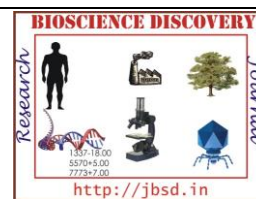


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Research Article



Diversity and distribution of Papilionaceae in Manas National Park, Assam, India

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Abstract

Manas National Park lies in between 26°35'-26°50'N latitude and 90°45'-91°15'E longitude is bounded on the north by the Royal Manas National Park of Bhutan, on the south by populous North Kamrup district and on both east and west by buffer forest reserves which are part of 2,840 sq. Km Manas Tiger Reserve. During the floristic exploration the Papilionaceae family represent 59 species and 24 genera. Among the genera recorded, *Desmodium* is represented by 12 species which represents the largest genera.

INTRODUCTION

Papilionaceae or Fabaceae, the largest family of the three families of the order Leguminales includes about 100 genera and 1083 species (Jain, 1983) in India. However, Sanjappa (1990) estimated that there about 1152 species under 179 genera in India and Kanjilal *et al.* (1934) reported in Assam 42 genera and 173 species. Currently Assam is represented by about 51 genera and 198 species (Baroah & Ahmed, 2014). The family Papilionaceae have a great economic importance and find a wide range of uses. The members of the family provide important foodstuffs, valuable fodder, fatty oil, timber, dyes, gums and several ornamental plants (Minton & Adamson, 1979; Mcmanus *et al.* 1993; Beckstrom-Sternberg & Duke, 1994; Lewis *et al.*, 2005; Gepts *et al.*, 2005; Singh *et al.*, 2005; Singh *et al.*, 2007). The seeds of several species are rich source of proteins and form an important part of our diet. It is cosmopolitan in distribution but abundant in tropical and subtropical regions, generally the plants are herbs, shrubs, climber and rarely trees (Anonymous, 1995; Devappa & Lingaraju, 2011; Siddique & Kumara, 2016).

Study Area: Manas National Park occupies an area of 500 sq. km and it is located at the foothills of the Bhutan Himalayas in Baksa and Chirang districts of Assam in between 26°35'-26°50'N latitude and 90°45'-91°15'E longitude. The National Park consists of three ranges namely -the Western Range with its headquarters at Panbari, the Central Range with Bansbari as its headquarters near Barpeta Road, and the Eastern Range with Bhuyapara near Pathsala as its headquarters. Out of the three ranges, two ranges namely Bansbari and Bhuyapar are under the Baksa district with an area of 394 sq. km. and the Panbari Range (106 sq.km.) is under the Chirang district. The vegetation of the park comprises of Brahmaputra Valley semi-evergreen forests ecoregion and the combination of Sub-Himalayan Bhabar Terai formation with riverine succession. It is for this reason it is considered as one of the richest biodiversity areas in the world. The prominent vegetation types of MNP comprises of Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts, East Himalayan mixed Moist and Dry Deciduous forests (the most common type), Low Alluvial Savanna Woodland and Assam Valley Semi-Evergreen Alluvial Grasslands.

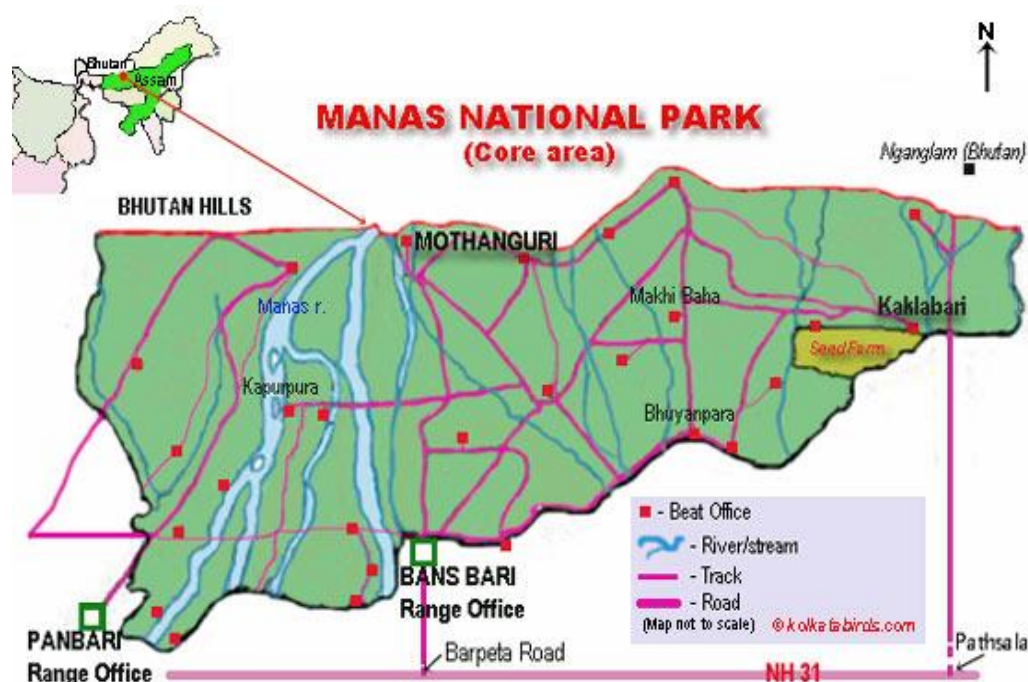


Fig.1. Map of Manas National Park (Source : <http://www.kolkatabirds.com/manas/manas>)

