

MEDICAL COLLEGE OF THE UNIVERSITY OF RZESZOW

HERBARIUM

STUDENTS OF MEDICAL COLLEGE
OF THE UNIVERSITY OF RZESZOW





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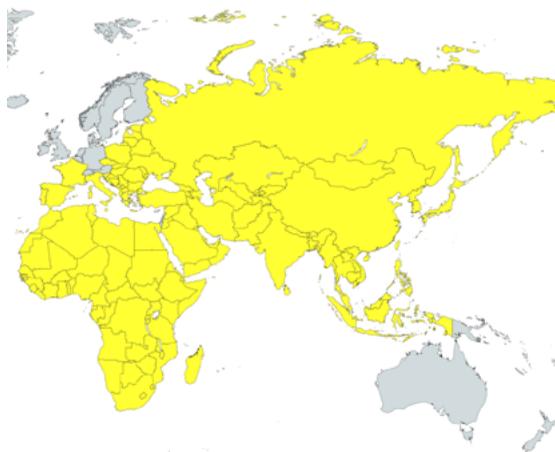
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Long-leaved mint

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Long-leaved mint (Latin: *Mentha longifolia*) belongs to the labial family. It is quite common in various areas, mainly in the shores of water reservoirs, in ditches and in meadows where water stands for a long time after rainfall. It can be found in Africa, southern and central Europe, and in Asia. It is grown mainly for its health-promoting properties, and also as an extremely

honey-bearing plant. *Mentha longifolia* grows up to a meter in height, its stem is completely covered with fine hairs. It creates quite large stolon below the ground. The mint leaves are long, lanceolate and pointed. The leaves are mostly sessile, only those close to the ground have a short petiole. The inflorescences are spike-shaped, up to 10 cm long. Long-leaved mint blooms pink or lilac.



Fig. 1. Long-leaved mint

References

1. Sumalan RM, Kuganov R, Obistioiu D, et al. Assessment of Mint, Basil, and Lavender Essential Oil Vapor-Phase in Antifungal Protection and Lemon Fruit Quality. *Molecules*. 2020;25(8):1831.
2. Togashi K, Goto M, Rim H, Hattori S, Ozawa R, Arimura GI. Mint companion plants attract the predatory mite *Phytoseiulus persimilis*. *Sci Rep*. 2019;9(1):1704.
3. Kapp K, Orav A, Roasto M, et al. Composition and Antibacterial Effect of Mint Flavorings in Candies and Food Supplements. *Planta Med*. 2020;86(15):1089-1096.

Lemon balm

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Lemon balm (Latin: *Melissa officinalis*) is a perennial that grows wild in northern Africa, southern Europe and Asia. In Poland it is called a swarmer, beekeeper or lemon herb. This plant is cultivated all over the world. Lemon balm has ribbed or serrated, intensely green

leaves. Lemon balm is a perennial that grows up to 60-100 cm in height. Lemon balm has ribbed or serrated, intensely green leaves. The flowers, blooming from June to September, can be white, yellowish or pale pink, but always heart-shaped.



Fig. 2. Lemon balm

References

1. Miraj S, Rafieian-Kopaei, Kiani S. *Melissa officinalis* L: A Review Study With an Antioxidant Prospective. *J Evid Based Complementary Altern Med*. 2017;22(3):385-394.
2. Scholey A, Gibbs A, Neale C, et al. Anti-stress effects of lemon balm-containing foods. *Nutrients*. 2014;6(11):4805-4821.
3. Taavoni S, Nazem Ekbatani N, Haghani H. Valerian/lemon balm use for sleep disorders during menopause. *Complement Ther Clin Pract*. 2013;19(4):193-196.

Large cranberry

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Large cranberry (Latin: *Vaccinium macrocarpon*) is a perennial shrub belonging to the heather family. For over thirty years it has been classified as a blueberry, hence its other name - “large cranberry blueberry”. The natural habitat of this plant is wetlands located in the eastern regions of North America. Cranberries are currently grown in almost all of North America and in some regions of South America, as well as in many parts

of Europe, including Poland. The largest European plantations are located in Lithuania and Belarus. Cranberry is a perennial, low, creeping shrub, the shoots of which can grow up to 0.5-1.5 m in length. Tiny, elliptical cranberry leaves have curled edges and are green, shiny and winter-hardy. Cranberry blooms in June and July and has numerous tiny white-pink flowers.



Fig. 3. Large cranberry

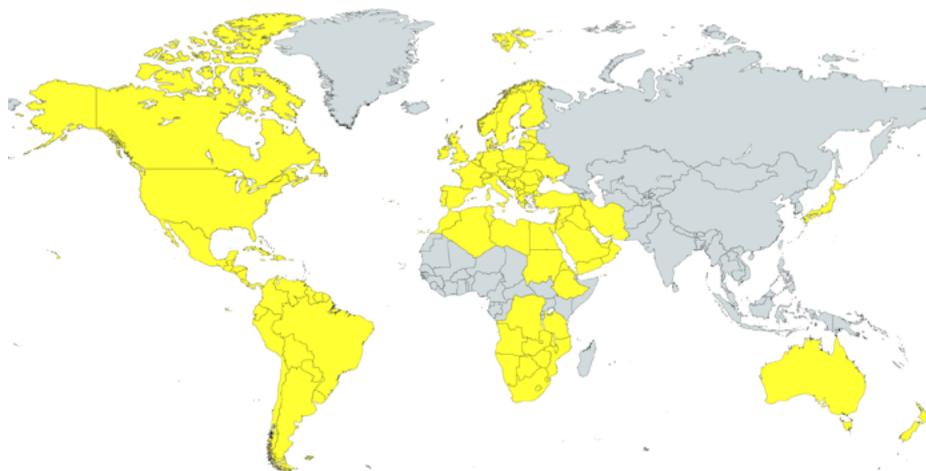
References

1. González de Llano D, Moreno-Arribas MV, Bartolomé B. Cranberry Polyphenols and Prevention against Urinary Tract Infections: Relevant Considerations. *Molecules*. 2020;25(15):3523.
2. Baranowska M, Bartoszek A. Antioxidant and antimicrobial properties of bioactive phytochemicals from cranberry. *Postepy Hig Med Dosw (Online)*. 2016;70(0):1460-1468.
3. Fu Z, Liska D, Talan D, Chung M. Cranberry Reduces the Risk of Urinary Tract Infection Recurrence in Otherwise Healthy Women: A Systematic Review and Meta-Analysis. *J Nutr*. 2017;147(12):2282-2288.

St. John's wort

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St. John's wort (Latin: *Hypericum perforatum*) belongs to the family of St. John's wort. It grows on grasslands, meadows and thickets, which makes it common in Poland. Naturally, it also occurs in Europe, West Asia and North Africa. It was brought to North and South America, South Africa, Australia, New Zealand and Japan. *Hypericum perforatum* is a perennial; its straight, oppositely leafed stem grows to a height of 60 cm. The leaves of *hypericum perforatum* are caudal and lance-shaped,

and when viewed against the light, brighter translucent dots can be seen to give the impression of pinholes. *Hypericum perforatum* has beautiful golden yellow, often black-dotted flowers, gathered in large and dense corymbs at the tops of the stems. When you crush them, juicy red juice flows out. The flowering season of *hypericum perforatum* is from June to September, and then its yellow flowers can be noticed.



Fig. 4. St. John's wort

References

1. Ng QX, Venkatanarayanan N, Ho CY. Clinical use of *Hypericum perforatum* (St John's wort) in depression: A meta-analysis. *J Affect Disord.* 2017;210:211-221.
2. Wölflé U, Seelinger G, Schempp CM. Topical application of St. John's wort (*Hypericum perforatum*). *Planta Med.* 2014;80(2-3):109-120.
3. Lawvere S, Mahoney MC. St. John's wort. *Am Fam Physician.* 2005;72(11):2249-2254.

Common sage

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Common sage (Latin: *Salvia officinalis*) is a popular herbal perennial that belongs to the Lamiaceae family. It comes from the region of Albania, Yugoslavia, Greece and Italy. Currently, sage is used in phytotherapy (herbal medicine), cosmetology and the catering industry. Sage thrives best in fertile, well-drained soil and in sunny but sheltered positions. It is a highly branched

plant, reaching up to 75 cm in height. Numerous woody stalks at the bottom are leafy opposite. Sage leaves are petiole, rounded at the base, and finely notched at the edge. Sage has light purple or pink flowers that are gathered in spikes at the top of the stems, resembling rye in the fields.



Fig. 5. Common sage

References

1. Gunduz-Bruce H, Silber C, Kaul I, et al. Trial of SAGE-217 in Patients with Major Depressive Disorder. *N Engl J Med*. 2019;381(10):903-911.
2. Kroska EB, Stowe ZN. Postpartum Depression: Identification and Treatment in the Clinic Setting. *Obstet Gynecol Clin North Am*. 2020;47(3):409-419.
3. Kargozar R, Azizi H, Salari R. A review of effective herbal medicines in controlling menopausal symptoms. *Electron Physician*. 2017;9(11):5826-5833.

Bilberry

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Bilberry (Latin: *Vaccinium myrtillus*), also known as blueberry, is a perennial plant in the heather family. It occurs in the temperate and arctic regions of Europe, Asia and North America. In Poland, it is very common in almost the entire country. It is usually in the form of a shrub, sometimes a shrub. Likes poor, acidic and

humus-rich soils. It is often a component of the undergrowth in deciduous and coniferous forests, but it also grows in pastures, moors and hills. It reaches a height of a maximum of 30 cm, in the mountains the shrubs may be shorter.



Fig. 6. Bilberry

References

1. Chan SW, Tomlinson B. Effects of Bilberry Supplementation on Metabolic and Cardiovascular Disease Risk. *Molecules*. 2020;25(7):1653.
2. Mauramo M, Onali T, Wahbi W, et al. Bilberry (*Vaccinium myrtillus* L.) Powder Has Anticarcinogenic Effects on Oral Carcinoma In Vitro and In Vivo. *Antioxidants (Basel)*. 2021;10(8):1319.
3. Riva A, Togni S, Franceschi F, Kawada S, Inaba Y, Eggenhoffner R, Giacomelli L. The effect of a natural, standardized bilberry extract (Mirtoselect®) in dry eye: a randomized, double blinded, placebo-controlled trial. *Eur Rev Med Pharmacol Sci*. 2017;21(10):2518-2525.

Common chamomile

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Common chamomile (Latin: *Matricaria chamomilla*) is a flower belonging to the Asteraceae family. In the wild, it is common almost all over Europe, in the Urals, the Caucasus, Asia Minor and partly in the western part of Asia. As a trailed plant, chamomile also grows wild in North America and Australia. Chamomile is a peren-

nial plant, but it freezes over in extremely cold winters. Feathery, thin leaves grow below the inflorescences. It grows up to about 40 cm in height, it is characterized by two-colored flowers, white with yellow centers. It blooms from May to August. In Poland, it is a common plant, there are no big demands on the environment.



Fig. 7. Common chamomile

References

1. Mao JJ, Xie SX, Keefe JR, Soeller I, Li QS, Amsterdam JD. Long-term chamomile (*Matricaria chamomilla* L.) treatment for generalized anxiety disorder: A randomized clinical trial. *Phytomedicine*. 2016;23(14):1735-1742.
2. Pazyar N, Yaghoobi R, Rafiee E, Mehrabian A, Feily A. Skin wound healing and phytomedicine: a review. *Skin Pharmacol Physiol*. 2014;27(6):303-10.
3. Rosenthal A, Israilevich R, Moy R. Management of acute radiation dermatitis: A review of the literature and proposal for treatment algorithm. *J Am Acad Dermatol*. 2019;81(2):558-567.

Fennel

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Fennel (Latin: *Foeniculum vulgare* Mill.), also known as sweet fennel, is a herbaceous biennial plant belonging to the celery family. Originally found in the Mediterranean region, as well as in Pakistan, Iran, Afghanistan, reaching Nepal as far as possible in the east. This plant is grown in many regions of the world, including Poland.

Although fennel may look like a tuber, they are actually thickened leaf sheaths that form a bulbous onion. Fennel stalks are surrounded by jagged leaves and can reach up to 2 meters in height. This plant produces small fruits at the end of summer, which are characterized by an intense, anise-like aroma.



Fig. 8. Fennel

References

1. Badgajar SB, Patel VV, Bandivdekar AH. *Foeniculum vulgare* Mill: a review of its botany, phytochemistry, pharmacology, contemporary application, and toxicology. *Biomed Res Int.* 2014;2014:842674.
2. Portincasa P, Bonfrate L, Scribano ML, et al. Curcumin and Fennel Essential Oil Improve Symptoms and Quality of Life in Patients with Irritable Bowel Syndrome. *J Gastrointest Liver Dis.* 2016;25(2):151-157.
3. Xu Y, Yang Q, Wang X. Efficacy of herbal medicine (cinnamon/fennel/ginger) for primary dysmenorrhea: a systematic review and meta-analysis of randomized controlled trials. *J Int Med Res.* 2020;48(6):300060520936179.

Garlic

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Common garlic (Latin: *Allium sativum*), belonging to the Liliaceae family. It comes from Central Asia. It has been known for thousands of years and has been used as a vegetable, spice and medicine for many past civilizations. Requires fertile, moist and well-drained soil; sunny or slightly shaded positions, tolerates poorer soils. Strongly aromatic plant. A spherical onion, composed of tiny onions, called cloves, covered with shells. Garlic

grows up to approx. 90 cm in height. Garlic leaves (so-called chives) are dark green, flat, smooth and even, they cover the lower part of the shoot. Garlic forms underground onions. Each onion consists of individual bulbs (so-called cloves), placed together in a group (in the head). The garlic stalk is reduced to the so-called Garlic blooms from July to August.



