

## REPORT ATTACHMENT 2

**Activity.** Update the inventory of the marine macroalgae species in Hispabiota Marina databases.

**Description.** 2. Search and review taxonomic, biological, ecological, biogeographic or genetic studies in the Atlantic and Caribbean region that include valid reports of marine macroalgae species for Haiti and the Dominican Republic, within the limits of their exclusive economic zones.

**Verification source.** Comparative table of references and summary of findings.

Table 1. References about Hispaniola macroalgae species in the 2001 and 2022 inventories. Present (1), Absent (0).

References	2001	2022
Agardh, C.A. (1824). <i>Systema algarum</i> . pp. [i]-xxxvii, [1]-312. Lundae [Lund]: Literis Berlingianis [Berling].	0	1
Agardh, J.G. (1851). <i>Species genera et ordines algarum, seu descriptiones succinctae specierum, generum et ordinum, quibus algarum regnum constituitur. Volumen secundum: algas florideas complectens. Part 2, fasc. 1.</i> pp. 337 [bis]-351 [bis] 352-506. Lundae [Lund]: C.W.K. Gleerup.	0	1
Almodóvar, L. R. and Álvarez, V. (1978). Adiciones a la flora marina bentónica macroscópica de la República Dominicana. <i>Contribuciones del Centro de Investigaciones de Biología Marina (CIBIMA), Universidad Autónoma de Santo Domingo</i> , 7: 141-147.	1	1
Almodóvar, L.R. and Bonnelly de Calventi, I. (1977). Notas sobre las algas marinas bentónicas macroscópicas de la República Dominicana. En: <i>Conservación y Ecodesarrollo, Centro de Investigaciones de Biología Marina, Universidad Autónoma de Santo Domingo, Editora Alfa y Omega</i> , pp. 379-395.	1	1
Álvarez, V. (1983). Características de los manglares ribereños del este y sur de la República Dominicana. <i>Contribuciones del Centro de Investigaciones de Biología Marina (CIBIMA), Universidad Autónoma de Santo Domingo</i> , 47: 1-20.	0	1
Álvarez, V. and Bonnelly de Calventi, I. (1978). Los manglares del sur y su Conservación. En: <i>Conservación y Desarrollo, Centro de Investigaciones de Biología Marina (CIBIMA), UASD, Editora Alfa y Omega, Santo Domingo</i> , pp. 147-192.	1	1
Bailey, J. C. (1999). Phylogenetic positions of <i>Lithophyllum incrustans</i> and <i>Titanoderma pustulatum</i> (Corallinaceae, Rhodophyta) based on 18S rRNA gene sequence analyses, with a revised classification of the Lithophylloideae. <i>Phycologia</i> 38: 208-216.	1	1
Ballantine, D.L. and Aponte, N.E. (1997). A revised checklist of the benthic marine algae known to Puerto Rico. <i>Carib. J. Sci.</i> , 33 (2-3): 150-179.	1	1
Begin, C. and Steneck, R.S. (2003). Crustose coralline algae and juvenile scleractinian corals of Navassa. pp. 57-65 In: Miller, M.W (Ed.). <i>Status of reef resources of Navassa Island: Cruise report 2002. NOAA Technical Memorandum NMFS-SEFSC-501</i> , 119 pp.	0	1
Bonnelly de Calventi (1977). Notas sobre las algas marinas bentónicas macroscópicas de la República Dominicana. En: <i>Conservación y Ecodesarrollo, Centro de Investigaciones de Biología Marina (CIBIMA), Universidad Autónoma de Santo Domingo, Editora Alfa y Omega</i> , pp. 379-395.	1	0
Børgesen, F. (1924). Marine algae. Pp. 13-35. En: <i>Ostenfeld, C. H., Botanical results of the Dana-Expedition, 1. Plants from Beata Island, St. Domingo, collected by C. H. Ostenfeld. Dansk Bot. Arkiv</i> , 3(6): 1-36.	1	1
Bucher, K.E., Ballantine, D.L., Lozada-Troche, C. and Norris, J.N. (2014). <i>Wrangelia gordoniae</i> , a new species of Rhodophyta (Ceramiales, Wrangeliaceae) from the tropical western Atlantic. <i>Botanica Marina</i> 57(4): 265-280.	0	1
Chiappone, M., Geraldès, F.X., Greer, L., Kiene, B., Pugibet, E., Rodríguez, Y., Schmitt, E., Sullivan Sealey, K.M., Swart, P.K., Torres, R.E., Tschirky, J. and Vega, M. (2001). <i>Coral Reef Conservation in Marine Protected Areas: A case study of Parque Nacional del Este, Dominican Republic. (Ed.) Mark Chiappone, The Nature Conservancy</i> , 244 pp.	0	1
CIBIMA (1994). Las algas. En: <i>Estudio preliminar sobre la biodiversidad costera y marina de la República Dominicana. Centro de Investigaciones de Biología Marina Universidad Autónoma de Santo Domingo, Editora Alfa y Omega, Santo Domingo</i> , 459 pp.	1	1

