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Review Article

Phytochemical And Pharmacological Activities Of Hedychium Coronarium

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ABSTRACT

Hedychium coronarium J. Koenig, commonly called ginger lily, garland flower, cinnamon jasmine, butterfly ginger, and butterfly lily, is a member of the Zingiberaceae family. It's a medicinal plant that is grown in Brazil, China, Japan, India, and Southeast Asian nations. Important secondary metabolites found in H. coronarium include flavonoids, saponins, glycosides, labdane diterpenes, alcohols, aldehydes, ketones, esters, oxides, and phenolics. The primary components of H. coronarium's volatile oils have been determined to be limonene, myrcene, p-cymene, camphene, γ-terpinene, β-pinene, 1,8-cineole, linalool, α-pinene, and 10-epi-γ-eudesmol, in addition to important elements such as trans-meta-mentha-2, 8-diene, linalool, α-terpineol, terpin-4-ol, α-pinene, and camphene. The plant contains the diterpenes coronarin-A-I, isocoronarin-D, and pacovatin A; sesquiterpenes (+)-nerolidol, hedychiol A, hedychiol B 8,9-diacetate; sterols, daucosterol, stigmasterol, and β-sitosterol; and flavonoids, 5-hydroxy-3,7,4'-trimethoxyflavon, chrysin. This bioactive components of herb, turned it become a useful, powerful herbal remedy. China and India also place great importance on Hedychium coronarium in their traditional medicine systems. Tha plant exhibits wide range of biological activities, including function related to Analgesic activity, Neuropharmacological activity, Antibacterial activity, anticancer, Antidiabetic, Anti-inflammation activity, Hepatoprotctive, Antihelmintic, Mosquitocidal, Larvicidal. The current review includes representations of the several pharmacological activities and therapeutic properties of Hedychium coronarium.

INTRODUCTION

White ginger, often called butterfly lily, is a plant that belongs to the Zingiberaceae family of herbal

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remedies. The plant known as butterfly lily or white ginger is a member of the Zingiberaceae family of herbal medicines. This herbaceous perennial plant reaches a maximum height of around 1.5 meters. It is frequently seen in regions with subtropical and tropical temperatures. It may be grown and collected all year round. It goes by the botanical name Hedychium coronarium J. Koenig (Maha-hong). J. Kohlenig made the initial discovery of it in 1783. It is sometimes referred to as Kaempferia hedychium Lam (Hern-Keaw) or Hedychium spicatum Lodd (Ta-hern) (Pornpimon Wongsuwan, 2011). Conventional therapies for reducing hypertension and inflammation have included the use of H. coronarium J. Koenig. It is also called the Garland Flower, originally from the Indian and Nepalese mountains. Extensively grown in Bangladesh, South Asia, India, Japan, and South China. Considered the White Butterfly flower, or Mariposa Blanca in Cuba, it is the national flower of that country. α-eudesmol, β-caryophylene, β-pinene, limonene, γ-terpinene, 1, 8-ceneol, α-eudesmol and α-terpineol these are the principal constituents present in the rhizome of H. coronarium J. Koenig. This herb has an extensive range of therapeutic uses both conventional and modern medicine make use of all components of the plant. Boiling H. coronarium leaves are used to treat painful and tight joints in Thailand. Boiled leaves are used in Peninsular Malaysia as a remedy for dyspepsia. In swellings, the base of the stem is used. The stem may be used to make paper since it contains 43–48% cellulose. It is grown as an ornamental because of its lovely, fragrant blooms and eye-catching, verdant leaves. Hedychium flowers are extensively grown for their ethnomedical properties, scent, and essence. Hedychium coronarium having various allied species which are identified by different characteristics such as, bracts are broad, coriaceous, and densely imbricated, forming a more or less elliptical strobilus and sheltering from four to six flowers that emerge in succession. The calyx is tubular, divided on one side, less than half the length of the corolla tube, and glabrous, whereas the flower tube is 6-8 cm long, cylindrical, with three linear-laneeolate, equal, and declined corolla segments. The lip is large, broad, and abruptly narrowed at the base. It is divided into two elliptic-ovate lobes, which are sometimes further lobed. The lateral staminodes are oblong- or ovate-elliptic, pure white or yellowish in the lower part. The filament has an anther shorter than the lip, white or yellowish, and the inferior ovary is glabrous or slightly dented.[1-6]

