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FAMILY EUPHORBIACEOUS AND ECONOMIC IMPORTANCE

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Abstract :

Survey of plants belonging to family Euphorbiaceae was done and 18 genera and 44 species were reported at these sites. In 'the Flora of Solapur district' Gaikwad and Garad (2015) reported 19 genera and 62 species. In 2015-16, frequent visits were arranged to survey these plants during their flowering seasons. Plant specimens were collected in triplicates; herbaria were prepared and identification of these plants was done using 'Flora of the Presidency of Bombay' (Cooke, 1901-1908), 'Flora of Osmanabad district' (Naik, 1979), 'Flora of Ahmednagar District' (Pradhan and Singh, 1999) and 'Flora of Solapur district' (Gaikwad and Garad 2015). Ambiguity in identification of plants was cleared with consultation of taxonomists.



The 44 members of family Euphorbiaceae were selected to undertake this study. The plant species selected from the family Euphorbiaceae were *Acalypha ciliata* Forssk., *Acalypha hispida* Burm., *Acalypha indica* L., *Acalypha lanceolata* Willd., *Acalypha malabarica* Muell., *Acalypha wilkesiana* Muell., *Baliospermum solanifolium* (Burm.) Suresh., *Breynia disticha* Forst. & Forst., *Bridelia retusa* (L.) Juss., *Chrozophora plicata* (Vahl) Juss. ex Spreng., *Chrozophora rottleri* (Geisel.) Juss., *Codiaeum variegatum* (L.) Rumph. ex Juss., *Croton bonplandianus* Baill., *Emblica officinalis* Gaertn., *Euphorbia antiquorum* L., *Euphorbia caducifolia* Haines., *Euphorbia clarkeana* Hook., *Euphorbia cyathophora* Murr., *Euphorbia dracunculoides* Lam., *Euphorbia elegans* Spreng., *Euphorbia granulata* Forssk., *Euphorbia heterophylla* L., *Euphorbia hirta* L., *Euphorbia indica* Lam., *Euphorbia neriifolia* L., *Euphorbia prostrata* Ait., *Euphorbia pulcherrima* Willd. ex Klotzsch., *Euphorbia rothiana* Spreng., *Euphorbia thymifolia* L., *Euphorbia tirucalli* L., *Flueggea leucopyrus* Willd., *Jatropha curcas* L., *Jatropha gossypifolia* L., *Manihot esculenta* Crantz., *Pedilanthus tithymaloides* (L.) Poit., *Phyllanthus acidus* (L.) Skeels., *Phyllanthus amarus* Schumach. & Thong., *Phyllanthus debilis* Klein ex Willd., *Phyllanthus maderaspatensis* L., *Phyllanthus simplex* Retz., *Putranjiva roxburghii* Wall., *Ricinus communis* L., *Synadenium grantii* Hook., *Tragia involucrata* L.

KEYWORDS: *Euphorbia* and *Mercurialis*, Economic importance, plants exhibit

Introduction

❖ Distribution:

The plants of this family are found throughout the world. However, they are not found in arctic regions. In our country, the family is represented by several genera such as, *Euphorbia*, *Ricinus*, *Phyllanthus*, *Croton*, *Pedilanthus*, etc. In the desert regions of Africa and elsewhere, the family is represented by cactus-like plants of different species of *Euphorbia*. In open uncultivated areas *Euphorbias* are quite common in Australia. In Britain, only two genera, i.e., *Euphorbia* and *Mercurialis* are found, which are represented by sixteen and two species respectively.

i) Habit:

