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Pharmacological Actions of *Eladwaya* (*Elettaria Cardamomum* Maton and *Amomum Subulatum* Roxb) - A Review

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ABSTRACT:

The two varieties of cardamom i.e *Ela Dwaya* viz; (*Elettaria cardamomum* Maton and *Amomum subulatum* Roxb). The *Sookshma Ela*(*Elettaria cardamom*) is considered as the queen of spices. The *Ela*(*Elettaria cardamomum* Maton) acts as stimulant. Both cardamom are herbaceous perennial plants belong to Zingiberaceae family. Extensively grow in South India. It is an excellent anti oxidant. It helps to relieve *Daha*(Burning sensation) and gastritis. It helps to relieve xerostomia(Dry mouth) and bad breath due to it's antibacterial actions. The *Elettaria cardamomum* Maton and *Amomum subulatum* Roxb help to alleviate *Shotha*(Inflammation), *Shirshula*(Headache), *Karnashula*(Earache), *Danta Shula*(Toothache), *Yakrit Vikara*(Disorders of liver), chest, *Kantha Vikara*(Throat diseases) due to it's anti inflammatory and analgesic activities. The second variety is *Brihat Ela*(*Amomum subulatum*) is black cardamom also called hill cardamom. It is perennial herbaceous plant belongs to the same family Zingiberaceae. The seed pods have a strong, camphor like flavour and are also used as spice similar to the green cardamom pods. The black cardamom is used for *Udara Vikara*(Stomach disorder) due to its gastroprotective action, and *Jwara*(Malarial fever) due to anti inflammatory and analgesic actions. The drug showed the importance of chemical constituents including carbohydrates, proteins, minerals, lipids, essential oils, flavonoids, terpenoids, caratenoids. The drug powder also helps in chronic cigarette de-addiction. The present work dealt with the data were obtained by several electronic scientific databases, articles, and the additional information was collected from the various *Ayurvedic* classical texts.

Keywords- *Eladwaya*, *Sookshma Ela*, *Brihat Ela*, *Ganas*, *Nighantus*, Chemical composition, Adulteration and substitution.

INTRODUCTION

The *Elettaria cardamomum* Maton and *Amomum subulatum* Roxb are cultivated in many parts of South India like Karnataka, Kerala, Tamilnadu. According to *Acharya Charaka*^[1] it is mentioned under *Swasahara Varg*,

Angamarda Prashamana Varga and *Vishaghna Varga*. According to *Acharya Sushruta*^[2] it is mentioned under *Eladi Gana*, *Pippalyadi Gana*. According to *Bhavaprakasha Nighantu*^[3] *Acharya Bhavamishra* mentioned under *Karpuradi Varga*. The two varieties of



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cardamom *Sookshma Ela (Elettaria cardamomum Maton)* and the *Sthoola Ela (Amomum subulatum Roxb)* can be found in *Bhavaprakasha Nighantu*^[4], *Dhanwantari Nighantu*^[5], and *Kaiyadeva Nighantu*^[6]. In case of retention of urine and dysuria^[7] the powder of *Elettaria cardamomum* and *Amalaki Rasa* (Juice of *Embllica officinalis*) is advised. In the progressive cataract the *Ela (Elettaria cardamomum Maton)* powder is immersed in Goat's urine for three days and used as *Anjana* (Collyrium)^[8]. Arab traders first introduced cardamom to the west and the Greeks and Romans used it for perfume, medicine and flavouring agent. The cardamom may have been used in *Ayurvedic* medicine as early as the 4th century BC^[9]. It is one of the contributor of Masala tea in India. It is one of the ingredient in *Chayavanaprasha*. The cardamom is used as a food plant by the larvae of the moth *Endoclita hosei*^[10]. It is commonly used in indigestion, nausea, vomiting, pulmonary diseases, stomachache, heartburn, throat troubles, congestion of the lungs, kidney stones^[11].

AIM OF THE STUDY

The review aims to provide brief introduction, pharmacological actions, traditional uses, modern research activities, botanical description, chemical composition, biological activities on the basis of digital scientific database.

MATERIAL AND METHODS

A survey was done by online as well as *Ayurvedic* classical texts books. The data were obtained by several electronic scientific databases and the additional information is obtained from the various *Ayurvedic* classical texts.

