# Rare and Threatened species of medicinal value under *Prosopis juliflora* (Swartz) DC. in District Tuticorin, Tamil Nadu ( India)

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**Abstract:** A survey in District Tuticorin, Tamil Nadu (India) shows that the industrial area harbors diverse species of various rare and threatened medicinal plants of tropical region. 40 species of medicinal and other ethno botanical uses have been recorded Out of 40 species 6 are listed as rare and threatened as per the IUCN categorization. This area therefore represents a very conducive habitat for their *in-situ* conservation. Maintaining such types of habitats may be very valuable in protecting and conserving these rare and endangered species of the tropical region of the country. The present paper describes in detail the rare and threatened flora inventoried in Tuticorin, Tamil Nadu. [New York Science Journal 2010;3(10):27-36]. (ISSN: 1554-0200).

**Keywords:** *Prosopis juliflora*, medicinal, diversity, rare, threatened.

## 1. Introduction

In recent decades there has been growing concern of the increasing acceptance of biological diversity as an important focus for human wellbeing. At international level this has perhaps been most clearly expressed by the entry into force and continuing implementation of the Convention on Biological Diversity (CBD).Thus, biodiversity has become the subject of various national and international policies and regulations. One result of this is a growing perception of the need for reliable ways to assess the state of biodiversity. Ever increasing dependency on the natural resources and their over exploitation has resulted in the loss of biodiversity on which well being of rural people greatly depends. Conservation of natural resources in order to maintain the structure and functions of the eco-system and to ensure tangible benefits in term of fuel, fodder and other resource base needs is also a matter of much concern to the whole world today (Elizabeth, and Dowdeswell, 1995).

Plants constitute a vital component of the biodiversity as they play a key role in maintaining earth's environmental equilibrium and ecosystem stability. They are also essential for the survival of not only the human beings but also animals at large. Wild plants have enormous endemic, cultural and aesthetic importance, and provide food, medicine, fuel, clothing and shelter to majority of people. However, a large number of plant species are under threat because of habitat modification, over exploitation, pollution, desertification, invasive alien species and climate change. The present trend of loss of plant diversity is one of the greatest challenges for the conservationists, the biodiversity managers and the governments throughout the world (Prance, 1997).

The SIPCOT Industrial Complex established within twenty-five kilometers of the Gulf of Mannar, is a marine national park at a distance of about 12 km from Sterlite Industries Limited. Anthropogenic activities in these natural landscapes may directly result into either loss of biological diversity or alteration in the natural flora and fauna. An effective management of resources of this area with distinct land forms calls for an in-depth assessment of their existing conditions and trends. A preliminary evaluation of the status of environment and natural resources including land, soil, water , air, and the life support systems like forests, rivers and coastal areas indicates that the health of such systems is threatened by serious levels of degradation(Annon ,2008).However, there is no information available about wild life census in the district except one of the reports on the environment of Thoothukudi (Annon.2008) where, it has been reported that few rare and threatened species viz., *Tephrosia barberi* and *Polycarpa diffusa* of flora and fauna, are available in the district.

Keeping this in view, present study has been undertaken to assess the rare and threatened plant diversity in 10 sq. km. area around Sterlite Industries India Limited (SIL), Tuticorin. The aspects covered in this study are identification of endangered/ threatened species according to IUCN Red list or protected under Indian National Laws. The medicinal and other

ethnobotanical uses of these species have also been documented.

## 2. Material and Methods

Tuticorin (Thoothukudi) is in South India about 540 km south west of Madras (Chennai) and is geographically located in the Gulf of Mannar. The district lies between 80 32' and 90 37' north latitude and 770 72'and 780 36' east longitude. The mixed landscape of the sea and the nearby terrestrial ecosystems form a typical feature of the area. The monthly average rainfall in the district was 55.18 mm during 1997-98 periods. During the months of October, November and December, the district receives a rainfall, which is more than the annual average rainfall. The average mean maximum and minimum temperatures for the district have been $31.40^0$ C and $24.30^0$ C respectively. Thoothukudi district does not have any good forests, the small area in the south west of the district is under scrubs.

