



ANTIMICROBIAL POTENTIAL OF POLYHERBAL FORMULATION VRANAHITKARA GHRUTAM - A REVIEW

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Article Received on
15 Oct. 2018,

Revised on 05 Nov. 2018,
Accepted on 25 Nov. 2018

DOI: 10.20959/wjpps201812-12828

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ABSTRACT

Vranahitkara ghruta is a Polyherbal ayurvedic preparation which is used for topical application in all types of wounds In ayurveda *vranahitkara ghruta* is an extremely useful as wound healer as it possesses antimicrobial activity. It is also useful in various skin afflictions. This formulation chiefly contains the plants *Berberis aistata*, *Azadirachta indica*, *Jasminum auriculatum*, *Pongamia glabra*. This review explains the antimicrobial potential of each ingredient present in this polyherbal ayurvedic formulation and needs a scientific exploration so as to document its therapeutic effectiveness.

KEYWORDS: Vranahitkara Ghruta, Antimicrobial, Ayurveda, Formulation.

INTRODUCTION

Infection and immunity involve interaction between the body (host) and the infecting organisms. These micro-organisms cause plenty of infectious diseases in human beings.^[1]

Antimicrobial agents presently available in the market are inadequate due to their toxicity, low effectiveness and prove expensive in case of prolonged treatment. The discovery of a potent remedy from plant origin will be a great advancement in microbial disease therapies.^[2] Consequently, researchers are increasingly turning their attentiveness to conventional medicine and probing for new leads to develop enhanced drugs against broad range microbial

infections including bacterial and fungal.^[3] Charaka Samhita contains a number of modified pharmaceutical preparations such as Asava, Arista, Churna, Avaleha, Vatika, Varti, Taila, Ghrita, Lepa, Mantha, Arka etc. Ghrutas are preparations in which ghruta is boiled with prescribed liquid media [Svarasa etc.] and a fine paste [Kalka] of the drugs specified in the formulation composition. Unless specified otherwise Ghruta means Goghruta. The medicated ghruta will have the odour, colour and taste of the drugs used in the process. Ghrutas are preserved in good quality of glass, steel or polythene containers. These medicated preparations retain the therapeutic efficacy for 24 months.^[4]

General Description

The ingredients of *vranahitkara ghruta* are Rhizome of Katuki (*Picrorhiza kurroa* Royle ex Benth), Madhuchchhisht (Beeswax of *Apis indica*), stem of Daruharidra (*Berberis aristata* DC.), Leaf of Karanja (*Pongamia glabra* L.), Leaf of Patola patra (*Trichosanthes dioica* Roxb.), Leaf of malti patra (*Jasminum aurichulatum* Vahl.), fruit/Seed of Karanja (*Pongamia glabra* L.), Leaf of Neem patra (*Azadirachta indica* L.), Root of Yashtimadhu (*Glycyrrhiza glabra* L.) Ghruta and Water.^[5]

Description of Ingredients

Picrorhiza kurroa Royle ex Benth [Scrophulariaceae]. Different pharmacological activities of *P. kurroa* include anti-microbial, anti-oxidant, anti-bacterial, anti-mutagenic, cardio-protective, hepato-protective, anti-malarial, anti-diabetic, anti-inflammatory, anti-cancer, anti-ulcer and nephro-protective activities were recorded from this plant.^[6] Rhizome of the plant is also used in treatment of high blood pressure, intestinal pain, eye disease, gastritis, bile disease, sore throats, blood, and lung fever.^[7] It is considered a bitter tonic, used as a cholagogue (promoting the flow of bile from the gall bladder), stomachic (stimulating gastric activity) and cathartic (purgative).^[8]

Bees wax is obtained from the honey comb of the bees *Apis indica* and some other species like *A. mellifera* [Apidae].^[9] Beeswax is a tough, waxy substance that honey bees produce and secrete in thin scales to be used in the formation of honeycomb, the cellular wall of the beehive. Beeswax is used to make fine candles, shoe polish, soap, skincare products, modelling waxes and other products. It is safe to ingest and used as a coating for pills as well as a solidifier for many candy products. Beeswax is known for its high melting point range, of 62 - 64°C (144 - 147°F).^[10]

***Berberis aristata* DC:** The *Berberis aristata* [Berberidaceae] is a medicinal, known locally as Chitra and Dar-Hald in Hindi, and Dar-E-Hald in Urdu, is a spinous shrub native to mountainous parts of North India and Nepal. These shrubs are distributed throughout the Himalayas. The Antibacterial, antifungal, anti-inflammatory, analgesic, antipyretic activities were reported.^[11] Berberine extracts and salts have demonstrated growth inhibition of *Giardia lamblia*, *Entamoeba histolytica*, *Trichomonas vaginalis*^[12] and *Leishmania donovani*^[13], with crude extracts being more effective than berberine salts.^[14] Berberine has already been reported to possess antimicrobial activities against a wide variety of microorganisms including Gram-positive and Gram-negative bacteria, fungi, and protozoa.^[15]

***Pongamia glabra* L.** The plant *Pongamia glabra* [Leguminosae] is locally known as karanja, is a mangrove plant. Traditionally, its bark is used in pile, leaves are effective as medicated bath and rheumatic, pains, seeds are used in hypertension, bronchitis, whooping cough, skin diseases and rheumatic arthritis, roots are effective in fistulous sores and gonorrhea and having antimicrobial activity.^[16]

