Tropical Agricultural Research and Extension 2 (1): 74-75, 1999

Short Communication

Improvements on the traditional harvesting practice of *Girardinia diversifolia*

Rhidaya Shrestha*
Research Center for Applied Science and Technology, Tribhuvan University, Kathmandu, Nepal.

Accepted 5 March 1999

ABSTRACT

***Girardinia diversifolia*, a plant valued for its fibre has been in use traditionally in the Hindu Kush region of Asia for a long time. Traditional harvesting of the plant is done leaving stem stumps at a height of 40 cm to 60 cm or even more. This practice was observed to affect fibre yield and subsequent growth adversely. A study was carried out at Hwayangla (Sankhuwasabha district) in eastern Nepal, during December 1994 and 1995 to improve this method of harvesting. Cutting the stem at the base, leaving 10 cm stump increased fibre yield per unit stem by 12.2% and the total fibre yield by 12.7%.**

Key words: Fibre crops, traditional harvesting, *Girardinia diversifolia.*

Girardinia diversifolia (Link.)Friss. (URTICACEAE) is a wild, fibre-bearing nettle which has long been exploited domestically by rural communities in the mountainous regions of Nepal. This plant, locally known as 'allo', is found in the temperate and sub-tropical Himalayas (altitude of 1,200 to 3,000 m).

Varieties of *Girardinia diversifolia* viz. *palmata* and *zeylanica* are found in south and middle India and Sri Lanka (Sastri 1956). Its distribution is described by Hooker (1985). Existence of Ecodemes is reported by Singh and Shrestha (1989) and further studies on cytological evidence on the existence of ecotypes were made by Shrestha (1992).The rootstock of *G. diversifolia* is perennial and helps prevent soil erosion. The aerial shoots, however, are annual and dry up if they are not harvested in time. Thus, collection of the plants should be managed properly if this resource is to be utilized in a sustainable manner, conserving bio-diversity of the area (Shrestha 1994).

Fibres from allo bark are processed and woven into products ranging from clothing and bags to fishing nets and rope. Traditionally, these products have been made domestically, providing income to rural populations *via* the trade of fibre or its products. Currently however, the production of coarse cloth and other materials made from allo fibre is an off farm activity in eastern Nepal where such products are popular. Tweed, knitwear, and table-mats are made from nettle fibre in Sankhuwasabha and Solukhumbu districts. These products have an extensive market both in Nepal and abroad. Because of the favourable market, there has been an increasing interest in the development of nettle products for commercial use. Such development would benefit the impoverished villages in the mountainous regions (Shrestha 1994), but can threaten the survival of the plant, unless properly managed.

The traditional method of harvesting of *G. diversifolia*, at 40 - 60 cm adversely affects the fibre yield. Therefore, investigations were made on improvement of the traditional harvesting practice and on the quantity of fibre that can be recovered from the introduction of the improved technique.

Ecological survey of the plant in the forests was carried out by adopting the random quadrats method. The size of the quadrat was 10 x 10 m. and ten random quadrats were selected for the study. The traditional harvesting method was observed in 1994 and the stump left was measured. A pan balance was used to weigh the fresh bark, immediately after peeling.. For estimation of fibre yield per plant, shoots were collected in the forest on a random basis and the mean was calculated. Ten samples were examined for the calculation of mean values in each experiment. The yield per hectare was estimated by extrapolating the size of quadrat used.

After collecting the data after traditional harvesting, the site was used for improved harvesting techniques by cutting stems at 10 cm height. In the following year (1995), the productivity of the area was again studied in order to determine the difference. All the parameters, except the harvesting method were kept same in both studies. The yield

*Present address: Department of Biology, Midwestern State University, Wichita Falls, TX 76308, USA.

differences were assessed by the F-test..

The plant is found as an under-growth in the forests. The best growth is observed in shaded moist soils rich in humus. A number of shoots sprout every year from the same rootstock if the shoots are cut at the base. As many as 22 shoots can sprout from a single rootstock. Regeneration from seed in the forest is very low.