METHODOLOGY

The present research work was conducted during the session 2014-16 as a part of the floristic exploration of the area. Extensive field work, exploration and collection of plants were carried out in different seasons. The morphological characters which cannot be studied from the dried specimens like colour, arrangements of plant parts, etc. were recorded in the field book. Interesting plant materials collected were preserved in F.F.A. for dissection along with dry specimen. All the herbaceous species were collected along with their root system. The Critical studies of all the plant specimens were done for their proper identification with the relevant literature (Allfred, 1989; Baishya, 1998; Rao, R R. 2002; Bora & Kumar, 2003; Subramaniam & Pandey, 2013). The plant specimens so collected were processed and preserved in the form of herbarium specimens with field data as per standard herbarium techniques (Jain & Rao, 1977) for future reference and one set of the herbarium specimens was deposited GUBH department of botany G.U

RESULTS AND DISCUSSION

In the present investigation the papilionaceous members occurring in different vegetation type of forest namely-Grassland, mixed deciduous forest and deciduous forest in Manas National Park were recorded (Anonymous, 1995; Lewis *et al.*, 2005). The study records the occurrence of 59 species under 24 genera. This includes 16 species of herbs, 23 shrubs, 11 trees and 9 climbers. The genus *Desmodium* with 12 species is the largest genus recorded from the area. This corroborated the fact the herbaceous and shrubby species are dominated in open and disturbed areas (Bruneu *et al.*, 2008). The table below (Table 1) provides the species occur in the area with their scientific names alphabetical order along with habit, phonological data and number of voucher specimens (Bh- Bhuyapara Range, Pr-Panbari Range, and Ba-Bansbari Range.)

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Table: 1 Papilionaceae members in Manas National Park

Sl.no	Genus	Scientific name	Habit	Flowering & Fruiting period	Place of collection/Vouch No.
1.	<i>Abrus</i>	<i>Abrus precatorius</i> Linn.	Climber	October-January	Bh; D.B 223
		<i>Abrus fruticulosus</i> Wall.	Climber	September- April.	Bh; D.B 250
2.	<i>Aeschynomene</i>	<i>Aeschynomene Americana</i> L.	Shrub	August-December	Pa; D.B 355
		<i>Aeschynomene aspera</i> . L.	Shrub	August-December	Bh; D.B 242
		<i>Aeschynomene indica</i> L	Herb	September- January	Bh; D.B 235
3.	<i>Alysicarpus</i>	<i>Alysicarpus rugosus</i> (Willd.) DC.	Herb	September-December	Ba;D.B 302
		<i>Alysicarpus vaginalis</i> (L.) DC.	Herb	September-December	Pa; D.B 317
4.	<i>Butea</i>	<i>Butea monosperma</i> (Lam.) Taub.	Tree	November-April	Pa; D.B 325
5.	<i>Cajanus</i>	<i>Cajanus cajan</i> (L.) Millsp.	Shrub	May-September	Bh; D.B 221
		<i>Cajanus elongatus</i> (Benth.) Maesen	Herb	August-December	Pa; D.B 237
6.	<i>Clitoria</i>	<i>Clitoria ternatea</i> L.	Climber	July-December	Bh D.B 319
7.	<i>Crotalaria</i>	<i>Crotalaria albida</i> Roth	Herb	November-February	Bh; D.B 326
		<i>Crotalaria bialata</i> Schrank	Undershrub	August-November	Bh; D.B 333
		<i>Crotalaria indobracteata</i> (Roxb. ex. DC) Bennet	Herb/shrub	October-January	Pa; D.B 230
		<i>Crotalaria juncea</i> L.	Undershrub	October-January	Bh; D.B 244
		<i>Crotalaria laburnifolia</i> L.	Shrubby herb	May-August	Pa; D.B 251
		<i>Crotalaria pallida</i> Aiton	Herb	October-December	Bh; D.B 302
		<i>Crotalaria prostrata</i> Willd.	Herb	October-February	Bh; D.B 311
		<i>Crotalaria sessiliflora</i> L.	Herb	August-December	Bh; D.B 341
8.	<i>Dalbergia</i>	<i>Dalbergia sissoo</i> Roxb.	Tree	March-January	Ba;D.B 246
		<i>Dalbergia volubilis</i> Roxb.	Woody climber	March-August	Ba;D.B 239
9.	<i>Derris</i>	<i>Derris cuneifolia</i> Benth.	Climbing Shrub	April-November	Ba;D.B 232
		<i>Derris robusta</i> Benth.	Tree	April-October	Bh; D.B 201
10.	<i>Desmodium</i>	<i>Desmodium caudatum</i> (Thunb.) DC	Shrub	July-December	Ba;D.B 308
		<i>Desmodium gangeticum</i> (L.) DC.	Shrub	June-October	Ba;D.B 319
		<i>Desmodium gyroides</i> (Roxb.) DC.	Shrub	September-January	Bh; D.B 234
		<i>Desmodium heterocarpon</i> var. strigosum	Herb	June-November	Ba;D.B 216
		<i>Desmodium heterophyllum</i> (Willd.) DC.	Herb	November-April	Ba;D.B 217
		<i>Desmodium laxiflorum</i> DC	Herb	June-December	Pa; D.B 224
		<i>Desmodium motorium</i> (Houtt.) Merr	Shrub	August-December	Ba;D.B 240
		<i>Desmodium pulchellum</i> (L.) Benth	Shrub	July-January	Bh; D.B 329
		<i>Desmodium triangulare</i> (Retz.) Merr.	Tree	June-November	Ba;D.B 323
		<i>Desmodium triflorum</i> (L.) DC	Herb	July-January	Ba;D.B 314
		<i>Desmodium triquetrum</i> (L.) DC.	Undershrub	October-March	Ba;D.B 306
<i>Desmodium velutinum</i> (Willd.) DC	Tree	February-June	Bh; D.B 252		
11.	<i>Erythrina</i>	<i>Erythrina arborescens</i> Roxb.	Tree	August-November	Ba;D.B 312
		<i>Erythrina fusca</i> Lour.	Tree	March-June	Ba;D.B 240
		<i>Erythrina stricta</i> Roxb.	Tree	February-June	Pa; D.B 210
12.	<i>Flemingia</i>	<i>Flemingia macrophylla</i> (Willd) Merr.	Shrub	April-June	Pa; D.B 211

