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DRUG REVIEW OF MOORVADI AGAD IN GARA VISHA JANYA HYPOTHYROIDISM

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ABSTRACT: Background: The concept of *Gara Visha* in *Ayurveda* encompasses cumulative toxic burden arising from incompatible food habits, environmental pollutants, chemical preservatives, and sedentary lifestyle. Prolonged exposure to such toxins is theorized to vitiate *Agni* (digestive fire), particularly *Dhatwagni*, resulting in a state of *Dhatwagnimandya* that shows clinical overlap with hypothyroidism. **Objective:** This article presents a comprehensive drug review of *Moorvadi Agad*, a classical formulation described in *Ashtanga Samgraha Uttara Tantra* (40/88), exploring its individual pharmacodynamic properties and collective therapeutic rationale in the conceptual management of *Gara Visha Janya Hypothyroidism*. **Review Methodology:** A systematic literature search was conducted using classical Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Ashtanga Samgraha*), authoritative *Nighantus* (*Bhavaprakasha Nighantu*, *Dravyaguna Vigyana*), and standard pharmacopoeial databases. Modern pharmacological data was sourced from PubMed, Google Scholar, and ScienceDirect (search period: 2000-2025) using keywords: "*Moorvadi Agad*," "*Gara Visha*," "hypothyroidism," "*Ayurveda*," "*Dhatwagnimandya*," along with individual plant names. **Selection Criteria:** Classical references describing *Moorvadi Agad* and its ingredients were included. Modern studies reporting antioxidant, anti-inflammatory, immunomodulatory, hepatoprotective, hypoglycemic, and metabolic activities of individual ingredients were prioritized. Animal studies, *in-vitro* experiments, and human clinical trials were included where available; anecdotal reports and unpublished data were excluded. **Principal Evidence:** Classical Ayurvedic texts establish the *Vishaghna* (antitoxin), *Deepana* (appetizer), *Pachana* (digestive), *Kapha-Medohara* (alleviates *Kapha* and fat), and *Srotoshodhana* (channel purification) properties of *Moorvadi Agad*. Modern pharmacological studies on individual ingredients demonstrate antioxidant, anti-inflammatory, immunomodulatory, and metabolic regulating activities. However, direct clinical evidence for the formulation in hypothyroidism is lacking. **Conclusion:** *Moorvadi Agad* presents a theoretically relevant classical formulation for conditions conceptualized as *Gara Visha Janya Dhatwagnimandya*, but requires systematic experimental and clinical validation before being considered an established treatment for hypothyroidism.

INTRODUCTION: In *Ayurveda*, successful management of any disease depends upon the proper application of *Chikitsa Chatushpada Bhishak* (physician), *Dravya* (drug), *Upasthata* (attendant), and *Rogi* (patient).

Among these, *Dravya* occupies a central role because even an expert physician becomes help less in the absence of an appropriate medicine. *Acharya Charaka* has emphasized that the ideal medicine is that which effectively breaks the *Samprapti* (pathogenesis) and restores the equilibrium of *Dosha*, *Dhatu*, and *Agni*^{1,2}.

*Gara Visha*³ is a significant poison under the *Krtrima Visha* category, possessing distinct pathogenesis, clinical features, and subacute systemic effects. The term *Gara* means *impure*, *artificial*, *improperly combined*, and *Visha* denotes

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a toxic substance. Thus, *Gara Visha* is an artificially formed poison created from incompatible substance combinations, low-potency toxins, improperly cooked or preserved foods, and environmental contaminants.

The present era is characterized by extensive exposure to incompatible food habits, preservatives, chemicals, pollutants, pesticides, synthetic medicines, stress, and a sedentary lifestyle. When a person consumes or comes in contact with any of these toxins for a long period, these substances start to accumulate in the body in small traces and act as toxins, known as *Gara Visha*. *Visha* possesses ten *Gun*as such as *Ruksha*, *Ushna*, *Tikshna*, *Sookshma*, *Aashu*, *Vyavayi*, *Vikashi*, *Vishad*, *Laghu*, *Apaki*. Due to *Sookshma*, *Aashu* and *Vyavayi Guna*, *Visha* attains the property of easily penetrating deeper into the body tissues and channels (*Srotas*), causing vitiation of *Agni*, especially *Dhatwagni* (the localized metabolic processes that operate within each of the seven bodily tissues), leading to impaired tissue metabolism known as *Dhatwagnimandya*.

Conceptual Framework: It is important to clarify that the proposed relationship between *Gara Visha*, *Rasa Dhatwagni* dysfunction, and hypothyroidism represents an Ayurvedic conceptual interpretation rather than an established endocrinological mechanism. The impairment of *Dhatwagni* disrupts the sequential formation and nourishment of the succeeding *Dhatus*. Since *Rasa Dhatu* is the primary tissue to be formed, *Rasa Dhatwagni* is theorized to be the first affected. The body's secretory functions are predominantly governed by *Rasa Dhatu*. Hence, vitiation of *Rasa Dhatwagni* may theoretically result in altered endocrine secretions, including those of the thyroid gland, which could contribute to the pathogenesis of hypothyroidism. Clinically, this condition manifests with symptoms such as *Gaurava* (heaviness), *Alasya* (lethargy), *Manda Agni* (suppressed digestive fire), *Sthoulya* (obesity), *Kandu* (itching), *Shotha* (edema), *Kesha Patana* (hair fall), *Sheeta Asahyata* (cold intolerance), and *Mala Sanchaya* (accumulation of waste in the body), which show symptomatic overlap with hypothyroidism²⁷⁻²⁹. However, this should not imply that environmental toxins or incompatible foods are established causes of clinical

hypothyroidism without supporting endocrinological evidence. The conceptual pathogenesis of *Gara Visha Janya Hypothyroidism* mainly involves: *Agnimandya*, *Ama Utpatti*, *Kapha Pradhana Tridosha Dushti*, *Srotorodha*, *Medo Dushti*, *Dhatwagni Vaigunya*. Hence, treatment should aim at: *Visha Shamana*⁴, *Agni Deepana*²³, *Ama Pachana*²³, *Kapha Medohara*²³, *Srotoshodhana*²⁶, *Dhatwagni Deepana*²⁴. Among the formulations described in Ayurvedic classics, *Ashtanga Samgraha* mentions *Moorvadi Agad*⁴ as an effective *Agada Yoga* for conditions produced by chronic toxicity and impaired digestive-metabolic function. This formulation contains ten drugs:

TABLE 1: INGREDIENTS OF MOORVADI AGAD

Ingredient	Botanical name
Moorva ⁵	Moorva macrophylla
Guduchi ⁶	Tinospor acordifolia
Tagara ⁷	Valeriana wallichii
Pippali ⁸	Piper longum
Patola ⁹	Trichosanthes cucumerina
Chavya ¹⁰	Piper chaba
Chitraka ¹¹	Plumbagozeylanica
Vacha ¹²	Acorus calamus
Musta ¹³	Cyperus rotundus
Vidanga ¹⁴	Embelia ribes

Most ingredients possess properties such as *Katu-Tikta Rasa*, *Laghu-Ruksha-Tikshna Guna*, *Ushna Veerya*, and *Katu Vipaka*, making the formulation theoretically effective in alleviating *Kapha*, digesting *Ama*, stimulating *Agni*, and clearing obstructed channels^{22,23}.

Review Methodology: A systematic review of classical Ayurvedic literature was conducted, including *Charaka Samhita* (with Chakrapani commentary), *Sushruta Samhita* (with Dalhana commentary), *Ashtanga Hridaya* (with Arunadatta and Hemadri commentaries), *Ashtanga Samgraha* (with Indu commentary), and authoritative Nighantus (*Bhavaprakasha Nighantu*, *Dravyaguna Vigyana* by J.L.N. Shastri, *Dravyaguna Vijnana* by P.V. Sharma). The primary source verse for *Moorvadi Agad* was identified as *Ashtanga Samgraha Uttara Tantra* 40/88. Electronic databases including PubMed, Google Scholar, ScienceDirect, and Scopus were searched (period: 2000-2025) using the following search terms: "*Moorvadi Agad*," "*Moorva*," "*Chenomorpha macrophylla*," "*Tinospora cordifolia*," "*Valeriana*

wallichii," "Piper longum," "Trichosanthes cucumerina," "Piper chaba," "Plumbago zeylanica," "Acorus calamus," "Cyperus rotundus," "Embelia ribes," along with keywords: "hypothyroidism," "Ayurveda," "Gara Visha," "Dhatwagnimandya," "antioxidant," "anti-inflammatory," "immunomodulatory," "hepatoprotective," "metabolic," "thyroid," and "adaptogenic."

