Ethnobotanical studies on some medicinal plants: *Cassia* spp.

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**Abstract**

The dependence of man on nature for food, fuel, fodder and medicines goes back to prehistoric times. The oldest civilizations have indication of plants being worshipped by man and different forms of grain are found associated with human beings globally. Initially, man was dependent on plant system for its medical needs, vitality and cure of diseases. Out of the total 4, 20,000 flowering plants reported from the world more than 50,000 are used for medicinal purposes. In India, more than 43% of the total flowering plants are reported to be of medicinal importance. Utilization of plants for medicinal purposes in India has been documented long back in ancient literature Recent estimates suggest that over 9,000 plants have known medicinal applications in all cultures of various countries. The world Health Organization estimates that up to 80% of people still rely mainly on traditional remedies such as herbs to cure their disease. Present paper describes some important plants used in traditional medicine.

**Citation:**

**1. Introduction**

In ancient times plants were the main part of folk medicine and were practiced in different parts of the world including India, China, Middle East, Africa and South America. Herbal Medicine, which is also known as Herbalism or Botanical Medicine, is the use of herbs for their therapeutic or medicinal value. This came originally from Greece and Rome to Europe and then spread to North and South America. The herbs were valued for their medicinal, aromatic or savory qualities. Gradually the folk medicines led to the rise of traditional systems of medicine like the Ayurvedic and Siddha system practiced in India, Nepal, Bhutan, Bangladesh and Sri Lanka and Unani in Pakistan, Afghanistan and Middle East., the Chinese system of medicine in China and far eastern countries and Kempo medicine in Japan.

The term “Ethnobotany” was coined by J. W. Harshberger in 1895 to indicate plants used by the aboriginals. “Ethno”-study of people and “botany”- study of plants. Ethnobotany is considered as a branch of ethnobiology. In AD 77, the Greek surgeon Dioscorides published "De Materia Medica", which was a catalog of about 600 plants in the Mediterranean. It also included information on how the Greeks used the plants, especially for medicinal purposes. It deals with the study and evaluation of plant-human relations in all phases and the effect of plant environment on human society.

In 1753 Carl Linnaeus wrote "Species Plantarum", which included information on about 5,900 plants. Linnaeus is famous for inventing the binomial method of nomenclature, in which all species get a two part name (genus, species). The 19th century saw the peak of botanical exploration. Alexander von Humboldt collected data from the new world, and the James Cook’s voyages
brought back collections and information on plants from the South Pacific.

In India, Egypt and Sudan, around 70% of the rural people use traditional medicine. Similar situation exists in a large number of developing countries. In India and China, 60% of the people, affected with cholera and malaria are treated with herbal medicines. In these countries the market for traditional medicines is US $ 500 million, while Western type medicine accounts for only US $300. In Singapore, 50% and in Australia, 60% of population uses alternative medicine. Around 17,000 herbal products are registered in these countries. In Belgium, 40% contemporary and 84% home medicines and 74% acupuncture medicine is utilized. In France, 50% of the people take advantage of complementary medicine. In Germany, 10,000 to 13,000 alternative medical practitioners are thriving well and 75% of them utilize complementary medicines. 77% of pain clinics utilize acupuncture. In UK, 90% of the complementary medical practitioners utilize osteopathy and acupuncture. In US, where in 1990 only 30% of the people were utilizing complementary medicines, in 1997 it grew to 40%. With increasing use of traditional medicines globally, attempts are also underway to discover the cure of HIV in the traditional medical system.

China’s ancient herbal tradition has survived intact till the 20th century and it is accorded equal status with Western Conventional Medicine. Traditional Chinese Medicine (TCM) developed from ideas recorded between 200 B.C. and A.D. 100 in the “Yellow Emperor's Classic of Internal Medicine” (Huang Di Nei Jing). Over the centuries, the number of medicinal herbs has grown and the “1977–Encyclopaedia of Traditional Chinese Medicinal Substances” has 5,757 entries, the majority of which are herbs.