Fig. 9. Common garlic

References

1. Nicastro HL, Ross SA, Milner JA. Garlic and onions: their cancer prevention properties. *Cancer Prev Res (Phila)*. 2015;8(3):181-189.
2. Kimura S, Tung YC, Pan MH, Su NW, Lai YJ, Cheng KC. Black garlic: A critical review of its production, bioactivity, and application. *J Food Drug Anal*. 2017;25(1):62-70.
3. Adaki S, Adaki R, Shah K, Karagir A. Garlic: Review of literature. *Indian J Cancer*. 2014;51(4):577-581.
4. Sobenin IA, Myasoedova VA, Iltchuk MI, Zhang DW, Orekhov AN. Therapeutic effects of garlic in cardiovascular atherosclerotic disease. *Chin J Nat Med*. 2019;17(10):721-728.

Ribwort plantain

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Ribwort plantain (Latin: *Plantago lanceolata*) belongs to the perennials of the plantain genus. This species is common throughout Europe, including Poland, North Africa and Asia. It has been dragged to South America, North America and even Madagascar. Plantain lanceolate quickly adapts to various conditions, hence its widespread use all over the world. Perennial plantain from the temperate zone; in Poland it is common on mead-

ows, pastures, roadsides, water banks; sometimes cultivated. He likes black earth, light, loamy-sandy and airy soils. Stem up to 40 cm high, leafless. The stem leaves form a rosette, numerous, lanceolate, entire edges, parallel innervated, gradually tapering into a long, grooved petiole. The most important (from a medical point of view) are its leaves, which should be collected from May to September.



Fig. 10. Ribwort plantain

References

1. Alsaraf KM, Mohammad MH, Al-Shammari AM, Abbas IS. Selective cytotoxic effect of *Plantago lanceolata* L. against breast cancer cells. *J Egypt Natl Canc Inst.* 2019;31(1):10.
2. Ferrazzano GF, Cantile T, Roberto L, et al. Determination of the in vitro and in vivo antimicrobial activity on salivary Streptococci and Lactobacilli and chemical characterisation of the phenolic content of a *Plantago lanceolata* infusion. *Biomed Res Int.* 2015;2015:286817.
3. Sanchez-Rivera MM, Bello-Pérez LA, Tovar J, Martinez MM, Agama-Acevedo E. Esterified plantain flour for the production of cookies rich in indigestible carbohydrates. *Food Chem.* 2019;292:1-5.

Common parsley

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Common parsley (Latin: *Petroselinum crispum*) is a species of plant from the celery family. In its natural state (as a wild vegetable) it can be found in the Balkans and the Apennine Peninsula, North-West Africa and the Canary Islands. It is a biennial plant with leaves resembling celery. It is commonly part of the Italian region. Greenish to yellowish flowers, as usual in the celery family, are gathered in complex umbels. A white-colored root with

a hard flesh is also suitable for consumption. In the first year, the plant consists of a thick tap root and leaves. The stem of the plant grows up in the second year, it is then naked and reaches 50-90 cm in height. The leaves all over the plant are glossy. The flowers are gathered in folded umbels they are green-yellow in color. The fruit is a small greenish-brown cleft. The root is most often white in color and is rich in essential oils.

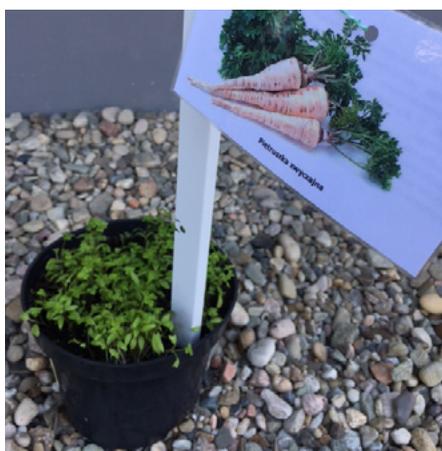


Fig. 11. Common parsley

References

1. Nirumand MC, Hajialyani M, Rahimi R, Farzaei MH, Zingue S, Nabavi SM, Bishayee A. Dietary Plants for the Prevention and Management of Kidney Stones: Preclinical and Clinical Evidence and Molecular Mechanisms. *Int J Mol Sci.* 2018;19(3):765.
2. Vázquez-Fresno R, Rosana ARR, Sajed T, Onookome-Okome T, Wishart NA, Wishart DS. Herbs and Spices- Biomarkers of Intake Based on Human Intervention Studies - A Systematic Review. *Genes Nutr.* 2019;14:18.
3. Tang D, Chen K, Huang L, Li J. Pharmacokinetic properties and drug interactions of apigenin, a natural flavone. *Expert Opin Drug Metab Toxicol.* 2017;13(3):323-330.

Broad-leaved linden

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Broad-leaved linden (Latin: *Tilia platyphyllos*) is one of about 30 species of linden. Another name for this tree that functions is large-leaved linden. It is a tree species belonging to the mallow family. In its natural environment, it occurs in Europe and Turkey. In Poland, it can be found mainly in the south of the country and is a species that occurs less frequently than, for example, small-

leaved linden. Yellowish-white flowers, usually gathered in 3 (less frequently 4-6); stamens longer than petals, oblong root, tapering gradually to both ends, 5-12 cm long, hairy on the nerve from below. It blooms in the second half of June, early July (two weeks earlier than the small-leaved linden). It is a powerful deciduous tree that can reach a height of up to 40 meters.



Fig. 12. Broad-leaved linden

References

1. Zhang Y, Fang L, Jing P. Analysis of broad leaved forest carbon sinks changes and forest economics and management in China. *Environ Sci Pollut Res Int.* 2020;27(12):12922-12931.
2. Bai Z, Yuan ZQ, Wang DM, Fang S, Ye J, Wang XG, Yuan HS. Ectomycorrhizal fungus associated determinants jointly reflect ecological processes in a temperature broad-leaved mixed forest. *Sci Total Environ.* 2020;703:135475.
3. Siger A, Antkowiak W, Dwiecki K, Rokosik E, Rudzińska M. Nutlets of *Tilia cordata* Mill. and *Tilia platyphyllos* Scop. Source of bioactive compounds. *Food Chem.* 2021;346:128888.

Raspberry

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Raspberry (Latin: *Rubus idaeus*), is a plant species that belongs to the rose family - Rosaceae. It is worth knowing that the common raspberry, as it is also called, naturally occurs in Asia, as well as in Europe, Iceland and Portugal. In Poland itself, it is a very common shrub that can be found throughout the country. The raspberry bush - *Rubus idaeus*, can grow up to about 2 m in height. It produces underground stolons and arched and rod-elongated

shoots, which are fully covered with spines. The leaves of the plant are 3-5-7 leaflets. It is characteristic that the top leaf is naked, while the underside is hairy-like. The important thing is that the edges of the leaf blade are sharply serrated. Let's not forget about the white flowers, which are gathered in panicles or loose hanging clusters. Raspberry fruits are made up of many of the most common red, fluffy hairy small drupes that gather in the collective fruit.



Fig. 13. Raspberry

References

1. Rattanawiwatpong P, Wanitphakdeedecha R, Bumrungrert A, Maiprasert M. Anti-aging and brightening effects of a topical treatment containing vitamin C, vitamin E, and raspberry leaf cell culture extract: A split-face, randomized controlled trial. *J Cosmet Dermatol*. 2020;19(3):671-676.
2. Wang PW, Cheng YC, Hung YC, et al. Red Raspberry Extract Protects the Skin against UVB-Induced Damage with Antioxidative and Anti-inflammatory Properties. *Oxid Med Cell Longev*. 2019;2019:9529676.
3. Staszowska-Karkut M, Materska M. Phenolic Composition, Mineral Content, and Beneficial Bioactivities of Leaf Extracts from Black Currant (*Ribes nigrum* L.), Raspberry (*Rubus idaeus*), and Aronia (*Aronia melanocarpa*). *Nutrients*. 2020;12(2):463.

Quince

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Quince (Latin: *Cydonia oblonga*) is a small tree or a tall shrub, 5-7 meters high, belonging to the Rosaceae family. It comes from the areas of Asia: Transcaucasia, Iran, Turkestan, Southeast Arabia, Asia Minor. Quince leaves are oval, large, up to 10 cm long, soft, silky, dark green and shiny on the top, slightly mossy underneath, grayish. Quince flower buds are formed on last year's small twigs and on shoots. The flowering of trees begins around mid-May, therefore spring frosts usually do not

damage the flowers. They are stately, about 5 cm in diameter, white or slightly pink in color, wonderfully fragrant. During full flowering, this scent can be felt even from a distance of several meters. The flowers are eagerly visited by insects collecting pollen and nectar, so there are no problems with pollination and fruit setting. Initially, the fruit is green, strongly mossy, and when ripe, almost naked, yellow, smooth, beautifully fragrant.



Fig. 14. Quince

References

1. Skrovankova S, Sumczynski D, Mlcek J, Jurikova T, Sochor J. Bioactive Compounds and Antioxidant Activity in Different Types of Berries. *Int J Mol Sci.* 2015;16(10):24673-24706.
2. Wang L, Liu HM, Zhu CY, Xie AJ, Ma BJ, Zhang PZ. Chinese quince seed gum: Flow behaviour, thixotropy and viscoelasticity. *Carbohydr Polym.* 2019;209:230-238.
3. Sut S, Dall'Acqua S, Poloniato G, Maggi F, Malagoli M. Preliminary evaluation of quince (*Cydonia oblonga* Mill.) fruit as extraction source of antioxidant phytoconstituents for nutraceutical and functional food applications. *J Sci Food Agric.* 2019;99(3):1046-1054.

Onion

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Onion (Latin: *Allium cepa*) is a vegetable from the amaryllis family, belonging to the genus 'garlic'. As a vegetable, it is grown in all countries. As history goes, it probably comes from Central Asia. Onions are easy to both grow and store. Its characteristic appearance is well known to everyone, but there are many varieties of this

plant, differing in color, shape and size. Color - from white, through red to purple, shape - from spherical to conical, and diameter from 10 mm to 8 cm or more. A good onion should be firm, with a skin that is firm and firm over the entire surface.



Fig. 15. Onion

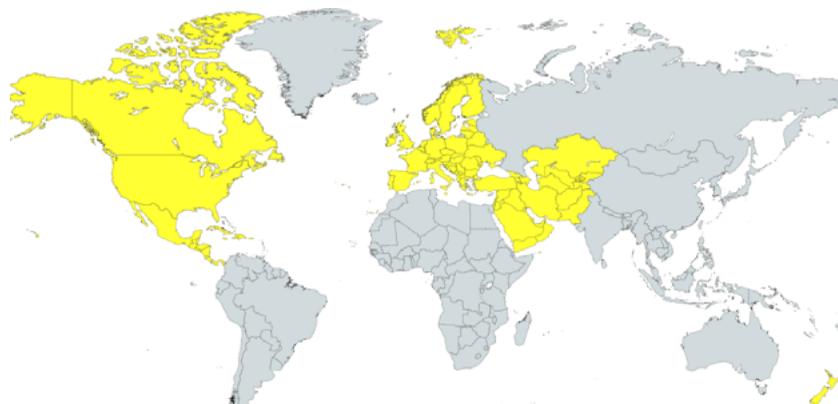
References

1. Suleria HA, Butt MS, Anjum FM, Saeed F, Khalid N. Onion: nature protection against physiological threats. *Crit Rev Food Sci Nutr.* 2015;55(1):50-66.
2. Romo-Pérez ML, Weinert CH, Häußler M, et al. Metabolite profiling of onion landraces and the cold storage effect. *Plant Physiol Biochem.* 2020;146:428-437.
3. Nicastro HL, Ross SA, Milner JA. Garlic and onions: their cancer prevention properties. *Cancer Prev Res (Phila).* 2015;8(3):181-189.
4. Griffiths G, Trueman L, Crowther T, Thomas B, Smith B. Onions--a global benefit to health. *Phytother Res.* 2002;16(7):603-615.

Horseradish

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Horseradish (Latin: *Armoracia rusticana*) is a perennial plant belonging to the Brassicaceae family. It occurs in Europe, the temperate part of Asia, New Zealand and North America. The plant produces thick, fleshy roots – pale yellow on the outside with white flesh on the inside. The stem is erect, branched in the upper part. Diverse leaves: large lower ovate, middle pinnate, upper lance-

olate. It blooms from May to July – producing white, small flowers, gathered in clusters. The fruit is a husk. Prefers light, carious substrates and bright positions. The harvest is usually at the end of October. Before harvesting the roots, the leaves should be removed. Stored roots can be mounded and covered with sand.



Fig. 16. Horseradish

References

1. Khanmohammadi M, Dastjerdi MB, Ai A, Ahmadi A, Godarzi A, Rahimi A, Ai J. Horseradish peroxidase-catalyzed hydrogelation for biomedical applications. *Biomater Sci.* 2018;6(6):1286-1298.
2. Alizadeh N, Salimi A, Hallaj R. Hemin/G-Quadruplex Horseradish Peroxidase- Mimicking DNzyme: Principle and Biosensing Application. *Adv Biochem Eng Biotechnol.* 2020;170:85-106.
3. Rodig SJ. Detecting Horseradish Peroxidase-Labeled Cells. *Cold Spring Harb Protoc.* 2019;2019(4).

Common pea

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Common pea (Latin: *Pisum sativum*) is a popular legume, valued for its taste and high nutritional value. It is native to Western Asia and the Caucasus, Eastern and Southern Europe and North Africa. Common pea is an annual plant. Its green, angular stem, depending on the variety, may be from 25 cm to 2-3 m long. The plant has a tapered root (1 m deep) with many side roots on

which growths of symbiotic nodule bacteria are formed. Pea leaves are pinnate, composed of 1-3 pairs of side leaves, ending with forked tendrils (thanks to which the plant climbs up the supports). Peas bloom in May and June. The butterfly flowers appear in the leaf axils and are white, but may be pink or red in cultivars. Peas are self-pollinating.