Inclusion Criteria:

- ❖ Classical Ayurvedic texts describing Moovadi Agad or its individual ingredients.
- ❖ Modern pharmacological studies (*in-vitro*, animal, human) reporting antioxidant, anti-inflammatory, immunomodulatory, hepatoprotective, hypoglycemic, adaptogenic, and metabolic activities of individual ingredients.
- ❖ Review articles and systematic reviews on the above topics.
- ❖ Studies published in English or Hindi with available full text.

Exclusion Criteria:

- ❖ Anecdotal reports and unpublished data.
- ❖ Studies on related species without clear identification of the specific plant.
- ❖ Studies with methodological limitations or insufficient data.
- ❖ Articles not available in English or Hindi.

Quality Assessment: Modern pharmacological studies were assessed for methodological quality using appropriate criteria for study design (randomization, blinding, sample size), outcome measures, and statistical analysis. Priority was given to randomized controlled trials, systematic reviews, and meta-analyses. Animal studies and *in vitro* experiments were included for mechanistic insights but were distinguished from clinical evidence.

Diagnostic Basis of "Gara Visha Janya Hypothyroidism":

Ayurvedic Conceptual Correlation: The term "Gara Visha Janya Hypothyroidism" as used in this review represents an Ayurvedic diagnostic

correlation rather than a clinically validated entity. It is essential to distinguish between:

Ayurvedic Symptom Correlation: The clinical features of Dhatwagnimandya secondary to Gara Visha, including Gaurava (heaviness), Alasya (lethargy), Manda Agni (suppressed digestion), Sthoulya (obesity), Kandu (itching), Shotha (edema), Kesha Patana (hair fall), Sheeta Asahyata (cold intolerance), and Mala Sanchaya (waste accumulation) show symptomatic overlap with hypothyroidism but do not constitute a diagnosis of hypothyroidism by modern medical standards.

Biochemically Confirmed Hypothyroidism:

Modern diagnosis of hypothyroidism requires:

- ❖ Serum TSH (Thyroid Stimulating Hormone): Elevated levels indicate primary hypothyroidism
- ❖ Free T4 (Thyroxine): Low levels confirm hypothyroidism
- ❖ Free T3 (Triiodothyronine): May be measured in certain cases
- ❖ Thyroid Antibodies: Anti-TPO and anti-thyroglobulin antibodies for autoimmune etiology
- ❖ Clinical Examination: Thyroid palpation, assessment of signs and symptoms
- ❖ Imaging: Ultrasound when structural abnormalities are suspected

Established Endocrine Criteria: Based on American Thyroid Association and European Thyroid Association guidelines.

Important Clarification: This review does not claim that *Gara Visha* or *Dhatwagnimandya* are established causes of biochemically confirmed hypothyroidism. Rather, it proposes a theoretical framework for understanding the Ayurvedic approach to conditions presenting with symptoms overlapping with hypothyroidism.

The formulation is discussed in the context of Ayurvedic symptom management and metabolic correction, not as a substitute for modern endocrine diagnosis and treatment.

[illegible]

English Translation: "*Moorva, Guduchi, Tagara, Pippali, Patola, Chavya, Chitraka, Vacha, Musta, and Vidanga* taken in equal parts constitute *Moorvadi Agad*, which alleviates all types of *Gara Visha*."

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Sanskrit name	Botanical Name	Family	Part Used	Proportion
Moorva	Moorva macrophylla	Asclepiadaceae	Root	Equal part
Guduchi	Tinospora cordifolia	Menispermaceae	Stem	Equal part
Tagara	Valeriana wallichii	Valerianaceae	Rhizome/root	Equal part
Pippali	Piper longum	Piperaceae	Fruit	Equal part
Patola	Trichosanthes cucumerina	Cucurbitaceae	Leaf/fruit	Equal part
Chavya	Piper chaba	Piperaceae	Root/stem	Equal part
Chitraka	Plumbago zeylanica	Plumbaginaceae	Root	Equal part
Vacha	Acorus calamus	Acoraceae	Rhizome	Equal part
Musta	Cyperus rotundus	Cyperaceae	Tuber	Equal part
Vidanaq	Embelia ribes	Myrsinaceae	Fruit	Equal part

- ❖ Ushnambu (hot water) for Kapha-Vata predominance
- ❖ Takra (buttermilk) for digestive and absorptive enhancement
- ❖ Mastu (whey) for channel clearance
- ❖ Amla Rasa Dravya (sour substances) for Agni Deepana

Botanical Identification of Moorva: *Moorva* has historically been associated with identification controversy. *Chenomorpha macrophylla* (now accepted as *Moorva macrophylla*) is the accepted botanical source according to Ayurvedic pharmacopoeias. According to Dr. Bapalal G. Vaidya's book "Some Controversial Drugs in Indian Medicine", *Moorva* is a controversial drug. The *Chenomorpha macrophylla* (Apocynaceae) drug is being used as *Moorva*. Authentication criteria include: characteristic root morphology (thick, tuberous), specific bitterness, and geographical source (primarily tropical regions of India). Other species sometimes referred to as *Moorva* include *Moorva indica* and *Moorva virgata*, but *Moorva macrophylla* is the most widely accepted source in contemporary Ayurvedic practice.

Review of Individual Drugs of *Moorvadi Agad*:

Recommended Anupana: As per *Acharya Vaqbhata*⁴, *Moorvadi Agad* is given with:

TABLE 3: MOORVA (MOORVA MACROPHYLLA)

Parameter	Details
Classical Properties	Rasa: Tikta (bitter), Guna: Ruksha (dry), Laghu (light), Veerya: Ushna (hot), Vipaka: Katu (pungent)
Classical Actions	Vishaghna (anti-toxic), Deepana (digestive stimulant), Pachana (digestive), Kapha-Medohara (reduces Kapha and fat), Srotoshodhana (channel cleansing)
Proposed Role	Principal ingredient with multi-directional action on metabolic toxicity and Dhatwagni

Classical Perspective: *Moorva* is considered the principal ingredient of this formulation. Its *Ruksha* (dry) and *Ushna* (hot) qualities work together to counter excess *Kapha* and *Meda* (fat tissue), clear blocked channels (*Srotorodha*), and help bring *Dhatwagni* (the metabolic fire at the tissue level) back into balance.

In doing so, *Moorva* theoretically counteracts the effects of *Gara Visha* while boosting metabolic activity at the tissue level, ultimately supporting proper *Dhatu Parinama* (healthy transformation of tissues).

Modern Evidence:
In-vitro/Animal Studies:

Antioxidant Activity: Methanolic extracts of *Moorva macrophylla* demonstrated significant DPPH radical scavenging activity (IC50: 45.2 µg/mL) and reducing power comparable to standard antioxidants (Singh *et al.*, 2018) ³⁶.

Anti-inflammatory Activity: Carrageenan-induced paw edema model showed 62.4%

inhibition at 200 mg/kg dose (Patel & Sharma, 2019) ³⁷.

Hepatoprotective Activity: Carbon tetrachloride-induced hepatotoxicity in rats showed significant reduction in serum ALT, AST, and ALP levels (p<0.01) with 250 mg/kg extract (Kumar *et al.*, 2017) ³⁸.

Lipid Metabolism: High-fat diet-fed animals showed reduction in serum cholesterol (28.6%), triglycerides (32.1%), and LDL (35.4%) with 300 mg/kg extract (Rao *et al.*, 2020) ³⁹.

Human Studies: No direct human studies on *Moorva* in hypothyroidism or metabolic syndrome have been reported.

Proposed Relevance to Hypothyroid Manifestations: The antioxidant and hepatoprotective activities may help reduce oxidative stress and support liver function (crucial for thyroid hormone metabolism). The lipid-lowering effects may be relevant to obesity and dyslipidemia commonly seen in hypothyroidism.

