



# **Report of Rapid Biodiversity Assessments at Chebaling National Nature Reserve, Northeast Guangdong, China, 1999, 2000 and 2001**

**Kadoorie Farm and Botanic Garden**  
in collaboration with  
**Guangdong Provincial Forestry Department**  
**South China Institute of Botany**  
**South China Normal University**

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# Report of Rapid Biodiversity Assessments at Chebaling National Nature Reserve, Northeast Guangdong, China, 1999, 2000 and 2001

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## Background

The present report details the findings of visits to Northeast Guangdong 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. 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 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, Gou	valley, stream
Kou	outlet
Ling	range
Nan	south
Ping	flat
Shan	mountain
Shi	city
Tun	hamlet
Wan	bay
Xi	west
Xi, Yong	stream
Xian	county
Xiang, Cun	village

# Report of Rapid Biodiversity Assessments at Chebaling National Nature Reserve, Northeast Guangdong, China, 1999, 2000 and 2001

## Objectives

- This report presents findings from several trips to Chebaling. The aim of the first trip was to release a rehabilitated bird rescued from Hong Kong. The second and fourth visits, in April 2000 and July 2001 respectively, were part of a species-specific survey for White-eared Night Heron (*Gorsarchius magnificus*), which included Chebaling following reports of the occurrence of the species there (Gao Yuren, South China Institute of Endangered Animals, pers. comm., Dec 1998). The aims of the third survey were to collect up-to-date information on the fauna and flora of Chebaling National Nature Reserve, and to use this to help determine conservation priorities within South China.

## Methods

- On 26-27 August 1999, members of KFBG (LKS, BC and Rupert Griffiths) and Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government (Mr. Chu Chak Kwan) visited Chebaling National Nature Reserve to release a rehabilitated Blyth's Kingfisher *Alcedo hercules* found in Hong Kong.
- On 7-11 April 2000 a team of biologists from Hong Kong (BH, LKS, JRF, VL, LY), France (HH) and Guangzhou (WRJ) visited Chebaling as part of a survey for White-eared Night Heron (Fellowes *et al.*, 2001).
- On 15-18 August 2000 a team of biologists from Hong Kong (BH, ML, LKS, CW, BC, NSC, GTR), Xinyang (LHJ), Guangxi (ZSY, HJH) and Guangzhou (XZ, DHJ, CZY, CBH, LS) conducted rapid biodiversity survey at Chebaling National Nature Reserve.
- On 20-23 July 2001 a team of biologists from Hong Kong (BC, LKS, SS) and France (OP) visited Chebaling as part of another survey for White-eared Night Heron.
- During fieldwork visual searching for plants, mammals, birds, reptiles, amphibians, fish, ants, butterflies and dragonflies were conducted. Frogs and birds were also identified 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 Chebaling was inferred based largely on past records (Lu *et al.* 1993; Zhang Y. *et al.* 1997 and references therein).
- Vascular plant records were made by CZY, CBH and NSC, and edited by NSC, except for orchids, for which records were verified or edited by Ms. Gloria Siu of Kadoorie Farm and Botanic Garden. Mammal records were made by LKS, ML, JRF, BH, BC, GTR or CW. Records of birds were made or verified by LKS, CW or ML, reptiles and amphibians by ML or BC, fish by BC, DHJ and CXL, ants by JRF, dragonflies by KW, GTR or ML and butterflies by GTR or ML.
- 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. (1996-2001); Anon. (2002a, 2002b); The Plant Names Project (2002);
  - Orchids (Angiospermae: Orchidaceae): Chen S.-C. (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 H.L. *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 (2002). Certain taxa, including orchids, reptiles, amphibians, fish and invertebrates, have yet to be properly assessed for global status. National conservation status of orchids is based on Wang *et al.* (in press)

- 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**

- Chebaling National Nature Reserve is in Shixing County, Shaoguan City District, Northeast Guangdong on the border with Jiangxi Province, at 24°14'-24°46'N by 104°09'-114°16'E (Zhang J., 1997) or 24°42'N by 114°10'E (MacKinnon *et al.*, 1996). The Reserve is about 76 km<sup>2</sup> in size (Zhang J., 1997), of which 65% was reported to be covered in broadleaf forest in the early 1990s (Lu *et al.*, 1993).
- The Nature Reserve has a mountainous landscape with altitude range from 330 m at Zhangdongshui to 1,256 m at the summit of Tianpingjia. The geology is dominated by sandy shale and volcanic rock (Xu, 1993).
- Chebaling has a subtropical monsoon climate. Mean monthly temperature ranges from 9.2°C in January to 28.5°C in July, with annual precipitation of around 1,500 mm, half of which occurs from April to June. November to January is the dry season (Zhang J., 1997). According to local residents, snow falls on the high ground each year.
- Chebaling was designated a nature reserve in 1981, and upgraded to a national nature reserve in 1988 to protect its subtropical evergreen broadleaf forests and rare fauna and flora (Lu *et al.* 1993; MacKinnon *et al.*, 1996).

## **Results**

### **Vegetation**

- The zonal vegetation of the Chebaling region is subtropical evergreen broadleaf forest dominated by Fagaceae, Lauraceae, and Theaceae. Two major types of broadleaf forest have been distinguished (Chen B. *et al.*, 1993):
  - i) Low altitude evergreen broadleaf forest at Sanjiaotang and Xianrendong at lower altitude; and
  - ii) Montane evergreen broadleaf forest, on hillsides at medium to high altitude.
- These forest types have a patchy distribution along valleys. In addition, there is a considerable extent of young secondary mixed coniferous and broadleaf forest, dominated by *Pinus massoniana*, *Liquidambar formosana* and *Castanopsis carlesii*, and plantation of *Pinus massoniana* and *Cunninghamia lanceolata* (China fir) in the Reserve (Chen B. *et al.*, 1993).
- The present survey in August 2000 covered mainly the core area and part of the buffer zone around the HQ at Zhangdongshui. Around Sanjiaotang, Xianrendong and Liangqiao Keng, mature secondary forest with trees 20-30 m tall and 60-80 cm dbh, dominated by *Acer cinnamomifolium*, *Castanopsis carlesii*, *C. lamontii*, *Liquidambar formosana*, *Schima superba* and *Alniphyllum fortunei*, could be found. Young secondary forest about 5-10 m tall, up to 20cm dbh and dominated by *Alniphyllum fortunei*, *Liquidambar formosana*, *Castanopsis fissa*, *Choerospondias axillaris* and *Pinus massoniana* could be found north of the HQ and around villages. These broadleaf forests were relatively extensive but to some extent fragmented by a mosaic of *Cunninghamia lanceolata* plantation and young *Pinus massoniana* forest.

### **Flora**

- The August 2000 survey recorded 602 vascular plant species including 69 fern species in 28 families, five gymnosperms in five families, and 528 angiosperms in 114 families (Table 1). This is a very high number given the two working days of fieldwork. Earlier surveys had recorded 1,457 vascular plant species in 199 families (Xiao *et al.*, 1993 and Wu H., 1993). This figure is likely to be an underestimate as a number of species recorded in the present survey were not mentioned by Xiao *et al.* (1993) or Wu (1993).
- Among the flora recorded in the survey, there are several plant species of conservation importance:
  - *Diplopanax stachyanthus* and *Halesia macgregorii* are considered globally Vulnerable. Both are widespread in South China. The former is restricted to mature forest.

- *Ixonanthes chinensis*, *Dalbergia balansae* and *Artocarpus hypargyreus* are considered globally Vulnerable. All three species are widespread and common in South China
- *Castanopsis kawakamii* and *Eurycorymbus cavaleriei* are at Lower Risk (Near-threatened) globally. Both are widespread in South China. The former occasionally dominates hillside broadleaf forest in South China. The latter is also under Class II National Protection and is restricted to relatively mature forest. *E. cavaleriei* was fairly common at Sanjiaotang and Liangqiao Keng and saplings were frequently seen.
- *Alsophila spinulosa* and *Gymnosphaera podophylla* belong to the tree fern family, which is under Class II National Protection in China. Both species have a wide distribution in China but are restricted to relatively mature forest. The former has been heavily exploited for medicinal purposes.
- *Cibotium barometz* is under Class II National Protection although it is locally common on hillside shrubland and forest margins in South China. It is threatened by collection for medicinal purposes.
- *Cinnamomum camphora* is under Class II National Protection but the plants seen are likely to be planted individuals.
- *Sarcococca longipetiolata* is endemic to Guangdong and South Hunan, and is rare wherever it occurs. Only a single plant was seen at Liangqiao Keng.
- *Blastus pauciflorus* is endemic to Guangdong and Jiangxi.

**Table 1.** Vascular plants of Chebaling National Nature Reserve recorded in the present survey (16-17 August 2000). Species which are nationally Protected (Class I or II) (State Forestry Administration & Ministry of Agriculture, 1999), globally Threatened or Lower Risk (Near-threatened) (IUCN, 2002) or globally restricted are indicated.

Family	Scientific name	Remarks
<b>PTERIDOPHYTA</b>		
Adiantaceae	<i>Adiantum caudatum</i> L. <i>Adiantum flabellulatum</i> L.	
Aspidiaceae	<i>Ctenitis rhodolepis</i> (C.B. Clarke) Ching <i>Ctenitis subglandulosa</i> (Hance) Ching <i>Tectaria subtriphylla</i> (Hook. & Arn.) Copel.	
Aspleniaceae	<i>Asplenium normale</i> D. Don <i>Asplenium pseudolaserpitifolium</i> Ching <i>Asplenium wrightii</i> Eaton ex Hook.	
Athyriaceae	<i>Allantodia virescens</i> (Kunze) Ching <i>Diplazium donianum</i> (Mett.) Tardieu <i>Diplazium subsinuatum</i> (Wall. ex Hook. & Grev.) Tagawa	
Blechnaceae	<i>Blechnum orientale</i> L. <i>Woodwardia japonica</i> (L.f.) Sm. <i>Woodwardia orientalis</i> Sw.	
Cyatheaceae	<i>Alsophila spinulosa</i> (Wall. ex Hook.) R.M. Tryon <i>Gymnosphaera podophylla</i> (Hook.) Copel.	Protected II Protected II
Davalliaceae	<i>Davallia tyermannii</i> (T. Moore) Hook. & Baker	
Dennstaedtiaceae	<i>Dennstaedtia scabra</i> (Wall.) Moore var. <i>glabrescens</i> (Ching) C. Chr. <i>Microlepia marginata</i> (Houtt.) C. Chr.	
Dicksoniaceae	<i>Cibotium barometz</i> (L.) J. Sm.	Protected II
Drynariaceae	<i>Pseudodrynaria coronans</i> (Wall. ex Mett.) Ching	
Dryopteridaceae	<i>Arachniodes chinensis</i> (Rosenst.) Ching <i>Cyrtomium balansae</i> (H. Christ) C. Chr. <i>Cyrtomium falcatum</i> (L. f.) C. Presl <i>Dryopteris decipiens</i> (Hook.) Kuntze <i>Polystichum eximium</i> (Mett. ex Kuhn) C. Chr.	
Equisetaceae	<i>Equisetum debile</i> Roxb.	
Gleicheniaceae	<i>Dicranopteris linearis</i> (Burm. f.) Underw. <i>Dicranopteris pedata</i> (Houtt.) Nakaike <i>Diplopterygium chinensis</i> (Rosenst.) DeVol	
Hemionitidaceae	<i>Coniogramme japonica</i> (Thunb.) Diels	
Huperziaceae	<i>Huperzia serrata</i> (Thunb.) Trevis.	
Hymenophyllaceae	<i>Crepidomanes auriculatum</i> (Blume) K. Iwats.	
Lindsaeaceae	<i>Lindsaea orbiculata</i> (Lam.) Mett. ex Kuhn	
Lycopodiaceae	<i>Lycopodium casuarinoides</i> (Spring) Holub <i>Palhinhaea cernua</i> (L.) Franco & Vasc.	
Lygodiaceae	<i>Lygodium japonicum</i> (Thunb.) Sw. <i>Lygodium scandens</i> (L.) Sw.	

