

## *Colchicum autumnale* – A view on Naked Lady Plant

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### SUMMARY

Colchicine is a toxic chemical derived from the bulb-like corms of the *Colchicum autumnale* plant that is often used to induce polyploidy in plants. Basically, the colchicine prevents the microtubule formation during cell division, thus the chromosomes do not pull apart like they normally do. Hence it leads to doubling of the chromosome number. Colchicine is also an anti-inflammatory drug that is used to treat a variety of conditions, including gout, recurrent pericarditis, and familial Mediterranean fever.

### INTRODUCTION

*Colchicum autumnale*, commonly known as autumn crocus, meadow saffron or naked ladies, is a toxic autumn-blooming flowering plant that resembles the true crocuses, but is a member of the plant family Colchicaceae, unlike the true crocuses, which belong to the family Iridaceae. The name "naked ladies" is because the flowers emerge from the ground long before the leaves appear (Clapham *et al.*, 1962). Despite the vernacular name of "meadow saffron", this plant is not the source of saffron, which is obtained from the saffron crocus, *Crocus sativus* – and that plant, too, is sometimes called "autumn crocus". The species is cultivated as an ornamental in temperate areas, in spite of its toxicity. The cultivar 'Nancy Lindsay' has gained the Royal Horticultural Society's Award of Garden Merit. (Gajic 1977).



*Colchicum autumnale* seed capsules

### Intention behind the naming

The name naked lady comes from the fact that the flowers emerge from the ground long after the leaves have died back.

### Colchicine

Colchicine is a toxic chemical derived from the bulb-like corms of the *Colchicum autumnale* plant that is often used to induce polyploidy in plants. Basically, the colchicine prevents the microtubule formation during cell division, thus the chromosomes do not pull apart like they normally do. Hence it leads to doubling of the chromosome number.

### Medicinal uses

Colchicine is an anti-inflammatory drug that is used to treat a variety of conditions, including gout, recurrent pericarditis, and familial Mediterranean fever. Recently, the drug has been shown to potentially reduce the risk of cardiovascular events in those with coronary artery disease.

### First usage of Colchicine

Although there is evidence that colchicine was used in ancient Greece more than 2000 years ago, it was first used as a specific treatment for gout by Byzantine physician Alexander of Tralles was one of the most eminent physicians in the Byzantine Empire around 600 AD.



Scientific classification		
Kingdom	:	Plantae
Clade	:	Tracheophytes
Clade	:	Angiosperms
Clade	:	Monocots
Order	:	Liliales
Family	:	Colchicaceae
Genus	:	<i>Colchicum</i>
Species	:	<i>C. autumnale</i>
Botanical Name	:	<i>Colchicum autumnale</i>

### Floral Biology

This herbaceous perennial has leaves up to 25 cm long. The flowers are solitary, 4–7 cm across, with six petals and six stamens with orange anthers and three white styles. At the time of fertilisation, the ovary is below ground.

### Description

*Colchicum autumnale*, or Autumn Crocus, is a perennial herb with basal, slender leaves; long, tubular, 6 parted, purple-pink to white flowers that blossom in autumn (hence the common name).

The flowers are very attractive to bees and butterflies. Native to southern Europe, Autumn Crocus can be found in meadows and damp woodland clearings on calcareous and neutral soils.

### Habitat

Autumn crocus prefers a rich, well-drained loam in a sunny position with a PH in the range of 4.5 to 7.5. It will tolerate partial shade and summer drought, but not dry soils. Plants are hardy to about -4 degrees F (-20°C) and the dormant bulbs are fairly hardy and will withstand soil temperatures down to at least 23 degrees F (-5°C). Autumn crocus are typically planted from corms, which should be planted about 2 3/4 to 4 inches (7 - 10cm) deep. Divide the bulbs in June or July when the leaves have died down. Larger bulbs can be planted out direct into their permanent positions. Pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out. The plant can be divided every other year for a quick increase. The Autumn crocus is also easily grown in grass and can be naturalized there, among shrubs, and by woodland edges. When grown from seed, the seedlings take 4 to 5 years to reach flowering size. The plants seem to be immune to damage from rabbits.

### Distribution

*C. autumnale* is the only species of its family native to Great Britain and Ireland, with notable populations under the stewardship of the County Wildlife Trusts. It also occurs across mainland Europe from Portugal to Ukraine, and is reportedly naturalised in Sweden, European Russia, and New Zealand.

### Pharmaceutical uses

- The bulb-like corms of *C. autumnale* contain colchicine, a useful drug with a narrow therapeutic index.

- Colchicine is approved in many countries for the treatment of gout and familial Mediterranean fever, but has a low therapeutic index.
- Colchicine is also used in plant breeding to produce polyploid strains.

### Toxicity

*Colchicum* plants are deadly poisonous due to their colchicine content and have been mistaken by foragers for ramsons, which they vaguely resemble. The symptoms of colchicine poisoning are similar to those of arsenic, and no antidote is known. This plant (and colchicine itself) poses a particular threat to felines. The leaves and fruit of meadow saffron contain the highest level of toxins, but all parts of the plant are regarded as poisonous

### Other medicinal uses

Colchicine is an alkaloid and is used medicinally as a gout suppressant, in the treatment of Familial Mediterranean Fever, in veterinary science as an antineoplastic, and in genetic research. Convallatoxin is used as a cardio tonic.

### Chemical constituents of *Colchicum autumnale*

*Colchicum autumnale* contains the alkaloid colchicine and related compounds which are responsible for the poisoning. The alkaloid is heat-stable and therefore not inactivated by high temperatures.

### CONCLUSION

The Colchicine is an alkaloid from the bulb-like corms which are mostly used in ploidy and mutation breeding. Colchicine is a widely used mitotic inhibitor for the induction of polyploidy in plants during their cell division by inhibiting the chromosome segregation (El-Nashar and Ammar 2015). Besides Colchicine is an important mutagen that induces mutation in plants. Plants that have been mutated through colchicine are known as colchi-mutants. (Ari *et al.*, 2015). Hence the Colchicine at different concentrations and time durations is used to induce polyploidy in many crops. It is also used medicinally as a gout suppressant, in the treatment of Familial Mediterranean Fever, in veterinary science as an antineoplastic, and in genetic research.

### REFERENCES

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