References	2001	2022
Delgado, G. A., M. Vega, R. E. Torres, M. Chiappone y E. Schmidt (1994). Evaluación ecológica rápida. Parque Nacional del Este, República Dominicana. Reporte Técnico Marino Proyecto Parks in Peril (PIP), 395 pp.	1	0
Díaz-Piferrer, M. (1978). Las investigaciones ficológicas en el Caribe. La flora marina de la República Dominicana. Moscosoa 1(2): 1-8.	1	1
Dreckmann K.M. (2012). Estudio de los géneros <i>Gracilaria</i> e <i>Hydropuntia</i> (Gracilariaceae, Rhodophyta) en las costas mexicanas del Golfo de México y Caribe. Monografías Ficológicas 4, 111-204.	0	1
Endlicher, S.L. (1843). Mantissa botanica altera. Sistens genera plantarum supplementum tertium. pp. [i-vi], 1-111. Vindobonae [Vienna]: apud Fridericum Beck, Universitatis Bibliopolam.	0	1
Foslie, M. (1906). Algologiske notiser II. Det Kongelige Norske Videnskabers Selskabs Skrifter 1906(2): 1-28.	0	1
Foslie, M. (1907). Algologiske notiser III. Det Kongelige Norske Videnskabers Selskabs Skrifter 1906(8): 1-34.	0	1
Fredericq, S. and Norris J. N. (1986). The structure and reproduction of <i>Dasya haitiana</i> sp. nov. (Dasyaceae, Rhodophyta) from the Caribbean Sea. Phycologia, 25:185-196.	1	1
Gabb, W. M. (1873). On the Topography and Geology of Santo Domingo. Transactions of the American Philosophical Society, new series, 15: 49 -259.	0	1
Gabrielson, P.W. and Hommersand, M.H. (1982). The Atlantic species of <i>Solieria</i> (Gigartinales, Rhodophyta): their morphology, distribution and affinities. J. Phycol., 18: 31-45.	0	1
Garbary, D. J. y J. T. Harper (1998). A phylogenetic analysis of the <i>Laurencia</i> complex (Rhodomelaceae) of the red algae. Cryptogamie Algologie 19: 185-200.	1	0
GBIF.org (30 July 2021) GBIF Occurrence Download <a href="https://doi.org/10.15468/dl.bmggjb">https://doi.org/10.15468/dl.bmggjb</a>	0	1
Geraldes, F. X., M. Vega, E. Pugibet, R. E. Torres, Y. Rodríguez, L. Almanzar y D. Guerrero (1997). Estudio y prospección de las condiciones ecológicas ambientales y uso del Parque Nacional Submarino La Caleta, D. N. MAMMA, Inc., Fundación Mac Arthur/ PRONATURA, 61 pp.	1	0
Guiry, M.D. and Guiry, G.M. (2012). AlgaeBase. World-wide electronic publication, National University of Ireland, Galway. <a href="http://www.algaebase.org">http://www.algaebase.org</a> ; searched on 30 July 2021.	0	1
Kapraun, D.F. and Norris, J.N. (1982). The red algal <i>Polysiphonia</i> Greville (Rhodomelaceae) from Carrie Bow Cay and vicinity, Belize. In Rützler, K. & Macintyre, I.G. (eds) The Atlantic Barrier Reef Ecosystem at Carrie Bow Cay, Belize. I. Structure and Communities. Smith. Contr. Mar. Sci.: 225-238.	0	1
Kim, M.S. and I.K. Lee. (1999). <i>Neosiphonia flavimarina</i> gen. et sp. nov. with a taxonomic reassessment of the genus <i>Polysiphonia</i> (Rhodomelaceae, Rhodophyta). Phycological Res., 47 (4), 271-281.	1	0
Krishnamutrthy, V. (1961). The morphology and taxonomy of the genus <i>Compsopogon</i> Montagne. J. Linn. Soc. (Bot.), 58 (372): 207-222.	0	1
Kützing, F.T. (1869). Tabulae phycologicae; oder, Abbildungen der Tange. Vol. XIX pp. i-iv, 1-36, 100 pls. Nordhausen: Gedruckt auf kosten des Verfassers (in commission bei W. Köhne).	0	1
Lamouroux, J.V.F. (1805). Dissertations sur plusieurs espèces de Fucus, peu connues ou nouvelles; avec leur description en latin et en français. pp. xxiv + 85, XXXVI plates. Agen & Paris: de l'Imprimerie de Raymond Nouvel & Chez Treuttel et Würtz.	0	1
Lamouroux, J.V.F. (1809). Observations sur la physiologie des algues marines, et description de cinq nouveaux genres de cette famille. Nouveau Bulletin des Sciences, par la Société Philomathique de Paris, 1: 330-333	0	1
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Leliaert, F., Rousseau, F., Reviere, B. de and Coppejans, E. (2003). Phylogeny of the Cladophorophyceae (Chlorophyta) inferred from partial LSU rRNA gene sequences: is the	0	1