Family	Scientific name	Remarks
Marattiaceae	<i>Angiopteris fokiensis</i> Hieron.	
Monachosporaceae	<i>Monachosorum henryi</i> H. Christ	
Nephrolepidaceae	<i>Nephrolepis auriculata</i> (L.) Trimea	
Osmundaceae	<i>Osmunda banksiifolia</i> (C. Presl) Kuhn	
	<i>Osmunda japonica</i> Thunb.	
	<i>Osmunda vachellii</i> Hook.	
Polypodiaceae	<i>Colysis elliptica</i> (Thunb.) Ching	
	<i>Colysis elliptica</i> (Thunb.) Ching var. <i>pothifolia</i> Ching	
	<i>Colysis hemionitidea</i> (Wall. ex Mett.) C. Presl	
	<i>Colysis wrightii</i> (Hook.) Ching	
	<i>Lemmaphyllum microphyllum</i> C. Presl	
	<i>Microsorium fortunei</i> (T. Moore) Ching	
	<i>Neolepisorus ovatus</i> (Wall. ex Bedd.) Ching	
	<i>Polypodiodes chinensis</i> (H. Christ) S.G. Lu	
	<i>Pyrrosia adnascens</i> (Sw.) Ching	
	<i>Pyrrosia lingua</i> (Thunb.) Farw	
Pteridaceae	<i>Histiopteris incisa</i> (Thunb.) J. Sm.	
	<i>Pteris fauriei</i> Hieron.	
	<i>Pteris insignis</i> Mett. ex Kuhn	
	<i>Pteris multifida</i> Poir.	
	<i>Pteris semipinnata</i> L.	
	<i>Pteris vittata</i> L.	
Selaginellaceae	<i>Selaginella delicatula</i> (Desv. ex Poir.) Alston	
	<i>Selaginella doederleinii</i> Hieron	
	<i>Selaginella moellendorffii</i> Hieron.	
Sinopteridaceae	<i>Onychium japonicum</i> (Thunb.) Kunze	
Thelypteridaceae	<i>Cyclosorus acuminatus</i> (Houtt.) Nakai ex H. Itô	
	<i>Cyclosorus parasiticus</i> (L.) Farw.	
	<i>Dictyocline griffithii</i> Moore	
	<i>Pronephrium aspera</i> (C. Presl) W. C. Shieh & J. L. Tsai	
	<i>Pronephrium triphyllum</i> (Sw.) Holttum	
<b>GYMNOSPERMAE</b>		
Cephalotaxaceae	<i>Cephalotaxus fortunei</i> Hook.	
Gnetaceae	<i>Gnetum montanum</i> Markgr.	
Pinaceae	<i>Pinus massoniana</i> Lamb.	
Podocarpaceae	<i>Podocarpus neriifolius</i> D. Don	
Taxodiaceae	<i>Cunninghamia lanceolata</i> (Lamb.) Hook.	planted
<b>ANGIOSPERMAE</b>		
<b>Dicotyledonae</b>		
Acanthaceae	<i>Baphicacanthus cusia</i> (Nees) Bremek.	
	<i>Championella tetrasperma</i> (Champ. ex Benth.) Brem.	
	<i>Dicliptera chinensis</i> (L.) Juss.	
	<i>Hygrophila salicifolia</i> (Vahl.) Ness	
	<i>Justicia adhodata</i> L.	
Aceraceae	<i>Acer cinnamomifolium</i> Hayata	
	<i>Acer fabri</i> Hance	
	<i>Acer tutcheri</i> Duthie	
Actinidiaceae	<i>Actinidia callosa</i> Lindl. var. <i>henryi</i> Maxim.	
	<i>Actinidia eriantha</i> Benth.	
	<i>Actinidia fulvicoma</i> Hance var. <i>lanata</i> (Hemsl.) C.F. Liang	
	<i>Actinidia latifolia</i> (Gardner & Champ.) Merr.	
	<i>Actinidia melliana</i> Hand.-Mazz.	
	<i>Saurauia tristyla</i> DC.	
Alangiaceae	<i>Alangium chinense</i> (Lour.) Harms.	
Amaranthaceae	<i>Achyranthes aspera</i> L.	
	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	
	<i>Alternanthera sessilis</i> (L.) DC.	pantropical weed
	<i>Amaranthus viridis</i> L.	
Anacardiaceae	<i>Choerospondias axillaris</i> (Roxb.) B.L. Burtt & A.W. Hill	
	<i>Rhus chinensis</i> Mill.	
	<i>Toxicodendron succedaneum</i> (L.) Kuntze.	
	<i>Toxicodendron sylvestre</i> (Siebold & Zucc.) Kuntze	
Annonaceae	<i>Artabotrys hongkongensis</i> Hance	
	<i>Desmos chinensis</i> Lour.	

Family	Scientific name	Remarks
	<i>Fissistigma glaucescens</i> (Hance) Merr.	
	<i>Fissistigma oldhamii</i> ( Hemsl. ) Merr.	
	<i>Uvaria calamistrata</i> Hance	
Apiaceae	<i>Uvaria microcarpa</i> Champ. ex Benth.	
Apocynaceae	<i>Centella asiatica</i> (L.) Urb.	
	<i>Alyxia sinensis</i> Champ. ex Benth.	
	<i>Kopsia arborea</i> Blume	
	<i>Pottsia laxiflora</i> (Blume) Kuntze	
	<i>Strophanthus divaricatus</i> (Lour.) Hook. & Arn.	
	<i>Trachelospermum jasminoides</i> (Lindl.) Lem.	
Aquifoliaceae	<i>Ilex ficoidea</i> Hemsl.	
	<i>Ilex hanceana</i> Maxim.	
	<i>Ilex kwangtungensis</i> Merr.	
	<i>Ilex micrococca</i> Maxim.	
	<i>Ilex pubescens</i> Hook. & Arn.	
	<i>Ilex rotunda</i> Thunb.	
	<i>Ilex triflora</i> Blume	
Araliaceae	<i>Aralia chinensis</i> L.	
	<i>Aralia decaisneana</i> Hance	
	<i>Aralia spinifolia</i> Merr.	
	<i>Dendropanax proteus</i> Benth.	
	<i>Diplopanax stachyanthus</i> Hand.-Mazz.	Vulnerable
	<i>Kalopanax septemlobus</i> (Thunb.) Koidz.	
	<i>Macropanax rosthornii</i> (Harms) C.Y. Wu ex C. Ho	
	<i>Schefflera delavayi</i> (Franch.) Harms	
	<i>Schefflera octophylla</i> (Lour.) Harms	
Asclepiadaceae	<i>Cynanchum paniculatum</i> (Bunge) Kitag.	
Asteraceae	<i>Ageratum conyzoides</i> L.	introduced from tropical America
	<i>Artemisia indica</i> Willd.	
	<i>Bidens pilosa</i> L.	introduced from tropical America
	<i>Blumea megacephala</i> (Randeria) Ching & Tseng	
	<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	introduced from Africa
	<i>Elephantopus scaber</i> L.	
	<i>Emilia sonchifolia</i> (L.) DC.	pan-tropical weed
	<i>Eupatorium chinense</i> L.	
	<i>Inula cappa</i> (Buch.-Ham. ex D. Don) DC.	
	<i>Ligularia japonica</i> (Thunb.) Less.	
	<i>Senecio scandens</i> Buch.-Ham.	
	<i>Vernonia cinerea</i> (L.) Less.	pan-tropical weed
	<i>Xanthium sibiricum</i> Patr. ex Widder	
Balsaminaceae	<i>Impatiens arguta</i> Hook. f. & Thomson	
Begoniaceae	<i>Begonia palmata</i> D. Don	
Boraginaceae	<i>Ehretia longiflora</i> Champ. ex Benth.	
Burseraceae	<i>Canarium album</i> (Lour.) Raeusch.	
	<i>Canarium pimela</i> Leenhouts	
Buxaceae	<i>Sarcococca longipetiolata</i> M. Cheng	endemic to Guangdong & South Hunan
Caesalpiniaceae	<i>Bauhinia championii</i> (Benth.) Benth.	
	<i>Gleditsia fera</i> (Lour.) Merr.	
Campanulaceae	<i>Campanumoea lancifolia</i> (Roxb.) Merr.	
	<i>Codonopsis lanceolata</i> (Siebold & Zucc.) Trautv.	
Capparaceae	<i>Capparis acutifolia</i> Sweet	
	<i>Capparis cantoniensis</i> Lour.	
Caprifoliaceae	<i>Lonicera confusa</i> (Sweet) DC.	
	<i>Lonicera japonica</i> Thunb. ex Murray	
	<i>Viburnum hanceanum</i> Maxim.	
	<i>Viburnum odoratissimum</i> Ker Gawl.	
	<i>Viburnum sempervirens</i> Koch	
Celastraceae	<i>Celastrus hindsii</i> Benth.	
	<i>Euonymus centidens</i> H. Lév.	
	<i>Euonymus hederaceus</i> Champ. ex Benth.	
	<i>Euonymus japonicus</i> Thunb.	



