

ANNOTATED CHECKLIST OF THE BUTTERFLIES (PAPILIONOIDEA) OF THE NAM CAT TIEN RESERVE (SOUTH VIETNAM)

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Abstract – Annotated list of 143 butterflies (Papilionoidea) of the Nam Cat Tien reserve (southern sector of the Cat Tien National Park, South Vietnam) is presented. The importance of the reserve as a regional Indochinese biodiversity hot spot for forest butterflies is stressed.

Key words: Vietnam, Indochina, checklist, Papilionoidea, lowland rainforest, faunal composition, habitat associations, conservation.

The Nam Cat Tien area is a southeastern sector of the Cat Tien National Park. Nam Cat Tien is situated in the southern part of Vietnam, approximately 130 km North of Saigon (Ho Chi Minh City) and about 150 km from the South China Sea (11°20'50" - 11°32'13"N and 107°11'13" - 107°28'20"E). The southeastern part, which seems to be most valuable component of the reserve, is the lowland tropical rainforest with various associated successional formations - 120-150m alt. (Fig. 3). It is the largest lowland semideciduous rainforest in Vietnam. The vegetation structure, floristic composition and dynamics of successional stages were described by Trung (1988a, 1988b) and by Blanc et al. (2000). Basic ecological and geogeographical data of biodiversity are also given by Spitzer et al. (1991). Nam Cat Tien is located in the monsoon tropical region of S.E. Asia.

STUDY AREA AND METHODS

The butterfly fauna (Papilionoidea) was investigated mostly in eastern parts of the reserve covered with dominant semideciduous rainforest habitats (including successional stages) and along the river Dong Nai (Fig. 1). The climax forest types were dominated by trees of *Lagerstroemia calyculata* (Fig. 2) and some dipterocarp species (see Spitzer et al., 1991 and Blanc et al., 2000). Understorey of closed forests, gaps, transects and trails were sampled but with few data about characteristic canopy species (e.g. *Delias* spp. and *Arhopala* spp. were not recorded). Records were based on both specimens captured and on sight records, where these were reliable. All the species were identified and voucher specimens are deposited at Institute of Entomology, Czech Academy of Sciences, České Budějovice. The first survey of our entomological study was carried out during the late rainy season of November 1989 (see Spitzer et al., 1991). The second survey was carried out during the early rainy season of June 1995. The peak of wet season is usually August - September.

RESULTS

In total, we identified 143 species of butterflies (Papilionoidea) during 18 days of November 1989 and 16 days of June 1995. All the recorded species are given in Table 1, with abbreviations of their habitat preference. The total period of activity for most strictly diurnal taxa was very short, with maximal activity between 0930h and 1400h. From faunal and conservation point of view, the most interesting species are associated with understorey of the climax semideciduous rainforest (e.g. *Coelites nothis* Westwood, *Tanaecia* spp., *Dophla evelina* (Stoll), *Bassarona* spp., *Lexias*

spp., *Paralaxita* spp. - Table 1). One of the most characteristic endemic Indochinese species associated with lowland virgin forest seems to be *Lexias albopunctata* (Crowley), which is not rare in Nam Cat Tien. This species is not conspecific with closely related *Lexias cyanipardus* (Butler) - see Morishita (1979), Corbet & Pendlebury (1992). Many local interesting species in Table 1 were also recorded from the forest gaps, trails and especially along the river Dong Nai (e.g. most of *Euploea* spp., *Polyura* spp. and *Terinos terpander* (Hewitson)). After a much longer monitoring the number of recorded species from Nam Cat Tien should increase significantly (Table 2).

DISCUSSION AND CONCLUSION

Vietnam was once almost entirely forested, but now approximately 10 % of rainforests remains only. The most endangered disappearing types of vegetation are lowland rainforests of similar characteristics like habitats of Nam Cat Tien, with highly specific insect biodiversity. As to the Nam Cat Tien area, the first survey of butterflies and other local insects was initiated in 1989 (Spitzer et al., 1991). Further data on butterflies were obtained in 1995 (this paper, Table 1). The only one review of total diversity of all Vietnamese butterflies was published by Metaye (1957) recording 393 species of Papilionoidea, but the complete number of species of the country is probably much higher (± 500 species of Vietnam) - see Table 2. For comparison, the butterfly fauna of the Tam Dao reserve (North Vietnam) is complementary with regard to different biogeography, faunistics and ecology: 170 recorded species of the Tam Dao montane cloud forest butterflies (Spitzer et al., 1993, 1997; Jaroš J. & Spitzer K., unpubl. records; Monastyrskii A. L., pers. comm.).