RESULTS

The *Elettaria cardamomum Maton* and *Amomum subulatum Roxb* are perennial herbaceous plant belong to Zingiberaceae family. The cardamom fruits are widely used as spices and flavouring agents in foods, and are often recognized by its health properties. The drug showed the importance of chemical constituents including carbohydrates, proteins, minerals, lipids, essential oils, flavonoids, terpenoids, caratenoids. The drugs possess biological roles such as antioxidant, antibacterial, gastroprotective, anti-inflammatory, analgesic, anti-spasmodic and insecticidal activities. The drug powder also helps in chronic cigarette de-addiction. The results supports with an *Ayurvedic* view like *Mukha*

Shodhana (Cleanses oral cavity), *Durgandha Nashana* (Relieves bad breath) due to its antibacterial actions *Rochana* (Promotes taste), *Deepana* (Appetizer), *Pachana* (Digestive), and *Anulomana* (Promotes normal evacuation of stool) due to its gastro protective action. *Hridya* (Cardio tonic) action is due to its anti oxidant property therefore advised in *Hridaya Daurbalya* (Cardiac weakness). It helps to alleviate *Kasa* (Cough), *Shwasa* (Dyspnoea) due to its anti-inflammatory actions. *Balya* (Tonic) and recommended in *Daurbalya* (General weakness), and *Kshaya Roga* (Tuberculosis) due to its anti-inflammatory, antibacterial and anti oxidant properties.

DISCUSSION

The data of *Sookshma Ela (Elettaria cardamomum Maton)* and *Sthoola Ela (Amomum subulatum Roxb)* were obtained by several electronic scientific databases, articles, and the additional information was obtained and discussed from the various *Ayurvedic* classical texts.

Botanical Description^[12].

Ela (Elettaria cardamomum Maton) is a robust perennial herb, up to 5mts tall, growing in a thick clump, with branched rhizomes from which arise 10-20 erect leafy shoots composed of the leaf sheaths and numerous decumbent flowering shoots.

Patra (Leaves)- Distichous petiole up to 2.5 cm long, sheathing at base and together with other sheaths forming the pseudostem; ligule entire, up to 1cm long, blade lanceolate, 25-100cms by 5-15cms, apex acuminate, dark green and glabrous above, light green and glabrous or pubescent beneath.

Pushpa Manjari (Inflorescence)- A prostrate, panicle, up to 1.2 m long, arising from the rhizome at the base of a leafy shoot; bracts alternate, lanceolate, up to 3cm each with an axillary, usually 2-3 flowered cincinnus; bracteole tubular, up to 2.5cms long.

Flowers bisexual, zygomorphic, about 4cms long, Calyx tubular, up 2cms long, with 2-3 teeth, green, corolla tubular, 3-lobed, tube as long as the calyx, lobes 1-1.5 cms long, up to 1cm wide, obscurely 3 lobed, white but streaked with violet; lateral staminodes inconspicuous, subulate, anther sessile, thecas about 1cm long, parallel, connective prolonged into a short crest; pistil with 2-3 mm long ovary, style slightly longer than anther, stigma capitate, small.

Phala (Fruit) - A globose or sub cylindrical trilobular capsule, 1-2 cm long, pale green to yellow, drying brown.

Beeja(Seeds) - 15-20 per fruit, angled, about 3mm long, dark brown, aromatic, with thin mucilaginous aril.

Chemical Composition^[13]

The dried fruit of cardamom contains an essential oil, fixed oil, pigments, proteins, cellulose, pentosans, sugars, starch, silica, calcium oxalate, and minerals. The approximate composition of dried fruits per 100gms is water 20g, protein 10g, fat 2g, carbohydrates 42g, fibre 20g, ash 6g. The major constituent of seed is starch up to 50% while in husk it is crude fibre up to 31%. The whole cardamom fruits usually have an essential oil content of 3.5-7%. The essential oil located predominantly in seeds which comprise 59%-79% of the whole dried fruit weight. The seeds of freshly harvested cardamom may contain as much as 11% essential oil. Cardamom oil is best obtained by steam distillation of fresh seeds. It is colourless or pale yellow oil which darkens when exposure to light. The essential oil comprises mainly 1,8-cineole 20%-60% and alpha terpinyl acetate 20%-53% together with smaller amounts of other oxygenated monoterpenes, monoterpene hydrocarbons and sesquiterpenes. This oil gives cardamom the pleasant odour and the characteristic warm, slightly pungent taste. The fatty oil content of the fruit has been reported to range from 1%-10%, the oil is predominantly present in the seed. Ten fatty acids have been identified with the major constituents being palmitic 28%-38%, oleic 43%-44% and linoleic acids 2%-16%.