Family	Scientific name	Remarks
	<i>Euonymus laxiflorus</i> Champ. ex Benth.	
Chloranthaceae	<i>Chloranthus spicatus</i> (Thunb.) Makino	
Clethraceae	<i>Clethra faberi</i> Hance	
Clusiaceae	<i>Calophyllum membranaceum</i> Gardner & Champ.	
	<i>Cratoxylum cochinchinense</i> (Lour.) Blume	
	<i>Garcinia multiflora</i> Champ. ex Benth.	
	<i>Garcinia oblongifolia</i> Champ. ex Benth.	
	<i>Hypericum japonicum</i> Thunb. ex Murray	
Connaraceae	<i>Rourea microphylla</i> (Hook. & Arn.) Planch.	
Cornaceae	<i>Dendrobenthamia angustata</i> (Chun) W.P. Fang	
	<i>Dendrobenthamia hongkongensis</i> (Hemsl.) Hutch.	
Daphniphyllaceae	<i>Daphniphyllum calycinum</i> Benth	
	<i>Daphniphyllum oldhami</i> (Hemsl.) Rosenth.	
Dilleniaceae	<i>Tetracera asiatica</i> (Lour.) Hoog.	
Ebenaceae	<i>Diospyros eriantha</i> Champ. ex Benth.	
	<i>Diospyros lotus</i> L.	
	<i>Diospyros morrisiana</i> Hance ex. Walpers	
Elaeagnaceae	<i>Elaeagnus gonyanthes</i> Benth.	
Elaeocarpaceae	<i>Elaeocarpus chinensis</i> (Gardner & Champ.) Hook. f. ex Benth.	
	<i>Elaeocarpus decipiens</i> Hemsl.	
	<i>Elaeocarpus japonicus</i> Siebold & Zucc.	
	<i>Sloanea sinensis</i> (Hance) Hemsl.	
Ericaceae	<i>Lyonia ovalifolia</i> (Wall.) Drude	
	<i>Rhododendron cavaleriei</i> H. Lév.	
	<i>Rhododendron championiae</i> Hook. f.	
	<i>Rhododendron levinei</i> Merr.	
	<i>Rhododendron mariesii</i> Hemsl. & E.H. Wilson	
	<i>Rhododendron moulmainsense</i> Hook. f.	
	<i>Rhododendron ovatum</i> (Lindl.) Planch. ex Maxim.	
	<i>Rhododendron simsii</i> Planch.	
	<i>Vaccinium bracteatum</i> Thunb.	
	<i>Vaccinium carlesii</i> Dunn	
Escalloniaceae	<i>Itea chinensis</i> Hook. & Arn	
Euphorbiaceae	<i>Alchornea trewioides</i> (Benth.) Müll. Arg.	
	<i>Antidesma bunius</i> (L.) Spreng.	
	<i>Antidesma fordii</i> Hemsl.	
	<i>Antidesma japonicum</i> Siebold & Zucc.	
	<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>Bridelia insulana</i> Hance	
	<i>Bridelia tomentosa</i> Blume	
	<i>Euphorbia hirta</i> L.	
	<i>Flueggea virosa</i> (Roxb. ex Willd.) Voigt.	
	<i>Glochidion hirsutum</i> (Roxb.) Voigt	
	<i>Glochidion puberum</i> (L.) Hutch.	
	<i>Glochidion wrightii</i> Benth.	
	<i>Glochidion zeylanicum</i> (Gaertn.) A. Juss.	
	<i>Macaranga denticulata</i> (Blume) Müll. Arg.	
	<i>Mallotus apelta</i> (Lour.) Müll. Arg.	
	<i>Mallotus japonicus</i> (Thunb.) Müll. Arg.	
	<i>Mallotus paniculatus</i> (Lam.) Müll. Arg.	
	<i>Mallotus philippinensis</i> (Lam.) Müll. Arg.	
	<i>Mallotus repandus</i> (Willd.) Müll. Arg. var. <i>chrysocarpus</i> (Pamp.) S.M.	
	Hwang	
	<i>Phyllanthus emblica</i> L.	
	<i>Phyllanthus reticulatus</i> Poir.	
	<i>Sapium discolor</i> (Champ. ex Benth.) Müll.-Arg.	
	<i>Sapium sebiferum</i> (L.) Roxb.	
	<i>Vernicia fordii</i> (Hemsl.) Airy Shaw	
	<i>Vernicia montana</i> Lour.	
Fagaceae	<i>Castanopsis carlesii</i> (Hemsl.) Hayata	
	<i>Castanopsis eyrei</i> (Champ. ex Benth.) Tutcher	
	<i>Castanopsis fabri</i> Hance	
	<i>Castanopsis fargesii</i> Franch.	

Family	Scientific name	Remarks
	<i>Castanopsis fissa</i> (Champ. ex Benth.) Rehder & E. H. Wilson	
	<i>Castanopsis fordii</i> Hance	
	<i>Castanopsis kawakamii</i> Hayata	Lower Risk (nt)
	<i>Castanopsis lamontii</i> Hance	
	<i>Cyclobalanopsis championii</i> (Benth.) Oerst.	
	<i>Cyclobalanopsis fleuryi</i> (Hickel & A. Camus) Chun ex Q. F. Zheng	
	<i>Cyclobalanopsis myrsinifolia</i> (Blume) Oerst.	
	<i>Lithocarpus corneus</i> (Lour.) Rehder	
	<i>Lithocarpus glaber</i> (Thunb.) Nakai	
	<i>Lithocarpus hancei</i> (Benth.) Rehder	
	<i>Lithocarpus oleaeifolius</i> A. Camus	
Flacourtiaceae	<i>Bennettiodendron leprosipes</i> (Clos) Merr.	
	<i>Casearia balansae</i> Gagnep.	
	<i>Casearia glomerata</i> Roxb.	
	<i>Homalium cochinchinense</i> (Lour.) Druce	
	<i>Idesia polycarpa</i> Maxim.	
Gentianaceae	<i>Gentiana davidii</i> Franch.	
	<i>Gentiana loureiroi</i> (G. Don) Griseb.	
Gesnariaceae	<i>Chirita eburnea</i> Hance	
	<i>Lysionotus pauciflorus</i> Maxim.	
	<i>Oreocharis benthami</i> C. B. Clarke ex A. & C. DC.	
	<i>Rhynchotechum ellipticum</i> (Wal. ex D. Dietr.) A. DC.	
Haloragidaceae	<i>Haloragis chinensis</i> (Lour.) Merr.	
Hamamelidaceae	<i>Altingia chinensis</i> (Champ. ex Benth.) Oliv. ex Hance	
	<i>Eustigma oblongifolium</i> Gardner & Champ.	
	<i>Exbucklandia tonkinensis</i> (Lecomte) Steenis	
	<i>Liquidambar formosana</i> Hance	
	<i>Loropetalum chinense</i> (R. Br.) Oliv.	
Hydrangeaceae	<i>Hydrangea kwangsiensis</i> Hu var. <i>hedyotidea</i> (Chun) C.M. Hu	
	<i>Hydrangea paniculata</i> Siebold	
	<i>Pileostegia viburnoides</i> Hook. f. & Thomson	
Icacinaceae	<i>Mappianthes iodoides</i> Hand.-Mazz.	
Illiciaceae	<i>Illicium lanceolatum</i> A.C. Sm.	
Ixonanthaceae	<i>Ixonanthes chinensis</i> Champ.	Vulnerable
Juglandaceae	<i>Engelhardtia fenzelii</i> Merr.	
	<i>Engelhardtia roxburghiana</i> Wall.	
Lamiaceae	<i>Anisomeles indica</i> (L.) Kuntze	
	<i>Paraphlomis javanica</i> (Blume) Prain	
	<i>Scutellaria indica</i> L.	
Lardizabalaceae	<i>Akebia quinata</i> (Houtt.) Decne.	
	<i>Stauntonia hexaphylla</i> Decne. fo. <i>uropphylla</i> (Hand.-Mazz.) Wu	
Lauraceae	<i>Beilschmiedia tsangii</i> Merr.	
	<i>Cassytha filiformis</i> L.	
	<i>Cinnamomum burmanni</i> (Nees & T. Nees) Blume	
	<i>Cinnamomum camphora</i> (L.) J. Presl.	Protected II
	<i>Cinnamomum porrectum</i> (Roxb.) Kosterm.	
	<i>Cryptocarya chinensis</i> (Hance) Hemsl.	
	<i>Cryptocarya concinna</i> Hance	
	<i>Lindera communis</i> Hemsl.	
	<i>Litsea cubeba</i> (Lour.) Pers.	
	<i>Litsea elongata</i> Benth. & Hook. f. var. <i>subverticillata</i> (Y.C. Yang) Yen C. Yang & P.H. Huang	
	<i>Litsea monopetala</i> (Roxb. ex Baker) Pers.	
	<i>Litsea rotundifolia</i> Hemsl. var. <i>oblongifolia</i> (Nees) C. K. Allen	
	<i>Litsea verticillata</i> Hance	
	<i>Machilus chinensis</i> (Champ. ex Benth.) Hemsl.	
	<i>Machilus robusta</i> W.W. Sm	
	<i>Machilus thunbergii</i> Siebold & Zucc.	
	<i>Machilus velutina</i> Champ. ex Benth.	
	<i>Neolitsea cambodiana</i> Lecomte var. <i>glabra</i> Allen	
	<i>Neolitsea chunii</i> Merr.	
	<i>Neolitsea levinei</i> Merr.	
	<i>Neolitsea pulchella</i> (Meissn.) Merr	
	<i>Phoebe sheareri</i> (Hemsl.) Gamble	
Loganiaceae	<i>Gelsemium elegans</i> (Gardner & Champ.) Benth.	
	<i>Strychnos cathayensis</i> Merr.	

Family	Scientific name	Remarks
Lythraceae	<i>Rotala rotundifolia</i> (Buch.-Ham. ex Roxb.) Koehne	
Magnoliaceae	<i>Manglietia fordiana</i> Oliv. <i>Manglietia moto</i> Dandy <i>Michelia figo</i> (Lour.) Spreng. <i>Michelia foveolata</i> Merr. ex Dandy <i>Michelia maudiae</i> Dunn <i>Michelia odora</i> (Chun) Nooteb. & B. L. Chen <i>Michelia skinneriana</i> Dunn	
Malvaceae	<i>Sida rhombifolia</i> L. <i>Urena lobata</i> L. <i>Urena procumbens</i> L.	pantropical weed pantropical weed
Melastomataceae	<i>Blastus cochinchinensis</i> Lour. <i>Blastus pauciflorus</i> (Benth.) Guillaumin	endemic to Guangdong & Jiangxi
	<i>Melastoma candidum</i> D. Don <i>Melastoma dodecandrum</i> Lour. <i>Melastoma sanguineum</i> Sims <i>Memecylon ligustrifolium</i> Champ. ex Benth. <i>Osbeckia crinita</i> Benth. ex Triana <i>Phyllagathis cavaleriei</i> (H. Lév. & Vaniot) Guillaumin	
Meliaceae	<i>Toona sinensis</i> (Juss.) Roem.	planted
Menispermaceae	<i>Cocculus orbiculatus</i> (L.) DC. <i>Cyclea hypoglauca</i> (Schauer) Diels <i>Pericampylus glaucus</i> (Lam.) Merr.	
Mimosaceae	<i>Acacia pennata</i> (L.) Willd. <i>Adenanthera pavonina</i> L. var. <i>microsperma</i> (Teijsm. & Binnend.) I. C. Nielsen <i>Albizia chinensis</i> (Osbeck) Merr. <i>Albizia corniculata</i> (Lour.) Druce <i>Pithecellobium clypearia</i> (Jack) Benth. <i>Pithecellobium lucidium</i> Benth.	
Moraceae	<i>Artocarpus hypargyreus</i> Hance ex Benth. <i>Artocarpus styracifolius</i> Pierre <i>Artocarpus tonkinensis</i> A. Chev. ex Gagnep. <i>Broussonetia kaempferi</i> Sieb. <i>Broussonetia papyrifera</i> (L.) L'Hér. ex Vent. <i>Cudrania cochinchinensis</i> (Lour.) Kudo & Masam. <i>Ficus erecta</i> Thunb. <i>Ficus esquiroliana</i> H. Lév. <i>Ficus fistulosa</i> Reinw. ex Blume <i>Ficus formosana</i> Maxim. form. <i>shimadai</i> Hayata <i>Ficus hirta</i> Vahl <i>Ficus hispida</i> L. f. var. <i>rubra</i> Corner <i>Ficus langkokensis</i> Drake <i>Ficus microcarpa</i> L. f. <i>Ficus nervosa</i> B. Heyne ex Roth. <i>Ficus pandurata</i> Hance <i>Ficus pumila</i> L. <i>Ficus pyriformis</i> Hook. & Arn. <i>Ficus sarmentosa</i> Buch.-Ham. ex Sm. var. <i>henryi</i> (King ex Oliv.) Corner <i>Ficus stenophylla</i> Hemsl.	Vulnerable
Myricaceae	<i>Myrica rubra</i> (Lour.) Sieb. & Zucc.	
Myrsinaceae	<i>Ardisia crenata</i> Sims <i>Ardisia hanceana</i> Mez <i>Ardisia lindleyana</i> D. Dietr. <i>Ardisia mamillata</i> Hance <i>Ardisia primulifolia</i> Gardner & Champ. <i>Ardisia pusilla</i> A. DC. <i>Ardisia quinquegona</i> Blume <i>Embelia parviflora</i> Wall. ex A. DC. <i>Embelia ribes</i> Burm. f. <i>Embelia rudis</i> Hand.-Mazz. <i>Embelia undulata</i> (Wall.) Mez <i>Embelia vestita</i> Roxb. <i>Maesa japonica</i> (Thunb.) Moritzi & Zoll.	

