponge biodiversity is still very limited: a few specific studies relate to sponge taxonomy and ecology in Nha Trang [6], Ha Long bay [7, 8], and the limestone archipelago [9]. Studies revealed that some substances with potential anti-cancer properties might be extracted from sponges that are abundant in the Vietnam Sea [10, 11].

In order to contribute to a complete understanding of the biodiversity of Sponges in Vietnam and for the identification of potential sites for the supply of substances with anti-cancer biological properties, the following study is presented, documenting the distribution and richness of Sponge assemblages in the coastal tract from Hon Me (Thanh Hoa) to Hai Van - Son Cha (Thua Thien Hue province).

In order to contribute to a complete understanding of the biodiversity of Sponges for the search for substances containing anti-

cancer biological activities, the following details will be presented on the biodiversity of Sponges species distributed in the sea from Thanh Hoa to Hai Van - Son Tra.

RESEARCH METHODS

Time and place of sampling

Sponge samples were collected at 43 stations clustered in 5 main areas (Figure 1), in December 2017 and August 2018, with an additional collection survey on June 2022.

Ten stations were located in Hon Me island (Thanh Hoa); 9 stations belonged to the reef tract of Nhat Le, Quang Binh. 5 stations belonged to the Vinh Moc promontory (Quang Tri) and further 14 stations were located in Con Co island (Quang Tri) offshore Vinh Moc. Finally, five stations were selected in the Hai Van - Son Cha tract, further South, in Thua Thien Hue province (Figure 1).

Methods and materials for collecting samples

Sponge specimens were collected from the intertidal zone, perpendicular to the shoreline, and from the high-tide area through the mid-tidal zone to the low-tide area. Both qualitative and quantitative samples were collected in standard plots of 40 × 40 cm, according to the method of Gunjanova, 1972 and Do Cong Thung (2014) [12, 13]. In the subtidal zone, samples were collected according to the method of English et al., (1994) [14] and Do Cong Thung (2014) [12] applied to hard bottom and coral reefs. On coral reefs and adjacent areas, in addition to observing and collecting samples directly on the reef surface (uses to SCUBA diving equipment), quantitative samples were also collected from the bottom using a specialized nylon-mesh frame of the size of 1 m × 1 m. The collected samples were weighed and measured in the field after collection, then fixed in the cold chamber and transferred to the laboratory for analysis.



Figure 1. Map of sampling locations

Sample analysis

Morphological and structural methods were used to identify Sponges, according to Boury et al., (1997) [11] and Hooper (2000) [2]. The taxonomy is based on Hooper & Van Soest (2002) [2] and revised according to Morrow &

Cárdenas (2015), after validation of the species names using the World Register of Marine Species (WoRMS). The classification criteria include (i) morphology (shape, color, surface structure, and distribution of the openings of the aquiferous system; (ii) skeleton structure and associated features (spicules and fibers);

(iii) ecology, such as depth, habitat, benthic matter, salinity, symbiotic species, etc.

RESEARCH RESULTS AND DISCUSSION

Sponge assemblage composition from Hon Me (Thanh Hoa) to Hai Van - Son Cha (Thua Thien Hue)

The results of our analysis revealed the presence of a total of 74 Sponge species belonging to 44 genera, 31 families, and 15 orders distributed in the Central Vietnam seas from Hon Me (Thanh Hoa) to Hai Van-Son Cha (Thua Thien Hue) (Table 1, and Appendix). By comparing our data with those from previous studies carried out in nearby areas of Vietnam (the Nha Trang bay assemblages revealed 100 species [6], the Ha Long bay, 46 species [16], Con Co island, 112 species [15]), we could confirm that the area investigated is also displaying one of the highest Sponge diversities in the region.

The degree of diversity for each taxonomic group is as follows.

