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An Analysis of a Herbal Antipyretic Medicine

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Abstract: *Medicines and herbs have been used in India for centuries to treat many illnesses, including fever. Fever (pyrexia) is a common health problem where body temperature rises, often with symptoms like shivering, loss of appetite, and tiredness. While modern medicines help control fever, increasing antibiotic resistance has created a need for safer alternatives. Herbal remedies made from natural ingredients show great promise in treating fever. This review focuses on plants such as nirgundi, ginger, baheda, amla, tulsi, and neem, which have properties that reduce fever, fight infections, and strengthen immunity. Their active compounds like flavonoids, alkaloids, terpenoids, and polyphenols help by reducing inflammation, blocking prostaglandins (fever-causing chemicals), and regulating the immune system. Studies have shown that these herbs can work effectively and may be safer and more affordable than synthetic medicines. However, issues like correct dosage, possible interactions with other drugs, and long-term safety still need more research. Future studies should explore exactly how these herbs work, improve their formulations, and combine them with modern treatments. This review highlights the importance of traditional herbal medicine in managing fever today and its potential to provide safe and effective long-term treatment options.*

In Siddha system of medicine, there are many polyherbal formulations used as antipyretics. This review article looks into the details of few commonly used herbs and elucidates scientifically as anti-pyretics, analgesic, anti-microbial & anti-inflammatory potential. Also Siddha compound herbal and herbo-mineral preparations in treating fever are included.anti-malarial activity of Andrographis paniculata, Cedrus deodara are also of great significance.

Keywords*:* Antipyretic, Fever-reducing herbs, Loss of appetite, Medicinal plants, Blocking fever-causing chemicals, Ginger, phytochemicals, pharmacological activity, Siddha medicine

I. INTRODUCTION

India has a long history of using medicinal and aromatic plants to treat different health problems. One of the most common health issues is fever (pyrexia), which means the body temperature rises above the normal range of 36.5–37.5°C. Fever often comes with tiredness, loss of appetite, sadness, sleepiness, and trouble concentrating. The body also reacts with shivering and muscle stiffness.Modern medicines called antipyretics help lower fever and make the patient feel better. Still, many people in India rely mainly on traditional medicinal plants for their healthcare. For a long time, doctors have used antibiotics to fight infections. But today, overuse of antibiotics has led to antibiotic resistance, where bacteria adapt and become harder to kill. This makes it important to explore alternative treatments.Medicinal plants have been used worldwide to create effective natural medicines. These herbal remedies can act like natural antibiotics, helping fight infections, cleanse the blood, boost immunity, and support organ function. They usually work by killing harmful microbes and restoring balance in the body.Herbal medicines are also affordable, easy to store, and can last for a long time at room temperature. However, it's important to remember that "natural" does not always mean completely safe. While many patients prefer herbal remedies, they should be used carefully, just like synthetic antibiotics.

Fever (Pyrexia or Febrile Response).Fever means a rise in body temperature above the normal range, caused by an increase in the body's temperature set point. It is one of the most common medical signs and can appear as the only symptom in many health conditions.Fever may happen due to:Viral, bacterial, parasitic, or fungal infections.Systemic illnesses (whole-body conditions).Side effects of medicines. Certain cancers. Around 30% of children and 75% of adults who visit healthcare centres come with fever. With growing antibiotic resistance, infections have become harder to treat. Epidemics and outbreaks of diseases like Ebola, dengue, chikungunya, and even fevers of unknown cause, highlight the need for safe and effective new antipyretic (fever-reducing) medicines. Microbes (bacteria, viruses, fungi, and parasites) adapt and survive by mutating and developing resistance genes. This makes them stronger, harder to kill, and more dangerous. Drug-resistant microbes are a serious concern for healthcare workers because treatments become costly and less effective. In the Siddha system of medicine, many herbs have been traditionally used to treat fever and related illnesses. Reviewing these herbal antipyretics can help in finding reliable, safe, and effective options for managing infectious fevers.