Whole areas was surveyed during different seasons of the year to prepare an inventory of plant species of common occurrence in different habitats viz., sites dominated by introduced *Prosopis juliflora*, grassland & Swamps, agricultural lands and fallow land . Intensive interviews with local villagers and other communities inhabiting the area were conducted as per the method described by Jain (1987) to document the medicinal and other ethnobotanical uses of the plant species. Local names of all the collected plant specimens were also recorded. Identification of the species was validated on the basis of Forest Research Institute's Dehradun Herbarium, local flora and other studies by various scientists (Gamble and Fischer, 1957; Mehrotra, 1996; Matthew, 1983; Balakrishan *et al.*, 2009; Ignacimuthu *et al.*, 2006; Kaushik and Dhiman, 2000). The species collected and recorded from the area were further categorized into common, threatened, rare, endangered, and vulnerable categories (Table 1). This categorization was done according to IUCN, Red Data Book (Walter and Gillett, 1998), and Red Data Book published by the Botanical Survey of India (Nayar and Shastry, 1987).

**Table 1.List of Common, Rare, Endangered and Vulnerable plant species recorded from the site**

| S. No. | Species | Local Status | Authority | Habit | Family |
|---|---|---|---|---|---|
| 1. | *Abutilon indicum* (L.) Sweet | Common | --- | Shrub | Malvaceae |
| 2. | *Acacia horrida* (Linn.) Willd. | Rare | ---- | Shrub | Mimosaceae |
| 3. | *Acacia planifrons* Wight & Arn. | Rare | ---- | Shrub | Mimosaceae |
| 4. | *Aloe vera* (Linn.) Burm. f. | Common | ----- | Shrub | Liliaceae |
| 5. | *Aristolochia bracteolata* Lam. | Rare | ------ | Herb | Aristolochiaceae |
| 6. | *Aristolochia indica* Linn. | Rare | ----- | Herb | Aristolochiaceae |
| 7. | *Asparagus racemosus* Willd. | Common | ---- | Shrub (creeper) | Liliaceae |
| 8. | *Boerhavia diffusa* Linn. | Common | ---- | Herb | Nyctaginaceae |
| 9. | *Borassus flabellifer* Linn. | Common | ---- | Tree | Arecaceae |
| 10. | *Calotropis gigantea* (L.) R.Br. | Rare | ---- | Shrub | Asclepiadaceae |
| 11. | *Centella asiatica* (L.) Urban | Rare | ----- | Herb | Apiaceae |
| 12. | *Chlorophytum malabaricum* Baker | Vulnerable | Red Data Book | Herb | Liliaceae |
| 13. | *Chlorophytum tuberosum* (Roxb.) Baker | Endangered | Red Data Book | Herb | Liliaceae |
| 14. | *Cissampelos pareira* Linn. | Rare | ----- | Herb (Creeper) | Menispermaceae |
| 15. | *Cissus quadrangularis* Linn. | Rare | ----- | Shrub | Vitaceae |
| 16. | *Clitoria ternatea* Linn. | Rare | ------ | Herb (Creeper) | Fabaceae |
| 17. | *Commiphora berryi* (Arn.) Engl. | Rare | IUCN,1994 | Shrub | Burseraceae |
| 18. | *Commiphora caudata* (Wight& Arn.) Engl. | Rare | ---- | Small tree | Burseraceae |

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| 19. | *Commiphora wightii* Jacq. | Endangered | Red Data Book | Shrub | Burseraceae |
| 20. | *Cryptocoryne spiralis* Wydler. | Common | ---- | Herb | Araceae |
| 21. | *Datura metel* Linn. | Common | ---- | Shrub | Solanaceae |
| 22. | *Evolvulus alsinoides* Linn. | Rare | ----- | Herb | Convolvulaceae |
| 23. | *Gloriosa superba* Linn. | Vulnerable | CITES,1998 | Herb | Liliaceae |
| 24. | *Jatropha glandulifera* Roxb. | Common | ----- | Shrub | Euphorbiaceae |
| 25. | *Jatropha gossypifolia* Linn. | Common | ----- | Shrub | Euphorbiaceae |
| 26. | *Mukia maderaspatana* (L.) M. Roemer | Common | ----- | Herb (Creeper) | Cucurbitaceae |
| 27. | *Ocimum canum* Sims | Common | ----- | Herb | Apiaceae |
| 28. | *Passiflora foetida* Linn. | Common | ----- | Herb( Creeper) | Cucurbitaceae |
| 29. | *Pedalium murex* Linn. | Common | ----- | Herb | Pedaliaceae |
| 30. | *Pergularia daemia* (Forsskal) Chiov. | Common | ----- | Shrub (Creeper) | Asclepiadaceae |
| 31. | *Rhynchosia minima* (L.) DC. | Rare | ---------- | Herb (Creeper) | Fabaceae |
| 32. | *Salvadora persica* Linn. | Rare | IUCN,1994 | Tree | Salvadoraceae |
| 33. | *Solanum surattense* Burm. f. | Rare | ---------- | Herb | Solanaceae |
| 34. | *Tephrosia purpurea* (L.) Pers. | Common | ------- | Herb | Fabaceae |
| 35. | *Trianthema portulacastrum* Linn. | Common | ------- | Herb | Aizoaceae |
| 36. | *Tribulus terrestris* Linn. | Common | ---------- | Herb | Zygophyllaceae |
| 37. | *Tridax procumbens* Linn. | Common | ---------- | Herb | Asteraceae |
| 38. | *Tylophora capparidifolia* Wight & Arn. | Rare | ------- | Shrub (Creeper) | Asclepiadaceae |
| 39. | *Tylophora indica* (Burm. f.) Merr. | Threatened | ----- | Shrub (Creeper) | Asclepiadaceae |
| 40. | *Vitex negundo* Linn. | Common | ------- | Shrub | Verbenaceae |

