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REVIEW ARTICLE

CRITICAL REVIEW ON *BOMBAX CEIBA*, *ALOE VERA* AND *XIMENIA AMERICANA*

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Abstract

Therapeutic plants are extensively increased in scenery with their efficient therapeutic properties. India has the greater natural ecosystem from past two decades, near has been a marvelous augment in the applications of natural medicines; though there is still a noteworthy deficiency in the research of medicinal plants and it has the great resources of medicinal plants which are noteworthy to human beings in many ways. The medicinal plants such as *Bombax ceiba*, *Aloe vera* and *Ximenia americana* are well known to cure several diseases therefore used in different Ayurvedic preparation somehow they are lagging behind in the list of medicinal plants for their applications in drug preparations. These plants has great ethnopharmaceutical and pharmacological properties with therapeutic applications therefore present review gives different aspects of *Bombax ceiba*, *Aloe vera* and *Ximenia americana* and may help to create awareness in society.

Keywords: *Aloe vera*, *Bombax ceiba*, ecology, ethnobotany, pharmacology, *Ximenia americana*.

INTRODUCTION

The British biologist Norman Myers coined the term "biodiversity hotspot" in 1988. He described them as a biogeographic area by characterizing their brilliant steps of plant endemism and grave levels of habitat loss¹. Further, Conservation International (CI) joined 'Myers hotspots criteria' in 1989-1996, and they made one organization for the reassessment of the hotspots concept and in 2005 they have in print an efficient posh Hotspots Revisited: Earth's Biologically Richest and Most Endangered Earthly Ecoregions². According to the CI report, there is the total of thirty-five biodiversity hotspots in the world, amongst them, four are in India. Mainly these three biodiversity hotspots are situated in the Himalaya, Indo-Burma, Sundaland, and the Western Ghats³. A Total of 17000-18000 flowering plant species, 8000 medicinal plants, are documented in folk and Ayurveda, Unani, Siddha, and Homoeopathy⁴. Herbs are the immense reserve base for the conventional medication & herbal industry and also it admits livelihood and health safety to a great section of Indian population. India has the greater natural ecosystem from past two decades, near has been a marvelous augment in the applications of natural

medicines; though there is still a noteworthy deficiency in the research of medicinal plants and it has the great resources of medicinal plants which are noteworthy to human beings in many ways⁵. According to the WHO, herbs are used as the best resource to get a diversity of bioactive compounds in the development of different drugs, those are effective as an antimicrobial, anti-tuberculosis, antioxidant, anticancerous, anti-inflammatory, antidiabetic, anthelmintic, hepatoprotective activity, larvicidal activity⁶⁻⁹. By taking the above background in the present review total of three medicinal plants revealed with their critical information.

In the present study a total of three medicinal plants were under study and their information is as follows.

***Bombax ceiba* Linn**

Bombax ceiba diversified under the family Bombacaceae. It is a bulky, deciduous, elegant plant inhabiting Africa, Australia, temperate and tropical Asia¹. It has been applied in traditional medicine for its versatility in nature against pathogens²⁻⁴. These plant roots and flowers were used to treat different ailments. The plant has different vernacular names such as Semal, Silk-cotton tree (English), Sembhal (Urdu), Semar (Hindi), Buruga (Telugu), Simalu (Assam),

Moca (Sanskrit), Shimool (Bengali), Shemalo (Gujarati)⁴.

The plant botanical classification is as follows:

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Malvales
Family: Bombacaceae
Genus: Bombax
Species: ceiba

It is extensively originated in moderate Asia, Africa, Australia and tropical Asia. In India, it can be originated at altitudes up to 1500 m. It is usually seen within the arid and wet deciduous forests and also by rivers of peninsular India. It is a huge light-eater and rapidly rising tree. It grows finest on bottomless grimy loams, especially in valleys, within the parts that are receiving 50 to 460 cm⁵. The morphology is shown in Figure 1. The dissimilar pieces of *B. ceiba* similar to all parts are revealed to hold various curative behaviors

in pharmacological surveys. In February, *B. ceiba* begins plummeting every one of its foliage. It is time for blossoming and follows an amazing exhibit of great silky red flowers at the tips of naked branches. In May, white cottony strands, from opened fruits, float downward, settling on the ground, houses and whatever else is in their mode. It displays spiky twigs orderly in horizontal tiers which are rough, straight and spiny with buttress roots¹⁻³. The body parts of the plant contain different chemicals. Bark contains lupeol, saponins, tannins, gums and trihydroxyflavone-3-O-β-D-glucopyranosyl(1-4)-α-L-rhamnopyranoside, nhexacosanol, shamimicin; Seeds contain palmitic acid; roots contains lactone, Hemigossypol-6-methyl; flowers contains polysaccharides; Leaves contain flavonols, C-glycoside shamimin and Xanthone. The plant has different medicinal activities such as anti-inflammatory, treating leprosy, muscular injury, wounds, asthma, birth control, sexual diseases¹⁻⁵.



