



Review Article

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A COMPREHENSIVE REVIEW ON *HEDYCHIMUM CORONARIUM* J. KOENIG. (DOLANCHAMPA / KAPURKACHRI)

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ABSTRACT

Hedychium coronarium J. Koenig (Family-Zingiberaceae) the White Ginger Lily or Dolanchampa or kapur kachri is a vigorous tall-growing ginger from the Himalayas and consist multiple stems per pot. It is hard, perennial, erect, branched, annual weed up to 3-6 feet height. The leaves are simple arranged in alternate manner with undulate margin. The flowers are white in color and have pleasant fragrance; summer flowering; fall flowering. The trunk is green in color and very thick. It is widely distributed over the tropical and subtropical region of the Asia and Africa. It is an annual branching herb which grows well on wastelands and in tropical region after the rainy season. It contains many bioactive compounds including saponins, glycosides, flavonoids, fats and volatile oil. The main plant chemical found in the plant includes hedychicoronarin, peroxycononarin D, 7 β hydroxyl-calcaratarin A and E, 7 β -hydroxy-6-oxo-labda-8, 12-diene-15, 16-dial. This plant has tremendous medicinal properties and its various parts are used in traditional as well as modern medicine. The rhizome of the plant is used in the treatment of diabetes, cold, body aches, headache, lancinating pain, contusion, inflammation and rheumatic pain. The rhizome has anti-cancerous, antioxidant, anti-hypertensive, diuretic, leishmanicidal, anti-malarial activities and also used in irregular menstruation, piles bleeding and stone in urinary tract.

Keywords: *Hedychium coronarium*, Glycosides, Flavonoids, Hedychicoronarin

INTRODUCTION

Plants are used as rich source of medicine since ancient time. Scientific exploration of traditional knowledge of use of herbs in treatment of various ailments is one of the thrust areas of research. Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs¹. *Hedychium coronarium* J. Koenig plant is widely utilized in traditional medicine systems wherever it grows, although applications vary by region. This plant has tremendous medicinal properties and its various parts are used in traditional as well as modern medicine². The rhizome of the plant is used in the treatment of diabetes, cold, body aches, headache, lancinating pain, contusion, inflammation and rheumatic pain³. The rhizome has anti-cancerous, antioxidant, anti-hypertensive, diuretic, leishmanicidal, anti-malarial activities and also used in irregular menstruation, piles bleeding and stone in urinary tract⁴. Recently, antifungal activity of *Hedychium coronarium* crude extracts was reported. The extracts are as good as or even better than standard drugs like nystatin and griseofulvin⁵. Cancer chemoprevention activity is also reported recently of labdane diterpenes from rhizomes of hedychium⁶. The medicinal value of this plant in the treatment of a large number of human ailments is mentioned in Ayurveda, Charaka Samhita and Sushruta Samhita. *Hedychium coronarium* J. Koenig plant (Family-Zingiberaceae) also known as the White

Ginger Lily or Dolanchampa or kapur kachri is a vigorous tall-growing ginger from the Himalayas and consist multiple stems per pot. It is hard, perennial, erect, branched, annual weed up to 3-6 feet height. The leaves are simple arranged in alternate manner with undulate margin⁷. The flowers are white in color and have pleasant fragrance; summer flowering; fall flowering. The trunk is green in color, very thick. It is widely distributed over the tropical and subtropical region of the Asia and Africa. It is an annual branching herb which grows well on wastelands and in tropical region after the rainy season⁸. Though the plant is traditionally used in many parts of Bangladesh, no scientific report is available to validate the folkloric use. Again, Plants have been a promising source of drug molecules for ages. Bangladesh is blessed with rich floristic resources. Still the untapped wealth of plant kingdom is a major target for the search of new lead compounds in drug discovery⁹.

Synonyms

Hindi: Dolan champa, Gulbakawali, Kapoor kachari, Manipuri: Takhellei angouba, Marathi: Sontakka, Kannada: Suruli sugandhi, Malayalam: Kalyana sauganthikum, English: White ginger, butterfly ginger, butterfly lily, cinnamon, jasmine, garland flower, garland lily, ginger lily, white butterfly ginger, white butterfly ginger lily, white garland lily. Cuba: Mariposa blanca literally white moth flower, Spanish: Guajiro's, Brazilian name: Lirio do brejo.

Taxonomical Classification

- Kingdom : Plantae
- Subkingdom : Angiosperm
- Class : Monocots
- Order : Zingiberales
- Family : Zingiberaceae
- Sub family : Zingiberoideae
- Genus : *Hedychium*
- Species : *coronarium*
- Binomial name: *Hedychium coronarium* J. Koenig¹⁰

Botanical Description

This Herb is perennial, erect, unbranched, up to 3-6 m high, growing from a rhizome. Leaves are simple, alternate, two-ranked, sessile at the top of the leaf sheath, blade elliptic to lanceolate, 20-30 x 3-10 cm, pubescent on lower surface. Flowers are continuously through the year; flowers many, in groups of one to six, borne among large, green, overlapping bracts in an ellipsoidal spike 7-20 cm long atop a leafy stem, fragrant. Corolla with fused tepals, white, the tube narrow, 6-9 cm long, the segments linear, 3-5 cm long with two petal-like ob lanceolate staminodes 3.5-5.5 cm long and a petal-like, sub round, apically notched labellum slightly longer with a yellowish green or dull white patch in the center. Fruits are oblong, many seeded, capsule. It is widely distributed over the tropical and subtropical region of the Asia and Africa. It is an annual branching herb which grows well on wastelands and in tropical region after the rainy season. It favors wet habitat, rain forest, moist forest, roadsides, open areas, stream sides^{11,12}.