Etiology

Fever, also known as pyrexia, is defined as an elevation of body temperature above the normal range, caused by an increase in the hypothalamic temperature set point. The upper limit of normal body temperature is generally considered to be between 37.2°C and 38.3°C (99.0°F to 100.9°F). When the set point is elevated, the body responds by conserving heat through muscle contraction and reducing heat loss. Once the set point stabilizes, sweating and cutaneous flushing occur to maintain balance. In most cases, fever does not exceed 41–42°C (106–108°F). However, in rare situations—particularly in infants—such elevations may lead to febrile seizures. A wide range of conditions can give rise to fever: Infectious causes: influenza, the common cold, meningitis, urinary tract infections (UTIs), appendicitis, Lassa fever, malaria, and COVID-19. Non-infectious causes: vasculitis, deep vein thrombosis (DVT), connective tissue disorders, adverse drug reactions, and malignancies. It is important to distinguish fever from hyperthermia, which is characterized by elevated body temperature due to impaired heat dissipation or excessive heat production, independent of hypothalamic regulation. In general, fever does not require treatment unless it produces discomfort. Symptomatic relief may be achieved with antipyretic agents such as paracetamol (acetaminophen) or ibuprofen. However, infants under three months of age and immunocompromised individuals require prompt medical evaluation. Fever is a common clinical finding, occurring in approximately 75% of critically ill adults and accounting for nearly 30% of pediatric healthcare visits. Associated manifestations may include fatigue, anorexia, dehydration, fever-associated nightmares, and delirium. Although fever serves as a natural defense mechanism, excessive concern regarding its occurrence—commonly referred to as "fever phobia"—is often disproportionate and not medically justified.

Clasification

Body Temperture	°C	°F
Normal	37-38	98.6-100.4
Mild/Low grade fever	38.1-39	100.5-102.2
Moderate Grade fever	39.1-40	102.2-104.0
High Grade fever	40.1-41.1	104.1-106.0

Table 1: - Classification types and patterns of fever

SYMPTOMS OF FEVER

Common signs of fever include shivering, loss of appetite, tiredness, sleepiness, headache, body or joint pain, and difficulty concentrating.

Warning signs include fever lasting more than 48 hours, trouble breathing, confusion, severe headache, or a temperature above 103°F. If these occur, medical help is needed.

To find the cause of fever, tests like CBC (blood count), blood culture, Widal test, chest X-ray, and urine test are done.

For relief, plants with antipyretic (fever-reducing) properties can be used.

Plants Used as Antipyretics

Herbal remedies can be prepared in many forms, such as teas, syrups, oils, capsules, and extracts (including tinctures, decoctions, and macerates). Since there is no universal standard, the composition often varies. Several medicinal plants are traditionally used to reduce fever, including Tulsi, Ashwagandha, Arjuna, and Neem. Extracts from Cleome viscosa, Bauhinia racemosa, and Acacia catechu have also been shown to possess antipyretic properties.

Some important medicinal plants and trees, along with their common names, botanical names, families, useful parts, and major biological effects, are listed below.

Sr.No	Common Name	Botanical name	Part used	Family	Uses
1	Tulsi	Ocimum sanctum	Leaves	Labiatae	Antipyretic; Antitussive
2	Neem	Azadirachta indica	Leaves	Meliaceae	Antipyretic; Antiseptic
3	Brahmi	Centella asiatica	Whole Plant	Umbelliferae	Antipyretic;Blood purifier
4	Amla	Emblica officinalis	Fruits	Euphorbiaceae	Antipyretic
5	Dhaniya	Coriandrum sativum	Fruits	Umbelliferae	Antipyretic; Carminative
6	Satavari	Asparagus adscendens	Roots	Liliaceae	Antipyretic;Nutritive tonic
7	Bahera	Terminalia belerica	Fruit	Combretaceae	Antipyretic
8	Cinchona	Cinchona officinalis	Bark	Rubiaceae	Antipyretic
9	Bhindi	Abelmoschus esculentus	Fruit	Malvaceae	Antipyretic
10	Imli	Tamarindus indica	Fruits	Caesalpiniaceae	Antipyretic; Carminative
11	Chandan	Santalum album	Wood	Santalaceae	Antipyretic; Sedative
12	Palwal	Trichosanthes dioica	Fruits	Cucurbitaceae	Antipyretic; Laxative
13	Nirgundi	Vitex negundo	Fruits; Bark; Leaves	Verbenaceae	Antipyretic
14	Bish	Aconitum ferox	Root	Ranunculaceae	Antipyretic; Antiseptic
15	Datiyani	Alstonia scholaris	Milky Latex	Apocynaceae	Stimulant;Antipyretic
16	Gulanch	Coscinium fenestratum	Leaves; Stem; Root	Menispermaceae	Antipyretic
17	Jhar Haldi	Coscinium fenestratum	Root	Menispermaceae	Antipyretic
18	Kanta-Kala	Daemia extensa	Leaves; Roots	Asclepiadaceae	Antipyretic
19	Chirayta	Swertia chirata	Whole Herb	Gentianaceae	Antipyretic
20	Guruch	Tinospora cordifolia	Stem; Root	Menispermaceae	Antipyretic; Antidote
21	Jahangir	Lawsonia inermis	Leaves	Lythraceae	Antipyretic
22	Lahusan	Allium sativum	Bulb	Liliaceae	Antipyretic
23	Kasondi	Cassia occidentalis	Leaves; Seeds	Caesalpiniaceae	Antipyretic; Purgative
24	Bhringaraj	Eclipta erecta	Roots;Leaves	Compositae	Antipyretic; Tonic
25	Akasbel	Cuscuta reflexa	Seeds; Stem	Convolvulaceae	Antipyretic; Carminative
26	Chhota Dhatura	Achyranthes aspera	Leaves; Bark; Oil	Amaranthaceae	Antipyretic
27	Cashew	Anacardium	Leaves;Dried	Anacardiaceae	Antipyretic; Irritant

