



**Report of a Rapid Biodiversity Assessment at
Xidamingshan Headwater Forest Nature Reserve,
Southwest Guangxi, China, 15-17 October 1998**

Kadoorie Farm and Botanic Garden
in collaboration with
Guangxi Zhuang Autonomous Region Forestry Department
South China Institute of Botany
Xinyang Teachers' College

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Report of a Rapid Biodiversity Assessment at Xidamingshan Headwater Forest Nature Reserve, Southwest Guangxi, China, 15-17 October 1998

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Background

The present report details the findings of a trip to Southwest Guangxi by members of Kadoorie Farm and Botanic Garden (KFBG) in Hong Kong and their colleagues, as part of KFBG's South China Biodiversity Conservation Programme, launched in February 1998. The overall aim of the programme is to minimise the loss of forest biodiversity in the region, and the emphasis in the first phase is on gathering up-to-date information on the distribution and status of fauna and flora.

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Translation of some common Chinese geographical terms

Romanized Chinese (pinyin)	English meaning
Bei	north
Dao	island
Dong	east
Feng shui	the Chinese system of geomancy
Feng, Ding	peak
Gang	harbour
Hai	sea
He, Chuan, Jiang	river
Hu, Chi	lake
Keng, Gu	valley
Kou	outlet
Ling	range
Nan	south
Shan	mountain
Shi	city
Tun	hamlet
Wan	bay
Xi	west
Xi, Yong	stream
Xian	county
Xiang Cun	village

Report of a Rapid Biodiversity Assessment at Xidamingshan Headwater Forest Nature Reserve, Southwest Guangxi, China, 15-17 October 1998

Objectives

- The aims of the survey were to collect up-to-date information on the condition and fauna of Xidamingshan Headwater Forest Nature Reserve, and to use this to help determine conservation priorities within South China.

Methods

- On 13 October 1998, a survey team assembled in Nanning with members from Kadoorie Farm and Botanic Garden (LC, JRF, BH, ML, LKS, GTR), Guangxi Forestry Department (XZH), South China Institute of Botany (LZX) and Xinyang Teachers' College (LHJ).
- During fieldwork visual searching for plants, mammals, birds, reptiles, amphibians, fish, ants, butterflies and dragonflies was conducted. Frogs and birds were also located by their calls. Plant records were made by field observation, with some specimens collected.
- Status of large and medium-sized mammals (excluding Insectivora, Chiroptera and Muridae) at Xidamingshan was inferred largely based on interviews with local people, with reference to colour pictures. For purposes of these interviews a list of South China mammals was compiled from various sources including Guangdong Forestry Department and South China Institute of Endangered Animals (1987), Corbet & Hill (1992) and Zhang Y. *et al.* (1997).
- Vascular plant records were made by LZX, and edited by NSC, except in the case of orchids, which were verified by GS. Mammal records were made by LKS, BH, JRF, ML and GTR. Records of birds were made or verified by LKS, reptiles and amphibians by ML, fish by BC and CXL, ants by JRF, butterflies by GTR and dragonflies by GTR and KW of Hong Kong.
- Nomenclature in the report is standardised based, unless otherwise stated, on the following references:
 - Flora (Pteridophyta, Gymnospermae and Angiospermae excluding Orchidaceae): Anon. (1959-2001); Anon. (1991); Anon. (1996-2001); Anon. (2002a, 2002b); The Plant Names Project (2002);
 - Orchids (Angiospermae: Orchidaceae): Chen (1999); Lang (1999); Tsi (1999);
 - Mammals (Mammalia): Wilson & Cole (2000);
 - Birds (Aves): Inskipp *et al.* (1996);
 - Reptiles and Amphibians (Reptilia and Amphibia): Zhao E.-M. & Adler (1993); Zhao E. *et al.* (2000);
 - Fish (Actinopterygii): Nelson (1994); Wu *et al.* (1999);
 - Ants (Insecta: Hymenoptera: Formicidae): named species according to Bolton (1995); unnamed species with reference numbers according to the collection currently held by KFBG.
 - Dragonflies (Insecta: Odonata): Schorr *et al.* (2001a, 2001b);
 - Butterflies (Insecta: Lepidoptera): Bascombe (1995).
- Information on the global status of species is from IUCN publications, notably IUCN Species Survival Commission (2002). Certain taxa, including orchids, reptiles, amphibians, fish and invertebrates, have yet to be properly assessed for global status.
- Protected status in China is based on Hua & Yan (1993) for animals, and State Forestry Administration & Ministry of Agriculture (1999) for plants.

Location and management

- Xidamingshan Headwater Forest Nature Reserve is at the junction of several counties (Fusui, Longan, Daxin and Chongzuo) in southwest Guangxi, at 22°40' - 22°58'N, 107°17' - 107°46'E (Forestry Department of Guangxi Zhuang Autonomous Region, 1993; Zhang W., 1998). The total area is 601 km².
- The geology is mainly sandy shale. The region has a mountainous landscape with altitude ranging from 100 m to 1,071 m at Xidamingshan and 973 m at Xiaomingshan.
- The region has a northern tropical monsoon climate, with mean monthly temperature ranging from 13 °C in January to 28 °C in July. Average annual rainfall is around 1,200 mm, and this occurs mainly from May to September.
- The reserve was established in 1982 as a Provincial Nature Reserve to protect headwater forest and endangered flora and fauna, including *Camellia nitidissima* and Oriental Pied Hornbill (Forestry Department of Guangxi Zhuang Autonomous Region, 1993). It is listed as a Forest Ecosystem Nature Reserve (Zhang W., 1998), and is managed by the Forestry Department of Guangxi.

