

Biological Properties, Phytochemistry and Traditional uses of Rudravanti (*Cressa Cretica*): A Review

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ABSTRACT

Since long, the ayurvedic period, the herbal drugs were the sole source of medication for majority of population pertaining to the holistic approaches consisting of easier method of uses and better results. Despite vast continuous developments in the drug therapy, herbal sources are still of great importance and nearly 60% of the world's population continuously using such drugs. These are not only used for primary healthcare in rural areas in developing countries, but also in developed countries as well where modern medicines are predominantly available. In spite of industrious and versatile unbroken advancements in ayurvedic medicines of the present therapeutic arena, still a huge number of herbal origins leading to a vast variety of flora remains unexplored that could be utilized in the treatments for several afflictions i.e. diabetes mellitus, hepatitis, inflammation, cirrhosis of liver, cancers etc. Hence the satisfactory and safer solution to these problems of the public health care requires tremendous attention of the researchers to explore out medicinally efficacious plants and isolate potent molecules from them. Evaluation of such molecules could generate broader spectrum of pharmacodynamic and pharmacokinetic parameters with least toxicity. *Cressa cretica* (Linn) belonging to family Convolvulaceae. It is commonly known as Rudravanti. Traditionally root and leaves of *Cressa cretica* are commonly used as expectorant and antibilious agent. It is a holophytic dwarf shrub used in folklore medicine. This article gives the updated information on its properties.

Keywords: *Cressa Cretica*, Biological Properties, Phytochemistry, Traditional uses

INTRODUCTION

The major hindrance in the amalgamation of herbal medicines into modern clinical therapy is the lack of scientific and clinical data, and better understanding of the efficacy and safety of the herbal products. To ensure the quality, safety and standardization of such products is the challenging task for phytochemists and the medicinal chemists of the present and future era. The holistic approaches provided valuable

clues for selection and preparation of such formulation, as efficacy has been established by the common use.^[1] In the last few decades there has been an exponential growth in the field of herbal medicine and the popularity of herbal drugs in the developed countries due to its natural origin with lesser side effects.^[2] Majority of the traditional medicines used in healthcare are obtained from plants.^[3] In spite of several advancements in the field of clinical

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and pharmaceutical investigations have in fact elevated the status of medicinal plants by identifying the role of active principles present in them and elaborating on their mechanism of action in the human system. ^[4] The WHO estimated that approximately 80% of world population trusts on traditional medicines in their health care but now a days Ayurveda coexists with modern system of medicine widely used in practice. ^[5] In the traditional system of medicine lot of practitioners used their own formulation. ^[6] *Cressa cretica* (Linn) is commonly known as Rudravanti and belonging to family Convolvulaceae. ^[7] *Cressa cretica* (Linn) a halophytic plant which is referred to by the name that reflects the features of Sanjeevani so it is called Sanjeevani. It is mysterious and sought after herbs in India mythology. It's existence and identity are steeped in deep controversy. ^[8]

SYNONYMS

Rudravanti, Uppugaddi, Dahna, Chaval, Uppusanaga, Mullumaddugida, Lona, Rudanti, Azhukanni, Uppu Marikkozhundu, Oan.

GEOGRAPHICAL DISTRIBUTION

Cressa cretica (Linn) is a small, dwarf shrub upto 38 cm height. It is start to shoot in the beginning of June. The heights of the plant were

found to be 7cm-29cm but mostly are of 14cm in height. The time of fruits and flowers from June to August but during September the plant gradually withers. The plant is distributed throughout India, along sandy shores. ^[9,10]

BOTANICAL DESCRIPTION

Cressa cretica is a cushion chamaephyte excretive halophyte, an erect dwarf twining shrub up to 38 cm in height. Roots horizontal geminate, with lateral branches leading upward to produce above-ground parts. Perennial subshrub or herb, usually much-branched. Stems at first erect and then becoming decumbent, apparently short-lived, grey appressed pilose to sericeous. The flowers are actinomorphic, often showy, and nearly always bisexual. ^[11] The perianth and androecial whorls are 5-merous. The sepals of the calyx are usually distinct but the corolla is strongly sympetalous, plaited, and often rotate or trumpet shaped with inconspicuous lobes. The stamens are often unequal, and are adnate to the base of the corolla tube and alternate with the lobes. The gynoecium consists of a single compound pistil of 2 or rarely up to 5 carpels, usually an unbranched or 2-cleft style, and a superior ovary of 2 or sometimes up to 5 locules, each with 1 or 2 axile ovules. ^[12]