By genus level: 44 genera have been identified, with an average of 1.68 species per genus. *Haliclona* revealed the highest number of species (8); the three genera *Agelas*, *Callyspongia*, and *Rhabdastrella* have four species per genus each; the genus *Dysidea* has three species per genus. The remaining thirty-nine genera have only 1–2 species per genus, accounting for 88.6% of the total population (Table 1). This species distribution proves that the structure of the Sponge communities in the area is not sustainable, being species underrepresented in the majority of the genera. For whatever reason, the disappearance of some Sponge species, from the assemblages of the area might cause the disappearance of entire genera with a remarkable biodiversity loss and biota impoverishment.

By family level: There are, on average, 2.4 species per family. The highest number of species belongs to the Chalinidae family (11 species); the second better-represented family is the Tetillidae with five species, followed by eight families having more than

2.4 species each (*Agelasidae*, 4 species; *Axinellidae*, 4 species; *Callyspongiidae*, 4 species; *Petrosiidae*, 4 species; *Ancorinidae*, 4 species; *Dictyonellidae*, 3 species; *Dysideidae*, 3 species, and *Spongiidae*, 3 species), The remaining 21 families, accounting for 67.7% of the families of the whole population, have many species ranging between 1 and 2 species per family, a value lower than the overall average index of 2.4 (Table 1).

By order level: Among the 15 represented orders, *Haplosclerida* has the highest number of species per order (22 species), followed by three orders with species numbers higher than the average index (4.93 species per order). These are the *Dictyoceratida* (10 species), *Poecilosclerida* (9 species), and *Tetractinellida* (10 species). The remaining eleven orders, accounting for 73.3% of the total number of represented orders, have a species number lower than the average index value of 4.93 (Table 1).

The results of the above analysis show that in the species composition structure, the Sponge assemblages from Hon Me (Thanh Hoa) to Hai Van-Son Cha (Thua Thien Hue), the predominance is of specimens belonging to the *Haplosclerida* order, with five families and 22 species.

The analysis results also reveal that 13 species have the widest distribution in 80–100% of the sampling stations. These include *Axinella dissimilis*, *Biemna megalosigma*, *Acanthella cavernosa*, *Dysidea fragilis*, *Callyspongia (Cladochalina) subarmigera*, *Haliclona (Gellius) cymaeformis*, *Haliclona varia*, *Clathria (Thalysias) reinwardti*, *Ruladahaevi (Mycal) australiensis*, *Tethya aurantium*.

There are six species recorded in 60–80% of the sampled sites, including *Callyspongia (Cladochalina) subarmigera*, *Xestospongia testudinaria*, *Clathria (Thalysias) reinwardti*, *Tethya aurantium*, *Gelliodes fibulata*, *Mycal (Mycal) laevis*.

The remaining 55 species are only distributed in certain areas and absent from others, with the frequency of occurrence lower than 60% of the sampled locations.

Table 1. Structure of Sponge community in the seas from Hon Me (Thanh Hoa) to Hai Van - Son Tra (Thua Thien Hue)

