

Potential Analgesic & Anti-Pyretic Herbal drugs: A Comparative Review of Marketed Products

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Abstract

Analgesic from the family of the non-steroidal anti-inflammatory drugs (NSAIDs) have probably been used for more than 2000 years. In the 1900 ASA become an established treatment for pain and migraine. The detection of the main mechanism of the clinical effect of ASAs in John R.Vane's group in 1972 (who received the Nobel Prize for medicine in 1982 for his discovery of prostaglandin synthesis inhibition) gave a new and persistent drive to the development of other chemically different NSAID. The currently available analgesic and antipyretic drugs in allopathic system of medicine are not so effective in combating wide variety of complications. The remedial measure may lie in the ayurvedic system of medicine. The various herbal drugs such as *Acacia nilotica*, *Bauhinia racemosa* Linn. *Cleome viscosa*, *Hippobromus paniculatus* etc known for their potential analgesic and antipyretic activity shall be discussed. The various branded herbal formulations like Rumalaya, Charak, Rumartho, Arthrella, and Reosto etc available in the market as analgesic and antipyretic remedies are also discussed along with their clinical merits. It may be concluded that since ayurvedic formulations contain number of ingredients in which one ingredient may act to enhance the action of other ingredient. Also as a result of so many ingredients present in the particular ayurvedic formulation it helps in combating other diseases in addition to analgesic and antipyretic activity.

Keywords: Analgesic, Ayurvedic system, Herbal drugs, Antipyretic.

Introduction

Herbal medicine is based on the fact that plants contain natural substances that can promote health and alleviate illness. In recent times, focus on plant research has increased all over the world and a large body of evidence has been collected to show immense potential of medicinal plants used in various traditional systems [1].

Traditional Indian system of medicine such as Ayurveda is based on holistic treatment of

diseases primarily relying on naturally occurring medicinal substances drug. Most ayurvedic preparations are polyherbal which take care of the multiple components of disease conditions. The group of antipyretic drugs has been defined in Charak Samhita[2].

Analgesic-antipyretic drugs have been shown by **Collier & Shorley (1960)** to antagonize the bronchoconstrictor action of bradykinin in the anaesthetized guinea pig, and **Lecomte (1960)** has demonstrated that phenylbutazone will prevent

the fall in blood pressure and the local increase in capillary permeability in response to bradykinin in the rabbit. It is widely recognized that analgesic-antipyretic drugs possess anti-inflammatory properties, both in rheumatoid diseases of man and also in experimentally induced inflammatory reactions in other species, but their mechanism of action is not clear (**Smith, 1953**). Bradykinin has been proposed by Hilton & Lewis (1955) as a possible mediator in certain inflammatory reactions, and their hypothesis is further substantiated by the fact that a chemically heterogeneous group of substances share the ability to inhibit both bradykinin and inflammatory reactions.

Several enzyme systems which are present in the mammalian body are reported to produce

polypeptides either very closely related to, or identical with, bradykinin (**Lewis, 1960a**)[3].

Pain is an unpleasant sensation no doubt, but on the whole it is usually beneficial to man (or animal). It is mainly a protective mechanism for the body, occurs whenever any tissues are being damaged, and it causes the individual to remove the pain stimulus. ^[4]

Analgesics relieve pain as a symptom, without affecting its cause. Currently available analgesic drugs such as opiates and NSAIDs are not useful in all cases due to their adverse effects [5]

Ayurveda in Relation to Analgesic and Antipyretic Drugs

Ayurveda, the ancient healing system of India,

Table 1: Presents the list of prominent medicinal herbs and their parts identified to possess analgesic activity along with other activities

