
HABITAT STUDY OF *CELASTRUS PANICULATUS*: A STEP TOWARDS CONSERVATION

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Abstract: In the study of vegetation, examination of environmental conditions is obligatory. The study of important medicinal plants which need conservation either by cultivation and / or domestication also involves the examination of environmental conditions where they are growing wild. The fate of newly introduced plant species is determined by its ecological amplitude. Environmental conditions at new home of plant species & conditions where it is growing wild should be more or less similar. Research should focus on species for which there are ready markets & natural sources are fast depleting. *C. paniculatus* is one of such plant. It has tremendous medicinal potential serving as a source of various wonder drugs & has withstood test of time. However, it is experiencing considerable anthropogenic pressure in terms of over-exploitation, habitat destruction, habitat fragmentation & degradation. This biotic interference has resulted in the depletion, dwindle & decline in number of wildy growing plants. As a result, it is threatened with extinction, therefore demanding & deserving conservation. To attempt conservation of *C. paniculatus* by domestication a need for basic research on environmental conditions where it grows wild was experienced.

Keywords: *Celastrus Paniculatus*, Environmental Conditions, Conservation, Climatic Study, Habitat Study.

Introduction: Annual growth rate of herbal products and plant raw material export market is 5 to 15%. The global drug market is worth 62 billion USD. In trading of medicinal plant-material, India is world's leading producing nation. India exports 38 medicinal plants (Prajapati *et. al*, 2003). Plant related trade in India is estimated at Rs.500 Corers per annum. The increasing demand for medicinal plants in developing countries has been met by indiscriminate harvesting of spontaneous flora including those in forests (de silva, 1997). A survey carried out among companies involved in trade & production revealed that although companies reported 60 to 90% of material was from cultivation, the number of species cultivated relative to the volume is small (Laird & Pierce, 2002).

For the last two decades there is growing trend of domesticating & cultivating medicinal plants (Ramesh *et. al.*, 1989). Domestication serves twin benefits a) conservation & b) source of plant material for drug extraction, relieving the pressure of collection and exploitation from the wild populations. Cultivation of medicinal plants is encouraged all over the world in order to save them from extinction (Ramesh *et. al.*, 1989 & Singh *et. al.*, 1993).

Even though cultivation is an important strategy for conservation & sustainable maintenance of natural stocks, few are actually cultivated. Lack of basic knowledge on biology, ecology, propagation methods for concerned species is responsible factor. Cultivation of some herbs has proved difficult because of low germination rates or specific ecological requirements (Vines, 2004). Successful cultivation of MAPs requiring information on the species adaptation to outside their natural habitats. As domestication & cultivation cannot be taken up for all potential MAPs, research as a first step should establish priority species based on participation surveys & market analysis involving rural people, traditional healers, material collectors & drug industry. Research should focus on species for which there are ready markets & natural sources are fast depleting. *C. paniculatus* is one of such plant. It has tremendous medicinal potential serving as a source of various wonder drugs & has withstood test of time. However, it is experiencing considerable anthropogenic pressure in terms of over-exploitation, habitat destruction, habitat fragmentation & degradation. This biotic interference has resulted in the depletion, dwindle & decline in number of wildy growing plants. As a result, it is threatened with extinction, therefore demanding & deserving conservation.

Domestication is best method of conservation. A successful introduction of a species & then its acclimatization are the two important aspects of domestication. The species growing under certain sets of environmental conditions have maximum chances of survival, if it is introduced to habitat where sets of environmental conditions are similar.

For domestication of priority species work should follow on ecology, natural distribution, reproductive biology, propagation technique, germplasm collection, evaluation & genetic improvement aimed at improving both yield & quality of the product. Simultaneously information should be produced on the soil & environmental conditions to which they are adapted, systems in which they can be grown, nutrient management, harvest technique & processing (Rao *et. al.*, 2004). To attempt conservation of *C. paniculatus* by domestication a need for basic research on environmental conditions where it grows wild was experienced.

Material And Method: The environmental studies involve study of climatic, topographic & edaphic factors. The climatic and topographic conditions were observed and recorded personally and information is collected from other sources. Information about climatic factors was collected from main observatories from each district viz. Palghar for Murbad, Dapoli for Kokan, Satara. Topography of area was studied at the time of material collection & overall observations were recorded. For additional information about topography the Flora of Maharashtra, Flora of Kolhapur, Flora of Bombay Presidency was referred.

Observations and Results: The environmental conditions prevailing at the natural home of *C. paniculatus* were studied as basic research required to develop agro-technique for the domestication of species.

Observation Table 1.1 - Overall Topographic Conditions

As reported by H. Panda (1994) the plant grows up to an altitude of 1200 meters throughout India. In Sub-Himalayan slopes it is found up to height of 200 meters. In M.P, Gujarat and South India it is present on Hilly slopes. During collection trips the plant was found growing on steep slopes in the crevices of slippery, soft and loose rocks. Many times the wildy growing plants were unreachable because they were growing at inaccessible places.