| Orders | | Families | | Genera | |
|-----------------------|-----------------------|--------------------------|------------------------|-----------------------|------------------------|
| Scientific names | Species number | Scientific names | Species number | Scientific names | Species number |
| 1. Agelasida | 4 | 1. Agelasidae | 4 | 1. Agelas | 4 |
| 2. Axinellida | 4 | 2. Axinellidae | 4 | 2. Axinella | 2 |
| | | | | 3. Dragmacidon | 1 |
| | | | | 4. Ptilocaulis | 1 |
| 3. Biemnida | 4 | 3. Biemnidae | 1 | 5. Biemna | 1 |
| | | 4. Dictyonellidae | 3 | 6. Acanthella | 3 |
| 4. Clionaida | 1 | 5. Spirastrellidae | 1 | 7. Spirastrella | 1 |
| 5. Chondrillida | 2 | 6. Chondrillidae | 2 | 8. Chondrilla | 2 |
| 6. Dictyoceratida | 10 | 7. Dysideidae | 3 | 9. Dysidea | 3 |
| | | 8. Spongiidae | 3 | 10. Spongia | 1 |
| | | 9. Irciniidae | 2 | 11. Hippospongia | 2 |
| | | 10. Thorectidae | 2 | 12. Ircinia | 2 |
| | | | | 13. Smenospongia | 1 |
| 7. Haplosclerida | 22 | 11. Calcifibrospongiidae | 1 | 15. Calcifibrospongia | 1 |
| | | 12. Callyspongiidae | 4 | 16. Callyspongia | 4 |
| | | 13. Chalinidae | 11 | 17. Haliclona | 8 |
| | | | | 18. Gellioides | 1 |
| | | | | 19. Amphimedon | 1 |
| | | | | 20. Niphates | 1 |
| | | 14. Petrosiidae | 4 | 21. Xestospongia | 2 |
| 15. Phloeodictyidae | 2 | 22. Neopetrosia | 2 | | |
| | | 23. Oceanapia | 2 | | |
| 8. Poecilosclerida | 9 | 16. Acarnidae | 1 | 24. Acarnus | 1 |
| | | 17. Crambeidae) | 1 | 25. Monanchora | 1 |
| | | 18. Desmacididae | 2 | 26. Desmacidon | 1 |
| | | 19. Microcionidae | 2 | 27. Desmapsamma | 1 |
| | | 20. Mycalidae | 2 | 28. Clathria | 2 |
| | | 21. Myxillidae | 1 | 29. Mycale | 2 |
| 9. Scopalinida | 1 | 22. Scopalinidae | 1 | 30. Myxilla | 1 |
| 10. Suberitida | 2 | 23. Halichondriidae | 1 | 31. Stylissa | 1 |
| | | 24. Suberitidae | 1 | 32. Hymeniacion | 1 |
| 11. Tetractinellida | 10 | 25. Ancorinidae | 4 | 33. Terpios | 1 |
| | | 26. Tetillidae | 5 | 34. Rhabdastrella | 4 |
| | | | | 35. Cinachyrella | 2 |
| | | | | 36. Craniella | 1 |
| | | | | 37. Paratetilla | 1 |
| 27. Geodiidae | 1 | 38. Tetilla | 1 | | |
| 12. Verongiida | 1 | 28. Pseudoceratinidae | 1 | 39. Geodia | 1 |
| 13. Suberitida | 2 | 29. Halichondriidae | 2 | 40. Pseudoceratina | 1 |
| | | | | 41. Ciocalypa | 1 |
| 14. Homosclerophorida | 1 | 30. Plakinidae | 1 | 42. Halichondria | 1 |
| 15. Tethyida | 1 | 31. Tethyidae | 1 | 43. Plakortis | 1 |
| Average | 4.93 species/order | | 2.38 species/family | 44. Tethya | 1 |
| | | | | | 1.68 species/geunus |

Distribution

Geographical distribution

Con Co island is where Sponge is most diversified (54 out of 74 identified species), followed by Hai Van - Son Cha, with 26 out of 74 identified species, the rocky reef tract of Nhat Le, Quang Binh (25 out of 74 species), and Hon Me (Thanh Hoa) with 24 species. The reefal area of Vinh Moc (Quang Tri) is the least diversified community, with 22 out of 74 species (Fig. 2).

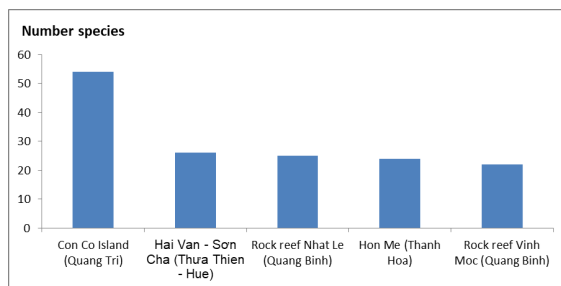


Figure 2. Number species of Sponge in the sampling locations

Distribution according to the type of bottom substrate

The bottom characteristics and typical benthic sponge habitat in the selected five study areas (Hon Me, reef tract in Quang Binh and Quang Tri, Con Co Island, and Hai Van - Son Cha) include: i) muddy substrate, ii) fine sand, iii) coral debris mixed with sand, iv) dead coral-reef, v) living coral-reef, vi) bedrock reef, vii) sand with sparse patch reefs, viii) muddy sand, ix) sand with sparse rock.