In conclusion, our records of the Nam Cat Tien butterflies gives a very good indication of the great nature conservation value of the reserve area for preservation of unique Indochinese insect biodiversity associated with endangered lowland tropical rainforests of S.E. Asia.

ACKNOWLEDGMENTS

Our entomological studies in Vietnam were partially supported by the Grant Foundation of the Czech Republic. We thank Dr. A. L. Monastyrskii (Hanoi) for the information on butterflies of Vietnam that he provided via personal communications. The authorities of the Cat Tien National Park provided us with permission to conduct the lepidopterological investigations in the field.

TABLE 1. List of the Papilionoidea of the Nam Cat Tien Reserve.

SPECIES	LATE RAINY SEASON (NOV. 1989)	EARLY RAINY SEASON (JUNE 1995)	HABITAT
PAPILIONIDAE: Papilioninae			
<i>Troides aeacus</i> (C. & R. Felder, 1860)	+	+	FG
<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	+	+	R, FG
<i>Chilasa clytia</i> (Linnaeus, 1758)	+	+	FG
<i>Papilio demoleus</i> Linnaeus, 1758	+	+	R
<i>Papilio demolion</i> Cramer, 1776	+	0	FG
<i>Papilio mahadeva</i> Moore, 1879	0	+	FG
<i>Papilio nephelus</i> Boisduval, 1836	+	+	F, FG
<i>Papilio helenus</i> Linnaeus, 1758	+	+	FG
<i>Papilio polytes</i> Linnaeus, 1758	+	+	R, FG
<i>Papilio memnon</i> Linnaeus, 1758	+	+	R, FG
<i>Graphium sarpedon</i> (Linnaeus, 1758)	+	+	R, FG
<i>Graphium doson</i> (C. & R. Felder, 1864)	+	+	FG
<i>Graphium eurypylus</i> (Linnaeus, 1758)	0	+	FG
<i>Graphium agamemnon</i> (Linnaeus, 1758)	+	+	FG, R
<i>Graphium arycles</i> (Boisduval, 1836)	+	0	FG
<i>Pathysa aristeus</i> (Stoll, 1780)	0	+	FG
<i>Pathysa antiphates</i> (Cramer, 1775)	+	+	FG
<i>Lamproptera curius</i> (Fabricius, 1787)	+	+	FG
<i>Lamproptera meges</i> (Zinken, 1831)	+	+	FG
PIERIDAE: Pierinae			
<i>Leptosia nina</i> (Fabricius, 1793)	+	+	R, FG
<i>Prioneris philonome</i> (Boisduval, 1836)	0	+	F, FG
<i>Cepora nadina</i> (Lucas, 1852)	0	+	FG
<i>Cepora iudith</i> (Fabricius, 1787)	+	+	F, FG
<i>Appias lyncida</i> (Cramer, 1777)	+	+	FG
<i>Appias nero</i> (Fabricius, 1793)	0	+	FG, R
<i>Appias albina</i> (Boisduval, 1836)	+	+	FG
<i>Appias paulina</i> (Cramer, 1777)	+	+	FG
<i>Ixias pyrene</i> (Linnaeus, 1764)	+	+	FG, R
<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	+	+	FG
<i>Pareronia anais</i> (Lesson, 1837)	+	+	FG, R
PIERIDAE: Coliadinae			
<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	+	+	FG, R
<i>Catopsilia pomona</i> (Fabricius, 1775)	+	+	R
<i>Catopsilia scylla</i> (Linnaeus, 1763)	+	+	FG, R
<i>Eurema brigitta</i> (Stoll, 1780)	+	+	R
<i>Eurema hecabe</i> (Linnaeus, 1758)	+	+	R, FG
<i>Eurema andersonii</i> (Moore, 1886)	+	0	R, FG
<i>Gandaca harina</i> (Horsfield, 1829)	+	+	FG
NYMPHALIDAE: Danainae			
<i>Danaus chrysippus</i> (Linnaeus, 1758)	0	+	R
<i>Danaus genutia</i> (Cramer, 1779)	+	+	R, FG
<i>Tirumala septentrionis</i> (Butler, 1874)	+	+	R, FG
<i>Tirumala limniace</i> (Cramer, 1775)	+	0	R, FG
<i>Parantica aspasia</i> (Fabricius, 1787)	+	+	F, FG
<i>Parantica agleoides</i> (C. & R. Felder, 1860)	+	0	FG
<i>Parantica aglea</i> (Stoll, 1782)	+	+	FG
<i>Ideopsis vulgaris</i> (Butler, 1874)	+	+	FG, R
<i>Euploea modesta</i> Butler, 1866	0	+	F
<i>Euploea crameri</i> Lucas, 1853	+	0	FG
<i>Euploea core</i> (Cramer, 1780)	+	+	FG, R
<i>Euploea algea</i> (Godart, 1819)	0	+	FG
<i>Euploea eyndhovii</i> C. & R. Felder, 1865	0	+	F, FG
<i>Euploea sylvester</i> (Fabricius, 1793)	0	+	FG
<i>Euploea mulciber</i> (Cramer, 1777)	+	+	FG, R
<i>Euploea tulliolus</i> (Fabricius, 1793)	+	+	FG
<i>Euploea midamus</i> (Linnaeus, 1758)	+	+	FG
<i>Euploea klugii</i> Moore, 1858	0	+	FG
<i>Euploea radamanthus</i> (Fabricius, 1793)	+	+	F, FG
NYMPHALIDAE: Satyrinae			
<i>Melanitis leda</i> (Linnaeus, 1758)	0	+	R
<i>Melanitis phedima</i> (Cramer, 1780)	+	0	R

