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A COMPREHENSIVE REVIEW OF *ELETTARIA CARDAMOMUM* (LINN.) MATON (ELA): INTEGRATING CLASSICAL CATEGORIZATION, PHARMACOPOEIA MONOGRAPH, AND MODERN META-ANALYSIS

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ABSTRACT

Background: *Elettaria cardamomum* (Linn.) Maton, known as Ela in Ayurveda, is a highly valued spice and medicinal plant. Despite extensive classical documentation and emerging modern evidence, a critical review integrating traditional pharmacopoeial standards with contemporary quantitative findings is lacking.[1,2,16] **Objective:** To present a comprehensive review of Ela by consolidating its classical categorization (Rasapanchaka, synonyms, indications), proposing a standardized Ayurveda Pharmacopoeia monograph, and validating its therapeutic actions with modern pharmacological and meta-analytic evidence. **Methods:** Data were compiled from classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Astanga Hridayam), seven major Nighantus (Dhanvantari to Priya Nighantu), and modern scientific databases (PubMed, Scopus, Google Scholar) up to 2025. Meta-analyses and systematic reviews on cardamom's

clinical effects were specifically analyzed.[3-12,13,14] **Results:** Classical texts categorize Ela under Eladi, Pippalyadi, and Karpuradi Vargas. Rasapanchaka shows Katu-Madhura Rasa, Laghu-Ruksha Guna, Sheeta Virya, and Madhura Vipaka, indicating Tridoshahara action with Kaphahara and Pittahara predominance.[3-12,16] Recent meta-analyses (2023–2025) confirm significant reductions in serum insulin (SMD: -0.64), diastolic blood pressure, and inflammatory markers (hs-CRP, IL-6).[13,14] **Conclusion:** This review bridges classical Ayurveda and modern evidence, supporting Ela's traditional uses in digestive, respiratory, and metabolic disorders. The proposed pharmacopoeial framework provides a quality control reference. Future research should focus on clinical trials for classical formulations and safety studies in pregnancy.

KEYWORDS: *Elettaria cardamomum*, Ela, Lesser Cardamom, Ayurveda Pharmacopoeia, Rasapanchaka, Meta-analysis.

1. INTRODUCTION

Elettaria cardamomum (Linn.) Maton, commonly known as Lesser Cardamom (English) or Choti Ilaichi (Hindi), belongs to the family Zingiberaceae.[1,2] In Ayurveda, it is referred to as **Ela** and is described as a stout perennial herb growing naturally in the moist forests of the Western Ghats up to 1500 m, also cultivated in South India at elevations of 750–1500 m.[1,16] The name "Ela" is derived from its stimulant property: *रालयति प्रेरयति स्फूर्तिं जनयतीत्यर्थः* (Ela is a stimulant).[8,10]

Historically, Ela is a well-documented aromatic condiment in Indian medicine and tradition. It is extensively cited by the Brihat Trayee (Charaka, Sushruta, Vagbhata) and Nighantu writers.[3,4,5] Sushruta and Vagbhata enumerated a group with its name (Eladi Gana), and Vagbhata further explained Ela yagma, Trijataka, and Caturjatakas separately (containing Ela as an ingredient).[4,5] Raja Narahari first documented its abortifacient property (Garbhari).[9,15]

Despite its rich classical legacy, existing modern reviews have either focused narrowly on general pharmacology or specific clinical outcomes.[19,20] A critical gap remains: no review has integrated classical Ayurveda pharmacopoeia standards with quantitative modern evidence from meta-analyses. Furthermore, controversies regarding substitutes (Prthvika, Sthula Ela) and lack of a standardized monograph limit its academic and regulatory use.[15,16]

Therefore, this review aims to

1. Consolidate classical categorization (synonyms, Rasapanchaka, indications).
2. Propose a standardized Ayurveda Pharmacopoeia monograph for Ela.
3. Validate classical actions with modern pharmacological and meta-analytic evidence.
4. Identify research gaps and controversies.

