

Flora of Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF) in District Kurukshetra, Haryana (India)

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Abstract: During periodic visits (from February, 2008 to July, 2008), Scan sampling method¹ was followed to record flora in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF), Haryana (India). In the Saraswati Plantation Wildlife Sanctuary, 22 species of trees, namely, *Acacia nilotica*, *A. Leucopholia*, *Albizza lebbek*, *Azadirachata indica*, *Bauhinia variegata*, *Butea monosperma*, *Cordea dichotoma*, *Crataeva nurvala*, *Dalbergia sissoo*, *Eucalyptus hybrid*, *Ficus bengalensis*, *Ficus glomerata*, *Ficus religiosa*, *Ficus rumphi*, *Morus alba*, *Parkinsonia aculeate*, *Prosopis cineraria*, *Prosopis juliflora*, *Salvadora oleoides*, *Tamarise aphylla*, *Tamarise cumini* and *Zizyphus mauritiana*; 14 species of herbs and shrubs, namely, *Adhatoda vasica*, *Argemone maxicana*, *Brassica campestris*, *Capparis sepiaria*, *Capparis desidua*, *Carissa opaca*, *Calotropis procera*, *Chenopodium album*, *Kochia indica*, *Solanum nigrum*, *Trifolium alexandarium*, *Triticum aestivum*, *Oryza sativa* and *Zizyphus mauritiana*, and 9 species of grasses, climber and sedges, namely, *Cuscuta reflexa*, *Desmostachya bipinnata*, *Cyprus rotundus*, *Cenchrus ciliaris*, *Dichanthium annuatum*, *Sporobolus marginatus*, *Saccharum spontaneum*, *Typha elephantia* and *Vetiveria zizanioides* were recorded. All the same species (except 1 species of plant, namely, *Ficus bengalensis*) were prevalent in Bir Sonty Reserve Forest (BSRF). Order-wise percentage distribution of tree, herbs, shrubs, climbers, grasses and sedges species were also recorded from both study sites.

Keywords: Biodiversity, Flora, Sanctuary, Forest, Haryana.

1. Introduction

Biodiversity, the most fascinating aspect of biology, includes variability among living organisms from all sources including interalia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; it includes diversity within species and ecosystem³. Biodiversity is manifested at all levels of organization, from cell to ecosystem and refers to variability of all kinds of living organisms inhabiting terrestrial, marine and fresh water ecosystems or in the atmosphere². India has rich biodiversity as it lies at the junction of three biogeographical provinces of Africa, temperate Eurasia and Oriental and, as a result, it has biological heritage that qualifies it as one of the 12 mega diversity nations of the world⁸. But, now the number of mega diversity nations has increased upto seventeen. More than 45000 species of plants and 65000 species of animals have been recorded from the Indian subcontinent representing 7% and 6.5% of the world flora and fauna respectively⁶. The Flora of India is one of the richest of the world due to wide range of climate, topology and environments in the country. In Haryana, Thorny, dry, deciduous forest and thorny shrubs can be found all over the state and during the monsoon season; a carpet of grass covers the hilly areas; Mulberry, Eucalyptus, Pine, Kikar, Shisham and Babul are dominant trees found in the state. However, scanty information is available on various aspects of flora in Haryana. Therefore, present study was planned to assess flora species in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF) in district Kurukshetra, Haryana.

2. Materials and Methods

Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF) were selected as study site

(Fig. 1). Saraswati Plantation Wildlife Sanctuary (76° 33' E latitude and 29° 56'- 30° N longitude) is located in between two districts (Kurukshetra and Kaithal) of Haryana with an area of 11,003 acres (Fig. 1). The climate of area is subtropical, semi arid type and contains alkali soil. Annual rain fall in the area is 516 mm and average temperature is 32.4°C⁴. The vegetation of the Saraswati Plantation Wildlife Sanctuary is categorized as "Sub-group 5B tropical deciduous forest".

