

# Fabrication and Characterization of Ropes from Stem of Eupatorium Odoratum

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**Abstract** - Eupatorium odoratum (EO) is rapidly growing herb. It is multi stemmed shrub of about 2.5m tall, found in the coastal area of Karnataka and Kerala. Generally it is treated as a weed plant. We utilized the fibers obtained from the stem of this plant to fabricate the rope. To fabricate the rope first soak the stem in water and separate the fibers. From these fibers the ropes were fabricated. The tensile strength of the rope is measured using Asian Tensile Strength apparatus MIL0301P and compared with the readymade ropes of coconut coir of same width. The quantity of fibers obtained by the different aged stem was studied. It is found that the quantity of fibers is more in average aged stem. But the strength of aged stem fiber is more. The average quantity of the fibers per kg of the stem is about 100 g. The tensile strength of rope of 3mm diameter is about 42 kg.

Seekhrasarp; in English as Eupatorium, Eupatorium odoratum, Common floss flower; in Hindi as bagh dhoka, tivra gandha and in Malayalam as Communist pacha. The stems reach 2cm in diameter. The plants are maintained by a system of abundant, yellowish, fine lateral roots. Multiple sprouts arise from the root crown and lower stems. The individual branches are long with relatively few branches. The leaves are sweet-smelling when crushed. This belongs to Family: Asterales, Genus: Chromolaena, Kingdom: Plantae, Botanical name: Eupatorium odoratum/Chromolaena odorata.

## EXPERIMENTAL

### Manufacturing Procedure:

Collect the stems of EO plant and soak it in water for about 7 days (fig.1.a). The loosely bound fibers are removed from the stem and allow it to dry in the atmospheric temperature (fig.1.b). The obtained fibers are woven in to ropes of required thickness (fig.1.c). Because it is high in sodium and potassium, it is treated before use as a growth medium for plants or fungi by soaking in a calcium carbonate buffering solution [2]

## INTRODUCTION

Eupatorium odoratum (EO) is rapidly growing herb. It is multi stemmed shrub of about 2.5m tall, found in the coastal area of Karnataka and Kerala[1]. Locally it is called Communist plant. In Sanskrit it is called as Ropani,



Fig(1.a): soaking



Fig(1.b): Fibers



Fig(1.c): rope

### Effectiveness testing:

The 3 mm diameter rope was tested for tensile strength using Asian Tensile Strength apparatus MIL0301P ( fig.2.a ). It is found that it can withstand maximum of 45.1 kg weight. Compare the strength with the rope of coir [2] of

same diameter available in the market, which can withstand maximum of 47.4 kg .The elongation during the tensile strength measurement is also noted. It is found that in both cases before break the elongation is almost from 3 inch to 5 inch,



Fig 2.a: T.S apparatus



Fig 2.b: Strength of Coir



Fig 2.c: Strength of EO rope

*Quantity of the fiber:*

Quantity of the fiber obtained from the stem of the plants with different age is studied. The fibers are collected from the stems of the plant of different ages starting from 1 month to 8 month. In each case measured the quantity of the fiber obtained per Kg of the stem.

*Strength of the fiber:*

The strength of the fiber with the age of the plant also is studied. Collect the fibers from the stems of different ages starting from 1 month to 8 month. In each case collect the fiber and form the rope of almost same diameter. Measure the Tensile strength of the rope.

The tensile strength is measured using Asian Tensile Strength apparatus MIL0301P. It also reads the elongation of the rope.