The survey showed no species distributed on muddy substrates and only three on the featureless sandy bottom. On the coral-reef rigid substrate, sponge species were represented with the highest (55 species). The following preferred habitat was the hard bedrock of whatever nature, 35 species out of the 74. On the mixed substrate of sand and coral reefs, 23 species were detected, and 20 on the dead coral-reef substrate. Only 12 species were represented in the sand and rocky habitats, while the least preferred

substrates by sponge assemblages were the mobile, muddy sand, sandy mud, and fine sand, with 0 to 4 species (Figure 3).

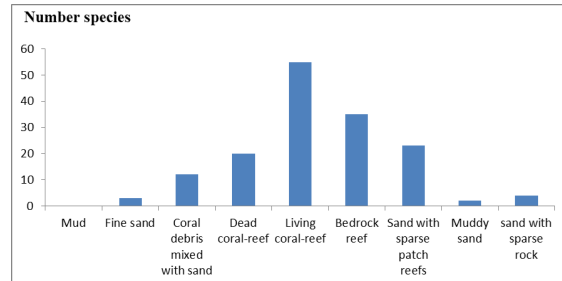


Figure 3. Distribution according to the type of bottom substrate

The depth distribution of Sponges

The five studied locations range in depth from 1 to 15 meters. In general, sponges are present with different abundance in all depth ranges. Most species occurred between 3 and 10 meters, with the highest diversity of 48.5% of the total number at approximately 5 meters. Below a ten-meter depth, the number of species decreases.

Quantitative biology and prospect of medicinal sponge-derived biologically active compounds in the study area

The study of the 139 samples collected from the 43 stations in 5 key areas of the Central Vietnam seas revealed the potential locations and abundances of sources of medicinal compounds to cater to the pharmaceutical industry.

Sponge communities are preferably concentrated in areas around the island rather than coastal habitats. The average organism biomass in these settings is relatively high, varying from 0.9 kg/m² to 2.5 kg/m² (Table 2). The highest biomass values are on Con Co island, with an average of 2.5 kg/m² kg/m², followed by Hai Van - Son Tra, in Thua Thien Hue Province with 1.9 kg/m², Hon Me archipelago (1.8 kg/m²), and the reef tract in Quang Binh Province (1.3 kg/m²). The lowest biomass values are recorded in the coastal reef

tract of Vinh Moc in Quang Tri Province, with only 0.9 kg/m².

Based on the species' biological values, abundance, and biomass, it is possible to prospect three areas that are likely to become medicinal-compound providers in our country. The largest Sponge medicinal field encircles Con Co island, at depths of 3–10 m.

The second most promising context is the Hai Van - Son Tra medicinal yard; there, sponge communities are distributed in pocket beaches and embayments of the Hai Van cape and then to the west and southwest of Son Cha island. The third potential marine medicinal field belongs to the Hon Me archipelago, Thanh Hoa.

Table 2. Biomass of Sponges in sampling locations from Hon Me (Thanh Hoa) to Hai Van - Son Cha (Thua Thien Hue)

| No. | Key Areas | Number of sampling stations | Number of collected samples | Average biomass (kg/m ²) |
|--------|----------------------------------|-----------------------------|-----------------------------|--------------------------------------|
| 1 | Hon Me archipelago (Thanh Hoa) | 10 | 30 | 1,8 |
| 2 | Nhat Le reef tract (Quang Binh) | 9 | 27 | 1,3 |
| 3 | Vinh Moc reef tract (Quang Tri) | 5 | 15 | 0,9 |
| 4 | Con Co island (Quang Tri) | 14 | 52 | 2,5 |
| 5 | Hai Van-Son Tra (Thua Thien Hue) | 5 | 15 | 1,9 |
| Totals | | 43 | 139 | |