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recognition of a separate order Siphonocladales justified?. European Journal of Phycology 38: 233-246.		
Littler, D.S. and Littler M.M. (1990). Systematics of <i>Udotea</i> species (Bryopsidales, Chlorophyta) in the tropical western Atlantic. Phycologia 29(2): 206-252.	0	1
Littler, D.S. and Littler M.M. (2000). Caribbean Reef Plants: An Identification Guide to the Reef Plants of the Caribbean, Bahamas, Florida and Gulf of Mexico. OffShore Graphics, Inc. Washington, D.C., 542 pp.	0	1
Littler, D.S. and Littler, M. M. (1992). Systematics of <i>Avrainvillea</i> (Bryopsidiales, Chlorophyta) in the tropical western Atlantic. Phycologia 31: 375-418.	0	1
Littler, D.S. and M.M. Littler (1991). Systematics of <i>Anadyomene</i> species (Anadyomenaceae, Chlorophyta) in the tropical western Atlantic. J. Phycol. 27: 101-118.	0	1
Littler, M.M.; Littler, D.S.; Brooks, B.L. (1999). The first oceanographic expedition to Navassa Island, U.S.A.: status of marine plant and animal communities. In: The first oceanographic expedition to Navassa Island, U.S.A.: status of marine plant and animal communities. Reef Encounter 25: 26-30.	0	1
Lozano-Orozco J. G., A. Senties, F. F. Pedroche and J. Díaz-Larrea (2016). <i>Dictyota chalcicueyecanensis</i> sp. nov. (Dictyotales, Phaeophyceae) en el Golfo de México: evidencias moleculares y morfológicas. Hidrobiológica 26 (2): 225-231.	0	1
Luczkovich, J.J. (1991). Marine Ecology of the Buen Hombre Coast. In: Satellite monitoring of coastal marine ecosystems: a case from the Dominican Republic, R. W. Stoffle & D. B. Halmo, eds., East Carolina University, pp. 93- 141.	1	1
Masuda, M. y K. Kogame (2000). <i>Herposiphonia elongata</i> sp. nov. and <i>H. tenella</i> (Rhodophyta, Ceramiales) from the western Pacific. Cryptogamie Algologie 21: 177-189.	1	0
Méndez-Tejeda, R. and G. Rosado (2019). Influence of climatic factors on Sargassum arrivals to the coasts of the Dominican Republic. J. Oceanogr. Mar. Sci. 10: 22-32.	0	1
MHCP (2022). Macroalgal Herbarium Consortium Portal. Macroalgal Digitization Project. <a href="http://www.macroalgae.org/portal/index.php">http://www.macroalgae.org/portal/index.php</a> Accessed on July 1, 2021.	0	1
MNHN (2022). Muséum National d'Histoire Naturelle, Paris. MNHN / Cryptogams (PC) <a href="https://collections.nmnh.si.edu/search/botany/">https://collections.nmnh.si.edu/search/botany/</a> Accessed on July 1, 2021.	0	1
Montagne, C. (1842). Troisième centurie de plantes cellulaires exotiques nouvelles. Décades V, VI, VII et VIII. Annales des Sciences Naturelles, Botanique, Seconde Série 18: 241-282, pl. 7.	0	1
Montero, M., I. Bonnelly de Calventi y L. R. Almodóvar (1983). Las algas marinas de la Laguna de Boca Chica, Bahía de San Andrés, Distrito Nacional. Contribuciones del Centro de Investigaciones de Biología Marina (CIBIMA), 3: 85-104.	1	0
Moreira, L and Cabrera, R. (2007). Anatomía de las estructuras reproductoras en dos variedades de <i>Sargassum</i> (Fucales, Sargassaceae). Rev. Invest. Mar. 28(1):91-94.	0	1
Murray, G. (1889). Catalogue of the marine algae of the West Indian region. Reprinted from Journal of Botany, 1888-89. Dulau & Co., Soho Square, London, 46 pp.	0	1
Nam, KW. (1999). Morphology of <i>Chondrophycus undulata</i> and <i>C. parvipapillata</i> and its implications for the taxonomy of the <i>Laurencia</i> (Ceramiales, Rhodophyta) complex. Eur.J.Phycol. 34 (5): 455-468.	1	0
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NHM (2022). Natural History Museum, London UK. <a href="http://www.nhm.ac.uk/index.html">http://www.nhm.ac.uk/index.html</a> Accessed on July 1, 2021.	0	1
NMNH (2022). National Museum of Natural History. Department of Botany Collections. <a href="https://collections.nmnh.si.edu/search/botany/">https://collections.nmnh.si.edu/search/botany/</a> Accessed on July 30, 2021.	1	1
Post, E. (1936). Systematische und pflanzengeographische Notizen zur Bostrychia-Caloglossa-Assoziation. Revue Algologique 9: 1-84.	0	1
Rosado, G., F. X. Gerales, C. Mateo, V. Alvarez, E. J. Marcano, M. Vega, S. Navarro, E. Pugibet, M. P. Pérez, H. Ramírez, V. Rivas, Y. Rodríguez, D. Montero, M. Asunción y C.	1	0

