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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**Available online at: <http://www.iajps.com>**Review Article****DOROTHY OF COLCHICUM VARIEGATUM L.****R.B. Saxena**Drug Standardisation Research Section, Central Research Institute- Ayurveda, Aamkho,  
GWALIOR- 474 009 (BHARAT).**Abstract:**

*Colchicum is a genus of perennial flowering plants containing around approximate 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 of south Africa and the western cape. In this genus the ovary of the flower is underground. As a consequence, the styles are extremely long in proportion, often more than 10 cm. The common names 'autumn crocus', 'meadow saffron', 'naked lady' and 'naked boys' may be applied to the whole genus or species. Three species were included in the genus colchicum (i) Colchicum montanum, (ii) Colchicum variegatum and (iii) Colchicum autumnale. In ancient periods, the herb colchicum was believed to be extremely noxious for use by human. Later during the middle ages, physicians in Arabia used the corm to treat gout as well as other joints. Colchicum variegatum was used for the treatment of gout and other joints. In this review, the colchicum, variegatum has taken for detail description i.e. taxonomy, distribution, ecology, phenology, uses etc. are provided with key to their identification.*

**Key words:** *Colchicum, Geographic area, Classification, Uses, Anatomy, Colchicum variegatum.*

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**INTRODUCTION [1-5]:**

In ancient period, the herb *colchicum autumnale* was believed to extremely noxious for use by human. Later during the middle age, physicians in Arabia used the corm of the plant to treat gout as well as other joints. *Colchicum* genus the consisting of about 30 species of herbs native of Eurasia and about seventy species are native Greece, Crete and Cyprus. Three species were included in the genus *colchicum* (i) *colchicum montanum* – A native of Spain, leaves appear in the autumn with flowers, (ii) *Colchicum variegatum* – A native of Greece islands, with undulate, widely-spread leaves and (iii) *Colchicum autumnale* – With flat, lanceolate leaves, common to meadow, roots possess diuretic and expectorant qualities, view an axymel and syrup are directed by the collegers of London and Edinburg. An over-dose proves narcotic and cathartic. *Colchicum variegatum* is corm bearing herb with short scape, annual herb found 150 – 1700 m asl. Smaller species of *colchicum variegatum* is suitable for rock garden, raised bed or through garden. *Colchicum variegatum* is very useful in medical and therapeutic. *Colchicum variegatum* should not be confused with *colchicum alpinum*, measuring 7.5 to 15.0 cms, grow some places. The cultivation of *colchicum variegatum* was started in 1619 by Parkinson, G. The corm tunics of studied genera contain calcium oxalate, which have not previously been overlooked except in *crocus*. The crystals on the surface of the observed corms taxa are determined as styloids. In *iridaceae*, all most taxa have styloids, with the exception of *sisyrinchium* and its close allies, which lack crystals altogether.

**PHYLO – GENETIC STUDIES IN COLCHICUM**

The taxonomic status of *colchicaceae* family and its infrageneric classification has been widely discussed. The taxonomic history of the family began in 1805 when de candolle was the first to use the family name *colchicaceae* in the *Flore Francaise* ( de candolle, A.P. 1805).

**SCIENTIFIC CLASSIFICATION <sup>6</sup>**

|    |                |                 |
|----|----------------|-----------------|
| 01 | Eukaryota      | Domain          |
| 02 | Kingdom        | Plantae         |
| 03 | Sub-kingdom    | Viridaplantae   |
| 04 | Phylum         | Tracheophyta    |
| 05 | Sub-phylum     | Euphyllophytina |
| 06 | Infra – phylum | Radiatopses     |
| 07 | Class          | Magnoliopsida   |
| 08 | Sub-class      | Liliidae        |
| 09 | Super-order    | Liliana         |
| 10 | Order          | Liliales        |

|    |            |                         |
|----|------------|-------------------------|
| 11 | Family     | Colchicaceae            |
| 12 | Sub-family | Colchicoideae           |
| 13 | Tribe      | Colchieae               |
| 14 | Genus      | Colchicum               |
| 15 | Species    | Colchicum variegatum L. |

**HISTORY [1,7-12]**

Old Mummy's (about 5000 B.C.) mass of urates taken for chemical analysis. A renal calculus found in nucleus of uric acid. Thus the studies documented chronic to phaceous gout and urate calculi as disorder of antiquity.

