



# HEALTHY EFFECTS OF CARDAMOM IN THE MAMMALIAN : A REVIEW

Saad S.R. Al- Janaby<sup>1</sup>, Ali M.A. Al-Kufaishi <sup>2</sup>, Hadeel Alaa Al-rubaei<sup>3</sup> and Noor J.T. Al-Musawi<sup>3</sup>

<sup>1</sup>Department of Community Health, College of Health and Medical Techniques, Al-Furat Al-Awsat Technical University, Kufa, Iraq -31003

<sup>2</sup>Department of Medical Laboratory Techniques, College of Health and Medical Techniques, Al-Furat Al-Awsat Technical University, Kufa, Iraq -31003

<sup>3</sup>DNA Research Center, University of Babylon, Iraq

## Abstract

Cardamom as a herbal has several medicinal practices in Indian Vedic remedy and the oil is consumed in scents and enrage and demanded in India as an aphrodisiac. It can be employed as a refreshing innervating bathtub. The extraction of it is involved the vital oil by steam condensation from the dried ripe fruit. The collection of researchers in this article are showing and proving the various influencing of cardamom are included pathophysiological and chemical activity, where it was significant differences ( $p \leq 0.05$ ) in case using of this herbal in treatment of infection (as anti-inflammatory) and cancer, lowering of blood sugar, antioxidant, asthma, peptic ulcer, and recently it is used in the field of aromatherapy in treatment of different disease beside to containing of nutrient elements such as vitamins A and E, in which it has interesting of supplementary complement.

**Key Words:** Cardomom, antioxidant, diuresis, cancer, hyperglycemia, anti-inflammatory, peptic ulcer, asthma, covid-19.

## Introduction

Cardamom is sometimes called cardamon or cardamum (Negi, Prashar and Gupta, 2019), is a spice prepared from the seeds of several plants in the genera *Elettaria* and *Amomum* in the family Zingiberaceae. Both genera are innate to the Indian subcontinent and Indonesia. They are acknowledged by their small pits shells: triangular in cross-section and spindle-shaped, with a thin, frail outer crust and small, black seeds; *Elettaria* pods are light green and smaller, while *Amomum* shucks are larger and dark brown.

Species employed for cardamom are native throughout sultry and subtropical Asia. The first sources to cardamom are found in Sumer, and in the Ayurvedic works of India (Negi, Prashar and Gupta, 2019). Nowadays, and it is cultured in some other countries,

such as Guatemala, Malaysia and Tanzania (Negi, Prashar and Gupta, 2019). The German coffee planter Oscar Majus Kloeffer presented Indian cardamom to cultivation in Guatemala before World War I; by 2000, that country had become the major producer and exporter of cardamom in the world, tailed by India (Badwe *et al.*, 2014). The word “cardamom” is derived from the Latin cardamomum, which is the Latinisation of the Greek καρδαμουν (kardamomon) (Meaney, 2013), a compound of καρδαμουν (kardamon), “cress” + αμωμων (amomon), where was maybe the name for a kind of Indian spice plant (Liddell and Scott, 1897). The earliest proved form of the word καρδαμουν signifying “cress” is the Mycenaean Greek ka-da-mi-ja, written in Linear B syllabic script (Revesz, 2018), in the list of flavorings on the “Spice” pills found among palace archives in the House of the Sphinxes in Mycenae (ILIEVSKI, 1968). The

\*Author for correspondence : E-mail: Kuh.sad@atu.edu.iq.

modern genus name *Elettaria* is derivative from the root clam showed in Dravidian languages (Jose *et al.*, 2018).

