Research article Available online www.ijsrr.org ISSN: 2279–0543

International Journal of Scientific Research and Reviews

Water Sensitive Plant (*Neptunia Oleracea Lour.*): An Income Bio-Resource as a significant Cash Crop in Manipur

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ABSTRACT: -

Neptunia oleracea lour. chr. no. 2n=28 water mimosa or water sensitive plant (Local name- Ising Ikaithabi in Manipuri) is a nitrogen fixing legume which belongs to the family Leguminosae (Fabaceae). It is a low volume and high cost cash crop of Manipur and it is sold in all local markets from May to November. In Manipur it is eaten as traditional cuisines like Eronba, Chagem pomba, Singju ect. with fermented fish. *Neptunia oleracea* lour. following systematic cultivation practices could be an income resource cash crop in homestead ponds as well as in farms of large scale area. So significant quality of food is supplemented from the wild bio-resources. It is a cash crop for the poverty line families as well. Large scale propagation is needed to increase the state economy.

KEY WORDS: Sensitive, Low Volume, Traditional, Bio-Resource, Homestead.

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INTRODUCTION

Neptunia oleracea lour. -chr. no. 2n = 28 (Local name- Ising Ikaithabi in Manipuri) or water mimosa or water sensitive plant was first described by Loureiro in 1790. It is a pan-tropical nitrogen fixing perennial legume which belongs to the subfamily- Mimosidae and family- Leguminosae (Fabaceae). It was originated from Mexico to northern S. America and cultivated widely in Africa, Asia, Central and S. America. It grows luxuriantly in fresh water ponds; floating and highly palatable. Its shoots after removing the cotton are eaten as traditional cuisines in Manipur as Eromba, Chagem Pomba or as a constituent of Singju with fermented fish. It is also estimated from CSIR-NEIST Lamphelpat that edible part of water sensitive plant contain high protein and vitamin and used for medicinal purposes too. So large-scale production is needed.

DISCUSSION

Neptunia oleracea lour. -chr. no. 2n = 28 (Local name- Ising Ikaithabi in Manipuri) is a low volume and high cost cash crop of Manipur and it is sold in all local markets from May to November. A branch of length 20-25 cm costs Rs. 3-5 depending upon the season. It is an income generating crop for the poverty line families as well (Fig. 1.).

Plucked and going to be made into bundles Growing in pond water

Fig. 1. *Neptunia oleracea* lour, Water mimosa or water sensitive plant (Local name-Ising Ikaithabi).

Cultivation package of practices

Neptunia oleracea lour. can suitably be cultivated both in tropical and temperate condition having higher rainfall in both shade and open bright sunshine areas (pH-5.5 to 7.0) It is cultivated in ponds having permanent water source. The plant is generally propagated through vegetative rhizomes or through seeds. The best time for sowing is during late spring i.e. the end of March. Firstly the fresh mature ripe seeds will be soaked in water for 10-12 days for sprouting. Then the

sprouted seeds are planted in the prepared soil beds covered with straw or gunny bags with regular sprinkling of water. Within 12-15 days, the seeds will germinate and sprout. When the plantlets attain the height of 8-12 cm on the nursery bed, can be transferred to water-pond having a few centimeters water depth.

Slowly, the spongy tissue starts developing around the stem of the plant and the plant floats on water (Fig. 2.). Then the water level of the pond can be raised to a desired level. The plant is floating on water stoutly, widely spreading and rooting at the nodes. When the plant grows in water, spongy, fibrous, induments of arrenchyma are formed around the stem between the nodes and this helps to keep the plant float on water. The flower is yellow in colour and silky (Fig.3.).

Fig. 2. Spongy stem of *Neptunia oleracea* lour.

Fig. 3. Flower of *Neptunia oleracea* lour.

The fully grown plant is green in color with white jackets on the stem and the plant starts spreading in all sides through its branches. The branches can be harvested after a month when they attain the height/length of around 30 cm. Profitable harvesting of branches can be started from May onwards till November. The plant produces flowers during July-September and fruiting October-November. The seeds (Fig. 4.) can be collected during November to December and can be stored in room temperature. Each plant produces 5-8 new branches in one week and the parent plant increases up to 25-30 cm in length in one week. Then it can be plucked and sold in the market (Fig. 5.).

Fig. 4. Seeds of *Neptunia oleracea* lour.

Fig. 5. A vendor selling bunches of *Neptunia oleracea* lour.

Neptunia oleracea lour. As cash crop:

Income:

- Spacing between the plants = 5.0 × 5.0 (25.0 m^2)
- 1 ha = 10,000 m^2
- Number of plants cultivated in one hectare of land = 400 plants

5 branches in one week or 20 branches in one month. So, 20 × 7 months harvesting = 140

Branches.

- Productivity ha^{-1} $year^{-1}$ = 56,000 branches
- Each branch costs on average of Rs. 3
- Annual income from 1 hectare of ponds/land = Rs. 1,68,000

Expenditure (Annual):

(Pond making is only one time investment)

- Total annual expenditure = Rs.20,000(approx)

Net income from one hectare of land/annum:

Rs. 1,68,000 - Rs. 20,000 = Rs. 1,48,000

As mixed crop:

Fishes like rohu, catla, mrigal, etc. can be reared along with the cultivation of *Neptunia oleracea* plant locally called Ishing-Ikaithabi. Cultivation of *Neptunia oleracea* does not affect rearing and production of fishes, rather it promotes the growth of fishes and enhances the income to a significant level. But the fishes like grass carp and common carp are not suitable as they eat up the tender shoot and young roots of the plant, thus affecting the healthy growth of the crop. Cultivation of this plant also enhances the quality of water by reducing turbidity of the water, thereby making the water fit for human use.

Composition and medicinal uses:

As per laboratory analysis at CSIR-NEIST Substation Lamphelpat, the edible parts of the plant contains protein-13%, vitamin C-5.4%, fibre-16%, fat-1.2%, ash content-5.4%, total Phenolic content-141.4 mg GAE/g dry weight and total flavonoids content-23 mg QE/g dry wt. of the plant.

Juice of the stems and roots are used for medicinal purposes. It is used for urinary troubles, piles, sinusitis, ear-ache, necrosis of bones of nose. Whole plant extract exhibits cyto-toxic activity on neoplastic cell lines. Extract of the herb exhibited hepato-protective activity.

CONCLUSION:

In Manipur, a significant quantity of food is supplemented from the wild bio-resources. Consumption of wild items formed a major source of nutrients for people in rural areas where vegetables cultivation was not much practiced (Misra et. al., 2008). Among the wetland edible vegetables, *Neptunia oleracea* is extensively cultivated in private lands. Due to increasing demand of the wild resources, limited availability and also for the generation of maximum net income, *Neptunia oleracea* becomes a widely cultivated wetland crop, thereby supplementing a significant quantity of food requirements to the people of Manipur. It needs to be produced in large scale to increase the state economy.

Acknowledgement goes to Department of Biotechnology, Govt. of India, New Delhi.

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