		occidentale	Bark; Oil		
28	Ganja	Cannabis sativa	Leaves;Dried	Flourrescence Cannabaceae	Antipyretic; Analgesic
29	Wild mint	Lantana involucrate	Whole Herb	Verbenaceae	Antipyretic
30	Bitter gourd	Momordica charantia	Fruit; Leaves;Seeds	Cucurbitaceae	Antipyretic; Stimulant
31	Bamboo	Bambusa vulgaris	Shoot; Seeds; Roots;Leaves	Graminae	Antipyretic; Diuretic
32	Australian fever tree	Eucalyptus globules	Dried leaves; Gum; Oil	Myrtaceae	Antipyretic; Carminative
33	Pan	Piper betel	Leaves	Piperaceae	Antipyretic; Carminative

Table 2: List of plant used as antipyretics

KEY MEDICINAL PLANTS AND THEIR THERAPEUTIC BENEFITS:

A wide range of medicinal plants have historically been utilized in the management of fever due to their potent antipyretic activity. Notable examples include Neem (Azadirachta indica), which exhibits pronounced antimicrobial and anti-inflammatory properties, and Tulsi (Ocimum tenuiflorum), recognized for its immunomodulatory effects and its role in supporting respiratory health. The potent antioxidant and immunomodulatory properties of Amla (Phyllanthus emblica), the analgesic and anti-inflammatory effects of Nirgundi, the digestive and antiemetic properties of Ginger (Zingiber officinale), and the therapeutic potential of Baheda (Terminalia bellirica) highlight the diverse pharmacological actions of these medicinal plants. Rich in bioactive compounds, these species offer safe and natural alternatives for the management of fever. Several essential aspects regarding these plants warrant particular attention.

1. Tulsi: (Ocimum tenuiflorum) is a fragrant perennial plant belonging to the family Lamiaceae, commonly known as Holy Basil or Tulsi. It is indigenous to tropical and subtropical regions, including Malesia and Australia. Renowned for its therapeutic properties, Tulsi has traditionally been employed in the treatment of various ailments such as fever, respiratory disorders, headaches, kidney stones, cardiovascular conditions, and insect bites. Its major phytoconstituents—linalool, eugenol, methyl chavicol, and methyl cinnamate—are rich in bioactive compounds that contribute to its antibacterial, anti-inflammatory, and adaptogenic (stress-relieving) effects. Taxonomical classification:Kingdom: Plantae ,Order: Lamiales,Family: Lamiaceae,Genus: Ocimum

Fig.1 :- Tulsi

2. Neem: (Azadirachta indica) is a member of the family Meliaceae (mahogany family) and is commonly referred to as Neem, Margosa, Nimtree, or Indian Lilac. It is widely recognized for its extensive therapeutic applications, including the treatment of fever, infections, inflammatory disorders, dermatological conditions, and oral health problems. The principal bioactive compound in Neem is azadirachtin, while other significant phytoconstituents include nimbolinin, nimbin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin, and quercetin. Collectively, these compounds impart potent antibacterial, anti-inflammatory, and multifaceted therapeutic properties, establishing Neem as an important medicinal plant in traditional and modern medicine.

Fig. 2:- Neem

3.Amla (Phyllanthus emblica) is a deciduous tree belonging to the family Phyllanthaceae, native to tropical and southern regions of Asia. Commonly known as Amla or Indian Gooseberry, it has been extensively utilized in traditional medicine for its wide range of therapeutic properties. The fruit is particularly valued for its efficacy in managing inflammatory conditions, hepatic disorders, digestive ailments, fever, and common colds, in addition to exhibiting laxative, diuretic, and hair-tonic effects.[10] Its pharmacological potential is attributed to a diverse array of bioactive constituents, including ellagic acid, gallic acid, emblicanin A and B, phyllembein, quercetin, and ascorbic acid, which collectively contribute to its medicinal significance.