Results

Vegetation

- The zonal vegetation of the region should be northern tropical monsoon rainforest. However, the original forest cover has been almost completely destroyed. In the early 1990s small fragments of monsoon rainforest dominated by *Erythrophleum fordii*, *Mischocarpus pentapetalus*, *Dysoxylum hongkongense*, and *Horsfieldia glabra* were reported to remain in ravines (Forestry Department of Guangxi Zhuang Autonomous Region, 1993). On hillsides at high altitude were remnant patches of hillside monsoon evergreen broadleaf forest dominated by *Castanopsis hystrix*, *C. fabri*, *C. carlesii*, and *Machilus naka* (Forestry Department of Guangxi Zhuang Autonomous Region, 1993).
- Existing natural vegetation as observed in the present survey was mainly young secondary forest, although small patches of mature forest that have escaped complete clearance in the past could still be found in places. Trees in these patches reached 20 m in height and 1 m dbh, with a well-developed and mature liana community. The majority of the area comprised plantations of *Ilex kudincha*, Star Anise (*Illicium verum*), Masson Pine (*Pinus massoniana*), and China Fir (*Cunninghamia lanceolata*).

Flora

- The flora of Xidamingshan has received little study in the past. The present rapid survey recorded 93 species of vascular plants in 50 families, including one fern, three gymnosperms, and 89 species of flowering plants (Table 1). This rather low total reflects both the short survey time and the degraded nature of the vegetation.
- Some species recorded were of conservation importance:
 - *Alsophila spinulosa* and *Cinnamomum camphora* are Nationally Protected. The former has a scattered distribution in South China and is mainly found in or near relatively old-growth and mature forest. The latter has a long history of planting in South China but wild trees are rarely found. It is, however, difficult to determine whether the plants seen here were planted trees or their progeny or truly wild trees.
 - Three species of orchids found are listed in CITES Appendix II and one of them (*Anoectochilus roxburghii*) is endangered nationally by over-collecting for medicinal use.
 - *Alpinia pinnanensis* is endemic to Guangxi.

- Earlier surveys have also recorded the following threatened or protected species: *Erythrophleum fordii* (Protected II, Endangered), *Michelia odora* (*Tsoongiodendron odorum*) (Lower Risk), and *Aquilaria sinensis* (Protected II, Vulnerable) (Forestry Department of Guangxi Zhuang Autonomous Region, 1993).

Table 1. Vascular plant species recorded in Xidamingshan Headwater Forest Nature Reserve from 15 to 17 October 1998. Species that are under National Protection (Class I or II) (State Forestry Administration & Ministry of Agriculture, 1999), globally Threatened or Lower Risk (Near-threatened) (IUCN Species Survival Commission, 2002) or narrowly restricted in South China are indicated.

Family	Scientific name	Remarks
PTERIDOPHYTA		
Cyatheaceae	<i>Alsophila spinulosa</i> (Wall. ex Hook.) R.M.Tryon	Protected II
GYMNOSPERMAE		
Gnetaceae	<i>Gnetum montanum</i> Markgr.	
Pinaceae	<i>Pinus massoniana</i> Lamb.	
Taxodiaceae	<i>Cunninghamia lanceolata</i> (Lamb.) Hook.	cultivated
ANGIOSPERMAE		
Dicotyledonae		
Acanthaceae	<i>Staurogyne stenophylla</i> Merr. & Chun	
Actinidiaceae	<i>Actinidia latifolia</i> (Gardner et Champ.) Merr. <i>Saurauia tristyla</i> DC.	
Alangiaceae	<i>Alangium chinense</i> (Lour.) Harms.	
Anacardiaceae	<i>Choerospondias axillaris</i> (Roxb.) B.L. Burt et. A.W. Hill <i>Rhus chinensis</i> Mill. <i>Toxicodendron succedaneum</i> (L.) Kuntze.	
Annonaceae	<i>Fissistigma oldhamii</i> (Hemsl.) Merr. <i>Uvaria microcarpa</i> Champ. ex Benth.	
Araliaceae	<i>Schefflera octophylla</i> (Lour.) Harms	
Asteraceae	<i>Crassocephalum crepidioides</i> (Benth.) S. Moore <i>Eupatorium odoratum</i> L. <i>Inula cappa</i> (Buch.-Ham. ex D. Don) DC.	introduced from Africa introduced from S. America
Bignoniaceae	<i>Oroxylum indicum</i> (L.) Kurz	
Caesalpiniaceae	<i>Bauhinia championii</i> (Benth.) Benth.	
Campanulaceae	<i>Campanumoea javanica</i> Blume	
Clusiaceae	<i>Cratoxylum cochinchinense</i> (Lour.) Blume	
Connaraceae	<i>Rourea microphylla</i> (Hook. & Arn.) Planch.	
Dilleniaceae	<i>Dillenia turbinata</i> Finet & Gagnep.	
Euphorbiaceae	<i>Aporosa dioica</i> (Roxb.) Müll. Arg. <i>Bischofia javanica</i> Blume <i>Bischofia polycarpa</i> (H. Lév.) Airy Shaw <i>Breynia fruticosa</i> (L.) Hook. f. <i>Croton tiglium</i> L. <i>Macaranga denticulata</i> (Blume) Müll. Arg. <i>Mallotus barbatus</i> (Wall.) Müll. Arg. <i>Mallotus paniculatus</i> (Lam.) Müll. Arg. <i>Mallotus philippinensis</i> (Lam.) Müll. Arg. <i>Phyllanthus emblica</i> L. <i>Sapium discolor</i> (Champ. ex Benth.) Müll.-Arg.	
Fagaceae	<i>Castanopsis fissa</i> (Champ. ex Benth.) Rehder et E. H. Wilson	
Hamamelidaceae	<i>Liquidambar formosana</i> Hance <i>Mytilaria laosensis</i> Lecomte	
Hernandiaceae	<i>Illigera rhodantha</i> Hance	
Illiciaceae	<i>Illicium verum</i> Hook. f.	cultivated
Juglandaceae	<i>Engelhardtia roxburghiana</i> Wall.	
Lauraceae	<i>Actinodaphne pilosa</i> (Lour.) Merr. <i>Cinnamomum burmanni</i> (Nees et T. Nees) Blume <i>Cinnamomum camphora</i> (L.) J. Presl.	Protected II

