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Cultivation Practices of Medicinal Plant : Phyllanthus Amarus Schum

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ABSTRACT

The resource pool of the medicinal plants were abundant in forest areas are dwindling fast due to anthropogenic pressure therefore the alternative means to generate more raw materials could be only through cultivation of medicinal plant in agriculture fields. National Medicinal plant board is working to promote cultivation under centrally sponsored scheme of National mission on medicinal plants since 2008-09. Medicinal plants are valuable natural resources. Unplanned development & overexploitation put many medicinal plants on way to endanger. Excess use of weedicide in agricultural fields affected many weeds sp. which were used for their medicinal properties. Phyllanthus amarus schum is one of the medicinal plant naturally occurring as weed. It is a broad spectrum medicinal plant that has received worldwide recognition (Etta, 2008)

Phyllanthus amarus has been used in the Ayurvedic system of medicine for over 2,000 years and referdto as Bhumyamalaki, which is widely used to treat liver disorders, Bladdr infections & kidney related disorders.

The plant of the genus Phyllanthus are widely dismibuted in most tropical & subrtropical countries and have long been used in traditional medicine to treat chroinic liver disease (Liu etal., 2003) The plant is found growing abundantly through out India. The plant has antiseptic, direticantiviral, ant diabetic, hypertensive and antipyretic properties and also used in the treatment of Jaundice, diarrhea, dysentery, wound, ulcers & Urogenital diseases. (Calixto eta, 1998; santos etal., 1995)

Cultivation ensure botanical identity, genetic improvement, quality and continuity in supply of raw materials to Pharma Industries and also promote Socio-economic growth of farmers. The present paper gives details regarding cultivation parameters, cultivation details, harvesting techniques, Marketing, Chemical Composition, Medicinal use and productivity. The study conducted at Pusad, Dist. Yavatmal, Maharashtra The cultivation cost required for phyllanthus amarus is low, no extra expenses on pesticides & fertilizers Hence beneficial for grower.

Keywords: Cultivation, Medicinal plants, Harvesting, Marketing.

I. INTRODUCTION

The plant is indigenous to South Africa but is found in all warm countries. In India prominently found as a weed in central and Southern India up to 1000 mt altitude.

It is a small annual herb known since the ancient period of Charak for its medicinal use. It grow up to 20-55cm consisting of root, stem, and leaf. The fresh juice of whole plant is found to be useful in various liver disorders. It belongs to family *Euphorbiaceae*. The plant is found growing abundantly throughout India mainly in the states of Maharashtra, Uttar Pradesh, Punjab, Bihar, Orissa, Andhra Pradesh and Some parts of Madhya Pradesh, Karnataka and Bengal etc Many times occurs as weed growing on fields or dump and waste soil.

The tradional uses of Phyllanthus amarus for kidney stones and gall bladder stones have been validated by clinical researsh where P. amarus extract was found to exhibit a potent & effective non-concentration dependent inhbilitory effect on calcium oxalate crystal formation, the building blocks of most kidney stones (Calxto, 2000) This may explain why it has long been used in traditional medicine as prevention against kidney stone formation (Compos and Schor., 1999) In study Phyllantus amarus has been found to be 94% successful in elimination stones (Maxwell, 1990)

Literature reivies shows that Phyllanthus amarus is generally employed to reduce pain, expel intestinal gas, to stimulate, promote digestion, as anti-helminthes to expel intestinal worms and acts as mild laxative.

II. MORPHOLOGICAL DESCRIPTION

Habitat –Terrestrial; Habit - Erect herbs or under shrubs 25-45 cm tall; Root – Tap root system, roots small, 2.6 –10cm long, nearly Straight, gradually tapering, with a number of fibrous secondary and tertiary roots, external surface light brown; fracture, short. Stem – Erect, smooth slender, glabrous; 20-60cm long, branching profuse towards upper region bearing 5-10 pairs of leaves, internode 1-3 cm long; odour, indistinct; taste- slightly bitter, greenish yellow, week stem; Leaves – Pinnately compound actually small simple leaves arranged in two files. rachis; alternate, opposite and decussate almost sessile, stipulate, oblong, entire; green colour, bitter–taste. Flowers–minute axillary, Redial, Stellate, male flowers are star shaped (2 mm wide size), fruit many smooth capsule, depressed, globose, scarcely lobed, triangular, Seeds very tiny (Cooke,1967;).

III. CULTIVATION PARAMETERS

i). **Soil:** *Phyllanthus amarus* is adopted to wide variety of soil, preferably well drained, rich organic manure added and light textured soils are best for this crop. It also grows luxuriantly on sandy loam soil.

ii). **Climate:** *Phyllanthus amarus* is very susceptible to climatic conditions.

iii). **Temperature:** Very high temperature or very low temperature conditions are harmful to this crop. It grows well between 25-38^{o}C.

iv). **Humidity:** 40-75% required

v). **Rainfall:** Water logging conditions are harmful to corp. Rainfall in the range of 40-45 cm. thrives best.