Phytochemical Characteristics

Hedychium coronarium J. Koenig contain many bioactive compounds including saponins, glycosides, fats and volatile oil. The main chemical found in the plant include hedychicoronarin, peroxyconarinarin D, 7 β hydroxyl-calcaratarin A and E, 7 β -hydroxy-6-oxo-labda-8, 12-diene-15,16-dial have been isolated from the rhizomes of *Hedychium coronarium*^{13,14}. Hedychicoronarin, peroxyconarinarin D were isolated as optically active colorless oil. The phytochemical study of the rhizomes from *Hedychium coronarium* showed the presence of benzoyl eugenol along with the labdane diterpenes isocoronarin D and ethoxy coronarin D also. *Hedychium coronarium* afforded oils whose major constituents were β -pinene (20.0 %), linalool (15.8 %), α -pinene (10.1 %), 1,8-cineole (10.7 %) and α -terpineol (8.6 %) in the leaf while the root consists mainly of β -pinene (23.6 %), α -humulene (17.1 %), β -caryophyllene (13.0 %), α -pinene (6.9 %) and elemol (6.9 %)^{15,16}. The volatile constituents of the various parts of *H. coronarium* from other parts of the world have been reported¹⁷. Although ubiquitous monoterpenes and sesquiterpeens were the main components of these oils, the identities of these compounds differed from one another. This led to the delineation of various chemotypic forms of the essential oils of *H. coronarium*. The compositional pattern of the leaf oil (β -pinene, linalool, α -pinene, 1,8-cineole) and the root (β -pinene, β -caryophyllene, α -humulene) in this study seems to be new chemotypic forms of essential oil of the plant when compared with previous studies^{18,19}.

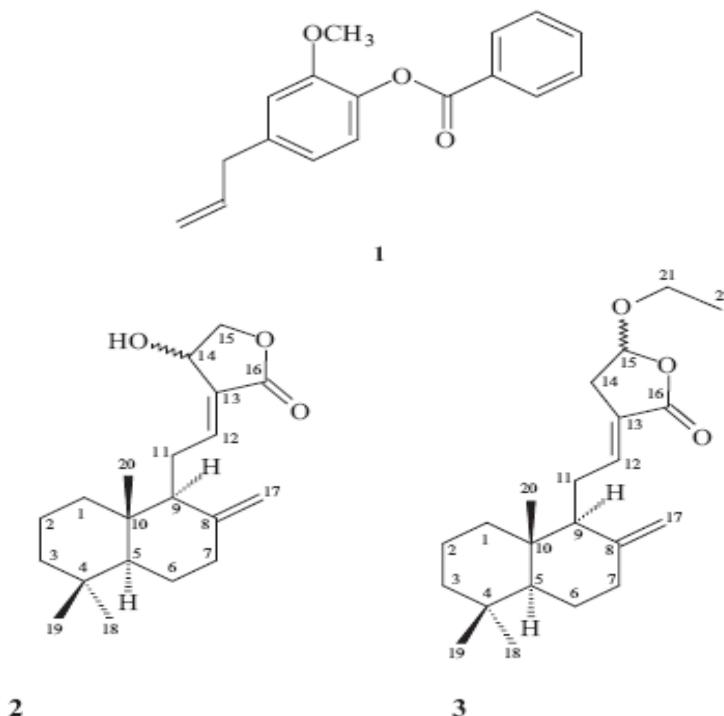


Figure 1: Hedychicoronarin 2. Peroxyconarinarin D, 3. 7 β hydroxyl-calcaratarin



Figure 4: *Hedychium coronarium* J. Koenig, Family-Zingiberaceae

Pharmacological Activities

Its rhizome is used in the treatment of diabetes. Traditionally it is used for the treatment of tonsillitis, infected nostrils, tumor and fever. It is also used as anti rheumatic, antioxidant, excitant, febrifuge, and tonic¹⁸. It has been reported that the essential oil extracted from leaves, flowers and rhizome of the plant have molluscicidal activity, potent inhibitory action, antimicrobial activities, antifungal, anti-inflammatory, antibacterial and analgesic effects. The seeds are aromatic, carminative and stomachic. The plant also possessed analgesic and neuropharmacological, anti-inflammatory, antimicrobial and cytotoxic activities²⁰. This plant has tremendous medicinal properties and its various parts are used in traditional as well as modern medicine. The rhizome of the plant is used in the treatment of diabetes, cold, body aches, headache, lancinating pain, contusion, inflammation and rheumatic pain. The rhizome has anticancerous, anti-hypertensive, diuretic, leishmanicidal, anti-malarial activities and also in irregular menstruation, piles bleeding and stone in urinary tract²¹.

CONCLUSION

Hedychium coronarium J. Koenig plant has been widely studied. It is believed that detailed information as presented in this review on its phytochemistry and various biological properties of the extracts and the constituents might provide incentive for proper evaluation of the use of the plant in medicine and in agriculture. Further work, however, still needs to be carried out on the toxicity of the plant and especially on some flavonoids, which have been shown in few cases to cause antilithiatic effect in rats.

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