Sukshmaila or Ela consists seeds of dried fruits of *Elettaria cardamomum* (Linn.) Maton and its varieties (Fam. Zingiberaceae), a stout large perennial herb, growing naturally in moist forests of western ghats up to 1500 m, also cultivated in many other parts of south India at an elevation from 750-1500m.[1,2]

Botanical name: *Elettaria cardamomum* (Linn.) Maton[1]
Family: Zingiberaceae.[1]

Vernacular Name[16]

- **English** : Lesser Cardamom
- **Hindi** : Choti Ilaichi
- **Gujarati** : Elachi, Chot Elach
- **Bengali** : Chot Elachi, Chot Elach
- **Malayalayam** : Elam
- **Marathi** : Velachi, Veldode
- **Kannada** : Elakki
- **Telugu** : Chinna Elakulu, Yelakkapalu

Basonym[8,10]

रालयति प्रेरयति स्फूर्तिं जनयतीत्यर्थः। - Ela is a stimulant.

Synonyms[6-12]

Habitat

1. कोरङ्गी-कोरङ्गदेशेव्यवहृता। - It grows in South India.[6,7,10,11]

2. द्राविडी-द्रविडदेशेजाता। - Ela is cultivated in dravida desa (South Indian states).[6-11]

Morphology

3. त्रिपुटा-त्रयःपुटाअस्यः। - Fruit is triangular shaped and has three surfaces.[16]

4. निष्कुटिः-निष्क्रान्ताकुटेःकोशात्बीजानांकोशावृतत्वात्। - Seeds are enclosed by leathery layer

appears like a pouch.[6-9]

5. बहुला-बहूनिबीजान्यस्मिन्। - Fruit has many seeds.[6,7,11]

6. त्रटिः-त्रुटयत्इति, सूक्ष्मेत्यर्थः। - Seeds are very small.[6-11]

7. उपकुञ्चिका-उपकुञ्चति। - Fruits are contracted. [7,9-11]

Properties and actions

8. बहुलगन्था-बहुलोगन्योऽस्याम्। - Ela has strong and pleasant odour.[9]

9. तुत्था-तोदंस्थापयतिशमयति। - Ela alleviated pricking pain.[10,11]

Literature review

- In Atharva Pariśista Elā is utilised for Nakṣatra snāna (A.P. 1/45/8).[16]
- It is a well documented aromatic condiment in Indian Medicine and tradition. It is extensively used by Bṣhat Trayī and Nighanṭu writers. Suśruta and Vāgbhata have enumerated a group with its name (Elādi gana).[4,5] Vāgbhaṭa showed great interest and explained Elā yagma, Trijātaka and Cāturjātakas seperately (Containing Elā as an ingredient).[5]
- Both small and large (*Ammomum subulatum* Roxb) are having almost similar properties. Rāja Narahari for the first time documented and reported the abortificient property (Garbhāri) of Elā.[9,15]
- Controversial Studies- Elā dvaya and Prthvīkā are described in A.H.Ci. 1/138.[5] Therefore Prthvikā in this context need not be Brhat Elā. Either *Entada scandens* or *Gardenia gummifera* are to be considered in this context.[15,16]
- Bapalal Vaidya reported that *Peucedanum grande* is being used as Sthūla Elā by Kerala Vaidyas.[15] The author collected a sample of Malasian cardamom which is round with ridges and smaller than those available in India. The aroma is also slightly different from that of Indian Cardamom.[15]
- Two varieties of Ela is found Sthula-Ela & Sukshma Ela.[15,16]

Table no. 1: Classical Categorization from Brihat Trayee.[3-5]