IV. CULTIVATION DETAILS

i) Propagation:

It is propagated by seeds and by broadcasting method as well as nursery raising. The seeds are very tiny hence mixed with sand and broadcasted for present practise.

Plate10: *Phyllanthus amaru*

Plate-1: *Phyllanthus amarus* seedlings

Plate-2 : 2 months old crop

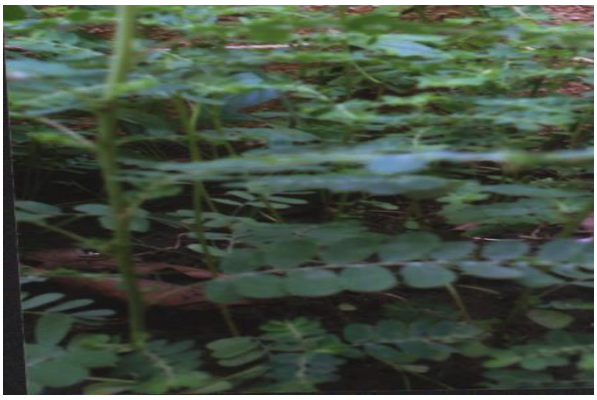


Plate-3: *Phyllanthus amarus* bearing fruits

Plate-4: Mature crop

ii) Seed rate and pretreatment :

4 kg / hectare of area no specific pretreatment of Speed is recommnded.

iii) Sowing:

Sowing is done after 2-3 rains when the soil consists little moisture and humus. For sowing the seeds are mixed with sand and broadcasted directly in field. After 4-5 days of sowing the seeds germinate. The plant is adaptive to climatic and soil conditions. Sowing was done on 6^{th},9^{th},1^{st},3^{rd} of July in 2004 to 2007.

iv) Crop Duration:

The crop matures within three to four months. (80 to 90 days)

v) Irrigation:

For proper growth of this plant regular irrigation is necessary but avoid it if rainfall is frequent. In the conditions when rainfall is inadequate requires irrigation i.e. 6 to 8 irrigations at the interval of 4 to 6 days. It is very necessary to keep the land moist as it affect the crop and production.

vi) Weeding:

As it is a small herb, regular hand weeding at an interval of 15 to 20 days is preferred to keep the crop-weed-free promoting its healthy growth.

vii) Plant Protection:

No disease as pest of serious kind is reported to attack the crop.

viii) Harvesting and Marketing:

The first harvesting carried in first week of September and the second in last week of December. The plants manure within 3 to 4 months. It has maximum active chemical ingredients at fruting period. They are usually harvested after rainy season is over, when the amount of green leaves is in abundance is the correct time for harvesting. Since the active constituent is present in leaves, higher leaf mass is expected during harvesting. For harvesting, sharp sickle is used. The field is again given 3-4 irrigations and plants are again allowed to grow and at final harvesting the whole plants are uprooted manually.

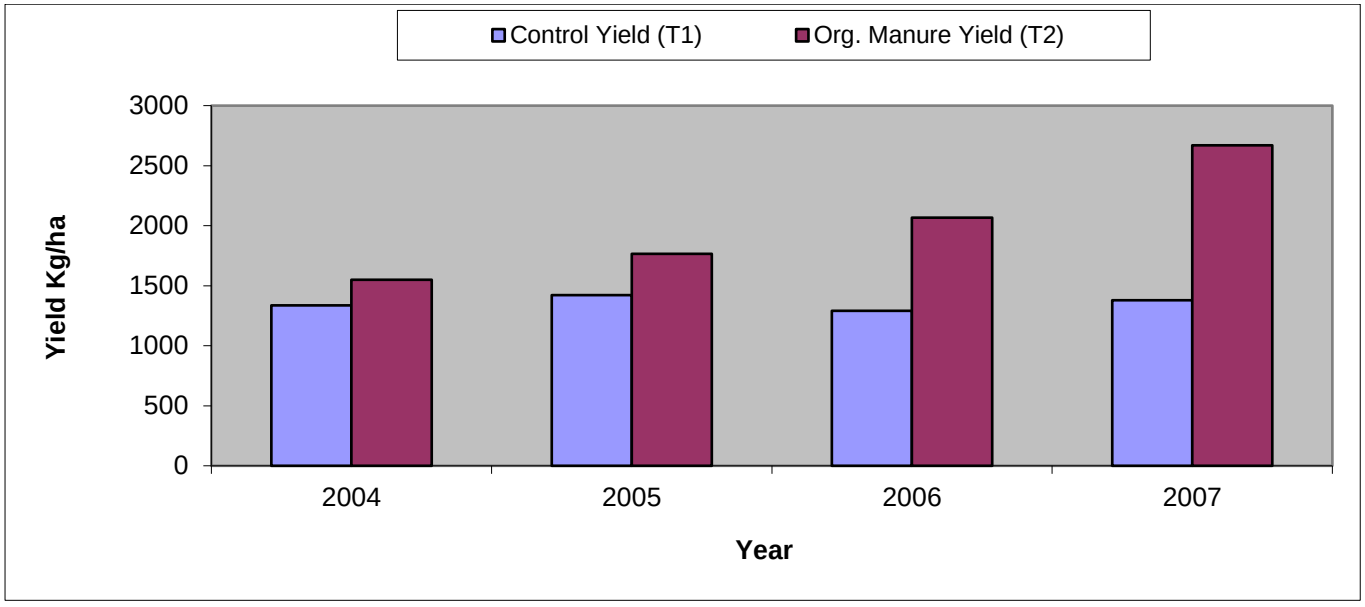
The collected whole plants are shuffled and the mud is separated, cleaned externally and later they are allowed to dry in sun light for1-2 days and afterwards in shade. After complete drying the plant raw material is preserved in polythene lined gunny bags at cool, well ventilated place (godwons)

