

Chelidonium

Chelidonium majus, commonly known as **greater celandine** or **tetterwort**,^[2] (although tetterwort also refers to *Sanguinaria canadensis*), **nipplewort**,^[3] or **swallowwort**,^[3] is a herbaceous perennial plant, the only species in the genus *Chelidonium*. It is native to Europe and western Asia and introduced widely in North America.

While the greater celandine belongs to the poppy family, the lesser celandine belongs to the buttercup family.

1 Taxonomy and naming

The greater celandine is one of the many species described by the father of taxonomy, Carl Linnaeus, in volume one of his *Species Plantarum* in 1753.^[4] According to the Oxford English Dictionary, *celandine* comes from Late Latin *celidonia*, from earlier Latin *chelidonia* or *chelidonium*, and ultimately from Ancient Greek χελιδόνιον, from χελιδών (*chelidōn*) "swallow". Ancient writers said that the flower bloomed when the swallows returned and faded when they left.^[5]

2 Description



Chelidonium majus

Greater celandine is a perennial herb with an erect habit, and reaches 30 to 120 cm high. The leaves are pinnate with lobed and wavy-edged margins, up to 30 cm long. When injured, the plant exudes a yellow to orange latex.

The flowers consist of four yellow petals, each about 1 cm long, with two sepals. A double-flowered variety occurs

naturally. The flowers appear from late spring to summer in umbelliform cymes of about 4 flowers.

The seeds are small and black, borne in a long, cylindrical capsule. Each has an elaiosome, which attracts ants to disperse the seeds (myrmecochory).

It is considered an aggressive invasive plant in natural areas.^[6] Control is obtained mainly via pulling or spraying the plant before seed dispersal.

3 Pharmacology



A cut stem dripping with yellow latex

The whole plant is toxic in moderate doses as it contains a range of isoquinoline alkaloids but there are numerous therapeutic uses when used at the correct dosage.^[7] The main alkaloid present in the herb and root is *coptisine*. Other alkaloids present include methyl 2'-(7,8-dihydroanguinarine-8-yl)acetate, *alloyptopine*,^[8] *stylopine*, *protopine*, *norchelidonine*, *berberine*, *chelidonine*, *sanguinarine*, *chelerythrine*,^[9] and *8-hydroxydihydroanguinarine*.^[10] *Sanguinarine* is particularly toxic with an LD₅₀ of 18 mg per kg body weight (IP in rats).^[11] Caffeic acid derivatives, such as *caffeoylmalic acid*, are also present.^[12]

Some alkaloids have shown potential activity against methicillin-resistant *Staphylococcus aureus*.^[13]

The effect of the fresh herb is of a mild analgesic, cholagogic, antimicrobial, oncostatic and central nervous system sedative.^[14] In *in vitro* experiments on animal cells celandine is shown to be cytostatic.^[15] An immune stimulating effect has also been noted. Some studies show that

the alkaloid extraction can have the same effects. The alkaloids are known to cause immobilization in mice after being ingested orally or injected. The alkaloids cause limpness and tone reduction of smooth muscle in rabbits. The alkaloids are also noted to stimulate the heart and lungs of frogs, cats and dogs, raising the blood pressure and widening the arteries.

The latex could be employed for cauterizing small open wounds. Early studies of celandine showed that it causes contact dermatitis and eye irritation, particularly from contact with the poisonous red to yellow latex of the stem. This effect has not been observed in animal studies; no inflammation was observed in rabbit eye tests. The latex can leave a non-permanent stain. Stains on skin of the fingers are sometimes reported to cause eye irritation after rubbing the eyes or handling contact lenses. The latex is also known to stain clothes.

The characteristic latex also contains proteolytic enzymes and the phytocystatin chelidostatin, a cysteine protease inhibitor.^[16] These co-constituents could explain the topical use of greater celandine against warts and moles.

