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DOROTHY HYBRID OF COLCHICUM LUTEUM BAKER

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Abstract:

Colchicum is a genus of perennial flowering plants containing around 160 species which grow from bulb-like corms. It is native of West Asia, Europe, parts of the Mediterranean coast, down the East Africa coast to South Africa and the Western cape. In this genus the ovary of the flower is under-ground. As a consequence, the style are extremely long in propottior, often more than 10 cm. The common names `Autumn crocus`,` meadow saffron` and naked lady` may be applied to the whole genus or to may of its species. Colchicum luteum is generally found at the height of 2000 – 9000 feet. It is generally found in areas of Himalayan region extending up-to the Hind-kush mountains. These species are highly valuated as ornamental and therapeutic use. The taxonomy of this genus is rather confused, and misnaming often occurs in the trade, so many of the so-called species in cultivation are actually hybrids of unknown origin. Botany, taxonomy, infra-specific taxa, distribution, ecology, description, chromosome counts, adulteration and phenology are provided with to their identification of Dorothy hybrid of colchicum luteum.

Key words: *Colchicum, Geographic area, Taxonomy, Cytology, Chromosome, God-gift hybrid of colchicum luteum.*

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INTRODUCTION: [1-6]

There are about seventy species in the genus and two are native to Bharat. The plants under this genus are corm bearing herbs with short sacpe. Colchicum luteum Baker is an annual herb and found at the height of 2000 – 9000 feet in the areas Himalayan region extending up to the Hind-Kush Mountains. It extends up to Afghanistan, Pakistan, Kashmir, Punjab and other areas of Himachal Pradesh and Uttarkhand as well a Nepal and Sikkam. In general it is that these plants available where climate conditions of low and has a temperature lower than 15^0C.

The word `Suranjana` probably came from Unani language and commonly known as ` Suranjaan – e- Talkh` in Urdu, Qalb-al-ard, Sooranjan, Haafiral-muhr, Assabi in Arabic,Suranjan in Persian, Colchique in French, Suranjan Shirin, Suranjan Talk in Urdu, Hiranya- Tuttha, Tuthanjana in Sanskrit, Virkum in Kannada, Hiran Tutiya, Suranja in Hindi, Suranjan, Hiranatutia in Ayurved Surajan Shireen in Unani, Nilotutho in Nepal, Surajan, Suranjankadva in Trade, Colchicum Luteum Baker in Latin, Suranjan-e-Lakh in Parashi. In English it is known as (1) Meadow saffron- due to its solatery, long, violet and tubular crocus like flowers with six bright red style branches. Ir differs from crocuses in having 6 stamens, 3 styles, and a superior ovary, while crocuses have only three stamens, one style divided into 3 and an inferior ovary. (2) Hermoactysis – as its finger shaped like flower. (3) Golden collyrium – as its perianth is funnel shaped and golden yellow in colour. (4) Colchicum- as the colchicum grows abundantly at a place of Italy known as Cholchic.

BOTANY [7]

The taxonomic classification of Colchicum luteum is as follows :	
01 Domain	Eukaryota
02. Kingdom	Plantae
03 Sub-kingdom	Viridaeplantae
04. Phylum	Tracheophyta
05.Sub- phylum	Euphyllophytina
06. Infra-phylum	Radiotopses
07 Class	Magnoliopsida
08. Sub-class	Liliidae
09. Super-order	Lilianae
10. Order	Liliales
11. Family	Colchicaceae
12. Sub- family	Colchicoideae
13. Tribe	Colchiceae
14. Genus	Colchicum
15. Species	Colchicum luteum Baker

Genus Colchicum [8-10]: Herb, small, perennial, bulb-like corms. Foliage like natural and `woody`, starts growing in February and dies away by the end of May; leaves few, all basal, not ever-green, free, 15-30 cm in length, 0.8-1.5 cm width. Flowers funnel-shape , lilac, pink, white or light lavender, appear in late September, ovary under-ground, styles extremely long in proportion often more than 10 cm, hermaphrodite.