<i>Elymnias hypermnestra</i> (Linnaeus, 1763)	+	+	R, FG
<i>Lethe europa</i> (Fabricius, 1775)	+	0	FG
<i>Mycalesis perseus</i> (Fabricius, 1775)	0	+	R
<i>Mycalesis mineus</i> (Linnaeus, 1758)	+	+	R
<i>Orsotriaena medus</i> (Fabricius, 1775)	+	+	R
<i>Coelites nothis</i> Westwood, 1850	+	+	F
<i>Ypthima huebneri</i> Kirby, 1871	+	0	R
<i>Ypthima baldus</i> (Fabricius, 1775)	+	+	R
NYMPHALIDAE: Morphinae			
<i>Amathusia phidippus</i> (Linnaeus, 1763)	+	0	FG
<i>Discophora sondaica</i> Boisduval, 1836	0	+	FG
NYMPHALIDAE: Nymphalinae			
<i>Ariadne ariadne</i> (Linnaeus, 1763)	+	+	R, FG
<i>Ariadne specularia</i> (Fruhstorfer, 1899)	+	+	FG
<i>Cupha erymanthis</i> (Drury, 1773)	0	+	FG
<i>Phalanta alcippe</i> (Stoll, 1782)	+	0	FG
<i>Vagrans egista</i> (Cramer, 1780)	+	+	FG, R
<i>Cirrochroa tyche</i> (C. & R. Felder, 1861)	0	+	FG
<i>Vindula erota</i> (Fabricius, 1793)	+	+	FG
<i>Vindula dejone</i> (Erichson, 1834)	+	+	FG
<i>Terinos terpander</i> Hewitson, 1862	0	+	F, FG
<i>Cethosia biblis</i> (Drury, 1773)	+	0	FG
<i>Junonia iphita</i> (Cramer, 1779)	+	+	FG
<i>Junonia atlites</i> (Linnaeus, 1763)	+	+	R, FG
<i>Junonia almana</i> (Linnaeus, 1758)	+	+	R
<i>Junonia lemonias</i> (Linnaeus, 1758)	+	+	R
<i>Junonia hierta</i> (Fabricius, 1798)	+	+	R
<i>Yoma sabina</i> (Cramer, 1780)	0	+	FG
<i>Hypolimnas misippus</i> (Linnaeus, 1764)	0	+	R
<i>Hypolimnas bolina</i> (Linnaeus, 1758)	+	+	R, FG
<i>Doleschallia bisaltide</i> (Cramer, 1777)	0	+	FG
<i>Cyrestis themire</i> Honrath, 1884	+	0	F
<i>Cyrestis cocles</i> (Fabricius, 1787)	+	+	FG
<i>Cyrestis nivea</i> (Zinken, 1831)	+	+	FG
<i>Neptis clinia</i> Moore, 1872	+	+	FG