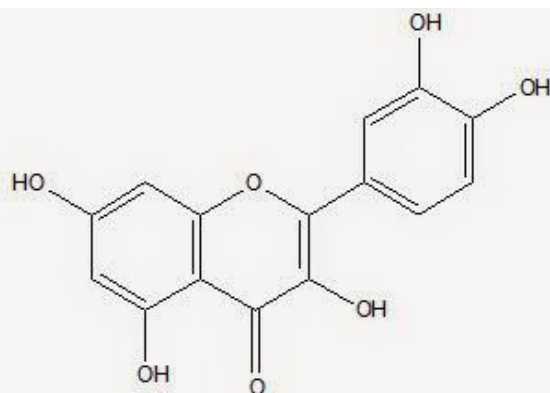


Young stems herbaceous, more or less cylindrical to oval in shape and slightly swollen at nodes. Stem at young tips more or less rectangular with deep green colour, odour remarkable, taste unpleasant and sour. Leaves on main branches are often larger than those on branchlets, the blade 1- 12mm long, lanceolate, ovate or elliptic to scale-like, sessile or shortly petiolate. Flowers solitary, axillary, 5- 8mm long, sessile or on short peduncles, bracteate, in spicate to head-like clusters at tips of branchlets, bracteoles unequal in length.^[13] Sepals ovate to obovate, imbricate. Corolla salver form, the limb 5-lobed, the lobes mostly ovate, imbricate, spreading to reflexed. Stamens exerted; filaments filiform; styles exerted. Ovary 2-locular, 4-ovulate; styles 2, distinct to the base; stigmas capitate. Fruit capsular, ovoid, unilocular, 2-4-valved, usually 1 seeded. Seeds 3- 4mm long, glabrous and smooth and shining to reticulate, dark brown.^[14]

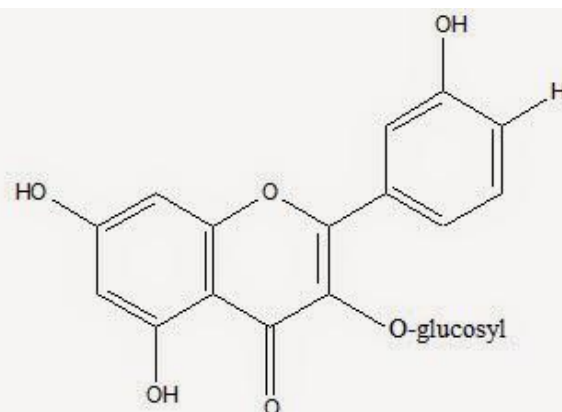
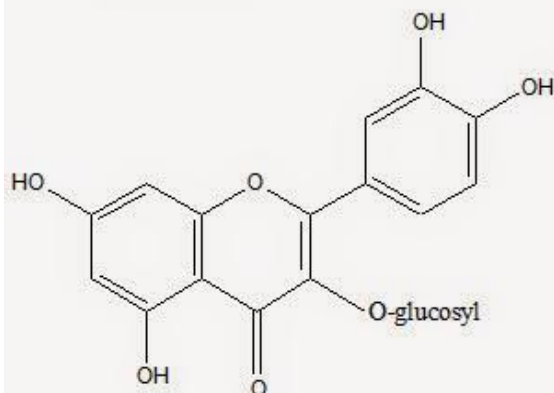
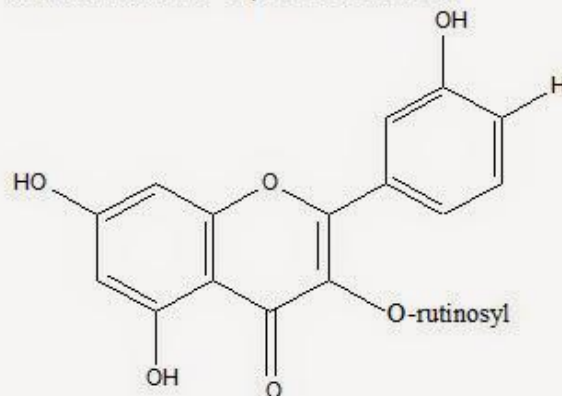
CHEMICAL CONSTITUENTS