"Ukrain" (Ukrainian: Україн) is an alternative medicine promoted to treat cancer based on chelidonium. The drug was created in 1978 by the Ukrainian chemist Vasyl Novytskyi. The drug is named in honor of the nation of Ukraine and is produced by an Austrian company Nowicky Pharma.^[17] Although the drug was never approved by any regulators, Novytskyi claimed it to be a complete cure for all cancers, radiation-induced diseases and AIDS and was arrested in Vienna for aggravated fraud on September 4, 2012.^[18]

C. majus has shown analgesic activity at 200 mg/kg dose in mice.^[19]

4 Herbalism

The aerial parts and roots of greater celandine are used in herbalism. The above-ground parts are gathered during the flowering season and dried at high temperatures. The root is harvested in autumn between August and October and dried. The fresh rhizome is also used. Celandine has a hot and bitter taste. Preparations are made from alcoholic and hot aqueous extractions (tea). The related plant bloodroot has similar chemical composition and uses as greater celandine.

As far back as Pliny the Elder and Dioscorides (1st century CE) this herb has been recognized as a useful detoxifying agent. The root has been chewed to relieve toothache.^[20] It was formerly used by gypsies as a foot refresher; modern herbalists use its purgative properties.^[21] Juliette de Baïracli Levy, the Jewish-English herbalist, recommended greater celandine for the eyes, diluted with milk, and the latex to be used for getting rid of warts.^[22] Chelidonium was a favourite herb of the French herbalist Maurice Mességué.

Chelidonium majus has traditionally been used for treatment of various inflammatory diseases including atopic dermatitis.^[23] It is also traditionally used in the treatment of gallstones and dyspepsia.^[24]

The Iroquois give an infusion of whole plant, another plant & milk to pigs that drool and have sudden movements.^[25]

5 References

- [1] "The Plant List: A Working List of All Plant Species". Retrieved June 7, 2014.
- [2] Hanzlik, P.J. (1920). "The pharmacology of chelidonin, a neglected alkaloid of chelidonium, or tetterwort". *Journal of the American Medical Association* **75** (20): 1324–1325. doi:10.1001/jama.1920.02620460022007.
- [3] "USDA GRIN Taxonomy".
- [4] Linnaeus C (1753). "Tomus I". *Species Plantarum* (in Latin). Stockholm: Laurentii Salvii. p. 505.
- [5] "Swallow". *Oxford English Dictionary, Second Edition*. Oxford University Press, Oxford. 1989.
- [6] "Invasive Plant Atlas of New England". Retrieved 2015-06-03.
- [7] Gruenwald, Joerg (2000). *PDR for Herbal Medicines*. Thomson PDR. ISBN 1-56363-361-2.
- [8] Cahlikova L., Opletal L., Kurfurst M., Macakova K., Kulhankova A., Host'alkova A., "Acetylcholinesterase and butyrylcholinesterase inhibitory compounds from *Chelidonium majus* (Papaveraceae)." *Natural Product Communications*. 5 (11) (pp 1751-1754), 2010. Date of Publication: 2010.
- [9] Li X.-L., Yao J.-Y., Zhou Z.-M., Shen J.-Y., Ru H.-S., Liu X.-L., "Activity of the chelerythrine, a quaternary benzo[c]phenanthridine alkaloid from *Chelidonium majus* L. on *Dactylogyrus intermedius*." *Parasitology Research*. 109 (1) (pp 247-252), July 2011
- [10] Park J.E., Cuong T.D., Hung T.M., Lee I., Na M., Kim J.C., Ryou S., Lee J.H., Choi J.S., Woo M.H., Min B.S., "Alkaloids from *Chelidonium majus* and their inhibitory effects on LPS-induced NO production in RAW264.7 cells". *Bioorganic and Medicinal Chemistry Letters*. 21 (23) (pp 6960-6963), 2011. Date of Publication: 01 Dec 2011.
- [11] Golob, Peter; Caroline Moss; Melanie Dales; Alex Fidge; Jenny Evans; Irene Gudrups (1999). *The use of spices and medicinals as bioactive protectants for grains*. FAO Agricultural Services Bulletin **137**. Rome: Food and Agriculture Organization. ISBN 92-5-104294-2. Retrieved 2008-07-17.
- [12] Hydroxycinnamic Acid Derivatives, Caffeoylmalic and New Caffeoylaldonic Acid Esters, from *Chelidonium majus*. Hahn R and Nahrstedt A, *Planta Med.*, February 1993, volume 59, issue 1, pages 71-75, PubMed

