Abstracts
of
International Conference on
Economics, Energy, Environment
and Agricultural Sciences
1-2 November, 2014
Pearl International Hotel, Kuala Lumpur, Malaysia

Jointly Organized by
Eutrophication State Monitoring for Unhealthy Aquatic Ecosystem Via Free-Floating Macrophytes Pattern

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Abstract
Nutrient enrichment or eutrophication is a process of increasing plant nutrients in water bodies, frequently due to run-off from the land, which causes a dense growth of plant life. Eutrophication process is assisted by internal and external sources of nutrients such as nitrogen fixation and phosphorus. In freshwater ecosystem, anthropogenic source of nutrients such as detergents, fertilizers and organic debris are among the sources of excess nutrients for nitrogen and phosphorus. It also has been proved to be a major factor which contributes to eutrophication and consequent algal blooms, spreading of certain aquatic macrophytes, depletion of oxygen and loss of key species leading to degradation of many freshwater ecosystems. This study aimed to discover the abilities of free-floating aquatic macrophyte species as an phytotoxicant for eutrophication either at contamination or pollution level in polluted aquatic ecosystem to support their upcoming development and prospective through landscape ecology approach. The effects of nutrients (ammonium, phosphate, nitrate and nitrile), the free-floating aquatic macrophyte species and locations have been studied on eutrophication in aquatic freshwater ecosystem. All species (Elodea canadensis, Lemna minor, Neptunia oleracea, Spirodela polyrhiza, Salvinia molesta and Pistia stratiotes) were detected with high level of phosphate at level III at all localities (Pahang, Selangor and Kelantan). Ammonium concentration was varied from class I to class III. In conclusion, changing in E. crassipes, L. minor and S. polyrhiza pattern and behavioral are proven to be the best phytotoxicant for eutrophication state monitoring.

Keywords: Eutrophication, Phytotoxicant, Free-floating macrophytes, Aquatic ecosystem