A Seminar Paper on the Review of Five well-known Medicinal Plants Used in Ethiopia

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Abstract

The indigenous knowledge of medicinal plants appeared when humans started and learned how to use the traditional knowledge of medicinal plants. The various literature available shows the significant role of medicinal plants in primary health care delivery in Ethiopia (about 70% of humans and 90% of livestock population) depend on traditional plant medicine. This is similar to many developing countries, particularly with those countries in Sub-saharan Africa. Medicinal plants provide a vital contribution to human and livestock health care. This seminar review was an attempt to present five medicinal plants (citrus lemon, caricapapaya, Moringa stenopetala, Allium sativum, Zingiber officinale).

Keywords: Ethno medicine; Flora; Health benefit; Indigenous knowledge; Medicinal plant use.

1. Introduction

The World Health Organization [1], defines traditional medicine as "the sum of combination of knowledge and practices, where explicable or not, used in diagnosing, preventing or eliminating physical, mental or social diseases which may rely exclusively on past experience and observation handed down from generation to generation, verbally or in writing". Traditional medicine has been utilized by the majority of the world population for thousands of years. Until the beginning of the 19th century, all medicines were traditional. As stated by Koita [2], yet, in many developing countries, it is true that for the majority of rural population, traditional medicine is the only primary or any other kind of health care available as stated by Koita [2].

Ethiopia has a long historical use of traditional medicine and has developed ways to combat diseases through it. The ways are also as diverse as the different cultures. Healing in Ethiopian traditional medicine is not only concerned with curing of diseases but also with the protection and promotion of human physical, spiritual, social, mental and material well-being [3].

The identification and documentation of plants of ethno-medicinal importance in many cultures has long been an active area of research and has been connected with various objectives. However, almost no studies have sought to understand local medicinal floras and IK as method for sustainable development in their corresponding localities [4].

Ethno-medicinal plants have been used since ancient time for human health care and still remain the most widely used medication system in developing and least developed nations like Ethiopia where over 80% of the population is dependent on traditional medicines [5]. There may be variations in approach with in systems. People in different locations with different religious, linguistic and cultural back grounds have their own specific knowledge about use of medicinal plants.

Knowledge on medicinal plants is largely oral, however, Ethiopia has an ancient church practice that have documented some of the knowledge about traditional medicine system usually described as medico religious written in Greek manuscripts of the 15 century [6]. The ancient written sources include the book of remedy (Metshehafefews) of 17th century which contains wide range of medicinal plants prescription [7]. The knowledge on most Ethiopian traditional medicine is kept in strict secrecy; however practitioners make every effort to widen their scope by reciprocal exchange of limited information with each other through reading the traditional pharmacopeias. Traditional medicine is an integral part of the local culture and is a major public health care system [8].

Traditional medicinal plants have remained as the most affordable and easily accessible source of treatment in the primary healthcare system of resource poor communities and the local therapy is the only means of medical treatment for such communities [9]. The objective of this work is to review on the five most important medicinal plants with respect to their botanical description, chemical ingredients, part of plant used, mode of administration and disease treated by these medicinal plants.
2. Five Medicinal Plants Used to Treat Ailments

2.1. Lemon (Citrus limon (L.) Burm. F

2.1.1. Botanical Description

Lemon is ever green tree; edible fruit-reaches 10 to 20 ft. (3-6 m) height and usually has sharp thorns on the twigs. The tree has few large branches, alternate leaves, reddish young, become dark green above, light-green below; are long, elliptic or long-ovate, 2/1 to 4/1 in (6.25- 11.25 cm) long. The plant has purple-white flower in clusters. Flowers may be solitary or there may be 2 or more clustered in the leaf axils. Buds are reddish; the opened flowers have 4 or 5 petals 3/4: in (2 cm) long, white on the upper surface, purplish beneath and 20-40 more or less united stamens with yellow anthers. The fruit is oval with a nipple-like protuberance at the 2/3: apex; 2/3:4 to 4: 3/4 in (7 - 12 cm) long; the peel is usually light-yellow though some lemons are variegated with longitudinal stripes of green and yellow or white. It is aromatic, dotted with oil glands. Some fruits are seedless; most have a few seeds, elliptic corovate, pointed smooth.