Fig. 17. Common pea

References

1. Cicero AFG, Allkanjari O, Busetto GM, et al. Nutraceutical treatment and prevention of benign prostatic hyperplasia and prostate cancer. *Arch Ital Urol Androl.* 2019;91(3):139.
2. Pascale R, Giannella M, Bartoletti M, Viale P, Pea F. Use of meropenem in treating carbapenem-resistant Enterobacteriaceae infections. *Expert Rev Anti Infect Ther.* 2019;17(10):819-827.

Curly kale

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Curly kale (Latin: *Brassica oleracea*) is one of the oldest forms of cruciferous plants. It has been cultivated in the Mediterranean for over 2,000 years. It is a member of the cruciferous family, known for its ability to thrive in the colder seasons. These plants tend to spread over many different continents. Kale is most associated with

large, dark green, oblong leaves. They have curly edges and a rigid system of light green gills. However, there are many varieties of kale. We can find straight leaves instead of crimped ones, and for example in a fipet trunk. You will also find green leaf cabbage with pipette stems and veins.



Fig. 18. Curly kale

References

1. Szutowaska J, Rybicka I, Pawlak-Lemańska K, Gwiazdowska D. Spontaneously fermented curly kale juice: Microbiological quality, nutritional composition, antioxidant, and antimicrobial properties. *J Food Sci.* 2020;85(4):1248-1255.
2. Michalak M, Gustaw K, Waśko A, Polak-Berecka M. Composition of lactic acid bacteria during spontaneous curly kale (*Brassica oleracea* var. *sabellica*) fermentation. *Microbiol Res.* 2018;206:121-130.
3. Szutowaska J, Gwiazdowska D. Probiotic potential of lactic acid bacteria obtained from fermented curly kale juice. *Arch Microbiol.* 2021;203(3):975-988.

Dill

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Dill (Latin: *Anethum graveolens*) is a plant richest in minerals such as calcium, iron and high phosphorus, provitamin A, vitamin D, E, K, B₁, B₂, B₆, B₁₂, H, a large amount of greeting faces C and other compounds and active substances, volatile oil constituting mainly the value of a given plant. Fennel is believed to be native to Southwest Asia. Fennel has long been cultivated in

Palestine, Egypt, Greece, and Rome, as well as in Arab countries. He was introduced to Europe by the Romans. Dill is grown directly from sowing straight into the ground. It can be sown 2-3 times a year. Green dill is harvested when the plant is 10-15 cm tall, and harvested when the fruit in the canopy is ripe.



Fig. 19. Dill

References

1. Hekmatzadeh SE, Bazarganipour F, Allan H, Aramesh S, Mohammadi J. Effects of Boiled Dill Seed on Anxiety During Labor: A Randomized Clinical Trial. *Chin J Integr Med.* 2020;26(2):100-105.
2. Goodarzi MT, Khodadadi I, Tavilani H, Abbasi Oshaghi E. The Role of *Anethum graveolens* L. (Dill) in the Management of Diabetes. *J Trop Med.* 2016;2016:1098916.
3. Talebi F, Malchi F, Abedi P, Jahanfar S. Effect of dill (*Anethum Graveolens* Linn) seed on the duration of labor: A systematic review. *Complement Ther Clin Pract.* 2020;41:101251.

Jerusalem artichoke

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The Jerusalem artichoke (Latin: *Helianthus tuberosus*) belongs to the Asteraceae family. His native continent is North America. As the name suggests, Jerusalem artichoke produces underground tubers that are edible and nutritious. Jerusalem artichoke has very low cultivation requirements and is often wild, which is why it is already considered a common weed in some places. Jerusalem

artichoke can grow up to 1-2 m in height. It produces strong stems covered with white hairs. The leaves are large, ovate or lanceolate. The edge of the leaf is heavily serrated. The entire leaf is covered with coarse hairs. Jerusalem artichoke flowers are quite large, yellow and characteristic of the Asteraceae family. They consist of lingual and tubular flowers.



Fig. 20. The Jerusalem artichoke

References

1. Sawicka B, Skiba D, Pszczółkowski P, Aslan I, Sharifi-Rad J, Krochmal-Marczak B. Jerusalem artichoke (*Helianthus tuberosus* L.) as a medicinal plant and its natural products. *Cell Mol Biol (Noisy-le-grand)*. 2020;66(4):160-177.
2. Szufa S, Piersa P, Adrian Ł, et al. Acquisition of Torrefied Biomass from Jerusalem Artichoke Grown in a Closed Circular System Using Biogas Plant Waste. *Molecules*. 2020;25(17):3862.

Asparagus

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Asparagus (Latin: *Asparagus officinalis*) is a plant belonging to the asparagus family. In natural conditions, we can meet it in the Mediterranean Basin and from Asia Minor, and from there it spread to Europe and North Africa. Ripe shoots grow up to 2 meters in height.

Asparagus produces dioecious flowers with a yellow or greenish tinge. Flowers in the form of a bell are pollinated by insects, as a result of which the plant produces small, red berries up to 1 cm in diameter.



Fig. 21. Asparagus

References

1. Singh R. Asparagus racemosus: a review on its phytochemical and therapeutic potential. *Nat Prod Res.* 2016;30(17):1896-908.
2. Garabadu D, Krishnamurthy S. Asparagus racemosus attenuates anxiety-like behavior in experimental animal models. *Cell Mol Neurobiol.* 2014;34(4):511-521.
3. Pandey AK, Gupta A, Tiwari M, et al. Impact of stress on female reproductive health disorders: Possible beneficial effects of shatavari (*Asparagus racemosus*). *Biomed Pharmacother.* 2018;103:46-49.

Common peach

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Common peach, true peach (Latin: *Prunus persica*) is a tree species that belongs to the rose family. It is an arable plant. Most likely it comes from central and north-eastern China. A peach can be up to 6 meters tall and live up to 30 years. It has dark brown-gray bark, lanceolate, serrated leaves. The pink flowers appear in April,

just before the leaves appear. Peach is best known for its fruit. It is a drupe with a weight of up to 200 grams and a characteristic mossy skin, yellow with a red blush. The ripening time of the fruit depends on its variety. Most often it is the period from July to October.



Fig. 22. Common peach

References

1. Hassan AK, Venkatesh YP. An overview of fruit allergy and the causative allergens. *Eur Ann Allergy Clin Immunol.* 2015;47(6):180-187. Erratum in: *Eur Ann Allergy Clin Immunol.* 2016;48(1):31.
2. Chua YT, Ang XL, Zhong XM, Khoo KS. Interaction between warfarin and Chinese herbal medicines. *Singapore Med J.* 2015;56(1):11-18.
3. Woodard TJ, Manigault KR, McBurrows NN, Wray TL, Woodard LM. Management of Benign Prostatic Hyperplasia in Older Adults. *Consult Pharm.* 2016;31(8):412-424.

Cornelian cherry

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Cornelian cherry (Latin: *Cornus mas*) is a shrub or small tree belonging to the Cornaceae family. It is native to Southeast Europe and Asia. It is widely cultivated in many countries. The plant has a raised habit and reaches up to 7 m in height. It creates elliptical leaves

arranged alternately. It is most decorative in the early spring, when it blooms, and in the fall – when it is fruiting. *Cornus mas* creates yellow, umbellate inflorescences, which are a delicacy for bees – it is a honey plant. The fruits are drupes of a red color.



Fig. 23. Cornelian cherry

References

1. Lietava J, Beerova N, Klymenko SV, Panghyova E, Varga I, Pechanova O. Effects of Cornelian Cherry on Atherosclerosis and Its Risk Factors. *Oxid Med Cell Longev*. 2019;2019:2515270.
2. Kazimierski M, Regula J, Molska M. Cornelian cherry (*Cornus mas* L.) - characteristics, nutritional and pro-health properties. *Acta Sci Pol Technol Aliment*. 2019;18(1):5-12.
3. Kawa-Rygielska J, Adamenko K, Kucharska AZ, Piórecki N. Bioactive Compounds in Cornelian Cherry Vinegars. *Molecules*. 2018;23(2):379.

Common hazel

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Common hazel (Latin: *Corylus avellana*) belongs to the birch family (*Betulaceae*). In the natural environment, it occurs in Europe (also in Poland) and Asia Minor. In Poland, it is grown mainly amateurs, while it is of greater importance in the countries of the Mediterranean basin. It is a large deciduous shrub, reaching up to 5 m in height, characterized by smooth, ashen bark and fairly

large, wide-oval leaves. The hazel blooms from February to April - it produces monoecious flowers, male flowers form characteristic cats, female flowers develop in buds and only their red stigmas are visible during flowering. Walnut with a smooth, brown shell, up to 2.5 cm long. Deeply jagged covers, usually shorter than nuts; nuts harvested 1-4 each, ripen in August - September.



Fig. 24. Common hazel

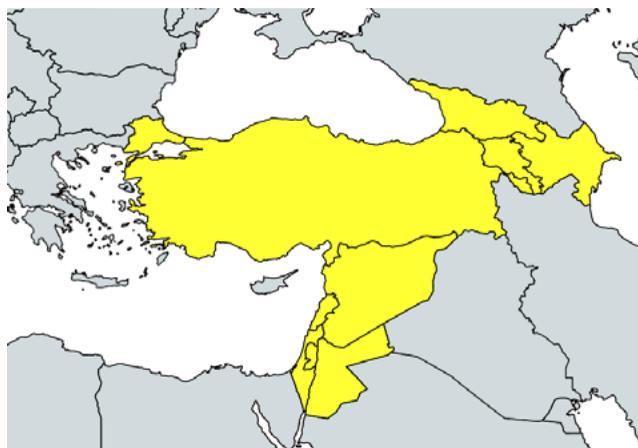
References

1. Olofinnade AT, Onaolapo AY, Onaolapo OJ, et al. *Corylus avellana* L. modulates neurobehaviour and brain chemistry following high-fat diet. *Front Biosci (Landmark Ed)*. 2021;26:537-551.
2. Ryan CJ, Smith MR, Fizazi K, et al. Abiraterone acetate plus prednisone versus placebo plus prednisone in chemotherapy-naïve men with metastatic castration-resistant prostate cancer (COU-AA-302): final overall survival analysis of a randomised, double-blind, placebo-controlled phase 3 study. *Lancet Oncol*. 2015;16(2):152-60.
3. Fizazi K, Scher HI, Molina A, et al. Abiraterone acetate for treatment of metastatic castration-resistant prostate cancer: final overall survival analysis of the COU-AA-301 randomised, double-blind, placebo-controlled phase 3 study. *Lancet Oncol*. 2012;13(10):983-92.

European plum

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European plum (Latin: *Prunus domestica*) is a plant belonging to the rosaceae family. It has several botanical varieties, differing in both fruit, habit and height. It is assumed that the primary area of occurrence of domestic plum is the Caucasus, sometimes also Asia Minor and Transcaucasia. House plum, depending on the variety, is a small tree with a short trunk and a loose, branched crown (approx. 8-10 m high) or a magnificent shrub. Its

shoots are covered with large, ovate, green leaves with serrations at the edges. The plant blooms in spring, usually before the leaves develop (April-June), producing white, five-petalled flowers, 2-3 in small bunches. After pollination, the flowers develop fleshy, ovate or round sheep (drupes) with a fairly delicate skin. Their size, shape and color, as well as the time of ripening, vary and depend on the variety.



Fig. 25. European plum

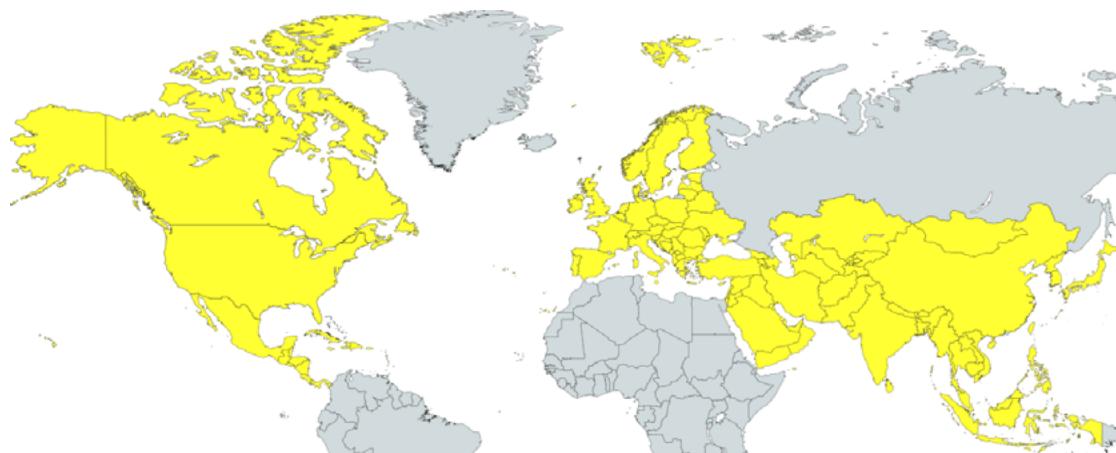
References

1. Arjmandi BH, Johnson SA, Pourafshar S, Navaei N, George KS, Hooshmand S, Chai SC, Akhavan NS. Bone-Protective Effects of Dried Plum in Postmenopausal Women: Efficacy and Possible Mechanisms. *Nutrients*. 2017;9(5):496.
2. Rodamilans B, Valli A, García JA. Molecular Plant-Plum Pox Virus Interactions. *Mol Plant Microbe Interact*. 2020;33(1):6-17.
3. Igwe EO, Charlton KE. A Systematic Review on the Health Effects of Plums (*Prunus domestica* and *Prunus salicina*). *Phytother Res*. 2016;30(5):701-731.