Bir Sonty Reserve Forest (30° 0' E latitude and 77° 1' N longitude) is also located on Kurukshetra-Ladwa link road around 20 Km East of Kurukshetra University campus and spread over an area of 474.50 acres (Fig. 1). Bir Sonty Reserve Forest is an artificial forest and contains majority of the cultivated plants. The area has dark colored, alluvial soil rich in organic matter and having high water retention capacity.

During periodic fortnightly visits (February, 2008 to July, 2008), Scan sampling method¹ was followed to record flora in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF). The collected data was later identified on various literatures.

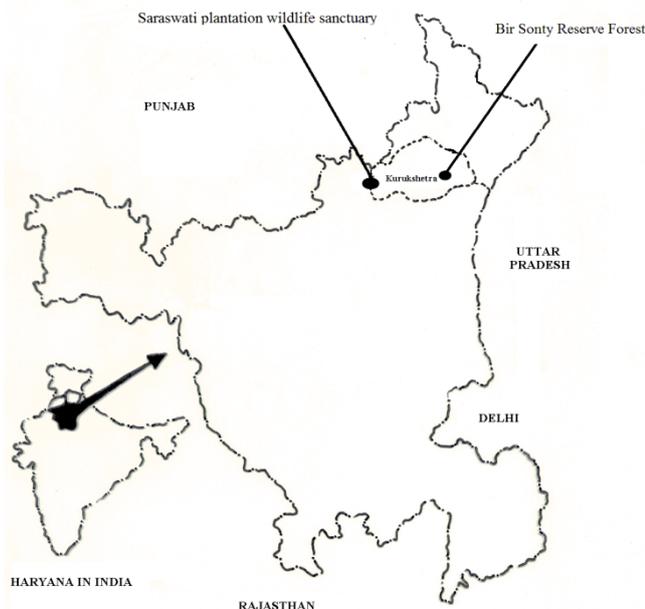


Figure 1: Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF) in district Kurukshetra, Haryana (India)

3. Results and Discussion

India is one of the 17 mega diversity nations in the world located in the tropics at the zone, confluence of three major bio-geographic realms, viz., the Indo-Himalayan (South and South-East Asia), Pale arctic (Europe and Northern Asia) and Afro-tropical (Africa) realms. India occupies only 2.4% of the world's land area but its contribution to the world's biodiversity is approximately 8% of the total number of species, which is estimated to be 1.75 million (As per Global Biodiversity Assessment of UNEP of 1995, described number of species so far is 1.75 million)⁷. A total of 356 species (belonging to 246 genera and 105 families) with potential artistic ornamental value in YSR district, Andhra Pradesh, India¹¹ while 335 species of vascular plants, viz., Angiosperms (300 species), Gymnosperms (4 species) and Pteridophytes (31 species) belonging to 237 genera and 102 families; 186 herbs; 71 shrubs and 19 climbers species were recorded from Calicut University campus, Kerala⁵.

Various number of tree species, namely, *Acacia chundra*, *Acacia eburnea*, *Acacia nilotica*, *Aegle marmelos*, *Atalantia racemosa*, *Barringtonia acutangula*, *Bauhinia purpurea*, *Bauhinia racemosa*, *Bombax ceiba*, *Buchanania axillaris*, *Butea monosperma*, *Cassia fistula*, *Cassia montana*, *Chukrasia tabularis*, *Cochlospermum religiosum*, *Crateva magna*, *Dichrostachys cinerea*, *Dolichandron falcata*, *Dolichandron atrovirens*, *Ficus microcarpa*, *Ficus hispida*, *Ficus tinctoria*, *Gyrocarpus asiaticus*, *Hibiscus platanifolius*, *Melia azedarach*, *Mimusops elangi*, *Mitragyna parviflora*, *Morinda pubescens*, *Ochna obtusata*, *Pterocarpus santalinus*, *Sterculia urens*, *Strychnos nuxvomica*, *Strychnos potatorum*, *Terminalia chebula* and *Vitex altissima*; grasses and sedges, namely, *Chloris virgata*, *Cymbopogon coloratus*, *Cynodon dactylon*, *Cyperus exaltatus*, *Eragrostiella bifaria*, *Fimbristylis argentea*, *Pycneus polystachyos*, *Saccharum spontaneum* and *Typha angustata*; herbs and shrubs, namely, *Acacia farnesiana*, *Artabotrys hexapetalus*, *Asparagus racemosus*, *Barleria*