	<i>Litsea cubeba</i> (Lour.) Pers.	
	<i>Litsea glutinosa</i> (Lour.) C. B. Rob.	
	<i>Litsea monopetala</i> (Roxb. ex Baker) Pers.	
Malvaceae	<i>Urena lobata</i> L.	pantropical weed
Melastomataceae	<i>Phyllagathis elattandra</i> Diels	
Meliaceae	<i>Melia azedarach</i> L.	
	<i>Toona sinensis</i> (Juss.) Roem.	
Mimosaceae	<i>Entada phaseoloides</i> (L.) Merr.	
	<i>Pithecellobium clypearia</i> (Jack) Benth.	
	<i>Pithecellobium lucidium</i> Benth.	
	<i>Pithecellobium utili</i> Chun et F.C. How	
Moraceae	<i>Ficus esquiroliana</i> H. Lév.	
	<i>Ficus hispida</i> L. f.	
	<i>Ficus variegata</i> Blume var. <i>chlorocarpa</i> (Benth.) King	
Myrsinaceae	<i>Ardisia primulifolia</i> Gardner & Champ.	
	<i>Ardisia quinquegona</i> Blume	
	<i>Embelia ribes</i> Burm. f.	
Myrtaceae	<i>Baeckea frutescens</i> L.	
	<i>Cleistocalyx operculatus</i> (Roxb.) Merr. et L. M. Perry	
	<i>Rhodomyrtus tomentosa</i> (Aiton) Hassk.	
Pandaceae	<i>Microdesmis caseariifolia</i> Planch.	
Papilionaceae	<i>Crotalaria assamica</i> Benth.	
	<i>Dalbergia rimosa</i> Roxb.	
	<i>Lespedeza formosa</i> (Vogel) Koehne	
	<i>Pueraria lobata</i> (Willd.) Ohwi var. <i>montana</i> (Lour.) Maesen	
Rhamnaceae	<i>Rhamnus crenata</i> Siebold & Zucc.	
Rubiaceae	<i>Schizomussaenda dehiscens</i> (Craib) H.L. Li	
	<i>Uncaria macrophylla</i> Wall.	
	<i>Wendlandia uvariifolia</i> Hance	
Rutaceae	<i>Evodia leptota</i> (Spreng.) Merr.	
Scrophulariaceae	<i>Paulownia fortunei</i> (Seem.) Hemsl.	
Solanaceae	<i>Solanum lasiocarpum</i> Dunal	
Sterculiaceae	<i>Byttneria aspera</i> Colebr. ex Wall.	
	<i>Sterculia lanceolata</i> Cav.	
Styracaceae	<i>Alniphyllum fortunei</i> (Hemsl.) Makino	
Theaceae	<i>Schima argentea</i> E. Pritz.	
Tiliaceae	<i>Microcos paniculata</i> L.	
Verbenaceae	<i>Callicarpa rubella</i> Lindl.	
Monocotyledonae		
Araceae	<i>Typhonium flagelliforme</i> (Lodd.) Blume	
Areaceae	<i>Caryota ochlandra</i> Hance	
Commelinaceae	<i>Commelina paludosa</i> Blume	
	<i>Floscopa scandens</i> Lour.	
Liliaceae	<i>Smilax perfoliata</i> Lour.	
Orchidaceae	<i>Anoectochilus roxburghii</i> (Wall.) Lindl.	terrestrial
	<i>Dendrobium lindleyi</i> Steud.	epiphytic
	<i>Tainia</i> sp.	terrestrial
Poaceae	<i>Miscanthus sinensis</i> Andersson	
Zingiberaceae	<i>Alpinia chinensis</i> (J. König) Roscoe	
	<i>Alpinia pinnanensis</i> T.L. Wu & S.J. Chen	endemic to Guangxi
	<i>Zingiber corallinum</i> Hance	

Mammals

- Pallas's Squirrels *Callosciurus erythraeus* were seen on 15 October, and on 17 October.
- Maritime Striped Squirrels *Tamiops maritimus* were seen on 17 October.
- A carnivore scat containing mammal fur and rat bones was found on a rock on 17 October.
- Species reported to occur by Forest Farm staff are listed in Table 2.

Table 2. The status of mammals (excluding Insectivora, Chiroptera and Muridae) at Xidamingshan Headwater Forest Nature Reserve, Guangxi, based largely on an interview with Forest Farm staff. Rank of abundance: “+” = rare, “++” = quite common, “+++” = abundant. Sequence follows Wilson & Cole (2000).

Scientific name	English name	Estimated abundance	Probable status
<i>Tupaia belangeri</i>	Northern Tree Shrew	+++	present
<i>Prionailurus bengalensis</i>	Leopard Cat	+++	present
<i>Arctonyx collaris</i>	Hog Badger	+	insecure
<i>Melogale moschata</i>	Chinese Ferret-badger	+++	present
<i>Mustela kathiah</i>	Yellow-bellied Weasel	+++	present
<i>Paguma larvata</i>	Masked Palm Civet	+++	present
<i>Prionodon pardicolor</i>	Spotted Linsang	+	insecure
<i>Viverricula indica</i>	Small Indian Civet	+	insecure
<i>Sus scrofa</i>	Wild Boar	+++	present
<i>Muntiacus reevesi</i>	Reeves's Muntjac	+++	uncertain
<i>Manis pentadactyla</i>	Chinese Pangolin	+	insecure
<i>Callosciurus erythraeus</i>	Pallas's Squirrel	+++	present
<i>Tamias maritimus</i>	Maritime Striped Squirrel	+++	present
<i>Rhizomys pruinosus</i>	Hoary Bamboo Rat	+++	present

- Some of the species reported to occur are of conservation concern:
 - Chinese Pangolin *Manis pentadactyla* is Near-threatened globally and Class II protected nationally.
 - Spotted Linsang *Prionodon pardicolor* and Small Indian Civet *Viverricula indica* are Class II protected nationally.

Birds

- A total of 74 species of birds were recorded in Xidamingshan Nature Reserve during this survey (Table 3).
- The most frequently encountered species were Chestnut Bulbul *Hemixos castanonotus*, Puff-throated Bulbul *Alophoixus pallidus*, Mountain Tailorbird *Orthotomus cuculatus*, Streak-breasted Scimitar Babbler *Pomatorhinus ruficollis*, Rufous-capped Babbler *Stachyris ruficeps* and Grey-cheeked Fulvetta *Alcippe morrisonia*.