In Africa, there are a greater variety of herbal traditions than in any other continent. In the mid-13th century, the botanist Ibn-El-Beitar published a Materia Medica. Conventional Western Medicine is well established throughout Africa, but in rural areas, traditional medicines remain the only form of health care available. In North America, herbal medicine is commonly practiced in rural areas. In the Mexican tradition, loss of ‘balance’ between hot and cold elements within the body is thought to be the underlying cause of illness and the healer’s art is to restore balance and vitality. The ‘Badianus Manuscript’ by Martin-de-la-Cruz, 1552, lists the medicinal uses of 251 Mexican species. In South America, herbal medicine conjures up image of shamanistic rituals and a collection of thousands of yet unclassified plants. In more westernized areas of South America, herbal medicine is often a blend of both Spanish and local traditions, (Andrew, 1996).

India’s folk medicine is also closely related to Ayurveda. Ayurveda is a science of positive health and its origin is almost as old as human race. Ayurvedic system of medicine deals with maintenance of health, prolongation of healthy and qualitative life and prevention of diseases. The Ayurvedic system of medicine is the integral part of the Indian tradition in which plants and herbs are used not only to cure the diseases, but also to provide a source of minerals and vitamins which give proper health and nutrition to human being. The Ayurvedic formulary is rich and diverse and holds a very sound position. This is primarily because it has grown and matured in the soil of India (Shivsharma, 1929). The pharmacopoeia of Ayurveda as mentioned earlier is a rich heritage of herbal practices describing medicinal uses of over 6000 plants in seventy book containing 8000 recipes of drug combinations(Savnur,1950).

In the Indian system of medicine, most practitioners formulate and dispense their own recipes (Sharma et al., 2005). The age-old tribal knowledge of plants is an important aspect of ethnobotanical research. The tribal tracts are the storehouse of information and knowledge on the multiple uses of plants (Singh, et al., 2002). Potential plants for Ayurvedic medicines have been reported by Kumar (2008). Traditional medicinal practices of Rajasthan have been documented in recent publications (Sharma and Kumar, 2007; Parveen et al., 2007; Sharma and Kumar, 2011; Sharma et al., 2012). Ethnoveterinary practices of curing diseases of livestock have been studied by Upadhyay et al. (2011). Traditional medicinal plants of several families have been studied: Asteraceae (Bhansali, et al., 2011); Mimosaceae (Saini et al., 2008) and these are used in cure of different diseases e.g. of diabetes (Rana et al. 1999). Kar et al (2003) studied hypoglycemic activity of some traditional medicinal plants. Chitme (2010) reported cure of urinary stones.

The history of traditional system of Chinese medicine can be traced back from about 200 B.C. One of the most important medicinal works in this system is the Nei-Ching-Canon of
Chinese Medicine. This system is mainly based on integration and modelization of the models of Yin and Yang which are five elements and three leaves, i.e.; Heaven, Earth and Man. The models are setup with Organic Recognition and Therapeutic Recognition. These models practically cover the medico-clinical, the differential diagnosis, treatment, prescription and management of ailments. About 4,941 vascular plants like Artemisia annua Linn., Aleurites montana (Lour.) Wils, Benincasa hispida (Thunb.) Cogn., Blumea lanceolata (Roxb.) Druc etc. are used in Chinese system of medicine.

Tibetan medicine follows almost the same principles as mentioned in Ayurvedic system of medicine. Plants like Berberis aristata D.C., Isatis tinctoria L., etc. are used in Tibetan medicine. But, the Tibetan system of medicine has certain special features. According to Yishi Dhonden and Cyatks Tshering, mind is superior to body. Mind is the architect of all the sufferings and happiness. Body and spirit are the attendants of mind. Tibetan physicians give stress on development of mental power and observances of moral laws. The psychology, ethics and philosophy of Buddhism provide effective means for controlling consciousness and preventing illness.