Observation Table 1.2- Overall Climatic Conditions

In the natural home of plants, the average temperature during winter is between 17-28°C, during summer is between 23-37°C and during monsoon is between 23-33°C indicating that winters are comparatively colder than summers. Compared to summer, in winter season relative humidity is high. Throughout the year, climate is breezy. Winds are strong in monsoon. These plants growing on hilly slopes are continuously subjected to pull of either gentle breeze/ strong winds. The rainfall is heavy and restricted to monsoon. The winter season experiences occasional rain showers. The habitat is characterized by hot and humid climate, with summer tending to become dry, especially in Satara.

Observation Table 1.3 - Climatic Conditions Present At 3 Localities

Parameters	Summer			Monsoon			Winter			
	Satara	Murbad	Kokan	Satara	Murbad	Kokan	Satara	Murbad	Kokan	
Temperature (°C)	Max	33-44	32-40.4	31-42	25-35	24.5-35	24.4-36.8	25-37	26.2-41	24.7-34
	Min	18-30	23.5-31.0	14.5-31	20-30	22-30	21.4-25	12-36	10.5-24	13.2-25
Relative Humidity	Rh ₁	55-81	42-94	53-98	49-95	44-98	83-100	54-80	54-98	90-100
	Rh ₂	34-80	25-67	36-87	40-89	35-98	56-100	35-59	25-76	28-100
Precipitation	0-1.2	0-2	0-1.2	0-200	0-170	0-208	0-80	0-75	0-92	
Wind velocity (Km/hr)	5-9	3-8	4-8.8	8-17	8-15	10-17.7	0.5-8	0-6	0.3-6.4	

Discussion and Conclusion: As per the results of our investigations about environmental conditions at habitat of *C. paniculatus*, the hilly slopes are the natural homes of *C. paniculatus* (Observation table 1.1). Even though the species have climbing habit, because of the steep slopes on which few strong trees grow successfully, less no. of members grow as climbers. Most of the members grow as stragglers on the slopes.

Many members are found growing in close associations but these members do not show luxuriant growth, because the soil on which they grow is less fertile, lateritic and becomes hard during dry season.

The data reveals that at climate is not too hot even in summer and too cold in winter. In all seasons, the relative humidity is higher in morning than at evening. Relative humidity at Kokan is highest in morning in winter as well as monsoon compared to at Satara and Murbad. The relative humidity (Rh₂) at evening is less because of high temperature during day time as well as wind velocity. The wind velocity is minimum in winter season. At all localities, it is moderate during summer and maximum during monsoon. Wind velocity indicates that the plants growing at all three sights are subjected to pull of breeze/strong wind continuously. Amount of precipitation at three localities during winter season is less and same. In monsoon season precipitation at all sights increase considerably and its quantity is almost same everywhere.

The climate in their habitat is moderately hot & humid with winters becoming cold & summers becoming dry. The plants continuously fight the pull of wind and may be because of that they show slow growth (Observation table 1.2).

Thus, study reveals that overall environmental conditions in natural home of *C. paniculatus* are steep slopes in hilly terrains, moderately warm & humid climate with constant breeze & hard, compact, less fertile, acidic soils with low moisture content. With proper development of agro-technique natives dwelling in hilly terrain of central & south India can successfully domesticate and cultivate the plant. The basic research carried out by us on environmental conditions existing at natural habitat of *C. paniculatus* will be hopefully helpful in development of proper agro-technique required.

References:

1. de silva, T. (1997). Industrial utilization of medicinal plants in developing countries. pp 38-48. In : Bodekar G, Bhat K.K.S, Burley J. & Vantomme P. (eds.), Medicinal plants for forest conservation and healthcare, Non-wood forest products No.11, FAO, Rome, Italy
2. Laird, S.A. & Pierce, A. R. (2002). Promoting sustainable & ethical botanicals. Strategies to improve commercial raw material sourcing. *Rainforest Alliance*, NewYork.
3. Panda, H; (1994). *Handbook on herbal drugs & its plant sources*. Delhi: NIIR publications.; pp 44-45.
4. Prajapati, M. D., Purohit, S. S., Sharma, A. K. & Kumar, T. (2003). *A handbook of medicinal plants*. Agribios (India), pp 553.
5. Ramesh, M. N., Farooqi, A. A. & Tilak, S; (1989). Influence of sowing date & nutrients on growth & yield of Isabagol (*Plantago Ovata*). *Crop Research*, Vol.2, pp 169-174.
6. Rao, M. R.; Palada, M. C.; Becker, B. N. (2004). Medicinal & aromatic plants in agroforestry systems, *Agroforestry Systems*, Vol.61, pp 107-122.
7. Singh, A.K.; Neoparly, B. (1993). Effect of NPK nutrition & Spacing on yield attributes in ginger. *Haryana Journal of Horticultural sciences*, Vol.22, pp 143-148.
8. Vines, G. (2004). Herbal harvests with a future towards a sustainable source for medicinal plants, *Plant life International*. www.platlife.org.uk