It was found to reduce the production of CT and bacterial invasion to epithelial cells. These results indicated that the crude decoction of *P. pinnata* has selective antidiarrheal action with efficacy against cholera and enteroinvasive bacterial strains. They attributed the activity to antimotility, antisecretory and antimicrobial actions of the compound.^[17]

Uddin et al. investigated the antifilarial potential of the fruits and leaves extracts of *Pongamia pinnata* on cattle filarial parasite. In their investigation, the aqueous and alcohol extracts of fruits and the alcohol extract of leaves caused an inhibition of spontaneous movements of the whole worm and the nerve-muscle preparation of *S. cervi*. The concentration required to inhibit the movements of the whole worm preparation was 250µg/mL for aqueous, 120µg/mL for alcohol extract of fruits and 270µg/mL for alcohol extracts of the leaves. The concentrations of *Pongamia pinnata* extracts required to produce an equivalent effect on the nerve-muscle preparation were 25µg/mL, 5µg/mL and 20µg/mL, respectively suggesting a cuticular permeability barrier.^[18]

***Trichosanthes dioica* Roxb.** The *Trichosanthes dioica* [Cucurbitaceae] it is a well-known plant in the traditional medicine. Based on its traditional use, methanolic extract of the plant was selected for assessment of healing potential in the form of simple ointment using full thickness burn wound model in rats. The effect produced by the extract ointment

showed significant healing when compared with the control and standard groups.^[19] It is used for overcoming constipation, fever, skin infections and wounds; seeds of the plant is also used as Antihyperglycemic agent.^[20]

***Jasminum auriculatum* Vahl.** The *Jasminum auriculatum* [Oleaceae] is a small herb found in south India and the western peninsula. The alcohol free defatted extract of *Jasminum auriculatum* leaves has been reported to contain lupeol and jasminol.^[21] Juice of leaves of *Jasminum auriculatum* has been shown to be beneficial in wound healing.

The plant reports antioxidant and antibacterial activities of the essential oils.^[22] The plant is documented to possess beneficial effects as aphrodisiac, antiseptic, emollient, antihelminthic, deobstruant, suppurative, leprosy, skin diseases, wounds, corns, aromatherapy. Pharmacological activities of the plant reported so far are antimicrobial, antioxidant, antiulcer, cytoprotective, chemoprotective, wound healing and anti-acne activity. The various ethnobotanical and traditional uses as well as phytochemical and pharmacological activities reported so far from *J. grandiflorum*.^[23]

***Azadirachta indica* L.** The *Azadirachta indica* [Meliaceae] is a herbal plant widely distributed in our subcontinent during all seasons. Each part of neem tree has some medicinal property. Neem leave, bark extracts and neem oil are commonly used for therapeutic purpose.^[24] Neem oil suppresses several species of pathogenic bacteria such as *Staphylococcus aureus* and *Salmonella typhosa*, all strains of *Mycobacterium tuberculosis* (MTB).^[25,26] The growth of *Salmonella paratyphi* and *Vibrio cholerae* was inhibited.^[27] Efficacy of NIM-76, a spermicidal fraction from neem oil was investigated for its antimicrobial action against certain bacteria, fungi and poliovirus as compared to whole neem oil. Available antimicrobial agents can control the infection but they are expensive and rapid emergence of anti-microbial resistance. Neem may be used for its easy availability and significant effect against bacteria. The neem tree is still regarded as 'village dispensary'.^[28] The ethanolic extract of *Azadirachta indica* showed high inhibitory activity against *Escherichia coli*.^[29]

Azadirachta indica leaf extract showed strong antimicrobial activity against all bacterial species studied at all the concentrations tested. It showed maximum inhibition against *Proteus mirabilis* at 6.25mg/ml concentration, when compared with erythromycin (p = 0.007). Against *Enterococcus faecalis*, there was a significant difference in the antibacterial activity

of the leaf extract at a concentration of 12.5mg/ml and those of ciprofloxacin, erythromycin, ceftriaxone, and gentamycin ($p = 0.004, 0.002, 0.003, \text{ and } 0.008$ respectively).^[30]

***Glycyrrhiza glabra* L** Licorice, [Fabaceae/Papilionaceae] is a plant with a rich ethnobotanical history. The roots are used as a folk medicine both in Europe and in Eastern countries. The root of *Glycyrrhiza glabra* is a traditional medicine used mainly for the treatment of peptic ulcer, hepatitis C, pulmonary and skin diseases, although clinical and experimental studies suggest that it has several other useful pharmacological properties such as antiinflammatory, antiviral, antimicrobial, antioxidative, hepatoprotective and cardioprotective effects.^[31]

Ghruta, Cow's ghee has been reported to exert significant wound healing activity. Its antifungal activity has also been shown to be independent of any antibiotic or antifungal agent, which may be included into the formulation. Ghee contains several saturated and unsaturated fatty acids which are capable of taking part in metabolic processes involved in any wound healing. It seems therefore worthwhile that the cow's ghee is explored further as an effective clinical agent.^[32]

CONCLUSION

Pharmacological activities of ingredients of *vranahitkara ghrutam* has shown its use as antimicrobial qualities proved scientifically. The phyto-medicinal therapy is easy to procure and administer with minimal side effects. So this suggests that the *vranahitkara ghrutam* may be having antimicrobial activity, which must be the area of interest for the scientists to explore this Ayurvedic formulation for therapeutic potentials. So this review helps the researcher to explore this formulation for pharmacological activities of the *vranahitkara ghrutam*.

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