2.1.2. Chemical Ingredients

It is cultivated mainly for its alkaloids, which have anti-cancer activities and antibacterial potential in crude extracts of different parts (viz., leaves, stem, root and flower) of lemon against bacterial strains.

2.1.3. Parts used, Route of Administration and Disease Treated

Lemon is one of the most popular and versatile citrus fruit. It is known by its refreshing flavor and scent making it a popular choice for flavoring many recipes and perfumes. Lemon juice is also widely used and given to relieve inflammation of the tongue, to prevent common cold, lemon juice used to prevent or treat urinary tract infection and gonorrhea. It is the best drink to prevent dehydration and shock in case of diarrhea. Lemon juice can also be used as a mouth wash. It removes plaque, whitens the teeth and strengthens the enamel. A few drops of lemon juice can also be mixed with water and believed to clear the digestive system and purify liver as well.

For treatment of scabies: applying fruit juice of lemon mixed with fine powder, root of Acokanthera schimperi, and applied to the affected part and sitting under the sun for about half an hour could be a best treatment scabies [10].

2.2. Papaya (Carica Papaya L.)

2.2.1. Botanical Description

Papaya is a small, frost-tender, succulent, broad leaved evergreen tree that bears papaya fruits throughout the year. Each tree typically has a single, un branched, non-woody trunk bearing the scars of old leaf bases. The trunk is topped by an umbrella-like canopy of palmate lobed-leases. Large, fleshy, melon-like fruits (papayas) hang in clusters attached to the trunk top just under the leaf canopy. Papaya typically grows to 6-20’ tall (container plants to 10’ tall) and is most noted for its edible melon-like fruit. Papaya tree sometimes branches due to injury and it contains -White latex in all parts. The stem is cylindrical, 10-30 cm in diameter, hollow with prominent leaf. Scars and spongy-fibrous tissue. It has an extensive rooting system. Leaves spirally arranged, clustered near apex of the trunk; petiole up to 1 m long, hollow, greenish or purplish- green; lamina orbicularr, 25-75 cm in diameter, palmate, deeply 7-lobed, glabrous, prominently veined; lobes deeply and broadly toothed. Reproductively, the species could be dioecious (male and female separate) or monocots (both male female on the same plant) the species plants are typically dioecious (hermaphroditic), and maple trees are uncommon. Hermaphroditic trees (flowers with male and female parts) are the commercial standard, producing a pear shaped fruit. These plants are self-pollinated. Flowers tiny, yellow, funnel-shaped, solitary or clustered in the leaf axils, of 3 types; female flowers 3-5 cm1, long, large functional pistil, no stamens, ovoid-shaped ovary; male flowers on long hanging panicles, with 10 stamens in 2 rows, gynoecium absent except for a pistil lode; hermaphrodite flowers larger than males, 5-carpellate ovary; occurrence depends on the season or age of the tree. The female flowers give way to smooth-skinned green fruits that ripen to yellow-orange with a yellow to pinkish-orange flesh and central cavity of pea-sized black seeds.

2.2.2. Parts of Plant used, Disease Treated and Mode of Administration

Papaya has many benefits due to high content of Vitamins A, B and C, proteolysis enzymes-like papain and chymopapain which have antiviral, antifungal and antibacterial properties. The methanol extract of the seeds and 2, 3, 4-trihydroxytoluene (caricaphenyltriol) (200 µg/ml) showed significant anti-fungal activity against Aspergillus flavus, Candida albicans and Penicillium citrinum.