Common juniper

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Common juniper (Latin: *Juniperus communis*) belonging to the Cypress family (*Cupressaceae*) is one of the least demanding conifers suitable for garden cultivation. The area of its occurrence is extensive, as it covers areas in Europe, Asia and North America. By nature, it is a slowly growing shrub with a columnar habit (height approx. 10-15 m). It has numerous branching shoots, covered with prickly, protruding needles, growing three in

a whorl. The shrub develops only conical leaves, which are slender, green, with a light, slightly concave streak visible on the outside, running through the center. It also creates spherical, green fruits that mature and become navy blue (used as a spice) after 1-2 years. Juniper has shallow roots, but has a well-developed root system, therefore it sticks well to the ground.



Fig. 26. Common juniper

References

1. Tammaro A, Adebajo GAR, Chello C, et al. Bullous dermatitis caused by common juniper. *Contact Dermatitis*. 2020;83(6):529-531.
2. Bogolitsyn KG, Zubov IN, Guskova MA, Chukhchin DG, Krasikova AA. Juniper wood structure under the micro-
- scope. *Planta*. 2015;241(5):1231-1239.
3. Peruč D, Gobin I, Abram M, et al. Antimycobacterial potential of the juniper berry essential oil in tap water. *Arh Hig Rada Toksikol*. 2018;69(1):46-54.

White clover

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White clover (Latin: *Trifolium repens*), is a plant belonging to the legume family. It comes from the areas of Europe, Asia and North Africa. It has a characteristic shape – a clump of small leaves with three petals (or four, but as we know, finding them is reserved only for the lucky ones), from which interesting inflorescences grow on raised stems – balls composed of tubular white butterfly

flowers. The flowers transform into a bursting pod that holds the seeds. They can be spread by animals without losing the ability to germinate in their digestive system. It is a perennial and extremely resistant to many different factors. First of all, it regenerates quickly after grazing animals, and is also resistant to trampling. It is not afraid of frost, heat, drought, and too much rain.



Fig. 27. White clover

References

1. Fritz H, Seely D, Flower G, et al. Soy, red clover, and isoflavones and breast cancer: a systematic review. *PLoS One*. 2013;8(11):e81968.
2. Stødkilde L, Damborg VK, Jørgensen H, Laerke HN, Jensen SK. White clover fractions as protein source for monogastrics: dry matter digestibility and protein digestibility-corrected amino acid scores. *J Sci Food Agric*. 2018;98(7):2557-2563.
3. Egan M, Galvin N, Hennessy D. Incorporating white clover (*Trifolium repens* L.) into perennial ryegrass (*Lolium perenne* L.) swards receiving varying levels of nitrogen fertilizer: Effects on milk and herbage production. *J Dairy Sci*. 2018;101(4):3412-3427.
4. Li Z, Cheng B, Yong B, et al. Metabolomics and physiological analyses reveal β -sitosterol as an important plant growth regulator inducing tolerance to water stress in white clover. *Planta*. 2019;250(6):2033-2046.

Spring pheasant's eye

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Spring pheasant's eye (Latin: *Adonis vernalis*) belongs to the family Ranunculaceae (*Ranunculaceae*). In the natural environment, it occurs in Europe (including Poland, where it is under strict species protection) and Asia. It is a short perennial (15-40 cm) with an erect and tough shape. The leaves are decorative - they have a

feathery shape. It blooms in spring (from April to May) - the flowers are single and yellow in color. The plant likes warm, sunny and wind-sheltered positions. It is a long-lived perennial and under favorable conditions it can grow in one place even for several dozen years.



Fig. 28. Spring pheasant's eye

References

1. Seitz LB, Haff GG. Factors Modulating Post-Activation Potentiation of Jump, Sprint, Throw, and Upper-Body Ballistic Performances: A Systematic Review with Meta-Analysis. *Sports Med.* 2016;46(2):231-240.
2. Moreno-Arrones OM, Serrano-Villar S, Perez-Brocal V, et al. Analysis of the gut microbiota in alopecia areata: identification of bacterial biomarkers. *J Eur Acad Dermatol Venereol.* 2020;34(2):400-405.
3. Seitz LB, Reyes A, Tran TT, Saez de Villarreal E, Haff GG. Increases in lower-body strength transfer positively to sprint performance: a systematic review with meta-analysis. *Sports Med.* 2014;44(12):1693-1702.

Common dandelion

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Common dandelion (Latin: *Taraxacum officinale*), easily confused with the common dandelion, is a segetal and ruderal weed found both in cultivated fields and in unused agricultural areas. The common dandelion covers almost all of Europe, northwest Africa and Asia. It is a short-lived perennial, and because it produces very strong and long tap roots, it has a long service life and resistance to mechanical removal. In the seedling stage, the

presented plant is 5-7 mm tall and green, ovate cotyledons tapering into short petioles. The leaves of adult specimens are up to 25 cm long, lanceolate or spatulate, with deep or shallow toothed edges – the lobes are shaped like triangles with the tips facing the base of the leaves. The common dandelion blooms in full summer, and in warm weather it also produces flowers in autumn.



Fig. 29. Common dandelion

References

1. Wirngo FE, Lambert MN, Jeppesen PB. The Physiological Effects of Dandelion (*Taraxacum Officinale*) in Type 2 Diabetes. *Rev Diabet Stud.* 2016;13(2-3):113-131.
2. Zhu H, Zhao H, Zhang L, et al. Dandelion root extract suppressed gastric cancer cells proliferation and migration through targeting lncRNA-CCAT1. *Biomed Pharmacother.* 2017;93:1010-1017.
3. Gamboa-Gómez CI, Rocha-Guzmán NE, Gallegos-Infante JA, Moreno-Jiménez MR, Vázquez-Cabral BD, González-Laredo RF. Plants with potential use on obesity and its complications. *EXCLI J.* 2015;14:809-831.

Marshmallow

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Marshmallow (Latin: *Althaea officinalis*) is a perennial of the mallow species. It comes from the Mediterranean area. It grows up to 1.5 meters, the stem and leaves are covered with soft, gray hair, and during the flowering period (July-August) pink-white flowers up to 5 cm in diameter appear on it. It is mainly used as a soothing

agent in the states of mouth and throat irritation accompanied by a dry cough. For medicinal purposes, both marshmallow root (*Althaeae radix*) and marshmallow leaf (*Althaeae folium*) are used - they contain valuable mucus compounds (polysaccharides) that have a protective and anti-inflammatory effect.



Fig. 30. Marshmallow

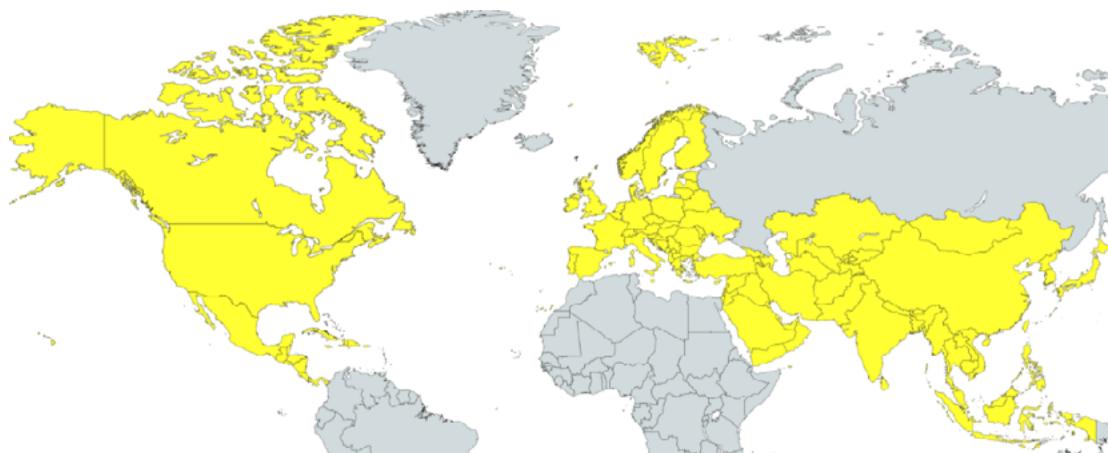
References

1. Mahboubi M. Marsh Mallow (*Althaea officinalis* L.) and Its Potency in the Treatment of Cough. *Complement Med Res.* 2020;27(3):174-183.
2. Fink C, Schmidt M, Kraft K. [Marshmallow Root Extract for the Treatment of Irritative Cough: Two Surveys on Users' View on Effectiveness and Tolerability]. *Complement Med Res.* 2018;25(5):299-305.

Meadow cress

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Meadow cress (Latin: *Cardamine pratensis*), a perennial plant from the cruciferous family (Cruciferae). It occurs in Europe, Asia and North America. It grows to a height of 15-45 (and sometimes even 60) cm. Short, dark brown rhizome and quite numerous roots. Erect, wind-blown stem, slightly hairy at the bottom, slightly branched, round in cross-section, slightly angular at the top. Pinnate, lower leaves collected in a rosebud, delicate, long-tailed, upper leaves - oblong. Young plants from adventitious buds may form on the lower leaves in

contact with moist soil. White or pale lilac flowers gathered in loose clusters. The flower consists of four sepals and four crown petals, one pistil with an elongated ovary and six four-strong stamens. The petals of the crown are fourfold, radial and most often arranged opposite. Fruits - long pods on stalks slanting upwards. Meadow cress develops in early spring. It blooms from April to June, giving the meadows a white appearance from a distance.



Fig. 31. Meadow cress

References

1. Rambaud-Lavigne L, Hay A. Floral organ development goes live. *J Exp Bot.* 2020;71(9):2472-2478.
2. Cesarino I, Dello Ioio R, Kirschner GK, et al. Plant science's next top models. *Ann Bot.* 2020;126(1):1-23.
3. Ouerdane L, Both EB, Xiang J, et al. Water soluble selenium metabolome of *Cardamine violifolia*. *Metallomics.* 2020;12(12):2032-2048.

Comfrey

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Comfrey (Latin: *Symphytum officinale*) is a forgotten plant with invaluable medicinal properties. It has been used in herbal medicine for centuries, its characteristic black and purple root is especially valuable. It occurs in Europe, with the exception of the southern ends, in Central Asia, Siberia, Asia Minor. Perennial reaches a height of 30 to 150 cm, the period of its flowering is in

late spring - months: May and June. Its flowers may be purple in color or, in the less common variety, white. The plant likes moist areas, the vicinity of rivers and water reservoirs, roadside ditches and forest edges. It owes its name to its use in the treatment of bone injuries. Colloquially, it is sometimes called a “living gun”.



Fig. 32. Comfrey

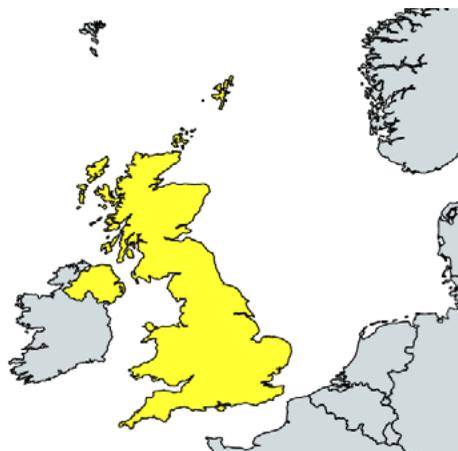
References

1. Sowa I, Paduch R, Strzemski M, et al. Proliferative and antioxidant activity of *Symphytum officinale* root extract. *Nat Prod Res.* 2018;32(5):605-609.
2. Avila C, Breakspear I, Hawrelak J, Salmond S, Evans S. A systematic review and quality assessment of case reports of adverse events for borage (*Borago officinalis*), coltsfoot (*Tussilago farfara*) and comfrey (*Symphytum officinale*). *Fitoterapia.* 2020;142:104519.
3. Staiger C. Comfrey: a clinical overview. *Phytother Res.* 2012;26(10):1441-8.

Peppermint

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Peppermint (Latin: *Mentha piperita*) is also called medicinal mint. They probably arose in England by the spontaneous crossing of two species of mint: water mint with spearmint, therefore it does not occur in the wild state. Peppermint is a perennial and winter hardy plant. It can grow up to 75 cm in height and develops two

types of stems: raised, richly leafed, ending with a flower spikelet with purple flowers, and also spreading on the ground, less frequently and finely leafed, characterized by the ability to root. Mint also develops numerous underground stolons.



Fig. 33. Peppermint

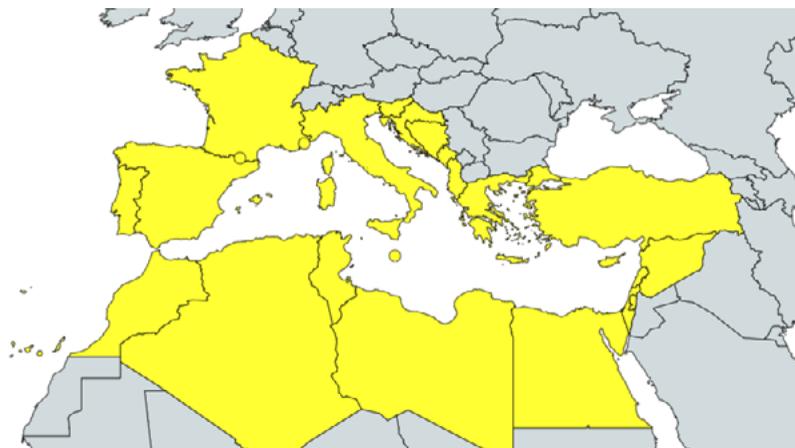
References

1. McKay DL, Blumberg JB. A review of the bioactivity and potential health benefits of peppermint tea (*Mentha piperita* L.). *Phytother Res.* 2006;20(8):619-633.
2. de Groot A, Schmidt E. Essential Oils, Part V: Peppermint Oil, Lavender Oil, and Lemongrass Oil. *Dermatitis.* 2016;27(6):325-332.
3. Göbel H, Heinze A, Heinze-Kuhn K, Göbel A, Göbel C. Oleum menthae piperitae (Pfefferminzöl) in der Akuttherapie des Kopfschmerzes vom Spannungstyp [Peppermint oil in the acute treatment of tension-type headache]. *Schmerz.* 2016;30(3):295-310.

