MSc Research Scholarship

Description:
Applications are invited from BSc in Biology, Chemistry, Environmental Sciences or similar areas for a 2-year MSc Research Scholarship in USJ Institute of Science and Environment. The work is an FDCT funded research project: “The role of mangroves on the bioaccumulation and citogenotoxic effects of metals and pesticides on the food web of a tropical coastal system/紅樹林對亞熱帶海岸系統食物鍊金屬的富集和細胞基因毒性的影響及殺蟲劑的角色” (see abstract below). Work will take place mainly in the science laboratories of the University of Saint Joseph, Macao SAR while training will be in the City University of Hong Kong, etc. The candidate will be supervised by the project coordinators, Professor Chan Shek Kiu and Karen Tagulao and consultant, Dr. Patricia Cardoso.

Qualifications required:
We are looking for a highly motivated candidate with a BSc degree in Biology, Chemistry, Environmental Sciences or other relevant areas. Experience in field sampling, conducting mesocosm experiments and data analysis is an asset. Availability to travel for scientific meetings and for training periods abroad is required. Candidates must also be fluent in English.

Conditions:
A stipend of MOP10,000 per month, 12 months per year. Travel subsidies to participate in scientific meetings are provided. Candidates are expected to start in February 2016. The maximum duration of the scholarship is 24 months.

Tuition fee is not funded.

How to apply:
Candidates should send a motivation letter, CV and one reference letter to karentagulao@usj.edu.mo and skchan@usj.edu.mo. Candidates can also use this email for any queries regarding the position. After CV evaluation, short-listed candidates will be asked for an interview. The position will remain open until filled.
Abstract

The role of mangroves on the bioaccumulation and citogenotoxic effects of metals and pesticides on the food web of a tropical coastal system (紅樹林對亞熱帶海岸系統食物鏈金屬的富集和細胞基因毒性的影響及殺蟲劑的角色).

Mangrove ecosystems are unique habitats which offer a great variety of goods and services to the ecosystem and to the society. Unfortunately, they have been globally threatened by urbanization and industrialization which have triggered widespread overexploitation of the world’s mangrove forests despite their ecological and economic importance. In South China, namely in Macao, the health and integrity of mangroves are aggravated due to substantial discharge of untreated industrial sewage into the Pearl River Estuary (PRE) from the coastal cities. Among different types of pollutants in the sewage, trace metals are of special concern since alarming levels of cadmium, lead and zinc were annually discharged into the Pearl River, potentially causing far-reaching ramifications on human health and ecosystems.

Besides metals contamination, pollution by pesticides is of great concern because of their ability to cause, in a global scale and years ahead from the present, severe environmental, ecologic and health consequences. Despite the numerous studies on phytoremediation, little attention has been paid to the role of mangroves on the bioaccumulation and citogenotoxic effects of metals and organic compounds on the food web and consequently on human health. So, the main objectives of this project are:

1) to do a spatial/seasonal characterization of the abiotic parameters as well as contaminants (metals and pesticides), the latter through a time-integrated passive sampling method, in mangrove vegetated versus non-vegetated areas;

2) to do an in situ characterization of the metals and pesticides levels at the biotic compartments along the food web (primary producers, primary consumers and predators) in mangrove vegetated versus non-vegetated areas;

3) to evaluate the in situ genotoxic effects and oxidative stress responses to contaminants exposure in vegetated versus non-vegetated areas;

4) to study the bioaccumulation and elimination kinetics and oxidative stress responses in the edible bivalve Geloina erosa to trace metals and pesticides exposure during a field transplant experiment.

Through the implementation of this project it is possible to better understand the role of mangroves on the protection of fauna and human health against these pollutants and establish possible management and conservation strategies.