Fig. 3:- Amla

4. Nirgundi (Vitex negundo) is a large, aromatic shrub that thrives in the warmer regions of India and holds a prominent place in traditional medicine. Within the Ayurvedic, Unani, and Siddha systems, it is employed in the management of fever, arthritis, respiratory disorders, inflammatory conditions, and pain. Its wide-ranging therapeutic potential is attributed to a rich phytochemical profile, which includes flavonoids, volatile oils, triterpenes, diterpenes, lignans, flavones, glycosides, and iridoid glycosides. These bioactive compounds collectively contribute to the plant's significant analgesic, anti-inflammatory, and antipyretic activities, establishing Nirgundi as a valuable medicinal resource.

Fig. 4: - Nirgundi

5. Brahmi (Bacopa monnieri) is a well-known medicinal herb in Ayurveda, traditionally employed to enhance memory and improve cognitive functions. Commonly referred to as Indian Pennywort or Water Hyssop, it is recognized for its potent therapeutic effects in both Indian and Chinese systems of traditional medicine. Its neuroprotective and cognition-enhancing properties are primarily attributed to its major phytoconstituents, including hersaponin, apigenin, brahmine, herpestine, nicotine, and monnierasides. Collectively, these compounds contribute to Brahmi's significant role in promoting neurological health and mental performance.

Fig. 5: - Brahmi

6. Black Pepper (Piper nigrum), commonly referred to as Kali Mirch, is a widely used culinary spice with notable medicinal applications. It is traditionally employed to enhance digestion, stimulate metabolic activity, manage diarrhea, and alleviate respiratory disorders.When applied topically, it has been reported to provide relief from dermatological conditions and neural discomfort. The primary bioactive constituents of Black Pepper include piperine, terpenes, and flavones, which are chiefly responsible for its antibacterial, antioxidant, and therapeutic activities.

Fig. 6:- Kali-Mirch

Method of Preparation of Herbal Antipyretic Drug

1 . Neem :- Fresh neem leaves (*A. indica*) were collected from Sri Venkateswara University campus, Tirupati and washed in distilled water till the surface dust is completely removed and dried under shade. The aqueous leaf extract was prepared as described earlier briefly, 50 gm of neem leaf powder was mixed with 500 ml of distilled water and boiled for about 30 min. The boiled solution was filtered using Whatman No. 1 filter paper and clear aqueous leaf extract was obtained. The extract was stored at 4°C until further use. The 1 mM $AgNO_3$ powder was added in 100 ml of distilled water and used within 24 h for the assay.

2. Tulsi :- Tulsi leaves were obtained from courtyards and local market. Leaves were separated from the stem, washed in clear water and dried until they were adequately dry to be ground (dried for 7 days). Dried leaves were powdered separately in an electric grinder until a homogenous powder was obtained. Ethanolic extract was prepared from the powder obtained using "cold extraction method. A total of 250 g of finely powdered Tulsi was macerated with 100% ethanol for 3 days. The alcoholic decoction was subjected to filtration with Whatman #1 filter paper to obtain a clear filtrate. The filtrate thus obtained was reduced at a low temperature of <60°C to obtain a solid residue of Tulsi extract From the 250 g of Tulsi powder dissolved in 1 L of ethanol, approximately 18 g of solid residue (extract) was obtained.

3.Amla :- Fresh amla fruit is extracted with 95% ethanol, filtered, and concentrated in a rotary evaporator. Soaking the Plant MaterialWeigh the plant material: Use a ratio of 1:10 (w/v) for maceration. For instance, if You have 10 grams of plant powder, add 100 mL of acidic solvent.Soak the plant material: Place the ground Phyllanthus Emblica in a glass container or beaker and add enough of the acidic solvent to cover it. Stir the mixture well to ensure Even contact between the plant material and the solvent. Filter the extract After the maceration period, filter the mixture through filter paper or a fine mesh cloth to Separate th liquid extract (which contains the alkaloid salts) from the plant material residue.

