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### REVIEW ARTICLE

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## A study: Dissertation entitled present status of *Taxus baccata* Linn in Siraj Forest Division of Himachal Pradesh

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### ABSTRACT

*Taxus baccata* is one of the important and widely exploited tree species of Western Himalayas. The tree is well suited in moist, shady and sheltered places in Fir (*Abies pindrow*) and Oak (*Quercus semicarpifolia*) forests of Western Himalayas. The rich potential as anti cancerous materials led to the exploitation of *Taxus baccata*, especially in the Kullu region of Himachal Pradesh. The present paper is a dissertation work entitled "Present status of *Taxus baccata* Linn in Siraj Forest Division of Himachal Pradesh" to investigate the population ecology of the species as a foundation for its conservation.

**Keywords:** *Taxus*, anti cancerous, Siraj and Ecology.

### INTRODUCTION

*Taxus baccata* Linn, belong to Taxaceae family. The species is well known as Himalayan yew, an evergreen shrub with spreading branches and dense foliage. The tree yields *Taxol*, an anti cancerous agent used for the treatment of uterus and breast cancer. *Taxol* is a poisonous substance present in the shoots of *Taxus baccata*. Traditionally, the tree contain diuretic properties and used in the treatment of viper bites, hydrophobia, hysteria and epilepsy.

Therefore, the documentation of this isolated and marginalized tree resource is initiated through the Dissertation work with the following objectives:

1. To study the present status of *Taxus baccata* in Siraj Forest Division
2. To study the Phyto sociology of *Taxus baccata*
3. To assess the perceptions of local inhabitants for propagation protection and regeneration of the species

## MATERIALS AND METHODS

Author selected two forest ranges namely Banjar and Sainj for the study. The sites were name as S1 and S2 on the basis of the species population. Five quadrates each of 10\*10m sizes were laid at each site to record the following parameters i.e. Name of the tree species, Diameter of the species and occurrence of each species in each quadrate. By using the Mishra (1968) formula, Basal area, Percent frequency, Density, Relative dominance, Relative frequency, Relative density and Importance Value Index (IVI) were calculated for each species found in the recorded sites. Author follows the IVI index in order to express the dominance and ecological success of any species. IVI index gives relationship among various species for the community. Likewise, Cair et al (1956) reported that IVI is a better expression of relative ecological importance of the species than the single absolute measure like frequency, density and abundance etc. The perception of the local people were conducted with the interview based structured questionnaire and informal discussions. Questionnaire method was used to get responses in a standardized and cost-effective way. To collect data on resource use pattern amongst large number of respondents, interview based questionnaire was used and the information was verified. Personal interview were also conducted to overcome the poor response rates of a normal questionnaire survey. Personal interviews provide opportunity to evaluate the validity of the respondent's answers by observing non verbal indicators. The questionnaire tested on local youth and leaders of the village community of varying ages, sexes and economic background to ensure clarity and effectiveness of the questions before use. Respondents were selected from different sex, age group, educational, social and economical classes.

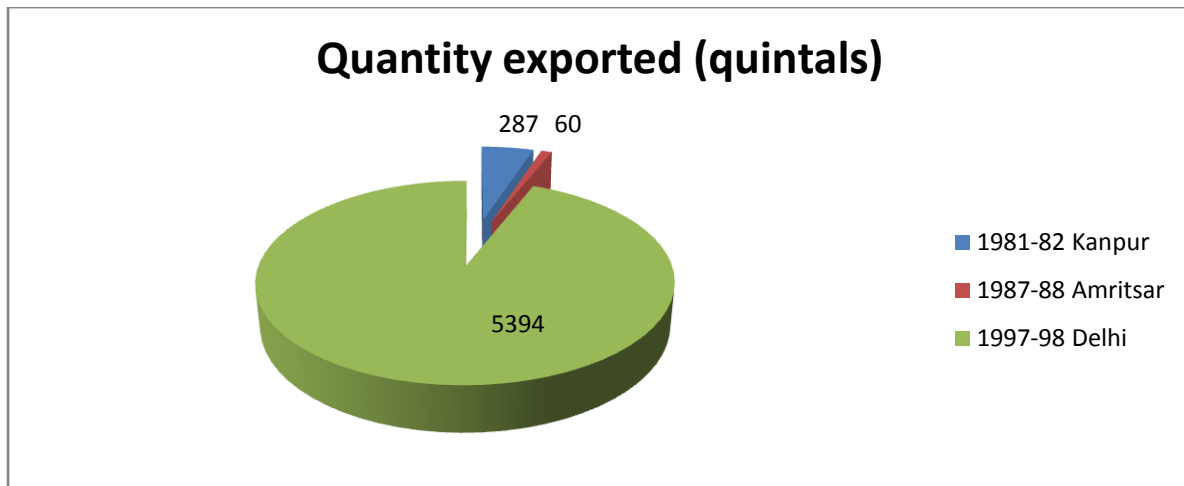
## RESULTS

Data collection is based on the working plan, Siraj Forest Division, Himachal Pradesh. The growing stock of *Taxus baccata* in different forest ranges of Siraj Forest Division is presented in table 1. Out of the total 400,000 plants distributed in an area of 7236.11 ha, maximum plants were recorded in Banjar range (193448) covering an area of 3265.17 ha. Minimum was found in Tirthan range (68133) distributed in an area of 1759.34 ha. The remaining plants were distributed in Sainj range (138419) in an area of 2211.59 ha.

