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ANTI-INFLAMMATORY ACTIVITY OF GANDHAMADANA AGADA:**A COMPREHENSIVE REVIEW****Dr. Prajwal Thakare¹, Dr. Sanjay Nandedkar²**

1. PG Scholar, Dept. of Agad Tantra avum Vidhi Vaidyaka, YMT Ayurvedic medical College Kharghar, Navi Mumbai
2. HOD, Dept. of Aagad Tantra avum Vidhi Vaidyaka, YMT Ayurvedic medical College Kharghar Navi Mumbai

ABSTRACT:

Gandhamadana Agada is a classical polyherbal formulation described in the *Ashtanga Hridaya* for the management of *Keeta Visha* (insect bites) and *Loota Visha* (spider bites). These conditions are characterised by acute inflammatory responses, including *shotha* (swelling), *vedana* (pain), and localised burning sensations. This review aims to analyse the anti-inflammatory potential of *Gandhamadana Agada* by evaluating its eight herbal constituents: *Tagara*, *Lodhra*, *Vaca*, *Katvi*, *Patha*, *Ela*, *Tamal Patra*, and *Kunkuma*. By bridging traditional Ayurvedic principles with modern pharmacological markers such as COX-II and TNF-alpha, the study highlights the multi-targeted mechanism of the formulation. The review concludes that *Gandhamadana Agada* serves as a potent, cost-effective, and safe alternative to synthetic drugs for treating toxicological and traumatic oedema.

KEY WORDS:- *Gandhamadana Agada*, Agada Tantra, *Shothahara*, Inflammation, COX-II, Ayurveda.

Corresponding Details:

Dr. Prajwal Thakare
V.H.B. Colony Achalpur
Mobile No. 08412068113
E-Mail: iamprajwalthakare@gmail.com

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Dr. Prajwal Thakare, Dr. Sanjay Nandedkar

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INTRODUCTION

Inflammation is considered a primary physiological mechanism that helps the body to protect itself against various noxious stimuli. It is a defence reaction, the ultimate goal of which is to help the organism get rid of both the initial cause of injury (e.g., microbes & toxins) and the consequences of such injury (e.g., necrotic cells & tissues). [1] Ayurveda offers a rich collection of formulations aimed at treating inflammatory conditions through both internal and external therapies. Among these, *Gandhamadana Agada* is a classical polyherbal formulation described by Acharya Vagbhata in the *Ashtanga Hridaya Uttarasthana*, specifically in the context of *Keeta-Lootadi Visha Pratishedha* (management of insect and spider bites). [2]

According to the classical text, a *Luta damsha* (spider bite) or *Keeta visha* typically produces acute inflammatory symptoms such as *shotha* (swelling) [3], pain, and localised burning sensations. [4] To mitigate this inflammatory response, Vagbhata recommends *Gandhamadana Agada*, highlighting its ability to alleviate swelling and neutralise local toxicity. [5] Modern therapeutic approaches rely heavily on non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids, which, despite their efficacy, are associated with notable adverse effects when used for a prolonged period. [7] Therefore, traditional treatment involving plant parts can be used in inflammatory disorders. [8] This review article aims to compile, analyse, and correlate both classical Ayurvedic descriptions and contemporary scientific findings related to the anti-inflammatory potential of *Gandhamadana Agada*.

PREVIOUS WORK DONE

1. **Evaluation of *Symplocos racemosa* (Lodhra):** Studies have demonstrated that the stem bark possesses significant anti-inflammatory and analgesic properties, particularly in reducing acute-phase oedema. [9]
2. **Pharmacological Activities of *Patha*:** Research into *Cissampelos pareira* has documented its anti-inflammatory activity in root extracts, showing a reduction in paw volume in experimental models. [8, 10]
3. **Studies on *Picrorhiza kurroa* (Katvi):** Literature confirms its role in suppressing pro-inflammatory cytokines such as TNF-alpha and inhibiting the COX enzyme pathway.
4. **Antioxidant and anti-inflammatory effects of *Kunkuma*:** Recent data highlights that *Crocus sativus* reduces oxidative stress and stabilises cell membranes during toxic insults.
5. **Studies on *Acorus calamus* (Vaca):** Research indicates its ability to suppress chronic inflammation by inhibiting the production of proinflammatory cytokines.