Figure 1: Leaves, stem, roots and seeds of *Bombax ceiba*.



Figure 2: Leaves, pulp and roots of *Aloe vera*.

Aloe vera

The plant comes under the Asphodelaceae family. It is a shrubby. It is perennial. It is xerophytic and succulent. It is pea green coloured plant. It mainly founds in the dry regions of the world. These dry regions are nothing but the regions from America, Asia, Africa and Europe. Inside India, the plant is found in Maharashtra, Gujarat, Andhra Pradesh, Tamil Nadu and Rajasthan⁶. It has leaves and these leaves are fleshy and triangular in nature. The leaves are jagged with edges. It consist yellow tubular flowers. It also consist fruits that contain frequent seeds⁷. The morphology is shown in Figure 2. Leaves are made up of three layers. Inner layer is made up of clear gel; middle layer is made up of latex while outer layer is made up of cells. The outer layer is thick in nature due to carbohydrates and proteins.

Taxonomy

Kingdom: Plantae **Order:** Asparagales
Division: Spermatophyte **Genus:** Aloe
Subdivision: Angiospermae
Class: Monocotyledoneae

Species: Barbadensis Mill

Synonyms: Aloe, Musabbar, Kumari

The plant contains nataloins and barbaloins. These two aloins are important in the view of medicinal applications. Nataloins gives picric acids and oxalic acids in the presence of nitric acid. It will not give a red coloration after reaction. Barbaloins gives aloetic acid and chrysammic acid in the presence of nitric acid. Barbaloin yields yellow coloured prismatic crystals⁶⁻⁸. *Aloe vera* produces six antiseptic agents. These agents are active against all pathogens and nothing but cinnamonic acid, lupeol, phenols and sulphur, salicylic acid and urea nitrogen. It is highly active in the action of scrapes, burns, abrasions, cuts, rheumatoid arthritis, allergic reactions, rheumatic fever, ulcers, acid indigestion, and many more inflammatory conditions of the digestive system. It also shows β- sitosterol and it is also powerful anti-cholesterol agent. It helps to lower damaging cholesterol levels⁶⁻⁹.

Ximenia americana

The *Ximenia americana* tree belongs to the Olacaceae family. It is mainly originated in Jabal, Marra and Radom which comes under Darfur. It is made up of leaves, bark and fruits. They have numerous uses in local medicine¹⁰. The leaves and twigs extracts are used to cure fever, cold, as a mouth wash for tooth aches¹¹. The leaves are used for headaches and poison antidote¹¹. The morphology is shown in Figure 3.



Figure 3: Leaves, stem, roots and seeds of *Ximenia americana*.

The plant contains big bulgy roots. These roots are used in the treatment of skin aches, headaches, and hemorrhoids, sexually transmitted diseases, sleeping thickness, leprosy, guinea worm and oedema. It is rich in fruits. Fruits are used in the treatment of constipation. The heartwood and flowers also contain essential oils. Plant parts contain different constituents used in folk medicines¹³. It was reported that *X. americana* seed oil contains acids. The most important ingredients of the volatile oil were benzaldehyde, hydroxy benzyl cyanide and isophorone¹². Stem of the plant consist steroids, triterpenoids, oleanolic acid, 3-oxo-oleanolic acid and sesquiterpenoids¹². Terpenoids and lipophilic aromatic compounds were involved in the liverworts biological activities. These all above secondary bioactive compounds employed in different biological activities such as, antimicrobial, antifungal, anticancer, and hematological effects¹⁰⁻¹³.

CONCLUSIONS

Present review article aimed to provide ill-intentioned, invasive, deleterious selected plants information to the readers. The knowledge about these three medicinal plants was insufficient in the literature; however this article will help to reveal more about the same plants. The ethanopharmaceutical and pharmacological studies revealed different aspects of *Bombax ceiba*, *Aloe vera* and *Ximenia americana* therefore present study may helpful to create awareness in society about the plants. And the article will help to clear different myths about plants and it will help to upgrade the same plants in the pharmaceutically vital list of medicinal plants.

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AUTHOR'S CONTRIBUTION

Mane RS: writing, review, and editing. **Vedamurthy AB:** methodology, data curation, formal analysis. The final manuscript was read and approved by all authors.

DATA AVAILABILITY

Data will be made available on request.

CONFLICT OF INTEREST

No conflict of interest associated with this work.

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