

MALAYSIA

Project Title: The Impact of Introduced Species (Non-native and Exotic) on the Genetic Diversity of Native Freshwater Fishes in Malaysia (RE-MYS-002)

Study leader: Yuzine B. Esa, Universiti Malaysia Sarawak

Significant findings: For the first year of the project, sampling studies were conducted in several rivers of Sarawak: Serting, Jempol, Negeri Sembilan Layar, Spak, Baking, Tinjar and Ba' Kelalan. One of the project's objectives is to develop and characterise molecular genetic markers useful for the identification of introduced and native freshwater fishes. In line with this, the research concentrated on examining the genetic diversity of several important indigenous freshwater fish species such as *Tor douronensis* (Semah), *Puntius schwanenfeldii* (Tengadak/Lampam Sungai) and *Hampala macrolepidota* (Adong/Juak/Sebaru). Several techniques were applied such as sequencing of amplified (PCR) mitochondrial genomes in order to resolve the genetic structure and diversity of those fishes. Phylogenetic analysis using sequencing of the mitochondrial *cytochrome b* gene revealed two distinct groups between samples of *Puntius schwanenfeldii* from Peninsular Malaysia and Borneo Island. A similar result was observed in samples of *Hampala macrolepidota*, most possibly related to the biogeographic history of the Sundaland region. Among *P. schwanenfeldii*, samples from Peninsular Malaysia formed a sister taxa to the Borneo samples. Samples of the introduced Indonesian *P. schwanenfeldii* also formed a separate cluster within the Borneo populations, showing their genetic distinctiveness from the local *P. schwanenfeldii*. More genetic analyses are underway to examine genetic diversity in both introduced and indigenous fish species.

Project Title: Community-based Plant Conservation in Ulu Padas, Sabah (RE-MYS-004)
Study leaders: Geoffrey Davison and Perpetua George, World Wildlife Fund - Malaysia

Significant findings: One of the objectives of this project, is to investigate opportunities for Plant Conservation Areas (PCAs) such as Ulu Padas to generate economic benefits and become financially self-supporting in the long-term. Another objective is to support and enhance skills and capacity amongst local communities and forest officers to manage both existing and newly-established PCAs. Thus the study leader considered and added a new dimension to the project, with the assistance of four students from Universiti Malaysia Sabah.

The students took soil samples from a high altitude acidic peat swamp forest, and from oak chestnut forest on dry ground. They expected that the microbial flora present in soils from the highly acidic swamp forest might display unusual biochemical properties.

The many isolates of actinomycetes were tested on three genes - MKK1, MSG5 and GLC7 - that are associated with cell proliferation in yeast *Saccharomyces cerevisiae* and in mammalian cancers.

None of the 79 samples tested against these genes acted as an inhibitor. However, 21 of the samples from oak chestnut forest were toxic against MKK1, and 24 from oak chestnut forest were toxic to these genes. The big surprise was that 7 peat swamp samples were toxic to the gene GLC7, but none from the oak chestnut forest. This is strange because toxicity to GLC 7 should march in step with toxicity to the other genes. The analysis was therefore repeated with the same result. Why the peat swamp samples are toxic to one gene, and the oak chestnut samples toxic to two other genes, would make an interesting study.

Fifty-three (53) samples from both peat swamp and oak chestnut forest all proved toxic to the mycobacterium responsible for human tuberculosis. This is not necessarily good news because what is toxic to the tuberculosis mycobacterium may also be toxic to mammalian cells. It would have been more encouraging to find an inhibitor acting selectively.

How are these results linked to the conservation of higher plants? First, the samples were taken from the main habitat types around Ulu Padas, so we know the plant communities these soil microbes are associated with, and can probably find them again. We know the soil type, pH and history of disturbance of the forest. Second, the soil samples were taken from the bases of named trees, so we know the precise plant association and can look for mycorrhizal associations. Third, the trees they were taken from fall into distinct groups, and we can seek out links between the soil microbes and characteristics of the trees. For example, soil was taken from around the roots of strangling figs, which are likely to grow at sites independent of soil type (because the seeds germinate on branches of other trees, high in the forest canopy, before they send roots down). Soils were also taken from beneath various oaks, and from beneath conifers. It will be interesting in the future to take samples from beneath casuarinas trees, which have nitrogen-fixing root nodules.

This work was developed unexpectedly as a result of the opportunity provided by the ARCBC activities, and we hope it will have a long term value for science and health. The work was carried out by Prof. Ho Coy Choke and his students, and will be continued.

