University of the Philippines Visayas
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SHORT-TERM IMPACTS OF OIL SPILLS ON FUNGAL POPULATION IN A MANGROVE AREA IN BATAD, ILOILO

A Special Problem
Presented to
The Division of Biological Sciences
University of the Philippines Visayas
Miag-ao, Iloilo

In Partial Fulfilment
of the Requirements for the Degree of
Bachelor of Science in Biology

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April 2014

ABSTRACT

Oil spills cause extensive damage on the marine environment, ranging from obliteration of its flora and fauna to biomagnifications of toxic components of petroleum. The location of mangroves at the sea-land interface makes the ecosystem susceptible to disturbances such as oil spills. There is a considerable information on the impacts of oil spills on mangrove while impacts on microbial populations, especially fungi, are limited. This study therefore assessed the effect of oil on the diversity and distribution of fungi of oil-contaminated sites in Batad, Iloilo due to Power Barge oil spill last November 8, 2013. The mangrove surface sediments were collected on January 11, 2014 at oil-contaminated sites in Batad, Iloilo and uncontaminated site in Ajuy, Iloilo. Sample were processed based on Pepper and Gerba (2004). Colony forming units per gram of soil (CFU/g) was used to express yeasts and filamentous fungi. On PDA medium, more fungal isolates were isolated at oil-contaminated site compared with uncontaminated site at 14 and 12 species respectively, there was also a higher Shannon Index of Diversity at 2.4858 and 2.4582, respectively. Among the filamentous fungi, three genera were represented by *Aspergillus*, *Penicillium*, and *Cladosporium*. However, *Aspergillus* was more diverse with 10 species. Six species were found only at the oil-contaminated sites - *Aspergillus* sp 2, *Aspergillus* sp 1, *Cladosporium cladosporioides*, *Penicillium* sp 2, *Penicillium* sp 3 and Yeast sp 2 while four species are found in the unoiled site – *Penicillium cf. lapidosum*, *Aspergillus* sp 3 . *Aspergillus* sp 4 *Penicillium* sp 1. Furthermore, there is a low index of similarity as shown by Jaccards coefficient of similarity (J=0.44) and Sorensen coefficient of similarity (C=0.61). Fungal load was higher at oil-contaminated soils compared with uncontaminated soils at 1.3 x 10^{-2} CFU/g and 6.0 x 10^{-3} CFU/g, respectively. Bushnell Haas Agar yielded more fungi isolates isolated from oil-contaminated sites compared with uncontaminated site of 4 and 3 species respectively. Furthermore, a higher Shannon Index Diversity (*H'*) was observed at oil-contaminated sites (1.3298) than those at uncontaminated site (0.6364) suggesting that there are more species of fungi capable to degrade the hydrocarbons and utilize it as a source of energy. The overall frequency of distribution of the major fungal genera in both oil-contaminated and uncontaminated sites showed that only Dueteromycota was isolated and dominated in both sites and in both media, the PDA and Bushnell Haas Agar. The major genera isolated in PDA medium included *Aspergillus*, *Penicillium*, *Cladosporium*, and yeast. In Bushnell Haas Agar, *Aspergillus* and yeast were the major genera isolated and are seen in both sites. The frequency of occurrence of various species in uncontaminated and oil-contaminated sites were not significantly different. The Deuteromycota were the dominant group that were isolated on all sites using two media. The overall result indicate the stimulating effect of oil are observed in the higher fungal load in oil-contaminated site.