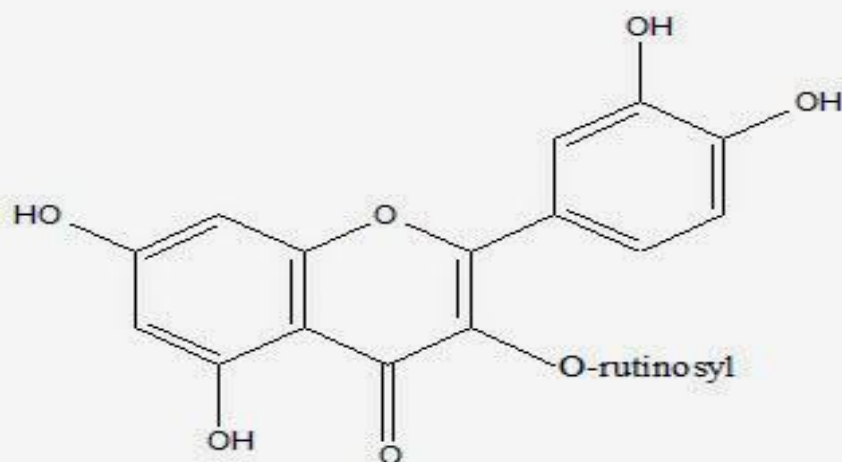
S.N.	Part of Plant	Extract/Tech.	Isolated Chemical Constituents	Ref. No.
1	Whole Plant	Atomic absorption and U.V. spectrophotometry	Cu, Al, Ca, Mn, P, S, Zn, Fe, Mg	15
2	Whole Plant	fixed oil extract	β - sitosterol, stigmasterol, avenasterol, β -tocopherol.	16
3	Seeds	Edible oil	Twelve unsaturated & four saturated fatty acids	17
4	Whole Plant	Atomic absorption spectroscopy	Four common heavy metals lead, zinc, copper and nickel	18
5	Whole Plant	EIMS, HREIMS, FAB, HRFABMS, NMR	Triacotanoic acid, 24-hydroxy-4 octacosanone, 24-nor-12-ursene, β -amyrin, stigmasterol, ursolic acid, and stigmasterol 3-O- β -D-glucoside,	19
6	Aerial parts	UV, FAB-MS, ^1H NMR and ^{13}C NMR	quercetin, quercetin-3-O-glucoside, kampferol-3-O- glucoside, kampferol-3-O-rhamnoglucoside and rutin.	20
7	Aerial part	Column chromatography	Cressanyl ester A, B, C, D, E, F and G, and cressatriterpenic acid.	21
8	Aerial part	^1H NMR and ^{13}C NMR	syringaresinol- β -d-glucoside	22
9	Shrub	Aqueous extract	Chemical analysis of minerals	23
10	Fruits	Alc. Extract	7,4'-dihydroxy-5 methoxy Coumaranochromone-7-O- β -D-glucoside	24
11	Aerial parts	Column chromatography	Quercetin glycoside	25
12	Aerial parts	^1H NMR and ^{13}C NMR, MASS spectroscopy	B-sitosterol, its glycoside, n-octacosanol, umbelliferone, scopoletin, isopimpinellin and quercetin	26

13	Whole Plant	Ethanol extract	26-cyclopentyl hexacosane (creticane), 4'-methyl hexa-5 ζ -enoyl-n-tetracos-17-ol-1-oate (cressatetracosanoate), n-nonacos-6-one-1-oic (cressanonacontanoic acid), tetratriaconta-29-one-1-oic acid (cressatetratriacontanoic acid), 25-methyl-n-triacont-3-one-25-ol acid (cressatriacontanone) and a-26-octadecahydronaphthacenyl-n-pentacos-3-one (cressanaphthacenone)	27
14	Aerial parts	Ethanol extract	n-Octacosanol, β -sitosterol, umbelliferone, scopoletin, isopimpinellin, β -sitosterol D (+) glucoside and quercetin.	28