Lavender

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Lavender (Latin: *Lavandula angustifolia*) belonging to the Lamiaceae family is an evergreen shrub, also known as medicinal lavender or aromatic lavender. It comes from the Mediterranean basin. It has many uses, which is why it is widely cultivated in many countries around the world. The scent of lavender and lavender oil relieves stress and tension - in England it is even believed that in a home where lavender grows, the spouses do

not argue. The plant forms compact, regular clumps and grows up to about 50 cm in height. One of its ornamental features are silvery hairs covering stiff, woody shoots and lanceolate leaves. The characteristic lavender inflorescences are composed of flowers that, depending on the variety, can be purple, purple or even dark pink (in some cultivated subspecies also white)



Fig. 34. Lavender

References

1. Cavanagh HM, Wilkinson JM. Biological activities of lavender essential oil. *Phytother Res.* 2002;16(4):301-308.
2. Donelli D, Antonelli M, Bellinazzi C, Gensini GF, Firenzuoli F. Effects of lavender on anxiety: A systematic review and meta-analysis. *Phytomedicine.* 2019;65:153099.
3. López V, Nielsen B, Solas M, Ramírez MJ, Jäger AK. Exploring Pharmacological Mechanisms of Lavender (*Lavandula angustifolia*) Essential Oil on Central Nervous System Targets. *Front Pharmacol.* 2017;8:280.

Asarabacca

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Asarabacca (Latin: *Asarum europaeum*) is an evergreen perennial belonging to the aristolochiaceae family. The asarabacca is found in the fertile forests of central and southern Europe and in Siberia. Only the species of the asarabacca is found in Europe. It can be found in damp, deciduous forests. It is under species protection. Its greenish-brown flowers appear in March and bloom

until April, sometimes May. Pitcher-shaped, inconspicuous flowers form below the leaves, close to the ground. Dense, glossy leaves (10 cm in diameter) make it the perfect groundcover for shaded areas in the garden. It is a short plant that grows up to 10 cm. It is worth noting that its stiff round leaves resemble a hoof in shape.



Fig. 35. Asarabacca

References

1. Maseehullah MD, Zakir M, Anas M, Kazmi MH. Ethno-pharmacology of Asaroon (*Asarum europaeum* L.) with special reference to Unani System of Medicine. *J Complement Integr Med*. 2021. doi: 10.1515/jcim-2021-0021.
2. Byard RW, Musgrave I, Maker G, Bunce M. What risks do herbal products pose to the Australian community? *Med J Aust*. 2017;206(2):86-90.

Common grape vine

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Common grape vine (Latin: *Vitis vinifera*) is a climber growing up to 20 m, belonging to the grapevine family (*Vitaceae*). It is common throughout the Mediterranean, the Caucasus and further east to Turkmenistan. It is grown all over the world, where many foods are made from the berries. The grapevine is usually 10 m long, but it can even grow up to 40. It produces a strong, woody shoot (in old plants it can be up to 1.5 m in circum-

ference!). It attaches well to wooden and metal structures with sticky whiskers, creating dense green walls. The plant produces light brown bark that comes off in stripes and palmate leaves on long petioles. It blooms in April – it produces inconspicuous, paniculate flowers with a green color. The fruits are blue, yellow-green or red-brown, and their clusters ripen from September to November.



Fig. 36. Common grape vine

References

1. Pazyar N, Yaghoobi R, Rafiee E, Mehrabian A, Feily A. Skin wound healing and phytomedicine: a review. *Skin Pharmacol Physiol.* 2014;27(6):303-310.
2. Tominaga-Wada R, Nukumizu Y, Wada T, Sawa S, Tetsumura T. CLAVATA3-like genes are differentially expressed in grape vine (*Vitis vinifera*) tissues. *J Plant Physiol.* 2013;170(15):1379-1383.

Elderberry

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Elderberry (Latin: *Sambucus nigra*) is a shrub that currently belongs to the musk family (*Adoxaceae*). It is often called white, wild, medicinal, pharmacy or common lilac. It occurs all over Europe, northwest. Africa and Asia Minor. It is a shrub or a low tree, reaching up to 7 m. Elderberry has a wide crown with a wide, spherical shape. The bark of this plant is light brown and cracked, and the young twigs are green. They are covered with numerous distinct pores. The leaves are usually composed

of 2-3 pairs of side lobes and one, larger apical leaf. They have an elliptical shape with a pointed tip and serrated edges. In addition, they are slightly hairy and have a characteristic scent when rubbed. Elderberry flowers are small, creamy-white, radiant, fivefold and tubular. They are gathered in flat or umbrella umbels, which can be up to 20 cm in diameter. The dangling seed heads are ornamental - they have a purple-purple coating, and the fruits themselves are very dark, almost black.



Fig. 37. Elderberry

References

1. Zielińska-Wasielica J, Olejnik A, Kowalska K, Olkowicz M, Dembczyński R. Elderberry (*Sambucus nigra* L.) Fruit Extract Alleviates Oxidative Stress, Insulin Resistance, and Inflammation in Hypertrophied 3T3-L1 Adipocytes and Activated RAW 264.7 Macrophages. *Foods*. 2019;8(8):326.
2. Hawkins J, Baker C, Cherry L, Dunne E. Black elderberry (*Sambucus nigra*) supplementation effectively treats upper respiratory symptoms: A meta-analysis of randomized, controlled clinical trials. *Complement Ther Med*. 2019;42:361-365.
3. Ulbricht C, Basch E, Cheung L, et al. An evidence-based systematic review of elderberry and elderflower (*Sambucus nigra*) by the Natural Standard Research Collaboration. *J Diet Suppl*. 2014;11(1):80-120.

Bird cherry

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Bird cherry (Latin: *Padus avium* Mill), a species of tree or large shrub of the rose family. It is found all over Europe, as well as in Asia Minor and Western Siberia. The bird cherry is a tree that grows up to 15 m in height. It can also occur as a shrub (it grows up to 4 m). Often there is not one main trunk, but several. The leaves are ovoid in shape with serrated edges. The flowers of the bird cherry appear in April-May. And then not only the bird cherry looks phenomenal, but also its intoxi-

cating scent can be felt within a radius of many meters. The flowers are white, gathered in hanging clusters. The fruits of the bird cherry are quite small. As they mature, they change color from green to red to almost black. This is what you can harvest. Black cherry blossoms like to grow in mixed forests. And because they like moist soil, they also appear on the banks of rivers, lakes and wetlands.



Fig. 38. Bird cherry

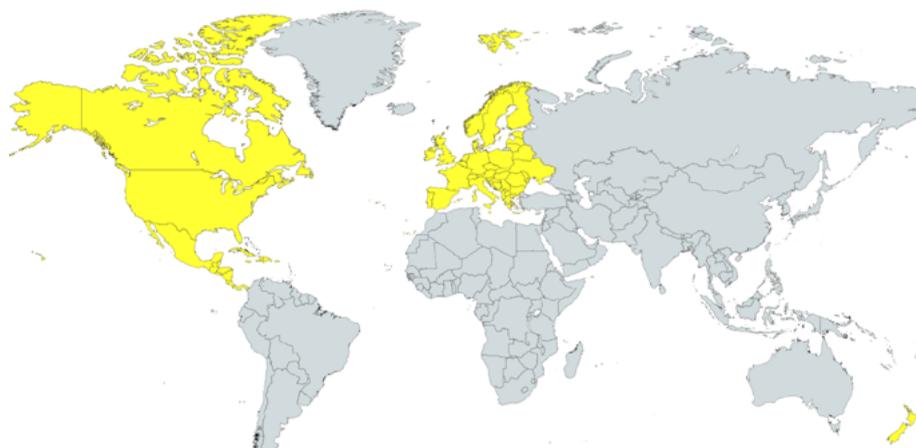
References

1. Vitale KC, Hueglin S, Broad E. Tart Cherry Juice in Athletes: A Literature Review and Commentary. *Curr Sports Med Rep.* 2017;16(4):230-239.
2. Chai SC, Davis K, Zhang Z, Zha L, Kirschner KF. Effects of Tart Cherry Juice on Biomarkers of Inflammation and Oxidative Stress in Older Adults. *Nutrients.* 2019;11(2):228.
3. Losso JN, Finley JW, Karki N, Liu AG, Prudente A, Tipton R, Yu Y, Greenway FL. Pilot Study of the Tart Cherry Juice for the Treatment of Insomnia and Investigation of Mechanisms. *Am J Ther.* 2018;25(2):e194-e201.

Common thyme

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Common thyme (Latin: *Thymus pulegioides*), also known as woodpecker, garden thyme or Italian murrur. occurs in vast areas of Europe, and introduced also in North America and New Zealand. It grows up to 20-

30 cm in height, its stiff, reddish shoots pubescent at the edges are raised. The plant blooms from May to late autumn and is strongly honey-bearing. The species is often found in forest glades and meadows.



Fig. 39. Common thyme

References

1. Pereira ASP, Banegas-Luna AJ, Peña-García J, Pérez-Sánchez H, Apostolides Z. Evaluation of the Anti-Diabetic Activity of Some Common Herbs and Spices: Providing New Insights with Inverse Virtual Screening. *Molecules*. 2019;24(22):4030.
2. Prieto MC, Lapaz MI, Lucini EI, Pianzola MJ, Grosso NR, Asensio CM. Thyme and suico essential oils: promising natural tools for potato common scab control. *Plant Biol (Stuttg)*. 2020;22(1):81-89.
3. Wagner L, Cramer H, Klose P, Lauche R, Gass F, Dobos G, Langhorst J. Herbal Medicine for Cough: a Systematic Review and Meta-Analysis. *Forsch Komplementmed*. 2015;22(6):359-68.

Black caraway

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Black caraway (Latin: *Nigella sativa*) is a plant that has small, black seeds with a characteristic, triangular shape and a very intense flavor and aroma. Coming from the areas of Southeast Europe and Western Asia. Black caraway is a plant that grows up to 60 cm in height. It has delicate stems and leaves, and its flowers are white, blue and yellowish. The fruit of the black seed is a follicle

with wrinkled seeds, similar to poppy seeds, but with a deep black color. Their initially bitter taste becomes spicy, reminiscent of pepper, while the aroma resembles that of nutmeg. Black cumin seeds are the source of many biologically active substances. These include: essential oil, fatty oil, saponins, tannins, proteins, sugars as well as minerals and vitamins.



Fig. 40. Black caraway

References

1. Kooti W, Hasanzadeh-Noohi Z, Sharafi-Ahvazi N, Asadi-Samani M, Ashtary-Larky D. Phytochemistry, pharmacology, and therapeutic uses of black seed (*Nigella sativa*). *Chin J Nat Med*. 2016;14(10):732-745.
2. Amin B, Hosseinzadeh H. Black Cumin (*Nigella sativa*) and Its Active Constituent, Thymoquinone: An Overview on the Analgesic and Anti-inflammatory Effects. *Planta Med*. 2016;82(1-2):8-16.
3. Zheng J, Zhou Y, Li Y, Xu DP, Li S, Li HB. Spices for Prevention and Treatment of Cancers. *Nutrients*. 2016;8(8):495.

Aloe

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Aloe (Latin: *Aloe vera*) is a plant that belongs to the group of succulents. It is mostly found in desert and semi-desert areas, as well as savannas. Aloe is a plant native to Africa, Madagascar and Asia Minor, and from there it was spread to many other regions of the world with similar climatic conditions. It creates a rosette of

gray-green, fleshy (slightly spiky) leaves, growing up to 40-50 cm in length, it is perfect for potting and does not take up much space. All aloe vera are leaf succulents, storing water in thickened leaves covered with a thick layer of cuticle, i.e. wax that reduces evaporation. These are plants characteristic of dry and warm desert areas.



Fig. 41. Aloe

References

1. Gao Y, Kuok KI, Jin Y, Wang R. Biomedical applications of Aloe vera. *Crit Rev Food Sci Nutr.* 2019;59(sup1):S244-S256.
2. Guo X, Mei N. Aloe vera: A review of toxicity and adverse clinical effects. *J Environ Sci Health C Environ Carcinog Ecotoxicol Rev.* 2016;34(2):77-96.
3. Hęś M, Dziedzic K, Górecka D, Jędrusek-Golińska A, Gujska E. Aloe vera (L.) Webb.: Natural Sources of Antioxidants - A Review. *Plant Foods Hum Nutr.* 2019;74(3):255-265.

Broadleaf plantain

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Broadleaf plantain (Latin: *Plantago major*), also known as plantain or broad-leaved plantain, is a close relative of the plantain. Plantain is a plant that grows naturally in Asia and Europe. The common plantain grows to a height of approx. 5-30 cm. The plant develops a bundle root system that grows out of a short underground rhizome. The stem of *Plantago major* is strongly shortened, with a leaf rosette with large, oval, ovoid or heart-shaped

leaves at the base. Plantain blooms in May and blooms until September. The plant produces tiny brown-green or white-yellow flowers that are gathered in a long inflorescence at the top of a stiff, upright stem. After pollination, the flowers transform into bolls, each containing shiny red-brown seeds that retain their germination for a long time.