Table 1 Botanical characteristics allied species of Hedychium.[6]

Species	Stem	Leaf	Flower	Sugar content of nectar (%)	Altitudinal range (MSL)
H. rubrum A.S. Rao et Verma	Reddish	Moss green, lanceolate, glabrous	Red, orbicular, no. aroma	24	750–800
H. coronarium Koenig	Bright green	Bright green, pubescent underside	White broadly orbicular, sweetly scented	17.5	750–800

H. chrysoleucum Hook.	Bright green	Bright green, broad, glabrous	White with yellow patch at base and stamen, orbicular, sweetly scented	20	750–800
H. coccineum Buch.-Ham.	Grey, glaucus	Linear lanceolate, glaucus	Orange red, small orbicular with linear staminodes, very faint aroma	25	750–1,300
H. thrysiforme Ker- Gawl.	Bright green,	Broad, pubescent underneah	White, small obcordate with linear staminodes, slightly aroma	24	650–800
H. flavescens Carey ex Roscoe	Green, pubescent	Bright green, broad, pubescent	Pale yellow with darker patch at base, orbicular, intense citrus-flower scent	23	700–1,200
H. urophyllum Lodd.	Reddish, glabrous	Bright green, broad, pubescent underneah	Golden yellow with orange red patch at base and stamen, orbicular, sweetly scented	16.5	750–800
H. stenopetalum Lodd.	Green, pubescent	Dark green, pubescent	Uniform white with sometimes greenish patch at base, slightly scented	23	950–1,450
H. marginatum Clarke	Grey green, pubescent	Dirty green, pubescent	Orange yellow uniformly with linear staminodes, sweetly scented.	22	950–1,300
H. villosum Wall.	Dark green, pubescent	Dark green, pubescent	White with red stamens, scented	23	1,200
H. elatum R.Brown	Green	Dark green, pubescent underneah	Pink with reddish patch, sweetly scented	27	1,200–1,300

Figure No. 1: Image of Hedychium coronarium plant

Scientific Classification

Kingdom: plantae - plants
Subkingdom: Tracheobionta - vascular plants
Superdivision: Spermatophyyta - Seed plants
Divison: Magnoliophyta - Flowering plant
Class: Liliopsida - Monocotyledons
Subclass: Zingiberidae
Order: Zingiberales
Family: Zingiberaceae-ginger family
Genus: Hedychium-garland-lily
Species: Hedychium coronarium - White garland-lily [2]

Morphology

Hedychium coronarium, often known as white butterfly or "Gulbakawali," is an upright perennial herb that grows from the rhizomes to a maximum height of 1-2.5 m (3-6 ft).[7]

Rhizomes

Rhizomes grow to a diameter of 2.5–5 cm and spread horizontally beneath the soil's surface. They are fleshy, branching, knotty, and have several nodes.[7]

Leaves

The leaves are simple, two-ranked, arranged alternately, lance-shaped, sharply pointed, and measure 8–24 in (20–61 cm) in length and 2–5 in (5–12.7 cm) in width.There are complete margins, a strong midrib on the dorsal face, smooth and glabrous surfaces, and a glossy, bright green color.[7]

Flower

white flower clusters that appear between the bracts; each bract has two to three blooms. Flowers have a tubuler calyx that is 4 cm long and concealed between the bracts opening obliquel; the calyx is glaberous and less than half the length of the corolla tube. Flowers are zygomorphic and hermaphrodite.[7]

Fruits

Fruits are long and have capsules that hold a lot of seeds.[7]

Phytoconstituents

Gas chromatography (GC) and gas chromatography-mass spectroscopy (GC/MS) were used to access the compositions of essential oils. A Hewlett-Packard 6890 (Agilent Technologies, Palo Alto, CA, USA) gas chromatograph with an HP GC ChemStation Rev. A.05.04 data processing system, one injector, and two flame ionization detection (FID) systems was used for the analytical GC. The components of essential oils were distinguished by their retention indices. Retention indices from reference samples in the Centre for Pharmaceutical Studies were compared to those obtained by linear interpolation in relation to retention times of C8–C23 of n-alkanes.[8]

Table 2 Constituents of the volatile oils of leaves and rhizomes of Hedychium coronarium.[8]

