Comparative study of a Fresh water Swamp of Doon valley

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Abstract: Fresh water swamps are the typical habitat where water oozes from the soil surface. They offer many important benefits including flood control, groundwater recharge, pollution cleanup, wildlife habitat, and recreation. In Doon valley fresh water swamp forest forms a distinct ecosystem. However increased population and developmental activities resulting in continuous encroachment upon forestland, many swamp areas have shrinked in around Doon valley. Today only a few small and scattered patches of swamps are left between the base of the outer Hills of Himalayas in the northern and the Shiwalik hills of the South. One of them is Mothronwala Fresh water swamp where the present work was carried out. It occurs as a compact area between 30^0 15' north latitude and 78^0 2' east longitude with an average altitude of 600m above mean sea level. In this paper we have attempted to assess the vegetation of Mothronwala Fresh water swamp and compare it with the vegetational data of Dakshini (1965). During the study a lot of changes have been recorded in the vegetation of Mothornwala Fresh water Swamp. The important characteristics tree, shrub, and herb species which was reported by Dakshini (1965) are missing now. The status of life form also declined from 224 to 194 in case of herbs, 52 to 34 in case of shrubs, and 38 to 25 in case of trees. 168 genera have emigrated as against to 116 immigrated. In case of species, the emigration was 212 species as against of immigration of 135 species. [The Journal of American Science. 2008;4(1):7-10]. (ISSN: 1545-1003).

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Introduction

Swamps are typical habitat where water oozes out places known as "Oogals" which form perennial streams. At these places the subsoil water maintains constant level throughout the year above the surface of the soil. Swamps play a vital role in landscaping with a wide variety of flora and fauna. Due to variation in topography, a distinct floristic diversity is seen which is quite varied from the surrounding area. The Doon valley known for its swamps. There was a time when low lying areas of the valley were having a chain of swamps but human interference once started in the name of malarious climate (King, 1871) still persist. The trees were cut at that time and the openings created which resulted in the extinction of most of the swamps. Kanjilal (1901) drew attention to the botanical interest of the three detached bits of Swamp forest in the neighbourhood of DehraDun and he considered Mothronwala as the most important of them, where the present work was carried out.

Mothronwala fresh water swamp forest lies at the foot of the shiwaliks that forms the Southern flank of the Doon valley. The swampy zone consist of numerous pools with water oozing out in a series of deep but narrow ravines giving rise to number of streams which after union form a well defined channel. This channels runs out of the swamp forest and acts as a natural drainage. In present Mothronwala fresh water swamp forest is under great biotic stress and has been degraded to a great extent due to the clustering of villages around the periphery of the swamp. Resulting is that the vegetation structure has been changed in last few decades. The important characteristics species have been extinct from the study area and the place of these species various exotic hardy species are invading and replacing in indigenous flora.

A detailed study of Mothronwala Fresh water Swamp was studied by Dakshini (1960a, 1960b, 1965, 1968, 1970 &1974). The present work is an attempt to compare vegetational changes in last few decades of Mothronwala Fresh water swamp of Doon valley.

Material and Methods

Doon valley is situated on the North east corner of Uttaranchal between 78^0 5' east longitude and 30^0 24' north latitude. The present study was conducted during the year 2003 in Mothronwala Fresh water Swamp forest. The area was exhaustively surveyed for the study. Usual methods of collection, preservation and maintenance of specimen in herbarium were followed (Jain & Rao, 1977). During the field study the specimen of plants with flower and fruit were recorded. Collection of plant species were made throughout

the year. After collection, the specimen were processed, preserved and mounted on herbarium sheets. The herbarium sheets identified from the BSD herbarium and deposited in the Herbarium of Ecology Research laboratory, Botany Department D.A.V (PG) College, DehraDun.

Results

The study has been resulted that the vegetation of Mothronwala fresh water swamp has been depleted at much faster rate during last few decades. A considerable changes have been noticed in the vegetation of Mothronwala Fresh water swamp during the present study. Table 1 shows the comparison of floristic diversity of Mothronwala fresh water swamp after four decades. In present 278 plant species of angiosperms with 218 genera and 71 families were collected from the study area which is very less in the comparison of Dakshini (1965).