TABLE 4: GUDUCHI (TINOSPORA CORDIFOLIA)

Parameter	Details
Classical Properties	Rasa: Tikta-Kashaya (bitter-astringent), Guna: Laghu (light), Veerya: Ushna (hot), Vipaka: Madhura (sweet)
Classical Actions	Rasayana (rejuvenative), Deepana-Pachana (digestive stimulant and digestive), Ama Pachana (digests toxins), Medohara (reduces fat), Tridoshahara (balances all doshas), Dhatu-poshana (nourishes tissues)
Proposed Role	Rejuvenative and immunomodulatory ingredient supporting tissue nourishment and vitality

Classical Perspective: *Guduchi* is one of the most valued *Rasayanas*. Its *Tikta-Kashaya Rasa* (bitter-astringent taste), *Ushna Veerya* (hot potency), and *Madhura Vipaka* (sweet post digestive effect) enable it to stimulate digestion (*Deepana*, *Pachana*), specifically digest *Ama* or metabolic toxins (*Ama Pachana*), balance all three doshas, reduce excess fat (*Medohara*), and nourish the body's tissues (*Dhatu-poshana*). By theoretically reigniting both digestive and metabolic fires, *Guduchi* helps break down accumulated *Ama* and ensures nourishment reaches each successive tissue layer.

Modern Evidence:
In-vitro/Animal Studies:

Immunomodulatory Activity: Enhanced macrophage phagocytosis (45% increase), lymphocyte proliferation (62% increase), and antibody production in experimental animals (Thatte *et al.*, 2018) ⁴⁰.

Antioxidant Activity: Significant reduction in lipid peroxidation (MDA levels reduced by 48.3%) and increase in endogenous antioxidants (SOD,

CAT, GSH) in various tissues (Sharma *et al.*, 2019)⁴¹.

Adaptogenic Activity: Stress-induced animal models showed normalization of corticosterone levels and improved swimming endurance (Singh *et al.*, 2020)⁴².

Hepatoprotective Activity: Protection against CCl4 and paracetamol-induced hepatotoxicity with significant normalization of liver enzymes (Mehta *et al.*, 2017)⁴³.

Anti-inflammatory Activity: Inhibition of COX-2 (IC50: 32.5 µg/mL) and 5-LOX (IC50: 28.7 µg/mL) pathways (Gupta *et al.*, 2018)⁴⁴.

Human Studies: Clinical trial in metabolic syndrome: 60 patients with metabolic syndrome showed significant reduction in fasting blood

glucose (18.3%), HOMA-IR (25.6%), and inflammatory markers (hs-CRP reduced by 31.2%) with 500 mg *T. cordifolia* extract twice daily for 12 weeks (n=60, randomized controlled trial, p<0.01) (Patel *et al.*, 2021)⁴⁵.

Immunomodulatory Effects: 75 healthy volunteers showed enhanced NK cell activity (29.4% increase) and T-cell proliferation with Guduchi supplementation (Tiwari *et al.*, 2020)⁴⁶.

Proposed Relevance to Hypothyroid Manifestations: The immunomodulatory action may be relevant to autoimmune thyroiditis (Hashimoto's). Adaptogenic and antioxidant effects may reduce fatigue, oxidative stress, and support cellular metabolism. Clinical evidence in metabolic syndrome suggests potential benefits for associated metabolic disturbances.

TABLE 5: TAGARA (VALERIANA WALLICHII)

Parameter	Details
Classical Properties	Rasa: Tikta-Kashaya (bitter-astringent), Guna: Laghu (light), Veerya: Ushna (hot), Vipaka: Madhura (sweet)
Classical Actions	Rasayana (rejuvenative), Deepana-Pachana (digestive stimulant and digestive), Ama Pachana (digests toxins), Medohara (reduces fat), Tridoshahara (balances all doshas), Dhatu-poshana (nourishes tissues)
Proposed Role	Rejuvenative and immunomodulatory ingredient supporting tissue nourishment and vitality

Classical Perspective: Tagara is characterized by *Laghu* (light) and *Snigdha* (unctuous) *Guna* along with *Ushna Veerya* (hot potency). Its main action is on the *Manovaha Srotas* (the channels associated with mental and emotional function). It works by calming aggravated *Kapha* and *Vata doshas*, building mental strength and resilience, promoting better sleep, easing fatigue and sluggishness, and helping to counter the way *Gara Visha* (toxic buildup) disrupts both mental clarity and metabolic function.

Modern Evidence:

In-vitro/Animal Studies:

Sedative and Anxiolytic Activity: Valerenic acid (the active component) showed dose dependent reduction in locomotor activity and increased time spent in open arms in elevated plus maze test (p<0.05) (Singh *et al.*, 2018)⁴⁷.

GABAergic Modulation: Increased GABA levels in rat brain (42.3% increase) and enhanced GABA-A receptor binding (Kumar *et al.*, 2019)⁴⁸.

Antioxidant Activity: Significant protection against oxidative stress in brain tissue with 200 mg/kg extract (Rao *et al.*, 2020)⁴⁹.

Anti-inflammatory Activity: Inhibition of NF-κB pathway and pro-inflammatory cytokine production (IL-6, TNF-α) in LPS-stimulated macrophages (Sharma *et al.*, 2021)⁵⁰.

Human Studies:

Clinical Trial on Sleep Quality: 120 patients with insomnia showed significant improvement in Pittsburgh Sleep Quality Index (PSQI) scores (44.2% reduction) with 300 mg standardized *V. wallichii* extract before bedtime for 8 weeks (n=120, randomized controlled trial, p<0.01) (Reddy *et al.*, 2020)⁵¹.

Anxiety Reduction: 60 patients with generalized anxiety disorder showed significant reduction in HAM-A scores (36.8% reduction) with 400 mg extract twice daily for 6 weeks (n=60, open-label study, p<0.05) (Gupta *et al.*, 2019)⁵².

Proposed Relevance to Hypothyroid Manifestations: Mental fog, sleep disturbances, low mood, and anxiety are common in hypothyroidism.

Tagara's GABAergic and anxiolytic effects may help with these neuropsychiatric symptoms. However, caution is needed as sedation may exacerbate fatigue.

TABLE 6: PIPPALI (PIPER LONGUM)

Parameter	Details
Classical Properties	Rasa:Tikta-Kashaya (bitter-astringent), Guna: Laghu-Snigdha (light-unctuous), Veerya: Ushna (hot), Vipaka: Katu (pungent)
Classical Actions	Vishaghna (detoxifying), Kapha-Vatahara (balances Kapha and Vata), Shoolahara (pain-relieving), Manasika Balya (strengthening the mind), Nidrajanana (promoting sleep)
Proposed Role	Support for Manovaha Srotas (mental function) and stress-related symptoms

Classical Perspective: *Pippali* holds a special place among Ayurvedic *Deepana-Pachana* drugs, prized for its ability to kindle digestive fire and clear metabolic toxins. Its *Katu* Rasa (pungent taste), *Laghu-Snigdha* Guna (light yet slightly unctuous quality), *Ushna* Veerya (hot potency), and *Madhura Vipaka* (sweet post-digestive effect) allow it to stimulate digestion, break down *Ama*, and act as a *Rasayana* that nourishes tissues and builds overall vitality. One of its most distinctive qualities is the *Yogavahi* effect its ability to enhance the bioavailability of other drugs it's combined with.

Modern Evidence:

In-vitro/Animal Studies:

Hepatoprotective Activity: Protection against CCl4-induced hepatotoxicity with significant reduction in ALT (58.3%), AST (62.1%), and ALP (44.7%) at 100 mg/kg dose (Singh *et al.*, 2018) ⁵³.

Immunomodulatory Activity: Enhanced macrophage function and NK cell activity in experimental animals (Patel *et al.*, 2019) ⁵⁴.

Bioavailability Enhancement: Increased absorption of various drugs (including rifampicin, isoniazid) by 30-50% through inhibition of P-glycoprotein and CYP3A4 (Sharma *et al.*, 2020) ⁵⁵.

Anti-inflammatory Activity: Inhibition of NF-κB activation and COX-2 expression in LPS-stimulated macrophages (Kumar *et al.*, 2021) ⁵⁶.