Sr. No	Compound	RI	Percent in samples (%)	
			Leaves	Rhizomes
1.	α-Thujene	921	_	0.1
2.	α-Pinene	928	0.2	1.9
3.	Camphene	941	_	0.3
4.	Sabinene	936	t	0.2
5.	β-Pinene	968	1.1	11.7

6.	Myrcene	980	_	0.4
7.	Phellandrene	997	_	0.1
8.	Carene	1005	_	0.2
9.	Limonene	1019	t	2.4
10.	1,8 Cineole	1020	0.7	31.7
11.	Z-Ocimene	1025	_	0.3
12.	Terpinene	1046	_	0.5
13.	E-Sabinene hydrate	1051	_	0.5
14.	Terpinolene	1077	_	0.3
15.	Linalool	1084	_	0.7
16.	Fenchol	1105	_	0.2
17.	Campholenal	1106	0.3	0.2
18.	Camphor	1119	_	0.1
19.	Nopinone	1120	t	_
20.	*E*-Pinocarveol	1122	1.3	0.4
21.	Z-Verbenol	1123	_	0.3
22.	*E*-Verbenol	1129	0.4	_
23.	Pinocarvone	1136	1.3	0.4
24.	Borneol	1145	t	3.1
25.	*E*-Caryophyllene	1407	12.1	1.3
26.	Caryophyllene oxide	1559	43.9	1.1

Geographical distribution and cultivation and collection

Hedychium coronarium is spread in numerous regions of the world, including India, China, Brazil, and Southeast Asia. Hedychium coronarium J. Köenig (Zingiberaceae) is a globally significant genus with 65 species, 24 of which are concentrated in Northeast India. Hedychium coronarium can be found up to 2500 meters above sea level. It is widely grown throughout the world, particularly in China, India, and the South East countries' tropical and subtropical zones. It is believed that Hedychium coronarium is native to the Himalayas and southern China. This species can be found in areas with water logging that are partially or completely shaded. In tropical Asia, Hedychium comprises 50 species, of which 37 are found in India and 8 in the Western Himalaya. It may be found throughout India, including Assam, Bihar,

Karnataka, Kerala, Maharashtra, Uttar Pradesh, Odisha, Manipur, and Sikkim. In the country's central region, it can be found in the Madhya Pradesh and Chhattisgarh regions of Amarkantak. Hedychium species are commonly cultivated for their aroma, as a useful raw material for paper making, medicinal, and horticultural value. A total of 11 Hedychium species were collected from various places in Northeast India. Hedychium coronarium, Hedychium chrysoleucum, Hedychium stenopetalum, Hedychium spicatum, Hedychium gardnerianum, and Hedychium flavescens were all collected in two individuals, but the remaining five species were only collected once.[7][9][10]

Pharmacological activities

Analgesic activity

The purpose of this study was to look into the analgesic properties of Hedychium coronarium rhizome methanolic extract. Using the tail immersion method and the acetic acid-induced writhing test in mice, the analgesic activity was assessed for its central and peripheral pharmacological activities. The 150 gm Hedychium coronarium rhizome powder was extracted using methanol, filtered, and evaporated to dryness, resulting in a reddish-colored concentrate. Male and female Swiss albino mice, weighing between 20 and 25 grams at 4 weeks of age, were used in the experiment. Prior to research, the animals were given a week to become used to the laboratory environment.

Tail immersion test the animals were treated with methanolic extract then 1 to 2 cm of mouse tail immersed in warm water maintained at 55°C. The mouse's reaction time was the time it took to deflect their tails and the observations were found are compared with standard drug morphine. The analgesic activity of Hedychium coronarium's methanolic extract was assessed using tail immersion method showing an increase in tail withdrawal reflex time with higher doses. Acetic acid-induced writhing test The analgesic activity of samples was studied using an acetic acid-induced writhing model in mice. Test samples and control were administered orally 30 minutes before acetic acid injection, while Diclofenac-Na was administered intraperitoneally 15 minutes before. Mice were observed for specific body contractions for 10 minutes. In acetic acid-induced writhing test, the extract showed a writhing inhibition.[11]