		<i>Flemingia prostrata</i> Roxb.	Shrub	March-July	Bh; D.B 339
		<i>Flemingia strobilifera</i> (L.) W.T.Aiton	Shrub	February-October	Bh; D.B 332
13.	<i>gliricidia</i>	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Tree	February-March	Bh; D.B 324
14..	<i>Indigofera</i>	<i>Indigofera zollingeriana</i> Miq.	Tree	August-December	Pa; D.B 212
15.	<i>Millettia</i>	<i>Millettia pachycarpa</i> Benth.	Climber	February-July	Pa; D.B 218
16.	<i>Mucuna</i>	<i>Mucuna pruriens</i> (L.) DC	Climber	September-January	Ba; D.B 233
17.	<i>Pisum</i>	<i>Pisum arvens</i> L.	Climber	December-February	Ba,D.B 346
18.	<i>Pongamia</i>	<i>Pongamia pinnata</i> (L) Pierre	Tree	February-January	Pa; D.B 352
19.	<i>Pueraria</i>	<i>Pueraria phaseoloides</i> (Roxb) Benth.	Herb	March-December	Pa; D.B 309
20.	<i>Rhynchosia</i>	<i>Rhynchosia viscosa</i> DC. Prodr.	Climber	December-March	Pa; D.B 219
21.	<i>Sesbania</i>	<i>Sesbania bispinosa</i> (Jacq.)Wight	Shrub	March-June	Pa; D.B 228
		<i>Sesbania grandiflora</i> Poir. Ency.	Shrub	April-October	Pa; D.B 236
		<i>Sesbania sesban</i> (L.) Merr.	Shrub	August-November	Ba;D.B 316
22.	<i>Smithia</i>	<i>Smithia sensitiva</i> Ait	Shrub	September-December	Ba;D.B 301
23.	<i>Tephrosia</i>	<i>Tephrosia candida</i> DC.	Shrub	August-December	Ba;D.B 248
24.	<i>Uraria</i>	<i>Uraria picta</i> Desv.	Undershrub	May-August	Bh; D.B 222
		<i>Uraria alopecuroides</i> (Roxb.) Wight.	Undershrub	August-October	Bh; D.B 214
		<i>Uraria lagopodioides</i> (L.) Desv	Undershrub	June-December	Pa; D.B 202
		<i>Uraria rufescens</i> (DC.) Schindl.	Undershrub	September-December	Bh; D.B 209

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Fig. 2. Some of the Papilionaceae members in their natural habitat (A) *Butea monosperma* (Lam.) Taub. (B) *Derris robusta* Benth. (C) *Mucuna pruriens* (L.) DC. (D) *Uraria rufescens* (DC.) Schindl. (E) *Flemingia macrophylla* (Willd) Merr. (F) *Uraria alopecuroides* (Roxb.) Wight. (G) *Uraria picta* Desv. (H) *Crotalaria juncea* L.

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