buxifolia, *Bauhinia racemosa*, *Breynia vitis-idaea*, *Calycopteris floribunda*, *Capparis zeylanica*, *Carissa carandas*, *Clerodendrum inerme*, *Crotalaria retusa*, *Gardenia gummifera*, *Grewia tenax*, *Helicteres isora*, *Indigofera aspalathoides*, *Jasminum cuspidatum*, *Lawsonia inermis*, *Mimosa intsia*, *Murraya paniculata*, *Pterolobium hexapetalum*, *Rauvolfia tetraphylla*, *Solanum trilobatum*, *Tarenna asiatica* and *Urena lobata* from Binog Wildlife Sanctuary Garhwal Himalayas (Mussoorie)⁹.

In the present study, 22 species of trees, namely, *Acacia nilotica*, *A. Leucopholia*, *Albizia lebbek*, *Azadirachata indica*, *Bauhinia variegata*, *Butea monosperma*, *Cordea dichtoma*, *Crataeva nurvala*, *Dalbergia sissoo*, *Eukalyptus hybrid*, *Ficus bengalensis*, *Ficus glomerata*, *Ficus religiosa*, *Ficus rumphi*, *Morus alba*, *Parkinsonia aculeate*, *Prosopis cineraria*, *Prosopis juliflora*, *Salvadora oleoides*, *Tamarise aphylla*, *Tamarise cumini* and *Zizyphus mauritiana*; 14 species of herbs and shrubs, namely, *Adhatoda vasica*, *Argemone maxicana*, *Brassica campestris*, *Capparis sepiaria*, *Capparis desidua*, *Carissa opaca*, *Calotropis procera*, *Chenopodium album*, *Kochia indica*, *Solanum nigrum*, *Trifolium alexandarium*, *Triticum aestivum*, *Oryza sativa* and *Zizyphus mauritiana*, and 9 species of grasses, climber and sedges, namely, *Cuscuta reflexa*, *Desmostachya bipinnata*, *Cyprus rotundus*, *Cenchrus ciliaris*, *Dichanthium annuatum*, *Sporobolus marginatus*, *Saccharum spontaneum*, *Typha elephantia* and *Vetiveria zizanoides* were recorded from Saraswati Plantation Wildlife Sanctuary (SPWS) (Table 1 to 3). All the same species (except 1 species of plant, namely, *Ficus bengalensis*) were prevalent in Bir Sonty Reserve Forest (BSRF) (Table 1 to 3).

The percentage distribution, viz., 77.1% dicots, 12.3% monocots, 9.52% Pteridophytes and only 0.9% of gymnosperms documented ornamental flora from Dehradun¹². A qualitative floristic survey represents that 136 species in 90 genera and 37 families, i.e., most specious family of study area were Asteraceae (with 18 species), Convolvulaceae (11 species), Caesalpiniaceae (9 species) and Amaranthaceae (8 species) in Thiruvallur district, Tamilnaru (India)¹⁰.