DESCRIPTION: [11-20]

Categories: herbs. Life cycle: perennial. Original: India. Habitat : native to East Asia- China to the Himalays- Afghanistan, Punjab, Kashmir, North-Bharat, Western temperate, Himalayas, Chamba and Murrce Hills. Height: 8-10. S pread : up to 25 cm. Distribution : found on the edges of forests or in open grassy places and temperate western Himalayas from Kashmir to Chamba. Growth rate: medium. Cultivation: stony or earthy hill-side and alpine meadows at higher altitude. Altitude: 700 – 2800 m. asl. In Bharat. Corm ; ovoid, oblong, 1.5 – 3.5 X 1-2 cm, brownish , with one side flate and other rounded and can be either translucent or opaque, scaly, membranous. Leaves : 3-6, appearing flower time, green, 10 -20 cm long and 0.8-1.5 cm broad, few , lorate, linear-oblong or oblanceolate , obtuse, continue to grow as long as 25 – 100 cm even after the flowers have faded. Flowers : 3-4, small, yellow, some-times tinged with lilac, flower per bulb in September with the leaves, 2.5 – 4.o cm across, when expanded, hermaphrodite. Perianth : funnel shaped, golden yellow. Tepals : 6, united below in too long, narrow tube, up to 9 cm long. Segments: oblong or oblanceolate, obtuse and many nerved, 2-3 cm long Stamens: 6, inserted the base of the segments and are included. Filament: 4-5 mm long. Anthers: yellow, linear, 1-1.5 cm long, basifixed. Ovary: superior, sessile, three-celled with long styles, long and filiform. Stigma : minute, ovule many. Capsule: fruit about 2.5 – 3.5 cm long, septicidal with recurved beaks. Seeds : numerous, 2-3 mm diameter, ovate shaped, light brown to white in color testa. 2n = 54

Phenology : May – July.

Characteristics: (1) The plant flowers soon after the snow melts at higher altitudes in March followed by fruiting in May. (2) Flowering during August – September and fruiting is in October- November. Bat its corms are collected much before flowering. (3) Pollinated by Bees, flies, self. (4) Can not grow in shade.

ANATOMY OF CORM [21]

Cross section of colchicum luteum corm shows the single layered epidermis which consists of rectangular to squarish, slightly thick wall parenchyamatous cells filled with starch granules and coated with thick cuticle, cells of ground tissue are polygonal to oval to spherical slightly thick

walled compact to filled with starch granules. Starch granulars are simple spherical and are of 4.5-23.0 µ in size but usually compounds with 2-4 or more components which are often muller shaped. A well marked central hilum which is irregularly oval in smaller granules. Vascular bundles are numerous conjoint, collecterial or bi-collatrial and scattered in the ground tissue.

CHEMICAL COMPOSITION [22-25]

Corms : 0.21 –o.25 % colchicine, higher amount of starch, gallic acid, tannic acid , gum. Seed-coat: 0.30- 0.43 % colchineine, cornigerine. Seeds: sugar, fixed oil, 0.41 –o.43 % poisonous alkaloids. Isolated alkaloids: Colchamine, 3-desmethylamine, 3- dismethyl-β – lunicolchamine, 3- desmethyl colchamine, β- lumicolchicine, N-desacetyl –N-
formylolchicine, luteidine, new alkaloid L-5 and L-6, lutiene, collutine N-oxide. Colchicine occurs in the form of yellow flakes, crystals or as whitish-yellow amorphous powder, which darkens on exposure to light.

ACTIVE PRINCIPAL AND PHARMACOLOGY

Colchicum contains tropolone alkaloids, Colchichicine, Colchicoside and N-deacetyl – N-formyl – colchicine. Colchicine analysis: deacetyl thiocolchicine (DTC), deacetyluethyl-colchicine (DMC) and tri-methyl-colchicinic acid (TMCA) were found effective in the treatment of gout; DMC and DTC may cilitagranulocytosis. Colchicine is readily soluble in water and decomposes in to colchiceine.