Family	Scientific name	Remarks
Myrtaceae	<i>Maesa perlaris</i> (Lour.) Merr.	introduced from tropical America
	<i>Mysine seguinii</i> H. Lévl	
	<i>Baeckea frutescens</i> L.	
	<i>Psidium guajava</i> L.	
Oleaceae	<i>Rhodomyrtus tomentosa</i> (Aiton) Hassk.	
	<i>Syzygium buxifolium</i> Hook. & Arn.	
	<i>Syzygium hancei</i> Merr. & L. M. Perry	
	<i>Syzygium levinei</i> (Merr.) Merr. & L. M. Perry	
	<i>Osmanthus matsumuranus</i> Hayata	
Onagraceae	<i>Ludwigia octovalvis</i> (Jacq.) Raven	Vulnerable
Oxalidaceae	<i>Oxalis corniculata</i> L.	
Papaveraceae	<i>Corydalis racemosa</i> (Thunb.) Pers.	
Papilionaceae	<i>Dalbergia balansae</i> Prain	
	<i>Dalbergia hancei</i> Benth.	
	<i>Desmodium heterocarpon</i> (L.) DC.	
	<i>Lespedeza bicolor</i> Turcz.	
	<i>Lespedeza formosa</i> (Vogel) Koehne	
	<i>Millettia dielsiana</i> Harms	
	<i>Millettia pachycarpa</i> Benth.	
	<i>Millettia reticulata</i> Benth.	
	<i>Mucuna birdwoodiana</i> Tutch.	
	<i>Ormosia henryi</i> Prain	
	<i>Ormosia semicastrata</i> Hance	
	<i>Phyllodium pulchellum</i> (L.) Desv.	
	<i>Podocarpium laxum</i> (DC.) Yen C. Yang & P.H. Huang	
	<i>Pueraria lobata</i> (Willd.) Ohwi	
<i>Pueraria phaseoloides</i> (Roxb.) Benth.		
<i>Tadehagi triquetrum</i> (L.) H. Ohashi		
Pentaphragaceae	<i>Pentaphragax euryoides</i> Gardner & Champ.	
Piperaceae	<i>Piper hancei</i> Maxim.	
	<i>Piper hongkongense</i> C. DC.	
	<i>Piper sarmentosum</i> Roxb.	
Pittosporaceae	<i>Pittosporum glabratum</i> Lindl.	introduced
Plantaginaceae	<i>Plantago major</i> L.	
Polygalaceae	<i>Polygala fallax</i> Hemsl.	
	<i>Polygala hongkongensis</i> Hemsl. var. <i>stenophylla</i> (Hayata) Migo	
	<i>Polygala japonica</i> Houtt.	
	<i>Xanthophyllum hainanense</i> Hu	
Polygonaceae	<i>Antenoron filiforme</i> (Thunb.) Roberty & Vautier	
	<i>Polygonum chinense</i> L.	
	<i>Polygonum hastato-sagittatum</i> Mak.	
	<i>Polygonum perfoliatum</i> L.	
	<i>Reynoutria japonica</i> Houtt.	
Primulaceae	<i>Lysimachia fordiana</i> Oliv.	
	<i>Lysimachia heterogenea</i> Klatt	
	<i>Lysimachia parvifolia</i> Franch.	
Proteaceae	<i>Helicia cochinchinensis</i> Lour.	
	<i>Helicia reticulata</i> W. T. Wang	
Ranunculaceae	<i>Clematis chinensis</i> Osbeck	
	<i>Clematis meyeniana</i> Walp.	
Rhamnaceae	<i>Berchemia floribunda</i> (Wall.) Brongn.	
	<i>Berchemia lineata</i> (L.) DC.	
	<i>Rhamnus lamprophylla</i> C.K. Schneid.	
	<i>Sageretia thea</i> (Osbeck) M.C. Johnst.	
	<i>Ventilago leiocarpa</i> Benth.	
Rhizophoraceae	<i>Carallia brachiata</i> (Lour.) Merr.	
Rosaceae	<i>Agrimonia nipponica</i> Koidz. var. <i>occidentalis</i> Skalicky	
	<i>Laurocerasus phaeosticta</i> (Hance) C. K. Schneid.	
	<i>Photinia benthamiana</i> Hance	
	<i>Photinia prunifolia</i> (Hook. & Arn.) Lindl.	
	<i>Prunus adenodonta</i> Merr.	
	<i>Pygeum topengii</i> Merr.	
	<i>Pyrus calleryana</i> (L.) Lindl.	
	<i>Rhaphiolepis indica</i> (L.) Lindl.	
	<i>Rosa laevigata</i> Michx.	

Family	Scientific name	Remarks
Rubiaceae	<i>Rubus alceaefolius</i> Poir.	
	<i>Rubus lambertianus</i> Ser.	
	<i>Rubus leucanthus</i> Hance	
	<i>Rubus pirifolius</i> Sm.	
	<i>Adina pilulifera</i> (Lam.) Franch. ex Drake	
	<i>Aidia canthioides</i> (Champ. ex Benth.) Masam.	
	<i>Aidia cochinchinensis</i> Lour.	
	<i>Canthium dicoccum</i> (Gaertn.) Teysmann & Binnedijk	
	<i>Cephalanthus tetrandrus</i> (Roxb.) Ridsdale & Bakh. f.	
	<i>Coptosapelta diffusa</i> (Champ. ex Benth.) Steenis	
	<i>Diplospora dubia</i> (Lindl.) Masam.	
	<i>Fagerlindia scandens</i> (Thunb.) Tirveng.	
	<i>Gardenia jasminoides</i> J. Ellis	
	<i>Hedyotis auricularia</i> L.	
	<i>Hedyotis consanguinea</i> Hance	
	<i>Hedyotis hedyotidea</i> (DC.) Merr.	
	<i>Ixora chinensis</i> Lam.	
	<i>Lasianthus chinensis</i> (Champ. ex Benth.) Benth.	
	<i>Morinda umbellata</i> L.	
	<i>Mussaenda esquirolii</i> H. Lév.	
	<i>Mussaenda pubescens</i> W. T. Aiton	
	<i>Ophiorrhiza cantoniensis</i> Hance	
	<i>Ophiorrhiza japonica</i> Blume	
	<i>Paederia scandens</i> (Lour.) Merr.	
	<i>Pavetta hongkongensis</i> Brem.	
	<i>Psychotria asiatica</i> L.	
	<i>Psychotria serpens</i> L.	
<i>Tarenna attenuata</i> (Voigt) Hutch.		
<i>Tarenna mollissima</i> (Hook. & Arn.) B.L. Rob.		
<i>Uncaria hirsuta</i> Havil.		
Rutaceae	<i>Acronychia pedunculata</i> (L.) Miq.	
	<i>Evodia glabrifolia</i> (Champ. ex Benth.) C.C. Huang	
	<i>Evodia leptota</i> (Spreng.) Merr.	
	<i>Evodia ruticarpa</i> (A. Juss.) Benth.	
	<i>Fortunella hindsii</i> (Champ. ex Benth.) Swingle	
	<i>Skimmia reevesiana</i> (Fortune) Fortune	
	<i>Toddalia asiatica</i> (L.) Lam.	
	<i>Zanthoxylum avicennae</i> (Lam.) DC.	
	<i>Zanthoxylum nitidum</i> (Roxb.) DC.	
	<i>Zanthoxylum scandens</i> Blume	
Sabiaceae	<i>Meliosma rigida</i> Siebold & Zucc.	
	<i>Meliosma squamulata</i> Hance	
	<i>Sabia japonica</i> Maxim.	
Santalaceae	<i>Sabia limoniacea</i> Wall. ex Hook. f. & Thomson	
Santalaceae	<i>Dendrotrophe frutescens</i> (Champ. ex Benth.) Danser	
Sapindaceae	<i>Eurycorymbus cavaleriei</i> (H. Lév.) Rehder & Hand.-Mazz.	Lower Risk (nt)
Sapotaceae	<i>Sarcosperma laurinum</i> (Benth.) Hook. f.	
Saururaceae	<i>Houttuynia cordata</i> Thunb.	
Schisandraceae	<i>Kadsura longipedunculata</i> Finet & Gagnep.	
Solanaceae	<i>Solanum americanum</i> Mill.	introduced from America
Stachyleaceae	<i>Euscaphis konishii</i> Hayata	
Stachyleaceae	<i>Turpinia arguta</i> (Lindl.) Seem.	
Sterculiaceae	<i>Byttneria aspera</i> Colebr. ex Wall.	
	<i>Helicteres angustifolia</i> L.	
	<i>Pterospermum heterophyllum</i> Hance	
Styracaceae	<i>Reevesia thyrsoidea</i> Lindl.	
	<i>Sterculia lanceolata</i> Cav.	
	<i>Alniphyllum fortunei</i> (Hemsl.) Makino	
	<i>Halesia macgregorii</i> Chun	Vulnerable
	<i>Huodendron biaristatum</i> (W.W. Sm.) Rehder	
	<i>Styrax confusus</i> Hemsl.	
Symplocaceae	<i>Styrax odoratissimus</i> Champ. ex Benth.	
	<i>Styrax suberifolius</i> Hook. & Arn.	
	<i>Symplocos cochinchinensis</i> (Lour.) S. Moore	