Papaya can be used for treatment of a numerous diseases like warts, corns, sinususes, eczema, cutaneous tuberculosis, glandular tumors, blood pressure, dyspepsia, constipation, amenorrhea, general debility, expel worms and stimulate reproductive organs , a result papaya can be regarded as nutraceutical [11]. Mode of administration of papaya is variable depending on the type of disease to be treated and route of application.
Firstly, wash the wound by water and soap, crushing the leaf and cover the wound party by that fine powder treats wound of Donkey and Camel. Chewed and swallowed fresh seed treat Amoebas and other intestinal parasites [12]. Fresh leaves crushed, boiled and drank orally to treat malaria, eating the fresh fruits treat anemia. Seeds dry crushed, powdered, mixed with coffee, boiled and drank orally to treat giardiasis [13]. Roasted seed, pounded and taken orally every mooring for three days could be used to treat jaundice [10]. The fruit and juice are eaten for gastro-intestinal ailments, fresh leaf treats sores, and a flower decoction is taken orally for coughs, bronchitis, and asthma and chest colds. Seed prepared and taken orally expel intestinal worms of human and ruminants. The tea, prepared with the green papaya leaf, promotes digestion and helps in the treatment of ailments such as chronic indigestion, overweight and obesity, arteriosclerosis, high blood pressure and weakening of the heart [14].

2.3. Moringa (Moringa stenopetala (Baker f.) Cufod)

2.3.1. Botanical Description

Moringa stenopetala belongs to family Moringaceae that is represented only by a single genus Moringa and 14 Species. The taxonomic position of the family is not clear. It has some features similar to those of Brassicaceae and Capparidaceae but the seed structure does not agree with either of the above families. Moringa stenopetala is a perennial tree having 6-12 m height and about 60 cm diameter at the breast height, and have smooth pale-gray bark. The species is endemic to east African countries mainly to Ethiopia (south) and Kenya (north) ranging from 390-2200 m above sea level covering west of rift valley lakes. This is a soft. wooded deciduous tree with a smooth gray bark. In Konso area (South Ethiopia) it is a perennial Source of leaf vegetable. Its leaves are made up of leaflets (3.3-6.5 cm) with a pointed rather than a rounded tip; its seeds are ellipsoidal and spherical, and cream-colored rather than dark brown.

2.3.2. Chemical Composition of Moringa

Moringa is rich in a variety of health enhancing compounds, including moringine, moringinine, the potent antioxidants quercetin, kaempferol, rhamnetin, and various polyphenols. The leaves seem to be getting the most market attention, notably for their use in reducing high blood pressure eliminating water weight, and lowering cholesterol.

2.3.3. Parts used, Route of Administration and Disease Treated

It is reported that the leaves and roots, mixed with water are used to treat malaria, hypertension, stomach disorders, asthma, diabetes. In Southern Ethiopia, the leaves are used to prevent colds and anemia, and the roots to treat epilepsy. The Gidole and Burji communities use it for treating digestion problems and dysentery. The leaves boiled in water, can cure malaria, hypertension and stomach pain. The roots, chopped and mixed with water for treating severe malaria. Leaves are used to expel retained placenta in women who have just given birth. The leaves are also used to treat hypertension and diabetes.

In many areas of Ethiopia, the leaves and roots are also used to treat malaria, hypertension, colds, asthma, stomach problems and diabetes. Drinking the soup of boiled fresh Moringa treats diabetes. The raw leaves of Moringa contain isothiocyanates (Cyanogenic glucosides) which is a known goitrogenic factor that can be detrimental to humans. Previous studies conducted in Ethiopia have shown a significant correlation between the prevalence of goiter and the frequency of consumption of the leaves.

People around Lake Turkana use the leaves for treatment of leprosy [15]. Chewing and swallowing fresh leaves stops vomiting [12]. Virtually all parts of the plant are used to treat inflammation, infectious disorders, and various problems of the cardiovascular and digestive organs while improving liver function and enhancing milk flow in nursing mothers. The lipophilic extract of leaves of the plant has been shown to have ant plasmodia activity. Several parts of the plant have been used in medicinal preparations. The bitter tasting water left over after cooking the leaves is consumed for several medicinal purposes by the traditional communities of Ethiopia.

2.4. Garlic (Allium Sativum L.)

2.4.1. Botanical Description

Allium sativum is a plant of a compound nature, consisting of numerous bulb lets known technically as ‘cloves,’ grouped together between the membranous scales and enclosed within r - a: whitish, skin, the leaves are long, narrow and flat like grass. The flowers are placed at the end of a Stalk rising direct from the bulb and are whitish, grouped together in a globular head, or umbel with an enclosing kind of leaf or spate, and among them are small bulbils.