The use of *colchicum* first as a poison and later in the treatment of gout can be traced back at least 2000 years. The new hormones, cortisone and ACTH have by no means usurped the ancient and useful position of the drug. Although the autumn crocus has been traced back to 1550 B.C. , when it was mentioned in an ancient medical text, the Ebers Papyms, and has long history of being important medically, it hardly is ever grown by these of us who love to grow flowers. Byzantine Empire Alexander of Tralles ( 525 – 605 A.D.), a Byzantine physician, and his contemporary, Aetius, were the first to indicate the usefulness of *colchicum* in the treatment of gout. There has been speculation those there early Byzantine physicians were referring to *colchicum eriegate* in rather than *colchicum autumnale*, the present-day source of colchicine. In 13<sup>th</sup> century, supposed virtues in the cure of gout and rheumatism of the joints. It is obtained the name of *Anima articularum* `The soul of joints`. It was the principal ingredient in all gout species and famous Eau Medicine is supposed to owe its virtues to a preparation from this plant.

In ancient Greeks called the tubers *colchicum* Hermodactylus and considered purging this as the best easiers method to get rid of the pain gout. The Herfsttijloosknolletjes were also referred to as the dates of Hermes. Hermodactylus means the finger of Hermes, the boot schapper god, the name referred to the rapid onset of autumn crocus. Dioscorides described in his `De Materia Medica` the *Kolchikon* mostly as poison and given medically application . Here it is not clear whether he *colchicum autumnale* or *colchicum variegatum* meant. Later writers as Nikander and Theophrastus speak of `ephemerum` or `epheneron` and not *colchicum* when they talk about gifknolletjes, but in the Medea a myth would be indeed to Hermodactylus autumn crocus. The Hermodactyles of the Arabians, formerly so celebrated for smoothing pains in the joints, where

corms of *colchicum variegatum*, a species found in the Mediterranean. Dr. Royle found them in the marker in India, where they bear name traceable to the  $\alpha\lambda\chi\upsilon\iota\varsigma\omicron\upsilon\varsigma$  and  $\epsilon\phi\epsilon\eta\epsilon\upsilon\omicron\upsilon\varsigma$  of the Gracis.

#### ANCIENT HISTORY OF NOMENCLATURE [9,13]

The plant owes its generic name to *colchis*, in Natolia, which abounded in this and other poisonous vegetables, and hences perhaps gave rise to some of the poetical fictitious repeating the enchan tree Medea, who was not unfrequently called *colchis*, from the place of birth. It was brought from Natolia and Egypt through Turkey. Linnaeus, on the authority of Bauhin, mentions it as of *Iris tuberosa* addo ` The plant from which it is obtained is *unicrocontournefort* and many others consider it species of *Iris*, while some take it for the *colchicum variegatum*.

The Latin name *colchicum* indicates the country of origin: *Colchis*, a region in Georgia, located in the vicinity of the Black sea where the plants originate. It was the place where according to Greek mythology: the sorceress Medea lived and the plant, according to the legend arose from the drops of the drink prepared Medea. According to legend, the Golden Fleece also is hidden there. The Golden Fleece was the fur of the golden lambs, symbol of both the innocence and the sun, which had hung Zeus is *Colchis* on the tree of life.

#### GENUS COLCHICUM [7, 14-17]

Plant : perennial. Flowering: September – October. Bulb (Cormus): solid, resembling that of a tulip, furrowed on one side. Leaves: strap spear-shaped, blunt, entire, dark green, smooth, 30 cm or more long, 3-5 cm broad. Flowers : several, rising from the root, appearing in succession, pale purple, sometimes white, Tube : 6-30 cm long, white surrounded at the base by 2 or 3 membranous sheaths. Limb: cut into 6, some-what un-equal , oblong, up-right, concave segments. Germen: base of the bulb in-closed in one common sheath accompanied by the rudiments of the future leaves. Style : as long as stamens, thread-shaped, reaching nearly to the base of the tube. Stigmas: linear, re-covered, channeled, downy. Fruit : oval, formed of three inflated, many-seeded capsules. Seeds: round, whitish, polished.