**Table 1.**

Sl no	Name of forest range	Total number of plants	Area (ha)
1	Tirthan	68133	1759.34
2	Sainj	138419	2211.59
3	Banjar	193448	3265.17
Total		400,000	7236.11

Source: Working Plan, Siraj Forest Division (1995)



**Figure 1.**

**Source: Official data, Divisional Forest Officer (DFO), Siraj**

The chart (Table 2) showing quantity of leaves exported in different parts of India. Most of the *Taxus baccata* needles were exported to neighbouring states like Kanpur, Amritsar and Delhi. The official data of Divisional Forest Officer, Siraj show that maximum number of needles were exported to Delhi (5394 quintals) followed by Kanpur (287 quintals). The minimum number of needles was exported to Amritsar (60 quintals). The needles were exported to other states for making tannin and to adulterate tea leaf. The trade name *Brimi* is used to sell the *Taxus baccata* leaves in other parts including Amritsar. The unrestricted heavy removals of these leaves, impacts of harvesting and its current regeneration patterns indicate that the tree may soon be extirpated from the Siraj Forest Division, Himachal Pradesh. Keeping in mind, the forest department has taken up several measures and completely banned on its extraction.

## DISCUSSION

Vegetative analysis of *Taxus baccata* in site 1 and site 2 of Banjar and Sainj forest ranges of Siraj Forest Division is tabulated in Table 3, 4, 5 and 6 respectively. In Table 3, the vegetation at site 1 was dominated by *Taxus baccata* followed by *Pinus wallichiana* and *Picea smithiana* with IVI 152.78, 49.32 and 31.28 respectively. *Quercus semicarpifolia* and *Juglans regia* show less distribution with IVI 24.95 and 21.58 respectively. *Abies pindrow* has a lowest distribution with IVI 20.09. Maximum IVI for *Taxus baccata* is attributed to its higher frequency, density and basal area. *Quercus semicarpifolia*, *Juglans regia* and *Abies pindrow* have low dominance due to their low density, frequency and basal area. Table 4 indicate that the species, *Taxus* dominated in site 2 followed by *Pinus wallichiana* and *Rosa moschata* with IVI values 148.38, 52.76 and 35.60 respectively. *Quercus semicarpifolia* and *Berberis aristata* has less distribution with IVI 26.73 and 17.89 respectively. *Picea smithiana* and *Cedrus deodara* has rare distribution with IVI 9.75 and 8.89 respectively. Maximum IVI for *Taxus baccata* is attributed to its higher basal area, frequency and density. *Pinus wallichiana* showed low dominance in comparison to *Taxus baccata* due to its low basal area and density. *Picea smithiana* and *Cedrus deodara* have least dominance at site II range due to their low basal area, frequency and density. Data tabulated in Table 5 indicates that basal area, frequency percentage and density of *Taxus baccata* were found to be 3.1426, 100 and 7.0 respectively. It is also evident from data that the vegetation at site 1 was dominated by *Taxus baccata* followed by *Pinus wallichiana* and *Picea smithiana* with IVI

161.45, 66.35 and 45.55 respectively. The relative dominance, relative frequency and relative density for *Taxus baccata* were found to be 91.43, 31.25 and 38.8 respectively. *Taxus baccata* showed maximum dominance followed by *Pinus wallichiana*. Maximum IVI for *Taxus baccata* is attributed to its higher basal area in comparison with *Pinus wallichiana* whereas *Berberis aristata* have low IVI due to its lower basal area, frequency and density. Table 6 show that vegetation at site II in Sainj forest range of Siraj Forest Division was dominated by *Taxus baccata* followed by *Pinus wallichiana* and *Picea smithiana* with IVI 113.85, 71.75 and 44.65 respectively. *Juglans regia* and *Quercus semicarpifolia* has less distribution with IVI 25.65 and 23.6 respectively whereas *Berberis aristata* have rare distribution with IVI 20.4 as compared to *Pinus wallichiana*.

Table 3.

Species	Basal area (cm <sup>2</sup> /100m <sup>2</sup> )	Frequency (%)	Density (No/100m <sup>2</sup> )	Relative dominance (%)	Relative frequency (%)	Relative density (%)	IVI
<i>Taxus baccata</i>	3.6419	100	1.8	87.30	26.35	39.13	152.78
<i>Pinus wallichiana</i>	0.0450	100	1.0	1.28	26.31	21.73	49.32
<i>Quercus semicarpifolia</i>	0.2525	40	0.4	6.34	10.52	8.09	24.95
<i>Juglans regia</i>	0.1032	40	0.4	2.37	10.52	8.69	21.58
<i>Picea smithiana</i>	0.0100	60	0.6	2.47	15.78	13.04	31.28
<i>Abies pindrow</i>	0.1182	40	0.4	0.24	10.52	9.33	20.09
Total	4.1708	380	4.6	100	100	100	300

Table 4.