Family	Scientific name	Remarks
	<i>Symplocos cochinchinensis</i> (Lour.) S. Moore subsp. <i>laurina</i> (Retz.) Noot.	
	<i>Symplocos congesta</i> Benth.	
	<i>Symplocos fukiensis</i> Ling	
	<i>Symplocos glauca</i> (Thunb.) Koidz.	
	<i>Symplocos lancifolia</i> Siebold & Zucc.	
	<i>Symplocos paniculata</i> (Thunb.) Miq.	
	<i>Symplocos poilanei</i> Guill.	
Theaceae	<i>Adinandra bockiana</i> E. Pritz var. <i>acutifolia</i> (Hand.-Mazz.) Kobuski	
	<i>Adinandra millettii</i> (Hook. & Arn.) Benth. & Hook. f. ex Hance	
	<i>Camellia caudata</i> Wall.	
	<i>Camellia oleifera</i> Abel	
	<i>Cleyera japonica</i> Thunb.	
	<i>Eurya chinensis</i> R. Br.	
	<i>Eurya ciliata</i> Merr.	
	<i>Eurya distichophylla</i> Hemsl.	
	<i>Eurya groffii</i> Merr.	
	<i>Eurya loquaiana</i> Dunn	
	<i>Eurya macartneyi</i> Champ.	
	<i>Eurya nitida</i> Korthals	
	<i>Schima superba</i> Gardn. & Champ.	
	<i>Ternstroemia gymnanthera</i> (Wight & Arn.) Bedd.	
	<i>Ternstroemia kwangtungensis</i> Merr.	
	<i>Ternstroemia luteoflora</i> L.K. Ling	
Thymelaeaceae	<i>Wikstroemia indica</i> (L.) C. A. Mey.	
	<i>Wikstroemia nutans</i> Champ. ex Benth.	
Tiliaceae	<i>Triumfetta cana</i> Blume	
Ulmaceae	<i>Aphananthe aspera</i> (Thunb.) Planch.	
	<i>Celtis tetrandra</i> Roxb. subsp. <i>sinensis</i> (Pers.) Y.C. Tang	
	<i>Trema cannabina</i> Lour.	
	<i>Trema orientalis</i> (L.) Blume	
Urticaceae	<i>Boehmeria densiglomerata</i> W.T. Wang	
Valerianaceae	<i>Patrinia scabiosifolia</i> Fisch. ex Trevir.	
	<i>Patrinia villosa</i> (Thunb.) Juss.	
Verbenaceae	<i>Callicarpa brevipes</i> (Benth.) Hance	
	<i>Callicarpa dichotoma</i> (Lour.) K. Koch	
	<i>Callicarpa formosana</i> Rolfe	
	<i>Callicarpa kochiana</i> Makino	
	<i>Callicarpa macrophylla</i> Vahl	
	<i>Callicarpa peichieniana</i> Chun & S. L. Chen	
	<i>Callicarpa rubella</i> Lindl.	
	<i>Clerodendrum canescens</i> Wall. ex Walp.	
	<i>Clerodendrum chinense</i> (Osbeck) Mabb.	mainly cultivated
	<i>Clerodendrum cyrtophyllum</i> Turcz.	
	<i>Clerodendrum fortunatum</i> L.	
	<i>Clerodendrum japonicum</i> (Thunb.) Sweet	
	<i>Lantana camara</i> L.	introduced
	<i>Verbena officinalis</i> L.	
	<i>Vitex negundo</i> L.	
	<i>Vitex negundo</i> L. var. <i>cannabifolia</i> (Siebold & Zucc.) Hand.-Mazz.	
	<i>Vitex quinata</i> (Lour.) F.N. Williams	
Violaceae	<i>Viola confusa</i> Champ. ex Benth.	
	<i>Viola diffusa</i> Ging.	
Vitaceae	<i>Ampelopsis cantoniensis</i> (Hook. & Arn.) Planch.	
	<i>Cayratia japonica</i> (Thunb.) Gagnep.	
	<i>Parthenocissus dalzielii</i> Gagnep.	
	<i>Tetrastigma planicaule</i> (Hook. f.) Gagnep.	
<b>Monocotyledonae</b>		
Amaryllidaceae	<i>Curculigo capitulata</i> (Lour.) Kuntze	
	<i>Curculigo orchioides</i> Gaertn.	
Araceae	<i>Acorus gramineus</i> Sol.	
	<i>Alocasia macrorrhiza</i> (L.) Schott	
	<i>Pothos chinensis</i> (Raf.) Merr.	
	<i>Pothos repens</i> (Lour.) Druce	
Areaceae	<i>Calamus rhabdocladus</i> Burret	

Family	Scientific name	Remarks
Commelinaceae	<i>Pinanga sinii</i> Burret	
	<i>Amischotolype hispida</i> (Less. & A. Rich.) D.Y. Hong	
Cyperaceae	<i>Murdannia triquetra</i> (Wall. ex C.B. Clarke) A. Brückn.	
	<i>Carex baccans</i> Nees	
	<i>Carex brunnea</i> Thunb.	
	<i>Carex cruciata</i> Wahlenb.	
	<i>Kyllinga brevifolia</i> Rottb.	
	<i>Lepidosperma chinensis</i> Nees & Meyen	
	<i>Rhynchospora rubra</i> (Lour.) Makino	
	<i>Schoenoplectus juncooides</i> (Roxb.) Palla	
	<i>Scleria chinensis</i> Kük.	
	<i>Scleria terrestris</i> (L.) Fassett	
	Dioscoreaceae	<i>Dioscorea cirrhosa</i> Lour.
<i>Dioscorea pentaphylla</i> L.		
<i>Eriocaulon buergerianum</i> Körn.		
Eriocaulaceae	<i>Eriocaulon cinereum</i> R. Br.	
Liliaceae	<i>Asparagus cochinchinensis</i> (Lour.) Merr.	
	<i>Aspidistra elatior</i> Blume	
	<i>Aspidistra minutiflora</i> Stapf	
	<i>Dianella ensifolia</i> (L.) DC.	
	<i>Smilax china</i> L.	
	<i>Smilax glabra</i> Roxb.	
	<i>Smilax hypoglauca</i> Benth.	
Musaceae	<i>Musa balbisiana</i> Colla	
Orchidaceae	<i>Anoectochilus</i> sp.	
	<i>Cymbidium kanran</i> Makino	
	<i>Habenaria ciliolaris</i> Kraenzl.	
	<i>Liparis bootanensis</i> Griff.	
	<i>Pholidota chinensis</i> Lindl.	
Pandanaaceae	<i>Spathoglottis pubescens</i> Lindl.	
	<i>Pandanus austrosinensis</i> T. L. Wu var. <i>longifolius</i> L. Y. Zhou ex X. W. Zhong	
Poaceae	<i>Arundinella anomala</i> Steud.	
	<i>Cyrtococcum patens</i> (L.) A. Camus	
	<i>Eleusine indica</i> (L.) Gaertn.	
	<i>Eragrostis pilosa</i> (L.) P. Beauv.	
	<i>Eragrostis unioloides</i> (Retz.) Nees ex Steud.	
	<i>Ichnanthus vicinus</i> (F.M. Bailey) Merr.	
	<i>Imperata koenigii</i> (Retz.) P. Beauv.	
	<i>Ischaemum ciliare</i> Retz.	
	<i>Lophatherum gracile</i> Brongn.	
	<i>Microstegium vagans</i> (Nees ex Steud.) A. Camus	
	<i>Miscanthus floridulus</i> (Labill.) Warb. ex K. Schum & Lauterb.	
	<i>Miscanthus sinensis</i> Andersson	
	<i>Panicum brevifolium</i> L.	
	<i>Panicum notatum</i> Retz.	
	<i>Panicum repens</i> L.	
	<i>Paspalum conjugatum</i> Bergius	
	<i>Paspalum thunbergii</i> Kunth ex Steud.	
	<i>Pennisetum alopecuroides</i> (L.) Spreng.	
	<i>Schizachyrium sanguineum</i> (Retz.) Alston	
	<i>Setaria glauca</i> (L.) P. Beauv.	
	<i>Setaria palmifolia</i> (J. Köenig) Stapf	
	<i>Setaria plicata</i> (Lam.) T. Cooke	
	<i>Themeda villosa</i> (Poir.) A. Camus	
<i>Thysanolaena maxima</i> (Roxb.) Kuntze		
Zingiberaceae	<i>Alpinia chinensis</i> (J. König) Roscoe	
	<i>Alpinia japonica</i> (Thunb.) Miq.	

### Mammals

- A dead Chinese Ferret-badger *Melogale moschata* was found on 8 April 2000.
- Maritime Striped Squirrels *Tamiops maritimus* were frequently seen or heard around the Reserve.
- A number of drowned rats, probably *Niviventer* sp., were found on 9 April 2000.
- A Red-hipped Squirrel *Dremomys pyrrhomerus* was heard on 10 April 2000.

- A very old pangolin burrow was found on 16 August 2000.
- The inferred status of mammals at Chebaling National Nature Reserve is listed in Table 2.

**Table 2.** Inferred status of mammals at Chebaling National Nature Reserve, based on past records from the Reserve or from Shixing County (Lu *et al.* 1993; Zhang Y. *et al.* 1997 and references therein). Abundance rating according to Lu *et al.* (1993), “+” = very rare or extirpated, “++” = rare, “+++” = common, “++++” = abundant. Sequence follows Wilson & Cole (2000).

Scientific name	English name	Past records	Probable status
<i>Pipistrellus abramus</i>	Japanese Pipistrelle	+++	present, confirmed
<i>Nyctereutes procyonoides</i>	Raccoon Dog	++ (Shixing)	insecure
<i>Catopuma temminckii</i>	Asiatic Golden Cat	+	insecure/extirpated
<i>Prionailurus bengalensis</i>	Leopard Cat	+++	present
<i>Neofelis nebulosa</i>	Clouded Leopard	+	insecure/extirpated
<i>Panthera pardus</i>	Leopard	+	insecure/extirpated
<i>Panthera tigris</i>	Tiger	+	insecure/extirpated
<i>Herpestes javanicus</i>	Javan Mongoose	++	insecure
<i>Herpestes urva</i>	Crab-eating Mongoose	++	insecure
<i>Lutra lutra</i>	Eurasian Otter	+	insecure/extirpated
<i>Arctonyx collaris</i>	Hog Badger	++	insecure
<i>Meles meles</i>	Eurasian Badger	++	insecure
<i>Melogale moschata</i>	Chinese Ferret-badger	++	present, confirmed
<i>Mustela kathiah</i>	Yellow-bellied Weasel	++	insecure
<i>Prionodon pardicolor</i>	Spotted Linsang	++	insecure
<i>Viverricula indica</i>	Small Indian Civet	+++	present
<i>Paguma larvata</i>	Masked Palm Civet	+++	present
<i>Sus scrofa</i>	Wild Boar	+++	present
<i>Cervus unicolor</i>	Sambar	+++	present
<i>Elaphodus cephalophus</i>	Tufted Deer	+	insecure/extirpated
<i>Muntiacus crinifrons</i>	Black Muntjac	++	insecure
<i>Muntiacus muntjak</i>	Indian Muntjac	+++	present
<i>Muntiacus reevesii</i>	Reeves's Muntjac	++	insecure
<i>Naemorhedus caudatus</i>	Chinese Goral	++	insecure
<i>Naemorhedus sumatraensis</i>	Serow	++	insecure
<i>Manis pentadactyla</i>	Chinese Pangolin	++	insecure
<i>Tamiops maritimus</i> (recorded as <i>T. swinhoei</i> )	Maritime Striped Squirrel	++ (Shixing)	present, confirmed
<i>Dremomys pyrrhomerus</i>	Red-hipped Squirrel		present, confirmed
<i>Dremomys rufigenis</i>	Red-cheeked Squirrel	+++ (Shixing)	unknown
<i>Petaurista petaurista</i>	Red Giant Flying Squirrel	++ (Shixing)	insecure
<i>Rhizomys pruinosus</i>	Hoary Bamboo Rat	++	insecure
<i>Rhizomys sinensis</i>	Chinese Bamboo Rat	+++	present
<i>Bandicota indica</i>	Large Bandicoot Rat	++++	present
<i>Mus musculus</i>	House Mouse	+++	present
<i>Rattus flavipectus</i>	Yellow-bellied Rat	+++	present
<i>Rattus norvegicus</i>	Brown Rat	++++	present
<i>Hystrix brachyura</i>	Malayan Porcupine	++	insecure
<i>Lepus sinensis</i>	Chinese Hare	+++	present

- Lu *et al.* (1993) commented that Red-cheeked Squirrel, Maritime Striped Squirrel, Indian Muntjac and Reeves's Muntjac were captured most frequently during the mammal survey conducted between 1988 to 1990.
- An unconfirmed record of Daubenton's Bat *Myotis daubentoni* was made in 1995 by Ades *et al.* (1996).
- Tiger tracks were reported to have been found near Xianrendong in around 1990 by one of the villagers (Ades *et al.*, 1996). Signs and prey remains of Tiger were also reported from Tianpingjia and Yaobeikeng (Lu *et al.* 1993).

