

# Weeds: Wealth of the World, not a Waste

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## Abstract

**Objectives:** The main object of this paper is to develop a constructive approach towards weeds and study their geographical distribution.

**Methods / Statistical Analysis:** The weed plants for the present study were random surveyed from in and around Chennai, Tamil Nadu. The weed plants were authentically identified with the help of Floras. The identification was based on floral and leaf characters. Some of the plants are selected for the preparation of extracts to control the larvicidal activity based on the standard basic principles.

**Findings:** A survey on weeds reveals that most of the weeds are of native flora and appear to be uniform distribution throughout state.

**Application / Improvements :** The knowledge of the geographical position and physiography of the state is essential in order to understand the distribution of weeds and their invasion.

**Keywords:** Chemical compounds, Medicinal uses, Mosquitoes repellent, Weeds.

## 1. Introduction

A weed is considered as a great menace to man. But to most of the Botanist, it is a variety and beauty. Whether they occur in the fields or forests, on moors or mountains, by road sides, rivers, canals, pools or ponds, there are the surprises beyond description for those who are willing to stop and stoop to have a look at them and study them with much patience and perseverance. Weeds are generally understood, a group of plants which are very aggressive, competitive and troublesome to man or shortly 'a plant out of place'. The word 'weed' itself is of obscure origin. According to the oxford dictionary the word 'weed' has originated from the Anglo-Saxon 'Woed'. The month of August is referred as 'Woedmonath' meaning 'month of weeds'. Ever since man realized the importance of plants as food, he began to cultivate them in large areas and to him any plant in his / her field other than the planted crop became weed [1][2][3].

It is really sickening to read about the 'killing' attitude generated by the newspaper towards the introduced weed *Parthenium hysterophorus* and the eradication by Government towards *Prosopis juliflora*. It is true that it is troublesome, spreading fast, threatening other vegetation causing allergic diseases in man like fever, asthma and eczematous dermatitis, so much so it is classified as one among the seven obnoxious, pernicious and poisonous weeds. In olden days a man died immediately after a bee sting, but no order to eradicate all the bees? Nobody will dare lest one may lose the mouth watering honey! Likewise at the other side of the coin *Parthenium hysterophorus* used as a powerful tonic, febrifuge, analgesic in neuralgia, in dysentery etc. [4]. It contains 'Parthenin' a bitter Glycoside which is supported to be very active against cancer. It is also free from insect predators, research is being conducted to use it as a pesticide. If it is successful, the costly synthetic insecticides can be replaced away with this compound. The other widespread weed like *Prosopis juliflora* contains very essential compound used for antibacterial, antifungal, anticancer, antioxidant and antimicrobial activities [5].

## 2. Materials and Methods

The weed plants for the present study were random surveyed from in and around Chennai, Tamil Nadu. The weed plants were authentically identified with the help of Floras [6][7][8]. The identification was based on floral and leaf characters. Some of the plants are selected for the preparation of extracts to control the larvicidal activity based on the standard basic principles [9].

### 3. Observations

One of the common weeds, *Eichhorniacrassipes*- the beautiful water hyacinth, is really a troublesome for upsetting the aquatic life and the ecosystem in a pond blocking the navigation and also its death and decay pollutes the drinking water. At the same time, it has been found by Dr. B. C. Wolerton of the U.S. National Space Technology Laboratory that this weed can be put in to a number of uses. Perhaps the most important is that it can absorb metals and toxic substances in substantial amount from backwaters. A hectare of weed has the potential of removing 300 gms. of Cadmium or Nickel from 53,000 gallons of polluted water within 24 hours, a big relief from industrial wastes that threatens the very existence of mankind. Another interesting point it is found in Tamil Nadu is that it increases milk yield by 10 – 20 % when buffaloes are fed by this weed. Million dollars worth of medicinal herbs (weeds) such as *Cassia auriculata*, *Cassia angustifolia* and lately *Catheranthusroseus* are exported from the parts of Tuticorin. The book *MateriaMedica* consists of about 70 % of plants which are weeds. Weed infestation is one of the most important factors that affect considerably the yield of crop plants. As present day needs have swelled up enormously in different directions, man is more and more depend heavily on plants and their products. The *MateriaMedica* and the later work by Chopra and Chopra (1956) consist of plants 75% of which are weeds. Weeds also serve as food for man and his animals especially at the time of scarcity and famine. *Portulacaoleracea*, *Amaranthusviridis*, *Cleome viscosa*, *Phyllanthus*, *Commelina*, *Cynadon* are some of the favorites of animals. The following is only the list of medicinal value of some of the weeds.