Synonyms^[14]

Triputa- The fruit is triangular shaped and has three surfaces.

Putra-

Nishkuti- The seeds enclosed by leathery layer like pouch.

Bahula- The fruit has many seeds.

Truti- The seeds are very small.

Upakunchika- Fruits are contracted.

Bahula Gandha- *Elas* has strong and pleasant odour.

Bhula Truti- More seeds

Tuthya- It alleviates pricking pain.

Chandra- Coolant similar to moon

Baala- Smaller variety

Tridiva- Triangular shaped fruit

Mashi- Seeds are black in colour

Trivodbhuta- Triangular shaped ,Pod fruit

Kanyaka- Possess small seeds

Chandrabala- Coolant similar to moon.

Dravidi- Cultivated in south India

Brihad Ela- Bigger Variety

Patra Ela- Pseudo stem

Twag Sugandhika- Aromatic plant

Kapota Varna- Looks like colour of pigeon

Bala Ela- Smaller variety

GANA-

According to *Acharya Charaka^[15]*- *Shwasahara Gana, Angamarda Prashamana Gana, Katuka Skandha, Shiro Virechanopaga Gana.*

According to *Acharya Sushruta^[16]*- *Eladi*

According to *Acharya Vagbhata^[17]*- *Eladi*

According to *Dhanwantari Nighantu^[18]*-

According to *Raja Nighantu^[19]*-

According to *Madanapala Nighantu^[20]*-

According to *Kayadeva Nighantu^[21]*-

According to *Priya Nighantu^[22]*-

According to *Bhavaprakasha Nighantu^[23]*- *Trijataka, Chaturjatak*

According to *Chandra Nighntu^[24]*-

Adulteration And Substitution^[25]

Species of *Amomum* and *Aframomum* K. Schumann, *Amomum compactum* Soland ex Maton, minor species like *Amomum acre* Valetton, *A. krervanha* Pierre ex Gagnepain, *A. ochreum* Ridley, *A. testaceum* Ridley, *A. uliginosum* J.G Konig Ex. Retz, *A. xanthioides* Wallich ex Baker and *A. xanthophebium* Baker. *A. aromaticum* Roxb, *A. Subulatum* Roxb, *Alpinia globosa* Horan. *Aframomum corrorima*(Braun) Jansen, *A. danielli* K. Schuman, *A. melegutea*(Roscoe) K. Schumann.

Rasa Panchaka^[26]

Rasa- *Katu, Madhura*

Guna- *Laghu, Ruksha*

Virya- *Sheeta Virya*

Vipaka- *Madhura*

Pharmacological Actions As Per Ayurvedic Science^[26]

Dosha Karma- It is *Tridosahara*(Alleviates three Doshas), recommended in diseases of *Vata, Pitta* and *Kapha*

Sansthanika Karma(Systemic actions)- *Pachana*

Sansthana- It is *Mukha Shodhana*(Cleanses oral cavity),

Durgandha Nashana(Relieves bad breath),

Chardinigranana(Subsides vomiting), *Trishna*

Nigrahana(Subsides excess thirst), *Rochana*(Promotes

taste), *Deepana*(Appetizer), *Pachana*(Digestive), and *Anulomana*(Promotes normal evacuation of stool). It is indicated in *Mukha Roga*(Diseases of mouth), *Vamana*(Vomiting), *Trishna*(Excess thirst), *Aruchi*(Loss of taste), *Agnimandhya*(Loss of appetite), *Udarashoola*(Pain abdomen), *Adhmana*(Distention of abdomen), *Arsha*(Haemorrhoids).

Raktavaha Sansthana- It is *Hridya*(Cardio tonic) therefore advised in *Hridaya Daurbalya*(Cardiac weakness).

Shwasana Sansthana- It is *Kapha Nissaraka*. It helps to alleviate *Kasa*(Cough), *Shwasa*(Dyspnoea).