2.4.2. Chemical Ingredients

Garlic contains at least 33 sulfur compounds, several enzymes and the minerals: germanium, calcium, copper, iron, potassium, magnesium, selenium and zinc; vitamins: A, B and C, fiber and, water. It also contains 17 amino acids: lysine, histidine, arginine, aspartic acid, threonine, swine, glutamine, proline, glycin, alanine, cysteine, valine, methionine, isoleucine, leucine, tryptophan and phenylalanine (Josling, 2005 as cited in [16]. The active properties of Garlic depend on a pungent volatile essential oil, which may readily be obtained by distillation with
water. It is a sulphide of the radially, present in all the onion family. This oil is rich in sulphur, but contains no oxygen. The peculiar penetrating odor of garlic is due to this intensely smelling sulphuret of ally, and is so diffusive that even when the bulb is applied to the soles of the feet, its odor is exhaled by the lung.

### 2.4.3. Parts used, Route of Administration and Disease Treated

Many marvelous effects and healing powers have been ascribed to garlic. It possesses stimulant and stomachic properties in addition to its other virtues. Syrup of garlic is an invaluable medicine for asthma, hoarseness, coughs, difficulty of breathing, and most other disorders of the lungs, being of particular virtue in "chronic bronchitis, on account of its powers of promoting expectoration. A remedy for asthma, that was formerly most popular, is a syrup of garlic, made by boiling the bulbs till soft and adding an equal quantity of vinegar to the water in which they have been boiled and then sugared and boiled down to a syrup. The syrup is then poured over the boiled bulbs, which have been allowed to dry meanwhile, and kept in a jar.

A clove or two of garlic, pounded with honey and taken two or three nights successively is rheumatism. The juice of garlic and milk of garlic made by boiling the bruised bulbs in milk is used as a vermifuge. It is made by pouring a quart of water, boiled hot, upon a pound of the fresh root, cut into slices, and allowed to stand in a closed vessel for twelve hours, sugar-then being added to make it of the consistency of syrup. Vinegar and honey greatly improve this syrup as a medicine. A little caraway and sweet fennel seed bruised and boiled-fauna short time in the vinegar before it is added to the garlic will cover the pungent smell of the latter. Bulb treats pneumonia. The bulb is pounded, mixed with honey and 2-3 tea spoons eaten every day for three days is used to treat cold. Bulb of garlic and rhizome of ginger are pounded and eaten with honey orally treats malaria [17]. Taking two spoons of crushed bulb together with one rhizome of Zingiber officinale and Lepidium sativum pasted with honey is used for treatment of evil eye. Bulb is pounded, mixed with the crushed fresh leaves of Ruta chalepensis, Solanum nigrum and applied externally to prevent malaria. For wound treatment: bulb is pounded together with the seed of Lepidium sativum and Ricinus communis and tied on the wound every two days [10] and also used for curing the following health problems as reviewed by Mengistu Gebrehiwot [10].

**Hemorrhoids**: Bulb dry/fresh crushed together with honey, Afromumkorarima, fermented, taking one tea spoon orally.

**Cold**: bulb dry/fresh crushed, mixed with butter, taking one tea spoon per day-orally.

**Sudden illness**: bulb dry/fresh chewing and swallowing and nasal.

**Gonorrhea**: bulb dry/fresh crushed mixed with *Allium cepa*, eating, and then drink liquid orally

**Asthma**: bulb dry crushed, mixed with cheese, stay for 24 hours, take one tea spoon for 5 days orally.

**Typhoid**: bulb dry grinds together with seeds of *Nigella sativa*, mixed with milk and butter, boil and drink orally.

**Malaria**: bulb dry powdered together with seed of *Carica papaya*, drank oral.

**Wound**: bulb dry crushed together with leaves of *Brueca antidysenterica*, apply to the affected area [13].

**Treat Asthma**: three-four cloves chopped and mixed with honey, dissolved by Kosso arake (spirit brewed with fermented grains and Hagenia abyssinica). The Kosso arake dissolves the Allium sativum mixed with (Cymbopogon citratus) and made into an infusion and filtered and drunk. Frequent eating of the fresh bulb with injera reduces blood pressure.