### History

Cardamom illustration in Chinese *Materia Medica* graphic (Ming period, 1368–1644). The common-sense name for the cardamom genus *Elettaria* originates from the Tamil name for “cardamom stones”. Manufacture started in earliest times, and it has been mentioned to in antique Sanskrit texts as “Ela” (Garbers and Scheller, 2013). The health profits of the spice early is configured by the Babylonians and Assyrians on, and craft in cardamom opened up along land ways and by the interspersed Persian Gulf route measured from Dilmun as early as the third millennium BCE Early Bronze Age,<sup>[2]</sup> into western Asia and the Mediterranean world.. The olden Greeks thought greatly of cardamom, and the Greek physicians Dissonances and Hippocrates wrote about its therapeutic assets, recognizing it as a digestive assistance. Because of demand in primordial Greece and Rome, the cardamom trade progressed into a good-looking extravagance commercial; cardamom was one of the spices suitable for introduction duty in Alexandria in 126 CE. In medieval times, Venice became the principal importer of cardamom into the west, laterally with cloves, pepper and cinnamon, which was operated with merchants from the Levant with meat products and salt (Boivin, Blench and Fuller, 2010). advanced, in the 16th century, the Portuguese became comprised in the trade, when it conquered the west coast of India, but the industry did not became of major interest on a wider gage to Europeans until the 19th century (Munoz *et al.*, 2015).

### The Benefits of Cardamon

#### Antioxidant and diuretic properties

Antioxidant grade had augmented by 90% by the culmination of the scrutiny. The Antioxidants have been connected to decrease blood pressure when they were governed 3 g of cardamom powder in two divided doses for 12 weeks to patients persons with main hypertension of phase 1. Blood pressure was enrolled primarily and at 4 weeks interval for 3 months. Blood testers were composed firstly and at 4 weeks interval for approximation of lipid outline, fibrinolysis and fibrinogen. overall antioxidant rank was originally evaluated and at the end of the trial. Management of 3 g cardamom powder significantly ( $p < 0.05$ ) enlarged fibrinolytic activity at the end of 12th week and significantly ( $p < 0.001$ ) reduced diastolic, systolic, and mean blood pressure (Verma, Jain and Katewa, 2009).

### Cancer - Fighting Compounds

Cardamom powder is shown in trainings in mice have can augment the activity of assured enzymes that aid, A significant dropping in the ethics of occurrence, load, and yield tumor and the progressive number of papillomas was noticed in mice treated orally with 0.5 mg of cardamom powder in suspension constantly at pre-, peri-, and post-initiation stages of papillomagenesis compared with the control group. The mean weight and diameter of tumors verified were also relatively lesser in the cardamom-healed mouse group. Administration of cardamom suspension by oral gavage for 15 days led a significant decline in the lipid peroxidation level of the liver ( $P < .01$ ). Also, the glutathione level reduction was significantly raised in comparison with the control group ( $P < .05$ ) subsequent cardamom suspension treatment. The investigators In one study subjected two groups of mice to a compound that induce skin cancer and fed one group 500 mg of ground cardamom per kg (227 mg per pound) of weight per day (Carrington, 2006). Cardamom, which is a dietary phytoproduct, has been used generally in fares for flavour and has numerous health assistances, such as improving digestion and stimulating metabolism and having antitumorigenic properties. We have noticed the efficacy of dietary cardamom against 7, 12-dimethylbenz[a] anthracene (DMBA)-encouraged skin papillomatogenesis in Swiss albino mice that strongly resembles human NMSC. Mice were categorized into normal remote type vehicle-treated (acetone), carcinogen-handled (DMBA), and DMBA and cardamom-given (DMBA+CARD) to describe the role of cardamom against DMBA-tempeted papillomatogenesis DMBA-treated mice that administered orally by cardamom was up-regulated the phase II detoxification enzymes, such as glutathione peroxidase and glutathione-S-transferase, may be thru activation of nuclear factor erythroid-2-related factor 2 transcription factor in 'DMBA+CARD' mice. Furthermore, dropped superoxide dismutase, glutathione reductase, and catalase were also up-regulated by cardamom in the same 'DMBA+CARD' group of mice in comparison with DMBA-treated mice. Cardamom ingestion in DMBA-treated mice blocked NF- $\kappa$ B activation and down-regulated cyclo-oxygenase-2 expression (Das *et al.*, 2012).