Table 3. Birds recorded in Xidamingshan Headwater Forest Nature Reserve, 15-17 October 1998. Sequence follows Clements (2000).

English name	Scientific name
Little Heron	<i>Butorides striatus</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
Black Baza	<i>Aviceda leuphotes</i>
Crested Serpent Eagle	<i>Spilornis cheela</i>
Crested Goshawk	<i>Accipiter trivirgatus</i>
Bonelli's Eagle	<i>Hieraaetus fasciatus</i>
Eurasian Hobby	<i>Falco subbuteo</i>
Chinese Bamboo Partridge	<i>Bambusicola thoracica</i>
Red Junglefowl	<i>Gallus gallus</i>
Silver Pheasant	<i>Lophura nycthemera</i>
Watercock	<i>Gallinix cinerea</i>
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>
Oriental Turtle Dove	<i>Streptopelia orientalis</i>
Common Cuckoo	<i>Cuculus canorus</i>
Lesser Coucal	<i>Centropus bengalensis</i>
Collared Owlet	<i>Glaucidium brodiei</i>
Common Kingfisher	<i>Alcedo atthis</i>
Blue-throated Barbet	<i>Megalaima asiatica</i>
Barn Swallow	<i>Hirundo rustica</i>
White Wagtail	<i>Motacilla alba</i>

English name	Scientific name
Grey Wagtail	<i>Motacilla cinerea</i>
Olive-backed Pipit	<i>Anthus hodgsoni</i>
Scarlet Minivet	<i>Pericrocotus flammeus</i>
Grey-chinned Minivet	<i>Pericrocotus solaris</i>
Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>
Black-crested Bulbul	<i>Pycnonotus melanicterus</i>
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>
Light-vented Bulbul	<i>Pycnonotus sinensis</i>
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>
Chestnut Bulbul	<i>Hemixos castanotus</i>
Puff-throated Bulbul	<i>Alophoixus pallidus</i>
Mountain Bulbul	<i>Hypsipetes maclellandii</i>
Black Bulbul	<i>Hypsipetes madagascariensis</i>
Orange-headed Thrush	<i>Zoothera citrina</i>
Eurasian Blackbird	<i>Turdus merula</i>
Hill Prinia	<i>Prinia atrogularis</i>
Rufescent Prinia	<i>Prinia rufescens</i>
Yellow-bellied Prinia	<i>Prinia flaviventris</i>
Plain Prinia	<i>Prinia inornata</i>
Asian Stubtail	<i>Urosphena squameiceps</i>
Mountain Tailorbird	<i>Orthotomus cuculatus</i>
Dusky Warbler	<i>Phylloscopus fuscatus</i>
Yellow-streaked Warbler	<i>Phylloscopus armandii</i>
Arctic Warbler	<i>Phylloscopus borealis</i>
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>
Eastern Crowned Warbler	<i>Phylloscopus coronatus</i>
Golden-spectacled Warbler	<i>Seicercus burkii</i>
Grey-streaked Flycatcher	<i>Muscicapa griseisticta</i>
Hainan Blue Flycatcher	<i>Cyornis hainanus</i>
White-tailed Robin	<i>Myiomela leucura</i>
Slaty-backed Forktail	<i>Enicurus schistaceus</i>
Grey Bushchat	<i>Saxicola ferrea</i>
White-throated Fantail	<i>Rhipidura albicollis</i>
Black-naped Monarch	<i>Hypothymis azurea</i>
Greater Necklaced Laughingthrush	<i>Garrulax pectoralis</i>
Hwamei	<i>Garrulax canorus</i>
White-browed Laughingthrush	<i>Garrulax sannio</i>
Streak-breasted Scimitar Babbler	<i>Pomatorhinus ruficollis</i>
Spot-breasted Scimitar Babbler	<i>Pomatorhinus erythrocnemis</i>
Pygmy Wren Babbler	<i>Pnoepyga pusilla</i>
Rufous-capped Babbler	<i>Stachyris ruficeps</i>
Silver-eared Mesia	<i>Leiothrix argenteauris</i>
Blue-winged Minla	<i>Minla cyanouroptera</i>
Grey-cheeked Fulvetta	<i>Alcippe morrisonia</i>
Black-chinned Yuhina	<i>Yuhina nigrimenta</i>
White-bellied Yuhina	<i>Yuhina zantholeuca</i>
Velvet-fronted Nuthatch	<i>Sitta frontalis</i>
Great Tit	<i>Parus major</i>
Yellow-cheeked Tit	<i>Parus spilonotus</i>
Fork-tailed Sunbird	<i>Aethopyga christinae</i>
Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>
Japanese White-eye	<i>Zosterops japonicus</i>
White-rumped Munia	<i>Lonchura striata</i>
Grey Treepie	<i>Dendrocitta formosae</i>

- Black Baza *Aviceda leuphotes*, Crested Serpent Eagle *Spilornis cheela*, Bonelli's Eagle *Hieraetus fasciatus*, Crested Goshawk *Accipiter trivirgatus*, Eurasian Hobby *Falco subbuteo*, Red Junglefowl *Gallus gallus*, Silver Pheasant *Lophura nycthemera*, Lesser Coucal *Centropus bengalensis* and Collared Owlet *Glaucidium brodiei* are Class II Protected species of China.

- The presence of many forest-dependent species (such as Red Junglefowl, Silver Pheasant, Blue-throated Barbet *Megalaima asiatica*, minivets, various bulbuls, babblers, some of the warblers, flycatchers and Velvet-fronted Nuthatch *Sitta frontalis*) at Xidamingshan indicated that the forest patches surveyed, although rather young, have quite high ecological integrity.

Reptiles and Amphibians

- Eight species of amphibians, two species of lizard and ten species of snake were recorded during this rapid survey (Table 4).
- The most frequently encountered species was *Rana limnocharis*.
- Unidentified tadpoles possibly belonging to *Paa spinosa* were also found in a forest stream.

