

Project 16/2003 - The Use of Biomarkers for Ecotoxicological Assessments of Persistent Organic Pollutants (POPs) and Heavy Metals on Birds at Mai Po Nature Reserve and Other Wetlands

Purpose

This paper seeks Members' approval to fund the captioned application for ECF made by Hong Kong Baptist University (HKBU).

Background

2. The funding requested by this project is \$600,200 for the expenditure on employing one Research Assistant for two years (\$300,000), partial support of a visiting scholar (\$12,200) and general expenses and field equipment (\$288,000). The project is expected to last for 24 months.

3. In fact, the total budget for the project is \$1,200,200. The principal investigator (PI) has secured a sum of \$600,000 from the Science Faculty Strategic Research Fund of HKBU and the ECF is requested to fund the balance \$600,200.

4. The major aim of the present proposal is to investigate the potential use of feather and eggshells, instead of eggs, to setup and evaluate biomarkers in birds for risk assessment of POPs and heavy metals at Mai Po Marshes. It is hoped that an integrative protocol can be generated combining chemical and biomarker analysis, which would be useful for decision-makers in assessing and managing Mai Po Marshes as well as other wetlands in Hong Kong and China.

5. The proposal has been assessed by two external expert reviewers and both of them considered the proposal well designed with a reasonable budget. The reviewers' comments and the PI's response are attached. AFCD and EPD have reviewed the proposal as well and considered it worthy of support. In the course of assessment, EPD made the following comments for members' reference only:

(a) The proposed budget is considered reasonable, taking into account the

scope and technical complexity of the study. The proposed ecological field surveys on bird foraging habitats and diet composition, comparison of Persistent Toxic Substances (PTS) levels of different population of selected bird species in wetlands among different regions (i.e. HK and China), the employment of various biomarker assays in the liver and blood of bird embryos, as well as the chemical analysis of POPs levels in bird eggs and feathers can be very costly

(b) The study team is comprised of local and mainland experts with good track records of conducting similar research in the field. This study, of which the main objective is to use bioindicators for examining the risks imposed by POPs and heavy metals on migratory birds, does not duplicate with EPD's, which has so far been centering around developing bioindicators for monitoring pollution of the marine environment of Hong Kong.

(c) EPD consider that the proposed study is worthy of support as –

- (i) The proposed study will provide very useful information on the levels of Persistent Toxic Substances (PTS) contamination in Hong Kong's Ramsar Site for the assessment of potential risks imposed to the waterbirds, and may help build the database on POPs and heavy metals pollution in Hong Kong's environment in general. The relationships between various biomarkers and POPs/heavy metals exposure and their deleterious effects (e.g. on the breeding success of migratory birds), if established successfully, may be used as good reference for long-term monitoring and ecological impact assessments targeting on the protection of endangered bird species in the Mai Po Nature Reserve and in the region at large.
- (ii) The study also makes good attempts to collaborate with the Mainland scientists to understand the sources and mechanisms of long-range transport of POPs, and the effort ties in with the need for strengthening regional POPs monitoring in the wake of the new developments of the Stockholm Convention, which would enter into force in May 2004.

Advice sought

6. Members are invited to advise whether the application for ECF should be supported with an approved grant of \$600,200 as detailed in paragraphs 2 to 4 above.

Secretariat, ECF Research Projects Vetting Subcommittee
November 2004