QUERCETIN

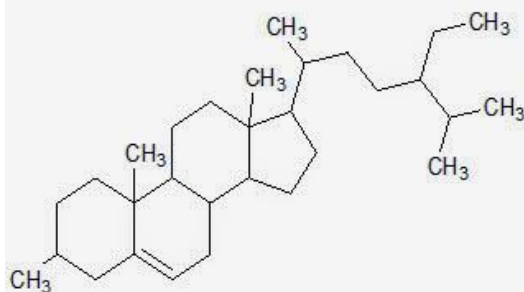
KAEMPFEROL-3-O- β -D-GLUCOSIDEQUERCETIN-3-O- β -D-GLUCOSIDEKAEMPFEROL-3-O- α -L-RHAMNOSYL (1-6)-O- β -D-GLUCOSIDE



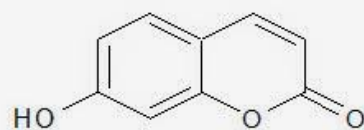
QUERCETIN-3-O- α -L-RHAMNO-(1 \rightarrow 6)- β -D-GLUCOSIDE



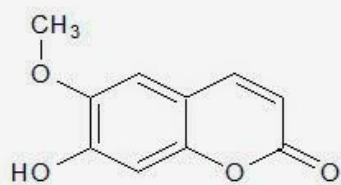
n-OCTASONAL



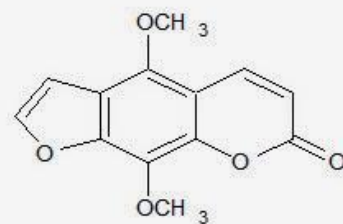
β -SITOSTEROL



UMBELLIFERONE



SCOPOLETIN



ISOPIMPINELLIN

BIOLOGICAL ACTIVITIES				
S.N.	Part of Plant	Extract Used	Biological activity	Ref. No.
1	Whole Plant	Methanolic extract	Antimicrobial activity	29
2	Whole Plant	water extract	Germination of pollen grains	30
3	Whole Plant	Ethylacetate and methanolic extract	Bronchodilatory activity and mast cell stabilising activity.	31
4	Aerial parts	Methanolic and ethyl acetate extract	Anti-inflammatory activity and Antioxidant activities	32
5	Whole Plant	Methanolic extract	Antitussive activity	33
6	Whole Plant	Crude solvent extract	Antifungal activity	34
7	Whole Plant	Aqueous and alcoholic extract	Antibacterial activity	35
8	Whole Plant	Aqueous and alcoholic extracts	Antibacterial activity	36
9	Whole Plant	n-butanol extracts	Antioxidant and radical scavenging activity	37
10	Whole Plant	n-butanol extract	Phosphomolybdenum complex assays and the radical scavenging activity	38
11	Whole Plant	Methanolic extract	Testicular function	39
12	Whole Plant	Ethanollic extract	antifungal activities	40
13	Whole Plant	Alcoholic extract	Contraceptive properties	41
14	Whole Plant	Ethanollic extract	Protective effective	42

USES

The plant *Cressa cretica* used as tonic, stomachic, anthelmintic with aphrodisiac properties. It is useful for the treatment of asthma, constipation, leprosy and urinary discharges. ^[43] Traditionally it is used as stomachic, anti bilious, expectorant, asthma, emetic and also used as alterative drug. ^[44,45]

CONCLUSION

Rudravanti (*Cressa cretica*) emerged as a good source of traditional medicine for the treatment of antimicrobial, bronchodilatory, anti-inflammatory, antioxidant, antitussive, antifungal, antibacterial activity. Although many of the experimental studies validated its traditional and medicinal uses. The study of

herbal medicine spans the knowledge of biology, history, source, physical and chemical nature, mechanism of action, traditional, medicinal and therapeutic use of drug. This article also provide knowledge about macroscopical and microscopical characters of rudravanti with vast knowledge of its cultivation, collection and harvesting with its geographical sources. Efforts are therefore needed to establish and validate evidence regarding safety and practices of ayurvedic medicines. The outcome of these studies will further expand the existing therapeutic potential of *Cressa cretica* and provide a convincing support to its future clinical use in modern medicine.

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