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Review

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HOW THE SORCERER'S VIOLET DRIVES AWAY EVIL SPIRITS BUT CARES FOR FRIENDSHIP

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The article describes the historical roots of the use of lesser periwinkle, its most important constituents, and their biological activity.

Keywords: periwinkle, vinca alkaloids, vincamine, vinblastine

Fig. 1. ***Vinca minor*** **L.**; family *Apocynaceae,* genus *Vinca,* ref.[2]

Some time ago, we published a review of the alkaloids of the genus *Vinca*[1]. The extensive work on 70 pages describes all representatives of the genus from all over the globe, stating the botanical aspects of the representatives of the genus, including 202 identified alkaloids. Let us try to look at our only periwinkle, for example, from a historical and perhaps slightly more popular point of view.

The lesser periwinkle *Vinca minor* L. (*see* Fig. 1, ref.[2]; family *Apocynaceae,* genus *Vinca)*, with a pungent, bitter taste, is described by Presl as an ornamental herb[3]: *… a proto w zahradách obyčejná, kdežto míwá kwět modrý, bílý, růžowý nebo nachowý, někdy i plný. Nať hořká, druhdy w lékařstwí se potřebowala. We Wlašíh ozdobují ratolístkami mrtwé děti, a protož slowe také umrlčí kwet* (fior di morto) … (*… and therefore common in gardens, whereas it tends to flower blue, white, pink, or purple, sometimes full. The leaves are bitter, sometimes used in medicine. Wallachians decorate dead children with its sprigs, hence the word "mortem flower".* (fior di morto) …).

It was added to love potions, scattered under the bed to increase sexual desire. The old traditional folk name from France and England was "Sorcerer 's Violet". It was considered a favorite flower of "wise persons", sometimes called witches, for making love spells and potions, and it was said that it could exorcise evil spirits[4]. The flowers, therefore, served as a protective talisman, which the Anglo-Saxons hung in homes to ward off the said evil spirits. Despite the poisonous nature of the plant, the 17th century English botanist Nicholas Culpeper claimed that the leaves, eaten together by a man and a woman, would bring about love between them, and the young tops made into jam were good against nightmares[5]. At weddings in western Ukraine, both the bride and groom wear wreaths of periwinkle on their heads. The plant, with its stiff, glossy, evergreen leaves (which can withstand both frost and high temperatures), symbolizes the eternal nature of their love and marital vows[6].

We read about it in ancient literature. The Germans considered it a flower of immortality and called it Singrün[7] (Sinngrün, from singrüene, all-green, singruoni, also Ingrün, Wintergrün, and then a distortion – Beerwinck), the French la pervenche; and it was poetically claimed that it cares for friendship[8], because its stems intertwine, bind (vincolo); in France it was also called "toute-saine", a panacea. In Czech we encounter the term brčál menší[9], but we also find in literature the term barvínek (zumozelen[10], zymostráž)[11]. Our favorite Mattioli uses the terms barvínek, zymostráž[12]. In English we find names like dwarf periwinkle, lesser periwinkle, vinca, running-myrtle, blue buttons, devil's eye, joy on the ground, sorcerer's violet.

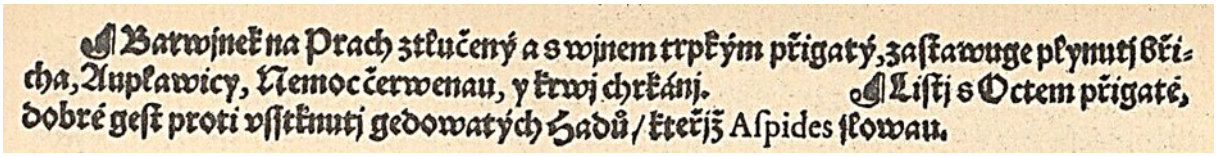
Barwinek na Prach ztlučený a s winem trpkým přigatý, zastawuge plynutj bři-
cha, Auplawicy, Nemoc čerwenau, y krwj chrkánj. Listj s Octem přigaté,
dobré geſt proti vſſtknutj gedowatých Hadů / kteřjž Aſpides ſlowau.

