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Studies on Performance of Endangered Medicinal Plants-Glory Lilly, *Decalepis hamiltoni* and *Holostemma adakodien*

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Abstract: Glory lilly is an export oriented medicinal plant grown in Tamilnadu and Andhra Pradesh, India. Colchicine is extracted from seeds of glory lilly which is widely used to treat gout, rheumatism. A Decalepis root are used in preparation of Nannarisharbatha health drink and help in cleansing blood, cooling of body and alleviates acidity. The tubers of Holostemma are used in fever, diarrhoea and opthalmopathy. At present all these species are being collected from forest areas. The study was conducted during 2009-2011 at Medicinal and aromatic Plants Research Station, Rajendranagar, Hyderabad, India. The mean plant height recorded in glory lilly was 1.47 m. The average number of pods recorded plant^{-1} was 30.3. The average seed weight pod^{-1} was 2.39 g. The average seed yield recorded over the three years was 56.8 kg/acre. *Declepis hamiltoni* produced 375 g of dry root yield after attaining the 24 months of age after planting. *Holostemma adakodien* produced 72.43 g of dry root yield per plant^{-1}.

Key words: Glory lilly · Colchicine · Declepishamiltoni · Holostemmaadakodien

INTRODUCTION

Glory lilly (*Gloriosasuperba* L.) is an export oriented medicinal plant grown in Tamilnadu and Andhra Pradesh, India. The seeds are rich source of colchicine and Colchicoside [1]. Colchicine is extracted from seeds of glory lilly which is widely used to treat gout, rheumatism. Colchicine is also used as an antimitotic agent in cancer research. Tuber is used for the treatment of bruises, sprains, chronic ulcers, haemorrohoids, cancer [2]. In scorpion and centipede sting, on application of the paste of the root, relief is obtained [3]. It is a native to tropical Asia and Africa and found growing throughout the tropical India upto an altitude of 2500 m [4]. In recent years there is lot of demand for seeds of glory lilly, due to export potential of this crop. Roots of *Decalepis* and *Holostemma* are also fetching higher price because of their health benefits. They both are growing wild in the forests in Kurnool, Kadapa, Ananthapur and Chittor Districts of Andhra Pradesh, India. A *Decalepis* root are used in preparation of Nannarisharbaths a health drink and help in cleansing blood, cooling of body and alleviates acidity [5]. *Holostemma adakodien* roots are used for maintaining youthful vigor, strength and vitality [6]. The roots of the plant are used as tonic, ophthalmic, stimulant, aphrodisiac, expectorant and galactogogue [7]. The terpenoid sugars present in the root are responsible for medicinal properties [8]. At present all these species are being collected from forest areas. It is very important to commercialize the cultivation of above species, as they were included in endangered species list.

MATERIALS AND METHODS

The study was conducted during 2011-2012 at Medicinal and aromatic Plants Research Station, Rajendranagar, Hyderabad, India. Glory lilly was raised by planting tubers on raised beds at a spacing of 30 x 40 cm. Pendals were erected during the crop growth period to provide support. While *Decalepis hamiltoni* and *Holostemma adakodien*were rose by sowing the nursery and 60 days old seedlings were transplanted in main field at a spacing of 100 x 60 cm and Pendals were erected for support. Necessary cultural operation were followed during the crop growth period In glory lilly data were recorded on plant height, number of branches & fruits plant^{-1}, fruit length, number of seeds fruit^{-1}, average seed pod^{-1} and seed yield per acre. In *Decalepis hamiltoni*

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number of roots plant^{-1}, number of lateral roots, root length, thickness of the root, fresh weight and dry weight of the root were collected at 14 months after planting (MAP), 16 MAP and 24 MAP. In *Holostemma adakodien data* were collected on number of roots plant^{-1}, root length, thickness of the root, fresh weight and dry weight of the root at 24 months after planting as the roots are very thin.

RESULTS

In Glory lilly the data collected over three years indicates that the average plant height recorded was 1.47 m (Table 1). No. of branches plant^{-1} was 3.63. Number of days taken for flowering was 60.0 days. Number of fruits plant^{-1} were 30.3. Length of the fruit was 7.56 cm. Number of seeds fruit^{-1} were 57.83. Seed weight fruit^{-1} was 2.39 g. The average yield acre^{-1} was 53.36 kg. Yield data indicates that during first year the yield was low. From second year onwards increase in yield was observed.

In *Decalepis hamiltoni* data on root characters were recorded at 14 months after planting (MAP), 16 and 24 MAP (Table 2). Data indicates that number of roots plant^{-1} were same at 14 and 16 MAP (4.0). While at 24 MAP number of roots were increased to 9.0. Increase in number of lateral roots and length of roots were observed from 14 months of planting to 24 MAP. Number of lateral roots plant^{-1} was 13.0, 22.5 and 26.0 at 14, 16 and 24 MAP respectively. The average length of longest root was 0.63 cm, 1.05 cm and 2.30 cm at 14, 16 and 24 MAP respectively. Thickness of root varies from 2.1 cm to 2.4 cm at 14 MAP to 24 MAP. The root yield differs with age of the plant. Increase in fresh weight of roots was observed from 0.46 kg plant^{-1} to 2.05 kg at 14 months after planting to 24 MAP. The average dry weight of the root yield recorded at 14 months after planting was 78 g and it was increased to 375 g plant^{-1} at 24 MAP. The results indicate that harvesting of *Decalepis hamiltoni* is more profitable when roots were harvested at 24 months after planting.

In *Holostemma adakodien* the number of roots plant^{-1} was 9 at 24 months after planting (Table 3). Length of the longest root was 90.0 cm. Thickness of the root was 1.2 cm. Root fresh weight plant^{-1} was 160.0 g and dry weight plant^{-1} recorded was 72.43 g.

From the recorded results it may be concluded that in glory lilly higher seed yield can be obtained from second year onwards. In *Decalepis hamiltoni* and *Holostemma adakodien* harvesting of the roots is profitable when the plant attains 24 months of age.

Table 1: Growth and yield characters of *Gloriosa superba.*

Data recorded	2009-10	2010-11	2011-12	Mean
Plant height (m)	1.47	1.33	1.63	1.47
No. of branches per plant	2.8	4.1	4.0	3.63
No.of days to flowering	59.0	62.0	59.0	60.0
No. of fruits per plant	9.8	44.1	37.1	30.3
Length of fruit (cm)	8.19	7.65	6.85	7.56
No. of seeds per fruit	53.0	67.9	52.6	57.83
Seed weight per fruit (g)	2.48	2.67	2.03	2.39
Yield per acre (kg)	35.8	67.5	56.8	53.36

Table 2: Performance of *Decalepis hamiltoni*

Data recorded	14 MAP	16 MAP	24 MAP
No.of roots/plant	4.0	4.0	9
No.of lateral roots/plant	13.0	22.5	26
Length of the longest root(m)	0.63	1.05	2.30
Thickness of the root (cm)	2.1	2.7	2.7
Root fresh weight/plant (kg)	0.46	1.28	2.050
Root dry weight/plant (g)	78	191	375

Table 3: Performance of *Holostemma adakodien* at 24 months after planting

Data recorded	24 MAP
No. of roots/plant	9
Length of the longest root (cm)	90.0
Thickness of the root (cm)	1.2
Root fresh weight/plant (g)	160.0
Root dry weight/plant (g)	72.43

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