Species	Basal area (cm <sup>2</sup> /100m <sup>2</sup> )	Frequency (%)	Density (No/100 m <sup>2</sup> )	Relative dominance (%)	Relative frequency (%)	Relative density (%)	IVI
<i>Taxus baccata</i>	5.0308	100	1.4	96.58	23.80	28	148.38
<i>Quercus semicarpifolia</i>	0.0229	60	0.6	0.43	14.30	12	26.73
<i>Pinus wallichiana</i>	0.0504	100	1.4	0.96	23.80	28	52.76
<i>Cedrus deodara</i>	0.007	10	0.2	0.13	4.76	4	8.89
<i>Picea smithiana</i>	0.050	10	0.2	0.97	4.78	4	9.75
<i>Berberis aristata</i>	0.019	40	0.4	0.37	9.52	8	17.89
<i>Rosa moschata</i>	0.027	80	0.8	0.56	19.04	16	35.60
Total	5.2071	400	5	100	100	100	300

Table 5.

Species	Basal area (cm <sup>2</sup> /100m <sup>2</sup> )	Frequency (%)	Density (No/100m <sup>2</sup> )	Relative dominance (%)	Relative frequency (%)	Relative density (%)	IVI
<i>Taxus baccata</i>	3.1426	100	7.0	91.43	31.25	38.8	161.45
<i>Pinus wallichiana</i>	0.0614	100	6.0	1.79	31.25	33.3	66.35
<i>Picea smithiana</i>	0.1358	80	3.0	3.95	25.0	16.6	45.55
<i>Berberis aristata</i>	0.0971	40	2.0	2.0	12.5	11.3	26.6
Total	3.4369	320	18	100	100	100	300

Table 6.

Species	Basal area (cm <sup>2</sup> /100m <sup>2</sup> )	Frequency (%)	Density (No/100m <sup>2</sup> )	Relative dominance (%)	Relative frequency (%)	Relative density (%)	IVI
<i>Taxus baccata</i>	4.0203	100	1.0	63.75	26.31	23.80	113.85
<i>Pinus wallichiana</i>	1.3962	100	1.2	22.13	21.09	28.57	71.75
<i>Picea smithiana</i>	0.6168	60	0.8	9.78	15.78	19.04	44.65
<i>Juglans regia</i>	0.0210	40	0.4	0.34	15.78	9.52	25.65
<i>Berberis aristata</i>	0.0262	40	0.4	0.41	10.52	9.52	20.4
<i>Quercus semicarpifolia</i>	0.2259	40	0.8	3.58	10.52	9.55	23.60
Total	6.3064	380	4.6	100	100	100	300

#### Perceptions about the propagation of *Taxus baccata*

Most of the surrounding villagers have no idea about the propagation techniques. Besides, the localities do not know the tree is propagated artificially. They saw the tree growing naturally inside the forested areas. Therefore, in order to tackle the problem, the villagers need proper guidance about its nursery raising technology and financial assistance from government sector for establishing the nurseries.

#### Perception about protection of *Taxus baccata*

- Grazing by cattle, flocks of sheep and goats in the *Taxus baccata* forests must be completely banned

- Heavy lopping of *Taxus baccata* by the local inhabitants, nomadic gujjars and commercial traders should be restricted
- Rotational scheme should be prepared for the forests which are very much exploited for the leaves after considering the previous pressure on these forests
- The trees should not be allowed to be defoliated beyond half of the length, only IV class and above trees should be lopped on alternate years

It is therefore, essential to strengthen species conservation through establishment of preservation plots (in situ conservation), nursery and plantation initially to multiply and extent area under it.

## CONCLUSION

Majority of the people told that the species is heavily lopped by the nomadic gujjars, commercial traders and localities. As a result, the growth of *Taxus baccata* shows poor generation. The tree is the only dominated species at all sites of Siraj Forest Division. Maximum amount of 5741 quintals dried *Taxus baccata* leaves were exported outside the state from Siraj Forest Division during 1981-2000. 400,000 plants of *Taxus baccata* were found to be distributed in an area of 7236.11 ha in Tirthan, Banjar and Sainj Forest Division of Himachal Pradesh. Alchemy International Private Limited (AIPL) situated at Shamshi in Kullu district of Himachal Pradesh is the only limited working on the artificial propagation of *Taxus baccata*.

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## REFERENCE

Mishra, R. 1968. Ecology work book. Oxford and IBH publishing company, Calcutta Working Plan, Siraj Forest Division (1995). (Ashem Rahul Singh, Yaiskul Hiruhanba Leikai, Imphal West 795001, Manipur).