According to Dakshini (1965) the vegetational formula of study area was 38 Trees +52 Shrubs+235 Herbs. In present a major decline have been recorded in the vegetation structure of the swamp is 25 Trees +34Shrubs +25 Climbers +194 Herbs Table 2. The original forest vegetation of Mothronwala Fresh water swamps had dwindled to a large extent. A very common and characteristic species of Doon valley swamps *Bischofia Javanica, & Diospyros montana* reported by Kanjilal (1901) & Dakshini (1965) was not recorded from the study area in present. Besides these there are various characteristic tree species which was recorded by Dakshini (1965) are missing now. At the places of these tree species 11 new tree species was recorded form the study area Table 3. A major loss of characteristics species have been recorded from the study area. Table 4 shows the characteristics tree, shrubs and herbs species which have been loss their status from the study area. Table 5 shows the emigrated and immigrated species of the Mothronwala Fresh water swamp. During the study it is observed that, 168 genera have emigrated as against to 116 immigrated. In case of species, the emigration was of 212 species as against of immigration of 135 species.

Table 1. Comparison of Taxonomic ranks of Mothronwala Fresh water Swmap

S.N	Taxon	1965	2003
1	Family	71	71
2	Genera	261	218
3	Species	365	278

Table 2. Change in life form of vegetation of Mothronwala Fresh water Swamp

S.N	Life form	1965	2003
1	Herbs	224	194
2	Shrubs	52	34
3	Climbers	42	25
4	Trees	38	25

Table 3. New Tree species recorded in Mothronwala Fresh water swamp after Dakshini (1965)

S.N	Tree spp	Family
1	*Bauhinia variegata* L	Leguminoseae
2	*Bombax cebia* L.	Bombacaceae
3	*Celtis australis* L.	Ulmaceae
4	*Cornus oblonga* Wall.	Cornaceae
5	*Grewia optiva* J. R. Dru.ex.Bur.	Tiliaceae
6	*Grevillea robusta* A.Cunn	Porteaceae
7	*Litsea monopetala* (Roxb)Pers.	Lauraceae
8	*Mangifera indica* L.	Anacardiaceae
9	*Melia azadirachta* L.	Meliaceae
10	*Pterospermum acerifolium* Willd.	Sterculiaceae
11	*Quercus leucotricophora* A.Camus	Fagaceae

Table 4. Emigrated and Immigrated taxa in last few decades

S.N	Taxon	Emigrated	Immigrated
1	Family	15	15
2	Genera	168	116
3	Species	212	135

Table 5. Loss of characteristic swampy species of Mothronwala fresh water swamp in last few decades

Life form	Species
Trees	*Bischofia javanica* Bl.
	Diospyrous montana Roxb.
	Shorea robusta Roxb.ex. Gaertner
Shrubs	*Elagenus conferta* Roxb.
	Trachelospermum lucidum (D.Don) K.Schumann
Herbs	*Adenostema lavenia* (L.) Kuntze
	Floscopa scandens Lour.
	Rotala mexicana Chamisso & Schlechtendal

Discussion

Doon valley has many fresh water swamps, due to its unique topography and peculiar situation in the foot hills of Himalaya. One of such swamp is Mothronwala Fresh water swamp, where the present study was carried out. The study concluded that in present, Mothronwala Fresh water swamp is under great anthropogenic pressure has been degraded to a great extent during the last few decades. The major portion of the swamp has been encroached upon by human settlement, agriculture, cultivation and related developmental activities by there nearby villagers. Villagers are depend on the swamp for fullfill their daily requirements such as fuel, food, fodder, timber and other domestic purposes. The villagers have occupied the peripheral area for cultivation of various fodder species. Lopping of trees by neighbouring villagers has resulted in the deformity of some of the trees with the consequent effect on the ground floor vegetation. Resulting is that exotic species like *Lantana camara, Eupatorium adenophorum, Parthenium hysterophorus, Ageratum conyzoides, Ipomea carnea, Malvastrum coromendelicum* invaded in a large number into the swamp area and have been changed the vegetation structure of the swamp.

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