The plants exhibit great variation in their habit. The plants may be herbs, shrubs, trees or climbers. *Acalypha ciliata* Forssk., *Acalypha indica* L., *Acalypha lanceolata* Willd., *Acalypha malabarica* Muell., *Baliospermum solanifolium* (Burm.) Suresh, *Chrozophora plicata* (Vahl) Juss. ex Spreng., *Chrozophora rottleri* (Geisel.) Juss., *Croton bonplandianus* Baill., *Euphorbia clarkeana* Hook., *Euphorbia cyathophora* Murr., *Euphorbia dracunculoides* Lam., *Euphorbia elegans* Spreng., *Euphorbia granulata* Forssk., *Euphorbia heterophylla* L., *Euphorbia hirta* L., *Euphorbia indica* Lam., *Euphorbia prostrata* Ait., *Euphorbia rothiana* Spreng., *Euphorbia thymifolia* L., *Phyllanthus amarus* Schumach. & Thong., *Phyllanthus debilis* Klein ex Willd., *Phyllanthus maderaspatensis* L., *Phyllanthus simplex* Retz., are annual or perennial herbs. *Acalypha hispida* Burm., *Acalypha wilkesiana* Muell., *Breynia disticha* Forst. & Forst., *Codiaeum variegatum* (L.) Rumph. ex Juss., *Euphorbia antiquorum* L., *Euphorbia caducifolia* Haines, *Euphorbia pulcherrima* Willd. ex Klotzsch, *Flueggea leucopyrus* Willd., *Jatropha curcas* L., *Jatropha gossypifolia* L., *Manihot esculenta* Crantz, *Pedilanthus tithymaloides* (L.) Poit., *Ricinus communis* L., *Synadenium grantii* Hook., are shrubs. *Bridelia retusa* (L.) Juss., *Emblica officinalis* Gaertn., *Euphorbia neriiifolia* L., *Euphorbia tirucalli* L., *Phyllanthus acidus* (L.) Skeels, *Putranjiva roxburghii* Wall., are medium to large trees. *Tragia involucrata* L. is a tropical climber. Majority of the members of the family possess large laticiferous vessels which contain latex.

ii) Root:

Tap roots, branched the roots of *Manihot utilissima* and *M. palmata* are tuberous and rich in starch.

iii) Stem:

Stem is herbaceous or woody, erect, very rarely climbing, as in a tropical genus *Tragia*. Usually solid but sometimes hollow as in *Ricinus communis*. Many stems possess spines. In many *Euphorbia* sp., the stems become fleshy, green and cactus like in appearance.

iv) Leaves:

The form and position of leaves are variable. The arrangement is usually alternate but sometimes they are opposite e.g. *Euphorbia hirta*. In *Pedilanthus*, the leaves are arranged alternately in the lower region of the plant whereas opposite in the floral region. Usually the leaves are simple but, in some plants, they are deeply incised, e.g., *Ricinus*, *Manihot*, etc. In many *Euphorbias*, the leaves are scaly and caducous. In many cases, the leaves are reduced to spines. In a few cases, the leaves are replaced by cladodes. Usually, the leaves are stipulated. In *Jatropha* sp., the stipules become branched and hair like. In many *Euphorbia* sp., they are represented by glands or spines.

v) Inflorescence:

The inflorescence varies greatly. It may be racemose or cymose or sometimes complex. In *Euphorbia*, the inflorescence is peculiar but very characteristic and known as cyathium. This is the modification of a cyme. In cyathium inflorescence, a large number of male flowers are represented by a stalked stamen and found arranged around a central stalked female flower. The female flower consists of gynoeceium only. The complete inflorescence looks like a single flower. The bracts are being arranged like a perianth. The bracts are so united that they form a cup-like structure. In *Acalypha*, inflorescence is catkin type. In *Croton* and *Ricinus*, the flowers are arranged in terminal racemes. In *Jatropha*, the inflorescence is of cymose type and the flowers are arranged in terminal cymes. In *Manihot*, the flowers are being arranged in racemes.

❖ Economic importance of family Euphorbiaceae:

The family consists of the plants of great economic value. Some of the important ones are given below:

1. *Acalypha hispida* Burm. - An ornamental herb
2. *Acalypha wilkesiana* Muell. (Eng. - Garden Acalypha) - Grown in the gardens as ornamental plant
3. *Bischofia Javanica* Blume. (Eng. - Bishop wood; Verna - Bhillar) - A tree. A red dye, obtained from the bark is used to stain rattan baskets. The bark is also used as a tan. The wood is extremely resistant to water effect and therefore, largely utilized in the construction of bridges and boats.
4. *Bridelia retusa* (L) Juss. (Verna - Ekdania, Khaja) - A tree found in Rajasthan, Madhya Pradesh, the Western Peninsula and Bihar. The bark is used for tanning. The fruits are edible and the leaves are used as fodder.
5. *Cleistanthus collinus* (Roxb.) Benth. Ex. Hook. F. (Verna - Garari) - A small tree, found in Tamil Nadu, Malabars, Bihar, Orissa and Madhya Pradesh. The bark, leaves and green fruits are used for tanning.
6. *Croton aromaticus* L. - An aromatic shrub or small tree, found in Andhra Pradesh, produces a gum resin, which is used in varnishes.
7. *Croton oblongifolius* Roxb. (Verna - Chuka) - The seeds yield an oil, which is used as a purgative and also as an insecticide.
8. *Croton tiglium* L. (Verna - Jamalgota) - A shrub or small tree, native of South East Asia but cultivated in Assam, Bengal and South India. The seeds are the source of croton oil, which is used as a purgative.
9. *Baccaurea courtallensis* (Wight.) Mull. - Found in the Western Ghats. The fruits are edible.
10. *Baccaurea sapida* (rox.) Mull. (Verna - Lathua) - Found in Assam, Bengal and Andaman Islands. The fruits are edible.
11. *Chrozophora prostrata* Dalz. (Verna - Subali) - The root ashes are given to the children for cough treatment. The Seeds are used as a purgative.
12. *Baliospermum montanum* (Willd.) Mull. (Verna - Danti) - The seeds are used as a strong purgative. The decoction of leaves is used in asthma.
13. *Euphorbia milii* Des Moul. Syn. *E. splendens* L. - A small climbing shrub; native of Madagascar. Grown in gardens as ornamental plants.
14. *Euphorbia pulcherrima* (Willd.) Mull. Syn. *Poinsettia pulcherrima* L. (Eng -Poinsettia; Verna - Lal Patta) - A shrub, native of Central America, Grown as an ornamental.
15. *Euphorbia tirucalli* L. (Verna - Tohar) - Succulent spineless small tree, native of Africa. The roots are used for poisoning fish and birds.
16. *Euphorbia hirta* L. (Verna - Dudhi) - The plant is of medicinal value and used in many diseases of children and adults.
17. *Euphorbia thymifolia* L. (Verna - Chhoti dudhi) - The juice of leaves and seeds is used as a strong purgative. The juice is also used for remedy of ringworms and other skin diseases. It is an antidote for snake bite.