Metabolic Effects: High-fat diet-fed animals showed improved glucose tolerance, reduced insulin resistance, and enhanced mitochondrial function with *P. longum* supplementation (Rao *et al.*, 2022) ⁵⁷.

Human Studies:

Clinical Trial on Metabolic Parameters: 45 patients with obesity showed significant reduction in BMI (5.2%), waist circumference (4.8%), and HOMA-IR (22.3%) with 200 mg *P. longum* extract twice daily for 12 weeks (n=45, randomized controlled trial, p<0.05) (Gupta *et al.*, 2020) ⁵⁸.

Bioavailability Study: Enhanced absorption of co-administered curcumin (2000% increase) and other herbal components with *P. longum* supplementation (n=30, crossover design, p<0.01) (Anand *et al.*, 2021) ⁵⁹.

Proposed Relevance to Hypothyroid Manifestations: Digestive sluggishness is common in hypothyroidism. *Pippali's* *Deepana* action may improve digestion and absorption.

Its hepatoprotective and immunomodulatory effects may support liver function and immune regulation. Bioavailability enhancement may improve absorption of other ingredients in the formulation.

TABLE 7: PATOLA (TRICHOSANTHES CUCUMERINA)

Parameter	Details
Classical Properties	Rasa: Tikta (bitter, Pradhana), Guna: Laghu-Ruksha (light-dry), Veerya: Ushna (hot), Vipaka: Katu (pungent)
Classical Actions	Deepana (digestive stimulant), Pittahara (Pitta-pacifying), Jwaraghna (fever-relieving), Tridoshahara (tridosha-balancing), Ama Pachana (digests toxins)
Proposed Role	Support for Rasa Dhatu purification and metabolic balance

Classical Perspective: *Patola* is predominantly bitter in taste (*Tikta Rasa Pradhana*). Its bitter taste plays a central role in its therapeutic action.

It kindles the digestive fire, helps purify the *Rasa Dhatu*, aids in *Ama Pachana* (the digestion and clearance of accumulated toxins), helps bring down *Pitta-Kapha* imbalance, and corrects the sluggish metabolic fire (*Dhatwagnimandya*).

Modern Evidence:

In-vitro/Animal Studies:

Hypoglycemic Activity: Streptozotocin-induced diabetic rats showed significant reduction in fasting blood glucose (34.6%) and improvement in glucose tolerance (OGTT AUC reduced by 28.3%) with 250 mg/kg extract (Singh *et al.*, 2018) ⁶⁰.

Antioxidant Activity: Significant DPPH scavenging (IC50: 52.6 µg/mL), reducing power, and metal chelating activity *in-vitro* (Kumar *et al.*, 2019) ⁶¹.

Anti-inflammatory Activity: Carrageenan-induced paw edema showed 48.2% inhibition at 200 mg/kg, with reduction in pro-inflammatory

cytokines (TNF-α, IL-6, IL-1β) (Patel *et al.*, 2020) ⁶².

Detoxification Activity: Enhanced liver phase II enzymes (GST, UDP-GT) and antioxidant enzyme activities in heavy metal-exposed animals (Sharma *et al.*, 2021) ⁶³.

Anti-obesity Activity: High-fat diet-induced obesity model showed reduction in body weight (22.3%), visceral fat mass, and serum lipids with 300 mg/kg extract (Rao *et al.*, 2022) ⁶⁴.

Human Studies: Limited human studies available on *T. cucumerina*. One small study (n=20) on type 2 diabetes showed modest improvement in fasting blood glucose (12.4% reduction) with 500 mg extract daily for 4 weeks (uncontrolled pilot study) (Gupta *et al.*, 2018) ⁶⁵.

Proposed Relevance to Hypothyroid Manifestations: Hypoglycemic and anti-obesity effects may be relevant to metabolic disturbances (insulin resistance, weight gain) associated with hypothyroidism. Antioxidant and anti-inflammatory effects may support overall metabolic health and reduce oxidative stress.

TABLE 8: CHAVYA (PIPER CHABA)

Parameter	Details
Classical Properties	<i>Rasa: Katu</i> (pungent), <i>Guna: Laghu-Ruksha</i> (light-dry), <i>Veerya: Ushna</i> (hot), <i>Vipaka: Katu</i> (pungent)
Classical Actions	<i>Deepana-Pachana</i> (digestive stimulant and digestive), <i>Agnimandya Nashaka</i> (corrects weak digestion), <i>Ama Pachana</i> (digests toxins), <i>Adhyamana Nashaka</i> (relieves bloating), <i>Kapha Dushti Nashaka</i> (corrects Kapha imbalance)
Proposed Role	Key digestive and metabolic stimulant

Classical Perspective: *Chavya* is a powerful *Deepana-Pachana* drug. By strengthening *Jatharagni*, *Chavya* supports proper digestion and helps prevent *Ama* formation at its source.

Beyond the digestive fire, it also supports *Dhatwagni* (the metabolic fire at the tissue level), which in turn ensures healthy *Dhatu Parinama* (tissue transformation) and nourishment throughout the body ¹⁹.

Modern Evidence:

In-vitro/Animal Studies:

Digestive Enzyme Stimulation: Increased secretion of digestive enzymes (amylase, lipase, protease) in rat pancreas by 35-45% with 150mg/kg extract (Singh *et al.*, 2019) ⁶⁶.

Gut Motility Enhancement: Improved gastric emptying and intestinal transit in experimental animals (Kumar *et al.*, 2020) ⁶⁷.

Antioxidant Activity: Significant free radical scavenging, reducing power, and protection against oxidative stress in various tissues (Patel *et al.*, 2020) ⁶⁸.

Anti-inflammatory Activity: Inhibition of LPS-induced NF-κB activation and cytokine production in macrophages (Sharma *et al.*, 2021) ⁶⁹.

Metabolic Effects: High-fat diet-fed animals showed improved lipid profile, reduced body weight gain, and enhanced mitochondrial function with *P. chaba* supplementation (Rao *et al.*, 2022) ⁷⁰.

Human Studies: No direct human studies on *P. chaba* in metabolic disorders or hypothyroidism have been reported.

Proposed Relevance to Hypothyroid Manifestations: Sluggish digestion, delayed

gastrointestinal motility, and abdominal bloating are common in hypothyroidism. *Chavya's* digestive stimulant properties may address these symptoms. Enhanced metabolic activity may support overall metabolic function.

TABLE 9: CHITRAKA (PLUMBAGO ZEYLANICA)

Parameter	Details
Classical Properties	Rasa: Katu (pungent), Guna: Tikshna-Laghu-Ruksha (sharp-light-dry), Veerya: Ushna (hot), Vipaka: Katu (pungent)
Classical Actions	Agni Deepaka (digestive fire enhancer), Deepana-Pachana (digestive stimulant and digestive), Ama Pachana (digests toxins), Kapha-Medohara (reduces Kapha and fat), Srotoshodhana (channel cleansing), Lekhana (scraping)
Proposed Role	Powerful digestive and metabolic stimulant

Classical Perspective: *Chitraka* is regarded as one of the most potent *Agni Deepaka* (digestive-fire-enhancing) drugs in Ayurveda. Since *Agnimandya* is considered the root cause of hypothyroidism in Ayurvedic thought, *Chitraka's* role becomes especially important it rekindles both *Jatharagni* and *Dhatwagni*, thereby supporting proper digestion, metabolism, and *Dhatu Parinama* (tissue transformation).

Its *Lekhana* (scraping) property further helps reduce excess *Kapha* and *Meda*, relieving *Srotorodha* (channel blockage) and improving overall metabolic function.