The bulb of *Allium sativum*, root of *Solanum dasyphyllum*, seed of *Lepidium sativum*, with *aniasomnifera*, *Schinus molle*, *Sida schimperi* are together crushed, powdered and mixed with little water and drunk orally then treat malaria [9].

### 2.5. Ginger (*Zingiber Officinale Roscoe*)

#### 2.5.1. Botanical Description

Ginger is a rain forest mono cot, with long, smooth, narrow and parallel leaves and succulent stem bears the leaves alternatively. The flowers are tubular, yellowish and attached to swollen terminal knobs. It is a *creeping perennial plant native to tropical south-east Asia arid; cultivated* in the West Indies, Africa and China. It produces a simple, leafy stem covered with the "4ea£1Sooaths of the lance late -oblong to linear leaves, and reaches a height of 1.25m. The leaves are up to 30cm long and the sterile flowers are white with purple streaks and grow in small dense-spikes. The flesh of the ginger rhizome can be yellow, white or red in color, depending upon the variety. It is covered with a brownish skin that may either be thick or thin, depending upon whether the plant was harvested when it was mature or young. The ginger rhizome has a firm, striated texture and a taste that is aromatic, pungent and hot. The aromatic, knotty rootstock is thick and fibrous, and whitish or buff in color. Seeds have never been found, ginger propagates through buddings from its knotty rhizome.

#### 2.5.2. Chemical Ingredients

Ginger is a rich source of volatile oil: gingerol,Zingiberol, zingiberene, phellandren, linallol and gingerenone. Ginger root contain gingerols, zingibain, bisabolene, oloresins, starch, essential oil (zingiberene, zingiberole, camphene,Cineole,borneol), mucilage, and protein. Ginger contains several chemical components: starch (50%), protein (9%), lipids (including glycerides, phosphatidic acid, lecithin’s, and fatty acids; 6-8%), protease (2.26%), volatile oils (including gingerol, shogaol, zingiberene, and zingiberol; 1-3%), pungent principles, Vitamin A and Vitamin B₃ (niacin).
2.5.3. Parts used, Disease Treated and Route of Administration

The rhizome (root) of ginger is popularly used for stomachache and respiratory problems. It is chewed or masticated with ‘feto’ (Lepidium sativum) for stomach disorders.

It is also popularly used for its carminative (relieves gas) and anti-nausea activities. *Zingiber officinale* has demonstrated anti-inflammatory effects, as well as anti-platelet, antioxidant, anti-tumor, and anti-rhino viral and anti-hepatoxice activities or preventing damage to the liver. Drinking fresh crushed rhizome is used to treat tonsillitis [13]. *Zingiber officinale* with Taeniasis, the Kosso flower taken with Tenadam, Shinkurt and Qorofaeye disease hypertension, scabies, provides a strong and widely used anthelmintic [7].

The plant is used to treat many forms of nausea, especially morning sickness when taken as powder. Orally reduce menstrual pain. Ginger fights infection and inhibit growth of many bacteria, effective against oral bacteria linked to inflammatory diseases in the gums, such as gingivitis and periodontitis. For unexplained stomachache (megagna) the juice is effective with the powdered leave- of zingibil, ariti and tenadam is taken with honey to treat stomachache mixed with-tenadam and- zingibil) made in to an infusion, filtered and drunk [18]. It has powerful anti-inflammatory and antioxidant effects.

3. Conclusion and Recommendation

3.1. Conclusion

From the review of this work it can be concluded that considerable number of studies were carried out to investigate the medicinal values of these five medicinal plants. The review of these work revealed that these medicinal plants are very important that can be used to treat different ailments. The review of the work also showed that the different parts of the plant can treat different ailments with different ways of preparation.

3.2. Recommendation

From this review it can be recommended that these plants are very important traditional medicinal plants with enormous ingredients and chemicals which need to be extracted and isolated for further investigation in order to develop modern medicine.

References


Appendix

### Appendix-1. List of plants mentioned in the review

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