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Exploration of underutilized plants in the coastal belts of Thoothukudi and Kanniyakumari district of Tamilnadu, India

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ABSTRACT

Surveys were undertaken to explore the underutilized plants in the sodic belts of Thhothukudi and Kanniyakumari district of Tamil Nadu during 2020-21. The areas covered were inland sodic soils and coastal tract including part of coastal wetlands. Plants distributed in these lands are collected along with soil samples. Further, information such as geographical location, utility, etc. was recorded. Totally 56 plant species were collected which includes arable crops, horticultural crops, underutilized edible species, fodder crops, medicinal plants, weeds and native wild flora. The information gathered will be useful for further exploitation of these plants for sustainable farming besides the reclaiming salt affected lands in a natural way.

Key words: *Salt affected soils, Underutilized plants, Exploration survey, Phytoremediation.*

Introduction

Utilization of salt affected soil is inevitable considering shrinking land availability, detoriation of soil quality and increasing food demand. Expanding aridic conditions and scarcity of fresh water prevents utilization of salt affected lands (Ventura and Sagi, 2013). Exploitation of salt tolerant and accumulating plants is one of the viable options for reclaiming salt affected lands as it is efficient and low-cost strategy (Qadir *et al.,* 2003). Halophytic plants reduce salt content of soil through salt excluding, excreting, or accumulating by their morphological, anatomical, physiological adaptations in their organelle level and cellular level (Hasanuzzaman *et al.* 2014). Numerous evidences are available for the use of halophytes in reclamation of salt-affected soils. But till date, complete information on halophytic plants and salt tolerant plants is missing for many of the ecosystem. Further, number of underutilized plants is also available from salt affected lands. With this backdrop, the plant inventory was carried out to explore the non conventional plants distributed from the salt affected regions of Thoothukudi and Kanyakumari district during 2020 – 21.

Materials and Methods

Salt affected regions of the Thoothukudi and Kanyakumari District was considered for inventory of plants. This includes sodic soils distributed in the inlands of Thoothukudi district and the coastal tract of Kanniyakumari and Thoothukudi district. Surveys conducted along the entire tract of salt affected soils of Thoothukudi and Kanyakumari. Plants present in the salt affected lands were observed and collected. In addition, soil samples also collected from the place wherein plants collected to get infor-

mation about soil salinity/sodicity. The utility of the plants was assessed by interacting with local peoples.

Results

Totally 56 plant species were collected which includes under-utilized crops, wild edible species, weeds, mangrove vegetations and others. Soil samples collected from each plant collection site and characterized for soil physico-chemical properties. Soils were slightly sodic (pH-8.4) in the inlands to highly sodic (9.8) in the coastal wetlands. In addition, latitude and longitude values also collected towards spatial distribution assessment. The collected plants were categorized according to their utility and presented in Table 1.

Mineral Composition of plants collected

S.No.	Plant species	Utility
	Underutilized plants	
1.	*Talinum fruticosum*	E, F
2.	*Theprosia purpurea*	G
3.	*Mukia maderaspatana*	E
4.	*Solanum tarvum*	E
5.	*Cucumis melo*	E
6.	*Amaranthus viridis*	E
7.	*Amaranthus dubius*	E
8.	*Cyamopsis tetragonoloba*	E
9.	*Coccinia grandis*	E
	Medicinal plants	
10.	*Vitex negundo*	M
11.	*Pilanthus niruri*	M
12.	*Momordica cymbalaria*	M
13.	*Cassia angustifolia*	M
14.	*Senna Auriculata*	M
15.	*Cissus quadrangularis*	M
	Arable crops	
16.	*Arachis hypogaea*	E
17.	*Vigna mungo*	E
18.	*Sesamum indicum*	E
19.	*Vigna radiata*	E
20.	*Abelmoschus esculentus*	E
21.	*Citrullus lanatus*	E
22.	*Lablab purpureus*	E
23.	*Luffa acutangula*	E
24.	*Eleusine coracana*	E
25.	*Cajanus cajan*	E
26.	*Crotalaria juncea*	G
27.	*Pennisetum glacum*	E
28.	*Sorghum bicolor*	F
29.	*Coriandrum sativum*	E
30.	*Gossypium herbaceum*	C
31.	*Cucurbita pepo*	E
32.	*Ricinus communis*	O
33.	*Amaranthus sp.*	E
	Horticultural crops	
34.	*Tagetes erecta*	H
35.	*Celosia argentea var. cristata*	H
	Fodder crops	
36.	Cumbu napier - *Pennisetum glaucum x P. purpureum*	F
37.	Wild fodder grass	F
38.	*Setaria viridis*	F
	Weeds	
39.	*Datura metel*	W
40.	*Chenopodium album*	W
41.	*Commelina bengalensis*	W
42.	*Mimosa pudica*	W
43.	*Parthenium hysterophorus*	W
44.	*Abutilon hirtum*	W
45.	*Gompocarpus cancellatus*	W
46.	*Aerva lanata*	W
47.	*Abutilon indicum*	W
48.	*Alternanthera paronychioides*	W
49.	*Physalis minia*	W
	Coastal plants	
50.	*Sesuvium portulocastrum*	F, E
51.	*Salicornia brackiata*	-
52.	*Aloe vera*	C
53.	*Salicornia sp.*	E
54.	*Avicenia officinalis*	F

* E – edible, F – Fodder, M – Medicinal, W – weeds/wild, G – Green manure, C – Commercial crop, O – oil seeds, H – Horticulture crops.

The plants gathered includes 9 underutilized plants, 6 medicinal plants, 12 arable crops, 3 horticultural crops, 5 coastal plants and remaining are weeds/wild plants. The collected plants have significant potential for cultivation in salt affected lands. Based on the commercial values, edible nature, fodder utility and salt accumulation, these plants can be exploited for sustainable farming in these salt affected lands. *Talinium fruitcosum* is one of the potential underutilized leafy vegetable which is tolerant to drought condition and can be used as fodder for cattle. Cumbu napier hybrid can be used as potential fodder cum salt removal plant wherever sufficient quantum of irrigation water is available. Depending upon the water availability, local preference soil conditions and climatic parameters, above listed plants except weeds can be exploited as suitable crops for sodic soils. These species will be utilized in evolving suitable cropping pattern for this region in order to utilize the salt affected soils as per their production capability without further degrada-

tion. In long run, the selected crops and suggested cropping pattern will aids in reclaiming the soil naturally besides augmenting farm income.

Conflict of interest: Nil

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