CONCLUSION

1. Species composition structure includes a total of 74 Sponge species belonging to 44 genera, 31 families, and 15 orders, unevenly distributed in the seas from Hon Me (Thanh Hoa) to Hai Van - Son Cha (Thua Thien Hue). The highest number of species per taxonomic group are recorded in the genus *Haliclona* (8 species), the family *Chalinidae* (11 species), and the order *Haplosclerida* (22 species). From 74 Sponge species that have been identified, there are 13 species with a wide distribution, present in 80–100% of the sampling sites, including *Axinella dissimilis*, *Biemna megalosigma*, *Acanthella cavernosa*, *Dysidea fragilis*, *Callyspongia (Cladochalina) subarmigera*, *Haliclona (Gellius) cymaeformis*, *Haliclona varia*, *Clathria (Thalysias) reinwardti*, *Mycale (Mycale (Mycalellarhabda) laevis*. Six species are recorded in 60–80% of the studied sites, and the remaining 55 species are usually locally distributed in less than 60% of the studied sites.

2. The Con Co island is the place where Sponge communities have the broadest and most diversified distribution (54 out of 74 species), followed by Hai Van - Son Cha (26 species), the rocky reef substrate of Nhat

Le, Quang Binh, with 25 out of 74 species, Hon Me, Thanh Hoa (24 species and the lowest numbers in the reef tract of Vinh Moc, Quang Tri, with 22 species.

3. Sponge communities are distributed mainly at 3 m to 10 m depth, with the highest concentration at 5 m depth. Hard rocky bottoms characterize preferred sponge habitats, either coral reefs with the highest number of species (55) or bedrock of the original reef rock (35 species). Mobile or mixed bottoms support less diverse communities: only 23 species were recorded on the sand with sparse coral-reef substrates, 20 dead coral species, 12 species on the sand and rocky bottom, and 0–4 species on muddy substrates (muddy sand and fine-grained).

4. The biomass varies from 0.9–2.5 kg/m², the highest recorded on Con Co island, with an average of 2.5 kg/m², followed by Hai Van-Son Cha, Thua Thien-Hue province (1.9 kg/m²), Hon Me archipelago (1.8 kg/m²), the reef tract in Quang Binh Province (1.3 kg/m²) and the lowest value in Vinh Moc, Quang Tri province (0.9 kg/m²).

It is possible to prospect three areas potentially becoming fields for medicinal compound supply from sponges in Vietnam: the Sponge Con Co medicinal yard, the Hai Van - Son Cha medicinal yard, the third marine

medicinal yard belonging to the Hon Me archipelago, Thanh Hoa.

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APPENDIX

Species composition and distribution of Sponge in the sea from Hon Me (Thanh Hoa) to Hai Van - Son Cha (Thua Thien Hue)