**3. Result and Discussion**

A big chunk of land in the area is dominated by introduced *Prosopis juliflora* besides other land use categories viz., grassland & Swamps, agricultural lands and fallow land. In this study reconnaissance survey was undertaken in the area of SIPCOT complex and inventory of rare and threatened species has been documented.

A total of 240 species were recorded during different times of the year (Soni *et al*, 2010) .Out of these 40 plant species are threatened and also highly medicinal (Jain and Rao, 1983; Bhargavan and Vajravelu, 1983; Maheswari, 2000 and Jain, 2001). Some of the species fall under the category of International Union for Conservation of Nature and Natural resources (IUCN, 2000) and Convention on International Trade of Endangered Species of Wild flora and fauna(CITES,1998 ) and Indian Red Data Book (Nayar and Shastry, 1987). The 40 recorded rare and threatened plant species belong to 23 families and 33 genera. Among these 6 were monocot and remaining 24 species were dicots (Table 1). Further, classification into plant forms shows 21 species are of herbaceous, 16 shrubs including creepers and 3 trees.

Out of three species belonging to family Liliaceae viz., *Chlorophytum malabaricum, Chlorophytum tuberosum* are Vulnerable, and Endangered and also included in Indian Red Data Book (Nayar and Shastry, 1987). *Gloriosa superba* has been listed in CITES, 1997 (Convention on International Trade Endangered species wild flora and fauna). Two species namely *Commiphora berryi, Commiphora wightii* belonging to family Burseraceae are listed in IUCN (1994) *Commiphora wightii* is also listed in Indian Red Data Book (Nayar and Shastry, 1987). *Salvadora persica* (family Salvadoraceae) is also a threatened species.

Conservation is the planned management of natural resources, to retain the natural balance, diversity and evolutionary change in the environment. Conservation is required chiefly to prevent the loss of genetic diversity of a species, to save a species become extinct and/or to protect an ecosystem from damage so as to promote its sustained utilization (IUCN, 1994).Traditional knowledge of medicinal or other uses is a suitable tool for both botanical and conservational purposes for economic and threatened plant species (Sheldon *et al*., 1998). Hence this study will be a milestone for conservation of important rare and endangered species in their natural habitat.