Fig. 2. **Mattioli[12] on periwinkle**

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As the classics say, it grows even where no one else wants it: *Brčál (Brčál menšj) w Čechách bogne roste, a gest obrazem naděge a politiky newjdané, neb pod ostatnjmi bylinami roste, a proti naďěgi tam se často ukáže, kde by sme geg neyméně očekáwali* (*Periwinkle (Lesser Periwinkle) grows abundantly in Bohemia, and is an image of hope and politics unseen, for it grows under other herbs, and against hope it often appears where we would see it least expected*)[13], or *Wšak barwinek, hle ! polokleslé rumy Opřádá wěcně ramenama swýma, Jak nadějná nám w době žalné dumy Myšlénka srdce útěchou objímá* (*But periwinkle, look! half-sunken rums Spins well by its shoulders, How hopeful for us in times of sorrowful mourning The thought embraces the heart with comfort*)[14]. We will learn about biology and other interesting facts from the article by P. Karlík[15].

While the term brčál, apart from barvínek, in Czech means something intensely green, the term barvínek, common in most Slavic languages, however suggestive, is not related to the color, but is a corruption of the German term "Beerwinck" resulting from a corruption of the Latin "pervinca"[16] (the Latin for *evergreen* is *sempervirens)*. However, the name barvínek or barwjnek (barvínek plamínek) is also used in old Czech for the genus *Clematis*[17], which is also stated by Mattioli[12].

Historically, it has been used in folk medicine to treat high blood pressure, diabetes[18,19], circulatory problems, and to support metabolism. In India, the juice of the leaves was used to treat wasp stings. In Hawaii, the plant was boiled for a poultice to stop bleeding. In China (小蔓长春花 hua ye man chang chun hua) was used as an astringent, diuretic, and cough medicine. In Central and South America, it was used as a home remedy for colds to relieve lung problems and inflammation, as well as sore throats[20].

It has also been shown to improve other conditions such as inflammation (cystitis, gastritis, enteritis) and diarrhea. Externally, crushed leaves are used for sore throats, nosebleeds, bruises, abscesses, and eczema[21]. Symptoms of intoxication may include hypotension, bradycardia, skeletal muscle paralysis, and convulsions. The alkaloids may be neurotoxic with prolonged use[19,22]. Unless otherwise noted in the text; pharmacological activity data are from the CAS SciFinder database.

Periwinkles (the genus includes 6 species) contain small amounts of alkaloids and are considered slightly poisonous, although no case of poisoning is known. The average alkaloid content in the leaves of the lesser periwinkle is about 0.3[23] to 0.68%[24], but also 1.4%[25]. Among the 60 alkaloids isolated from *V. minor,* vincamine, vincine, isovincamine, vincamide, vincaminorein have been identified. Today, the drug is officially used only for the isolation of the indole alkaloid vincamine[19]. Some other biologically active substances have been synthesized on the basis of vinca alkaloids, such as vinpocetine (bravinton, cavinton, ceractin, ultra-vinca, vinporal), which is, among other things, described as a promising candidate for the treatment of Alzheimer's disease[20].

The results show that the first isolated and most abundant indole alkaloid **vincamine** ((+)-vincamine, pervone, pervincamine, minorin, novicet …), with a dry drug content of 0.0055%[26], is a potent voltage-gated sodium channel inhibitor, which is an effective cerebral vasodilator[27] and can effectively treat and prevent ischemic cardiovascular and cerebrovascular diseases and other complications[28]. It also has a positive effect on memory and learning, counteracts the negative effects of stress, and improves sleep[29]. Among other things, it has inhibitory activity as a 5-hydroxytryptamine receptor agonist in the treatment of cancer[30] and its effect on primary degenerative and vascular dementia[31]. The effect of vincamine is also discussed in retinal circulatory disorders[32].