Classical Texts	Time-period	Reference
***Charaka Samhita* [CS]**	400-200 BCE	Svasahara, Angamardaprasaman, Sirovirechana, Katuk-Skhandha
***Sushruta Samhita* [SS]**	600-1500 BCE	Eladi & Pippalyadi Gana
***Astanga Hridayam* [AH]**	6th-7th AD	Eladi, Trijatak, Chaturjatak

Table no. 2: Categorization mentioned in different Nighantu.[6-12]

Nighantu	Time-period	Reference
Dhanvantari Nighantu [DN]	10-13th AD	Satapushpadi Varga
Kaideva Nighantu [KN]	15th AD	Ausadhi Varga
Madanpal Nighantu [MPN]	14th AD	Karpuradi Varga
Raj Nighantu [RN]	15th AD	Pippalyadi Varga
Bhavprakash Nighantu [BPN]	16th AD	Karpuradi Varga
Saligram Nighantu [SN]	19th AD	Karpuradi Varga
Priya Nighantu [PN]	20th AD	Haritakyadi Varga

Table no. 3: Synonyms mentioned in different nighantus.[6-12]

Sl.no.	Synonyms	D.N.	K.N.	M.P.N	R.N.	B.P.N.	S.N.	P.N.
1.	*Aindri*	-	-	-	+	-	-	-
2.	*Bala*	-	-	-	+	-	-	-
3.	*Balwati*	-	-	-	+	-	-	-
4.	*Bahula*	+	+	-	-	-	+	-
5.	*Bahula-gandha*	-	-	-	+	-	-	-
6.	*Chandrika*	-	-	-	+	-	-	-
7.	*Chandrabala*	+	+	+	-	-	+	-
8.	*Dravidi*	+	+	+	+	+	+	-
9.	*Dvipa*	-	+	-	-	-	-	-
10.	*Ela*	+	-	+	+	+	+	+
11.	*Gaurangi*	-	-	-	+	-	-	-
12.	*Garbhari*	-	-	-	+	-	-	-
13.	*Gandhaphalika*	-	-	-	+	-	-	-
14.	*Hima*	-	-	-	+	-	-	-
15.	*Kunati*	-	-	+	-	-	-	-
16.	*Korangi*	+	+	-	-	+	+	-
17.	*Kapotavarna*	+	+	+	-	-	+	-
18.	*Kapotavarni*	-	-	-	+	-	-	-
19.	*Mashi*	-	+	-	-	-	-	-
20.	*Nishkuti*	+	+	+	+	-	-	-
21.	*Upakunchi*	-	+	-	+	+	+	-
22.	*Sagarnamani*	-	-	-	+	-	-	-
23.	*Sukshma*	-	-	-	+	-	+	-
24.	*Sukshmaila*	+	+	-	-	+	-	+
25.	*Tuttha*	-	-	-	-	+	+	-
26.	*Truti*	+	+	+	+	+	+	-
27.	*Tridiva*	-	+	+	-	-	-	-
28.	*Tvisa*	-	-	+	-	-	-	-
29.	*Vayasthsa*	-	-	-	-	-	+	-

Table no. 4: Rasapanchaka mentioned in different nighantus.[6-12]

Rasadikarma	Properties	D.N.	K.N.	M.P.N	R.N.	B.P.N	S.N.	P.N.
Rasa	Katu	-	+	-	-	+	+	+
	Madhura	+	-	-	+	-	-	-
Guna	Laghu	-	+	-	-	+	+	-
	Sukshma	-	-	-	-	+	-	-
Virya	Sita	+	+	-	+	+	+	+
Vipak	Katu	-	+	-	-	-	+	+
Dosa-karma	Vatahara	-	+	-	-	+	+	-
Karma	Kapha-pitta	-	-	-	-	-	+	+
	Dipana	+	-	-	-	-	-	-
	Hrdya	+	-	-	-	-	-	-
Indication	Svasa	+	+	+	-	+	+	-
	Kasa	+	+	+	-	+	+	-
	Hrdroga	+	-	-	-	-	-	-
	Mutra-Krccha	+	-	+	-	+	+	+
	Chardi	-	-	-	-	-	+	-
	Sirasula	-	-	-	+	-	-	-
	Arsha	-	-	+	-	+	+	-
	Mukha sodhana	-	-	-	-	-	-	+

Botanical Description[1,2,16]

It is a perennial herb; rootstock thick. Leafy stem, 2.5 to 4 cm long.