AYURVEDA CATEGARIZE, CONTAINED, PART USED AND RECOMMENDED DOSE [19,26-27]

There are three category according to taste and color : (1) Shwet (White) – madhur (Sweet) in taste. (2) Peet (Yellow)-small in size znd has ticket (bitter taste).(3) Krishna (Black)- it is poisonous. Contained: (1) Gunna (properties)- laghu (light and ruksh (dry). (2) Rasa (taste) – tickta (bitter) and Katu (pungent) and Virya (potency) – ushan (hot). Part used – tuberous stc. (1) Powder : used various dishese orally and for local application such as arthritis and joint pain . (2) Extract : used in indigestion and gastric related problems. It is also helpful in liver and spleen related problems. Recommended dose : (1) Sweet variety – 2-3 gm powder (2) Bitter variety – for external use only.

MEDICINAL USES [28-30]

The parts medicinally uses are : dried corms (Colchici tuber) dry seeds (colchici semen), Hiranya-Tuttha (a dark brown dry extract of colchicum luteum Baker) and fresh flowers.

The dry corm od colchicum luteum Baker is bitter, pungent, hot and Kapha vata suppressant, therefore it is used in Inflammation, Swelling, Joint pain, Gout, Sciatica, Osteoarthritis, Rheumatoid Arthritis, Indigestion and Healing of Wounds.

It is also acts as diuretic thus it is used in urinary tract related problems i.e. stones, dysuria, urinary tract infection. It is mild laxative and helps in relieving from constipation. The corm is used in liver and spleen related ailments and it is also a good blood purifier, thus used in skin and blood related disorders like leprosy. It also acts as anti-depressant if take in proper dose.

Hiranaya-Tuttha (dry extract of colchicum luteum Baker) is used in preparations prescribed by Medical practitioners mainly for acute attacks of gout and rheumatism. Tinctures of meadow saffron are used in homeopathy for the same complaints.

The seeds are acrid, bitter, anodyne, astringent, anti- inflammatory, analgesic, sedative, aphrodisiac, carminative, alternative, aperient, laxative, blood purifier and are useful in neuralgia, gout, leukaemia, pruritis, liver disorders, enlarge of spleen, sexual debility, sciatica, lumbago and familial Mediterranean fever.

Flowers contain colchine and democolcine which are used for the treatment of solid tumors and for certain forms of leukaemia, especially for chronic myelocytic leukaemia.

THERAPEUTIC USES [20,.29,31-35]

There are two varieties of colchicum, one is the sweet variety and the other is bitter. Both varieties are analgesic, anti rheumatism, astringent, cathartic and emetic. They are used to relieve the pain and inflammation of avute gout, arthritis, and rheumatism. The bitter variety is poisonous and applied externally to reduce pain and swelling. The sweet variety is also useful in sexual debility.

01. Alternative: The colchicum luteum causes a gradual change in the body which asually because of improve nutritive absorption as well as the elimation of toxins from the body.
02. Aphrodisic : This herb works as an aphrodisiac that increases the sexual desires of a person.
03. Rheumatic arthritis: Majoon suranjana is a polyherbal formulation used in unani system of medicine for the treatment of rheumatic arthritis.

04 Treatment of Dysurea, constipation, inflammation and arthritis: The unani pharmacopoeia, ``llaj ul Amraz`` as an unani formulation contains (i) dried rhizome of Ginger (Zingiber officinale Linn) – 3.5 gm (ii) dried corm of Suranjana (Colchicum luteum Baker) – 3.5 gm and (iii) dried exudate of Aloe (Aloe vera Linn) – 7 gm is used for treatment.