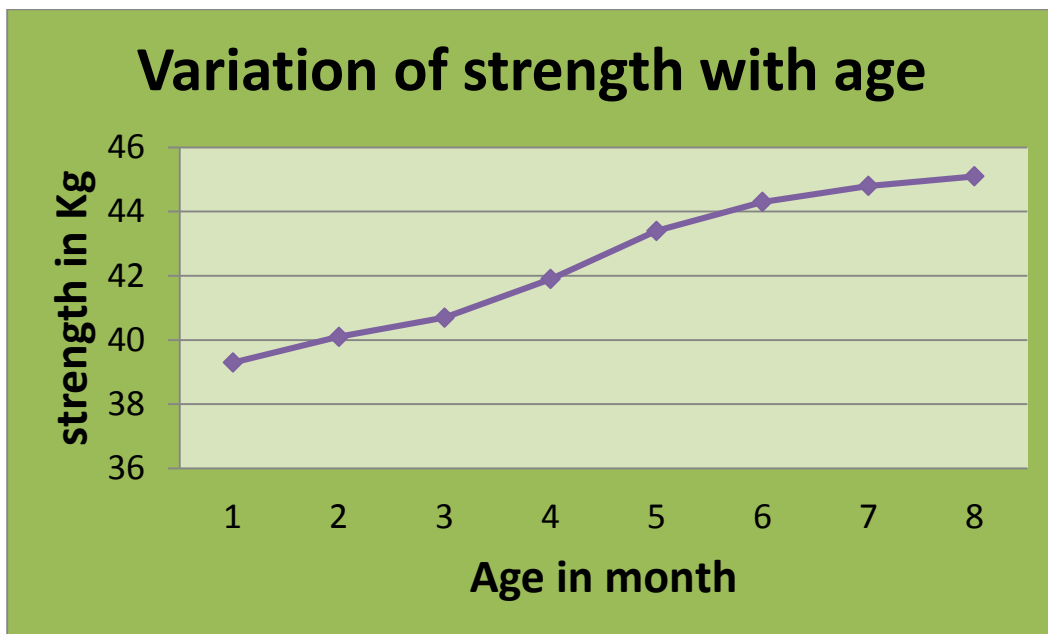
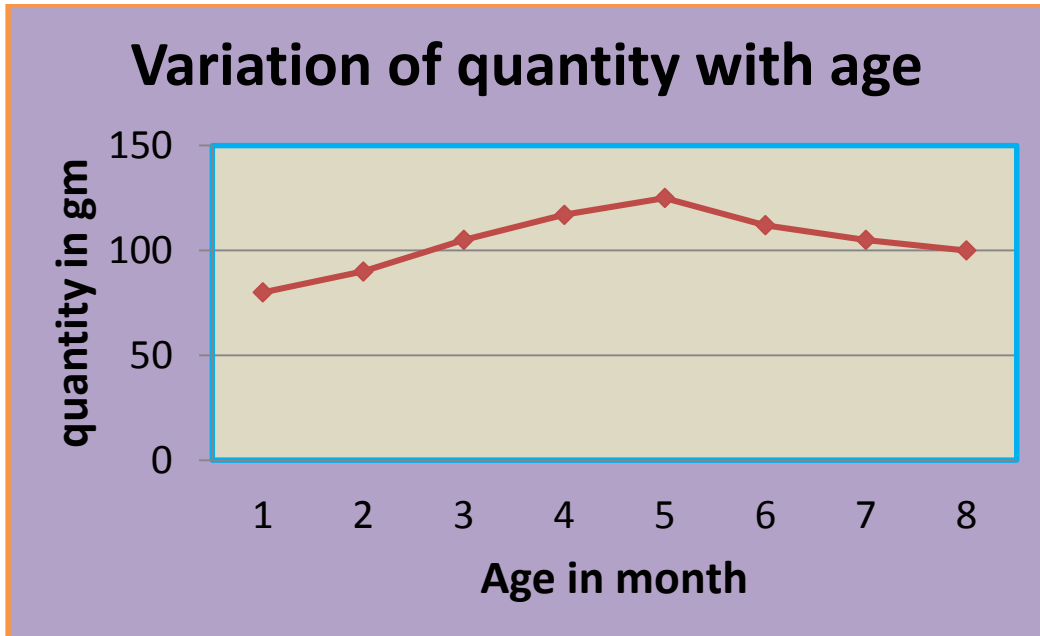
RESULTS AND DISCUSSION

Table V: Quantity and tensile strength with age of the plant

Age of the plant in month	Quantity of the fiber in gram per Kg	Tensile strength of the rope (in kg)
1	80	39.3
2	90	40.1
3	105	40.7
4	117	41.9
5	125	43.4
6	112	44.3
7	105	44.8
8	100	45.1

It is found that the middle aged stem contains large quantity of fibers. The strength of the rope from 8 month old plant is very strong. After that age the strength

remains almost constant. The detail is tabulated. The experiments were carried out several times and taken the average value and tabulated in Table V.



#### CONCLUSION

The rope can be fabricated from the fibers obtained from the stem of Eupatorium Odoratum plant. The strength of the rope is comparable with the coir rope existing in the market. The quantity of the fibers obtained from the 5 month aged plant is maximum. The strength of the rope

fabricated from the 8 month plants are high and remains almost constant after words.

#### REFERENCE:

- [1] [https://en.wikipedia.org/wiki/Chromolaena\\_odorata](https://en.wikipedia.org/wiki/Chromolaena_odorata)
- [2] <http://en.wikipedia.org/wiki/Coir>
- [3] <http://findmeacure.com/2011/09/08/eupatorium-odoratum/>