<i>Neptis hylas</i> (Linnaeus, 1758)	+	+	FG, R
<i>Neptis nata</i> Moore, 1858	+	0	FG
<i>Neptis miah</i> Moore, 1858	+	0	FG
<i>Neptis magadha</i> C. & R. Felder, 1867	+	0	FG
<i>Pantoporia hordonia</i> (Stoll, 1790)	+	+	FG
<i>Pantoporia sandaka</i> (Butler, 1892)	+	0	FG
<i>Pantoporia paraka</i> (Butler, 1879)	0	+	FG
<i>Athyma perius</i> (Linnaeus, 1758)	0	+	FG
<i>Athyma selenophora</i> (Kollar, 1844)	+	0	F, FG
<i>Athyma nefte</i> (Cramer, 1779)	0	+	FG
<i>Moduza procris</i> (Cramer, 1777)	+	+	FG
<i>Lebadea martha</i> (Fabricius, 1787)	+	+	F
<i>Parthenos sylvia</i> (Cramer, 1775)	+	+	FG, R
<i>Tanaecia munda</i> Fruhstorfer, 1899	+	0	F
<i>Tanaecia julii</i> (Lesson, 1837)	0	+	F
<i>Tanaecia cocytus</i> (Fabricius, 1787)	0	+	F
<i>Dophla evelina</i> (Stoll, 1790)	0	+	F
<i>Bassarona teuta</i> (Doubleday, 1848)	+	+	F
<i>Bassarona recta</i> (de Nicéville, 1886)	0	+	F
<i>Lexias dirtea</i> (Fabricius, 1793)	+	+	F
<i>Lexias pardalis</i> (Moore, 1878)	+	+	F
<i>Lexias albopunctata</i> (Crowley, 1895)	+	+	F
<i>Rohana parisatis</i> (Westwood, 1850)	+	+	FG
<i>Polyura athamas</i> (Drury, 1773)	+	+	FG
<i>Polyura delphis</i> (Doubleday, 1843)	+	+	F, FG
<i>Polyura schreiber</i> (Godart, 1824)	+	0	F
<i>Charaxes bernardus</i> (Fabricius, 1793)	+	+	FG
NYMPHALIDAE: Libytheinae			
<i>Libythea narina</i> Godart, 1819	0	+	F, FG
<i>Libythea myrrha</i> Godart, 1819	0	+	FG
LYCAENIDAE: Riodininae			
<i>Paralaxita telesia</i> (Hewitson, 1861)	+	0	F
LYCAENIDAE: Curetinae			
<i>Curetis bulis</i> (Westwood, 1851)	0	+	FG
<i>Curetis saronis</i> Moore, 1877	0	+	FG