Many weeds are good source of green manures. Most of the Leguminous plants by their virtue of fixing atmospheric nitrogen serve as good nitrogen replenishes. *Calotropis gigantean*, *Croton bonplandianum*, *Cassia hirsute*, *Cassia tora* and many other plants are found useful for making compost.

One of the definitions of weed is that it is harmful and troublesome. Some poisonous compounds of weeds taken along with the fodder crops in the farm or the field in sufficient quantity cause irritation in the stomach and other internal organs resulting in death. Children are very easily affected by eating the berries. *Withaniasominifera* Dunal, the berries contain a poisonous alkaloids somniferin. *Daturametel* Linn. *Datura* poison is obtained as extracted from leaves and seeds. The symptoms of poisoning are visual disturbance, thirst, flushed skin, convulsions and death. The toxic substances are atropine, hyoscyamine and scopolamine. *Abrusprecatorius* Linn. the seeds are highly poisonous. One seed is enough to kill a person. The symptoms of poisoning are nausea, diarrhea, cyanosis, disorientation, drowsiness, stupor and circulatory failure. The substance identified is abrin which a glycoprotein and resembles ricin of *Ricinus*. It caused the clumping of red corpuscles (haemagglutination). Even though it is harmful compound as abrin and ricin are toxic to malignant tissues attempts are being made to use them to treat cancer.

*Partheniumhysterophorus* Linn. an American weed recently introduced in this state. This causes allergic contact dermatitis or allergic skin reactions. The chemicals responsible for this are parthenin and ambrosin belonging to sesquiterpene lactones. Electron microscopic studies have revealed the presence of four types of glandular hairs filled with the allergens. When these glands are broken and the exudates come in contact with the skin they cause rashes and blisters on the face, hands and ears. *Calotropisgigantea* R. Br. the latex is poisonous because it causes blindness. *Solanumnigrum* Linn. fruits are said to be poisonous to children. *Catharanthuspusillus* G. Den. and *Crinumdefixum* Ker are reported to be poisonous to cattle. In the recent research finding shows that the toxic substance of the plant materials only from the external epidermal hairs. If it is removed from the plant surfaces as well as portions were it is located, the remaining plant parts are useful to mankind.

Many weeds are a great menace to crops by being the host of various insects pests, fungi and viruses. In absence of crop, fungi and viruses including insects pests like stem borers switch on to weeds and subsequently infect the crops. *Sidacordifolia* and *S. veronicaefolia* are found to be the alternate host for the virus and produce leaf curl disease of tobacco. Reference is already made to *Eichhorniacrassipes*[10] and *Salvinia* that pollute water. *Lantana camara* is another aggressive weed that has caused immense damage to forest. It is responsible for the fast spreading of forest fires. *Eupatorium* is another weed of great menace to the agricultural lands, forest and plantations. The growth is so thick that the teak saplings are virtually suffocated to death in forest areas. Two species of *Eupatorium perfoliatum*, *E. purpureum* often caused abortion in cattle. The active substances found to contain nitrates Treonetol, the poisonous chemical isolated from *E. rugosum* is responsible for trembles in cattles and milk sickness in man.

The biological weed control method is chiefly consists of employing insects, fungi and other animals that harbor the weeds [11]. Cattle grazing to remove weed can also be considered one among them. One successful attempt made in this country is the control of water fern *Salvinia*. *Paulinia acuminata*, a water bug is found to feed on the

leaves of this plant. The insect *Teleonemiascrupulosa* was imported from Australia to this country in 1941 to control this weed menace namely *Lantana camara*. A large number of fungi, bacteria and viruses are also used as pathogens against weeds. Fungi like *Fusarium*, *Physalospora* etc seemed to have restricted the spread of weed like *Opuntia* etc. Many grassy weeds are controlled by animal grazing. The fish *osphronemusolifax* is widely grown in Ceylon to control the weed *Hydrillaverticillata*.