#### Anti-Inflammatory Effects

Inflammation take place when your body is subjected to foreign substances (antigen). Acute inflammation is essential and valuable, but long-standing inflammation can lead to chronic diseases. The antioxidants material, found in profusion in cardamom, and safeguard cells from

damage and cease inflammation from happening the deceptive progressively deceptive in which certain types of inflammatory tissue injury are arbitrated by reactive oxygen metabolites. The greatest probable causes of these oxidizing mediators are the phagocytic leukocytes (*e.g.*, neutrophils, monocytes, macrophages, and eosinophils) that assault the tissue. These reactive radicals and oxidants may harm cells and tissue directly by oxidative degradation of crucial cellular components as well as hurt cells indirectly by altering the protease/ antiprotease balance that normally exists within the tissue interstitium. It is progressively attractive outward that in adding to endorsing cytotoxicity, inflammation might similarly initiated and/or magnified by reactive oxygen metabolites through the up-regulation of numerous varying genes included in the inflammatory response, such as those that code for proinflammatory cytokines and adhesion molecules, and follow this may ensue by the activation of certain transcription factors, such as nuclear transcription factor  $\kappa$ B (NF- $\kappa$ B). NF- $\kappa$ B is a ubiquitous transcription factor and pleiotropic regulator of numerous genes involved in the immune and inflammatory reaction. Necessary nutrients such as vitamins E and C may defense against oxidant-mediated inflammation and tissue damage by virtue of their capability to hunt free radicals and by their facility to prevent the activation of NF- $\kappa$ B (and possibly other oxidant-sensitive transcription factors) (Conner and Grisham, 1996).

### Peptic ulcers

Cardamom has been exhausted for thousands of years to aid with ingestion, and It's frequently blended with other therapeutic spices to alleviate nausea and vomiting, awkwardness, actually, at doses of 12.5 mg per kg (5.7 mg per pound) of body weight, cardamom essence was more effective than a common anti-ulcer medication, Cardamom, the fruits of *Elettaria card Amomum* Maton. (Zingiberaceae) commonly known as "Heel khurd" is consumed in Unani system of medicine to heal gastrointestinal disorders. A natural methanolic extract (TM), primary oil (EO), petroleum ether soluble (PS) and insoluble (PI) elements of methanolic extract, were reviewed in rats at doses of 100-500, 12.5-50, 12.5-150 and 450 mg/kg, respectively for their aptitude to inhibit the gastric lesions tempted by ethanol, aspirin, and pylorous ligation. In addition their effects on wall mucus and gastric acid output were documented. All portions (TM, EO, PS, PI) inhibited significantly gastric lesions caused by aspirin and ethanol but not those stimulated by pylorus ligation. TM demonstrated to be active reducing lesions by about 70% in the EtOH-induced ulcer model at 500 mg/kg (Jamal *et al.*, 2006).