| No. | Scientific names | Distribution location | | | | |
|-----|---|-----------------------|---------------------------------|---------------------------------|---------------------------|------------------------------------|
| | | Hon Me (Thanh Hóa) | Nhat Le reef tract (Quang Binh) | Vinh Moc reef tract (Quang Tri) | Con Co island (Quang Tri) | Hai Van - Son Tra (Thua Thien Hue) |
| | Class Demospongiae | | | | | |
| | Order Agelasida | | | | | |
| | Family Agelasidae (1) | | | | | |
| | Genus Agelas | | | | | |
| 1 | <i>Agelas ceylonica</i> (Dendy, 1905) | | | | + | |
| 2 | <i>Agelas oroides</i> (Schmidt, 1864) | + | | | | |
| 3 | <i>Agelas axifera</i> Hentschel, 1911 | + | + | + | | |
| 4 | <i>Agelas cervicornis</i> (Schmidt, 1870) | | | | | + |
| | Axinellida | | | | | |
| | Axinellidae | | | | | |
| | Axinella | | | | | |
| 5 | <i>Axinella polypoides</i> Schmidt, 1862 | | | | + | |
| 6 | <i>Axinella dissimilis</i> (Bowerbank, 1866) | + | + | + | | + |
| | Dragmacidon | | | | | |
| 7 | <i>Dragmacidon reticulatum</i> (Ridley & Dendy, 1886) | | | | + | |
| | Ptilocaulis | | | | | |
| 8 | <i>Ptilocaulis walpersii</i> (Duchassaing & Michelotti, 1864) | | | | + | |
| | Biemnida | | | | | |
| | Biemnidae | | | | | |
| | Biemna | | | | | |
| 9 | <i>Biemna megalosigma</i> Hentschel, 1912 | + | + | + | + | + |
| | Dictyonellidae | | | | | |
| | Acanthella | | | | | |
| 10 | <i>Acanthella cavernosa</i> Dendy, 1922 | + | | + | + | + |
| 11 | <i>Acanthella klethra</i> Pulitzer-Finali, 1982 | | | | + | + |
| 12 | <i>Acanthella ramosa</i> Kumar, 1925 | | | | | + |
| | Clionaida | | | | | |
| | Spirastrellidae | | | | | |
| | Spirastrella | | | | | |
| 13 | <i>Spirastrella cunctatrix</i> Schmidt, 1868 | | | | + | |
| | Chondrillida | | | | | |
| | Chondrillidae | | | | | |
| | Chondrilla | | | | | |
| 14 | <i>Chondrilla australiensis</i> Carter, 1873 | | | | + | |
| 15 | <i>Chondrilla mixta</i> Schulze, 1877 | | | | + | |
| | Dictyoceratida | | | | | |
| | Dysideidae | | | | | |

| No. | Scientific names | Distribution location | | | | |
|-----|--|-----------------------|---------------------------------|---------------------------------|---------------------------|------------------------------------|
| | | Hon Me (Thanh Húa) | Nhat Le reef tract (Quang Binh) | Vinh Moc reef tract (Quang Tri) | Con Co island (Quang Tri) | Hai Van - Son Tra (Thua Thien Hue) |
| | Dysidea | | | | | |
| 16 | <i>Dysidea avara</i> (Schmidt, 1862) | | | | + | |
| 17 | <i>Dysidea fragilis</i> (Montagu, 1814) | + | + | + | + | + |
| 18 | <i>Dysidea cinerea</i> Keller, 1889 | | | | + | + |
| | Spongiidae | | | | | |
| | Spongia | | | | | |
| 19 | <i>Spongia (Spongia) ceylonensis</i> Dendy, 1905 | | | | + | |
| | Hippospongia | | | | | |
| 20 | <i>Hippospongia fistulosa</i> Lendenfeld, 1889 | | + | + | | + |
| 21 | <i>Hippospongia gossypina</i> (Duchassaing & Michelotti, 1864) | | | | | + |
| | Irciniidae | | | | | |
| | Ircinia | | | | | |
| 22 | <i>Ircinia echinata</i> (Keller, 1889) | | + | + | + | |
| 23 | <i>Ircinia ramosa</i> (Keller, 1889) | | | | + | |
| | Thorectidae | | | | | |
| | Smenospongia | | | | | |
| 24 | <i>Smenospongia cerebriformis</i> (Duchassaing & Michelotti, 1864) | | | + | + | |
| | Hyrtios | | | | | |
| 25 | <i>Hyrtios erectus</i> (Keller, 1889) | | | | + | |
| | Haplosclerida | | | | | |
| | Calcifibrospongiidae | | | | | |
| | Calcifibrospongia | | | | | |
| 26 | <i>Calcifibrospongia actinostromarioides</i> Hartman, 1979 | | | | + | |
| | Callyspongiidae | | | | | |
| | Callyspongia | | | | | |
| 27 | <i>Callyspongia (Cladochalina) diffusa</i> (Ridley, 1884) | | | | + | |
| 28 | <i>Callyspongia (Cladochalina) subarmigera</i> (Ridley, 1884) | + | + | | + | + |
| 29 | <i>Callyspongia (Callyspongia) barodensis</i> Burton, 1959 | | | | | + |
| 30 | <i>Callyspongia (Callyspongia) eschrichtii</i> Duchassaing & Michelotti, 1864 | | | | | + |
| | Chalinidae | | | | | |
| | Haliclona | | | | | |
| 31 | <i>Haliclona (Gellius) cymaiformis</i> (Esper, 1794) | + | + | + | + | + |
| 32 | <i>Haliclona (Gellius) fibulata</i> (Schmidt, 1862) | | | | + | + |
| 33 | <i>Haliclona (Halichoelona) vansoesti</i> de Weerdt, de Kluijver & Gomez, 1999 | | | | + | |
| 34 | <i>Haliclona (Reniera) tubifera</i> (George & Wilson, 1919) | | | | + | + |
| 35 | <i>Haliclona baeri</i> (Wilson, 1925) | + | + | | + | |
| 36 | <i>Haliclona varia</i> (Bowerbank, 1875) | + | + | | + | + |
| 37 | <i>Haliclona (Soestella) xena</i> De Weerdt, 1986 | + | + | + | | |
| 38 | <i>Haliclona (Haliclona) oculata</i> (Linnaeus, 1759) | | | | | + |
| | Gellioides | | | | | |
| 39 | <i>Gelliodes fibulata</i> (Carter, 1881) | + | + | | | + |
| | Amphimedon | | | | | |