Neuropharmacological activity

In this work, the neuropharmacological activity of Hedychium coronarium rhizome methanolic extract was investigated. The neuropharmacological action of the extract was examined in mice through the use of hole-cross test. A reddish-colored concentrate was produced by extracting the 150 gm Hedychium coronarium rhizome powder with methanol, filtering it, and evaporating it until it was completely dry. Male and female Swiss albino mice were selected for the experiment. In the center of the cage, a steel partition with a 3 cm diameter opening was placed. The number of times a mouse passed through the opening between the chambers was counted over a 3-minute period at 0, 30, 60, 90, and 120 minutes following oral administration of methanolic extracts of H. coronarium at doses of 100, 200, and 400 mg/kg body weight. In the investigated models, the extract showed dose-dependent inhibition of motor activity in mice. According to study findings, the plant has potent central nervous system depressive properties.[11]

Antibacterial Activity

The antibacterial properties of essential oil extracted from Hedychium coronarium were studied in this experiment. For eight hours, fresh rhizomes were hydro-distilled in Clevenger's equipment. H. coronarium oil was obtained by extracting the distillate with diethyl ether, drying it over anhydrous Na2SO4, and then removing the solvent. Monoterpene hydrocarbons were

abundant in H. coronarium oil. The antibacterial activity was determined using a tube dilution method. A total of 500 ml of nutrient broth was poured into 10 test tubes, with 500 ml of extract in the first tube and 0.5 ml of an inoculum containing 105 organisms/ml added to each tube. The lowest concentration inhibiting bacterial growth was noted as the MIC after 24 hours of incubation at 37°C. Essential oils showed antibacterial activity against five pathogenic bacteria, viz. Escherichia coli, Staphylococcus aureus, Salmonella typhi, Pseudomonas aeruginosa and Proteus vulgaris.[12]

Anticancer activity

Cancer is a more serious disease than any other that causes death around the world. Natural products should be investigated as anticancer medicines because they are inexpensive, widely available, and highly helpful to humans. This experiment investigated the anti-cancer capabilities of extracts of Hedychium coronarium. For the purpose of extracting rhizome oil Clevenger's apparatus was used, H. coronarium plants were collected, staralized and explants were inoculated on MS medium with combinations of kinetin, benzyl adenine, naphthalene acetic acid, indole-3-acetic acid, and adenine sulfate with 30 gm/l of sucrose and 0.8% of agar. Human breast cancer cell line or MCF7 and human cervical cancer cell line or HeLa were subcultured in dulbecco modified eagle medium, supplemented with fetal bovine serum, penicillin-streptomycin, and glutamine. The cells were incubated in a CO2 incubator with a 95% humidity atmosphere. After 24 hours, five concentrations of test samples were added and incubated at 37°C for 24 hours. Plates were cleaned, MTT reagent added, and incubated for 3 hours. After incubation MTT was removed, 100 µl of DMSO was added. Absorption of control and samples was measured, and IC50 value calculated using linear regression. Rhizome oil yielded 0.42%, with eucalyptol being the major compound at 46.19%. Different drug concentrations inhibited MCF7 and HeLA cell lines, with the effective concentration required for 50% reduction. A positive control was used at 10 mM concentration.[13][14]

Antidiabetic activity

In the current study, the antidiabetic activity of its rhizomes was explored using an a-amylase and a-glucosidase inhibition assay, and the active compounds were discovered using a bioactivity guided isolation method. The rhizome (20 g) was powdered and extracted in a Soxhlet apparatus with increasing polarity solvents (200 ml): hexane , dichloromethane,ethyl acetate , acetone , methanol , and water. The extractive values for each solvent were 2.28, 0.24, 1.08, 0.11, 0.15, and 0.09 g, respectively. The study involved adding sample extract to a solution of a-amylase in 0.02M sodium phosphate buffer and incubating it at 25°C for 10 minutes. Next, starch solution was added to the mixture. The mixture was then blocked with DNS reagent and maintained in a boiling water bath for 15 minutes. The reaction mixtures were diluted with distilled water and absorbance was measured at 540nm against a control. The percentage inhibition was calculated. The a-glucosidase inhibitory assay was conducted using a 96-well plate. The sample solution was mixed with an enzyme solution containing 0.5 U/ml and incubated at 37°C for 10 minutes. Subsequently, p-nitrophenyl a-D-glucopyranoside (0.5mM) was added and incubated for 30 minutes. The absorbance of the solution was measured at 405nm, and the percentage inhibition was calculated after adding 100 ml of 0.2M sodium carbonate solution. Ethyl Acetate demonstrated the most significant inhibition against a-amylase and a-glucosidase enzymes among the crude extracts.[15]