### Birds

- Ninety-five species of birds were recorded during this survey (Table 3). The birds of Chebaling have been well surveyed by Hong Kong ornithologists since 1995, with some 154 species recorded (Lewthwaite, 1996a). The present survey added only four new records to these: Collared Scops Owl *Otus bakkamoena*, Ashy Minivet *Pericrocotus divaricatus*, Rufous-faced Warbler *Abroscopus albogularis* and Indian Grackle *Gracula religiosa*.



- The most frequently encountered species included Black-browed Barbet *Megalaima oorti*, Chestnut Bulbul *Hemixos castanonotus*, Grey-cheeked Fulvetta *Alcippe morrisonia* and Grey Treepie *Dendrocitta formosae*.

**Table 3.** Birds recorded at Chebaling National Nature Reserve (August 1999, April & August 2000, July 2001). Sequence follows Clements (2000).

<b>English name</b>	<b>Scientific name</b>
Little Heron	<i>Butorides striatus</i>
White-eared Night Heron	<i>Gorsachius magnificus</i>
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>
Black Baza	<i>Aviceda leuphotes</i>
Crested Serpent Eagle	<i>Spilornis cheela</i>
Besra	<i>Accipiter virgatus</i>
Crested Goshawk	<i>Accipiter trivirgatus</i>
Chinese Bamboo Partridge	<i>Bambusicola thoracica</i>
Common Pheasant	<i>Phasianus colchicus</i>
Silver Pheasant	<i>Lophura nycthemera</i>
Chestnut-winged Cuckoo	<i>Clamator coromandus</i>
Large Hawk Cuckoo	<i>Hierococcyx sparverioides</i>
Asian Koel	<i>Eudynamys scolopacea</i>
Drongo Cuckoo	<i>Surniculus lugubris</i>
Greater Coucal	<i>Centropus sinensis</i>
Lesser Coucal	<i>Centropus bengalensis</i>
Eurasian EagleOwl	<i>Bubo bubo</i>
Mountain Scops Owl	<i>Otus spilocephalus</i>
Collared Scops Owl	<i>Otus bakkamoena</i>
Oriental Scops Owl	<i>Otus sunia</i>
Collared Owlet	<i>Glaucidium brodiei</i>
Asian Barred Owlet	<i>Glaucidium cuculoides</i>
Grey Nightjar	<i>Caprimulgus indicus</i>
House Swift	<i>Apus affinis</i>
Red-headed Trogon	<i>Harpactes erythrocephalus</i>
Blyth's Kingfisher	<i>Alcedo hercules</i>
Common Kingfisher	<i>Alcedo atthis</i>
Crested Kingfisher	<i>Ceryle lugubris</i>
Dollarbird	<i>Eurystomus orientalis</i>
Great Barbet	<i>Megalaima virens</i>
Black-browed Barbet	<i>Megalaima oorti</i>
Speckled Piculet	<i>Picumnus innominatus</i>
Grey-capped Woodpecker	<i>Picoides canicapillus</i>
Great Spotted Woodpecker	<i>Dendrocopos major</i>
Rufous Woodpecker	<i>Celeus brachyurus</i>
Grey-headed Woodpecker	<i>Picus canus</i>
Bay Woodpecker	<i>Blythipicus pyrrhotis</i>
Barn Swallow	<i>Hirundo rustica</i>
Red-rumped Swallow	<i>Hirundo daurica</i>
Asian House Martin	<i>Delichon dasypus</i>
Olive-backed Pipit	<i>Anthus hodgsoni</i>
White Wagtail	<i>Motacilla alba</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Ashy Minivet	<i>Pericrocotus divaricatus</i>
Scarlet Minivet	<i>Pericrocotus flammeus</i>
Grey-chinned Minivet	<i>Pericrocotus solaris</i>
Large Wood Shrike	<i>Tephrodornis gularis</i>
Collared Finchbill	<i>Spizixos semitorques</i>
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>
Light-vented Bulbul	<i>Pycnonotus sinensis</i>
Chestnut Bulbul	<i>Hemixos castanonotus</i>
Mountain Bulbul	<i>Hypsipetes mccllellandii</i>
Black Bulbul	<i>Hypsipetes leucocephalus</i>
Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>
Blue Whistling Thrush	<i>Myophonus caeruleus</i>
Oriental Magpie Robin	<i>Copsychus saularis</i>
Siberian Stonechat	<i>Saxicola torquata</i>
Brown Dipper	<i>Cinclus pallasii</i>
Plumbeous Water Redstart	<i>Rhyacornis fuliginosus</i>

English name	Scientific name
Slaty-backed Forktail	<i>Enicurus schistaceus</i>
Hill Prinia	<i>Prinia atrogularis</i>
Yellow-bellied Prinia	<i>Prinia flaviventris</i>
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>
Pallas's Leaf Warbler	<i>Phylloscopus proregulus</i>
Rufous-faced Warbler	<i>Abroscopus albogularis</i>
Blue-and-white Flycatcher	<i>Cyanoptila cyanomelana</i>
Hainan Blue Flycatcher	<i>Cyornis hainanus</i>
Greater Necklaced Laughingthrush	<i>Garrulax pectoralis</i>
Lesser Necklaced Laughingthrush	<i>Garrulax monileger</i>
Hwamei	<i>Garrulax canorus</i>
White-browed Laughingthrush	<i>Garrulax sannio</i>
Spot-breasted Scimitar Babbler	<i>Pomatorhinus erythrogenys</i>
Streak-breasted Scimitar Babbler	<i>Pomatorhinus ruficollis</i>
Rufous-capped Babbler	<i>Stachyris ruficeps</i>
Red-billed Leiothrix	<i>Leiothrix lutea</i>
Grey-cheeked Fulvetta	<i>Alcippe morrisonia</i>
Striated Yuhina	<i>Yuhina castaniceps</i>
White-bellied Yuhina	<i>Yuhina zantholeuca</i>
Black-throated Tit	<i>Aegithalos concinnus</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>
Long-tailed Shrike	<i>Lanius schach</i>
Ashy Drongo	<i>Dicrurus leucophaeus</i>
Red-billed Blue Magpie	<i>Urocissa erythrorhyncha</i>
Grey Treepie	<i>Dendrocitta formosae</i>
Crested Myna	<i>Acridotheres cristatellus</i>
Indian Grackle	<i>Gracula religiosa</i>
White-rumped Munia	<i>Lonchura striata</i>
Scaly-breasted Munia	<i>Lonchura punctulata</i>
Black-faced Bunting	<i>Emberiza spodocephala</i>

- A number of species are of conservation concern:
  - White-eared Night Heron *Gorsachius magnificus* is globally Endangered and Class II Protected nationally. From 1998 to 2001, six individuals have been recorded in the Chebaling area: two birds seen in the wild, three specimens held by reserve staff and one live captive specimen which was released during the August 1999 visit. Mr Dai, a Yao resident of the ecological village, reported that White-eared Night Heron was usually seen in fields in June and July, suggesting a small population exists in the Chebaling area.
  - Blyth's Kingfisher *Alcedo hercules*, considered at Lower Risk (Near-threatened) globally, is known from only three sites (Chebaling, Huaping and Jiulianshan) in South China. In March 1996 seven individuals were counted at Chebaling by ornithologists from Hong Kong (Leven, 1996).
  - Black Baza *Aviceda leuphotes*, Crested Serpent Eagle *Spilornis cheela*, Besra *Accipiter virgatus*, Crested Goshawk *Accipiter trivirgatus*, Silver Pheasant *Lophura nycthemera*, Greater Coucal *Centropus sinensis*, Lesser Coucal *Centropus bengalensis*, Eagle Owl *Bubo bubo*, Mountain scops Owl *Otus spilocephalus*, Oriental Scops Owl *Otus sunia*, Collared Owlet *Glaucidium brodiei* and Asian Barred Owlet *Glaucidium cuculoides* are Class II Protected nationally.
  - Common Pheasant *Phasianus colchicus*, Ashy Minivet *Pericrocotus divaricatus*, Large Wood Shrike *Tephrodornis gularis* and Indian Grackle *Gracula religiosa* have rarely been encountered during KFBG surveys. The record of Indian Grackle could represent escaped or released bird since Chebaling is far from its known range.
- Chebaling has been well surveyed by Hong Kong ornithologists since 1995, with some 154 species recorded (Lewthwaite, 1996a). In addition to the above species, these included several species of conservation concern:
  - Black Eagle *Ictinaetus malayensis* is Class II Protected nationally and rare in South China. One bird was also seen during a visit to the Reserve in June 1996 (ML & JRF, unpublished data).
  - Mountain Hawk Eagle *Spizaetus nipalensis* and Mandarin Duck *Aix galericulata*, Chinese

Sparrowhawk *Accipiter soloensis*, Eurasian Hobby *Falco subbuteo* and Peregrine Falcon *Falco peregrinus* are Class II Protected nationally.

- The presence of many species in forest-dependent groups like woodpeckers and owls, and stream-associated species such as certain ardeids, Blyth's Kingfisher and Brown Dipper, indicated that some of the forests and streams at Chebaling have high integrity. A number of species have been recorded at exceptionally high abundances (Lewthwaite, 1996b).

### **Reptiles and Amphibians**

- Eleven species of amphibian and twelve species of reptile (four lizards and eight snakes) were recorded at Chebaling during the surveys (Table 4). *Platyplacopus kuehnei*, *Sphenomorphus incognitus*, *Xenopeltis hainanensis*, *Dinodon flavozonatum* and *Lycodon ruhstrati* are new for the Reserve.
- The record of *Xenopeltis hainanensis* is apparently the first for Guangdong.

**Table 4.** Amphibians and reptiles recorded in Chebaling National Nature Reserve. Sequence follows Zhao E.-M. & Adler (1993).

<b>Species</b>	<b>Habitat</b>
<b>AMPHIBIA</b>	
<i>Megophrys mangshanensis</i>	forest stream
<i>Bufo melanostictus</i>	forest edge
<i>Amolops ricketti</i>	stream forest
<i>Paa spinosa</i>	stream
<i>Rana fujianensis</i>	forest pool forest ditch forest
<i>Rana guentheri</i>	paddy field forest edge
<i>Rana latouchii</i>	forest
<i>Rana limnocharis</i>	forest ditch abandoned field paddy field forest shrubland village
<i>Rana livida</i>	forest edge stream forest
<i>Rana schmackeri</i>	stream forest edge forest
<i>Microhyla heymonsi</i>	forest pool forest ditch
<b>REPTILIA</b>	
<i>Acanthosaura lepidogaster</i>	forest
<i>Platyplacopus kuehnei</i>	village
<i>Sphenomorphus incognitus</i>	stream
<i>Sphenomorphus indicus</i>	forest/field forest
<i>Xenopeltis hainanensis</i>	forest edge
<i>Amphiesma boulengeri</i>	forest edge
<i>Boiga kraepelini</i>	forest edge
<i>Dinodon flavozonatum</i>	forest
<i>Oligodon chinensis</i>	forest edge
<i>Lycodon ruhstrati</i>	forest forest edge
<i>Bungarus multicinctus</i>	forest edge
<i>Protobothrops mucrosquamatus</i>	forest edge

- *Megophrys mangshanensis* is of conservation significance, as it has a restricted distribution in Hunan and Guangdong.