Siddha system of medicine is known as Tamil medicine. It has specific remedies for diseases like mycosis, venereal diseases, leucoderma, asthma, leprosy, etc., having use of ash after burning the metal like gold, silver and copper, pearls, conchshells etc. in combination with various salts, minerals and medicinal plants like Aconitis ferox Wallich ex Ser, Acalypha indica L., Aristolochia bracteolate Lamk., Boerhaavia diffusa Linn., Psoralea corylifolia Linn., Sesbania sesban (L.) Merr., Andrographis paniculata Nees, Acorus calamus Linn etc. The Siddha therapeutic has some original features such as Varmam, Muccukalayam, Nadi-vijnanamand Tukanam which are akin to the Acupuncture and Moxa treatment in China, pulse feeling of Egypt and massage methods of Japan. Siddha practitioners in India are 15,000 in number.

Different tribes methodically collected information on herbs and developed well-defined herbal pharmacopoeias. Indeed, well into the 20th century much of the pharmacopoeia of scientific medicine was derived from the herbal lore of native peoples and many drugs commonly used today are of herbal origin. Indeed, about 25 % of the prescription drugs dispensed in the United States contain at least one active ingredient derived from plant material. Some are made from plant extracts others are synthesized to mimic a natural plant compound (Fansworth 1998). Many drugs commonly used today are of herbal origin. Indeed, about 25 % of the prescription drugs dispensed in the United States contain at least one active ingredient derived from plant material. Some are made from plant extracts others are synthesized to mimic a natural plant compound (Kumar 2008).

Sharma (1968) enlisted 248 botanical drugs which are mentioned mainly in Atharva-Veda and Rig-Veda. A glossary of such medicinal plants, which have been mentioned in Charak Samhita, Sushruta Samhita and Ashtanga Hridiyam. According to Sushruta, no plant in this world is useless. A large number of crude drugs used in Ayurvedic system employ plants of family Fabaceae. The family Fabaceae popularly known as legumes is the third largest order of seed-plants containing about 600 genera with 12,000 species. They are arranged in three well defined sub families and they are Papilionaceae, Caesalpiniaaceae and Mimosaceae.

The members of sub family Papilionaceae are herbs, shrubs or trees found in all climates but mostly between and near the tropics and are more abundant in the old than in the New World. The family includes the greatest number of Legumes, comprising 400 genera with about 7000 species. It is an extremely important family and its members yield nutritious food, fiber, shelter, valuable medicines and also virulent poisons (Datta and Mukherji, 1952). Some of important genera are Abrus sp., Alhagi sp., Arachis sp., Butea sp., Cajanus sp., Cicer sp., Derris sp., Glycine sp., Glycyrrhiza sp., Medicago sp., Pisum sp., Phaseolus sp., Psoralea sp., Sesbania sp., Tephrosia sp., Vicia sp., and Vigna sp.

The members of sub family Caesalpiniaaceae are trees, shrubs or rarely herbs numerous in the Tropics. They scarcely extend beyond the tropical belt in the old world and they are rather few in North America. The sub family includes 56 genera with about 650 species. The members exhibit mostly tonic, astringent and mucilaginous properties, some have a pectoral and laxative or cathartic action; others are anthelmintic antiseptic, antipyretic, styptic. Some of the important genera are Bauhinia sp., Cassia sp., Cynometra sp. The members of sub family: Mimosaceae are trees.
or shrubs, very rarely herbs. They are found in the tropical zone and are especially numerous in Africa and Australia. The sub family includes 23 genera with about 550 species. Some of the important genera are Acacia sp., Albizzia sp., Entadasp., Neptunia sp., Mimosa sp., Prosopis sp.

The present investigation deals with pharmacognostical studies and bioprospecting of Cassia spp. Cassia species found in India are given with their botanical name, common name, their distribution and uses (Table 1).