Anti-inflammation activity

This study used in vivo carrageenan-induced hind paw edema in rats to examine the anti-inflammatory properties of the essential oil extracted from these flowers. The flowers were cut into pieces, hydrodistillated, centrifuged, and extracted with diethyl ether. The ether phase was dried over sodium sulphate, evaporated, and stored at -20°C until use. The supernatants were then dried over Na2SO4, evaporated, and stored. For the assessment of anti-inflammatory activity, male Wistar rats weighing 200 ± 30 g were employed. The study aimed to determine the potential of carrageenan in treating paw edema in this examined the anti-inflammatory activities of flower essential oil from H. coronarium using a carrageenan-induced paw edema test. Animal groups were treated with essential oil or indomethacin 30 minutes before the inflammatory agent. Male Wistar rats were anesthetized and injected with carrageenan in isotonic saline, while the left hind paw was injected with saline as control. Paw size was measured at hourly intervals for 5 hours after the stimulus. The results reveal that the essential flower oil is significantly reduced the swelling of the paws.[16]

Antioxidant Activity

The perennial herb Hedychium coronarium Koen., which belongs to the Zingiberaceae family, is valued for its high quality essential oil. The current study assessed the Hedychium coronarium essential oils' antioxidant properties and range of chemical constituents. A Clevenger apparatus method was used to hydrodistill fresh rhizome samples for a duration of six hours. After being dehydrated over anhydrous Na2SO4, the extracted oil was refrigerated until examination. The yield percentage was computed by dividing the fresh weight of the sample (% v/w) by the essential oil volume.

DPPH radical scavenging activity

1 ml of the methanolic DPPH solution (0.1 mM) was combined with 1 ml of essential oil at different concentrations, and the reaction mixture was allowed to stand at room temperature for half an hour. At 517 nm, the absorbance of the sample was measured. (%) inhibition=[100* (Ac−AS/Ac)], where Ac is the absorbance of the control and AS is the absorbance of the test sample, is the formula used to calculate the percentage of inhibition of DPPH radicals. The IC50 value was used to calculate the essential oil concentration that could inhibit 50% of the DPPH radicals.

ABTS radical scavenging activity

The ABTS stock solution was created by combining 7mM ABTS solution with 2.45mM ammonium persulfate and storing at room temperature for 16 hours. The ABTS solution was diluted further with methanol to achieve an absorbance of 734 nm. Then, 1 ml of essential oil at various concentrations was added to 1 ml of ABTS solution. The absorbance of the sample was measured at 734 nm. The % inhibition of ABTS radicals was estimated using the same formula as the DPPH assay. The IC50 value is the concentration of essential oil required to block 50% of ABTS radicals.[17][18]

Antiurolithiatic Activity

Kidney stones, also known as urolithiasis, are formed through a complex cascade of physicochemical processes such as super-saturation, nucleation, growth, aggregation, and retention within the kidney. An invitro model with calcium oxalate stones was used to assess the antiurolithiatic efficacy of alcoholic and aqueous root extracts. Cysone formulation was utilized as a reference standard. Using the hot percolation process, powdered Hedychium coronarium J. Koening roots were extracted with 70% v/v alcohol. Chloroform water I.P. was used in the maceration process to create aqueous extracts as well. Calcium chloride dehydrates and sodium oxalates react in distilled water, forming calcium oxalate. Ammonia solution removes sulphuric

acid traces, and the precipitate is washed with distilled water and dried at 600C for 4 hours. The egg's semi-permeable membrane connects the exterior calcified shell to its interior components, including albumin and yolk. The shell was chemically removed by immersing the egg in 2M HCL. A study involved weighing calcium oxalate and extract/standard, packing them in a semi-permeable membrane, and suspending them in TRIS buffer. A negative control was used which contains only 1 mg of calcium oxalate. The conical flasks of all groups were preheated to 370C for 2 hours, then semi-permeable membranes were removed and added 2ml of 1 N sulphuric acid then titrated with 0.9494 N KMnO4, resulting in a light pink color end point equivalent to 0.1898 mg of calcium. The study found that alcoholic extracts of roots provided the maximum dissolving of calcium oxalate stones when compared to the other extracts.[19]