References	2001	2022
Montero (1998). Las algas. En: La diversidad biológica de los ecosistemas marinos del Parque Nacional Montecristi, Reporte Proyecto GEF-PNUD/ONAPLAN: CIBIMA, 36 pp.		
Rosenberg, G., Y. León, R. Sims and C. Clark (1995). Field Notes/Preliminary Report Dominican Republic - Jaragua National Park. Reporte Técnico del Grupo Jaragua, Inc. al Proyecto GEF-PNUD/ONAPLAN, 14 pp.	1	1
Sáez, J. L. (1989). Miguel Domingo Fuertes Loren (1871-1926): Benemeritus Florae Domingensis. <i>Moscosoa</i> 5: 281-291.	0	1
Santelices, B., (1998). A taxonomic review of the species of <i>Pterocladia</i> . <i>Journal of Applied Phycology</i> 10: 237-252.	1	1
Saunders, G. W., I. Strachan and G. T. Kraft (1999). The families of the order Rhodymeniales (Rhodophyta): a molecular-systematic investigation with a description of <i>Faucheaecae fam nov.</i> <i>Phycologia</i> 38: 23-40.	1	0
Schneider, C. W. (2004). Notes on the marine algae of the Bermudas. 6. Some rare or newly reported Ceramiales (Rhodophyta), including <i>Crouania elisiae</i> sp. nov. <i>Phycologia</i> 43: 563-578.	0	1
Schneider, C.W. and Lane, C. E. (2005). Notes on the marine algae of the Bermudas. 7. Additions to the flora, including <i>Chondracanthus saundersii</i> sp. nov. (Rhodophyta, Gigartinales) based on rbcL sequence analysis. <i>Phycologia</i> 44: 72-83.	0	1
Segonzac, G. (1969). Presence de <i>Polystrata fosliei</i> dans la mer des Caraïbes. <i>Rev. algol.</i> 9: 359-360.	0	1
Taylor, W.R. (1933.) Notes on algae from the tropical Atlantic Ocean, II. <i>Papers Mich. Acad. Sci., Arts and Lett.</i> , 16: 395-407.	1	1
Taylor, W.R. (1940). Marine algae of the Smithsonian-Hartford Expedition to the West Indies, 1937. <i>Contr. U. S. Nat. Herb.</i> , 28:549-562.	1	1
Taylor, W.R. (1943). Marine algae from Haiti collected by H. H. Bartlett in 1941. <i>Papers Mich. Acad. Sci., Arts and Lett.</i> , 28:143-163.	1	1
Taylor, W.R. (1960). Marine algae of the eastern tropical and subtropical coasts of the Americas. University of Michigan Press, Ann Arbor, 870 pp.	1	1
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Tronholm A., Afonso-Carrillo J., Sanson M., Leliaert F., Fernandez-Garcia C. & De Clerck O. (2013). Taxonomy of the <i>Dictyota ciliolata-crenulata</i> complex (Dictyotales, Phaeophyceae). <i>Phycologia</i> 52: 171-181. DOI: 10.2216/12-005.1	0	1
Verbruggen H. & Kooistra W. H. (2004) Morphological characterization of lineages within the calcified tropical seaweed genus <i>Halimeda</i> (Bryopsidales, Chlorophyta), <i>European Journal of Phycology</i> , 39:2, 213-228, DOI: 10.1080/0967026042000202163	0	1
Vieira, C., Morrow, K., D'Hondt, S., Camacho, O., Engelen, A.H., Payri, C.E. & De Clerck, O. (2020). Diversity, ecology, biogeography, and evolution of the prevalent brown algal genus <i>Lobophora</i> in the greater Caribbean Sea, including the description of five new algal species. <i>J. Phycol.</i> , 56(3): 592-607.	0	1
Wade B.F., White, A.D., Howe, S.G., Burton, A.A., and F. Douglass (1871). Report of the Commission of Inquiry to Santo Domingo. Washington: Government Printing Office, 297 pp.	0	1
Wilcox E, Deyo T, Gardella A, García R, Glick D, Goneaga C, Medina A. and V. Vicente (1989). Proposed Les Arcadins National Marine Park resource document. World Wildlife Fund and Conservation Foundation Wilcox Associates, 104 pp.	0	1
Williams, E.H., I. Clavijo, J. J. Kimmel, P. L. Colin, C. Díaz, A. T. Bardales, R. A. Armstrong, L. Bunkley, R. H. Boulon y J. R. García (1983). A checklist of marine plants and animals of the south coast of the Dominican Republic. <i>Carib. J. Sci.</i> 18 (1-1): 39-54.	1	1
Woelkerling, W. J. y D. Lamy (1998). Non-geniculate Coralline Red Algae and the Paris Muséum, Paris, Publications Scientifiques du Muséum/A.D.A.C.: iviii, 1-767.	1	0
Woelkerling, W.J., Gustavsen, G., Myklebost, H.E., Prestø, T. and Sæstad, S.M. (2005) The coralline red algal herbarium of Mikael Foslie: revised catalogue with analyses. <i>Gunnaria</i> 77: 1-625.	0	1