In the present study, order-wise percentage distribution of tree species recorded from minimum 4% (Spindcales) to maximum 50% (Fabales) in Saraswati Plantation Wildlife Sanctuary while it recorded from minimum 5% (in each of Urticales and Spindales) to maximum 52% (Fabales) in Bir Sonty Reserve Forest (Fig. 2). Similarly, order-wise percentage distribution of herbs and shrubs species recorded from minimum 8% (in each of Lamiales and Ranunculales) to maximum 25% (Poales) in both study areas, i.e., Saraswati Plantation Wildlife Sanctuary and Bir Sonty Reserve Forest (Fig. 3). Also, order-wise percentage distribution of grasses, climbers and sedges were recorded from minimum 11% (in each of Typhales, Cyperales, Sonalanes) to maximum 67% (Poales) in both study areas, i.e., Saraswati Plantation Wildlife Sanctuary and Bir Sonty Reserve Forest (Fig. 3).

4. Acknowledgement

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Table 1: Prevalent tree species in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF), Kurukshetra, Haryana (India)

S. No.	Plant species				
	Local name	Scientific name	Order	SPWS	BSRF
1	Kikar	<i>Acacia nilotica</i>	Fabales	+	+
2	Nimber	<i>A. Leucopholia</i>	Fabales	+	+
3	Siris	<i>Albizia lebbek</i>	Fabales	+	+
4	Neem	<i>Azadirachata indica</i>	Spindales	+	+
5	Kachnar	<i>Bauhinia variegata</i>	Fabales	+	+
6	Dhak	<i>Butea monosperma</i>	Fabales	+	+
7	Lasura	<i>Cordea dichotoma</i>	Fabales	+	+
8	Barna	<i>Crataeva nurvala</i>	Brassicales	+	+
9	Shisham	<i>Dalbergia sissoo</i>	Fabales	+	+
10	Safeda	<i>Bukalyptus hybrid</i>	Fabales	+	+
11	Barh	<i>Ficus bengalensis</i>	Rosales	+	-
12	Gular	<i>Ficus glomerata</i>	Rosales	+	+
13	Peepal	<i>Ficus religiosa</i>	Rosales	+	+
14	Pilkhan	<i>Ficus rumphi</i>	Urticales	+	+
15	Tut	<i>Morus alba</i>	Rosales	+	+
16	Parkinsonia	<i>Parkinsonia aculeata</i>	Fabales	+	+
17	Jand	<i>Prosopis cineraria</i>	Fabales	+	+
18	Walayti jand	<i>Prosopis juliflora</i>	Fabales	+	+
19	Jaal	<i>Salvadora oleoides</i>	Brassicales	+	+
20	Jamun	<i>Syzygium cumini</i>	Myrtales	+	+
21	Frash	<i>Tamarise cumini</i>	Myrtales	+	+
22	Beri	<i>Ziziphus mauritina</i>	Rosales	+	+

+ Present; - Absent; SPWS- Saraswati Plantation Wildlife Sanctuary, BSRF- Bir Sonty Reserve Forest

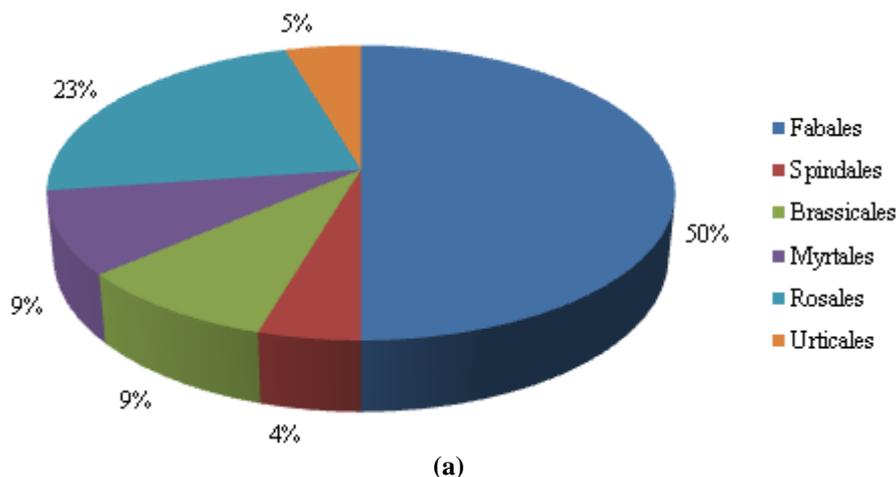
Table 2: Prevalent herbs and shrubs species in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF), Kurukshetra, Haryana (India)