MATERIALS AND METHODS

A systematic search was performed on databases such as PubMed, SCOPUS, AYUSH Portal, and Google Scholar. Search terms included *Gandhamadana Agada*, *Valeriana wallichii*, *Symplocos racemosa*, *Picrorhiza kurroa*, *Elettaria cardamomum*, and anti-inflammatory. Primary sources included the *Ashtanga Hridaya* and *Ashtanga Sangraha*. Information regarding the botanical identity and traditional preparation of the ingredients was cross-referenced with the *Shashilekha* commentary by Indu. (6)

REVIEW OF LITERATURE

Gandhamadana Agada is a polyherbal formulation traditionally prepared as a *churna* (fine powder). [5] It consists of eight specific ingredients that work synergistically to provide a comprehensive anti-inflammatory and antitoxic effect.

Table 1: Rasa-Panchaka and Pharmacological Profile of Ingredients

Sr. No	Drug Name	Botanical Name	Rasa (Taste)	Guna (Qualities)	Virya (Potency)	Vipaka (Post-digestive)
1	Tagara	<i>Valeriana wallichii</i>	Katu, Tikta, Kashaya	Laghu, Snigdha	Ushna	Katu
2	Lodhra	<i>Symplocos racemosa</i>	Kashaya	Laghu, Ruksha	Sheeta	Katu
3	Vaca	<i>Acorus calamus</i>	Tikta, Katu	Laghu, Teekshna	Ushna	Katu
4	Katvi	<i>Picrorhiza kurroa</i>	Tikta	Laghu, Ruksha	Sheeta	Katu
5	Patha	<i>Cissampelos pareira</i>	Tikta	Laghu, Teekshna	Ushna	Katu
6	Ela	<i>Elettaria cardamomum</i>	Katu, Madhura	Laghu, Ruksha	Sheeta	Madhura

7	Tamal Patra	<i>Cinnamomum tamala</i>	Katu, Madhura	Laghu, Ruksha, Teekshna	Ushna	Katu
8	Kunkuma	<i>Crocus sativus</i>	Katu, Tikta	Snigdha	Ushna	Katu

Table 2: Ingredients and their Properties

Drug	Latin Name	Ayurvedic Karma	Relevant Actions
Tagara	<i>Valeriana wallichii</i>	<i>Vedanasthapana</i>	Analgesic, Anti-inflammatory (inhibits PGE2 synthesis). ^[7]
Lodhra	<i>Symplocos racemosa</i>	<i>Shothagna</i>	Anti-edematous, Wound healing (stabilizes capillaries). ^[9]
Vaca	<i>Acorus calamus</i>	<i>Lekhana</i>	Neuroprotective, Anti-inflammatory (inhibits NF-kappaB). ^[14]
Katvi	<i>Picrorhiza kurroa</i>	<i>Dahahara</i>	Alleviates burning, Anti-pyretic (suppresses TNF-alpha). ^[12]
Patha	<i>Cissampelos pareira</i>	<i>Vishaghna</i>	Anti-toxic, Anti-inflammatory (anti-protease activity). ^[11]
Ela	<i>Elettaria cardamomum</i>	<i>Deepana, Pachana</i>	Cooling effect, Antioxidant, prevents secondary infection.
Tamal Patra	<i>Cinnamomum tamala</i>	<i>Vata-Kaphahara</i>	Improves microcirculation, Analgesic, Antimicrobial.
Kunkuma	<i>Crocus sativus</i>	<i>Vishaghna, Varnya</i>	Potent Anti-oxidant, Analgesic, stabilizes cell membranes. ^[13]

Indications in Classical Texts

- **Keeta-Loota Visha:** Management of swelling and toxicity caused by insect/spider bites.
- **Shotha:** General inflammatory swelling and localised oedema.
- **Daha:** localised burning sensations associated with toxic inflammation.