- Additional species recorded in a survey from 31 May to 3 June 1996 (Lau, 1996) include: *Bufo gargarizans*, *Paa exilispinosa*, *Polypedates dennysi*, *Polypedates megacephalus*, *Microhyla butleri*, *Microhyla ornata*, *Takydromus septentrionalis*, *Scincella* (cf. *rupicola*) sp. (as *Sphenomorphus* sp.), *Amphiesma popei*, *Cyclophiops major*, *Psammodynastes pulverulentus*, *Pseudoxenodon bambusicola*, *Sinonatrix percarinata*, *Zaocys dhumnades*, *Calliophis maccllellandi* and *Naja atra* (as *N. naja*). In the reserve museum, specimens of *Pachytriton brevipes*, *Rana rugulosa*, *Platysternon megacephalum*, *Eumeces chinensis*, *Achalinus rufescens*, *Pareas chinensis*, *Ptyas korros*, *Sinonatrix aequifasciatus*, *Xenochrophis piscator* and *Azemiops feae* were also present. These are believed to have been collected within the Reserve.
- In addition to these Liang (1993a, 1993b) reported the following species: *Megophrys boettgeri*, *Hyla chinensis*, *Hyla simplex*, *Rana japonica*, *Kaloula pulchra*, *Microhyla pulchra*, *Chinemys reevesii*, *Sacalia bealei* (as *Clemmys bealei*), *Palea steindachneri* (as *Trionyx steindachneri*), *Pelodiscus sinensis* (as *Trionyx sinensis*), *Calotes versicolor*, *Gekko chinensis*, *Gekko subpalmatus*, *Hemidactylus bowringi*, *Hemidactylus frenatus*, *Eumeces elegans*, *Takydromus sexlineatus*, *Amphiesma stolatum*, *Calamaria septentrionalis*, *Dinodon rufozonatum*, *Elaphe carinata*, *Elaphe taeniura*, *Enhydryis plumbea*, *Ptyas mucosus*, *Rhabdophis nigrocincta*, *Sinonatrix annularis*, *Bungarus fasciatus*, *Ophiophagus hannah*, *Deinagkistrodon acutus* and *Trimeresurus stejnegeri*.
- The high diversity of forest and forest stream herpetofauna indicates high integrity in the forests at Chebaling.

### Fish

- A total of 15 freshwater fish species were recorded from Chebaling National Nature Reserve; an additional 11 species have been recorded and are listed here (Table 5).
- The most frequently encountered species were *Pseudogastromyzon changtingensis tungpeiensis*, *Zacco platypus* and *Acrossocheilus parallens*.
- The stream catfish *Pterocryptis* sp. is new to science; a specimen from Chebaling has been assigned as a paratype (Ng & Chan, in preparation). A species in the stream-goby genus *Rhinogobius* could not be identified using existing keys to Chinese freshwater fish.

**Table 5.** Freshwater fish recorded from Chebaling National Nature Reserve, North Guangdong, August 2000 and July 2001, and on reserve checklist produced (Lin Y.H. et al. 1993). Sequence of families follows Nelson (1994). "\*" = nomenclature follows Pan (1991).

Species	Reserve checklist	Survey result
<i>Anguilla japonica</i>	✓	
<i>Zacco platypus</i>	✓	✓
<i>Opsariichthys bidens</i>	✓	✓
<i>Hemibarbus medius</i>	✓	
<i>Acrossocheilus parallens</i>	✓	✓
<i>Onychostoma barbatula</i>	✓	✓
<i>Onychostoma lini</i>	✓	✓
<i>Cyprinus carpio</i> *	✓	
<i>Carassius auratus</i>	✓	
<i>Misgurnus anguillicaudatus</i>	✓	
<i>Pseudogastromyzon changtingensis tungpeiensis</i>	✓	✓
<i>Pseudogastromyzon fangi</i>	✓	✓
<i>Vanmanenia pingchowensis</i>	✓	✓
<i>Schistura fasciolata</i>	✓	✓
<i>Schistura incerta</i>	✓	✓
<i>Leiocassis adiposalis</i>	✓ (as <i>P. adiposalis</i> )	
<i>Pterocryptis</i> sp. nov.	? (as <i>Silurus cochinchinensis</i> )	✓
<i>Clarias fuscus</i>	✓	
<i>Glyptothorax fukiensis fukiensis</i>	✓	✓
<i>Mastacembelus armatus</i>	✓	
<i>Siniperca undulatus</i>	✓	
<i>Rhinogobius duospilus</i>		✓
<i>Rhinogobius</i> sp.	? (as <i>Ctenogobius brunneus</i> )	✓
<i>Macropodus opercularis</i>	✓	
<i>Channa asiatica</i>	✓	✓
<i>Channa maculata</i>	✓	

- Certain species are of particular conservation significance:
  - *Hemibarbus medius* is restricted to South China and northern Vietnam and is uncommon in South China;
  - *Pterocryptis* sp. nov. is known only from scattered localities in the Beijiang and Xijiang catchments of the Zhujiang drainage system.
- General abundance of the stream fish fauna was very high at the times of our visits, with many large-sized individuals. The Zhangdongshui main stream draining the nature reserve had high fish diversity and abundance, especially around the HQ. The Reserve has very high conservation value for South China freshwater fish.

#### **Ants**

- While it has not been possible to process records of ants found during the present surveys, past records (Fellowes, 1996) can be updated. Forty species have been recorded from Chebaling.

**Table 6.** Ant species recorded at Chebaling, June 1996. No frequency data available.

<b>Species</b>
<i>Aenictus (laeviceps group)</i> sp. 2 (recorded as <i>A. laeviceps</i> )
<i>Aenictus (dentatus group)</i> sp. 4 (recorded as <i>A. dentatus</i> )
<i>Aphaenogaster (cf. exasperata)</i> sp. 2
<i>Aphaenogaster (cf. hunanensis)</i> sp. 3
<i>Camponotus (cf. mitis)</i> sp. 11 (recorded as <i>C. mitis</i> )
<i>Camponotus (cf. aethiops vitiosus)</i> sp. 21 (recorded as <i>C. (cf. tokioensis)</i> sp. 21)
<i>Camponotus (nr. aethiops vitiosus)</i> sp. 27 (recorded as <i>C. (cf. tokioensis)</i> sp. 27)
<i>Camponotus</i> sp. 28 group
<i>Cardiocondyla</i> sp. 2 (recorded as <i>C. wroughtonii</i> )
<i>Cataulacus granulatus</i>
<i>Cerapachys sulcinodis</i>
<i>Crematogaster (cf. travancorensis)</i> sp. 2
<i>Crematogaster (cf. laboriosa)</i> sp. 3
<i>Crematogaster (cf. dohrni)</i> sp. 8
<i>Dilobocondyla (cf. fouqueti)</i> sp. (recorded as <i>D. fouqueti</i> )
<i>Hypoponera</i> sp. 3
<i>Leptogenys kitteli</i>
<i>Liometopum (cf. sinense)</i> sp. 1
<i>Monomorium chinense</i>
<i>Monomorium</i> sp. 2
<i>Myrmecaria</i> sp. 1
<i>Odontomachus monticola</i>
<i>Pachycondyla (javana group)</i> sp. 1 (recorded as <i>P. astuta</i> )
<i>Pachycondyla (cf. luteipes)</i> sp. 2 (recorded as <i>P. obscurans</i> )
<i>Paratrechina sauteri</i>
<i>Paratrechina (cf. bourbonica)</i> sp. 4 (recorded as <i>P. bourbonica</i> )
<i>Paratrechina (cf. opaca)</i> sp. 26
<i>Pheidole (cf. noda)</i> sp. 1
<i>Pheidole</i> sp. 7 (recorded as <i>P. (cf. fervida)</i> sp. 7)
<i>Pheidologeton (cf. melasolenus)</i> sp. 8
<i>Polyrhachis dives</i>
<i>Polyrhachis tyrannica</i>
<i>Polyrhachis halidayi</i>
<i>Polyrhachis vigilans</i>
<i>Polyrhachis (cf. bicolor)</i> sp. 17
<i>Polyrhachis (nr. phalerata)</i> sp. 18
<i>Pristomyrmex pungens</i>
<i>Technomyrmex albipes</i>
<i>Tetraaponera attenuata</i>
<i>Tetraaponera allaborans</i> (recorded as <i>T. (allaborans complex)</i> sp. 3)

- Of these 30% are forest-associated, a rather low proportion for a forest area but forest habitats were under-sampled compared to other KFBG surveys.

### **Dragonflies**

- Only 25 species were recorded during the two-day survey in August 2000 (Table 6), of which two (*Planaeschna* sp. and *Cephalaeschna* sp.) remain unidentified.

**Table 6.** Dragonflies recorded at Chebaling, 16-17 August 2000. Sequence of families follows Schorr *et al.* (2001a, 2001b).

<b>Species</b>
<i>Archineura incarnata</i>
<i>Calopteryx melli</i>
<i>Matrona basilaris</i>
<i>Neurobasis c. chinensis</i>
<i>Ceriagrion f. fallax</i>
<i>Copera ciliata</i>
<i>Ischnura senegalensis</i>
<i>Anisopleura qingyuanensis</i>
<i>Bayadera melanopteryx</i>
<i>Euphaea decorata</i>
<i>Coeliccia cyanomelas</i>
<i>Cephalaeschna</i> sp.
<i>Planaeschna</i> sp.
<i>Leptogomphus divaricus</i>
<i>Brachydiplax chalybea flavovittata</i>
<i>Crocothemis servilia</i>
<i>Orthetrum melania</i>
<i>Orthetrum pruinatum</i>
<i>Orthetrum sabina</i>
<i>Palpopleura sexmaculata</i>
<i>Pantala flavescens</i>
<i>Pseudothemis zonata</i>
<i>Sympetrum parvulum</i>
<i>Tramea virginia</i>
<i>Trithemis aurora</i>

- *Planaeschna* and *Cephalaeschna* are genera of forest-dependent dragonflies. The presence of four calopterygids and three euphaeid species indicates that rivers in the area surveyed had high water quality.

### **Butterflies**

- Thirty-nine species were recorded during the two-day survey in August 2000 (Table 7). Of these, 12 are apparently new records for the Reserve, i.e. not listed in Su *et al.*(1993) and Walthew ( 1996).

**Table 7.** Butterflies at Chebaling, 16-17 August 2000. “\*” = New record for Chebaling.

<b>Species</b>
<i>Astictopterus jama</i> *
<i>Celaenorrhinus leucocera</i> *
<i>Notocrypta curvifascia</i>
<i>Odontoptilum angulatum</i> *
<i>Graphium antiphates</i>
<i>Graphium sarpedon</i>
<i>Papilio helenus</i>
<i>Papilio polytes</i>
<i>Papilio protenor</i>
<i>Eurema hecabe</i>
<i>Eurema laeta</i>
<i>Hebomoia glaucippe</i>
<i>Ixias pyrene</i>
<i>Abisara echerius</i>
<i>Abisara fylloides</i> *
<i>Acytolepis puspa</i> *
<i>Curetis acuta</i>
<i>Neopithecops zalmora</i>
<i>Sinthusia chandrana</i> *
<i>Stiboges nymphidia</i> *
<i>Taraka hamada</i>

**Species**

*Abrota ganga* \*  
*Acraea issoria*  
*Athyma jina* \*  
*Cethosia biblis*  
*Charaxes bernardus*  
*Ideopsis similis*  
*Kallima inachus*  
*Kaniska canace*  
*Lethe confusa*  
*Limenitis (Bhagadatta) austenia*  
*Mycalesis gotama*  
*Neptis (Phaedyma) columella* \*  
*Neptis clinia* \*  
*Parathyma sulphitia*  
*PentHEMA adelma*  
*Precis (Junonia) iphita*  
*Stibochiona nicea* \*  
*Stichopthalma howqua*

- Several forest-associated species were present, most notably *Bhagadatta austenia*, *Mycalesis gotama*, *Stibochiona nicea*, *Stiboges nymphidia*, *Stichopthalma howqua*, *Abisara fylloides* and *Neopithecops zalmora*.
- An additional 42 species of butterfly were recorded from Chebaling during a two-day visit conducted in June 1996 (Walthew, 1996). These included the rare skipper *Parasovia perbella*, apparently not previously recorded from China (Bascombe, 1995; Chou, 1994). The 1996 survey detected more species, in part because it covered more open habitats where common species are more easily observed.
- A total of 138 butterfly species is now known from Chebaling National Nature Reserve based on Su *et al.* (1993), Walthew (1996) and the results reported here.