Characteristics: The flowers appear in September, the leaves and fruit not till the spring flowering. The seeds lie buried all winter within the root, in spring they grow up on a fruit-stalk, and are ripe about the time of hay-harvest. May not the very great length of the shafts account, in some measure, for the delay

in ripening of the seeds! As this plant blossoms late in the year and not probably would not have.

#### DIFFERENT SPECIES IN COLCHICUM [1]

Three species were included in the genus *colchicum* : (i) *Colchicum montanum*- A native of Spain, leaves appear in the autumn with flowers. (ii) *Colchicum variegatum*: A native of Greek islands, with undulate, widely-spread leaves. (iii) *Colchicum autumnale*: with flat, lanceolate leaves, common to meadow, roots possess' diuretic and expectorant qualities, view an oxymel and syrup are directed by the colleges of London and Edinburg. An over – doses proves narcotic and cathartic.

#### DESCRIPTION OF COLCHICUM VARIEGATUM [12, 14, 18-28]

Synonym (s):

*Colchicum tessellatum* Salisb [illegitimate]

*Colchicum tessulatum* Mill

*Colchicum chionense* Haw ex Kunth

*Colchicum parkinsonii* Hook f

*Colchicum variegatum* subsp. *Parkinsonii* (Hook.f)

K. Richt

*Colchicum variegatum*s. De colorans Candargy

*Colchicum variegatum* var. *desii* Pamp.

Common name : Naked ladies, Naked boys, False Autumn crocus , Checkered meadow saffron, variegated meadow saffron.

Plant life : perennial. Habit: erect. Native : Turkey and Greece. Growth habit: depending on site. Habitat : sub-alpine Pinus woods, rich terra rose, maquis and forest openings, on calcareous substrate, scrub, Abieswood land. Found : Asia-Temperate : western Asia East Aegean in ----- turkey, Europe : SE Europe Greece. Cultivated: many other places. Distribution: Cyclades, Aegean island and south-west Turkey. Altitude: 150 – 1700 m asl. Corm : 2-4 (-5) x 2 – 3.5 cm, ovoid to sub-globose, outer tunics dark brown, inner dark reddish-brown, coriaceous or sub-coriaceous, apex produced into a persistent neck 5 – 15 cm. Leaves : 3-4, hysteroanthous, patent, linear-lanceolate or ligulate, 9-15 cm x (7-) 10 – 20 (-23) mm, obtuse-acute, glabrous, smooth, margins cartilaginous, up-dulate, green, deciduous. Flowers: 1-2 (-3), rotate, soft to deep-purple, with intense mosaic, open wide in sunshine, often with gradual twisted. Perianth –tube: exceeding the cataphyll by 2-10 cm, white or yellowish-white. Segments : deep red violet-purple, occasionally paler or white base, strongly tessellated, lanceolate to elliptic or oblanceolate, (2.2 -) 4-6 (-7) x (0.5-) 1-2 (2.5) cm, frequently slightly twisted near obum or acuminate apex, glabrous, each segments 10 – 20 veins, without auricles at base, filament channeled glabrous. Stams:

$\frac{1}{2}$  or longer of perianth limb in length. Filaments: 1.5 – 3.5 (-4) cm, white, cream or yellowish- white, glabrous. Anthers: 4-10 x 0.5 – 1.2 mm, purple, purplish- black or purplish – brown , without membranous in margins. Pollen : yellow. Styles : straight or occasionally slightly curved and swollen at apex, cream white, light purplish-pink or violet purple. Stigmas: decurrent for 1.5 – 2 mm. Capsule: 1-4 x 0.8 – 1.5 (-2) cm, elliptic to oblong ovoid, light or dark brown, dotted when dry, glabrous. Seeds: 1.4- 4 mm diameter, ovoid to sub-globose, sometimes flattened laterally, light to dark brown.  $2n = 54$ . Phenology: September – November.