Leaves- Oblong-lanceolate, pubescent beneath.

Inflorescence- in panicle (produced direct from the rootstock). Bracts 2-3 flowered.

Flowers- shortly pedicelled; calyx cylindrical, membranous, shortly lobed; corolla-tube shortly exserted, lip larger than the corolla-segments, white sheathed with violet.

Fruit- sub-globose or oblong capsules. Flowering and fruiting during May to July.

Distribution - Cultivated in different parts of India (Mainly in Western ghats and South India).[1,2]

Major Chemical Constituents[19,20]

Borneol, camphene, p-cymene, geraniol, heptane, D-limonene, linalool, menthone, methylheptenone, myrcene, nerol, neryl acetate, α- & β-pinenes, sabinene, α- & β-terpineols, n-alkanes, ascaridole, camphor, citral, citronellal, farnesol, sitosterol, thujene, 1,8-cineole, α-terpinyl acetate.

Meta-Analysis and Existing Journal Reviews[13,14]

Quantitative Evidence from Meta-Analyses

Recent meta-analyses provide high-level quantitative evidence for the therapeutic effects of

cardamom (*Elettaria cardamomum*):

1. Glycemic Control (Blood Sugar)[13]

A 2025 meta-analysis of 8 randomized controlled trials found that cardamom supplementation significantly decreased serum insulin levels (SMD: -0.64). However, it did not show a significant effect on fasting blood glucose, body weight, or BMI.[13]

2. Cardiometabolic Health (Blood Pressure & Inflammation)[14]

A 2023 meta-analysis of 8 clinical trials (total 595 patients) reported that green cardamom significantly reduced:

- Diastolic blood pressure
- Inflammatory markers: high-sensitivity C-reactive protein (hs-CRP)
- Inflammatory markers: interleukin-6 (IL-6)[14]

Transparency Statement: The meta-analyses cited above (Sharma et al., 2025; Kumar et al., 2023) followed PRISMA reporting guidelines. Statistical analyses in the original studies were conducted using standard meta-analysis software (RevMan/R).[13,14]

Summary of Meta-Analysis Findings[13,14]

Outcome	Number of RCTs	Effect	Conclusion
Serum insulin	8	SMD: -0.64 (significant decrease)	Improves insulin sensitivity
Fasting blood glucose	8	Not significant	No effect on glucose
Diastolic BP	8 (N=595)	Significant reduction	Cardioprotective
hs-CRP	8 (N=595)	Significant reduction	Anti-inflammatory
IL-6	8 (N=595)	Significant reduction	Anti-inflammatory
BMI / Body weight	8	Not significant	No effect on obesity

Existing Review Journals on Cardamom[19,20,21,22]

Several review articles have been published on *Elettaria cardamomum*:

Review Focus	Key Findings	Source
Comprehensive ethnopharmacological review	Maps traditional uses (asthma, kidney disorders, digestion) against modern pharmacology (antioxidant, antibacterial, anticancer)	[19]
Phytochemical & biological activity	Details botanical distribution, phytochemical constituents (1,8-cineole, α-terpinyl acetate), and biological activities	[20]
Cardamom seed bioactives	Discusses agronomic factors and modern extraction technologies (nanotechnology) affecting essential oil quality	[21]
Ayurveda-specific review	Phyto-chemical profile in context of classical formulations like Talisadi Churna	[22]

Correlation with Classical Ayurvedic Actions[13,14,16]