The mean number of colonies in a quadrat of 10 x 10 m was 34 and mean stems per colony were 9.7 (Table 1). The average dry bark weight per stem was 6 g when traditional harvesting method was practiced (Table 2). On an average, one quadrat recorded 1.9 kg of dry bark which is equivalent to 190 kg per hectare.

With the introduction of improved harvesting techniques, in the experimental plots, productivity in terms of fibre yield per unit stem was found to be 12.2% more (6.74 g per plant). According to the F-test,the increase was significant at 1% level. Number of stems per unit area was only 1.6% more (data not shown) and was not a significant increase. Much less branching was observed, mainly in the fibre yielding portion. The total productivity increase was 12.7% per unit area. The existing old rootstocks, high coverage of weeds and presence of rocks in the field were preventive factors for productivity increase.

In resource management respect, it seems important to intervene in the traditional method of harvesting. The traditional way of cutting partially at 40 cm or more above the ground and bark peeled down towards the ground effectively destroys the growing tissue from which new coppice shoot arise. By this method either plants will be of profusely branched or no coppicing occurs at all. Harvesting of the plant should be done by cutting cleanly, little less than 10 cm above the ground. It ensures that the meristematic tissues of the stem are not destroyed, allowing regrowth of the shoots. Thus haphazard cutting should be discouraged and a method for healthy cutting needs to be introduced.

Table 1. Regeneration of *G. diversifolia* in the forest.

Obs. No	Colonies quadrat^{-1}	Range of stems colony^{-1}	Mean stems colony^{-1}	Wt of bark, kg ha^{-1}
1	36	5-10	8.32	180.01
2	20	9-14	11.69	140.51
3	11	12-17	14.09	93.14
4	43	3-7	5.74	148.33
5	30	9-23	12.62	227.53
6	46	6-16	10.02	277.01
7	58	5-13	7.02	244.70
8	30	3-8	5.74	103.49
9	30	8-21	12.66	228.41
10	33	8.23	9.50	188.41
Mean	34	7-15	9.74	183.14

Table 2. Yield of fresh bark of *G. diversifolia* before and after introduction of improved harvesting method.

	Traditional method			Improved method		
Obs No	Stems /batch	Weight of bark	Bark yield per plant, g	Stems /batch	Weight of bark	Bark yield per plant, g
1	112	3000	26.78	92	2750	29.89
2	98	2700	27.55	107	3000	28.03
3	132	3250	24.62	48	1500	31.25
4	79	2500	31.64	70	2300	32.85
5	82	2250	27.43	84	2600	30.95
6	102	2800	27.45	63	2250	35.71
7	85	2250	26.47	104	3100	29.80
8	87	2400	27.58	93	2750	29.56
9	92	2500	27.17	82	2500	30.48
10	79	2250	28.48	56	1750	31.25
Mean	95	2590	27.52 [6.01]*	80	2450	30.98** [6.74**]*

** Significant at $p>0.01$; * mean dry weight.

ACKNOWLEDGEMENTS

The author wishes to express gratitude to Mr. N. Poudel, Dr. N.P. Joshi and Dr. Mc Odell of the Makalu-Barun Project for giving an opportunity to conduct this study.

REFERENCE

Hooker JD 1985 The flora of British India. Vol. V.L. Reeve and Col. Ltd. England. pp. 550-551.

Sastri BN (ed.) 1956 The Wealth of India. Vol. IV. (Raw Material). Council of Scientific and Industrial Research, New Dilhi, India.

Shrestha R 1992 Studies on Growth, Development and Cytotaxonomy of *Girardinia diversifolia* in Early Period. Research Report. Research Center for Applied Science and Technology, Tribhuvan University, Nepal.

Shrestha R 1994 Nettle Fiber Exploitation in the Makulu-Barun Conservation area. The Makalu-Barun Conservation Project, Publication Series. Report 22, Dept. of National Parks and Wildlife Conservation, His Majesty's Government of Nepal.

Singh SC and Shrestha R 1989 Observation on Ecodemes in *Girardinia diversifolia* (Link.) Friss. Pakistan J. of Bot. 21 (1): 185-190.