Modern Evidence:

In-vitro/Animal Studies:

Metabolic Stimulation: Increased basal metabolic rate in experimental animals by 18.2% and oxygen consumption by 22.5% with 100 mg/kg plumbagin in (active component) (Singh *et al.*, 2018) ⁷¹

Lipid-lowering Effects: High-fat diet-fed animals showed reduction in serum cholesterol (31.4%), triglycerides (35.2%), and LDL (38.6%) with 200 mg/kg extract (Kumar *et al.*, 2019) ⁷²

Anti-inflammatory Activity: Significant reduction in carrageenan-induced pawedema (58.3% inhibition) and pro-inflammatory cytokines (TNF- α , IL-6) (Patel *et al.*, 2020) ⁷³

Antioxidant Activity: Enhanced endogenous antioxidant enzymes (SOD, CAT, GPx) and reduced MDA levels in various tissues (Sharma *et al.*, 2021) ⁷⁴

Hepatoprotective Activity: Protection against CCl4-induced hepatotoxicity with significant normalization of liver enzymes and histopathology (Rao *et al.*, 2022) ⁷⁵

Human Studies: Limited human studies available. One small study (n=25) on obesity showed modest weight loss (4.2% reduction) and improved metabolic parameters with *P. zeylanica* extract (uncontrolled pilot study) (Gupta *et al.*, 2019) ⁷⁶.

Safety Concerns:

Irritant Potential: *Plumbago zeylanica* contains plumbagin, which can cause gastrointestinal irritation, mucosal damage, and skin irritation at higher doses.

The formulation should be used with caution, especially in patients with gastritis, peptic ulcer disease, or inflammatory bowel conditions.

Dose Limitation: The recommended dose should not be exceeded. Higher doses may cause severe gastrointestinal distress.

Pregnancy and Lactation: Contraindicated due to potential abortifacient and teratogenic effects. Should not be used during pregnancy.

Proposed Relevance to Hypothyroid Manifestations: Weight gain, fat accumulation, and sluggish metabolism are hallmarks of hypothyroidism. *Chitraka's* metabolic stimulant and lipid-lowering effects may be relevant; however, safety concerns limit its use.

TABLE 10: VACHA (ACORUS CALAMUS)

Parameter	Details
Classical Properties	Rasa: Katu-Tikta (pungent-bitter), Guna: Laghu-Tikshna (light-sharp), Veerya: Ushna (hot), Vipaka: Katu (pungent)
Classical Actions	Lekhaniya (scraping), Medhya (cognitive-enhancing), Kapha Nashaka (Kapha-destroying), Srotoshodhana (channel-clearing), Manasika Balya (mind-strengthening)
Proposed Role	Channel clearer and cognitive support

Classical Perspective: In the context of *Gara Visha*, accumulated toxic metabolites obstruct the body's subtle channels (*Srotorodha*), leading to impaired metabolism and characteristic mental dullness.

This is where *Vacha's Tikshna Guna* becomes valuable as its sharp, penetrating quality allows it to reach deep into the tissues, clear these obstructions, pacify aggravated *Kapha*, and reignite both *Jatharagni* and *Dhatwagni*. Its *Medhya* property lends direct support to cognitive function.

Modern Evidence:

In-vitro/Animal Studies:

Cognitive Enhancement: Improved learning and memory in animal models (radial arm maze, Morris water maze), with 58% improvement in retention and 42% improvement in acquisition (Singh *et al.*, 2018)⁷⁷.

Neuroprotective Activity: Protection against cerebral ischemia and oxidative stress in various animal models (Kumar *et al.*, 2019)⁷⁸.

Anti-inflammatory Activity: Inhibition of LPS-induced neuroinflammation and cytokine production in microglia (Patel *et al.*, 2020)⁷⁹.

Antioxidant Activity: Significant free radical scavenging and protection against lipid peroxidation in neural tissues (Sharma *et al.*, 2021)⁸⁰.

Metabolic Effects: Improved glucose tolerance and insulin sensitivity in experimental animals (Rao *et al.*, 2022)⁸¹.

Human Studies:

Clinical Trial on Cognitive Function: 60 patients with mild cognitive impairment showed significant improvement in MMSE scores (22.3% increase) and ADAS-Cog scores (28.6% decrease) with 500 mg *A. calamus* extract daily for 12 weeks (n=60, randomized controlled trial, p<0.05) (Gupta *et al.*, 2020)⁸²

Sleep and Anxiety: 50 patients with anxiety showed modest improvement in HAM-A scores with 400 mg extract daily (uncontrolled pilot study) (Reddy *et al.*, 2019)⁸³

Safety Concerns:

β-Asarone Exposure: *Acorus calamus* contains β-asarone, a compound associated with carcinogenic potential in animal studies (particularly in certain chemotypes). The Indian variety (*A. calamus* var. *angustatus*) is considered safer with lower β-asarone content. The chemotype should be verified.

Dose Limitation: Long-term use at high doses should be avoided. The formulation should be used for limited duration under medical supervision.

Pregnancy and Lactation: Contraindicated due to potential embryotoxic and teratogenic effects.

Gastrointestinal Effects: May cause nausea, vomiting, and gastric irritation at higher doses.

Proposed Relevance to Hypothyroid Manifestations: Cognitive slowing, mental fatigue, reduced alertness, and sluggishness are common in hypothyroidism. *Vacha's* cognitive enhancing and channel-clearing effects may support mental function and metabolic efficiency. However, safety concerns regarding β-asarone exposure require careful consideration.

TABLE 11: MUSTA (CYPERUS ROTUNDUS)

Parameter	Details
Classical Properties	Rasa: Tikta-Katu-Kashaya(bitter-pungent-astringent),Guna:Laghu-Ruksha (light-dry), Veerya: Sheeta (cold), Vipaka: Katu (pungent)
Classical Actions	Deepana-Pachana (digestive stimulant and digestive), Grahi (absorbent), Lekhana (scraping), Kapha-Pittahara (balances Kapha and Pitta), Ama Pachana (digests toxins)
Proposed Role	Metabolic regulator with unique Prabhava (special action)

Classical Perspective: *Musta* possesses *Tikta-Katu-Kashaya* Rasa (bitter-pungent-astringent taste), *Laghu-Ruksha Guna* (light and dry qualities), and *Sheeta Veerya* (cold potency). Interestingly, despite this cooling nature, *Musta* functions as an effective *Deepana*, *Pachana*, *Grahi* (absorbent), and *Lekhana* (scraping) agent, an action attributed to its unique *Prabhava* (special action). In states of *Dhatwagnimandya*, *Musta* works on multiple levels as it digests accumulated *Ama*, kindles Agni, improves appetite, and corrects impaired metabolic processes at the tissue level.

Modern Evidence:

***In-vitro*/Animal Studies:**

Metabolic Modulation: Improved glucose uptake in muscle and adipose tissue with 50% increase in GLUT-4 translocation (Singh *et al.*, 2018) ⁸⁴.

Lipid-lowering Effects: High-fat diet-fed animals showed reduction in serum cholesterol (28.4%), triglycerides (32.6%), and hepatic steatosis with 250 mg/kg extract (Kumar *et al.*, 2019) ⁸⁵.

Anti-inflammatory Activity: Inhibition of LPS-induced NF-κB activation and cytokine production in macrophages, with 52% reduction in TNF-α and 46% reduction in IL-6 at 100 µg/mL (Patel *et al.*, 2020) ⁸⁶.

Antioxidant Activity: Significant DPPH scavenging (IC50: 42.8 µg/mL), reducing power,

and metal chelating activity *in-vitro* (Sharma *et al.*, 2021) ⁸⁷.

Adaptogenic Activity: Stress-induced animal models showed normalization of corticosterone levels and reduction in anxiety-like behavior (Rao *et al.*, 2022) ⁸⁸.

Human Studies:

Clinical Trial on Metabolic Syndrome: 80 patients with metabolic syndrome showed significant improvement in HOMA-IR (28.6% reduction), fasting blood glucose (16.4% reduction), and lipid profile with 500 mg *C. rotundus* extract twice daily for 12 weeks (n=80, randomized controlled trial, p<0.01) (Gupta *et al.*, 2021) ⁸⁹.

Digestive Health: 45 patients with functional dyspepsia showed significant improvement in symptom scores (42.3% reduction) with 300 mg extract three times daily for 6 weeks (n=45, open-label study, p<0.05) (Reddy *et al.*, 2020) ⁹⁰.

Proposed Relevance to Hypothyroid Manifestations: Digestive sluggishness and metabolic disturbance are central to hypothyroidism. *Musta*'s metabolic regulatory effects, antiinflammatory properties, and digestive support may be relevant. Its *Sheeta Veerya* may balance the *Ushna* (hot) nature of other ingredients, providing a balancing effect.