Table 1. Weeds used for Medicine

S. No.	Binomial	Family	Medicinal Uses
1.	<i>Abutilon indicum</i> (Linn.) Sw.	Malvaceae	Leaf – piles, ulcers, cough, dysuria, Jaundice, diuretic, diabetes
2.	<i>Acalypha indica</i> Linn. (Figure 1)	Euphorbiaceae	Whole plant laxative, leaf – earache, diabetes
3.	<i>Achyranthesaspera</i> Linn. (Figure 2)	Amaranthaceae	Whole plant – Jaundice, piles, stomach disorders, scorpion sting
4.	<i>Boerhaviadiffusa</i> Linn.	Nyctaginaceae	Whole plant – Jaundice, constipation, anaemia, cardiac diseases
5.	<i>Calotropis gigantea</i> (Linn.) R. Br. (Figure 3)	Asclepiadaceae	Root – poisonous bites, skin diseases, milk latex - antiseptic
6.	<i>Cassia auriculata</i> Linn.	Caesalpiniaceae	Root – skin diseases, thirst, polyuria, leprosy, worm infection, bark astringent, haematuria. Leaf – anthelmintic, seed – eye diseases, chylous urine, diabetes mellitus, diarrhea, urinary troubles
7.	<i>Chloris barbata</i> Sw.	Poaceae	Whole plant - Rheumatism
8.	<i>Clitoria ternatea</i> Linn.	Fabaceae	Root – laxative, diuretic, anthelmintic, tuberculosis glands, filariasis, headache, ulcers, leucoderma, alexiteric, leaf – fever, diabetes, dog bite, earache, seed – purgative, aperients, cathartic, laxative
9.	<i>Datura metel</i> Linn. (Figure 4)	Solanaceae	Whole plant – Narcotic, wounds, skin diseases
10.	<i>Eichhornia crassipes</i> (Mart.) Solms. (Figure 5)	Pontederiaceae	Whole plant chronic skin diseases, haemorrhoids, dysentery, refrigerant, demulcent, diuretic, disorders of blood diabetes
11.	<i>Euphorbia hirta</i> Linn. (Figure 6)	Euphorbiaceae	Whole plant – urinary disorders, constipation, leucorrhoea, asthma, cough, colic, dysentery, purgative, dyspnoea, genito-urinary tract diseases, hepatoprotective, leaf – bowel problems
12.	<i>Gomphrenadecumbens</i> Jacq. (Figure 7)	Amaranthaceae	Root and leaf – Tonic stomachic
13.	<i>Hyptis suaveolens</i> Poit.	Lamiaceae	Whole plant – emetic, stimulant, sudorific, carminative, worm – infection, root – stomachic, appetite, seed – menorrhagia, leucorrhoea
14.	<i>Lantana camara</i> Linn.	Verbenaceae	Root – toothache, leaf – haemorrhage, wounds, cuts
15.	<i>Leucas aspera</i> Spring.	Lamiaceae	Whole plant – febrifuge, hepatoprotective, leaf swellings, poisonous bites, skin eruptions
16.	<i>Melothria maderaspatana</i> (Linn.) Cogn.	Cucurbitaceae	Root - Toothache
17.	<i>Parthenium hysterophorus</i> Linn.	Compositae	Whole plant – high fever, tonic, febrifuge, root - dysentery, remedy for skin inflammation, rheumatic pain, diarrhea, urinary tract infections, dysentery, malaria. Leaf – analgesic, fever, dysentery
18.	<i>Pergularia daemia</i> (Forsk) Blatt & Moc.	Asclepiadaceae	Root – emetic, expectorant, diabetes, leaf – jaundice, asthma, diarrhoea
19.	<i>Prosopis juliflora</i> DC. (Figure 8)	Mimosaceae	Stem bark and fruit – Giddiness, diarrhea, dysentery, piles, worm infestation, skin diseases, cough
20.	<i>Ruellia tuberosa</i> Linn.	Acanthaceae	Root – cancer, whole plant – emetic, gall bladder stones
21.	<i>Sida acuta</i> Burm.	Malvaceae	Root and leaf febrifuge, ear diseases, poisoning, elephantiasis, diarrhea, skin eruptions, worm infection, arthritis
22.	<i>Tridax procumbens</i> Linn. (Figure 9)	Compositae	Whole plant – Hepatoprotective, leaf dysentery cuts, wounds, bronchial catarrh
23.	<i>Typha angustata</i> Bury & Chaub	Typhaceae	Rhizome – Astringent, diuretic, cooling, whole plant – urinary calculi, dysuria, erysipelas, syphilis

Of all the insects that transmit diseases, mosquitoes represent by far, the greatest menace. WHO has declared the mosquito “Public Enemy Number one”, because mosquitoes are responsible for the transmission of various dreadful diseases [12]. Mosquitoes are pestiferous insects, which are responsible for the transmission of various dreadful diseases. In India, the most important disease transmitting mosquitoes belong to the genera Anopheles, Culex, Aedes and Mansonia. Malaria, Filariasis, Japanese Encephalitis, Dengue and Dengue Haemorrhagic Fever (DHF) are the major mosquito-borne diseases in India.