Botanical name	Plant part used	Vernacular name	Family	Reported activity	Reference
Amaranthus viridis	Whole plant	Chilaka, thota-kura	Amaranthaceae	Analgesic, diuretic, antirheumatic, antiulcer, antiemetic, anti-asthmatic.	[6-15]
Hygrophila spinosa T. Ander	Leaves	Gokhula - kanta	Acanthaceae	Antipyretic, anti-inflammatory, anti diuretic, treatment of anemia, pain, hepatic obstruction, gout, bacterial infection.	[16-21]
Descurainia sophi L.	Whole plant	Khubkallana	Cruciferae (brassicaceae)	Antipyretic, analgesic, antimicrobial, hypoglycemic, hypotension, lung cancer	[22, 23]
Acacia nilotica	Roots	Babul	Liguminosae	Antiplasmodial, analgesic and anti-inflammatory	[24]
Bauhinia racemosa Lam	Stem bark	Aptakanchal	Caesalpiniaceae	Antipyretic, anti-inflammatory, treatment of blood disease, skin diseases, antidysenteric, antidiarrhoeal	[25, 26]
Cissus quadrangularis	Whole Plant	Hadjod	Vitaceae	Analgesic, anti-inflammatory, antipyretic, bone fracture healing property, antifungal activity	[27-29]
Helicteres isora L.	Roots	mrigshringa	Sterculiaceae	Antipyretic, expectorant, antiasthmatic, antidiabetic, antifatulence	[30-32]
Chenopodium ambrosioides L.	-	Mkhinza	Chenopodiaceae	Treatment of gastrointestinal infection & typhoid, antipyretic, antiparasitic, antiviral, antifungal, cytotoxic.	[33-40]
Bauhinia racemosa Linn.	Bark & leaf	Kachnal	Caesalpiniaceae	Antiinflammatory, analgesic & antipyretic	[41]
Cleome viscosa	Leaves & flowers	Hulhul	Capparidaceae	Antimicrobial, analgesic, antipyretic, hypoglycaemic	[42, 43]
Gmelina asiatica	Leaves & flowers	Gopabhadra	Verbenaceae	Antimicrobial, anti-inflammatory, antiproliferative, treatment gonorrhoea, rheumatism & blood purifier	[45, 46]
Hippobrom	Leaves	Ulathile	Sapindaceae	Anti-inflammatory, Antipyretic, analgesic,	[47-49]

Hippobromus panciflorus	Leaves	Ulathile	Sapindaceae	Anti-inflammatory, Antipyretic, analgesic, malaria, diarrhoea	[47-49]
Curcuma longa	Whol plant	Haldi	Zingiberaceae	Analgesic, Antipyretic, antidiabetic, hemorrhoids, anemia, jaundice, asthma, wound healing	[50, 51]
Solanum melongena	Leaves	Brhati	Solanaceae	Analgesic, Antipyretic, asthma, antioxidant & hypolipidemic	[52-56]
Sphaeranthus indicus	Whol plant	Gorakhmundi	Asteraceae	Analgesic, Antipyretic, bronchitis, jaundice, anthelmintic & tuberculosis.	[57-59]
Dalbergia sissoo	Leaves	Sisam	Leguminosae	Analgesic, Antipyretic, ulcer, leucoderma, & dysentery	[60-63]
Benincasa hispida	Seeds	Kadu	Cucurbitaceae	Antinociceptive, antipyretic, anti-helminthic, syphilis, appendicitis	[64-66]
Lippia nodiflora	Whol plant	Bakkan	Verbenaceae	Diuretic, antimalarial, anti-inflammatory, analgesic, & antipyretic	[67-69]
Zingiber zerumbet	Whol plant	Wild ginger or lempoyang	Zingiberaceae	Analgesic, Antipyretic, anti-inflammatory, ulceration, antioxidant, & antimicrobial	[70-74]
Pergularia daemia	Root	Masi	Asclepidaceae	Analgesic, Antipyretic, anti-inflammatory, anti-helminthic, laxative, diarrhoea, & antidiabetic	[75-79]
Carissa carandas	Root	Gotho	Apocyanaceae	Analgesic, anti-inflammatory, Antipyretic, stomachic, antidiarrheal, anthelmintic	[75, 80, 78]
Laportea crenulata gaud	Root	Agnichutra	Urticaceae	Antipyretic, diuretic, stimulant, stomachic, anti-inflammatory, antioxidant, antimicrobial & antiulcer	[81-86]
Achillea millefolium	Aerial parts	Puthkanda	Asteraceae	anti-inflammatory, Antipyretic, Analgesic, antihemorrhagic	[87, 88]
Salix	Bark	Bharroi	Salicaceae	wound healing, anti-inflammatory, treating fever, mild rheumatic	[87, 89]
Malvastrum coromandelianum	Whol plant	Daikat	Malvaceae	anti-inflammatory, Analgesic, antidysenteric, jaundice & antinociceptive activity	[90-95]
Aleuritis moluccana	Leaves	Candlenut	Euphorbiaceae	anti-inflammatory, Analgesic, skin sores, ulcers, diarrhea, asthma	[96-101]
Gongronema latifolium	Leaves	Utazi	Aslepiadaceae	Analgesic, Antipyretic, antibacterial	[102, 103]
Caesalpinia bonducella	Seed	C. bonduc	Caesalpiniaaceae	Analgesic, Antipyretic, antidiabetic, anti-inflammatory, antioxidant	[104-107]
Cussonia panicula	Stem& bark	-	Araliaceae	anti-inflammatory, Analgesic, antimicrobial, inflammation	[108-111]
Hunteria umbellata	fruit	Osu or Edo	Apocynaceae	Antipyretic, Analgesic, anti-diabetes, peptic ulcers, infertility	[112-114]
Mikania scandens	Whol plant	-	Asteraceae	Analgesic, antioxidant, antimicrobial, anti-inflammatory, Antipyretic	[115-120]
Borassus flabellifer	Flower	Tarkajhar	Areceaceae	Analgesic, Antipyretic, antilaprotic, diuretic, heamorrhages	[121-123]