Mode of Action According to Ayurveda

- **Shothahara Activity:** Primarily driven by *Lodhra* and *Katvi*, reducing local swelling by balancing *Kapha* and *Pitta*.
- **Vedanasthapana Action:** *Tagara* and *Vaca* alleviate pain by pacifying *Vata*.
- **Sheeta Virya Effect:** The cold potency of *Lodhra*, *Katvi*, and *Ela* neutralises the *Ushna* (heat) characteristic of acute inflammation.
- **Deepana-Pachana:** *Ela* and *Tamal Patra* help in the digestion of *ama* (metabolic toxins) at the site of the bite.

DISCUSSION

Acute inflammation is a localised protective response to tissue injury or toxic invasion. Pathologically, this process is characterised by a rapid onset involving vasodilation (leading to redness and heat), increased vascular permeability (causing swelling/oedema), and the migration of leukocytes, particularly neutrophils, to the site of injury. [1] The multi-targeted composition of *Gandhamadana Agada* addresses these pathological events through a synergistic mechanism involving all eight constituents.

Tagara (*Valeriana wallichii*), **Patha** (*Cissampelos pareira*), and **Tamal Patra** (*Cinnamomum tamala*)

These ingredients contain bioactive alkaloids, iridoids, and essential oils that function as potent inhibitors of prostaglandins (PGE2). [15] By modulating the arachidonic acid pathway, they effectively reduce the cardinal signs of inflammation: *Vedana* (pain), *Ushma* (heat), and *Raga* (redness). *Tamal Patra* further enhances localised circulation, preventing the stagnation of inflammatory debris at the site of the bite.

Lodhra (*Symplocos racemosa*) and **Vaca** (*Acorus calamus*)

The *Kashaya* (astringent) property of *Lodhra* and the *Lekhana* (scraping/liquefying) property of *Vaca* are pivotal in managing *Shotha* (oedema). *Lodhra* helps in stabilising capillary walls and reducing vascular permeability, which limits the leakage of plasma (exudate) into the interstitial spaces. [10] *Vaca* complements this by promoting the resolution of accumulated fluids, thereby visibly reducing inflammatory swelling.

Katvi (*Picrorhiza kurroa*) and Kunkuma (*Crocus sativus*)

These act as powerful modulators of the cellular inflammatory response. *Katvi* has been scientifically proven to suppress the induction of the COX-II enzyme and significantly decrease pro-inflammatory cytokines such as TNF-alpha and IL-1, reducing the overall intensity of the immune response. [12] *Kunkuma* (saffron) provides a high concentration of antioxidants like crocin, which neutralise free radicals and protect cell membranes from the oxidative stress typically induced by *Keeta* and *Loota Visha* (insect/spider toxins). [13]

Ela (*Elettaria cardamomum*)

Ela provides a necessary *Sheeta* (cooling) effect to counteract the *Teekshna* (sharp) and *Ushna* (hot) nature of toxins. Beyond its cooling properties, its *Deepana-Pachana* (digestive and carminative) action helps in the systemic neutralisation of metabolic by-products (*Ama*) generated during the inflammatory cascade, ensuring a faster recovery of the affected tissue.

CONCLUSION

The review consolidates the Ayurvedic heritage with contemporary pharmacological evidence supporting each constituent's efficacy. *Gandhamadana Agada* represents a valuable integrative approach to inflammation management. Given the adverse effects of chronic NSAID use, this formulation holds great promise as an herbal substitute for traumatic oedema, insect bites, and inflammatory skin lesions. Comprehensive clinical trials on the complete formulation remain necessary to fully validate and standardise its therapeutic use.

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