Mutravaha Sansthana- It is *Mutranjana*(Promotes urination). It is recommended in *Mutrakrichra*(Dysuria).

Tapakrama- It is *Daha Prashamana*(Alleviates heat). It alleviates *Daha Roga*

Satmikarana- It is *Balya*(Tonic). It is used in *Daurbalya*(General weakness), and *Kshaya Roga*(Tuberculosis).

Part used- Beeja(Seeds)

Formulations- *Elakanadi Kashaya*, *Eladi Ghrita*, *Eladi Taila*, *Chaturjataka Churna*.

Dosage- *Choorana*(Powder)- 0.5 -1gm

Pharmacological Actions As Per Modern Science-

The volatile oils were demonstrated to be good sources of bio active compounds, in the form of cyclic and acyclic, non- oxygenated or oxygenated hydrocarbons of monoterpenes, sesquiterpenes and diterpenes. It is used in the treatment of relieving pain, wounds, nausea, cancer lesions in folk medicines^[27]. The extract has potential for being used as preservatives in the food industry owing to their antibacterial and flavouring properties, and are considered as preferred alternative to synthetic compounds^[28]. The essential oils of *Elettaria cardamomum* Maton grown in India, and Guatemala on shows significant actions on Gram negative bacteria and Gastro intestinal disorders^[29]. In 2018, several species were removed from *Elettaria* and placed in a new genus called *Sulettaria*. These species are recognized as of October 2018- *Elettaria brachycalyx* S. Sakai & Nagam, Sarawak, *Elettaria kapitensis* S. Sakai & Nagam, Sarawak, *Elettaria linearicristata* S. Sakai & Nagam, Sarawak, *Elettaria longipilosa* S. Saki & Nagam, Sarawak, *Elettaria multiflora*(Ridl) R.M.Sm, Sumatra, Sarawak, *Elettaria rubida* R.M.Sm, Sabah, Sarawak, *Elettaria surculosa*(K.Schum) B. L. Burt and R.M.Sm, Sarawak Poulsen, Axel; Baserud Mathisen, Helena; Newman, Mark; Ardiyani, Marlina; Lofthus, Bjora, Charlotte(2018-

08-01)^[30]. Decoction of *Amomum subulatum* rhizomes are used in the therapy of jaundice^[31].

Antibacterial Activity^[32]- The ethanol extract of *E. cardamomum* possess antibacterial action at the dose of 512micro gram/ml.

Gastroprotective activity^[33]- The Gastroprotective activity of *E. cardamomum* was found in the petroleum ether soluble extract which inhibited lesions by nearly 100%at 12.5 mg/kg in the aspirin-induced gastric ulcer. Methanol extract also possess gastroprotective effect.

Anti-inflammatory, Analgesic and Antispasmodic Activity^[34]- Seeds of *E.cardamomum* possess anti inflammatory, analgesic and antispasmodic. In carrageenan induced rat paw oedema the oil extract of *E. cardamomum* seeds, in doses of 175 and 280 micro liters/kg were found to reduce the inflammation. Analgesic activity was evaluated by p-benzoquinone-induced writhing method but antispasmodic activity was evaluated in vitro. Studies reveal that antispasmodic action is produced through muscarinic receptor blockage.

Antioxidant property^[35]- The cardamom oil is effective as an antioxidant property because of glutathione.

Cigarette De-addiction^[36]- The cardamom used to ease cigarette addiction. Eating a few seeds of cardamom can safely be recommended to initially minimize the number of cigarettes being smoked and slowly the smoker may give up the chronic addiction to chain smoking.

Skin disorders^[37]- The 27 group of plants including cardamom is used in promoting skin complexion, destroying itching and pustules

CONCLUSION

The *Elettaria cardamomum* Maton and *Amomum subulatum* Roxb are perennial herbaceous plant belongs to Zingiberaceae family. The seed pods have a strong, camphor like flavour, used as spice. The drug possesses biological roles such as antioxidant, antibacterial, gastroprotective, anti inflammatory, analgesic, anti spasmotic and insecticidal activities. The present work dealt with the data were obtained by several electronic scientific databases, articles, and the additional information is obtained from the various *Ayurvedic* classical texts.

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