Table 4. Amphibians and reptiles of Xidamingshan Headwater Forest Nature Reserve and neighbouring area. Sequence follows Zhao E.-M. & Adler (1993).

Species	Habitat
AMPHIBIA	
<i>Bufo melanostictus</i>	stream
<i>Occidozyga lima</i>	stream
<i>Rana guentheri</i>	stream
<i>Rana limnocharis</i>	seepage
	ditch
	stream
	abandoned field
<i>Rana livida</i>	stream
<i>Rana rugulosa</i>	stream
<i>Polypedates megacephalus</i>	forest
<i>Microhyla pulchra</i>	abandoned field
REPTILIA	
<i>Calotes versicolor</i>	paddy field
	field/ shrubland
	plantation edge
<i>Tropidophorus sinicus</i>	stream
<i>Ahaetulla prasina</i>	shrubland
<i>Amphiesma stolatum</i>	paddy field/shrubland
<i>Enhydris chinensis</i>	ditch
<i>Ptyas mucosus</i>	stream
<i>Ptyas korros</i>	abandoned field
<i>Rhabdophis subminiatus</i>	forest
	fir plantation edge
<i>Sinonatrix aequifasciata</i>	stream
<i>Sinonatrix percarinata</i>	stream
<i>Xenochrophis piscator</i>	stream
<i>Ophiophagus hannah</i>	forest

- The presence of *Tropidophorus sinicus*, *Ahaetulla prasina*, *Sinonatrix aequifasciata* and *Ophiophagus hannah* indicates that the remaining forests and streams in Xidamingshan are quite intact.

Fish

- A total of 13 freshwater fish species were recorded from Xidamingshan; an additional nine species were reported to be present but specimens have not been examined by specialists (Table 5).
- The most widespread species recorded included *Rhinogobius yaoshanensis*, *Schistura fasciolata*, *Zacco platypus* and *Capoeta semifasciolata*.

- Specimens of the balitorid *Vanmanenia* (cf. *tetraloba*) sp. do not fit the description of any species known from Guangxi, and may prove to be of scientific/conservation interest.
- A number of species have restricted global range: *Rhinogobius yaoshanensis* is endemic to Guangxi, *Microphysogobio elongata* is endemic to the Zhujiang (Pearl River) drainage, and *Parazacco spilurus spilurus* and *Nicholsicypris normalis* to the Indochina region.

Table 5. Freshwater fish recorded from Xidamingshan, 15-17 October 1998 (“✓” = present, “#” = unconfirmed report).

Species	
<i>Parazacco spilurus spilurus</i>	✓
<i>Zacco platypus</i>	✓
<i>Nicholsicypris normalis</i>	✓
<i>Microphysogobio elongata</i>	✓
<i>Acheilognathus barbatulus</i>	#
<i>Capoeta semifasciolata</i>	✓
<i>Onychostoma barbata</i>	✓
<i>Carassius auratus</i>	#
<i>Misgurnus anguillicaudatus</i>	✓
<i>Vanmanenia</i> (cf. <i>tetraloba</i>) sp.	✓
<i>Pseudogastromyzon fangi</i>	✓
<i>Schistura fasciolata</i>	✓
<i>Schistura incerta</i>	✓
<i>Pelteobagrus fulvidraco</i>	#
<i>Mystus guttatus</i>	#
<i>Pterocryptis</i> sp.	✓
<i>Glyptothorax fukiensis fukiensis</i>	#
<i>Clarias fuscus</i>	#
<i>Mastacembelus armatus</i>	#
<i>Coreoperca whiteheadi</i>	#
<i>Rhinogobius yaoshanensis</i>	✓
<i>Macropodus opercularis</i>	#

- The presence of a variety of lotic fish species indicated the streams at Xidamingshan were rather intact.

Ants

- At least 57 species were recorded (Table 6). Many of these require specialist verification.
- The most frequently encountered species were *Camponotus rufoglaucus*, *Leptogenys kitteli* and *Myrmicaria* sp. 2.

Table 6. Ant species recorded at Xidamingshan, October 1998. * Species with a strong forest association.

Species	Habitat
<i>Aenictus</i> (<i>aratus</i> group) sp. 5	open broadleaf forest
<i>Aenictus binghami</i> *	forest, shrubland
<i>Camponotus nicobarensis</i>	shrubland
<i>Camponotus rufoglaucus</i>	forest, shrubland, grassland
<i>Camponotus</i> (cf. <i>wasmani</i>) sp. 35	low bamboo
<i>Camponotus</i> sp. 43	agricultural
<i>Cataulacus granulatus</i>	open forest
<i>Crematogaster</i> (cf. <i>dohrni</i>) sp. 8	open shrubland, grassland
<i>Crematogaster</i> (cf. <i>laboriosa</i>) sp. 3	grassland
<i>Crematogaster</i> (cf. <i>travancorensis</i>) sp. 2	open fir, open shrubland
<i>Crematogaster</i> sp. 21 *	closed pine & broadleaf forest
<i>Diacamma</i> (nr. <i>rugosum</i>) sp. 1	forest