- [13] Zuo G.Y., Meng F.Y., Hao X.Y., Zhang Y.L., Wang G.C., Xu G.L."Antibacterial alkaloids from *chelidonium majus* linn (papaveraceae) against clinical isolates of methicillin-resistant *Staphylococcus aureus*." *Journal of pharmacy & pharmaceutical sciences : a publication of the Canadian Society for Pharmaceutical Sciences, Societe canadienne des sciences pharmaceutiques*. 11 (4) (pp 90-94), 2008.
- [14] European Medicines Agency. Assessment report on *Chelidonium majus* L., herba. Date of Publication: 20/01/2012. http://www.ema.europa.eu/docs/en_GB/document_library/Herbal_-_HMPC_assessment_report/2012/01/WC500120711.pdf
- [15] Robert Nawrot, Maria Wołui-Cholewa & Anna Goździcka-Józefiak (2008). "Nucleases isolated from *Chelidonium majus* L. milky sap can induce apoptosis in human cervical carcinoma HeLa cells but not in Chinese Hamster ovary CHO cells". *Folia Histochemica et Cytobiologica* **46** (1): 79–83. doi:10.2478/v10042-008-0011-x. PMID 18296268.
- [16] Rogelj, B.; et al. (1998). "Chelidocystatin, a novel phytocystatin from *Chelidonium majus*". *Phytochemistry* **49** (6): 1645–9. doi:10.1016/s0031-9422(98)00281-7. PMID 9862139.
- [17] The official site about the drug Ukrain
- [18] Allheilmittel gegen Aids und Krebs: Zwei Verhaftungen wegen Betrugs in Wien, Der Standard, 4 Sept. 2012
- [19] Sever Yilmaz B., Ozbek H., Saltan Citoglu G., Ugras S., Bayram I., Erdogan E."Analgesic and hepatoprotective effects of *Chelidonium majus*" L.. *Ankara Universitesi Eczacilik Fakultesi Dergisi*. 36 (1) (pp 9-20), 2007.
- [20] Chevallier, Andrew (1996). *The encyclopedia of medicinal plants*. New York: DK Publishing. p. 185. ISBN 0-7894-1067-2.
- [21] Howard, Michael (1987-05-21). *Traditional Folk Remedies*. Century Paperbacks. Ebury Press. pp. 146–147. ISBN 978-0-7126-1731-4.
- [22] Bailes M., "The Healing Garden" , ISBN 978-0-7318-0753-6
- [23] Gabsik Yang, Kyungjin Lee, Mi-Hwa Lee, So-Hyung Kim, In-Hye Ham & Ho-Young Choi (2011). "Inhibitory effects of *Chelidonium majus* extract on atopic dermatitis-like skin lesions in NC/Nga mice". *Journal of Ethnopharmacology* **138** (2): 398–403. doi:10.1016/j.jep.2011.09.028. PMID 21963561.
- [24] Gabriela Mazzanti, Antonella di Sotto, Antonio Franchitto, Caterina Loredana Mammola, Paola Mariani, Sabina Mastrangelo, Francesca Menniti-Ippolito & Annabella Vitalone (2009). "*Chelidonium majus* is not hepatotoxic in Wistar rats, in a 4 weeks feeding experiment". *Journal of Ethnopharmacology* **126** (3): 518–524. doi:10.1016/j.jep.2009.09.004. PMID 19761826.
- [25] Rousseau, Jacques 1945 Le Folklore Botanique De Caughnawaga. Contributions de l'Institut botanique l'Universite de Montreal 55:7-72 (p. 45)

6 External links

- Flora of North America
- Flora Health website
- Blanchan, Neltje (2005). *Wild Flowers Worth Knowing*. Project Gutenberg Literary Archive Foundation.

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