In the “Table 2: The compositions some ayurvedic formulations which are being used as analgesic and antipyretic medicines are given”:

S.no.	Product	Ingriiedients
1.	Rumalaya	Mahagograj guggul, shemkha bhasma, shilajit, latakasturi, swarnamakshika bhasma, maharasnadi quath, manjishtha, shigres, gokshura, guduchi.
2.	Rumalaya fort	Shallaki, guggula, rasna, yashtimadhu, gokshura, guduchi, nirgundi, sunthi
3.	Reosto	Guggula, godanti bhasma, rasna, arjuna, ashvagandha, bala, kukkutandatvak bhasma.

4.	Charak	Suvarna paan, muktashukti bhasma, kukkudtandwak, shallaki, guggul, nirgundi, shyonak, guduchi, bala mool, gokhsur, ashvagandha, shuddha, kupilu.
5.	Arthrella	Suvarna paan, errand tel, shallaki guggul, nirgundi, shyonak, nagarmotha, shunthi, shuddha kupilu, khurasani ajwayan.
6.	Rymanyl	Abhrak bhasma, suvarnamakshik bhasma, vang bhasma, nag bhasma, ras sindur, suvarna paan, shyonaka, nirgundi, guggul shuddha, errand mool, nagarmotha, punarnava, guduchi, pippali mool, ashvagandha, mnishottar, shunthi, khurasani ajawayan, kupilu shuddha, bachanag shuddha.
7.	R-compound	Guggul, vavdine, haldi, jatamansi, rasna, nirgundi, sunth, bel chal, chitrak chal, chop chini, devdasu, gangrene, ajwayan, neem chal, sarson, white nawsadar, swarn bhasma, abrak bhasma, bang bhasma, yasada bhasma, mandur bhasma, loh bhasma, pippli mool, dared, errand mool, vacha, chavak, amala, vasaka, aru chal, ashvagandha, behra.
8.	Rumartho	Suvarna makshik bhasma, vyadhiharan, kasis bhasma, agmvatari ras, ashvagandha churna, chop chini, sudha kuchla, punarnava mool, dasmula churna.
9.	Jwarankush	Suddha parad, suddha gandhak, suddha vats nabh, suddha kanak seed, suddha tankad, suddha harital.

Other clinical merits of ingredients used in marketed aurvedic analgesic and anti-pyretic