05. Rheumatic and other form of swelling: A paste of colchicum luteum, saffron and egg paste can be applied for relieving.
06. Wounds: Dried and powdered corms of the plant is very useful in healing the wounds , it should be sprinkled on the affected areas. It promotes cicatrisation.
07. Tutthanjan: A term applied to a collyrium made of copper sulphate and root of colchicum luteum Baker is used as a cleanser for the eyes.
08. Piles: when a cloth coated with cow ghrit and paste of corm is applied on the piles mass, it nccroses and falls down in due time.
09. Extract: The extracted colchine is employed orally in tablet from for acute gout, enlarged prostate, gonorrhea, sropsy and familial Mediterranean fever. It is also used most of fingers, wrists and abdomen the most painful locations, in rheumatoid headache and rheumatic iritis, swollen joints, with or without effusion, muscular pain sub acute and chronic sciatica.
10. Double chromosome number : Alkaloid colchicine extracted from this plant and used to alter the genetic makeup of plants in an attempt to find new, improved varities. It works by doubling the chromosome number.
11.It is used to treat rheumatic complaints especially gout also prescribed for its cathartic and anti- emetic effects and also in initial treatment for pericarditis.
12. Anti-phlogistic effects:: Colchicum inhibits mitosis through the inhibition of motility, particulary of the phagcytosing lymphocytes. This is of therapeutic uses for blocking the immigration and the autolysis of phaogcytes in inflammatory process and there by producing and anti-phlogistic effects.
13. Carminative: It reduces flatulence and helps in expelling excessive gas from the intestine.
14. Laxative: This herb is known to stimulate the bowl movement in the body naturally and solve the problem of constipation.
15. Anodyne: It is known its pain relieving properties. It is also a very beneficial pain relieving agent.

CONTRA – INDICATION [25, 28,29,35]
01. The bitter variety is not to be ingested under any circumstances as it may cause death.
02. Avoid the use of sweet variety in patients taking colchicine.
03. Caution is also warranted in patients on cyclosporine gemfibrozil, macrolide antibiotics and st. john`s wort.
04. Care must be observes with old and weaked patients, as well as with those who suffer from heart, kidney or gastro-intestinal conditions.
05.The sweet variety is also contraindicated during pregnancy and breast feeding.
06.This plant is also toxic to animals, particularly when they are fed or dry fodder. The alkaloid even pass into milk and can accumulate to rich toxic level.
07.The toxic dose in humans is about 10 mg, while 40 mg would always be fatal (leads respiratory and cardiovascular disruption within a few days).
08.At herapeutic dose, colchicine is an extremely effective as anti-inflammatory agent and pain killer, as it prevent the migration of macrophages to the inflamed joint, associated with an acute attack of gout(caused by precipitation of urate crystals).
09.Long term use of colchicum can cause kidney and liver damage.
10.The regular use of colchicines can cause severe irritation to intestines. The counteract this, it is available to use the drug with Suchi (Atropa Belladonna Linn) and Khurasani Ajvain (Hyoscyamus niger Linn).
11.When taken in large doses it may cause diarrohea, salivation, vomiting, abdominal cramps, convulsions and general paralysis, these symptoms appears several hours after administration even if the dose is large and this is probably due to its conversion in oxydicolchins.
12.Colchicine in large doses low body temperature, potentiates the action of central depressant drugs, increase the effect of sympathomimetic agents depress the respiratory centre, stimulates the chemoreceptor trigger some an vaso motor centre causing contraction of blood vessels and rise blood pressor.
13.Muscular weakness and ascending paralysis may occur in toxic doses and death may take place due to the failure of respiratory centre.

RESERCH STUDIES [29,36-45]
01. Colchicine extracts also being useful in treatment of S L E. Which is an auto immune disorder affects many organs but more particularly the brain, skin, kidney and joints?
02. Cancer treatment: Colchicum luteum, contains tropolone groups of alkaloid colchicines, colchicine shows antimitotic activity and used in cancer for the dispersal of tumors and for treatments of carious neoplastic diseases. Cancer cells usually divide much faster than normal cells Therefor compounds that stop cell division i.e. alkaloids such as colchicine, demecolcine are also being helpful in canaer treatment.
03. Anti_oxidant activity: The ethanolic extract from corms of colchicum luteum was investigated Phyto-chemically and found that the colchicum offered promising anti-oxidant activity. The highest activity was displayed by chloroform fraction 91 % while the overall range was found 56-91 %.
04.Anti – fungal and Anti-bacterial activity : The methaloic extract of the corms of colchicum luteum and its sub-sequent fraction in different systems

were screened for anti-bacterial and anti-fungal activites. The crude extract and all the fraction demonstrated moderate to excellent anti-fungal activity against tasted pathogens in anti-fungal bioassay. Excellent anti-fungal activity was shown against trichophyton longifusus, up to 75 %, and microsporum canis, up to 85% while the crude extract and sub-sequent fractions shows mild to moderate activities in an anti-bracterial bioassay with maximum anti-bacterial activity 58 % against bacillus subtilis.