### Improving of breath and treatment of asthma

The cardamom is using to treat terrible breath and expand oral health is an early remedy. Also it's common to freshen your breath by ingestion full cardamom shells after a mealtime. The most significant compounds of cardamom, as spice, is the volatile oil with its quality aroma, prescribed commonly as sweet, comphoraceous, aromatic spicy. The cardamom oil has little mono- or sesquiterpenic hydrocarbons and is dominantly processing of oxygenated components, and they are potentially aroma elements. Whilst many of the detected compounds (aldehydes, esters, and , alcohols) - are generally presented in many spice oils (or even volatiles of many varying foods), the predominance of the ether, 1,8- cineole and the esters, oc-terpinyl and linalyl acetates in the composition, make the cardamom volatiles a exclusive mixture (SALZER and UW, 1975). The aroma alterations in various sources of cardamom are assigned to the proportion of the esters and 1,8 cineole (Hamed, 2018). Cardamom (*Elettaria card Amomum*) is used broadly in traditional medicine for the treatment of asthma. This study explains its airways relaxant potential, with clarification of achievable underlying mechanism. Crude content of cardamom which confirmed positive for flavonoids, sterols, saponins, alkaloids and tannins, when experienced against carbachol-mediated bronchoconstriction in rats under anesthesia, it dose-dependently (10-100 mg/kg) suppressed the carbachol (1  $\mu$ mol/kg)-evoked increase in the inspiratory pressure. In isolated rabbit trachea tissues, crude separate of cardamom induced relaxation of both carbachol (1  $\mu$ M) and high K<sup>+</sup> (80 mM)-induced contractions, like that caused by verapamil, suggesting its Ca<sup>++</sup> channel blockade action (Gilani, Khan and Khan, 2011).

### Antibacterial Effects and Treatment of Infections

Cardamom has antibacterial and anti-inflammatory effects outside of the antimicrobial activity of petroleum ether, methanol and aqueous extracts from roots and leaves, essential oil and isolated vasicine from *A. vasica* were verified against different microorganisms. Antimicrobial activity was performed by disc diffusion approach. The inhibition zone was noticed and compared with that of standard drugs, fluconazole and ciprofloxacin. Minimum inhibitory concentration (MIC) was recognized against microorganisms employed in the experiment. The study's results uncover that methanol extract of fruits of *A. subulatum* reveal remarkable antimicrobial activity against *Escherichia coli* while in case of other microorganisms used it was found low-grade to the standard drug used. Methanol extract of peel displayed

good antimicrobial activity against *Staphylococcus aureus*. In addition to that it was found that the essential oil sequestered was effective against majority of microorganisms used viz. *Bacillus pumilus*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Saccharomyces cerevisiae* (Agnihotri and Wakode, 2010).

### Hyperglycemia

Cardamom has the ability to drop blood sugar. It is consumed in traditional medicine exercises and cooking since ancient times. The present inquiry was undertaken to assess the potential interest of cardamom powder supplementation in high carbohydrate high fat (HCHF) diet prompted obese rats, cardamom powder supplementation enhanced the glucose intolerance significantly ( $p > 0.05$ ) and inhibited the abdominal fat deposition in HCHF diet fed rats, and the latest also progressed dyslipidemia, raised fat accumulation and inflammation in liver compared to control rats. Cardamom powder supplementation significantly prevented the elevate of lipid parameters ( $p > 0.05$ ) in HCHF diet fed rats. Histological evaluation proved that HCHF diet progressed the fat sedimentation and inflammatory cells infiltration in liver which was standardized by cardamom powder supplementation in HCHF diet fed rats. So that, HCHF diet amplified lipid peroxidation, diminished antioxidant enzymes activities and elevated progressive protein oxidation product level significantly ( $p > 0.05$ ) both in plasma and liver tissue which were amended by cardamom powder supplementation in HCHF diet fed rats (Rahman *et al.*, 2017).

### Conclusion

With briefly, and from numerous practical trails and by different studies showing that the Cardamom has varying pathophysiology, kinetic, dynamic, chemical, and microbiological effects, also regarding with anti-inflammatory as antioxidant, and therefore due to these different benefits, chemical and nutrient contents, and antimicrobial properties of cardamom, so the last can be of interest as a immune boosters for patients suffering from various viral diseases such as COVID-19 beside with other diseases that are considered immunosuppressant and increase the serious critical effects of COVID-19.

### References

Agnihotri, S. and S. Wakode (2010) 'Antimicrobial activity of essential oil and various extracts of fruits of greater cardamom', *Indian journal of pharmaceutical sciences*. Wolters Kluwer--Medknow Publications, **72(5)**, p. 657.