Plants are a rich source of bioactive organic chemicals and synthesize a number of secondary metabolites to serve as defense chemicals against insect attack. Reports of laboratory test and field trials of plant extracts and purified chemicals showed larvicidal activities against mosquitoes. Traditionally smoke from burning dried plant leaves such as *Pongamia* has been used for domestic protection.

**Some commonly occurring weeds**

Figure 1. *Acalypha indica* Linn. Figure 2. *Achyranthes aspera* Linn. Figure 3. *Calotropis gigantea* (Linn.) R. Br.



Figure 4. *Datura metel* Linn. Figure 5. *Eichhornia crassipes* (Mart.) Solms. Figure 6. *Euphorbia hirta* Linn.



Figure 7. *Gomphrena decumbens* Jacq. Figure 8. *Prosopis juliflora* DC. Figure 9. *Tridax procumbens* Linn.



Table 2. Plants tested for larvicidal activity against *Culexquinquefasciatus*

S. No.	Plant Names	Hexane	Diethyl Ether	Dichloromethane	Ethy Acetate	Methanol
1.	<i>Achyranthesaspera</i> Linn.	+	+	-	-	-
2.	<i>Leucasaspera</i> Spreng.	+	+	+	+	+
3.	<i>Phyllanthusdeblis</i>	+	+	+	+	+
4.	<i>Sidaacuta</i> Burm.	+	+	+	+	-
5.	<i>Streblusaspera</i>	+	+	+	+	+
6.	<i>Tephrosiapurpurea</i>	+	+	+	+	-
7.	<i>Vitexnegundo</i>	+	+	+	+	+

(+ = shows larvicidal activity, - = No larvicidal activity)

The leaf extracts of *Aristolochiaindica*, *Leucasaspera*, *Ocimum sanctum* and pulp extracts of *Aristolochiasativum* and rhizome extract of *Curcuma longa* acted as potent repellents against the malarial vector *Anophelesstephensi* [13].

Table 2. List of plants used for mosquito control

S. No.	Binomial	Parts used
1.	<i>Acalyphaindica</i> Linn. Euphorbiaceae	Aerial parts [14]
2.	<i>Hyptissuaveolens</i> Poit.Laminaceae	Whole plant [15]
3.	<i>Lantana camara</i> Linn. Verbenaceae	Flower [16]
4.	<i>Tridaxprocumbens</i> Linn. Compositae	Whole plant [17][18]

The Table 1, 2 and 3 show some of the commonly occurring weed plants used for controlling mosquito population by recent researches as well as medicinal values. Therefore need not use the word weeds for waste land plants, instead of using weeds, use the word weapons for those plants to kill mosquitoes and used for curing diseases.

#### 4. Discussion

The chief biological aspects of weeds are their rapidity of growth, early maturity and efficiency not only in flowering and seed production but also in their disseminations coupled with their capacity to grow in any adverse terrain and climate. That is why weeds are labeled as aggressive and troublesome. Weeds are therefore not just useless plants to be thoughtlessly uprooted and needlessly eradicated and exterminated. Therefore, no plant on earth will be considered as weed. Following this line of thought L.H. Bailey commented as early as 1895 that 'Nature knows no plants as weeds'. Weeds therefore demand a special care from man. From the scientific point of view a complete disappearance of an organism whether it be plant / animal involves an irreparable loss and permanent impoverishment which cannot be made good. In the many efforts of man to increase food production, weed control, through a formidable task, is one of them. Weeds not only compete with the crops for light and space but also for water and nutrients. In this competitive spirit, weeds are always on the winning side and thus the crops suffer. At the same time, with increasing technology, weeds are becoming more and more useful, offering a signal service to mankind. So the traditional and archaic definition that weeds is 'useless plants' should be given up and a new virile, attitude should be cultivated if a fruitful use is to be made of weeds. Hence the study of weed is an important and imperative as the cultivation of any crop.

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