Fig. 42. Broadleaf plantain

References

1. Stanojković-Sebić A, Maksimović J, Dinić Z, Poštić D, Ilić R, Stanojković A. Microelements and Heavy Metals Content in Frequently Utilized Medicinal Plants Collected from the Power Plant Area. *Nat Prod Commun.* 2017;12(2):185-188.
2. Uddin MR, Park SU, Dayan FE, Pyon JY. Herbicidal activity of formulated sorgoleone, a natural product of sorghum root exudate. *Pest Manag Sci.* 2014;70(2):252-257.
3. Mertens A, Bawin Y, Vanden Abeele S, Kallow S, Toan Vu D, Thi Le L, Dang Vu T, Swennen R, Vandeloock F, Panis B, Janssens SB. Genetic diversity and structure of *Musa balbisiana* populations in Vietnam and its implications for the conservation of banana crop wild relatives. *PLoS One.* 2021;16(6):e0253255.

Cornflower

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Cornflower (Latin: *Centaurea cyanus*) is a plant of the Asteraceae family. It occurs throughout Europe and Western Siberia. Its other names are walloszka, wasilek, blueberry, cornflower or cornflower. Cornflower has very little foliage, it forms fields. Reaches a height of 30-90 cm. Its stem is thin, hairy and branched. The flowers

are tubular. Flower baskets are 2-3 cm in diameter. The crown consists of 5 petals. The cornflower flowers are most often dark blue, but are also found in red, pink or white. The cornflower growing among the crops is treated as a field weed, but when planted in the home garden, it becomes a very nice-looking decoration.



Fig. 43. Cornflower

References

1. Deng C, Wang J, Lu C, Li Y, Kong D, Hong Y, Huang H, Dai S. CcMYB6-1 and CcbHLH1, two novel transcription factors synergistically involved in regulating anthocyanin biosynthesis in cornflower. *Plant Physiol Biochem.* 2020;151:271-283.
2. Kuś PM, Jerković I, Tuberoso CI, Marijanović Z, Congiu F. Cornflower (*Centaurea cyanus* L.) honey quality parameters: chromatographic fingerprints, chemical biomarkers, antioxidant capacity and others. *Food Chem.* 2014;142:12-18.
3. Różyło R, Szymańska-Chargot M, Gawlik-Dziki U, Dziki D. Spectroscopic, mineral, and antioxidant characteristics of blue colored powders prepared from cornflower aqueous extracts. *Food Chem.* 2021;346:128889.

Wild garlic

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Wild garlic (Latin: *Allium ursinum*) is a representative of plants from the garlic subfamily, growing wild in Europe, Asia Minor and the Caucasus. It is also grown in other regions. Wild garlic grows in humus-rich wet meadows, in shady and moist river valleys, under shrubs, and in deciduous and mountain forests. Its strong garlic scent is felt before the plant is even noticed.

Its characteristic features are long (up to 20-30 cm tall) lanceolate leaves, as well as spherical, white inflorescences with single star-shaped flowers emitting an intense garlic aroma, located on long (up to 50 cm) stems. White flowers contain harmful substances therefore they are not edible. The wild garlic season runs from mid-April to mid-May.

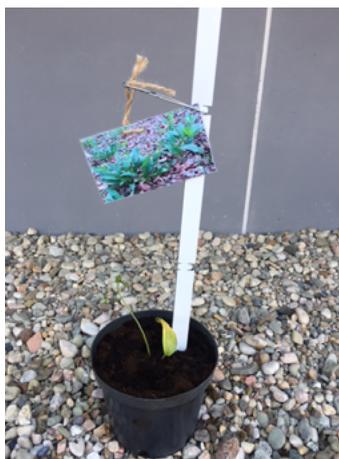


Fig. 44. Wild garlic

References

1. Ekşi G, Gençler Özkan AM, Koyuncu M. Garlic and onions: An eastern tale. *J Ethnopharmacol.* 2020;253:112675.
2. Tomšik A, Šarić L, Bertoni S, Protti M, Albertini B, Mergolini L, Passerini N. Encapsulations of wild garlic (*Allium ursinum* L.) extract using spray congealing technology. *Food Res Int.* 2019;119:941-950.
3. Murugesan S, Pandiyan A, Saravanakumar L, Moodley K, Mackraj I. Protective role of wild garlic on isoproterenol-induced myocardial necrosis in wistar rats. *J Ethnopharmacol.* 2019;237:108-115.

Violet tricolor

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Violet tricolor (Latin: *Viola tricolor*) is an annual or biennial plant belonging to the violet family. It occurs in the wild in Europe and Asia (Western Siberia, Turkey, Iran). It blooms from June to September. It grows on fields, meadows, roads and hills. Farmers treat it as a weed. It feels good on sandy, dry and poor soils. Its stem

usually grows to a height of about 10-30 cm. It is covered with corrugated leaves, heart-shaped and lanceolate or elliptical in shape. The tricolor violet produces single, bisexual flowers of various colors depending on the botanical variety. The fruits of the violet are small, brown-yellow seeds.



Fig. 45. Violet tricolor

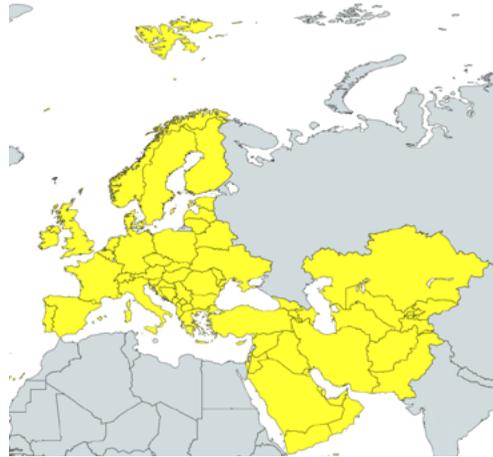
References

1. Guan J, Xu F, Tian C, Pu L, Yuan MS, Wang J. Tricolor Luminescence Switching by Thermal and Mechanical Stimuli in the Crystal Polymorphs of Pyridyl-substituted Fluorene. *Chem Asian J*. 2019;14(1):216-222.
2. Kirichenko TV, Sobenin IA, Nikolic D, Rizzo M, Orekhov AN. Anti-cytokine therapy for prevention of atherosclerosis. *Phytomedicine*. 2016;23(11):1198-1210.

Yellow water-lily

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Yellow water-lily (Latin: *Nuphar lutea*) is an aquatic perennial (also known as a water lily) belonging to the *Nymphaeaceae* family. It is extremely useful in water reservoirs as, thanks to its underwater leaves, it provides the necessary oxygen in winter when the surface is covered with ice and snow. It's a poisonous plant! The plant produces long rhizomes (up to 3 m), heart-shaped, leathery leaves and yellow, strongly fragrant flowers set

on thick stalks. The water lily blooms from May to August. It produces fruit-bags with a specific, bottle-shaped shape. The water lily can grow in water 50-200 cm deep. Likes stagnant water - so do not place the plant near cascades. It prefers sunny positions - then it produces lush flowers. The plant is best planted in special baskets (they can be masked with stones).

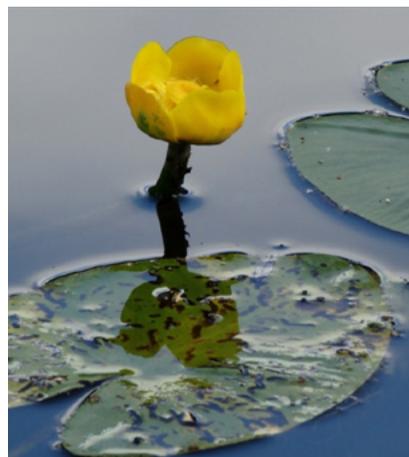


Fig. 46. Yellow water-lily

References

1. Luo H, Chen S, Jiang J, Teng N, Chen Y, Chen F. The AP2-like gene *NsAP2* from water lily is involved in floral organogenesis and plant height. *J Plant Physiol.* 2012;169(10):992-998.
2. Zhu M, Zheng X, Shu Q, Li H, Zhong P, Zhang H, Xu Y, Wang L, Wang L. Relationship between the composition of flavonoids and flower colors variation in tropical water lily (*Nymphaea*) cultivars. *PLoS One.* 2012;7(4):e34335.

Caraway

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Caraway (Latin: *Carum carvi*) is a biennial plant belonging to the celery family. It occurs both in Africa, Asia and Europe. In the first year it develops a tap root and a rosette of feathery leaves, and in the next year it develops an erect and highly branched stem. Small, most often white flowers appear on their tops, forming umbels. When they bloom, the plant bears fruit - brown,

elongated and bent inwards. It is propagated only from seeds, which are best placed in the soil in early spring - at the end of March and April. Warm, fertile and moist soils are best for him, but they must not be waterlogged. Most of the caraway is harvested in the second year of cultivation, in June and July.



Fig. 47. Caraway

References

1. Eddouks M, Lemhadri A, Michel JB. Caraway and caper: potential anti-hyperglycaemic plants in diabetic rats. *J Ethnopharmacol.* 2004;94(1):143-148.
2. Mahboubi M. Caraway as Important Medicinal Plants in Management of Diseases. *Nat Prod Bioprospect.* 2019;9(1):1-11.
3. Krueger D, Schäuuffele S, Zeller F, et al. Peppermint and caraway oils have muscle inhibitory and pro-secretory activity in the human intestine in vitro. *Neurogastroenterol Motil.* 2020;32(2):e13748.

Common yarrow

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Common yarrow (Latin: *Achillea ageratum*) is a medicinal perennial plant in the *Asteraceae* family. It occurs in Europe and Turkey. It is best grown in sunny, dry places (then it blooms profusely), but it also works well in partial shade. It prefers permeable, moderately fertile soils (slightly alkaline or close to neutral). Perennial reaches 30-80 cm in height. It has an erect, clumpy shape. The shoots are softly pubescent. It produces gray-

green or green pinnate leaves. The greatest decoration of the yarrow is the umbellate, flat inflorescences consisting of small but numerous flowers. Depending on the variety, they can be white, yellow, orange, salmon, pink or red. The advantage of perennials is also long flowering – flowers last from June to October. The plant gives off a characteristic, slightly spicy scent.



Fig. 48. Common yarrow

References

1. Pereira ASP, Banegas-Luna AJ, Peña-García J, Pérez-Sánchez H, Apostolides Z. Evaluation of the Anti-Diabetic Activity of Some Common Herbs and Spices: Providing New Insights with Inverse Virtual Screening. *Molecules*. 2019;24(22):4030.
2. Ali SI, Gopalakrishnan B, Venkatesalu V. Pharmacognosy, Phytochemistry and Pharmacological Properties of *Achillea millefolium* L.: A Review. *Phytother Res*. 2017;31(8):1140-1161.
3. de Sousa DP, de Almeida Soares Hocayen P, Andrade LN, Andreatini R. A Systematic Review of the Anxiolytic-Like Effects of Essential Oils in Animal Models. *Molecules*. 2015;20(10):18620-18660.

Common poppy

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The field poppy (Latin: *Papaver rhoeas*) belongs to the poppy family (*Papaveraceae*). Its native area covers mainly Europe and the countries of North Africa and West Asia located on the Mediterranean Sea and Pakistan. They are fast growing annuals and herbaceous or winter hardy perennials with brightly colored flowers (white, yellow, pink, orange, red and even black). Most often grown in rock and country gardens. The field poppy has a straight, single or branched and hairy stem that

can reach a height of 90 cm. The stems produce leaves set at the base of the plant, which are caudal and pinnate with sharply toothed sections. It blooms in the first half of summer or at the end of spring (20-30 days on average), creating flowers up to 9 cm wide, with extensive and overlapping petals that are smooth, single-colored or have a black spot inside the calyx. The flowers are scarlet or red, pink and sometimes white.



Fig. 49. The field poppy

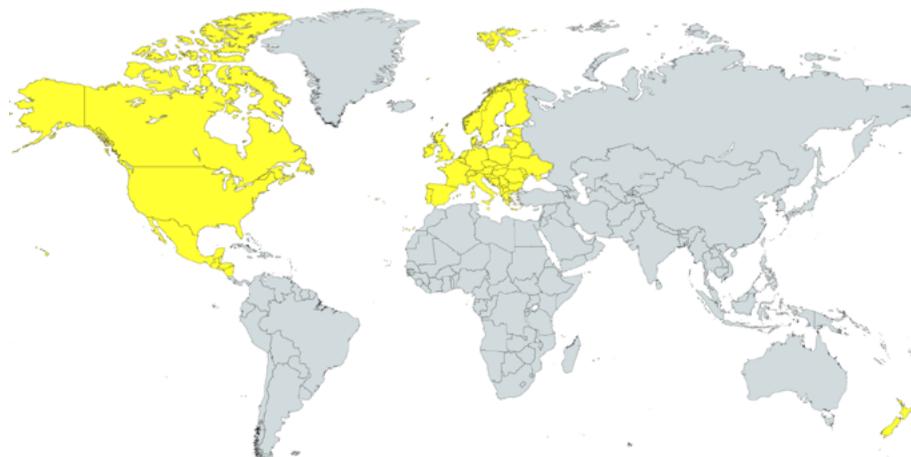
References

1. Patel A, Bahna SL. Hypersensitivities to sesame and other common edible seeds. *Allergy*. 2016;71(10):1405-13.
2. Kaminski TW, Hertel J, Amendola N, Docherty CL, Dolan MG, Hopkins JT, Nussbaum E, Poppy W, Richie D; National Athletic Trainers' Association. National Athletic Trainers' Association position statement: conservative management and prevention of ankle sprains in athletes. *J Athl Train*. 2013;48(4):528-45.