Species	Habitat
<i>Dolichoderus</i> sp. 9	forest, shrubland
<i>Gnamptogenys bicolor</i>	forest
<i>Hypoponera</i> sp. 5	closed broadleaf forest
<i>Hypoponera</i> (cf. <i>excoecata</i>) sp. 2	forest
<i>Iridomyrmex</i> (<i>anceps</i> group) sp. 1	closed pine & broadleaf forest
<i>Leptogenys binghamii</i> *	open fir forest
<i>Leptogenys kitteli</i> *	forest
<i>Leptogenys</i> (cf. <i>lucidula</i>) sp. 15 *	closed broadleaf forest
<i>Monomorium</i> (cf. <i>impexum</i>) sp. 2 *	closed broadleaf forest
<i>Monomorium</i> sp. 4 *	closed broadleaf forest
<i>Myrmecaria</i> (cf. <i>brunnea</i>) sp. 2	forest, grassland
<i>Odontomachus monticola</i> *	open broadleaf forest
<i>Odontomachus</i> (cf. <i>silvestrii</i>) sp. 3	open broadleaf & bamboo wood
<i>Odontoponera</i> (cf. <i>denticulata</i>) sp. 1	forest, grassland
<i>Oligomyrmex</i> (cf. <i>wheeleri</i>) sp. 1 *	closed forest
<i>Pachycondyla leeuwenhoekei</i> *	closed forest
<i>Pachycondyla</i> (cf. <i>luteipes</i>) sp. 2 *	closed forest
<i>Pachycondyla</i> (cf. <i>nigrita</i>) sp. 17 *	forest, shrubland, grassland
<i>Pachycondyla rufipes</i>	open shrubland
<i>Pachycondyla</i> (cf. <i>sharpi</i>) sp. 12	open shrubland
<i>Paratrechina</i> (cf. <i>bourbonica</i>) sp. 4	abandoned field
<i>Paratrechina</i> (cf. <i>opaca</i>) sp. 26 *	open bamboo/shrubland
<i>Paratrechina</i> (nr. <i>indica</i>) sp. 9 *	closed forest
<i>Pheidole</i> cf. sp. 11	open fir, grassland
<i>Pheidole</i> (cf. <i>noda</i>) sp. 1	forest, shrubland
<i>Pheidole</i> sp. 11	closed forest
<i>Pheidole</i> sp. 13 *	closed broadleaf forest
<i>Pheidole</i> (<i>rinae</i> group) sp. 9	closed broadleaf forest
<i>Pheidole</i> (cf. <i>tsailuni</i>) sp. 7 *	closed broadleaf forest
<i>Pheidologeton</i> (cf. <i>melasolenus</i>) sp. 8 *	closed forest
<i>Polyrhachis demangei</i>	open shrubland
<i>Polyrhachis latona</i>	shrubland
<i>Pristomyrmex pungens</i>	forest edge
<i>Pyramica canina</i> *	closed forest
<i>Recurvidris</i> (cf. <i>recurvispinosa</i>) sp. 1 *	closed pine & broadleaf forest
<i>Rhoptomyrmex</i> (cf. <i>wroughtonii</i>) sp. 1	agricultural
<i>Tapinoma</i> sp. 1	open shrubland
<i>Technomyrmex albipes</i>	open broadleaf & pine forest
<i>Technomyrmex</i> sp. 2 *	forest
<i>Technomyrmex</i> sp. 6	closed forest
<i>Tetramorium bicarinatum</i>	agricultural
<i>Tetramorium</i> (cf. <i>tonganum</i>) sp. 12	open broadleaf
<i>Tetraoponera binghami</i>	open bamboo/shrubland
<i>Tetraoponera modesta</i>	closed broadleaf forest
<i>Vollenhovia</i> (cf. <i>emeryi</i>) sp. 1 *	closed forest

- *Leptogenys* (cf. *lucidula*) sp. 15 is known only from Xidamingshan, but matches unidentified specimens collected from Vietnam and Thailand by Seiki Yamane (JRF & S. Yamane of Kagoshima University, personal observations, November 2000).
- The proportion of forest-associated ants was low (37%), indicating the disturbed nature of the habitat. No confirmed exotic species were recorded; *Paratrechina* sp. 4 and *Technomyrmex albipes* are possibly exotic (Fellowes, 1999).

Dragonflies

- A total of 15 dragonfly species were recorded in the Xidamingshan area over the period 15-17 October. All but one of these were recorded at Lizhi on the first day (Table 7).

Table 7. Dragonflies recorded at Xidamingshan Headwater Forest Nature Reserve, 15-17 October 1998. Sequence of genera follows Schorr *et al.* (2001a, 2001b).

Species
<i>Rhinocypha p. perforata</i>
<i>Pseudagrion rubriceps</i>
<i>Euphaea decorata</i>
<i>Copera ciliata</i>
<i>Anax guttatus</i>
<i>Crocothemis servilia</i>
<i>Diplacodes trivialis</i>
<i>Neurothemis fulvia</i>
<i>Orthetrum glaucum</i>
<i>Orthetrum pruinosum</i>
<i>Orthetrum sabina</i>
<i>Pantala flavescens</i>
<i>Tamea virginia</i>
<i>Trithemis aurora</i>
<i>Trithemis festiva</i>

- The odonate fauna was generally typical of mixed habitats, and no restricted or forest-specialist species were recorded.

Butterflies

- A total of 79 butterfly species were recorded in the Xidamingshan area (Table 8).
- *Doleschallia bisaltide*, *Euripus nyctelius* and *Ticherra acte* are apparently new provincial records, not recorded from Guangxi by Chou (1994) or Bascombe (1995).

Table 8. Butterflies recorded at Xidamingshan, 15-17 October 1998.

Species	Habitat	Notes
<i>Erionota torus</i>	farmland/ shrub	
<i>Notocrypta curvifascia</i>	forest/ shrub	
<i>Parnara guttata</i>	farmland/ shrub	
<i>Tagiades litigiousus</i>	forest/ shrub	
<i>Telicota colon</i>	farmland/ shrub	
<i>Graphium agamemnon</i>	farmland/ shrub	
	forest/ shrub	
<i>Graphium chironides</i>	forest/ shrub	
<i>Graphium sarpedon</i>	farmland/ shrub	
	forest/ shrub	
<i>Graphium (Pathysa) antiphates</i>	farmland/ shrub	
	forest/ shrub	
<i>Lamproptera curius</i>	farmland/ shrub	
	forest/ shrub	
<i>Papilio helenus</i>	forest/ shrub	
<i>Papilio memnon</i>	farmland/ shrub	
<i>Papilio paris</i>	farmland/ shrub	
	forest/ shrub	
<i>Papilio polytes</i>	forest/ shrub	
<i>Papilio protenor</i>	farmland/ shrub	
	forest/ shrub	
<i>Catopsilia pomona</i>	farmland/ shrub	
<i>Catopsilia pyranthe</i>	farmland/ shrub	
<i>Cepora nadina</i>	forest/ shrub	
<i>Cepora nerissa</i>	farmland/ shrub	
	forest/ shrub	
<i>Delias pasithoe</i>	farmland/ shrub	
	forest/ shrub	
<i>Dercas verhuelli</i>	forest/ shrub	
<i>Eurema brigitta</i>	forest/ shrub	