V. OBSERVATIONS

The yield obtained are given in table 1. Kokate et.al. (2004) obtained yield of fresh herb per hectore was about 2-3 tonnes by application of FYM. Due to the application of organic manure the fresh yields obtained was satisfactory in every season has shown gradually increase in yields. The yields of *phyllanthus* was 1550.08, 1765.37, 2066.78 and 2669.59 kg/ha. obtained during the present study.

Table 1: Yield obtained of *Phyllanthus amarus.*

Sr. No.	Duration of crop	Yield Kg/quad.		Yield Kg/ha	
		T_1	T_2	T_1	T_2
1	June-Dec. 04	3.1	3.6	1334.79	1550.08
2	June-Dec. 05	3.3	4.1	1420.91	1765.37
3	June-Dec. 06	3.0	4.8	1291.73	2066.78
4	June-Dec. 07	3.2	6.2	1377.85	2669.59



Graph 1.(a) : Productivity of *Phyllanthus amarus.*

VI. CHEMICAL CONSTITUENTS

The plant extract have been found to contain high levels of saponins, tannins, flavonoids & alkaloids (Fernand, 1998; Naaz 2007; Krithika and Verma 2009). Plants contain constitunts some tend to possers some level of toxicity have been reported (Santos etal., 1995; shaw etal 1997; kaplowitz, 1997)

The leaves, stem, root and seeds contains lignans as phyllanthin, hypophyllanthin, Leucodelphimidin, alkaloids, flavoroids as querceting, Astralagin, Quercitrin, Isoqercitrin and rutin. It also consists phyllanthine and hypophyllanthine.The complete herb contains alkaloids as Sicurinin, nirurin, norsicurinin, methoxysi- curinin; benzonoids-galic acid, corilagin, flavonoids- quercetin, quercitrin, iso-quercitrin, rutin, kaempferol-4-rhamnopyranoside, eriodictyol-7-rhamnopyranoside, In terpenoids- leupeol acitate, leupeol, tetracosenen, phyllanthusiin-D; culic tannin as amarulo- nes, amariin, geraniin, quercetin-3-0-glucoside are also present.

Medicinal use:

In a Brazilian resarches in the mid 1980's reported the alkaloid extract demostated smooth muscle relaxation specific to the urinary & biliary tract (Miller 1998, Calixo 1984) P. amarus ha been classifed among plants with a low potential for toxicity with an LD 50 averaging 2000 mg/kg/day (Krithika & Verma, 2009)

The complete herb is astringent, anorexic, antidropsical, antidiarrheal, antiseptic, bitter, cooling, carminative, diuretic, stomachic. The drug is used as hepatoprotective, 10-20ml. Of drug extracted in juice form is advised (Kokate, 2002). It is mainly used in treatment of viral hepatitis and various other liver disorders. It is taken in powder form also (4-6gms/day) for diuretic problems. It is used to treat Oedema. Externally used to relieve inflammation. It is a good appetizer. It is anti-hepatotoxic, antilithic, antihypertension, anti HIV and antihepatitis-B (Naik and Juvekar, 2003). It is effective on hyperacidity. It may reduce urinary calcium and inhabiting kidney stone (Nishiuira, et. al. 2004).

Market product:

Ayurvedic formulation: Brown colored Powder-Churna, Citraka haritak; Madhuyastyddi taila; Pippalyddighrta; Chyavanaprasa; Satavari- guda.

Patented product: Vimliv, Nirocil.

VII. CONCLUSION

Medicinal plants can be cultivated as alternative income source for farmar's along with traditional crops. In order to meet the growing demand for raw material medicinal plant cultivation practices must be promoted for socio economics upliftment of farmer cultivation cost is low so it benefits the grower. chemical fertilizers not wed only in used to ensure natural growth of plant & preserve it original chemical composition. Cultivation ensures botanical identity, genetic improvement, quality and continuity in supply of quality raw material to industries.

Recommendation :-

There should be an organised marketing system, network. The grower have to depend largely on the middlemen, who deprive the farmers of their legitimate share of revenue.

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