S. No.	Herbs and Shrubs species				
	Local name	Scientific name	Order	SPWS	BSRF
1	Bansa	<i>Adhatoda vasica</i>	Lamiales	+	+
2	Kandai	<i>Aegemone maxicana</i>	Ranunculales	+	+
3	Sarso	<i>Brassica indica</i>	Brassicales	+	+
4	Hins	<i>Capparis sepiaria</i>	Brassicales	+	+
5	Kair	<i>Capparis desidua</i>	Brassicales	+	+
6	Karaunda	<i>Carissa opaca</i>	Gentianales	+	+
7	Ak	<i>Calotropis procera</i>	Gentianales	+	+
8	Bathua	<i>Chenopodium album</i>	Caryophyllales	+	+
9	Bui	<i>Kochia indica</i>	Poales	+	+
10	Mahua	<i>Solanum nigrum</i>	Solanales	+	+
11	Bersin	<i>T. alexandarium</i>	Fabales	+	+
12	Wheat	<i>Triticum aestivum</i>	Poales	+	+
13	Paddy	<i>Oryza sativa</i>	Poales	+	+
14	Malha	<i>Ziziphus mauritina</i>	Rosales	+	+

Table 3: Prevalent grasses, climbers and sedges species in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF), Kurukshetra, Haryana (India)

S. No.	Grasses, Climbers and Sedges				
	Local name	Scientific name	Order	SPWS	BSRF
1	Akash bel	<i>Cuscuta reflexa</i>	Sonolanes	+	+
2	Della	<i>Cyprus rotundus</i>	Poales	+	+
3	Anjan	<i>Cenchrus ciliaris</i>	Poales	+	+
4	Dab	<i>Desmostachya bipinnata</i>	Poales	+	+
5	Sarkanda	<i>Dichanthium annuatum</i>	Poales	+	+
6	Chirhia grass	<i>Sporobolus marginatus</i>	Poales	+	+
7	Kans	<i>Saccharum spontaneum</i>	Poales	+	+
8	Patera	<i>Typha elephantia</i>	Typhales	+	+
9	Panni/Kans	<i>Vetiveria zizinooides</i>	Cyperales	+	+

+ Present; - Absent; SPWS- Saraswati Plantation Wildlife Sanctuary, BSRF- Bir Sonty Reserve Forest



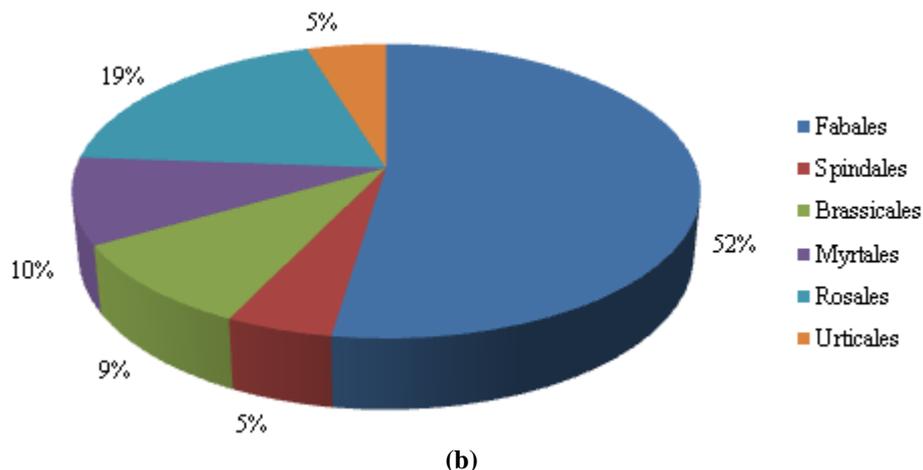


Figure 2: Order-wise percentage distribution of tree species in (a) Saraswati Plantation Wildlife Sanctuary (SPWS) and (b) Bir Sonty Reserve Forest (BSRF) in district Kurukshetra, Haryana (India).