<b>References</b>	<b>2001</b>	<b>2022</b>
Wynne, M. J. (2011). The benthic marine algae of the tropical and subtropical Western Atlantic: changes in our understanding in the last half century <i>Algae</i> 26(2): 109-140.	1	1
Wynne, M.J. (2011). A checklist of benthic marine algae of the tropical and subtropical Western Atlantic: third revision. <i>Nova Hedwigia</i> 140: 166 pp.	1	1
Wynne, M.J. and Huisman, J.M. (1998) First report of <i>Yamadaella caenomyce</i> (Liagoraceae, Rhodophyta) from the Atlantic Ocean, with descriptive notes and comments on nomenclature. <i>Carib. J. Sci.</i> , 34(2-3): 280-285.	1	1
Zanoni, T. A. and Read R.W. (1989). Las expediciones botánicas de Joseph N. Rose a la República Dominicana (1913) y Haití (1918). <i>Moscosoia</i> 5: 299-306.	0	1
<b>Total</b>	<b>33</b>	<b>69</b>

### **Summary of findings:**

When comparing the species inventories of 2001 with 2022 for Hispaniola Island it is observed:

- 36 new references are added.
- The list of macroalgae species is expanded from 325 to 423 taxa (98 new taxa)
- The increments by phyla are: Rhodophyta: 181 to 230; Ochrophyta: 42 to 55; Chlorophyta 102 to 138.
- For the first time, the references included the Macroalgae Herbarium Consortium Portal, which incorporates several records from thirteen new museums.
- Other museums were incorporated, e.g. Muséum National d'Histoire Naturelle Paris and Natural History Museum of London.