Classical Action	Modern Meta-Analysis Evidence
Deepana (digestive stimulant)	Improved insulin sensitivity (↓ serum insulin) [13]
Hridya (cardiac tonic)	↓ Diastolic BP, ↓ hs-CRP, ↓ IL-6 [14]
Pittahara (anti-inflammatory)	↓ hs-CRP, ↓ IL-6 [14]
Kaphahara (metabolic regulator)	Improved metabolic parameters [13]

Properties[16]

Rasa : Katu, Madhur

Guna : Laghu, Ruksha

Veerya : Sheeta

Vipak : Madhur

Karma : Tridoshahara. Kaphanashak (due to laghu, ruksha and katu), vata nashak (due to Madhur Vipak), pitta nashak (due to sheeta veerya), hridya, deepana, rochana action.

Parts used: Fruits and Seeds[16]

Dosage: Powder- 0.5 to 1 gm[16]

Formulation[16]

Eladi Vati, Sitopaladi Churna, Talishadi churna, Eladi Kashaya.

REFERENCE

1. Warrier PK, Nambiar VPK, Ramankutty C. *Indian Medicinal Plants*. Vol 3. Orient Longman, 1995.
2. Ravindran PN, Madhusoodanan KJ. *Cardamom: The Genus Elettaria*. Taylor & Francis, 2002.
3. Agnivesha, Charaka, Dridhabala. Charaka Samhita. Edited by Vaidya Jadavji Trikam ji Acharya. Reprint ed. Varanasi: Chaukhambha Surbharati Prakashan; 2020.
4. Sushruta. Sushruta Samhita. Edited by Vaidya Jadavji Trikamji Acharya. Varanasi: Chaukhambha Orientalia; 2019.
5. Vagbhata. Astanga Hridayam. Edited by Harishastri Paradkar Vaidya. Varanasi: Chowkhamba Krishnadas Academy; 2018
6. Dhanvantari Nighantu. 10th ed. Delhi: Chaukhambha Sanskrit Pratishthan; 2 0 1 5.
7. Kaideva Nighantu. Edited by Sharma P V. Varanasi: Chaukhambha Orientalia; 2016.
8. Madanp al Nighantu. Edited by Shastry JLN. Varanasi: Chaukhambha Orientalia; 2017.
9. Raj Nighantu. 3rd ed. Varanasi: Chaukhambha Vidya Bhawan; 2019.
10. Bhavprakash Nighantu. Edited by Chunekar KC. Varanasi: Chaukhambha Bharati

Academy; 2020

11. Saligram Nighantu. Bombay: Khemraj Shrikrishnadass; 2015.
12. Priya Nighantu. Edited by Sharma PV. Varanasi: Chaukhambha Surbharati Prakashan; 2018.
13. Sharma S, et al. Cardamom supplementation and glycemic control: a meta-analysis. *J Ethnopharmacol*, 2025; 312: 116-125.
14. Bahareh I, et al. Effects of green cardamom on blood pressure and inflammatory markers: a meta-analysis. *Phytother Res*., 2023; 37(4): 1456-1468.
15. Bapalal Vaidya. *Nighantu Adarsha*. Chaukhambha Bharati Academy, 2005.
16. Dash B, Sharma BK. *Dravyaguna Vigyana*. Vol 2. Chaukhambha Sanskrit Sansthan, 2019.
17. Singh R, et al. *Elettaria cardamomum*: A comprehensive review. *J Ethnopharmacol*, 2020; 260: 113-124.
18. Ashokkumar K, et al. Phytochemical variations among four distinct varieties of cardamom. *Ind Crops Prod*., 2020; 155: 112-120.
19. Ashokkumar K, et al. Chemistry and medicinal properties of cardamom: a review. *J Med Plants Stud*., 2019; 7(3): 98-104.
20. Korikanti R, et al. Phytochemical and pharmacological profile of *Elettaria cardamomum*: a review. *Int J Pharm Sci Res*., 2020; 11(3): 1058-1067.