01. Enzyme inhibition activity :The crude methanolic extract and various fraction of colchicum luteum including chloroform, ethyl-acetate, n-butanol and aquous were carried out against acetyl- cholinesterase butyrylinesterase, lipoxygenase and urease enzymes , a significant enzyme inhibition activity (80%) is shown by the crude methalonic extract against lipoxygenase, while low to significant activity (32 %) was evident against butyrylcholinesterase and acetylcholinesterase (29-61 %) and no activity against urease.

02. Inflammation in rheumatoid disorder: In modern medicine, anti-inflammatory dis-order and produce associated side effects. They have the tendency to develop Lolerance and gradually the dosage is increased to marked levels.

In this study, the drug colchicum luteum was selected due to the anti-inflammation, anti-rheumatic and analgestic activites claimed by unani physician and philosophers.

The above observation shows the drug seems to have anti-inflammatory and analgesic effects of the drug in rheumatoid arthritis, as it reduces or minimizes the symptoms/sign of the aliments. The study also Revealed that the drug has no effect on blood pressure, pluse, respiration and weight of patients. During study , gastric upsets (2%) leading to loose motions were observed as side effect of the drug.the results are highly significant at $P< 0.012$, respectively.

01.Phyto-toxic assay : the medium was prepared by mixing various inorganic constituents in distilled water (100 ml) and pH was adjusted(5.5 – 6.5) by adding KOH solution. The medium was than auto-claved at 121 ^{0}C for 15 min. The samples (30.0 gm) dissolved in ethanol (15ml) served as stock solution. Sterilized 9 flasks, three for each concentration, were inoculated with 1000, 100 and 10 µl for stock solution to give the final concentration of 1000, 100 1nd 10 µg/ml, respectively. The solvent was allowed to evaporate over night under sterile condition. The each flask, 20ml of medium at a pH of 5.5 to 6.5 was added. The 10 plants of L. dcquinoctialis Welv., each containing a rosette of three fronds was added to each flasks. One other flask was supplemented with solvent, and reference plant growth Inbitor (paraquat) that served as negative control. All flasks were plugged with cotton and kept in the growth cabinet for 7 days. The number of fronds per flask were counted and recorded on day seven. 7% growth inhibition = 100-No of found in test/ No of found in control x 100.

Insecticides activity: The crude extract and various fraction of colchicum luteum Baker were screened against various insects like R.dominica 25 % and analis 15 %. The chloroform fraction show low activity against R. dominica 25 % and analis 35 %. In case of n-butanol fraction, showed 33 % R. dominica and against analis 44.0 %. The rest of fraction were displayed no activities against there.

ADULTERATION [46-50]

Colchicum luteum are occasionally adulterated with corms of the sweet variety and on other plant viz. Narcissus tacetta a belong to the same natural order, growing abundantly in Persia and which is supposed to have similar properties.

01.Organoleptographic evolution suggest that corm of colchicum luteum has bitter taste which justifies Ellwood et. al. which noticed corms have unpleasant and acrid taste. Bulbs of Nacissus tacetta are tasteless and if added powder of colchicum luteum does not show any characteristic taste and order.

02.Corm powder study by microscopy method: Epidermis in surface view showing cells with more uniformly thickened walls, parenchyma and part of spirally thickened vessels, fragrant of vessels with spiral and annular thickening. It also showed fragrant of a vittae of surface view, sclereids of the wings, endo- sperm cells with microrosette crystals of calcium oxalate and oil globules. This cellular contest was identical for particular drugs and genuinely standard of the formulation.

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