**Summary of flora and fauna**

- The vegetation of the surveyed area was mainly old secondary forest in a matrix of young disturbed forest and plantation of *Pinus massoniana* and China fir. The core area was largely covered in mature forest up to 30 m tall and 80 cm dbh. The part of the buffer zone visited was covered in a mosaic of plantation and young secondary forest about 5-10 m tall and up to 20cm dbh.
- The survey in August 2000 recorded 602 vascular plant species in two days of fieldwork. The recorded flora included 11 globally Threatened and/or nationally Protected species and a further two globally restricted species.
- The Zhangdongshui main stream draining Chebaling National Nature Reserve is one of the most ecologically-intact forest streams encountered by the KFBG survey team in South China, with dragonflies indicative of good water quality, and a well-structured fish community. This in turn supports healthy populations of stream-dependent birds: Little Heron, Crested Kingfisher, Common Kingfisher, Brown Dipper and Slaty-backed Forktail occur in high numbers while Chebaling is one of the only sites in the region known to support populations of White-eared Night Heron and Blyth's Kingfisher. Besides these the aquatic fauna includes several species of conservation importance (e.g. the restricted frog *Megophrys mangshanensis*).
- The terrestrial fauna was also rich. While the survival of large predators such as Tiger and Leopard has not been confirmed in recent years, herbivorous mammals and other small carnivores appear to be present in good numbers.
- The Reserve was considered of only local biodiversity importance by MacKinnon *et al.* (1996), presumably due to its relatively small size and the fact that much important forests lay outside the reserve boundaries. The present surveys suggest the Reserve is of national importance, especially if plans to include surrounding unprotected forests (Rao Jiteng, Reserve Director, pers. comm., July 2001) are realised. The possibility that this largely forested range still harbours the globally Critically Endangered South China Tiger (*Panthera tigris amoyensis*) makes Chebaling an extremely important site for biological conservation.

### **Threats and problems**

- Dynamite-fishing was observed outside the reserve area, where there are sightings of the globally Endangered White-eared Night Heron, as well as the Blyth's Kingfisher. Direct (decline in the birds' food source) and indirect (e.g. noise and physical disturbance) impacts may affect the breeding success of these globally threatened bird species.
- In an attempt to generate self-sustained revenue, the Nature Reserve has in recent years built an extensive network of catchwater channels to capture stream water for the Xiba hydroelectric station, as well as operating rafting and fishing activities in Zhangdongshui main stream near the HQ. Concern has been expressed about the ecological impacts of these developments (Leven, 1998). The building of catchwater channels on steep hillsides weakens the slope and may cause landslides, increasing erosion and impacting the forests and streams below.
- With the attempts to develop tourism in the Reserve, rather substantial investment has gone into infrastructural development. A large museum building, a horseriding track, and two new guesthouses were built around the HQ in the last decade and sections of the access road to the Reserve were concrete-paved in 2000. Educational signs were put in places surrounding the HQ. So far tourism does not seem to have generated good revenue for the Reserve; during the various visits by the KFBG team, no tour groups were encountered. The horseriding track has since been shut down, and construction of part of the new guesthouse building has yet to be completed.
- There have been reports of increased disturbance; at least 50 people were reportedly collecting forest products in the restricted core area in November 1998, and snares were apparently set for pheasants but also caught other birds (Leven, 1998). Recently an increase in illegal logging was noted by Huang (2002), mainly by villagers from Quannan County in neighbouring Jiangxi Province.

### **Opportunities**

- Chebaling National Nature Reserve has some outstanding model practices applicable to other reserves in the region. These are reflected in the high cover of natural forest with clean, high-integrity streams, the local community participation including environmental education, the educational signs and facilities, and the commitment to ecological farming. Compared to other South China reserves there are relatively few conflicts between the local community and conservation. The local economy was based mainly on rice, supplemented by other vegetables – no income came from logging. Overall it appeared that local people supported the nature reserve status, and understood the need to control hunting and other practises<sup>1</sup>.
- The exceptional integrity of the catchment of Zhangdongshui stream owes much to active management. The Reserve restricts fishing within the reserve area to line and rod recreational angling near the HQ, allowing a thriving fish fauna with little collecting pressure, in contrast with most streams across South China. Thus the Reserve has great potential to fulfil its conservation function.
- Opportunities for ecotourism development to generate revenue for the Reserve also exist. Chebaling has important elements for eco-tourism in its good forests and abundant fauna. To properly develop tourism, staffing is critical.
- Apart from local tourism opportunities, Chebaling is also famous among bird watchers in Hong Kong. To develop packaged international tours to facilitate small group birdwatching at Chebaling is feasible, and this has been conducted in the past. To increase the attractiveness of Chebaling to international

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<sup>1</sup> To obtain a preliminary understanding of the impact of agriculture at Chebaling (particularly on the White-eared Night Heron population), an interview was held in April 2000 with Mr Dai, a Yao official from the ecological village. One rice crop was grown per year, planted in April and harvested in September. Fifty kilograms of fertilizer (15 kg of nitrogen, 20 kg of phosphorus, 15 kg of potassium) were applied per mu (Chinese acre, = 0.67 ha). Pesticides were applied from June to August, to combat three main pests (one a moth) – around 170 g per mu, costing 25 yuan per litre. These fertilizing and pesticide practises had been little changed for about ten years, and about 860 mu of paddy occurred at Chebaling, but there was increasing growth of vegetables in recent years. An increasing number of households were able to afford chickens, buffalo and pigs, whose manure reduced the need for artificial fertilizers. For self-sufficiency, local fodder was enough to feed livestock; for commercial farming, purchase of feeds was necessary. When asked his opinion on the impacts on stream vertebrates and invertebrates, he felt the nitrogen and phosphorus had depleted them, but that the pesticides had not.



tourists, especially birdwatchers, a few good forest trails with adequate educational displays on flora, fauna and ecology, and staff trained to provide guided tours, would help this tourism potential to be realised.

- While no adverse ecological impact from the hydroelectric developments has so far been documented, great attention should be paid to potential disturbances to the forested stream valleys in view of its importance for rare stream-associated birds (e.g. White-eared Night Heron and Blyth's Kingfisher) and aquatic fauna (the abundant fish life). Before any further hydroelectric development is planned, an environmental impact assessment should be carried out to determine and mitigate the impacts, a step required by law but rarely conducted by qualified ecologists. This would set a model of how to develop environmentally-friendly hydroelectric plants in forest regions.
- MacKinnon *et al.* (1996) recommended redesigning the reserve borders to include surrounding good forest. It could also be linked to good forests in neighbouring Jiangxi Province. Whether or not Tiger survives in these mountains, transprovincial cooperation would be advantageous to allow forest regeneration at the landscape scale.

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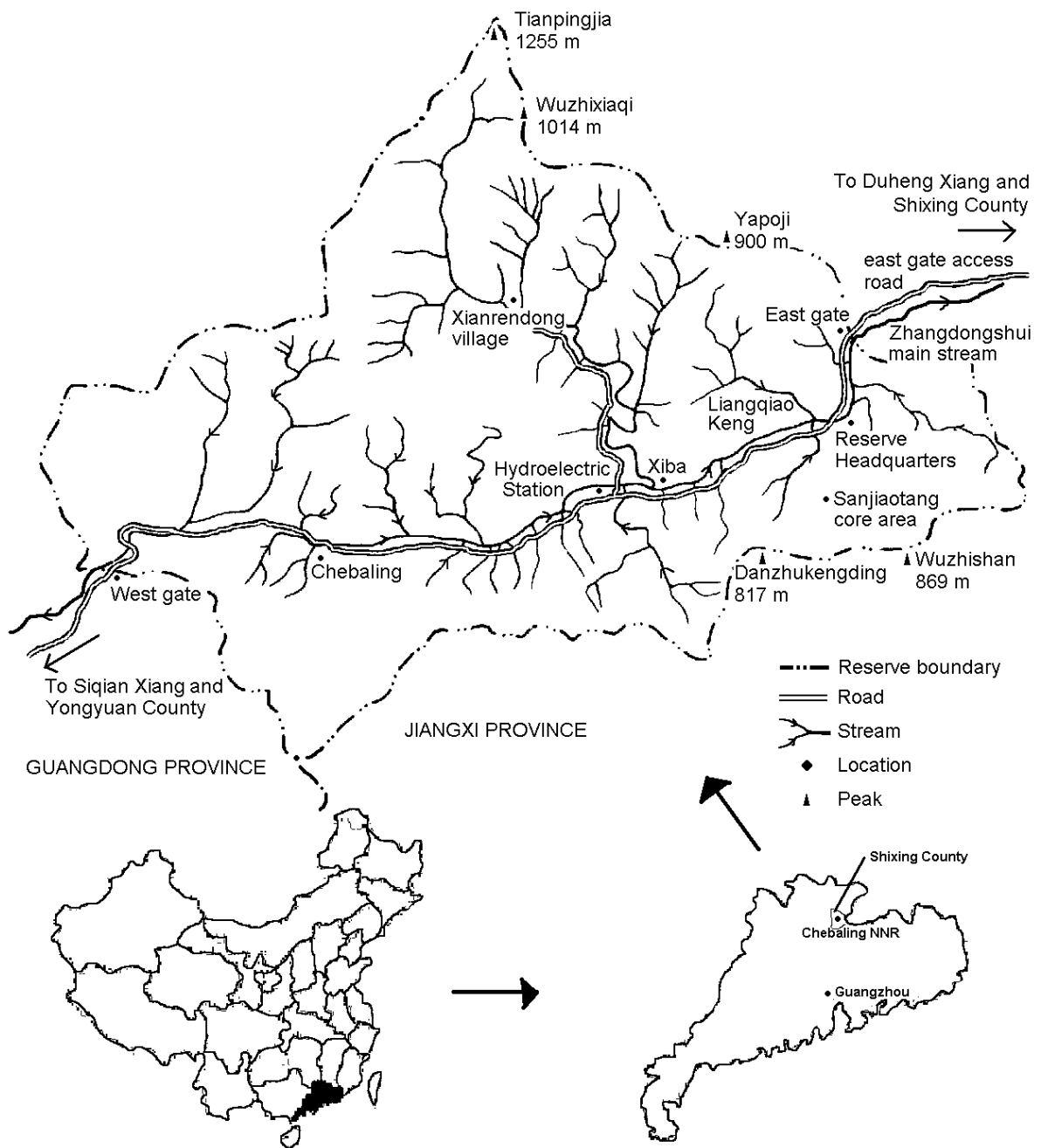
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**Figure 1.** Map showing location of Chebaling National Nature Reserve, Northeast Guangdong, China.