4.Nirgundi :- V. negundo ethanol extract. The glitter sheets Were carefully selected and washed in the current study to Remove impurities. Approximately 100 g of fresh leaf tissueis extracted by thermal extraction using a soxhlet extraction apparatus using 60% alcohol as the solvent. Extraction continues until the solvent in the cannula becomes clear, then a few drops of solvent collect in the control tube when the cycle is complete and a solvent chemical check is complete. After each extraction, the extract is evaporated to dryness on a rotary evaporator under vacuum.Additionally, part of the extract was saved for initial phytochemical screening to detect various botanical constituents and the final extract was used.

5. Brahmi :- 1. Selection of High-Quality PowderThe process begins with sourcing pure, finely milled Brahmi Bacopa Monnieri Powder. Quality at this stage is critical, as impurities or low-grade raw material affect extraction yield.2. Solvent ExtractionSolvent Choice – Water, alcohol, or hydro-alcoholic solutions are commonly used.Soaking/Percolation – The powder is soaked in the solvent, allowing active compounds like bacosides to dissolve.3. FiltrationOnce soaked, the mixture is filtered to remove plant residues, leaving behind a liquid rich in extracted compounds.4. ConcentrationThrough evaporation or vacuum techniques, the solvent is reduced, leaving behind a concentrated extract.5. Drying and StandardizationThe concentrated liquid is then dried (commonly through spray drying or freeze-drying) to create a fine powdered extract. This extract can be standardized to a specific bacoside content, ensuring consistent potency.6. Testing for QualityFinal extracts are tested for purity, bacoside concentration, and safety standards before being used in nutraceutical formulations.

6. Kali Mirch :- For extraction 45 mg of black pepper powder and 60 mL of 95% ethanol were mixed completely. The suspension was stored overnight and then filtered using vacuum filtration. Filtrate was divided into three portions of 20 mL. Twenty five micro liter of the first portion was injected to HPLC immediately. The second portion was freeze dried and the third portion was oven dried. Remaining yellow residue of the second and third portions were redissolved in 20 mL of ethanol %95 and 25µl of this solution was injected to HPLC and its chromatograms were recorded and processed.

II. SUMMARY

Fever, a natural physiological response to infection and inflammation, has been managed through various methods across human history. Among these, herbal antipyretics emerge as a promising approach that harmonizes traditional wisdom with contemporary scientific investigation. This review explores the efficacy, safety, and mechanisms of action of herbal antipyretic agents, offering valuable insights into their potential therapeutic applications.

For thousands of years, herbal remedies have constituted an essential component of healthcare systems across different cultures. Plants possessing antipyretic properties have been utilized for fever treatment since ancient civilizations and among indigenous communities. A thorough examination of ancient texts and ethnobotanical records reveals a wealth of traditional knowledge concerning herbal antipyretics, which continues to guide modern scientific research.

The plant kingdom abounds with species containing bioactive antipyretic compounds, such as flavonoids, alkaloids, terpenoids, and phenolic constituents. Understanding the phytochemical composition of these plants establishes the foundation for evaluating their pharmacological and medicinal significance.

Herbal antipyretics exert their fever-reducing effects through multiple mechanisms. These botanicals engage in intricate interactions with physiological pathways, including modulation of pro-inflammatory cytokines, inhibition of prostaglandin synthesis, and enhancement of immune function. Comprehending these molecular mechanisms provides insight into their pharmacodynamic activity and clinical relevance.

Clinical investigations evaluating the effectiveness of herbal antipyretics offer crucial evidence regarding their practical applicability. Evidence-based analyses, encompassing randomized controlled trials and systematic reviews, provide critical assessments of the role of herbal formulations in fever management. This section emphasizes the strength of available evidence supporting specific herbal agents, with particular attention to their comparative efficacy and safety profiles.

Although herbal antipyretics are generally regarded as safe, considerations regarding toxicity, herb–drug interactions, and the implications of long-term administration must be thoroughly addressed. An in-depth evaluation of their safety parameters—including potential adverse effects and contraindications—serves to inform and guide healthcare practitioners and researchers in promoting their responsible and effective therapeutic use

III. CONCLUSION

In conclusion, herbal antipyretics represent a significant therapeutic resource that effectively bridges the gap between traditional healing systems and modern medical science. Through rigorous scientific investigation and evidence-based validation, these herbal formulations offer a credible and efficacious alternative for the management of fever. Their continued study underscores the enduring relevance of nature's pharmacopeia in promoting human health, enhancing well-being, and contributing to the advancement of integrative medical practices. The Paper reviewed the antipyretic effect of the medicinal plants to be utilized in medical applications as a result of effectiveness and safety.

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