**Table2. List of medicinal/ ethno medicinal plant species.**

| Sl.. No. | Species | Common Name | Family | Flowering & fruiting period | Description | Medicinal/ ethnobotanical Uses |
|---|---|---|---|---|---|---|
| 1. | *Abutilon indicum* | Thuthi | Malvaceae | January-December | Shrub upto 2m height, branchlets cinereous by minutely short stellata-pubescent and simple hair. Leaves cordate broadly oblong, 3-nerved from base. Flowers chocolate-brown, to 5 cm long, in axillary racemes. Capsules oblong, to 5 cm long. Seeds winged finely. Frequent in open forests, on hedges and other shrubs. | Leaves crushed and juice given orally to ease child birth. |
| 2. | *Acacia horrida* | Holothudi | Mimosaceae | July-November | Large shrub or tree upto 6m. height. Leaves in a cluster, form elliptic, petiole with a gland near the middle; stipular thorns unequal, white, hallow. Pods are curved, turgid; seeds ovoid. A characteristics feature of this species is diverging pairs of white hollow thorns. | Pod and leaves are cattle fodder. |
| 3. | *Acacia planifrons* | Chatrokhi | Mimosaceae | January-March | Shrub or tree upto 6m. height. Leaves in a cluster. Leaflet in a pair, elliptic Stipular throns unequal; short ones recurved, long ones straight, divergent, to 4 cm, white. *Pod* subterete, acute and circinate. | Seed possesses hypoglycemic and anticancer activity. Plant is a host for lac-insect. Pod used as fodder. |
| 4. | *Aloe vera* | chotthu kaththalai | Liliaceae | October-December | Leaves radical, in rosettes, ensiform, succulent and spiny. Flower *bisexual*, *Perianth*- tube terete, curved; scrub jungles, wastelands, etc. Discrete clumps. | The fleshy leaves are ground with garlic and given to cattle to increase digestion. Leaves after removing the spines and epidermis, ground with turmeric, applied for 3-4 days on blisters formed on legs. Leaves after removing the spines and epidermis, taken along with *Terminalia chebula* to reduce body temperature. |
| 5. | *Aristolochia bracteolate* Lam. | Aaduthinn apalai | Aristolochia ceae | January-December | Prostrate herb, often stunted. Leaves cordiform-reniform, 5-nerved from base. Bracts cordate-orbicular. Flower *dark* purple, limb entire, 1-lipped rolled back emarginated. Fruit Capsule, seeds cordate Flower yellow, schizocarp globose. | The leaf paste applied over the head relieves dandruff and other fungal infection. |
| 6. | *Aristolochia Indica* | Siva mooli | Aristolochia ceae | January-December | Twiner. Leaves | Root is dried and pasted along with saliva. The paste is applied externally to the affected part. The paste is also mixed with hot water and taken orally 3 to 4 times. It cures snake bite, stomach- ache and unknown poisonous bite. |
| 7. | *Asparagus racemosus* | Thannir vittan | Liliaceae | | Armed vine to 6m; spines erect. Leaves scaly, triangular, | Herb tonic, diuretic and galactagoglue. Fresh root juice is mixed with honey and given in dyspepsia. Roots forms constituent of medicinal oil used for nervous and |
| 8. | *Boerhavia diffusa* | Punarnava, Patharchat a | Nyctaginace ae | January-December | Diffusely branched herb. Leaves linear-ovate, oblong or rounded, acute or obtuse, rounded or cordate bases. Flowers pink. Fruit ribbed. | Alcoholic extract of the roots increased the weight of mammary glands in post partum and estrogen primed rats. Crushed fresh roots or decoction with sugar in doses of 5-10 grams given twice a day for fever, liver, and spleen disorder. |

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| 9. | *Borassus flabellifer* | Panai | Arecaceae | February-April | Dioecious tree upto 40 m height. Stem obscurely hooped. Leaf palmate (fan-shaped. Fruit drupe yellow when ripe. It is an indicator species for the more arid plains. | Used as cooling beverages. |
| 10 | *Calotropis gigantea* | Erukku | Asclepiadaceae | December - May | Shrub upto 3m height. Latex milky. Leaves Elliptic to oblong. Inflorescence umbellate panicle. | Warmed leaves used as bandage on the painful parts of the body to cure to rheumatic joint pains and swellings. The latex is applied around the thumb nails and leg for getting immediate relief from burning sensation while passing urine |
| 11. | *Centella asiatica* | Vallarai | Apiaceae | January-December | Prostrate herb. Leaves simple in rosette form, orbicular-reniform. Inflorescence umbel simple. | Leaf extract is used to cure dysentery and improve the memory power. |
| 12. | *Chlorophytum malabaricum* | Muza | Liliaceae | June-November | Erect herb. Leaves linear, keeled, scape. Inflorescence raceme simple. | Tuber used as an adulterant |
| 13. | *Chlorophytum tuberosum* | Musala | Liliaceae | October-November | Erect herb. Leaves ensiform. Inflorescence raceme, Perianth lobe white. Fruit capsule. | Tuber used as an adulterant |
| 14. | *Cissampelos pareira* | Malain Thanke | Menispermaceae | January-December | Tomentose climber. Leaves reniform, cordate. Inflorescence subcorymbose cymes. Fruit drupe ovoid. | Root powder given early in the morning with 2-3 teaspoonful honey for stomach ulcer. |
| 15. | *Cissus quadrangularis* | Pirandai | Vitaceae | January-December | Perennial, succulent, twining rambling shrub; rooting at nodes. Stems green and quadrangular. Leaves simple caduceus, ovate to cordate. Fruit berry globose, apiculate. Seed smooth It was dominant in scrub | Stem paste prepared by adding a bit of fresh lime and applied on the insect bite (Balakrishan *et al*., 2009). Poultice of powered stem along with rock salt used for the treatment of fractures. Green leaves and young bud |