- Badwe, R. A. *et al.* (2014) 'Cancer incidence trends in India', *Japanese journal of clinical oncology*. Oxford University Press, **44(5)**, pp. 401–407.
- Boivin, N., R. Blench and D. Q. Fuller (2010) 'Archaeological, linguistic and historical sources on ancient seafaring: a multidisciplinary approach to the study of early maritime contact and exchange in the Arabian Peninsula', in *The evolution of human populations in Arabia*. Springer, pp. 251–278.
- Carrington, C. H. (2006) 'Clinical depression in African American women: Diagnoses, treatment, and research', *Journal of clinical psychology*. Wiley Online Library, **62(7)**, pp. 779–791.
- Conner, E. M. and M. B. Grisham (1996) 'Inflammation, free radicals, and antioxidants', *Nutrition*. Elsevier, **12(4)**, pp. 274–277.
- Das, I. *et al.* (2012) 'Antioxidative effects of the spice cardamom against non-melanoma skin cancer by modulating nuclear factor erythroid-2-related factor 2 and NF-kB signalling pathways', *British journal of nutrition*. Cambridge University Press, **108(6)**, pp. 984–997.
- Garbers, C. and J. Scheller (2013) 'Interleukin-6 and interleukin-11: same same but different', *Biological chemistry*. De Gruyter, **394(9)**, pp. 1145–1161.
- Gilani, A.-H., A. Khan and Q. J. Khan (2011) 'Pharmacological basis for the medicinal use of cardamom in asthma', *Bangladesh Journal of Pharmacology*, **6(1)**, pp. 34–37.
- Hamed, M. H. (2018) 'Response of Broiler Chicks fed on Dietary of cardamom Essential oils as Natural Growth Promoter'. Sudan University of Science and Technology.
- ILIEVSKI, P. (1968) 'Some Observations/on Mycenaean Epigraphy', *Klio*. Akademie-Verlag., **50**, p. 39.
- Jamal, A. *et al.* (2006) 'Gastroprotective effect of cardamom, *Elettaria cardamomum* Maton. fruits in rats', *Journal of ethnopharmacology*. Elsevier, **103(2)**, pp. 149–153.
- Jose, M. *et al.* (2018) 'The prehistoric Indian Ayurvedic rice Shashtika is an extant early domesticate with a distinct selection history', *Frontiers in plant science*. Frontiers, **9**, p. 1203.
- Liddell, H. G. and R. Scott (1897) *A greek-english lexicon*. New York: American Book Company.
- Meaney, A. (2013) 'What was Lybcom?', *Leeds Studies in English*. Leeds Studies in English, pp. 146–205.
- Munoz, J. F. *et al.* (2015) 'The dynamic genome and transcriptome of the human fungal pathogen *Blastomyces* and close relative *Emmonsia*', *PLoS genetics*. Public Library of Science, **11(10)**.
- Negi, J., B. Prashar and J. Gupta (2019) 'Sitopaladi Churna As Anti-Tussive: A Review', *International Journal of Health and Clinical Research*, **2(6)**, pp. 1–5.
- Rahman, M. M. *et al.* (2017) 'Cardamom powder supplementation prevents obesity, improves glucose intolerance,

inflammation and oxidative stress in liver of high carbohydrate high fat diet induced obese rats', *Lipids in health and disease*. BioMed Central, **16(1)**, p. 151.

Revesz, P. Z. (2018) 'Spatio-Temporal Data Mining of Major European River and Mountain Names Reveals Their Near Eastern and African Origins', in *European Conference on Advances in Databases and Information Systems*. Springer,

pp.20–32.

SALZER, U. W. and S. UW (1975) 'Analytical evaluation of seasoning extracts (oleoresins) and essential oils from seasoning. II'.

Verma, S. K., V. Jain and S. S. Katewa (2009) 'Blood pressure lowering, fibrinolysis enhancing and antioxidant activities of cardamom (*Elettaria cardAmomum*)'. CSIR.