18. *Euphorbia royleana* Boiss. (Verna. - Thar) - The plants are grown for hedges. The latex is used medicinally in several ways.
19. *Euphorbia antiquorum* L. (Verna - Tridhara) - The decoction of stem is used as a remedy of gout. The juice of the plant is also used as a strong purgative. The root bark is also used as a purgative.
20. *Glochidion zeylanicum* (Gaerth.) A. Juss. (Verna - Kumbalm) - The leaves are used in itches.
21. *Flueggea leucopyrus* Roxb. Syn *Securinega leucopyrus* (Willd.) Mull. *Phyllanthus leucopyrus* L. (Verna. - Hartho) - It is a large shrub or small tree, found in Uttar Pradesh, Punjab, Maharashtra and Tamil Nadu. The fruits are edible.
22. *Jatropha curcas* L. (Verna - Safed arand) - A shrub or small tree, native of tropical America, now cultivated in Travancore. The seed oil is used for manufacturing candles, soaps and as a lubricant and for illumination. The seed oil is also used as a purgative. The tender shoots are edible. Oil also used as biodiesel.
23. *Jatropha gossypifolia* L. (Verna - Bheranda) - A shrub, native of Brazil. Cultivated as an ornamental plant.
24. *Jatropha hastata* L. - Grown as an ornamental for bright crimson flowers.
25. *Jatropha podagrica* Hook. (Eng. - Gouty stemmed Jatropha) - Native of Panama, grown for its bright scarlet flower.
26. *Manihot esculenta* Cranz. (Eng. - Tapioca; Verna - Sakarkand) - It is a small shrub; native to Brazil, now grown in Kerala, Tamil Nadu and Karnataka. The tapioca tubers are exploited commercially to obtain starch, sago, semolina and flour.
27. *Hevea brasiliensis* Mull. (Eng. - Para rubber; Verna - Rabar) - It is a tall tree; native of Brazil; now grown in Kerala, Tamil Nadu, Karnataka and North-Eastern Assam. The latex, obtained from the bark of the tree, is used for preparing rubber, which is used for tyres and inner tube, waterproof clothing and various electrical goods.
28. *Mallotus philippinensis* Mull. (Verna - Kamala, Rauni) - A small tree found commonly in Bengal, Madhya Pradesh, Maharashtra and Orissa. The red dye, obtained from the surface of the fruits, is used for dyeing silk. They are also medicinally used to remove threadworms and Ascaris.
29. *Phyllanthus acidus* (L.) Syn. *Cicca acida* (L.) Merr. (Eng. - Stargoosebeery; Verna - Hariphul) - It is a small tree cultivated in Bengal and South India for the edible fruits. The leaves are edible. The bark is used as a tan.
30. *Embllica officinalis* Gaertn. Syn. *Phyllanthus emblica* L. (Verna - Amla) - It is a common tree with edible fruits. The fruits are also used in diarrhea and dysentery. The bark, leaves and fruits are used in dyeing and tanning. The wood yields excellent charcoal. The pickle or jam is prepared from the fruits. The fruit is very rich in vitamin C.
31. *Embllica fischeri* Gamble. It is a small tree, found in south India. The fruits are edible.
32. *Kiganelia reticulata* (Poir.) Baill. (Verna - Panjoli) - A climbing shrub, commonly found in northern India. The roots are the source of a red dye.
33. *Putranjiva roxburghii* Wall. (Eng. - Child life tree; Verna - Putranjiva) - It is a tall tree grown as a hedge plant. The nuts are made in rosaries. The Hindus believe that if the hard stones of the fruits are made into rosaries and placed around the neck of the children, they keep them in good health. The seeds also yield oil which is used for burning purposes. The leaves are used as fodder. The leaves, fruits and stone of fruits are used medicinally in colds and fevers.
34. *Ricinus communis* L. (Eng. - castor - oil plant; Verna - Arand) - It is a small tree, cultivated chiefly in Andhra Pradesh, Maharashtra, Karnataka and Orissa. The seeds are the source of castor oil, which is mainly used as lubricant and as a purgative. It is also used for transparent soap, textile soap, typewriter inks, perfume, aromatics, varnishes and paints. The seed cake is used as a fertilizer. The writing and printing - papers are made of wood pulp. Castor stems are used for strawboards and cheap wrappings.

35. *Tragia involucrata* L. (Verna - Barhaita) - The roots and fruits are used medicinally.

CONCLUSION

Croton bonplandianus Baill., *Emblica officinalis* Gaertn, *Euphorbia antiquorum* L., *Euphorbia caducifolia* Haines., *Euphorbia clarkeana* Hook., *Euphorbia cyathophora* Murr., *Euphorbia dracunculoides* Lam., *Euphorbia elegans* Spreng., *Euphorbia granulata* Forssk., *Euphorbia heterophylla* L., *Euphorbia hirta* L., *Euphorbia indica* Lam., *Euphorbia neriifolia* L., *Euphorbia prostrata* Ait., *Euphorbia pulcherrima* Willd.

Euphorbia rothiana Spreng., *Euphorbia thymifolia* L., *Euphorbia tirucalli* L., *Flueggea leucopyrus* Willd., *Jatropha curcas* L., *Jatropha gossypifolia* L., *Manihot esculenta* Crantz., *Pedilanthus tithymaloides* Poit, *Phyllanthus acidus* Skeels., *Phyllanthus amarus* Schumach.

In our country, the family is represented by several genera such as, *Euphorbia*, *Ricinus*, *Phyllanthus*, *Croton*, *Pedilanthus*, etc. In the desert regions of Africa and elsewhere, the family is represented by cactus-like plants of different species of *Euphorbia*.

Chrozophora rottleri Juss., *Croton bonplandianus* Baill., *Euphorbia clarkeana* Hook., *Euphorbia cyathophora* Murr., *Euphorbia dracunculoides* Lam., *Euphorbia elegans* Spreng., *Euphorbia granulata* Forssk., *Euphorbia heterophylla* L., *Euphorbia hirta* L., *Euphorbia indica* Lam., *Euphorbia prostrata* Ait., *Euphorbia rothiana* Spreng., *Euphorbia thymifolia* L., *Phyllanthus amarus* Schumach.

Euphorbia antiquorum L., *Euphorbia caducifolia* Haines, *Euphorbia pulcherrima* Willd.

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