DOMESTICATION AND CULTIVATION TRAILS ON *PSORALEA CORYLIFOLIA* (BABCHI) AT MEDICINAL PLANTS FARM, PESHAWAR

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Abstract

Psoralea corylifolia plant is reputed for its psoralen content, largely used in psoriasis and certain immune diseases. To assess the possibility of its introduction and cultivation as a specialized crop, yield trials with different levels of nitrophos fertilizer (20:20 NP) on the seed yield were conducted for three consecutive years at Medicinal Plant Farm of Pakistan Forest Institute, Peshawar. The plant has successfully acclimatized under climatic and edephic conditions; gave better growth and higher seed yield by the application of split doses of 200 kg nitrophos/ha.

Introduction

Psoralea corylifolia (Babchi) is a rare endangered herbaceous medicinal plant, distributed in the tropical and subtropical regions of the world (Jain 1994). It can be easily cultivated under irrigated conditions and has good potential for supplementing the farmer's income either on marginal land or can be planted as a border crop along with the field for protection and providing additional benefits. Babchi is one of the most frequently used herb in the treatment of odd looking white spots on skin. The traditional healers are also practicing and using Babchi for the treatment of skin disorders particularly the leucoderma. Most of traditional healers recommend its external use. *Psoralea* helps fight vitilago, a disorder in which patches of skin lose their pigmentation. Vitilago and inflammatory diseases of skin for many decades (Nadkarni 1954). It is used as a laxative, aphrodisiac, diuretic and diaphoretic in febrile conditions. It has been specially recommended in the treatment of leucoderma, leprosy, psoriasis and inflammatory diseases of the skin and has been prescribed both for oral administration and external application in the form of a paste or ointment (Anonymous 1988). Seeds yield 20% essential oil which contains 0.5 to 0.8 percent basic furocoumarins namely psoralen (Atal and Kapoor 1977). Seed germination is unreliable due to poor germination and the death of young seedlings under natural condition. Pharmaceutical industries largely depend upon material procured from naturally occurring stands which are being depleted rapidly, raising concern about possible extinction and providing justification for development of *in-vitro* techniques for this species. *In-vitro* plant regeneration via organogenesis has been achieved in *Psoralea corylifolia* (Saxena *et al*., 1997). Somatic embryogenesis potentially offers an alternative and efficient system for plant multiplication (Ammirato 1987; Rout *et al.*, 1995). Plant regeneration via somatic embryogenesis from single cells that can be induced to produce an embryo and then a complete plant has been demonstrated in many medicinal plant species (Purohit *et al*., 1994; Zhou *et al*., 1994; Johri and

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Aminuddin Pal 1996; Gastaldo *et al*., 1996; Choi *et al*., 1997; Su *et al*., 1997).

Leaves are good for diarrhea, fruit are diuretic and useful in treatment of piles, vomiting, bronchitis, inflammation, anemia, improves hair and complexion; seeds are refrigerant, alterative, purgative, good for heart troubles, urinary discharges, leprosy, skin troubles etc. The psoralen and other linear furocoumarins have also recently gained importance as a result of new research initiative because of their potential not only in psoriasis, but also in leukemia and possibly certain immune diseases such as AIDs (Duke, 1987).

It is the most active constituent for photosensitizing activity and is effectively used for curing various skin diseases and is the basic constituent of suntan lotions. There is a brisk demand of psoralen and xanthotoxin from within the country as well as abroad. The interested people collect the seed from wild resources for used by the Attibas in the country. Keeping in view of its therapeutic importance and demand in the market, domestication and yield trials were conducted for three consecutive years (2003-05) at Medicinal Plants Farm, Peshawar, to standardize its cultural requirements and to find out appropriate dose of nitrophos for obtaining better seed yield. Results achieved are presented in this article.

Material and Methods

Seeds of *P. corylifolia* were collected from wild plants growing in Punjab. The experiment was set up in a complete randomized block design replicated four times to determine the optimum dose of nitrophos for obtaining higher seed yield. The plot size was kept 40m^2 and net plot size at the time of harvest was kept as 30m^2. Seeds @ of 20 kg/ha was sown in well-prepared replicated plots in lines spaced 25 cm during third week of April, 2003. Different doses of nitrophos fertilizer (100, 200 and 300 kg/ha) were applied as a basal dose at the time of seed sowing according to lay out plan every year. First irrigation was provided immediately after sowing and eight subsequent irrigations at an interval of fourteen days were given to the crop up to the end of November. Two weeding and hoeing were given to the crop during the months of July and September every year. The plant produced racemose type of inflorescence from July to November, thus resulting in irregular maturity of fruits. The fruits were plucked when attained blackish colour in September, October and December. Later on fruits were spread in the sun for drying for three to four days. Seed yield was recorded as kg/plot after drying and winnowing. The weight of dried root and stem was also recorded (kg/plot) to judge the proportion of biomass with the seed yield.

Results and Discussion

Application of nitrophos @200 kg/ha as a basal dose resulted in a significant increase in the yield of seed (427 kg/ha) as compared to 100 kg/nitrophos/ha (363 kg/ha) and control (294 kg/ha) during three consecutive years. No significant difference was observed in the mean seed yield of 200 and 300 kg/nitrophos/ha respectively. Therefore, application of 200 kg/nitrophos/ha proved to be appropriate dose for obtaining better seed yield.

Table 1. Comparative effect of different doses of nitrophos fertilizer on seed yield of *P. corylifolia* kg/plot (30 m^2)

Doses of Nitrophos kg/ha	Mean seed yield (kg/plot)			*Average*
	2003	2004	2005	
0	0.83	0.81	0.99	0.88
100	0.94	0.94	1.41	1.09
200	1.09	1.09	1.70	1.28
300	1.12	1.23	1.61	1.32
LSD (5%)	0.11	0.23	0.37	0.14

To find out the ratio of biomass (dry stem and roots) with seed yield, dried stem and roots were weighed (kg/ha) during December 2005. The average weight (kg/plot) and proportion with seeds under various treatments are given as under:

Table 2. Percentage of seed and biomass as affected by various doses of Nitrophos kg/ha

Doses of Nitrophos kg/ha	Seed yield	Dried weight of stem, leaves & roots (kg/plot)	Seed %	Biomass %
0	0.88	5.38	14.06	85.94
100	1.09	5.45	16.67	83.33
200	1.28	6.31	16.86	83.14
300	1.32	6.04	17.93	82.07
Average	1.14	5.79	16.33	83.62

The percentage of biomass ranged from 82 to 86% while that of seeds constituted from 14 to 18% of total biomass.

Conclusion

Psoralea corylifolia seeds are known for their therapeutic value as photosensitizing agents. The plant can be easily domesticated under Peshawar climatic conditions and humid climate. Therefore, it is suggested that interested growers in the irrigated areas of Punjab and Sindh may take up its cultivation. The seeds have a potential to develop as a minor cash crop depending on its demand position in the market.

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