



Variation in the Colonization of Artificial Substrates by Mangrove Root Fouling Species of the Port Royal Mangrove Lagoons in the Eutrophic Kingston Harbour, Jamaica

PDF (Size: 652KB) PP. 377-387 DOI : 10.4236/jwarp.2012.46043

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ABSTRACT

The aim of this study was to investigate temporal changes in mangrove root fouling species settled on artificial substrates in the mangrove zone of the Port Royal lagoons and to determine the effect of stress as part of a larger project to determine appropriate indicators of eutrophication in mangrove lagoons. Five Perspex® panels were suspended in the prop root zone at five contrasting stations within the Port Royal mangroves and the fouling organisms were monitored fortnightly using underwater digital photography. Nine taxonomic categories of epibionts were recorded of which the most prevalent group was the ascidians. Barnacles and hydroids were initially found to have established on the artificial substrates at all stations but were quickly replaced by ascidians and bryozoans at most. Species composition was similar between all stations by the end of the study, however, the dominant taxa were different. Sheltered lagoons like Fort Rocky lagoon (north and south) had a clear dominance of non-shelled species (ascidians and polychaetes) by the end of the study, while molluscs- bivalves and barnacles dominated Hurricane Refuge lagoon. This station, deemed to be experiencing greatest stress due to exposure to the eutrophic Kingston Harbour, also had the greatest proportion of shelled taxa represented in the epibiont biomass at the end of the study. Differences in biomass and species composition of root fouling species can therefore be used to indicate water quality in the mangrove lagoons.

KEYWORDS

Mangrove Lagoons; Water Quality Indicators; Root Fouling Species; Eutrophication

Cite this paper

T. Elliott, G. Persad and M. Webber, "Variation in the Colonization of Artificial Substrates by Mangrove Root Fouling Species of the Port Royal Mangrove Lagoons in the Eutrophic Kingston Harbour, Jamaica," *Journal of Water Resource and Protection*, Vol. 4 No. 6, 2012, pp. 377-387. doi: 10.4236/jwarp.2012.46043.

References

- [1] K. Kathiresan and B. L. Bingham, " Biology of Mangroves and Mangrove Ecosystems," *Advances in Marine Biology*, Vol. 40, No. 2, 2001, pp. 81-251. doi:10.1016/S0065-2881(01)40003-4
- [2] B. L. Bingham, " Life Histories in an Epifaunal Community: Coupling of Adult and Larval Processes," *Ecology*, Vol. 73, No. 6, 1992, pp. 2244-2259. doi:10.2307/1941472
- [3] A. M. Ellison and E. J. Farnsworth, " The Ecology of Belizean Mangrove Root Fouling Communities: Patterns of Epibiont Distribution and Effects on Root Growth," *Hydrobiologia*, Vol. 247, No. 3, 1992, pp. 87-98. doi:10.1007/BF00008207
- [4] I. M. Goodbody, " The Biology of *Ascidia nigra* (Savigny). II. The Development and Survival of Young Ascidians," *Biological Bulletin*, Vol. 124, No. 1, 1993, pp. 31-44. doi:10.2307/1539566
- [5] E. J. Farnsworth and A. M. Ellison, " Scale Dependent spatial and Temporal Variability in Biogeography of Mangrove Root Epibiont Communities," *Ecological Monographs*, Vol. 66, No. 1, 1996, pp. 45-66. doi:10.2307/2963480
- [6] I. M. Goodbody, " Kingston Harbour, Jamaica—An Overview," *Bulletin of Marine Sciences*, Vol. 73,

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- [7] I. M. Goodbody, " The Ascidian Fauna of Port Royal, Jamaica I. Harbor and Mangrove Dwelling Species," *Bulletin of Marine Sciences*, Vol. 73, No. 2, 2003, pp. 457-476.
- [8] M. M. Creary, " Spatial Distribution of Epibenthic Bryozoans Found on the Roots of *Rhizophora* mangrove, Kingston Harbour, Jamaica, W. I.," *Bulletin of Marine Sciences*, Vol. 73, No. 2, 2003, pp. 477-490.
- [9] C. P. J. Jackson and M. Webber, " Sponges of the Port Royal Mangroves and Factors that Affect Their Distribution," *Jamaica Journal*, Vol. 29, No. 1-2, 2005, pp. 42-49.
- [10] M. Begon, J. L. Harper and C. R. Townsend, " *Ecology: Individuals, Populations and Communities*," 3rd Edition, Blackwell Science Ltd, 1996.
- [11] D. F. Webber and P. WilsonKelly, " Characterization of Sources of Organic Pollution to Kingston Harbour, the Extent of Their Influence and Some Rehabilitation Recommendations," *Bulletin of Marine Sciences*, Vol. 73, No. 2, 2003, pp. 257-271.
- [12] G. P. Alleng, " Historical Developments, Present Status and Management Guidelines for the Port Royal Mangal, Jamaica," MPhil Dissertation, University of the West Indies, Mona, 1990.
- [13] G. P. Alleng, " The Fauna of the Port Royal Mangal, Kingston, Jamaica," *Studies on the Natural History of the Caribbean Region*, Vol. 73, No. 1, 1997, pp. 23-42.
- [14] M. K. Webber and I. Goodbody, " Mangroves," DEMO Palisadoes Project Report, National Resource Conservation Authority, Kingston Jamaica, 1998.
- [15] K. O. McDonald, D. F. Webber and M. K. Webber, " Mangrove Forest Structure under Varying Environmental Conditions," *Bulletin of Marine Sciences*, Vol. 73, No. 2, 2003, pp. 491-505.
- [16] B. L. Bingham and C. M. Young, " Stochastic Events and Dynamics of a Mangrove Root Epifaunal Community," *Marine Ecology*, Vol. 16, No. 2, 1995, pp. 145-163. doi:10.1111/j.1439-0485.1995.tb00401.x