Among other main indole alkaloids, which older literature sometimes classifies as bitters due to their bitter taste, and which are (as true alkaloids) toxic, we see, for example:

(+)-Vincine (11-methoxyvincamine), where, as an example of toxicity, we find LD_{50} (house mouse)[33], 180 mg kg^{-1},

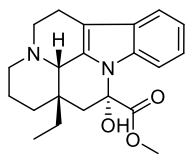
9-methoxyvincamine, which was found to have antimicrobial and cytotoxic activity[34],

isovincamine ((+)-*trans*-vincamine, 3-epivincamine) in periwinkle contained along with vincamine, is being investigated for cardiovascular[35] and cerebral[36] activity,

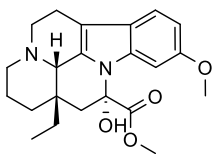
vincamidine (strictamine), **(+)-vincaminorine**, **(+)-vincaminorein**, and **(−)-minovin** are being investigated as a treatment for Alzheimer's disease[37],

(+)-minovincin, and **(−)-minovincinin**, which has been found to have antimicrobial and cytotoxic activity[34],

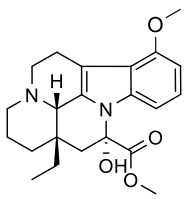
(−)-akuammicin, investigated for anti-inflammatory activity and for the treatment of Alzheimer's disease, cancers, and asthma.



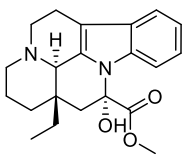
vincamine



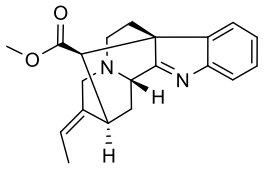
(+)-vincine (11-methoxyvincamine)



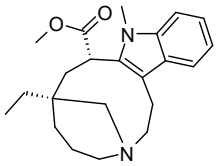
9-methoxyvicamine



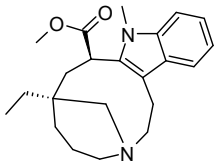
isovincamine



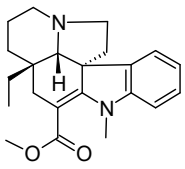
vincamidine



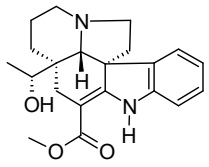
(+)-vincaminorine



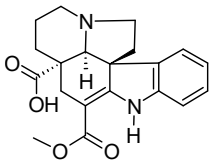
(+)-vincaminorein



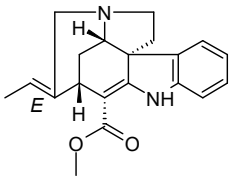
(−)-minovin



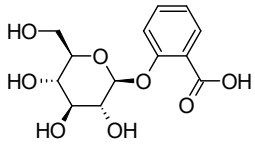
(+)-minovincin



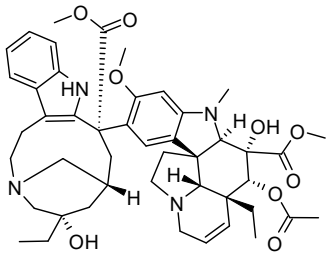
(−)-minovincinin



(−)-akuammicin



salicylic acid glucoside



(+)-vinblastine

Cancerostatic **(+)-vinblastine** (vincaleucoblastine), belongs to the so-called vinca alkaloids (vinca alkaloids), used in chemotherapy for cancer treatment (*Vinblastine sulfas*), but they are obtained from a different plant, the pink (Madagascar) periwinkle (*Catharanthus roseus*), because it is only contained in minimal amounts in the lesser periwinkle[38]. The pink periwinkle originates from Madagascar and was previously also classified in the genus *Vinca.* Studies have been published describing the possibility of producing vinblastine in a culture of genetically modified yeast *Saccharomyces cerevisiae* (yeast)[39,40].

Among other things, *V. minor* also contains a small amount of **salicylic acid glucoside**[41], which was once considered a suitable analgesic[42].