#### COLLECTION OF THE CORMI (BULBS) [7]

Dr. Christison has expresses some doubts as the propriety of collecting the cormi in july, they are plumpest, firmest, and abound most in starch at this period, yet found shriveled cormi in the succeeding cormi in the following April, to be equally, not more bitter. Stoltze shows October cormus 2 %, March 6 % of bitter extract. There is an error in the quotation which vitiates the inference intended to be drawn from it. Stoltze found in October cormus 2.17 % bitter extractive and March 5.91 %, sweet extractive matter, combined with some bitter extractive, and concludes that October cormus more active and more bitter extractive than spring cormus.

#### CORM DRYING [7]

Before drying the cormus, first remove the dry coat than cut transversely in to this slices. Slices quickly dried in dark, airy place, heat not exceed 170° C. Dr. A.T. Thompson recommends the slices to be dried on clean, white paper, without artificial heat. The objection to this is time required.

#### MICROSCOPIC STRUCTURE OF CORM [29-31]

Cross section of *colchicum variegatum* L. shows the single layered epidermis which consists of rectangular to squarish, slightly thick wall parenchymatous 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 granules are simple spherical and are of 4.5 – 23.0 $\mu$  in size but usually compounds with 2-4 more components. Which are often mullers shaped. A well marked central hilum which is irregularly oval in smoller granules. Vascular bundles are numerous canjoint, collecterial or bi-collatrical and scattered in the ground tissue.

#### CHEMICAL COMPOSITION [31-35]

*Colchicum variegatum* contains phenolic compounds i.e. vaniline, vanillic acid, coumaric acid, caffeic acid, luleolin. Biological precursors of most alkaloids are amino acids such as ornithine, lysine, phenylalanine, tyrosine, tryptophan, histidine, nicotinic acid, anthranilic acid, and dmethylde-mecolcine. Seeds contain 0.3 -1.2 % total alkaloids, of which 0-8 % colchicum. Leaves contain 0.07 – 0.2 % colchine and corm contains 0.6 % colchicine. Chemical composition of corm: difference in alkaloid yields concentrations in different plant parts strongly suggest that alkaloids can be translocated in the plant. Colchicine, starch, gum, resin, tannin and fat, trace gallic acid and fatty oil 1.8 – 4 %. When sliced and dried, they loss about 70 % water. By driging the (probably) volatile body up on which the odours of the fresh corm depend is lost. Seeds : *Colchicum* seeds were introduced into Medical practice by W. H. Williams, of Ipswich, about 1820 of the ground of their bring more certain action than the corm. They were admitted to the London Pharmacopoeia in 1824. Bitter and acrid taste. They are very hard and difficult to powder.

The concentration of total alkaloids is variable from 0.3 -1.2 % about 20 alkali-type compall have been isolated from drugs. Most of them occur only is small quantities. Almost of them are amides that are weakly or not basic. Some occur as glycoside (colchicoside – 0.4 %). Colchicine and colchicoside are structurally having common tropolone nucleus (tropolone alkaloids) demecolcine, autumnaline.

The metals in corm are found – Fe, Mn, Cu, Zn, Pb, Ni, Co, cr, si, silt (sand collected by water), clay (Lenacious earth, human body) and organic matter.

#### RELATIONSHIP BETWEEN CORM COMPONENTS AND EFFECTS [36]

Corm colchicine concentration as well as corm Fe content increased with increasing soil, Fe, Mn, Zn, Co,, Cu, Pb and Cd contents and that corm Fe content has positive effect on the production of colchicine. However the corm Co, Mn, Zn and Cd were inhibitors for the formation of corm colchicine.

Effects: (i) 31 % variation was mainly related to corm colchicine concentration, Fe content positive side and Co, Zn and Mn content in the negative side effect. (ii) explain 27 % of variarion was mainly related to corm Ni and Cd contents in the positive side and Mn had a

negative loading ( 0.60) in the second factor. (iii) 20 % variation was mainly related to the Pb content has a negative loading (-52) in the third factor.