| No. | Scientific names | Distribution location | | | | |
|-----|--|-----------------------|---------------------------------|---------------------------------|---------------------------|------------------------------------|
| | | Hon Me (Thanh Hóa) | Nhat Le reef tract (Quang Binh) | Vinh Moc reef tract (Quang Tri) | Con Co island (Quang Tri) | Hai Van - Son Tra (Thua Thien Hue) |
| 40 | <i>Amphimedon trindanea</i> (Ristau, 1978) | | | | + | |
| | Niphates | | | | | |
| 41 | <i>Niphates erecta</i> Duchassaing & Michelotti, 1864 | | | | + | |
| | Petrosiidae | | | | | |
| | Xestospongia | | | | | |
| 42 | <i>Xestospongia testudinaria</i> (Lamarck, 1815) | + | + | + | | |
| 43 | <i>Xestospongia muta</i> (Schmidt, 1870) | | + | + | | |
| | Neopetrosia | | | | | |
| 44 | <i>Neopetrosia carbonaria</i> (Lamarck, 1814) | | | | + | |
| 45 | <i>Neopetrosia exigua</i> (Kirkpatrick, 1900) | + | + | + | | |
| | Phloeodictyidae | | | | | |
| | Oceanapia | | | | | |
| 46 | <i>Oceanapia amboinensis</i> Topsent, 1897 | | | | + | |
| 47 | <i>Oceanapia ramsayi</i> (Lendenfeld, 1888) | | | | + | |
| | Poecilosclerida | | | | | |
| | Acaridae | | | | | |
| | Acarus | | | | | |
| 48 | <i>Acarus innominatus</i> Gray, 1867 | | | | + | |
| | Crambeidae | | | | | |
| | Monanchora | | | | | |
| 49 | <i>Monanchora unguiculata</i> (Dendy, 1922) | | | | + | |
| | Desmacididae | | | | | |
| | Desmacidon | | | | | |
| 50 | <i>Desmacidon fruticosum</i> (Montagu, 1814) | + | + | + | | |
| | Desmapsamma | | | | | |
| 51 | <i>Desmapsamma anchorata</i> (Carter, 1882) | | | | + | |
| | Microcionidae | | | | | |
| | Clathria | | | | | |
| 52 | <i>Clathria (Thalysias) reinwardti</i> Vosmaer, 1880) | + | + | + | + | + |
| 53 | <i>Clathria (Thalysias) basiarenacea</i> (Boury-Esnault, 1973) | | | | | + |
| | Mycalidae | | | | | |
| | Mycale | | | | | |
| 54 | <i>Mycale (Aegogropila) contarenii</i> (Lieberkühn, 1859) | | | | + | |
| 55 | <i>Mycale (Mycale) laevis</i> (Carter, 1882) | + | + | | + | + |
| | Myxillidae | | | | | |
| | Myxilla | | | | | |
| 56 | <i>Myxilla (Burtonanchora) pistillaris</i> Topsent, 1916 | | | | + | |
| | Scopalinida | | | | | |
| | Scopalinidae | | | | | |
| | Stylissa | | | | | |
| 57 | <i>Stylissa carteri</i> (Dendy, 1889) | | | | + | |
| | Suberitida | | | | | |
| | Halichondriidae | | | | | |
| | Hymeniacion | | | | | |
| 58 | <i>Hymeniacion perlevis</i> (Montagu, 1818) | | | | + | |
| | Suberitidae | | | | | |
| | Terpios | | | | | |
| 59 | <i>Terpios cruciata</i> (Dendy, 1905) | | | | + | |

