

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' advice in funding 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. The project was discussed at the meeting of the Research Projects Vetting Subcommittee (RPVSC) on 2.12.2004. The meeting agreed to support the proposal in principle subject to further clarification by the PI on the following areas -

- (a) Objectives of the Proposal - The PI should clarify how the study of the contamination on Egrets/Herons would help achieve the objective of protecting the endangered bird species.
- (b) Project Details -
 - (i) The PI should clarify whether it had previously been established or the study would establish any causal relationship between site contamination, food contamination, health risk of the birds and pollutants found in eggshells and feathers of birds.
 - (ii) The PI should explain how the origins of POPs and heavy metals found in the eggshells and feathers could be identified if some of the birds to be studied were migratory birds.

4. The PI's responses are attached at Annex 1. Taken into account the comments by the RPVSC, the PI has revised the proposal (Annex 2) with the major objective of the study to investigate if the aquatic bird species, especially endangered species at Mai Po Marshes are at risk.

5. The PI has also explained the selection of study sites, choice of the bird species and use of the biomarkers –

- (a) Three sites have been identified, including Mai Po Marshes Nature Reserve of Hong Kong, Taihu Lake (at Jiangsu Province, a polluted site due to industrial, agricultural and domestic discharges,) and Dafeng Milu Nature Reserve (also at Jiangsu Province, a clean site serves as the control) of China.
- (b) Two common resident fish-eating aquatic feeding bird species including Little Egret (*Egretta garzetta*) and Black-crown Night Heron (*Nycticorax nycticorax*), sharing similar habitats as Black-faced Spoonbill and Nordmann's Greenshank will be used. At Taihu Lake and Dafeng Meilu, these two species may either station at the two places, if the weather is warm; or migrate if the weather is cold (November to February). Nevertheless, during the breeding season between April to June, the level of contaminants in eggs (including eggshells) and feather of these female birds will reflect the levels of contaminants in food they consume within the breeding season, and the breeding ground (Taihu Lake and Dafeng Meilu). On the other hand, these two species are entirely residential at Mai Po and therefore they can be used to indicate the contamination levels at Mai Po.
- (c) One of the major objectives (objective 3 listed in the proposal) of the present project is to compare the use of biomarkers on eggshells and feather, with eggs. Twenty eggs from each species will be collected from Taihu Lake and Dafeng Milu Nature Reserve. Twenty eggshells will be collected randomly from each site. Feathers will be collected at the same nests from which the eggs are sampled. If significant correlations can be established between the two (eggshells and feather, with eggs), future biomarkers can be performed on eggshells and/or feather, instead of eggs, which will be more convenient and less invasive. They can also provide information on the cellular responses of the living organisms to contaminants.

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For Discussion**

6. AFCD and EPD have reviewed the explanation from the PI and the revised proposal and considered it worthy of support.

7. Regarding the budget, the “Guide to Application for the Fund” stipulated that overseas participants in a local function are normally expected to pay for their own traveling and living expenses. Hence, according to the guideline, this amount (\$12,200) will not be supported should the project be approved.

Advice sought

8. Members are invited to advise whether the application for ECF should be supported and the exact amount of fund to be supported.

Secretariat, ECF Research Projects Vetting Subcommittee
January 2005