LYCAENIDAE: Lycaeninae			
<i>Castalius rosimon</i> (Fabricius, 1775)	0	+	FG, R
<i>Discolampa ethion</i> (Westwood, 1851)	0	+	FG
<i>Pithecopis corvus</i> Fruhstorfer, 1919	+	0	FG
<i>Neopithecopis zalmora</i> (Butler, 1870)	0	+	FG
<i>Zizina otis</i> (Fabricius, 1787)	0	+	R
<i>Catochrysops panormus</i> (C. Felder, 1860)	+	+	FG
<i>Jamides celeno</i> (Cramer, 1775)	0	+	FG
<i>Jamides pura</i> (Moore, 1886)	0	+	FG
<i>Jamides alecto</i> (C. Felder, 1860)	+	+	FG
<i>Ionolyce helicon</i> (C. Felder, 1860)	0	+	FG
<i>Prosotas nora</i> (C. Felder, 1860)	0	+	FG
<i>Prosotas dubiosa</i> (Semper, 1879)	0	+	FG
<i>Petrelaea dana</i> (de Nicéville, 1884)	0	+	F
<i>Anthememolus</i> (Godart, 1824)	+	+	FG
<i>Surendra quercetorum</i> (Moore, 1857)	0	+	F, FG
<i>Amblypodia anita</i> Hewitson, 1862	+	+	FG
<i>Loxura atymnus</i> (Stoll, 1780)	+	+	FG
<i>Cheritra freja</i> (Fabricius, 1793)	0	+	F, FG
<i>Hypolycaena erylus</i> (Godart, 1824)	0	+	FG
<i>Zeltus amasa</i> (Hewitson, 1865)	+	+	FG

+ - recorded, 0 - not recorded, R - ruderals, agricultural lands and grasslands, FG - forest gaps, forest roads and margins, F - closed climax forests



Fig. 1. Dong Nai river with riverine mixed dipterocarp forests.

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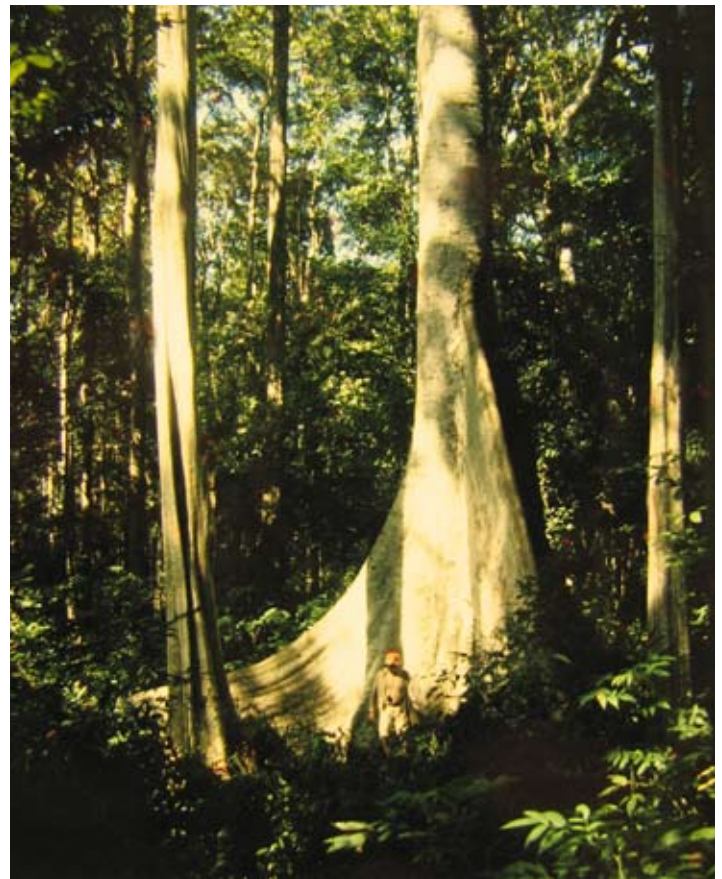


Fig. 2. Closed semideciduous rainforest of Nam Cat Tien with dominant *Lagerstroemia* and *Tetrameles* trees.

TABLE 2. Number of butterfly species (Papilionoidea) in Nam Cat Tien and Tam Dao Reserves, Vietnam.

	NAM CAT TIEN	TAM DAO	VIETNAM TOTAL
N	143	170	393*
%	36,4	43,3	100

Data from Nam Cat Tien (this paper), Tam Dao (Spitzer et al., 1993, 1997; J. Jaroš & K. Spitzer, unpubl. records and A. L. Monastyrskii, pers. comm. 1999), Vietnam (Metaye, 1957).