| No. | Scientific names | Distribution location | | | | |
|-----|---|-----------------------|---------------------------------|---------------------------------|---------------------------|------------------------------------|
| | | Hon Me (Thanh Hóa) | Nhat Le reef tract (Quang Binh) | Vinh Moc reef tract (Quang Tri) | Con Co island (Quang Tri) | Hai Van - Son Tra (Thua Thien Hue) |
| | Tetractinellida | | | | | |
| | Ancorinidae | | | | | |
| | Rhabdastrella | | | | | |
| 60 | <i>Rhabdastrella distincta</i> (Thiele, 1900) | + | + | + | + | |
| 61 | <i>Rhabdastrella globostellata</i> (Carter, 1883) | | | | + | |
| 62 | <i>Rhabdastrella reticulata</i> (Carter, 1883) | + | + | + | + | + |
| 63 | <i>Rhabdastrella providentiae</i> (Dendy, 1916) | | | | | + |
| | Tetillidae | | | | | |
| | Cinachyrella | | | | | |
| 64 | <i>Cinachyrella anomala</i> (Dendy, 1905) | | | | + | |
| 65 | <i>Cinachyrella australiensis</i> (Carter, 1886) | + | + | + | + | + |
| | Craniella | | | | | |
| 66 | <i>Craniella tethyoides</i> Schmidt, 1870 | | | | | |
| | Paratetilla | | | | | |
| 67 | <i>Paratetilla bacca</i> (Selenka, 1867) | | | | + | |
| | Tetilla | | | | | |
| 68 | <i>Tetilla ternatensis</i> (Kieschnick, 1896) | | | | + | |
| | Geodiidae | | | | | |
| | Geodia | | | | | |
| 69 | <i>Geodia cydonium</i> (Linnaeus, 1767) | + | + | + | | |
| | Verongiida | | | | | |
| | Pseudoceratinidae | | | | | |
| | Pseudoceratina | | | | | |
| 70 | <i>Pseudoceratina purpurea</i> (Carter, 1880) | | | | + | |
| | Suberitida | | | | | |
| | Halichondriidae | | | | | |
| | Ciocalypta | | | | | |
| 71 | <i>Ciocalypta stalagmites</i> Hentschel, 1912 | + | + | + | | |
| | Halichondria | | | | | |
| 72 | <i>Halichondria panacea</i> (Pallas, 1766) | | | | + | |
| | Homosclerophorida | | | | | |
| | Plakinidae | | | | | |
| | Plakortis | | | | | |
| 73 | <i>Plakortis communis</i> Muricy, 2011 | + | + | + | | |
| | Tethyida | | | | | |
| | Tethyidae | | | | | |
| | Tethya | | | | | |
| 74 | <i>Tethya aurantium</i> (Pallas, 1766) | + | + | + | + | + |
| | Total | 24 | 25 | 22 | 54 | 26 |