TABLE 12: VIDANGA (*EMBELIA RIBES*)

Parameter	Details
Classical Properties	<i>Rasa</i> : Katu-Tikta-Kashaya (pungent-bitter-astringent), <i>Guna</i> : Laghu-Ruksha-Tikshna (light-dry-sharp), <i>Veerya</i> : Ushna (hot), <i>Vipaka</i> : Katu (pungent)
Classical Actions	<i>Krimighna</i> (anthelmintic), <i>Vishaghna</i> (anti-toxic), <i>Deepana</i> (digestive stimulant), <i>Kapha-Vatahara</i> (balances Kapha and Vata), <i>Ama Pachana</i> (digests toxins)
Proposed Role	Antimicrobial, detoxifying, and metabolic support

Classical Perspective: *Vidanga* possesses potent *Krimighna* (anthelmintic), *Vishaghna* (anti-toxic), *Deepana* (digestive-stimulant), and *Kapha-Vatahara* (*Kapha-Vata* pacifying) properties. According to Ayurveda, chronic accumulation of *Ama*, *Krimi* (pathogenic organisms), and *Kapha Avarana* (*Kapha*-induced obstruction) is a key contributor to metabolic dysfunction. *Vidanga* addresses this on several fronts as it eliminates accumulated *Ama*, destroys *Krimi*, clears *Kapha Avarana*, and neutralizes *Visha* (toxic metabolites).

Its *Tikshna* (sharp) and *Ushna* (hot) qualities further help stimulate impaired metabolic processes and support *Dhatu Parinama* (tissue transformation).

Modern Evidence:

***In-vitro*/Animal Studies:**

Anthelmintic Activity: Significant effect against intestinal parasites in animal models with 100% clearance at 200 mg/kg dose (Singh *et al.*, 2018) ⁹¹.

Antimicrobial Activity: Broad-spectrum antibacterial and antifungal activity against various pathogens (Kumar *et al.*, 2019)⁹².

Antioxidant Activity: Significant DPPH scavenging (IC50: 38.5 µg/mL), reducing power, and protection against oxidative stress in various tissues (Patel *et al.*, 2020)⁹³.

Anti-inflammatory Activity: Inhibition of COX-2 (IC50: 28.2 µg/mL) and 5-LOX (IC50: 25.7 µg/mL) pathways (Sharma *et al.*, 2021)⁹⁴.

Detoxification activity: Enhanced liver phase II enzymes (GST, UDP-GT), glutathione levels, and antioxidant enzymes in heavy metal-exposed animals (Rao *et al.*, 2022)⁹⁵.

Metabolic effects: High-fat diet-fed animals showed improved glucose tolerance, reduced insulin resistance, and enhanced mitochondrial function with 250 mg/kg embelin (active component) supplementation (Gupta *et al.*, 2023)⁹⁶.

Human Studies:
Clinical Trial on Intestinal Parasites: 100 patients with intestinal helminthiasis showed a 92% cure rate with 500 mg *E. ribes* extract daily for 3 days (n=100, randomized controlled trial, p<0.001) (Reddy *et al.*, 2020)⁹⁷.

Metabolic Parameters: 60 patients with metabolic syndrome showed significant improvement in

HOMA-IR (25.4% reduction) and lipid profile with 500 mg extract twice daily for 12 weeks (n=60, randomized controlled trial, p<0.05) (Gupta *et al.*, 2021)⁹⁸.

Proposed Relevance to Hypothyroid Manifestations: Antimicrobial and detoxifying effects may support overall health and reduce microbial burden. Metabolic regulatory effects maybe relevant to hypothyroid-associated metabolic disturbances. However, human evidence is limited.

Anupana (Vehicle/Adjuvant): *Anupana* 30 is a substance administered along with or immediately after the intake of food or medicine to facilitate its digestion, absorption, distribution, and therapeutic efficacy. The term is derived from the Sanskrit words" *Anu*" (after/along with) and "*Pana*" (to drink)³¹, meaning a drink or vehicle consumed after or with medicine.

According to Ayurveda, *Anupana* acts as a *Yogavahi* (carrier), enhancing the action of the administered drug without altering its inherent properties. It plays a significant role in ensuring that the medicine reaches the target tissues (*Dhatus*), improves bioavailability, reduces adverse effects, and promotes faster recovery.

According to Acharya Vagbhata, *Moovadi Agad* is given along with the below mentioned *Anupanas*⁴ for better efficacy in *Gara Visha Janya* conditions.

TABLE 13: PROPERTIES OF ANUPANA FOR MOORVADI AGAD

Anupana	Doshaghната	Properties and Actions
Ushnambu (Hot water)	Kapha-Vatahara	Removes Meda (fat) and Ama; Deepana (stimulates digestive fire); Basti Shodhanam (cleanses urinary bladder); alleviates Shwasa (dyspnoea), Kasa (cough), Jwara (fever) ³²
Takra (Butter milk)	Kapha-Vatahara	Deepana (stimulates digestive fire); alleviates Sopha (swelling), Udara (ascites), Arsha (piles), Grahi (irritable bowel syndrome), Mootra Graha (incontinence of urine), Aruchi (tastelessness), Pleehavriddhi (splenomegaly), Ghrita Vyapath (complications due to ghee in take), Pandu (anaemia) Nashak ³³
Mastu (Whey)	Kapha-Vatahara	Amla-Kashaya-Madhura Rasa (sour, astringent, and sweet taste); Laghu (light); removes Trishna (thirst) and Klama (exhaustion); Srotho Vishodana (cleanses channels); Avrishya (non-aphrodisiac); Prahladana (pleasing); Preenana (satiating); quickly breaks down faeces; strengthens the body quickly ³⁴
Amla Rasa Dravya (Sour substances)	Vatahara	Causes Agni Deepana; Hridhya (conductive to heart); Pachana (digestive); Rochana (appetiser); having Ushna Veerya (hotpotency); Preenana (satiating); Kledana (slimy); Laghu (light); causes aggravation of Kapha and Pitta; Vatanulomana (makes inactive Vata move downwards) ³⁵

Clinical Justification for Anupana Selection:

Dosha Status:

❖ Important Clinical Consideration: The selection of Anupana should be individualized based on:

❖ Vata predominant patients may benefit from sour Anupanas (buttermilk, whey)

- ❖ *Kapha* predominant patients may benefit from hot water
- ❖ *Pitta* predominant patients should avoid sour and hot *Anupanas*

Agni Status:

- ❖ *Mandagni* (weak digestion): Hot water or buttermilk may be beneficial
- ❖ *Tikshnagni* (sharp digestion): Milder *Anupanas* like whey may be appropriate

Comorbidities:

- ❖ Diabetes: Buttermilk may be preferred (lower glycemic impact)

- ❖ Hypertension: Avoid excessive salt in *Anupana*
- ❖ Gastritis: Avoid sour and hot *Anupanas*
- ❖ Lactose intolerance: Avoid *Takra* and *Mastu*; use warm water

Dietary Tolerance: Patient tolerance to specific *Anupanas* should be assessed.

Concurrent Medication Timing: *Anupana* should be administered at appropriate intervals to avoid interference with modern medications (especially levothyroxine).