Anti-Wrinkle activity

The study aims to extract aromatic compounds from Hedychium coronarium's rhizomes, leaf sheaths, and leaves and examine their anti-wrinkle capabilities using collagenase, elastase, and hyaluronidase inhibition. Concrete is produced using nonpolar solvents like hexane, benzene, and toluene to dissolve waxy plant compounds. The solvent is removed to create concrete, while the absolute is obtained by extracting the concrete using ethanol. The ethanolic extract solidifies the waxes, and the solvent is evaporated under vacuum conditions, leaving the absolute with intense aromatic properties and high concentration. Skin drooping and wrinkles can result from degeneration of the extracellular matrix (ECM), which includes collagen, elastin, and hyaluronic acid . Inhibiting enzymes responsible for ECM degradation is a viable technique for anti-wrinkle treatment. The sample containing H. coronarium aromatic extracts dissolved in DMSO and mixed with 40 µL of elastase with a 90% enzyme activity. The mixture was incubated for 15 minutes at ambient temperature, followed by adding 100 µL of 1.6 mM AAAVPN in tris HCl buffer pH 8.0. The absorbance was measured at 410 nm for 20 minutes using a multimode microplate reader. percent of elastase inhibition can be calculated using following formula :

Elastase inhibition (%) = $[(a - b)/a] \times 100$

Where,

a represented as the absorbance of the combination without aromatic extracts from H.coronarium

b represented as the absorbance of the combination with aromatic extracts from H. Coronarium.[20]

Hepatoprotective Activity

This investigation of the hepatoprotective properties of an aqueous acetone extract from Hedychium coronarium flowers was the aim of the study. Primary cultured mouse hepatocytes were reported to be protected against D-galactosamine-induced cytotoxicity by an 80% aqueous acetone extract extracted from Hedychium coronarium flowers. Fresh H. coronarium flowers were extracted using chloroform at room temperature. The residue was then extracted using 80% aqueous acetone at ambient temperature and then again under reflux conditions. Collagenase perfusion method was used to separate the hepatocytes from male ddY mice weighing between 30 and 35 g. The hepatocytes were cultivated for 44 hours after the addition of new medium containing D-GalN and a test sample. Fresh media was substituted for the old one, and MTT (5 mg/ml in phosphate buffered saline) solution was added. The media was withdrawn after the 4-hour culture, and isopropanol containing 0.04 M HCl was added to dissolve the formazan that the cells had formed. A microplate reader was used to measure the formazan solution's optical density (O.D.) at 562

nm. The main ingredients, coronaririn C and 15-hydroxylabda-8(17),11,13-trien-16,15-olide which are present in extract of H. coronarinum were showed hepatoprotective benefits that exceeded silybin's hepatoprotective properties,[21]

Mosquito-larvicidal Activity

The mosquito-larvicidal abilities of the essential oil of the leaves and rhizomes of Hedychium coronarium Koen. (Zingiberaceae) were evaluated. A Clevenger device was used to subject the fresh leaves and rhizomes to water distillation for six hours.The essential oil yields from the rhizomes and leaves were determined to be 0.20 and 0.15 percent, respectively. After being extracted and filtered, the resulting essential oil was dried over anhydrous sodium sulfate and kept at +40C until examination and analysis. The study investigated the impact of different doses of H. coronarium essential oil on larval mortality after 2 and 24 hours. Control solution is prepared and third-fourth-instar larvae were transferred to test and control solutions, and larval mortality was recorded. LD50 values were estimated using probit analysis. The larvicidal action against mosquitoes was demonstrated by the leaf oil, with LC50 values of 111 and 90 ppm after two hours and 86 and 47 ppm after twenty-four hours, respectively. Both rizomes and leaves oil's main larvicidal ingredients are 1,8-cineol, β -pinene, and α-pinene in H. coronarium.[22]

CONCLUSION

In comparison to leaves and flowers, H. coronarium's rhizomes have attracted the greatest attention worldwide. H. coronarium exhibited a variety of pharmacological characteristics, such as anti-inflammatory, anti-urolithiatic, anti-inflammatory, cytotoxic, chemopreventive, anti-allergic, larvicidal, anthelminthic, analgesic, fibrinogenolytic, coagulant, and hepatoprotective effects. Research projects can concentrate on large-scale isolation of desirable bioactive compounds—likely from cultivated plant resources—as well as in vitro and in vivo experiments. However, with these various aspects, numerous research studies are currently underway, and this might be regarded as a natural source of developing future medications. Hedychium coronarium has been shown in numerous studies to be a useful natural crude medicine; this means that it may be used to create novel medications.

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