#### DOSES [7]

Small doses: (i) frequently repeated, produce debility, sensation of malaise and headache. (ii) 20 evacuations of stool from the dose of colchicum variegatum, without producing corresponding debility. (iii) Violet salivation as the result of small doses. (iv) The chief effects, in small and repeated doses, seem to be a tendency to promote the action of the secreting organs, especially of the intestinal mucous membrane, and produce perspiration.

Large doses: Colchicum variegatum acts as a violent poison, and many fatal cases have been recorded. (i) 2 ounce of wine of the seeds taken by mistake for rum, about one and half hour swallowing it, acute pain in the bowels, slow and copious vomiting with yellow fluid, tenesmus, small, slow and feeble pulse. Pain was described as of a knife piercing him, tongue natural, countenance anxious, features sharp, cheeks, lips and palperae purple, sensation of losing his limbs on walking, vomiting increased, the fluid brought up like coffee grounds, and patient died 47 hours after taking the poison.

#### PHYSICOLOGICAL EFFECTS [7]

Fresh juice of slices: (i) acrid particles emitted from it irritated the nostrils, fauces, breath, ends of fingers with which it had been held became quite benumbed. (ii) Applied for 2 minutes on tongue of tip, rendered the part rigid and almost void of sensation for six hours. (iii) Less than a grain wrapped up in a crumb of bread taken internally, produced alarming symptoms, burning heat, pain in stomach and bowels, symptoms, tenesmus, thirst, total loss appetite etc. Which were greatly relieved by an acidulous mixture of syrup of poppies. (iv) an infusion of 3 grains of root in 4 ounces of wine, slowly swallowed, occasioned a tickling in larynx and a short, dry cough. A heat of urinary passages and a copious discharge of pale urine, without sensibly affecting the other organs of the body. (v) 1 ounce of the sliced root being digested in a pound of vinegar for forty-eight hours, frequently shaken, the root became insipid, but vinegar became acrid, irritated the fauces and produced cough.

#### PHARMACOLOGICAL ACTIVITY [37]

The autumn crocus is very toxic, ingested, the corms kills by suffocation, like mushroom. The ingestion of all part of the plant causes swallowing difficulties, abdominal pains with diarrhea, muscle cramps, hypotension, and respiratory difficulties. In case of

serious intoxication, death occurs by respiratory arrest or cardiovascular collapse, several days after intoxication.

#### POST-MORTEM EXAMINATION [7]

(i) Face, neck and front of the thorax were found covered with a purple efflorescence. (ii) Stomach and bowels coated with thick, tenacious, colourless mucus. (iii) Blood effused between the muscular and peritoneal coats. (iv) Pleurae costals were much reddened. (v) Heart flabby and structure easily broken down. (vi) Two red patches were found one stomach and second jejunum. (vii) Ecchymosed spots observed on surface of lungs, heart and diaphragm.

#### ANTI-DOTES [7]

Large doses: (i) vinegar and Honey (ii) Caustic ammonia- six to eight drops, in some eau sucre (Schonlein). (iii) Homoeopathic doses Cocculus. Nux Vomica. Pulsatilla.

#### USES [37-52]

The autumn crocus, known to the Greeks for its toxicity, was used in the Byzantine empire since 15<sup>th</sup> century to treat gout. It appeared at the end of 18<sup>th</sup> century in the form of a 'tincture', two parts of roots in four parts of rectified wine. Colchicine was crystallized by chemists by Laborde and Houd'e in 1884. The formula was established by Dewar in 1945.

Medical uses: The parts medically use are corm (colchici tuber), dry beeds (Colchici seman), Hiranya-Tuttha (a dark brown dry extract of colchicum variegatum) and fresh flowers.

The dry corm of colchicum variegatum is bitter, pungent, acrid, hot and kapha-vata suppressant, there for it is used in inflammation, swelling, joint pain, gout, sciatica, osleoarthritis, rheumatoid arthritis, indigation and healing of wounds.

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

Hiranga-Tuttha ( dry extract of colchicum variegatum ) 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 alterative, aperient, laxative, blood purifier, neuralgia, gout, leukaemia, puritis, liver disorders, enlarge of spleen, sexual debility, sciatica, lumbago and familial Mediterranean fever.