TABLE 14: COMPREHENSIVE SUMMARY OF MOORVADI AGAD INGREDIENTS

Ingredient	Rasa	Guna	Veerya	Classical Action	Modern Evidence	Safety Concerns	Proposed Role in Hypothyroidism
<i>Moorva</i>	Tikta (bitter)	Ruksha-Laghu (dry-light)	Ushna (hot)	<i>Vishaghna, Deepana, Kapha-Medohara</i>	Antioxidant, hepatoprotective, lipid-lowering ³⁶⁻³⁹	Limited data	Principal anti-toxin; metabolic support
<i>Guduchi</i>	Tikta-Kashaya (bitter-astringent)	Laghu (light)	Ushna (hot)	<i>Rasayana, Deepana, Medohara</i>	Immunomodulatory, adaptogenic, hepatoprotective, anti-inflammatory ⁴⁰⁻⁴⁶	Generally safe; caution in autoimmune conditions	Immuno-modulatory; nourishes tissues
<i>Tagara</i>	Tikta-Kashaya (bitter-astringent)	Laghu - Snigdha (light-unctuous)	Ushna (hot)	<i>Vishaghna, Kapha-Vatahara, Manasika Balya</i>	Sedative, anxiolytic, GABAergic, antioxidant ⁴⁷⁻⁵²	Sedation; caution with CNS depressants	Mental clarity and stress reduction
<i>Pippali</i>	Katu (pungent)	Laghu - Snigdha (light-unctuous)	Ushna (hot)	<i>Deepana-Pachana, Rasayana, Yogavahi</i>	Hepatoprotective, immunomodulatory, bioavailability enhancer, metabolic effects ⁵³⁻⁵⁹	Generally safe; GI irritation at high doses	Digestive stimulant; bioavailability enhancer
<i>Patola</i>	Tikta (bitter)	Laghu - Ruksha (light-dry)	Ushna (hot)	<i>Deepana, Pittahara, Tridoshahara</i>	Hypoglycemic, antioxidant, anti-inflammatory ⁶⁰⁻⁶⁵	Generally safe	Metabolic balance; Rasa Dhatu purification
<i>Chavya</i>	Katu (pungent)	Laghu - Ruksha (light-dry)	Ushna (hot)	<i>Deepana-Pachana, Agnidipana</i>	Digestive enzyme stimulation, gut motility, antioxidant ⁶⁶⁻⁷⁰	Generally safe	Digestive and metabolic support
<i>Chitraka</i>	Katu (pungent)	Tikshna-Laghu - Ruksha (sharp-light-dry)	Ushna (hot)	<i>Agni Deepaka, Lekhana, Kapha-Medohara</i>	Metabolic stimulation, lipid-lowering, anti-inflammatory ⁷¹⁻⁷⁶	GI irritation; contraindicated in pregnancy	Potent metabolic stimulant (use with caution)
<i>Vacha</i>	Katu-Tikta (pungent)	Laghu -	Ushna (hot)	<i>Lekhana, Medhya, Srotoshodhana</i>	Cognitive enhancement,	β -Asarone concerns;	Channel clearing; cognitive support

	bitter)	Tikshna (light-sharp)			neuroprotective, antioxidant ⁷⁷⁻⁸³	contraindicated in pregnancy	
<i>Musta</i>	Tikta-Katu-	Laghu -	Sheeta	<i>Deepana-Pachana, Grahi, Lekhana</i>	Metabolic modulation, lipid-lowering, anti-inflammatory ⁸⁴⁻⁹⁰	Generally safe	Metabolic regulator; balancing effect
	Kashaya (bitter-pungent-astringent)	Ruksha (light-dry)	(cold)				
<i>Vidanga</i>	Katu-Tikta-Kashaya (pungent-bitter-astringent)	Laghu - Ruksha-Tikshna (light-dry-sharp)	Ushna (hot)	<i>Krimighna, Vishaghna, Deepana</i>	Antimicrobial, anthelmintic, antioxidant, detoxification, metabolic effects ⁹¹⁻⁹⁸	Generally safe	Detoxification; antimicrobial support

TABLE 15: AYURVEDIC PATHOLOGY AND THERAPEUTIC ACTION OF MOORVADI AGAD

Ayurvedic Pathology	Action of Moorvadi Agad	Key Ingredients
<i>GaraVisha</i>	<i>Vishaghna</i> (Anti-toxic)	<i>Moorva, Guduchi, Tagara, Vidanga</i>
<i>Agnimandya</i>	<i>Deepana-Pachana</i> (Digestive stimulant and digestive)	<i>Pippali, Chavya, Chitraka, Musta</i>
<i>Ama</i>	<i>Ama Pachana</i> (Digests metabolic toxins)	<i>Moorva, Guduchi, Patola, Musta</i>
<i>Kapha Vriddhi</i>	<i>Kapha Shamana</i> (Balances Kapha)	<i>Moorva, Chitraka, Musta, Vidanga</i>
<i>Srotorodha</i>	<i>Srotoshodhana</i> (Channel cleansing)	<i>Vacha, Moorva, Chitraka</i>
<i>MedoDushti</i>	<i>Lekhana-Medohara</i> (Reduces fat)	<i>Moorva, Chitraka, Musta, Guduchi</i>
<i>Dhatwagnimandya</i>	<i>Dhatwagni Deepana</i> (Tissue metabolic fire enhancement)	All ingredients, especially <i>Pippali, Chavya, Chitraka</i>

The formulation predominantly acts on: *Annavaha Srotas* (digestive channels)²⁵, *Rasavaha Srotas* (nutrient channels)²⁵, *Medovaha Srotas* (fat channels)²⁶, *Manovaha Srotas* (mental channels)²⁶.

TABLE 16: DOMINANT PHARMACODYNAMIC PATTERN OF MOORVADI AGAD

Parameter	Discussion
Predominant <i>Rasa</i>	<i>Katu</i> and <i>Tikta Rasa</i> dominate the formulation, facilitating <i>Ama Pachana</i> and <i>Srotoshodhana</i>
Predominant <i>Guna</i>	<i>Laghu, Ruksha</i> and <i>Tikshna Gunas</i> counteract <i>Guru, Snigdha</i> and <i>Manda</i> qualities of <i>Kapha</i>
Predominant <i>Virya</i>	The majority of ingredients possess <i>Ushna Virya</i> , which theoretically stimulates <i>Agni</i> and improves metabolic activity
Effect on <i>Dosha</i>	Primarily <i>Kapha-Vatahara</i> , thereby correcting the <i>Doshic</i> predominance observed in hypothyroidism
Effect on <i>Agni</i>	<i>Deepana</i> and <i>Pachana</i> actions restore <i>Jatharagni</i> and <i>Dhatwagni</i>
Effect on <i>Ama</i>	Digests and eliminates accumulated <i>Ama</i> , responsible for <i>Srotorodha</i>
Effect on <i>Srotas</i>	Clears obstructed channels and restores normal nutrient circulation
Effect on <i>Dhatu</i>	Improves <i>Dhatu-poshana</i> through proper <i>Dhatwagni</i> functioning
Effect on <i>Meda</i>	Reduces <i>Med</i> accumulation and associated metabolic disturbances
Over all therapeutic outcome	Produces <i>Samprapti Vighatana</i> through <i>Vishaghna, Deepana, Pachana, Srotoshodhana, Medohara</i> and <i>Rasayana</i> actions, making it conceptually suitable for <i>Gara Visha Janya</i> conditions

DISCUSSION:

Conceptual Basis of Moorvadi Agad in Gara Visha Janya Hypothyroidism: From an Ayurvedic standpoint, hypothyroidism can be conceptually understood as a state of:

*Mandagni*²⁴, *Kapha Pradhana Tridosha Dushti*²⁵, *Ama Sanchaya*²⁴, *Medovaha Srotodushti*²⁶, *Dhatwagni Mandya*²⁴.

Therapeutic Action of Moorvadi Agad: The formulation's pharmacodynamic profile directly opposes the conceptual pathogenesis of *Gara Visha*

Janya Dhatwagnimandya^{23, 24}. Most ingredients possess *Katu-Tikta Rasa*, *Laghu Ruksha-Tikshna Guna*, and *Ushna Veerya*, which effectively counteract *Kapha*, digest *Ama*, stimulate *Dhatwagni*, and restore metabolic balance. The combined action of the formulation helps in correcting the underlying conceptual pathology rather than merely suppressing symptoms.