Project title: Regional Collaboration for Peatland Biodiversity in Southeast Asia (RE-MYS-003)

Study leader: Faizal Parish, Global Environment Center

Background

At the Ministerial Forum during the World Conference and Exhibition on Land and Forest Fires Hazards in Kuala Lumpur on 10 June 2002, the Malaysian Minister of Science, Technology and the Environment called for cooperation amongst ASEAN countries to address the issue on fire prevention and control in peatlands. Subsequently, the 19th ASOEN Haze Technical Task Force (HTTF) and the 9th ASEAN Ministerial Meeting on Haze (AMMH) on 10 -11 June 2002 discussed the issue on fire prevention and control in peatlands, which is considered critical to the ASEAN region. An update was given to the HTTF on the recent work in the region such as by the Global Environment Centre (GEC), coordinator for the Southeast Asia Peatland Network (SEA-PEAT), which brings together more than 340 individuals and more than 50 agencies involved in peatland assessment and management. GEC is a recipient of funding from ARCBC to develop regional collaboration for the conservation of peatland biodiversity in Southeast Asia. The incidence of peatland fire and associated haze has been seen as the main threat to peatland biodiversity, hence there is a strong linkage between protection of biodiversity and prevention and control of fires in peatlands. Due to the severe impact of peatland fire and haze on the regional economy and health, the AMMH subsequently decided to develop further the concept for a regional initiative on peatland management and fire prevention. The HTTF Chair was requested to follow up on this matter.

Updates

Following that, the HTTF with technical inputs from GEC and the ASEAN Secretariat developed a draft working paper on ASEAN Peatland Management Initiative (APMI): Sustainable Management of Peatlands, Prevention and Control of Peatland Fires. The working paper was then circulated through the HTTF to the member countries in early August 2002. It was presented at the 11th and 12th Joint Meetings of the Working Groups on the Sub-Regional Fire-fighting Arrangements (SRFA) for Sumatra and Borneo in Singapore in August 2002 and Brunei in January 2003, respectively. The SRFA working group supported the further development of the APMI proposal and suggested that the collection of critical peatland status and management information be made through the development and circulation of a questionnaire. Hence before the end of 2002, questionnaires were circulated to all HTTF focal points in the ASEAN countries to gather information and feedback regarding

Peatland Management Initiative. Questionnaires were also sent out to other international/local agencies, institutions, NGOs and individuals and have a wider range of feedbacks. Results from the questionnaires were analysed and a revised proposal for the initiative was developed based on these feedback and inputs. The proposal was discussed and adopted on 28 February 2003 at the 20th ASOEN HTTF meeting in Manila. The APMI was then further supported by the ASEAN Ministers of Environment during the 10th ASEAN Ministerial Meeting on Haze meeting in Siem Riep, Cambodia on 4 March 2003.

Framework of APMI

The objectives of the APMI are to:

- Build capacity and understanding on peatland management issues in the region;
- Reduce the incidence of peatland fires and associated haze in the region;
- Prepare national action plans and support their implementation at the local level; and
- Develop a regional strategy and cooperation mechanism to promote sustainable peatland management.

One of the main focuses of the initiative is to find ways of building upon or linking up all the existing activities/work on peatlands in the Southeast Asian region. The primary tool for information dissemination and sharing would be the internet using "Simplify" community portal software and building on the initial "PEAT-PORTAL" site and SEA-PEAT Network developed by GEC and partners in 2001/02. The initiative would link all these activities, facilitating exchanges of information or promoting dialogues between the different groups working on these projects. The initiative aims to support on-the-ground actions in different ASEAN countries to restore and improve management of peatlands by developing pilot projects and establishing demonstration sites for best practices. Experiences and lessons learned from demonstration sites will be shared and disseminated between the countries in the region. The Initiative will also look into aspects of facilitating exchange and sharing of international experiences in successful peatland management, ecological restoration and fire prevention/control with the countries in the region through best management practices (BMP).

The endorsed APMI concept proposal can be viewed at the PEAT-PORTAL (www.peat-portal.net). For those who are interested in knowing more regarding the development and activities and possible involvement in this Initiative, or would like to share information on the BMP of peat, i.e case studies, please contact Dr. Raman Letchumanian (raman@aseanses.org) or David Lee at (david@genet.po.my) or at 7A, Jalan 19/29, 46300 Petaling Jaya, Selangor, Malaysia. ■