Among other substances, periwinkle contains saponins, tannins, pectin, phenolic acids (such as vanillic, coumaric, chlorogenic, and caffeic), flavonoids (rutin), and ursolic acid[43], in addition to glycosides, tannins, ascorbic acid, and carotenoids[44]. The dried stem, collected before flowering, is a medicinal drug.

The beautiful structures, whose formulas are almost impossible to draw nicely, and the highly biologically active compounds make our periwinkle a deep well of knowledge, because it is rare to find such a useful and truly resilient herb in nature.

The article is part of a series of contributions in this journal describing various chemical aspects of the issue of natural substances, such as[45–48]. It aims to contribute to a considered approach of readers to chemistry, about which the media often contains very condemnatory articles, even more often full of half-truths and fabrications.

REFERENCES

1. Vrabec R., Drašar P., Opletal L., Kosturko Š., Blunden G., Cahlíková L.: Phytochem. Rev. *24*, 3665 (2025).
2. Kops J.: *Vinca minor — Flora Batava* ; https:// www.BioLib.de, downloaded 28. 2. 2025.
3. Presl J. S.: *Jana Swatopluka Presla Wšeobecný rostlinopis, čili, Popsání rostlin we wšelikém ohledu užitečných a škodliwých*, Part 2. Kronbergr and Řivnáč, Prague 1846.
4. White Rabbit Institute of Healing: *Healing Herb Directory,* https:// www.whiterabbitinstituteofhealing.com/herbs/, downloaded 28. 2. 2025.
5. Culpeper N., Sibley E.: *Culpeper's English Physician and complete Herbal.* E. Sibley, London 1789.
6. Mlčoch Z.: *Barvínek menší - účinky na zdraví, co léčí, použití, užívání, využití, pěstování*; https:// www.bylinkyprovsechny.cz/byliny-kere-stromy/ jedovate-byliny/2100-barvinek-mensi-ucinky-na-zdravi-co-leci-pouziti-uzivani-vyuziti-pestovani, downloaded 28. 10. 2025.
7. Hessen H.: *New Garten – Lust*. Johann Ludwig Gleditschen, Leipzig 1703.
8. von Matthisson F.: *Gedichte von Matthisson.* Franz Haas, Wien + Prag 1803.