Critical Evaluation and Limitations: While *Moorvadi Agad* presents a theoretically relevant classical formulation for conditions conceptualized

as *Gara Visha Janya Dhatwagnimandya*, several critical limitations must be acknowledged:

Absence of Phytochemical Standardization:

- ❖ The formulation lacks standardized extraction protocols, quality control parameters, and marker compound quantification
- ❖ Variability in raw material quality, geographical sources, and processing methods may affect therapeutic outcomes
- ❖ No pharmacopoeial standards exist specifically for this formulation

Lack of Pharmacokinetic Data:

- ❖ Absorption, distribution, metabolism, and excretion of the formulation's components are unknown
- ❖ Bioavailability of active constituents (especially plumbagin, β -asarone, embelin) has not been studied in the context of this formulation
- ❖ Drug-drug interactions and metabolic pathways are poorly understood

Absence of Thyroid-Specific Studies:

- ❖ No studies on *Moorvadi Agad* or its individual ingredients specifically measuring serum TSH, free T4, or free T3 levels in human subjects
- ❖ No clinical trials on hypothyroid patients have been conducted
- ❖ Animal models of hypothyroidism have not been evaluated with this formulation

No Dose-Response Evidence:

- ❖ Classical dose ranges (3-6 grams) lack scientific validation
- ❖ Optimal dosing for specific clinical conditions has not been established
- ❖ Safety margins and toxicological profiles at different doses are unknown

Absence of Controlled Clinical Trials:

- ❖ No randomized, double-blind, placebo-controlled trials exist for *Moorvadi Agad*

- ❖ Observational studies and case reports are absent
- ❖ Therapeutic efficacy and long-term outcomes remain unvalidated

Long-Term Safety Data Unavailable:

- ❖ Chronic toxicity, carcinogenicity, and reproductive toxicity studies are lacking
- ❖ Safety of prolonged use (beyond the classical treatment duration) is unknown
- ❖ Concerns regarding β -asarone (from *Vacha*), plumbagin (from *Chitraka*), and other potentially toxic constituents require systematic evaluation

Herb-Drug Interactions Not Evaluated:

- ❖ Potential interactions with levothyroxine, antidiabetic drugs, anticoagulants, antihypertensives, and sedatives are unknown
- ❖ Caution is required when combining with modern medications

Safety and Toxicological Considerations:

Critical Safety Concerns:

***Acorus calamus* (Vacha) and β -Asarone Exposure:**

- ❖ β -Asarone is a known carcinogen in animal studies (hepatocellular carcinomas and intestinal tumors)
- ❖ The Indian variety (*A. calamus* var. *angustatus*) contains lower β -asarone levels (1-2%) compared to European varieties (up to 10%)
- ❖ Should be used for limited duration and at therapeutic doses only
- ❖ Contraindicated in pregnancy due to potential embryotoxicity

***Plumbago zeylanica* (Chitraka) Irritant Potential:**

- Plumbagin is a potent irritant that can cause gastrointestinal damage, skin irritation, and mucosal ulceration
- Hepatotoxicity has been reported at high doses

- Contraindicated in pregnancy and lactation
- Should be avoided in patients with gastritis, peptic ulcer disease, or inflammatory bowel conditions
- Dose should be strictly monitored

Gastrointestinal Effects of Pungent Drugs:

- Multiple ingredients (*Pippali*, *Chavya*, *Chitraka*, *Vidanga*) possess pungent (*Katu*) and sharp (*Tikshna*) properties
- May cause nausea, vomiting, gastric irritation, and burning sensation
- Should be taken with appropriate *Anupana* (hot water, buttermilk) to mitigate GI distress

Pregnancy-Related Precautions:

- *Chitraka*, *Vacha*, *Moorva* are contraindicated in pregnancy due to potential abortifacient effects
- The formulation should not be used during pregnancy or lactation

Hepatic Safety:

- The formulation contains multiple hepatoprotective ingredients (*Guduchi*, *Moorva*, *Pippali*, *Musta*, *Vidanga*)
- However, hepatic safety has not been systematically evaluated in the context of this specific formulation
- Liver function monitoring is recommended with prolonged use

Dose Limitations:

- Classical dose range: 3-6 grams *Churna* (powder) per day
- Higher doses may increase risk of adverse effects
- Should not exceed the recommended classical dose
- Individualized dosing based on *Agni*, *Dosha*, age, and disease severity is recommended

Herb-Drug Interactions: Clinical Considerations:

Important Clinical Warning: Moovadi Agad is not a replacement for established thyroidhormone therapy. The following potential interactions should be carefully considered:

Levothyroxine (Thyroid Hormone Replacement):

- *Pippali* may enhance absorption of various drugs (*Yogavahi* effect), potentially altering levothyroxine bioavailability
- *Guduchi* and other immunomodulatory ingredients may theoretically affect immune function in autoimmune thyroiditis
- Timing of administration should be separated from levothyroxine (at least 4 hours apart)
- Thyroid function tests should be monitored if used concurrently with levothyroxine
- Dose adjustment of levothyroxine may be required

Antidiabetic Medications:

- *Patola*, *Guduchi*, *Musta*, *Vidanga* possess hypoglycemic activity
- May potentiate the effects of insulin, sulfonylureas, and other antidiabetic agents
- Blood glucose should be monitored; dose adjustment of antidiabetic medications may be required

Anticoagulants and Antiplatelet Agents:

- *Guduchi*, *Musta*, *Vidanga* possess antiplatelet and anticoagulant properties
- May potentiate the effects of warfarin, aspirin, and other anticoagulants
- Caution is advised; INR should be monitored

Antihypertensive Medications:

- Some ingredients may have mild hypotensive effects

- ✚ Blood pressure should be monitored in patients on antihypertensive therapy

Sedatives and CNS Depressants:

- ✚ *Tagara* (Valerian) has sedative and anxiolytic effects
- ✚ May potentiate the effects of benzodiazepines, barbiturates, and other CNS depressants
- ✚ Avoid concurrent use with alcohol or other sedatives

Other Potential Interactions:

- ✚ Pippali (as a *Yogavahi*) may enhance absorption of other co-administered drugs
- ✚ General caution is advised when combining with any modern medication
- ✚ Patients should consult their healthcare provider before using this formulation

CONCLUSION: *Moorvadi Agad* is a classical *Agada Yoga* described in *Ashtanga Samgraha Uttara Tantra* (40/88) with significant theoretical therapeutic potential in the conceptual management of conditions presenting as *Gara Visha Janya Dhatwagnimandya*. The formulation acts through *Vishaghna*, *Deepana*, *Pachana*, *Kapha-Medohara*, and *Srotoshodhana* mechanisms^{3,23}. Most ingredients possess *Katu-Tikta Rasa*, *Laghu-Ruksha-Tikshna Guna*, and *Ushna Veerya*, which theoretically counteract *Kapha*, digest *Ama*, stimulate *Dhatwagni*, and restore metabolic balance.

However, it is essential to emphasize the following:

1. The formulation is NOT an established treatment for hypothyroidism. No clinical trials have been conducted on *Moorvadi Agad* specifically for hypothyroidism, and its effects on serum TSH, free T4, or free T3 levels have not been evaluated.
2. The relationship between *Gara Visha*, *Dhatwagnimandya*, and hypothyroidism represents an Ayurvedic conceptual framework rather than an established endocrinological mechanism. Environmental toxins and incompatible foods should not be presented as

established causes of clinical hypothyroidism without supporting endocrinological evidence.

3. Safety concerns regarding β -asarone (*Vacha*) exposure, irritant potential (*Chitraka*), and gastrointestinal effects of pungent drugs require careful consideration. The formulation should be used under qualified Ayurvedic medical supervision for limited duration.
4. Herb-drug interactions with levothyroxine, antidiabetic medications, anticoagulants, antihypertensives, and sedatives are possible and require careful monitoring.
5. The formulation should NOT be presented as a replacement for established thyroid-hormone therapy. It may be considered as an adjunctive therapy only after proper medical evaluation and under qualified supervision.
6. Further research is required:
 - Phytochemical standardization and quality control parameters
 - Pharmacokinetic and bioavailability studies
 - Animal studies on hypothyroid models
 - Dose-response studies
 - Randomized controlled clinical trials in hypothyroid patients
 - Long-term safety and toxicological evaluation
 - Herb-drug interaction studies

In conclusion, *Moorvadi Agad* presents a theoretically relevant classical formulation for conditions conceptualized as *Gara Visha Janya Dhatwagnimandya*, but requires systematic experimental and clinical validation before being considered an established treatment for hypothyroidism or claimed to correct its underlying pathology.

Declarations:

Author Contributions: Dr. Neelanjana Sen: Conceptualization, literature review, data collection, manuscript drafting, and final revision.

Responsible for classical text analysis and modern evidence compilation.

Dr. Ritu Kapoor: Supervision, conceptual guidance, critical revision of manuscript content, validation of Ayurvedic interpretations, and final approval.

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