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DISTRIBUTION OF *A. MODESTA*, *A. JULIBRISSIN* AND *M. HIMALAYANA GAMBLE* IN PIR LASURA NATIONAL PARK

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ABSTRACT

Pir Lasura National Park (PLNP) in Azad Jammu and Kashmir, Pakistan is located in the Kotli Forest division and spans across an area of 13,900 acres. The list obtained through this study included 46 tree species of angiosperms, out of which only 3 species belong to the family Mimosaceae; *A. modesta*, *A. julibrissin* and *M. himalayana gamble*. *A. modesta* had 1.6 % constancy and belonged to class I, *A. julibrissin* had 3.3% relative cover and belonged to class I, whereas the relative vegetative cover of *Mimosa himalayana gamble* was too less to be tabulated. All the three species of the Mimosaceae family were scantily available. However, *A. modesta* and *A. julibrissin* had enough vegetative cover with respect to other species for them to be reported whereas *M. himalayana gamble* didn't have any significant distribution in the selected area.

Keywords: national park, angiosperm, acacia, albizia, mimosa

Abbreviations: PLNP: Pir Lasura National Park,

INTRODUCTION

Pir Lasura National Park (PLNP) in Azad Jammu and Kashmir, Pakistan is located in the Kotli Forest division and spans across an area of 13,900 acres. The park area falls between 33° 25' 10".50 N to 33° 30' 5.88 N and 74° 2' 52".02 E to 74° 6' 29".17" E and altitude range between 817 and 1,796m (asl.). PLNP has a sedimentary alluvial soil, composed of loam and clay. Lime content is uniformly distributed throughout soil profile. Sandy clay loam or loam soil is dominant. Top soil is rich in organic matter and decaying detritus, especially along gentle slopes, having potentials of supporting good vegetation.

In different parts of the world, species of Acacia have been utilized for treatment of various ailments affecting the GI tract, diabetic patients and inflammation (Li et al., 2003). Murad et al. (2011) describes the ethnobotanical use of *Acacia modesta* in Northern Pakistan for curing musculoskeletal

pain and digestive issues. Apart from medicinal benefits such as treatment of dysentery; species of Acacia are used for stick tooth brushes, fuel source of energy and multiple types of structural frames (Sher et al., 2012). According to Quattrocchi (2012) *A. modesta* is a small tree plant that does not have climbing vines; its bark is not smooth, has a thorny texture and produces a yellow gum. It has antimicrobial properties and can be used to halt bleeding. Napar et al. (2012) conducted a study on three different species of Mimosaceae and found *A. modesta* Wall to be very potent in antimicrobial and antioxidant properties.

Albizia Julibrissin is also known as the silk tree. It was considered as moderately invasive by Binggeli (1999). They grow very fast and have light pink flowers. This tree is native to Pakistan (cabi.org, 2018). Since this plant has a good tolerance against draught and salt stresses it can occupy a wide range of locations (Global invasive species

database, 2018). This species can also be found in Japan and China. It is a deciduous plant with flowers that may be used for food. It has many health benefits that include pain relieving and anticancer properties, helps relieve several problems linked to the nervous system,

Mimosa himalayana gamble is a shrub belonging to the Fabaceae family. Shakoor et al. (2014) found that methanolic extracts of this species were very effective against the bacterial and fungal strains tested. Quattrocchi (2012) describes the benefits of *M. himalayana gamble* for fever, pain in teeth and urogenital issues; it is antiemetic and antirheumatic.

MATERIALS AND METHODS

Sample collection

The survey was done during June – July, 2009. A list of the species of the Mimosaceae sub-family found in field was constructed. A physical examination of the PLNP area and its associated tracts was done using Rapid Biodiversity Assessment (RBA). Attempts were made to collect/record all the plant species present under different microhabitat variation. This dataset was used to construct list of the plant species in PLNP. Hence, broad areas having reasonably similar vegetative conditions were identified using satellite imagery and physical reconnaissance of the area, and were recognized as stands for sampling of vegetation. All the stands were assigned reference numbers and sampled using different numbers of 50 m long line transects at randomly selected locations in different parts of the stand.