Species	Habitat	Notes
<i>Eurema hecabe</i>	farmland/ shrub forest/ shrub	
<i>Hebomoia glaucippe</i>	farmland/ shrub forest/ shrub	
<i>Ixias pyrene</i>	farmland/ shrub	
<i>Pieris (Artogeia) canidia</i>	farmland/ shrub	
<i>Prioneris thestylis</i>	farmland/ shrub forest/ shrub	
<i>Abisara echerius</i>	farmland/ shrub forest/ shrub	
<i>Acytolepis puspa</i>	forest/ shrub	
<i>Jamides bochus</i>	forest/ shrub	
<i>Loxura atymnus</i>	farmland/ shrub	
<i>Pithecops corvus</i>	forest/ shrub	
<i>Spindasis lohita</i>	farmland/ shrub	
<i>Ticherra acte</i>	forest/ shrub	new Guangxi record
<i>Zemerus flegyas</i>	farmland/ shrub	
<i>Zizina otis</i>	farmland/ shrub forest/ shrub	
<i>Acraea issoria</i>	forest/ shrub	
<i>Apatura (Rohana) parisatis</i>	farmland/ shrub forest/ shrub	
<i>Argyreus hyperbius</i>	farmland/ shrub	
<i>Ariadne ariadne</i>	farmland/ shrub	
<i>Athyma nefte</i>	forest/ shrub	
<i>Athyma perius</i>	farmland/ shrub forest/ shrub	
<i>Athyma selenophora</i>	farmland/ shrub forest/ shrub	
<i>Cethosia biblis</i>	farmland/ shrub	
<i>Cethosia cyane</i>	farmland/ shrub forest/ shrub	
<i>Charaxes bernardus</i>	farmland/ shrub forest/ shrub	
<i>Cyrestis thyodamas</i>	farmland/ shrub	
<i>Danaus genutia</i>	farmland/ shrub forest/ shrub	
<i>Dichorragia nesimachus</i>	forest/ shrub	
<i>Doleschallia bisaltide</i>	forest/ shrub	new Guangxi record
<i>Euploea multiciber</i>	farmland/ shrub	
<i>Euploea tulliola</i>	forest/ shrub	
<i>Euripus nyctelius</i>	farmland/ shrub	new Guangxi record
<i>Euthalia lubentina</i>	forest/ shrub	
<i>Euthalia niepelti</i>	farmland/ shrub forest/ shrub	
<i>Euthalia phemius</i>	forest/ shrub	
<i>Hypolimnas bolina</i>	farmland/ shrub	
<i>Kaniska canace</i>	farmland/ shrub	
<i>Lethe confusa</i>	farmland/ shrub forest/ shrub	
<i>Limenitis (Moduza) procris</i>	farmland/ shrub forest/ shrub	
<i>Limenitis (Parasarpa) dudu</i>	forest/ shrub	
<i>Melanitis leda</i>	farmland/ shrub forest/ shrub	
<i>Mycalesis gotama</i>	farmland/ shrub	
<i>Mycalesis zonata</i>	farmland/ shrub forest/ shrub	
<i>Neptis clinia</i>	forest/ shrub	

Species	Habitat	Notes
<i>Neptis hylas</i>	farmland/ shrub forest/ shrub	
<i>Pantoporia hordonia</i>	farmland/ shrub forest/ shrub	
<i>Parantica aglea</i>	forest/ shrub	
<i>Polygonia (Kallima) inachus</i>	forest/ shrub	
<i>Polyura athamas</i>	farmland/ shrub	
<i>Precis (Junonia) almana</i>	forest/ shrub	
<i>Precis (Junonia) atlites</i>	farmland/ shrub forest/ shrub	
<i>Precis (Junonia) iphita</i>	farmland/ shrub forest/ shrub	
<i>Precis (Junonia) orithya</i>	farmland/ shrub	
<i>Symbrenthia lilaea</i>	farmland/ shrub	
<i>Tanaecia jului</i>	forest/ shrub	
<i>Tirumala limniace</i>	farmland/ shrub forest/ shrub	
<i>Vindula erota</i>	farmland/ shrub forest/ shrub	
<i>Ypthima baldus</i>	farmland/ shrub forest/ shrub	

- Several species were previously unrecorded during KFBG surveys, and apparently rare in South China. These included *Cepora nadina*, *Doleschallia bisaltide*, *Euploea tulliola*, *Euripus nyctelius*, *Moduza procris*, *Loxura atymnus* and *Ticherra acte*.
- Besides these, the butterfly fauna was typical of mixed habitats in the region.

Summary of flora and fauna

- The zonal vegetation of Xidamingshan should be northern tropical monsoon rainforest. At the time of the survey the vegetation was mainly young secondary forest, with patches of relatively mature forest in ravines and on hillsides at both low and high altitudes. There were also large areas of plantations of tree crops and timber.
- The present survey detected only 93 species of vascular plant, reflecting both the brevity of the survey and the degraded nature of the vegetation. Only two nationally Protected species and one endemic species were found. The three species of orchids found are listed in CITES Appendix II and one of them (*Anoectochilus roxburghii*) is endangered nationally by over-collection for medicinal use.
- Xidamingshan has quite a rich avifauna including many forest-dependent species (e.g. Red Junglefowl, Silver Pheasant, Blue-throated Barbet, minivets, various bulbuls, babblers, some of the warblers, flycatchers and Velvet-fronted Nuthatch). A number of the animal and plant species recorded, such as Blue-throated Barbet and White-tailed Robin, are rare in South China as their distributions are centred further west.
- The streams surveyed were rather rich in fish, reptiles and dragonflies. The presence of many potentially large-bodied fish species suggests that the impact of fishing has not been too severe.
- MacKinnon *et al.* (1996) considered Xidamingshan of national biodiversity significance on the basis of its large size and good forest quality, despite its low reported forest cover (30%). Forest integrity has apparently been further degraded during the 1990s, but the area remains of high local importance to biodiversity.