***Appendix after proofs:** Monastyrskii & Devyatkin (2003) recorded 737 species of Papilionoidea from the territory of Vietnam.

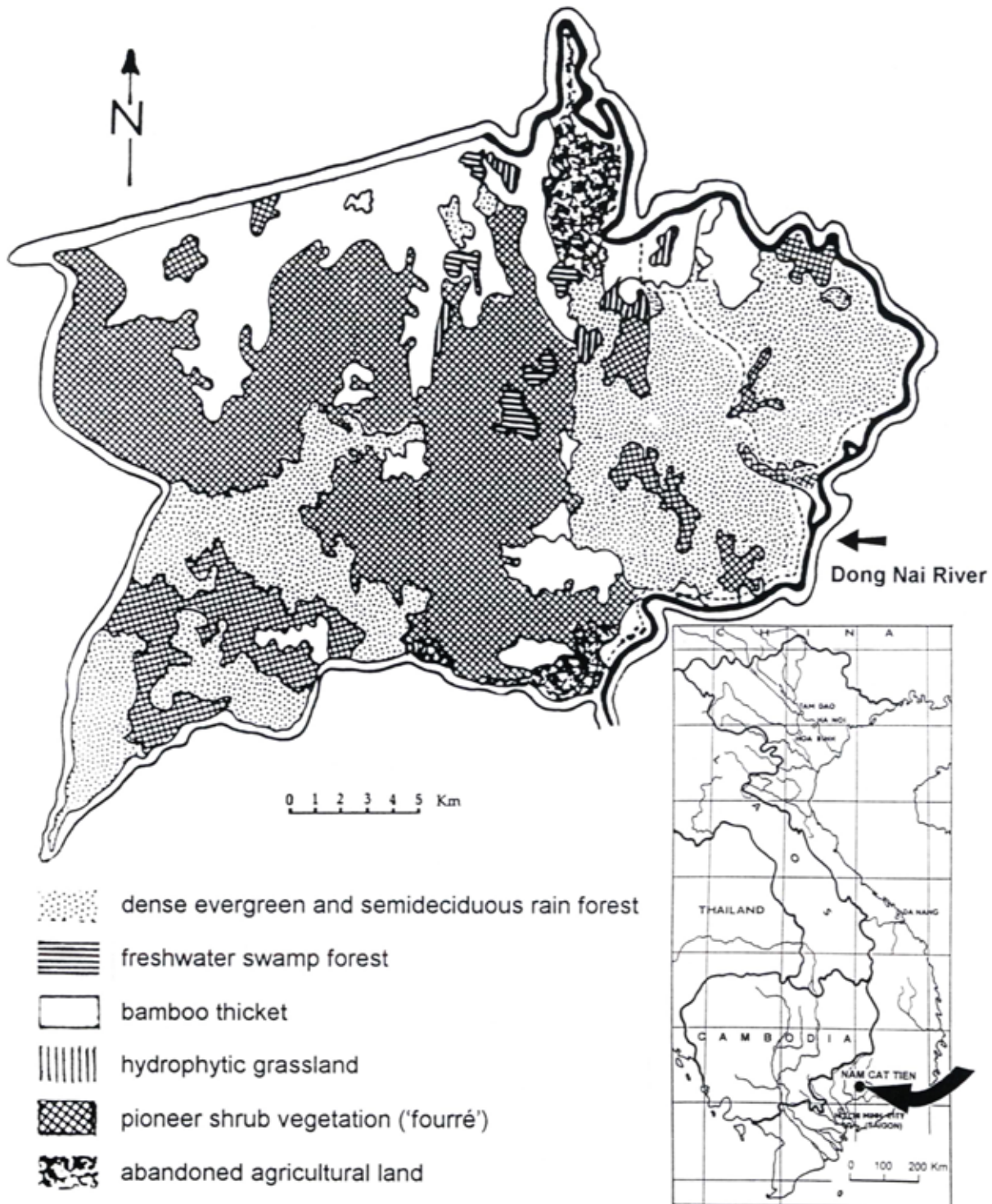


Fig. 3. Vegetation map of the Nam Cat Tien Reserve (after Thai Van Trung, adapted).