Broad-leaved thyme

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Broad-leaved thyme (Latin: *Thymus pulegioides*), also known as woodpecker, common thyme, garden thyme or Italian murmur. occurs in vast areas of Europe, and introduced also in North America and New Zealand. It

grows up to 20-30 cm in height, its stiff, reddish shoots pubescent at the edges are raised. The plant blooms from May to late autumn and is strongly honey-bearing. The species is often found in forest glades and meadows.



Fig. 50. Broad-leaved thyme

References

1. Sakkas H, Papadopoulou C. Antimicrobial Activity of Basil, Oregano, and Thyme Essential Oils. *J Microbiol Biotechnol.* 2017;27(3):429-438.
2. Kowalczyk A, Przychodna M, Sopata S, Bodalska A, Fecka I. Thymol and Thyme Essential Oil New Insights into Selected Therapeutic Applications. *Molecules.* 2020;25(18):4125.
3. Salehi B, Mishra AP, Shukla I, et al. Thymol, thyme, and other plant sources: Health and potential uses. *Phytother Res.* 2018;32(9):1688-1706.

Field mint

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Field mint (Latin: *Mentha arvensis*) is a species of plant, perennial belonging to the Lymnaceae family. It occurs all over Europe (excluding Iceland) and a large part of Asia (Western and Central Asia, Siberia, the Caucasus). Vegetable perennial has a very aromatic smell that is very characteristic of this species. The plant grows up to 5 to 45 cm in height. It is also worth mentioning that the stem of a mint can be branched or single, but it is always hairy. Additionally, it is 4-square, with leaves with-

out flower whorls appearing on its tops. The leaves are arranged crosswise on the stem. Their shape can range from ovoid to oblong. They usually have 2 to 6 lateral nerves. On the other hand, the flowers collected in the heads or in the ears in the quilted rings appear in the corners of inconspicuous bracts. The flowers are dorsal and can be pink or purple in color. They appear on the plant from July to September.



Fig. 51. Field mint

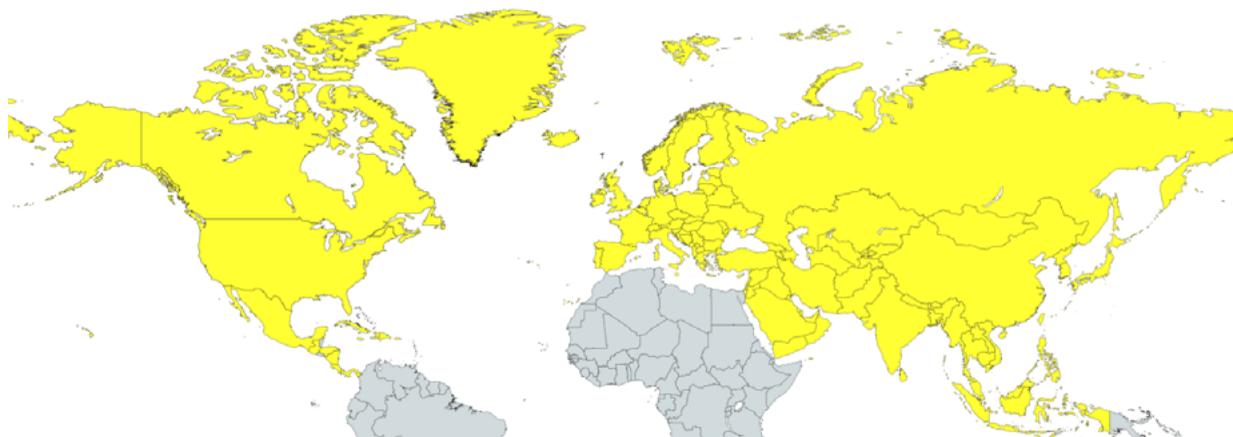
References

1. Matthews A, Haas DM, O'Mathúna DP, Dowswell T. Interventions for nausea and vomiting in early pregnancy. *Cochrane Database Syst Rev.* 2015;2015(9):CD007575.
2. Dung JKS. Verticillium Wilt of Mint in the United States of America. *Plants (Basel).* 2020;9(11):1602.
3. Moini Jazani A, Hamdi K, Tansaz M, Nazemiyeh H, Sadeghi Bazargani H, Fazljou SMB, Nasimi Doost Azgomi R. Herbal Medicine for Oligomenorrhea and Amenorrhea: A Systematic Review of Ancient and Conventional Medicine. *Biomed Res Int.* 2018;2018:3052768.

Bearberry

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Bearberry (Latin: *Arctostaphylos uva-ursi*) belongs to the heather family. It is a plant that grows in Europe, Asia, North America and Greenland. In the mountains, it grows only in selected sites and we will rarely see it there. It is a shrub growing up to a dozen or so centimeters high, with shoots creeping on the ground, up to

1 meter in length. It easily takes root and grows. It has small, light pink flowers, it bears red fruit with a powdery taste, hence the name of the plant. It blooms from April to June. He likes bright, dry positions and the sun. Sometimes it forms entire fields of dense vegetation.



Fig. 52. Bearberry

References

1. Mohd Azman NA, Gallego MG, Segovia F, Abdullah S, Shaarani SM, Almajano Pablos MP. Study of the Properties of Bearberry Leaf Extract as a Natural Antioxidant in Model Foods. *Antioxidants (Basel)*. 2016;5(2):11.
2. Asensio E, Vitales D, Pérez I, Peralba L, Viruel J, Montaner C, Vallès J, Garnatje T, Sales E. Phenolic Compounds Content and Genetic Diversity at Population Level across the Natural Distribution Range of Bearberry (*Arctostaphylos uva-ursi*, Ericaceae) in the Iberian Peninsula. *Plants (Basel)*. 2020;9(9):1250.
3. Song XC, Canellas E, Asensio E, Nerin C. Predicting the antioxidant capacity and total phenolic content of bearberry leaves by data fusion of UV-Vis spectroscopy and UHPLC/Q-TOF-MS. *Talanta*. 2020;213:120831.

Common marigold

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Common marigold (Latin: *Calendula officinalis*) is an annual plant belonging to the *Asteraceae* family. It probably comes from the Mediterranean or Iran. The plant produces an erect, stiff stem that is quite branched, 20-50 cm high. It has glandular Italian. Marigold leaves

are short-tailed and sessile, they cover the stem. Marigold flowers are yellow and orange in color. Calendula blooms from June to September. In agriculture, the ointment is used in many cases.



Fig. 53. Common marigold

References

1. Posadzki P, Watson LK, Ernst E. Adverse effects of herbal medicines: an overview of systematic reviews. *Clin Med (Lond)*. 2013;13(1):7-12.
2. Lovecka P, Lipov J, Thumova K, Macurkova A. Characterization of Biologically Active Substances from *Calendula officinalis*. *Curr Pharm Biotechnol*. 2017;18(14):1167-1174.
3. Givol O, Kornhaber R, Visentin D, Cleary M, Haik J, Harats M. A systematic review of *Calendula officinalis* extract for wound healing. *Wound Repair Regen*. 2019;27(5):548-561.

Milk thistle

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Milk thistle (Latin: *Silybum marianum*) is an annual plant in the *Asteraceae* family. Its natural positions can be found in countries with a Mediterranean climate and in some regions of Asia, such as Pakistan and India. Milk thistle has a tall stem (about 1 m), branched

at the top. Its leaves are very decorative - they have irregular white spots and they are spiky at the edges. The purple flowers, resembling thistle flowers, are gathered in baskets 4-5 cm long. In our climate, it blooms in July or August.



Fig. 54. Milk thistle

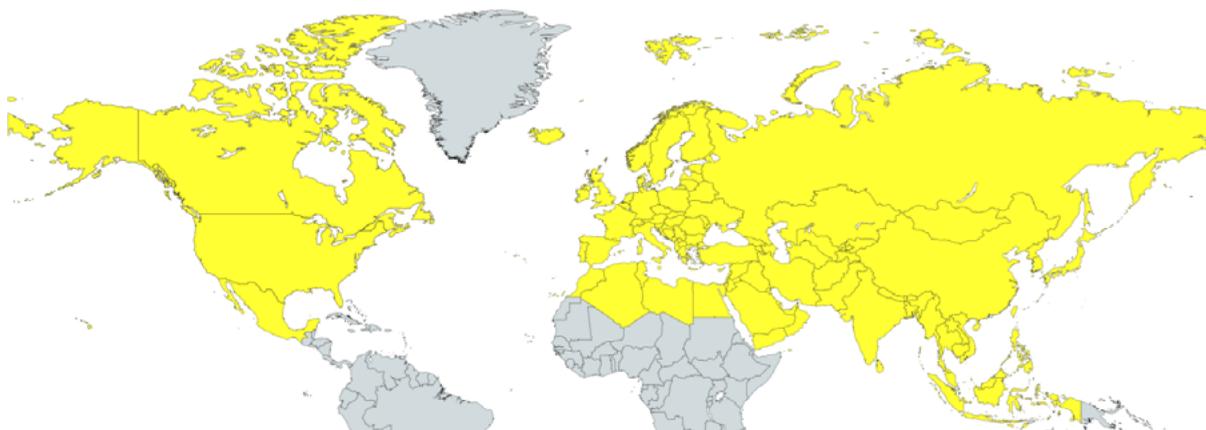
References

1. Abenavoli L, Izzo AA, Milić N, Cicala C, Santini A, Capasso R. Milk thistle (*Silybum marianum*): A concise overview on its chemistry, pharmacological, and nutraceutical uses in liver diseases. *Phytother Res.* 2018;32(11):2202-2213.
2. Flora K, Hahn M, Rosen H, Benner K. Milk thistle (*Silybum marianum*) for the therapy of liver disease. *Am J Gastroenterol.* 1998;93(2):139-143.
3. Tighe SP, Akhtar D, Iqbal U, Ahmed A. Chronic Liver Disease and Silymarin: A Biochemical and Clinical Review. *J Clin Transl Hepatol.* 2020;8(4):454-458.

Common nettle

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Common nettle (Latina: *Urtica dioica*) is a species of annual plant of the nettle family (*Urticaceae*) found in the wild in Europe, Asia, North Africa and North America. Nettle is a perennial plant growing up to 2 meters, its root is branched and the stem is stiff and erect. The nettle leaves are dark green in color, and heart-shaped

with a pointed tip and jagged, they are placed opposite on the stem. The entire plant is covered with short bristled hairs and longer stinging hairs containing formic acid. It blooms from June to September, the flowers are small, greenish, gathered in hanging clusters. The fruit of the nettle is a nut.



Fig. 55. Common nettle

References

1. Masłowski M, Aleksieiev A, Miedzianowska J, Strzelec K. Common Nettle (*Urtica dioica* L.) as an Active Filler of Natural Rubber Biocomposites. *Materials (Basel)*. 2021;14(7):1616.
2. Frassová Z, Rudá-Kučerová J. Ostropestřec mariánský (*Silybum marianum*) jako podpůrný fytoterapeutický prostředek v onkologii [Milk Thistle (*Silybum Marianum*) as a Supportive Phytotherapeutic Agent in Oncology]. *Klin Onkol*. 2017;30(6):426-432.

Rosemary

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Rosemary (Latin: *Rosmarinus officinalis*) is a thermophilic, long-lived (more than 2 years old), wild and evergreen plant that grows mainly in the Mediterranean and the Black Sea coast as well as in the United States and Mexico. In its natural environment, rosemary forms dense, aromatic, evergreen shrubs that grow up to 2-3 m in height. In our climatic conditions, the shrub grows up to about 70 cm in height and width. Rosemary produces

stiff, erect, four-hexagonal shoots, which become woody in the second year. The leaves are lanceolate, leathery, with curled edges, dark green on the top, covered with a silvery cutter on the underside, strongly aromatic. Blue flowers (in some varieties pink) are gathered in the axils of the leaves. They are honey-giving. Rosemary blooms in the early spring, usually around February.



Fig. 56. Rosemary

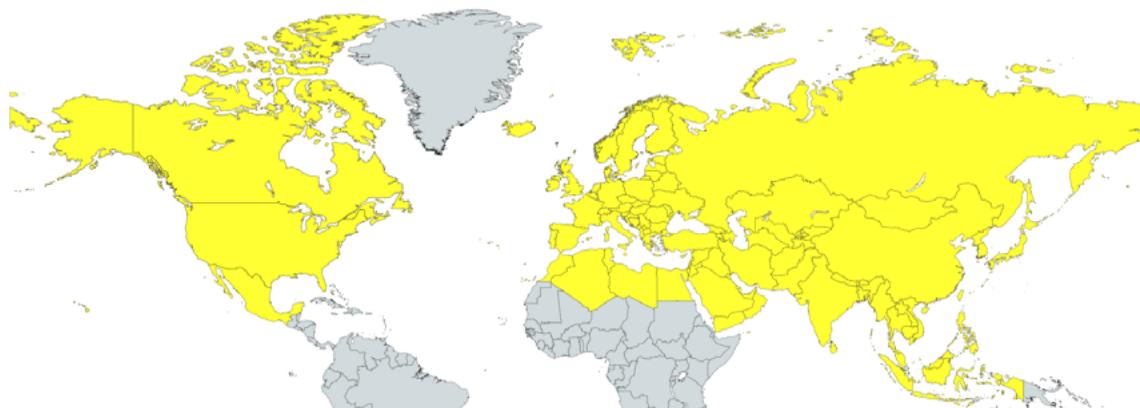
References

1. de Oliveira JR, Camargo SEA, de Oliveira LD. Rosmarinus officinalis L. (rosemary) as therapeutic and prophylactic agent. *J Biomed Sci.* 2019;26(1):5.
2. de Macedo LM, Santos ÉMD, Militão L, Tundisi LL, Ataide JA, Souto EB, Mazzola PG. Rosemary (*Rosmarinus officinalis* L., syn *Salvia rosmarinus* Spenn.) and Its Topical Applications: A Review. *Plants (Basel).* 2020;9(5):651.
3. Ghasemzadeh Rahbardar M, Hosseinzadeh H. Therapeutic effects of rosemary (*Rosmarinus officinalis* L.) and its active constituents on nervous system disorders. *Iran J Basic Med Sci.* 2020;23(9):1100-1112.