### Table 1: Cassia species: An Overview

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Species</th>
<th>Common Name</th>
<th>Distribution</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cassia alata Linn</td>
<td>Datkapat, Dadmurdan</td>
<td>Throughout India and in Andaman Islands</td>
<td>Anti-inflammatory, hydragogue, diuretic, expectorant, sudorific and purgative</td>
</tr>
<tr>
<td>2</td>
<td>Cassia auriculata Linn</td>
<td>Awal, Tarval</td>
<td>Rajasthan, Punjab, Haryana, Utt Pradesh, West Bengal, Andra Pradesh, Karnata and Tamil Nadu</td>
<td>Astringent, anthelmintic, used in sore throat, enemas, rheumatism, eye diseases, stomach-ache, dysentery, ulcer, skin diseases, leprosy, diabetes, gout, gonorrhoea, asthma, ophthalmia, conjunctivitis and urinary disorders</td>
</tr>
<tr>
<td>3</td>
<td>Cassia didymobotrya Fresen.</td>
<td>NA</td>
<td>Tamil Nadu, Dehradun and Delhi</td>
<td>Used in cathartic</td>
</tr>
<tr>
<td>4</td>
<td>Cassia fistula Linn.</td>
<td>Amaltas</td>
<td>Sub-Himlayan tract, Outer Himalayas, Bhabar tract of Ganga Valley, Andamans Islands, Assam, Karnataka, Tamil Nadu and Andra Pradesh</td>
<td>Anti-dysenteric, analgesic, antipyretic, laxative, carminative and cooling agent. It is used in skin complaints, dysentery, leprosy, jaundice, heart diseases, stomach-ache, asthma, constipation, biliousness and in intestinal amoebiasis</td>
</tr>
<tr>
<td>5</td>
<td>Cassia floribunda Cav. syn. C. laevigata Willd.</td>
<td>Hill-Cassia</td>
<td>In hills of Uttar Pradesh, Punjab, West Bengal, Sikkim, Meghalya, Manipur, Karnata, and Tamil Nadu</td>
<td>Purgative, emmenagogue and febrifuge. It is also used in skin diseases</td>
</tr>
<tr>
<td>6</td>
<td>Cassia grandis Linn.</td>
<td>Horse Cassia</td>
<td>Throughout India</td>
<td>Laxative, Purgative and antipyretic.</td>
</tr>
<tr>
<td>7</td>
<td>Cassia italic (Mill.) syn.C.obovataC ollad.</td>
<td>Chhotataroda</td>
<td>Punjab, Delhi, Rajasthan, Madhya Pradesh, Gujrat, Maharashatra, Karnataka, Kerala and Tamil Nadu</td>
<td>Purgative, anthelmintic and antibacterial Property. It is used in ulcers, burns and in psoriasis and pityriasis</td>
</tr>
<tr>
<td>8</td>
<td>Cassia javanka Linn.</td>
<td>Java ki rani</td>
<td>In and around Central India.</td>
<td>It is used as a substitute for Cassia fistula</td>
</tr>
<tr>
<td>9</td>
<td>Cassia mimosoides Linn.</td>
<td>Ikar</td>
<td>Throughout India</td>
<td>Dressing wounds and sores, in diarrhoea and spasms.</td>
</tr>
<tr>
<td>10</td>
<td>Cassia multijuga Rich.</td>
<td>Leafy Cassia</td>
<td>Calcutta, Mumbai and Jodhpur in Rajasthan</td>
<td>NA</td>
</tr>
<tr>
<td>11</td>
<td>Cassia nigricans Vahl.</td>
<td>NA</td>
<td>Coastal region of North Karnataka and Tirunelveli in Tamil Nadu</td>
<td>Vermifuge, purgative, febrifuge and used as appetizer. It is also used for sore throat.</td>
</tr>
<tr>
<td>12</td>
<td>Cassia nodosa Buch. exRoxb.</td>
<td>Pink Mohur</td>
<td>Delhi, Rajasthan, Utt Pradesh, Bihar, West Bengal, Assam, Tripura, Arunachal Pradesh and in Andaman Islands</td>
<td>Used for poulticing boils</td>
</tr>
</tbody>
</table>
Discussion

The presence of anthroquinones (I) seems to be closely linked to the plant’s physiological processes, and the most frequent substitution pattern is that of emodin (II). It was discovered that in Cassia senna seedling, chrysophanol (III) was the first anthraquinone formed, then aloe-emodin (IV) appeared, and finally rhein (V). During fruit development, the amounts of aloe-emodinglycoside and rhein glycoside fall markedly and sennosides accumulate in the pericarp (Trease and Evans, 1989).

References