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

**Therapeutic uses:** The therapeutic uses of *colchicum variegatum* are similar to *colchicum luteum* and *colchicum pusillum*, because the compositions are found similar. 01. Alternative: The *colchicum variegatum* causes a gradual change in the body which as usually because of improve nutritive absorption as well as the elimination of toxins from the body. 02. Aphrodisic: These herb works as an aphrodisic that increases the sexual desires of a person. 03. Rheumatic arthritis: *colchicum variegatum* is a poly-herbal formulation used in unani system of medicine for the treatment of rheumatic arthritis. 04. Treatment of Dysurea, constipation, inflammation and arthritis: According to unani formulation contain (i) dried rhizome of Ginger (*Zingiber officinale* Linn.) – 3.5 gm. (ii) dried corm of *colchicum variegatum* – 3.5 gm and (iii) dried exudate of Aloe ( *Aloe vera* Linn)- 7 gm used for treatment. 05. Rheumatic and other form of swelling: A paste of *colchicum variegatum*, saffron and egg paste is applied for relieving. 06. Wounds: A dried and powdered corm of the plant is very useful in healing the wounds, powder sprinkled on effected areas. It promotes circulation. 07 Tuttharja: A term applied to a collyrium made of copper sulphate and root of *colchicum variegatum* is used as a cleanser for the eyes. 08. Piles : When a cloth coated with cow Ghrita and paste of corm is applied on the piles mass, it necroses and falls down in due time. 09. Extract: The extracted colchine is employed orally in tablet form for acute gout, enlarge prostate, gonorrhea, dropsy and familial Mediterranean fever. It is also used most of finger wrist and abdomen the most painful location, in rheumatoid headache and rheumatic iritis, swollen joints, with or without effusion, muscular pain sub-acute and chronic sciatica. 10. Affect chromosome separation: Nordenstan (1998) considered that polyploidy in this genus might be related to the presence of colchicine, an alkaloid known to affect chromosome separation after the anaphase of mitosis. This effect of colchicine was discovered by B. Permice in 1889, described more fully by Eigstiefal (1945) and revolutionized cytogenetics because it permitted experimental

generation of polyploidy. 11. Scavenger activity: Methanol extract of *colchicum* has acetylcholinesterase (ACHE), butyryl cholinesterase (BCHE) and 2, 2-diphenyl-1- picrylhydrazyl (DPPH) inhibitory and radical scavenging activity. The percentage SEM is -1. The *colchicum variegatum* ACHE (35.50 + 2.26) demonstrated mediocre activity. *Colchicum variegatum* BCHE (67.71 + 2.79) showed prominent activity. Along with this, extract was determined for their DPPH (scavenging activity) below than 40 %. 12. Rheumatic complaints: It is used to treat rheumatic complaints especially gout also prescribed for its cathartic and antiemetic effects and also in initial treatment for pericarditis. 13. Anti-phlogistic effect: *Colchicum* inhibits mitosis through the inhibition of motility, particular of the phagocytosing lymphocytes. This is of the therapeutic uses for blocking the immigration and the autolysis of phagocytes in inflammatory process and thereby producing an anti-phlogistic effect. 14. Cerminative: It reduces flatulence and helps in expelling excessive gas from the intestine. 15 Laxative: This herb is known to stimulate the bowel movement in the body naturally and solve the problem of constipation. 16. Anodyne: It is known for its pain relieving properties. It is also a very beneficial pain relieving agent. 17. Derivative related to colchicine: Thiocolchicoside (colchcoside) is used as a muscular pain relaxant. It is not curare and it acts through a central effect on the spastic hypertony of the skeletal muscle.