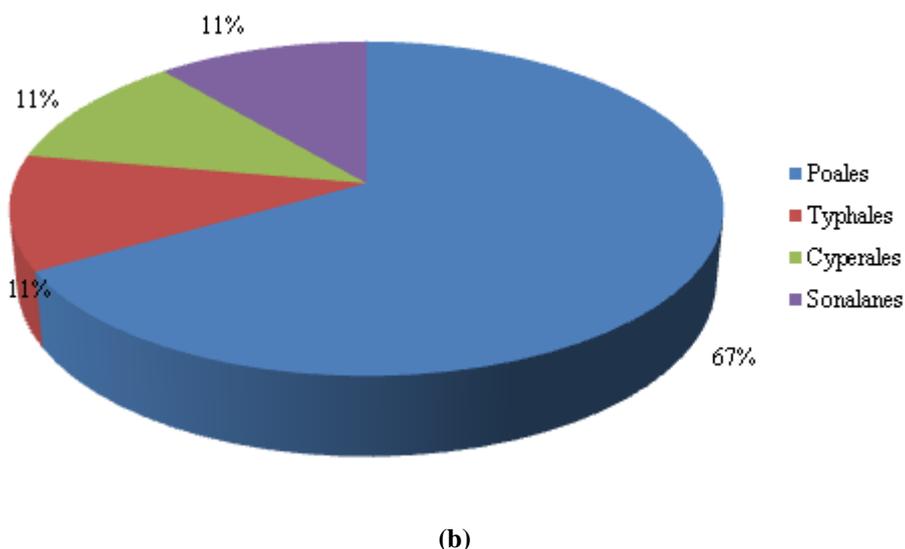
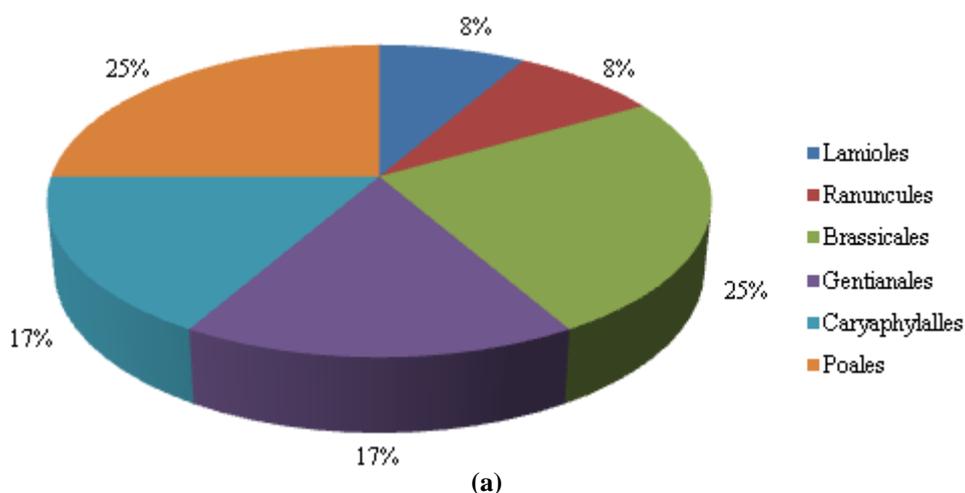


Figure 3: Order-wise percentage of (a) herbs and shrubs, and (b) grasses, climbers and sedges in Saraswati Plantation Wildlife Sanctuary (SPWS) and Bir Sonty Reserve Forest (BSRF), Kurukshetra, Haryana (India).

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