Threats and problems

- Most of the more natural forests at Xidamingshan were young and fragmented. Residents of the nature reserve still relied on logging and planting tree crops such as Pine, China Fir, *Illicium verum*, and *Ilex kudincha* for income. Hunting also still took place. Such activities undermine the integrity of the ecosystem, and the roles of the reserve in water, soil and biodiversity conservation.
- Of the three sections of the nature reserve, the Fenghuangshan section has been reported to be the best managed and most easily accessible (Forestry Department of Guangxi Zhuang Autonomous Region, 1993). However, at the time of our visit in 1998, we were told that the Fenghuangshan Forest Farm section of the nature reserve had no reasonable access and the forest was disturbed. This may be indicative of the general lack of attention and resources to properly manage this nature reserve.

Opportunities and recommendations

- The management authorities at Xidamingshan recognised the need for solutions enabling forests to be managed in a sustainable and diversified way, following the national ban on logging of natural forests. To achieve this will call for creative initiatives with a sound ecological basis.
- As a priority, existing natural forests need protection. Any logging and establishment of new plantations, and planting of saplings of tree-crops and timber, should be conducted more strategically such that the remaining natural forests will not be further degraded, and that they are linked by habitat corridors. Key habitats should be properly mapped, and the reserve should be zoned in terms of compatible human activities.
- Reforestation using native species should be considered in areas with unnatural vegetation, including old plantations with low output. An assembly of tree species representative of the remnant forests or original forest cover should be used. Seeds and saplings for reforestation could be collected locally or from nearby sites with similar geology. Advice on nursing seedlings and reforestation can be obtained from KFBG and from South China Agricultural University, both of which are running native tree nursery projects aimed at reforestation in South China.
- Training opportunities are needed for reserve staff to increase their knowledge and awareness of conservation, and their management effectiveness.

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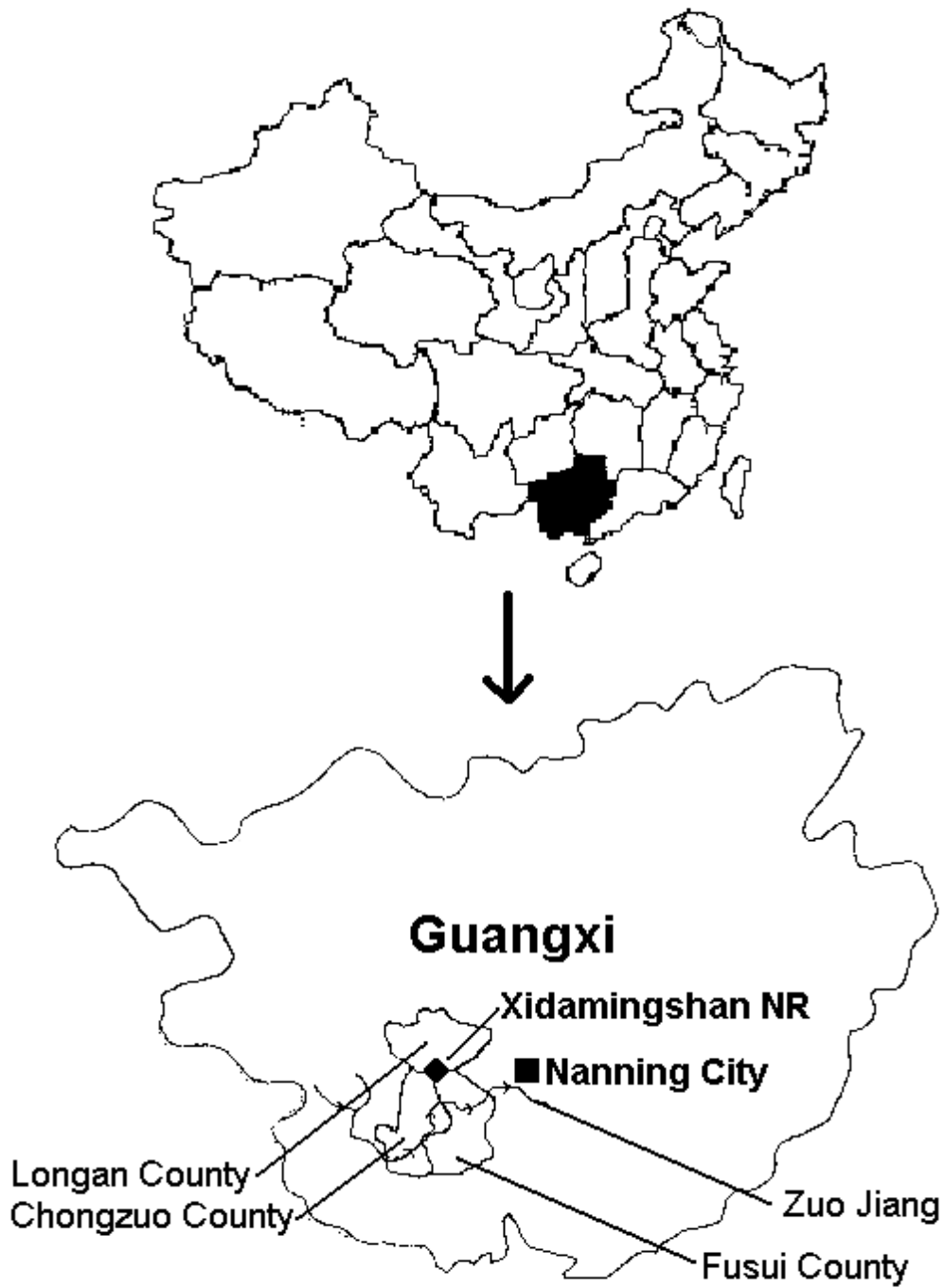


Figure 1. Map showing location of Xidamingshan Headwater Forest Nature Reserve, Southwest Guangxi, China.