EVALUATION OF THE CONSERVATION STATUS AND RISKS FOR SOME ENDANGERED PLANT SPECIES IN BA BE NATIONAL PARK, BAC KAN PROVINCE, VIETNAM

By
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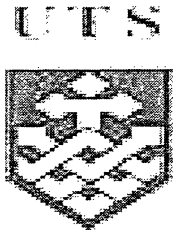

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Certificate of Authorship/Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as acknowledged within the text.
I also certify that the written preparation of the thesis, and all experimental work associated with it, has been carried out solely by me, unless otherwise indicated. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. Finally, I certify that all information sources and literature used are acknowledged in the text.

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Van Hung Hoang
July, 2010

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ABSTRACT

Ba Be National Park, in the northern mountainous region of Vietnam, is an important conservation area with numerous rare, endangered and endemic plant and animal species. The plant resources of the park are exploited by local ethnic minority (hill tribe) people to provide food, medicines and wood products; their high birth rate, general ignorance of plant propagation and husbandry and their dependence on the forest resources to maintain a subsistence level of life has placed many plant species in the Park at increasing risk of local extinction. Moreover, many essential plants are becoming so difficult to find that the local peoples' lifestyle is threatened. This thesis evalualuates the socio-economic features of the threat to plant species in the Park, the broad ecological determinants of the distribution of plants in the area and the genetic diversity of a selected number of plant species. The results demonstrate that national and international schemes for the classification of the conservation status of plant species is of limited relevance in the local context and a mixture of national, international and local criteria enabled the compilation of a plant species conservation ranking for the Park. A suite of environmental factors was chosen to investigate their collective influence on plant species distribution; the main determinants of floristic composition appear to be topography and disturbance, with soil factors being important for endangered species, though other factors not measured here may influence species composition at small scales. The genetic diversity of four priority plant species was determined using the Randomly Amplified Polymorphic DNA (RAPD) technique and the Random Amplified Microsatellite Polymorphisms (RAMP) technique was used to further investigate genetic diversity in two of the four species; the latter proved somewhat more useful in distinguishing between populations than the former. A preliminary evaluation of the location of high-genetic-diversity populations and individuals should allow an informed selection of source plants for future propagation. Some recommendations on future management of the National Park are made.

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TECHNICAL ABBREVIATIONS USED IN THE THESIS

AFLP	amplified fragment length polymorphisms
ALP	amlicon length polymorphisms
ANOVA	analysis of variance
BME	beta mercapto ethanol
CTAB	cetyltrimethylammonium bromide
DO	dominant tree
DT	disturbance
D.W	dry weight
DNA	deoxyribonucleic acid
DT1	disturbance 1
DT2	disturbance 2
EDTA	ethylene diaminetetra acetic acid
EN	endangered species
MS	moist site
PCR	polymerase chain reaction
PH	physical (factor)
PRA	participatory rural appraisal
PVP	polyvinyl-pyrrolidone
RAMP	random amplified microsatellite polymorphisms
RAMPo	random amplified microsatellite polymorphisms
RAMP-PCR	ramdom amplified microsatellite polymorphisms – polymerase chain reaction
RAPD	random amplified polymorphic DNA
RAPD-PCR	random amplified polymorphic DNA – polymerase chain reaction
RFLP	restriction frament length polymorphisms
RNA	ribonucleic acid
RRA	rural rapid appraisal
RU	relatively undisturbed
SO	Soil (factor)
SSR	simple sequence repeats
Taq	thermus aquaticus
TBE	tris borate EDTA
TE	tris – EDTA
V/V	volume per volume
VE	Vegetation (factor)
W/V	weight per volume

INSTITUTIONAL ABBREVIATIONS USED IN THE THESIS

ASEAN	Association of South East Asian Nations
BBNP	Ba Be National Park
(S)CBD	(Secretariat for the) Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
FAO	Food and Agriculture Organisation (United Nations)
FIPI	Forest Inventory and Planning Institute (Vietnam)
GOV	Government of Vietnam
HELVETAS (helvetas)	helvetas Vietnam: Swiss Association for International Cooperation
IUCN	International Union for the Conservation of Nature
MARD	Ministry of Agriculture and Rural Development (Vietnam)
MSTE	Ministry of Science, Technology and the Environment (Vietnam)
PARC	Protected Areas for Research and Conservation (Vietnam)
SCEMMA	State Committee for Ethnic Minorities and Mountainous Areas (Vietnam)
SEE	Society for Environmental Exploration
SRV	Socialist Republic of Vietnam
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WB	World Bank
WRI	World Resources Institute
WWF	World Wildlife Fund