#### CONTRA INDICATION [38,39,53-54]

01. The bitter variety is not to be ingested under any circumstance 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 observed in old and weakened 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, particular when they are fed on dry fodder. The alkaloid even passes in the milk and can accumulate to a rich toxic level. 07. The toxic dose in humans is about 10 mg, while 40 gm would always be fatal (leads respiratory and cardiovascular disruption within few days). 08. At therapeutic dose, colchicine is an extremely effective anti-inflammatory agent and pain killer, as it prevents 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 variegatum* can cause kidney and liver damage. 10. Regular use of colchicines can cause

sebare irritation to intestine. To counterate this, it is available to use the drug with Suchi (*Atropa Belladonna* Linn) and khurasani Ajvani (*Hyoscyamus Niger* Linn.). 11. When taken in large doses it may cause diarrhoea, salivation, vomiting, abdominal cramps, convulsions and general paralysis, these symptoms appears several hours after administration even if the dose is large and this probably due to its conversion in the oxydicolchins. 12. Colchicine in large doses low body temperature potentiates the action of central depressant drug, increase the effect of the chemoreceptor trigger some as vaso motor centre causing contraction of blood vessels and rise blood pressure. 13. Muscular weakness and ascending paralysis may occur in toxic doses and death may take place due to failure of respiratory centre.

### RESEARCH STUDIES [38,55-64]

01 Colchicine extracts also being useful in the treatment of SLE. Which is an auto immune disorder affects many organs but more particular the brain, skin, kidney and joints. 02. Cancer treatment: *colchicum variegatum*, contains Tropolone groups of alkaloids colchicines, colchicine shows anti-mitotic activity and used in cancer for the dispersal of tumors and for treatments of various neoplastic diseases. Cancer cells usually divide much faster than normal cells. Therefore compounds that stop cell division i.e. alkaloids such as colchicine, demecolcine are also being helpful in cancer treatment. 03. Anti-oxidant activity: The ethanolic extract from corms of *colchicum variegatum* was investigated phyto-chemistry and found *colchicum* offered promising anti-oxidant activity. The highest activity was displayed by chloroform fraction about 91 %, while overall range was found 56 – 91 %. 04. Anti-fungal and anti-bacterial activity: The methaloic extract of corms of *colchicum variegatum* and sub-sequent fraction in different systems were screened for anti-bacterial and anti-fungal activities. The crude extract and all the fraction demonstrated moderate to excellent anti-fungal activity against tested pathogens in anti-fungal bio-assay. 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-bacterial bio-assay with maximum anti-bacterial activity 58 % against *bacillus subtilis*. 05. Enzyme inhibition activity : The crude methanolic extract and various fraction of *colchicum variegatum* including chloroform, ethyl-acetate, n- butanol and aqueous were carried out against acetyl-choline sterase butylcholines terase, lipoxygenase and urease enzymes, a significant enzyme inhibition activity (

80 %) is shown by the crude methaloic extract against lipoxygenase, while low to significant activity (32 %) was evident against butyrylcholine- sterase and acetylcholinesterase ( 29-61 %) and noactivity against urease. 06. Inflammation in rheumatoid disorder: In modern medicine, anti-inflammatory disorder and inflammatory disorder and produce associated side effects. They have the tendency to develop tolerance and gradually the dosage is increased to marked levels. In this study the drug *colchicum variegatum* was selected due to the anti-inflammation, anti-rheumatic and analgesic activities 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 ailments. The study also revealed that the drug has no effect on blood pressure, pulse, respiration and weight of patients. During study, gastric upset ( 2 %) leading to loose motions were observed as side effect of the drug. The results are highly significant at  $P < 0.001$  and  $P < 0.012$ , respectively. 07. 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 taken auto-claved at  $121^{\circ}\text{C}$  for 15 min. The samples (30.0gm) dissolved in ethanol ( 15 ml) served as stock solution. Sterilized 9 flasks, three for each concentration, were inoculated with 1000, 100 and 10  $\mu\text{l}$  for stock solution to give the final concentration of 1000, 100 and 10  $\mu\text{g/ml}$ , respectively. The solvent was allowed to evaporate over night under sterile condition. The each flask, 20 ml of medium at a pH of 5.5 to 6.5 was added. The 10 plants of *L. dequinoctialis* Welw, each containing a rosette of three fronds was added to each flasks. One other flask was supplemented with solvent, and reference plant growth inhibitor (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.  $\text{Seven \% growth inhibition} = 100 - \frac{\text{No found in test}}{\text{No of found in control}} \times 100$ . 08. Insecticides activity: The crude extract and various fraction of *colchicum variegatum* 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. dominice* and against *analis* 44 %. The rest of fraction were displayed no activity against there.

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