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| | | | | | jungles and wastelands. It is a indicator species of dry region. | grind on the stone (silbatta) and mix with green chillies, common salt, leaves of *Murraya koenigii* and *Cocos nucifera* (Raw nariyal) by Villagers surrounding the Sterlite Industries used as Chatni (For use with Dosa, Idli and Bara). Young buds and green leaves used as vegetable (Bhuzia) by villagers. at the time of scarcity of food. It is a dominant species under the Prosopis juliflora population. Young tops cooked and eaten for dysentery. Paste of the leaves of pirandai and chilli mixed with salt and administered for appetite in livestock. |
| 16. | *Clitoria ternatea* | Kakkanathi | Fabaceae | January - December | Vine to 6 m. Leaves odd – pinnate, Leaflets in pairs, opposite, ovate, stipules persistent. | The paste prepared from ten grams of whole plant with water is applied externally two times in a day for a period of one week to treat inflammation and to relive the pain. |
| 17. | *Commiphora berryi* | Kiluvai | Burseraceae | March-April | Deciduous, armed shrub/tree, 3-6m height; branchlets spine- tipped. Leaves in a cluster form sometimes 3-foliolate. Leaflets ovate-suborbicular, laterals smaller. Flower in axillary clusters. Fruit drupe ovoid- | It is a small fragrant tree grown as a hedge surrounding the agricultural field. |
| 18. | *Commiphora caudata* | Kiluvatt | Burseraceae | Jauary-DEcember | Unarmed (except on old wood), deciduous tree, 5 -12 m height. Leaves 3-7-foliolate. Leaflets opposite, ovate- | It is a handsome tree. Grown as avenue. |

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| | | | | | oblong/elliptic. Fruit drupe globose. | |
| 19. | *Commiphora wightii* | Guggulu | Burseraceae | April - December | Shrubs with papery bark. Leaves sessile, alternate or fascicled, 1-3 foliated; leaflets glabrous, ovate serrate. Flowers red or pinkish- white. Only few plants recorded from agricultural field . | Medicines are prepared from the gum resin and given to reduce cholesterol level in blood. |
| 20. | *Cryptocoryne spiralis* | Araceae | lodgi | January-April | Rhizomatous perennial herbs. Leaves tufed apically on rhizomes, blade usually linear-lanceolate. Inflorescence spadix. | The whole plant collected by villagers for feeding of goat and cattle. |
| 21. | *Datura metel* | Umathai | Solanaceae | January-December | Subshrub upto 80 cm height. Leaves elliptic to angulate, base unequally truncate. | Leaves are warmed with castor oil and applied externally for pus release and heal the wounds. |
| 22. | *Evolvulus alsinoides* | Vishnukrandi | Convolvulaceae | January-December | Prostrate to ascending herbs. Leaves elliptic, oblong to lanceolate. Fruit capsule. | Decoction used in fever, Memory power. Leaf juice mixed with ghee and drink. Leaves made into cigarettes inhale. Hair growth: Prepare oil, by using leaf and coconut oil |
| 23. | *Gloriosa superba* | Langli | Liliaceae | October-March | Twining branched herb with tuberous rootstock. Leaves lanceolate with spiral apex. Flowers showy, peduncled, drooping, lower half yellow, upper half red, finely becoming deep red. It was a abundant species recorded from *Prosopis juliflora* population. | Tuber paste fried in mustered oil and applied externally to cure gout and rheumatism. Tuber paste is applied to navel, super pubic region and vagina with the object of promoting labour. In retaining placenta a paste of root is applied to the palms and soles |
| 24. | *Jatropha glandulifera* | Adalai | Euphorbiaceae | January-December | Shrub upto 3 m height. Leaves deeply lobed, margin serrate. Flower unisexual. Fruit capsule. | Latex of this plant used for thoothache. |
| 25. | *Jatropha gossypifolia* | Atalai | Euphorbiaceae | January-December | Shrub upto 3m height. Branchlets purplish. Leaves | Villager use stem for Toothache and infected teeth. |