Botanical name	Family	Common name	Clinical merits	Reference
Terminalia arjuna	Combretaceae	Arjuna	Antidyslipidemic, antioxidant, hypolipidemic, cardioprotective activity, cardioprotective, anthelmintic.	[123-129]
Glycyrrhiza glabra	Leguminosae	Mulithi	Antidiabetic, expectorant, anti-inflammatory, anti ulcer	[130, 131]
Sesamum indicum	Pedaliaceae	Til tail	Antifungal, antioxidant, inflammatory, hypolipidaemic, hypoglycemic.	[132-135]
Tribulus terrestris	Zygophyllaceae	Gokhru	CNS stimulant, diuretic, antiurolithiatic, antioxidant and antihypertensive, tonic, aphrodisiac	[136-138]
Tinospora cordifolia	menispermaceae	Guduchi	Hepatoprotectant and immunomodulant, diuretic, general debility, antileprotic, chronic rheumatism, diabetes and malarial fevers, leprosy, jaundice, rheumatoid.	[137, 138, 139, 143]
Smilax chinensis	Liliaceae	Chopchini	Anti-diabetic, Anti-inflammatory, antioxidants, anti-cancer, analgesic agent, pelvic inflammation, chronic pelvic inflammation	[143, 144]
Commiphora wightii	Burseraceae	Guggul	Hypolipidemic, antiarthritic, hypertension	[145]
Strychnos Nux-Vomica	loganiaceae	kucchla	Anti-inflammatory, antioxidant, appetizer, tonic, anthelmintic, febrifuge, purgative, diabetes, paralysis, rheumatism.	[146-150]
Rubia cordifolia	Rubiaceae	Indian madder	Anti-cancer, hypoglycemic, diabetes, anticonvulsant, anti-inflammatory, analgesic.	[151-155]
Phyllanthus embilica	Phyllanthaceae	Amla	Anti-inflammatory, antiannemic, diuretic, antisenescence, reduces LDL, antioxidant, immunomodulatory and diabetes.	[156-157]
Withania somnifera	solanaceae	Ashwagan dha	Antioxidant, adaptogen, anxiolytic, antidepressant, memory enhancer, antiulcerogenic agents	[158]
Vitex negundo	Verbenaceae	Sambhalu, nirgundi	Analgesic, anti-inflammatory, anticonvulsant, antioxidant, anti-histaminic, hepatoprotective, diuretic, antifilarial, antibacterial, antimalarial	[159-161]
Azadirachta indica	Meliaceae	Neem	Hypolipidaemic, hypoglycaemic, antiviral immunostimulant, hepatoprotective, anti-inflammatory, antifertility antidiabetic, antibacterial.	[162-163]
Curcuma longa	Zingiberaceae	Haldi	HIV-1 and HIV-2 protease inhibitor, anti-inflammatory, antioxidant, hepatoprotective, hypoglycemic, hypolipidemic, anticancerous	[164, 165]
Boerhaavia diffusa	Nyctaginaceae	Punarnava	Immunomodulatory effects, immunosuppressive activity, antidiabetic, anti-metastatic, antioxidant, antiproliferative & antiestrogenic, analgesic, anti-inflammatory, antibacterial activity.	[166]

Pluchea lanceolata	composite	rasna	Treat of kidney, anti-inflammatory, antidysenteric, antipyretic, hemorrhoid, inflammation.	[167]
Boswellia serrata	Burseraceae	Shallaki	Wound healing, inflammation, granulation, fibroplasia, wound contraction	[168]
Oroxylum indicum	bignoniaceae	Shyonaka	Astringent, anti-inflammatory, anti-helminthic, anti-rheumatic, anti-anorexic, leprosy, tuberculosis.	[169]
Piper longum	Piperaceae	Papal	Bioavailability enhancer, bronchitis, hepatoprotective, antimicrobial activity.	[170]

has steadily increased its popularity in the western world in recent years. This 5000 old system of medicine recommends a combination of lifestyle management (which include diet, exercise and meditation), and treatment with specific herbs and minerals to cure various diseases. The botanicals in the Ayurvedic material medica have been proven to be safe and effective, through several hundred to several thousand years of use. Ayurvedic physicians have treated diabetes for thousands of years using a combination of regulated lifestyle and herbal formulations.

Conclusion

Herbal medicines make an enormous contribution to primary health care and have shown great potential in modern phytomedicine against numerous ailments and the complex diseases and ailments of the modern world.

There will always be risks when appropriate regulations do not handle the appropriate formulation of the remedies or when self medication fosters abuse.

Clearly strategic planning for research in herbal medicine is needed. The lack of a pharmacological basis for the efficacy and toxicity and clinical data on the majority of herbal medicines is the major constraint to the integration of herbal medicine into conventional medicinal practices. Adverse events, including drug-herb interaction, must also be monitored to promote the safe integration of efficacious medicines into conventional medicinal practices.

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