The plants were identified in the field. Herbarium sheets of all specimens were made and brought back to the laboratory. The field samples were then identified in the laboratory using Flora of Pakistan (Nasir and Ali, 1970-2008; Stewart, 1972; Toshiyuki and Malik, 1992, 1993) and through physical assessment with the known samples available

at Herbaria of Quaid-e-Azam University Islamabad, and Pakistan Museum of Natural History, Islamabad. Data from the different quadrates was gathered to evaluate the approximate percentage of the relative vegetative cover of different plant species and total vegetative cover of stands. TWINSpan was used to establish the variety of vegetation using stand comparisons in the vegetative composition. Distribution of different plant species was placed on the digitized map of PLNP using satellite imagery. Information regarding benefits of these species was accumulated by interviewing the locals for traditional knowledge and studying by previously published works.

The list obtained through this study included 46 tree species of angiosperms, out of which only 3 species belong to the family Mimosaceae. *A. modesta* had 1.6 % constancy and belonged to class I, *A. julibrissin* had 3.3% relative cover and belonged to class I, whereas the relative vegetative cover of *Mimosa himalayana gamble* was too less to be tabulated.

PLNP mainly comprises of a U-shaped folded hill slopes with a narrow valley, with an entry from the western side. Natural hill ravines drain the rain or spring water into the lake. East slopes of PLNP have thicker forested vegetation and without human settlement while north east and south west human settlements. The average rainfall per annum during the study was 1500 mm. Due to degradation of biodiversity and habitat loss, the total area of the forests has been decreasing rapidly since last few decades.

Acacia modesta is native to a lot of tropical and subtropical regions and has great commercial value. The study conducted by Sher et al. (2012) found that this species is able to grow on a variety of soil types.

RESULTS AND DISCUSSION

Table 1: Vegetative biodiversity of PLNP

S #	Scientific Names	Subfamily	Remarks	Usage
	<i>Acacia modesta</i> Wall (Phulai) (Figure 1)	Mimosaceae	Small, medium sized deciduous tree, young shoot glabrous to sub glabrous, bark brownish or greenish grey, rough, prickles in pairs, below petiole, compressed.	Hard and durable wood, used for cane crushers, Persian wheel and agricultural implements, as fuel, gum, arbica; tender twigs for cleaning teeth.
	<i>Albizia julibrissin</i> Durazz	Mimosaceae	Small sized tree, dark-grey bark, young parts with yellowish brown hairs.	Bark is used to cure bruises, as a vermicide, seeds used as food for livestock, flowers good nectar source for honeybees.
	<i>Mimosa himalayana</i> Gamble	Mimosaceae	Large straggling deciduous, branches ribbed, densely hairy; prickles present on nodes/inter nodes, straight or hooked, 4 mm long; leaf bipinnate, rachis 10-23 cm, long, prickly, mostly hooked.	Wood for tent pegs and making gunpowder/charcoal, root, leaves and fruits are of minor medicinal importance.

Table 2: Relative vegetative cover (% ±) shared between different plant species in PLNP by Ward's method.

S. No	Names	A (1, 3, 19, 33-35, 36, 38, 46, 47, 48, 49, 50, 56, 57, 60, 68)	B (4,5, 7, 8, 9, 10, 12,13, 17, 21, 22, 23, 25, 26, 29, 31, 32, 37, 40, 41, 42, 43, 44, 52, 54)	C (2,16, 18, 28, 30, 45, 53, 59)	D (6,11, 14, 15, 20, 24, 27, 39, 55)	Constancy (%) /class
		Mean ± S.E	Mean ± S.E	Mean ± S.E	Mean ± S.E	
1.	<i>Acacia modesta</i>	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	1.6/ (I)
2.	<i>Albizia julibrissin</i>	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	3.3/ (I)

The results obtained in this study indicate that although both *Acacia modesta* and *A. julibrissin* were noted in the field but their low relative abundance showed how scarce they were. *M. himalayana gamble*, was so scarce when compared to other species that although it was observed in field, no significant value was obtained for the relative vegetative cover.

Since these plants are readily harvested for wood, fodder and their health

benefits it is possible that over exploitation has affected their density in PLNP. Especially *A. julibrissin*, which is considered as moderately invasive should naturally has a higher field coverage.



Figure 1. *Acacia modesta*

CONCLUSION.

The list obtained through this study included 46 tree species of angiosperms, out of which only 3 species belong to the family Mimosaceae. *A. modesta*, *A. julibrissin* and *M. himalayana gamble*. All the three species of the Mimosaceae family were scantily available. However, *A. modesta* and *A. julibrissin* had enough vegetative cover with respect to other species for them to be reported whereas *M. himalayana gamble* didn't have any significant distribution in the selected area.

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