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| | | | | | deeply lobed, stipules ciliate, glandular. Flower unisexual. Fruit capsule | |
| 26. | *Mukia maderaspatana* | Mosumosukkai | Cucurbitaceae | November-February | Prostrate/climbing vine. Leaves ovate deltoid. | Root paste used in tooth paste. |
| 27. | *Ocimum canum* | Thulasi | Lamiaceae | November-February | Strongly aromatic herb up to 50 cm height. Leaves elliptic –oblong. Flowering peduncles green. | The juice of the leaves is mixed with cumin and given to cure the dry cough |
| 28. | *Passiflora foetida* | Korvanva | Passifloraceae | November-May | *Vine*. Leaves usually lobed to halfway, sub orbicular to ovate, stipules subreniform, deeply cleft into glandular processes. | Fruit eaten by villager. |
| 29. | *Pedalium murex* | YaanaiNerinjii | Pedaliaceae | January-December | Herb upto 50 cm height. Leaves alternate, repand-angulate. Flower axillary, pedicel with a pair of yellow glands. | Dry fruits ground &,mixed with sugar to make laddu taken 2-3 times in a day for increasing the vigour in men |
| 30. | *Pergularia daemia* | Velipparuthi | Asclepiadaceae | September - May | Straggler. Latex milky. Leaves cordiform. Fruit follicles paired, curved, basally swollen. | Bath with leaves boiled in water cures body pain |
| 31. | *Rhynchosia minima* | rothei | Fabaceae | January-February | Spreading herb to vine. Leaves three foliate. Leaflet obovate. Inflorescence raceme. | fodder |
| 32. | *Salvadora persica* | Saltbushi | Salvadoraceae | March-April | A much branched evergreen shrub/tree. Bark dull grey, deeply cracked. Leaf elliptic, ovate. Flower greenish white. Fruit globose, round, smooth drupe. | Leaf eaten by villager as vegetable. Decoction of leaves given to asthma and cough. |
| 33. | *Solanum surattense* | Pipatpala | Solanaceae | January-December | Armed diffuse herb. Leaves lacerate. Fruit berry. | Flower eaten by local people for cough and cold. |
| 34. | *Tephrosia purpurea* | Chimarui | Fabaceae | January-February | Subshrub upto 1m height. Leaves ovate to obovate. | Fodder |
| 35. | *Trianthema portulacastrum* | Bisuki | Aizoaceae | January-December | Prostrate herb. Leaves ovate elliptic. | Plants used as vegetable as Bhuzia. |

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| | | | | | Inflorescence sub umbellate cluster. | |
| 36. | *Tribulus terrestris* | Nerunji | Zygophyllaceae | January-December | Variable prostrate annual herb upto 90 cm height. Leaves sub opposite. Leaflet 4-5 pair. Flower yellow in colour. Fruit schizocarp, 5 angled each pair of woody spines. | Fruit diuretic and tonic , used for the treatment of calculous affections. |
| 37. | *Tridax procumbens* | Vettukkaya poondu | Asteraceae | January-December | Hirsute upto 70cm height. Leaves opposite, lanceolate to ovate, pinnatisect. Inflorescence capitulam, yellow. | The juice of leaves is applied externally for healing the wounds. |
| 38. | *Tylophora capparidifolia* | Kitala | Asclepiadaceae | November-January | Twines. Leaves elliptic- obovate to oblong. Inflorescence umbel .simple | Leaves used as a fodder for cattle. |
| 39. | *Tylophora indica* | Antamul | Asclepiadaceae | January-December | Twining perennial herb. Leaves opposite, ovate, acute, fleshy. Flowers yellow, purple within, in clusters, Fruits ridged with many fine ridges, pointed at tip. | Leaves (raw) used empty stomach for asthma, Villager collect the twine from the field for feeding for goat |
| 40. | *Vitex negundo* | Nochi | Verbenaceae | January - December | Shrub upto 4m height. Leaves 3-7 foliate. Leaflet obovate, oblanceolate | Fresh leaves boiled with water and the vapour is inhaled twice a day for the treatment of fever. |

## 4. Conclusions

The present study in aimed at in depth study on the field survey, systematic, correct identity and economic importance or ethno botanical importance for better understanding of such species. There are lots to be done in this promising field with the active support of village people so that importance of these, threatened, rare and economically important plants could be rejuvenated for the benefit of our future generation. Further studies are needed to cover more of the morphological variability, ecological diversity and monitoring of threatened habitats and the interdependent elements responsible for the regeneration and reproduction.

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