9. Presl S., Presl B.: *Flora čechica indicatis medicinalibus, oeconomicis technologicisque plantis = Květena česká : s poznamenánjm lékařských, hospodářských a řemeslnických rostlin.* J. G. Calve, Prague 1819.
10. Dobrovský J.: *German-Bohemian Wörterbuch.* Herrl, Prague 1821.
11. Palkovič J.: *Böhmisch-deutsch-lateinisches Wörterbuch mit Beyfügung der den Slowaken und Mähren eigenen Ausdrücke und Redensarten zunächst für Schulen durchaus neubearbeitet, auch mit einem vollständigen deutschen Wortregister versehen und auf eigene Kosten.* Josepha Vetterl v. Wildenbrunn, Prague 1820.
12. Mattioli P. A., Huber z Risenpach A., Adam z Veleslavín D.: *Herbář, aneb, Bylinář doktora Petra Ondřege Mathiola.* B. Kočí, Prague 1924.
13. Tomíček J. S., Franta Šumavský J., Amerling K.: *Slowanka, Sbjrka národnjch pověstj.* H. J. Enders, Prague 1833.
14. Kapper S.: *České listy od Sígfrída Kappera.* Calveské kněhkupectví, Prague 1846.
15. Karlík P.: Les. Práce *100*, 36 (2021).
16. Karlík P., Nekula M., Pleskalová J.: *Nový encyklopedický slovník češtiny online;* https:// www.czechency.org/, downloaded 28. 10. 2025.
17. von Berchtold F., Presl J. S.: *O přirozenosti rostlin, aneb, Rostlinář, obsahugjcj popsánj a wyobrazenj rostlin podlé řádů přirozených zpořádané..., ustanowený pro lékaře, hogiče, hospodáře, umělce, řemeslnjky a wychowatele*. B. Haase, Prague 1823.
18. Spilková J., Martin J., Siatka T., Tůmová L., Kašparová M.: *Farmakognozie*. Univerzita Karlova, Karolinum, Prague 2016.
19. Sturluson T.: *Lesser Periwinkle – Medicinal Uses and Benefits* ; https://www.herbal-supplement-resource.com/periwinkle-herb.html, downloaded 28. 10. 2025.
20. Sun Z. K., Yang H. Q., Chen S. D.: Transl. Neurodegener. *2*, 6 (2013).
21. Khanavi M., Pourmoslemi S., Farahanikia B., Hadjiakhoondi A., Ostad S. N.: Pharm. Biol. *48*, 96 (2010).
22. Jahodář L: *Rostliny způsobující otravy*. Universita Karlova, Karolinum, Prague 2018.
23. Neczypor W.: Pharmazie *24*, 273 (1969).
24. Neczypor W.: Pharmazie *20*, 735 (1965).
25. Farahanikia B., Akbarzadeh T., Jahangirzadeh A., Yassa N., Shams Ardekani M. R., Mirnezami T., Hadjiakhoondi A., Khanavi M.: Iran J. Pharm. Res. *10*, 777 (2011).
26. Schlittler E., Furlenmeier A.: Helv. Chem. Acta *36*, 2017 (1953).
27. Szantay C.: Pure Appl. Chem. *62*, 1299 (1990).
28. Hou E., Li D.: Xibei Yaoxue Zazhi *25*, 314 (2010).
29. Yazawa K.: Nonai Roka Seigyo to Baiomaka: Kiban Kenkyu to Shokuhin Sozai *2009*, 235.
30. Norwood V. M. IV: J. Med. Chem. *63*, 5119 (2020).
31. Fischhof P. K., Moslinger-Gehmayr R., Herrmann W. M., Friedmann A., Russmann D. L.: Neuropsycho-biology *34*, 29 (1996).
32. Koch H. J., Raschka C., Fischer-Barnicol D.: Pharm. Ztg. *148*, 16 (2003).
33. Potier P., Kan-Fan C.: FR2092726 (1972).
34. El-Senduny F. F., Elgazar A. A., Alwasify H., A., Abed A., Foda M., Abouzeid S., Lewerenz L., Selmar D., Badria F.: Planta Med. *89*, 964 (2023).
35. Czibula L., Nemes A., Visky G., Farkas M., Szombathelyi Z., Karpati E., Sohar P., Kessel M., Kreidl J.: Liebigs Ann. Chem. *1993*, 221.
36. Imamoto T., Nukada T., Tada K: Nō to shinkei = Brain and nerve *29*, 341 (1977).
37. Vrabec R. and 17 co-authors: Phytochemistry (Elsevier) *194*, 113017 (2022).
38. Ciorîță A., Zăgrean-Tuza C., Moț A. C., Carpa R., Pârvu M.: Molecules *26*, 3040 (2021).
39. Srinivasan P., Smolke C. D.: Med *3*, 727 (2022).
40. Zhang Jie and 29 co-authors: Nature (London, UK) *609*, 341 (2022).
41. King F. E., Gilks J. H., Partridge M. W.: J. Chem. Soc. *1955*, 4206
42. Eisai Co., Ltd. Japan: JP59152328 A (1984).
43. Jirásek V., Zadina R., Blažek Z., Jiřincová L.: *Naše jedovaté rostliny*. ČSAV, Prague 1957.
44. Lyapunov P. N.: Izuch. and Ispol'z. Medicine. Grow. Resursov USSR (Leningrad: Med.) Sb. *1964*, 255.
45. Jurášek M., Drašar P.: Chem. Listy *119*, 672 (2025).
46. Lener T., Nesměrák K.: Chem. Listy *119*, 374 (2025).
47. Grbavčic M., Jurášek M., Drašar P.: Chem. Listy *118*, 448 (2024).
48. Eremia N. G., Coșeleva O., Jereghi V., Sucman N., Mardari T., Cataraga I., Macaev F. Z.: Chem. Listy *118*, 668 (2024).