Common horsetail

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Common horsetail (Latin: *Equisetum arvense*) is a perennial species belonging to the horsetail family. The plant is found almost everywhere in Europe, North Africa, North America and parts of Asia. The winter (summer) shoot is green, branched and slightly reminiscent of a Christmas tree. The leaves are small, gathered in

whorls. Due to the high content of silica in the leaves and the herb, we hear a characteristic creaking sound after the plant has been crushed. The sporangious (spring) shoot is brown, brown and unbranched. At the top of the shoot is sporangious ear, which dies after the spores mature.



Fig. 57. Common horsetail

References

1. Dragos D, Gilca M, Gaman L, Vlad A, Iosif L, Stoian I, Lupescu O. Phytomedicine in Joint Disorders. *Nutrients*. 2017;9(1):70.
2. Gründemann C, Lengen K, Sauer B, Garcia-Käufer M, Zehl M, Huber R. *Equisetum arvense* (common horsetail) modulates the function of inflammatory immunocompetent cells. *BMC Complement Altern Med*. 2014;14:283.
3. Saslis-Lagoudakis CH, Bruun-Lund S, Iwanycki NE, Seberg O, Petersen G, Jäger AK, Rønsted N. Identification of common horsetail (*Equisetum arvense* L.; Equisetaceae) using Thin Layer Chromatography versus DNA barcoding. *Sci Rep*. 2015;5:11942.

Jacobaea vulgaris

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Jacobaea vulgaris (Latin: *Senecio jacobaea*) Represents the species-rich *Asteraceae* family. It occurs all over Europe, a large part of Asia and North Africa. It is essentially a biennial, but under certain conditions it becomes a perennial or perennial - for example, when repeated mowing or grazing prevents it from producing fruit. It

can reach a height of over 1 m, although it is usually shorter. Its stems are erect, erect, with branches pointing upwards, woolly hairy or almost naked, often purple feathery. Lower leaves lyre, upper leaves pinnate with sections protruding almost at right angles on the main axis; spider webs hairy in youth, then almost naked.



Fig. 59. *Jacobaea vulgaris*

References

1. Chen Y, Klinkhamer PGL, Memelink J, Vrieling K. Diversity and evolution of cytochrome P450s of *Jacobaea vulgaris* and *Jacobaea aquatica*. *BMC Plant Biol.* 2020;20(1):342.
2. Jung S, Lauter J, Hartung NM, These A, Hamscher G, Wissemann V. Genetic and chemical diversity of the toxic herb *Jacobaea vulgaris* Gaertn. (syn. *Senecio jacobaea* L.) in Northern Germany. *Phytochemistry.* 2020;172:112235.
3. Gottschalk C, Kaltner F, Zimmermann M, Korten R, Morris O, Schwaiger K, Gareis M. Spread of *Jacobaea vulgaris* and Occurrence of Pyrrolizidine Alkaloids in Regionally Produced Honeys from Northern Germany: Inter- and Intra- Site Variations and Risk Assessment for Special Consumer Groups. *Toxins (Basel).* 2020;12(7):441.

Common sorrel

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Common sorrel (Latin: *Rumex acetosa*) is a perennial plant belonging to the knotweed family (Polygonaceae). Sorrel is a plant that grows in Europe, Asia, Australia and North Africa. The plant likes fertile and nitrogen-rich soil. It grows best in sunny positions. Sorrel is a perennial, frost-resistant plant that grows up to a meter high. Its leaves have a characteristic elongated shape

and an intense green color. Sorrel flowers are small and reddish in color, arranged in narrow panicles. The plant usually blooms from May to June and its seeds are dispersed by the wind. Sorrel grows wild, but can also be grown in gardens. Grown sorrel has a more delicate flavor, while wild sorrel is more acidic.



Fig. 60. Common sorrel

References

1. Jeong D, Irfan M, Lee DH, Hong SB, Oh JW, Rhee MH. *Rumex acetosa* modulates platelet function and inhibits thrombus formation in rats. *BMC Complement Med Ther.* 2020;20(1):98.
2. Prakash Mishra A, Sharifi-Rad M, Shariati MA, et al. Bioactive compounds and health benefits of edible *Rumex* species-A review. *Cell Mol Biol (Noisy-le-grand).* 2018;64(8):27-34.
3. Grau M, Mardones P, Donoso G, Aguilera RE, Nicklas L, Iglesias V, Cordova A. Principales aeroalérgenos en rinoconjuntivitis alérgica en la ciudad de Temuco, Chile [Aeroallergens causing rhinoconjunctivitis]. *Rev Med Chil.* 2018;146(9):994-1000.

Willow

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Willow (Latin: *Salix caprea*) - a species of plants from the willow family. This graceful tree can be found in natural habitats - wet meadows, forest edges and glades in Europe and Asia. Iva willow grows to a height of 22 meters as a tree or 9 meters as a shrub. It has a spherical shape and dark gray, cracked bark. Its leaves are quite distinctive - oblong, delicately quilted at the edge-

es, pointed at the end. The underside of the leaf is covered with white, dense hairs and covered with a network of protruding veins. The ivory tree is a dioecious plant, which means that male and female flowers appear on separate trees. Just before the leaves appear, it produces fluffy bases, also called kittens.



Fig. 61. Willow

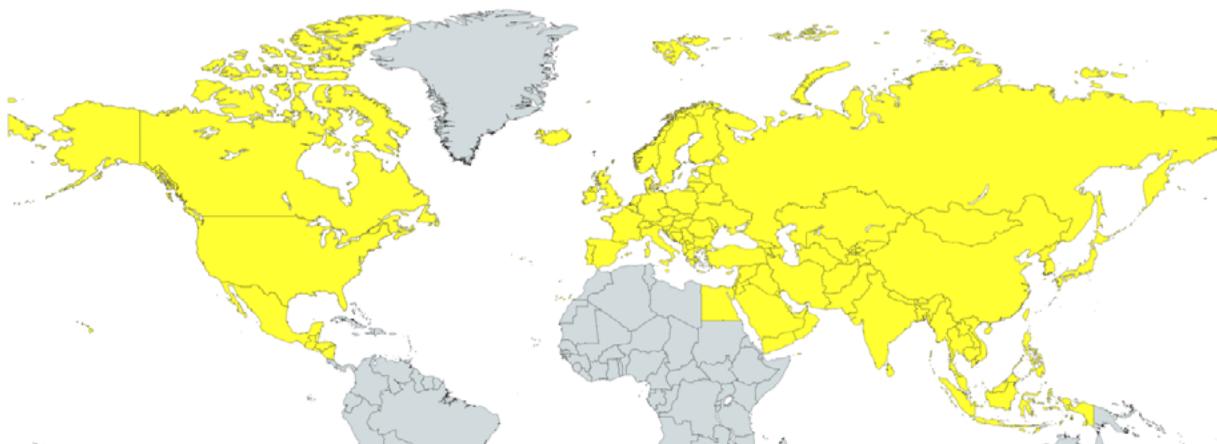
References

1. Shara M, Stohs SJ. Efficacy and Safety of White Willow Bark (*Salix alba*) Extracts. *Phytother Res.* 2015;29(8):1112-1116.
2. Oketch-Rabah HA, Marles RJ, Jordan SA, Low Dog T. United States Pharmacopeia Safety Review of Willow Bark. *Planta Med.* 2019;85(16):1192-1202.
3. Orlandi F, Ruga L, Fornaciari M. Willow phenological modelling at different altitudes in central Italy. *Environ Monit Assess.* 2020;192(11):737.

Chamaenerion angustifolium

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Chamaenerion angustifolium (Latin: *Epilobium angustifolium*) is a plant belonging to the Evening primrose family (*Onagraceae*). Also known as narrow-leaved willow. *Chamaenerion angustifolium* grows in the countries of the Northern Hemisphere, it is found in South America and Europe. The flowers appear in apical clusters and are about 2-4 cm in diameter. The crown pet-

als are pink-red with a slight purple tinge. They are wide and shallowly indented. It is also characteristic that the sepals are hairy and the neck of the pistil has a four-point birthmark. It blooms from July to August, purple-pink flowers gathered in clusters at the tops of the shoots.



Fig. 62. *Chamaenerion angustifolium*

References

1. Frolova TS, Salnikova OI, Dudareva TA, Kukina TP, Synitsyna OI. [Isolation of pomolic acid from *Chamaenerion angustifolium* and evaluation of its genotoxicity by microbiological tests]. *Bioorg Khim.* 2014;40(1):92-98.
2. Kowalczyk D, Szymanowska U, Skrzypek T, Basiura-Cembala M, Materska M, Łupina K. Corn starch and methylcellulose edible films incorporated with fireweed (*Chamaenerion angustifolium* L.) extract: Comparison of physicochemical and antioxidant properties. *Int J Biol Macromol.* 2021;190:969-977.
3. Karpiński L, Szczepański WT, Boldgiv B, Walczak M. New data on the longhorn beetles of Mongolia with particular emphasis on the genus *Eodorcadion* Breuning, 1947 (Coleoptera, Cerambycidae). *Zookeys.* 2018;(739):107-150.

Artemisia absinthium

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Artemisia absinthium (Latin: *Artemisia absinthium*) is a herb used in folk medicine for a long time. It occurs in Africa, Asia, America and Europe. In Poland, wormwood is commonly known and used in herbal medicine.

It is a plant with a characteristic appearance - in summer it is covered with spherical, tiny baskets of yellow flowers.



Fig. 63. *Artemisia absinthium*

References

1. Batiha GE, Olatunde A, El-Mleeh A, et al. Bioactive Compounds, Pharmacological Actions, and Pharmacokinetics of Wormwood (*Artemisia absinthium*). *Antibiotics (Basel)*. 2020;9(6):353.
2. Szopa A, Pajor J, Klin P, et al. *Artemisia absinthium* L.-Importance in the History of Medicine, the Latest Advances in Phytochemistry and Therapeutical, Cosmetological and Culinary Uses. *Plants (Basel)*. 2020;9(9):1063.
3. Naß J, Efferth T. The activity of *Artemisia* spp. and their constituents against Trypanosomiasis. *Phytomedicine*. 2018;47:184-191.

White hellebore

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White hellebore (Latin: *Helleborus niger*) is a species of perennial belonging to the buttercup family (*Ranunculaceae*). In nature, it can be found in forest sites in Southern and Central Europe. The white hellebore is a small perennial (approx. 20-40 cm high), with winter-hardy, dark green, leathery, palm-shaped leaves, set on long, thick petioles, growing straight from the ground and

forming a loose clump. Due to their weight, and also due to water scarcity, the leaves can fluff to the sides. The hellebore develops very attractive, large, five-petalled, snow-white, slightly greenish flowers at the base with a large, yellow center, filled with numerous protruding stamens. The flowers remain on the shoots for a long time, but as they age, their petals turn green.



Fig. 64. White hellebore

References

1. Schink M, Garcia-Käufer M, Bertrams J, et al. Differential cytotoxic properties of *Helleborus niger* L. on tumour and immunocompetent cells. *J Ethnopharmacol.* 2015;159:129-136.
2. Kumar VK, Lalitha KG. Pharmacognostical and Phytochemical Studies of *Helleborus niger* L Root. *Anc Sci Life.* 2017;36(3):151-158.
3. Čakar J, Haverić A, Haverić S, Maksimović M, Parić A. Cytotoxic and genotoxic activity of some *Helleborus* species. *Nat Prod Res.* 2014;28(12):883-887.

Common chicory

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Common chicory (Latin: *Cichorium intybus*) is also known as the macaw and the blue traveler. Perennial perennial occurring in Europe, in the Urals, in the North. Africa and Asia in the lowlands and lower mountain parts, on roads, pastures and meadows. Stems up to 120 cm high, stiff, angular, branched, with little foliage, usually roughly hairy. The lower leaves are sinus-point-

ed, collected in a rubella; stalk leaves lanceolate with distantly toothed edge, covering the stem. Blue flowers, gathered in baskets, on the tops of shoot branches or in the leaf axils. Lingual, light blue marginal flowers, darker in the middle – tubular. There is white milk juice in the whole plant, mainly in the root. The plant is wind-sowing.



Fig. 65. Common chicory

References

1. Imam KMSU, Xie Y, Liu Y, Wang F, Xin F. Cytotoxicity of *Cichorium intybus* L. metabolites (Review). *Oncol Rep.* 2019;42(6):2196-2212.
2. Street RA, Sidana J, Prinsloo G. *Cichorium intybus*: Traditional Uses, Phytochemistry, Pharmacology, and Toxicology. *Evid Based Complement Alternat Med.* 2013;2013:579319.
3. Satmbekova D, Srivedavyasari R, Orazbekov Y, Omarova R, Datkhayev U, Ross SA. Chemical and biological studies on *Cichorium intybus* L. *Nat Prod Res.* 2018;32(11):1343-1347.

Greater celandine

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Greater celandine (Latin: *Chelidonium majus*) – perennial species of the poppy family (*Papaveraceae*). It is native to Europe and western Asia and introduced widely in North America. A perennial plant growing up to 90 cm in height. Stem erect, strong, branched, hairy. Pinata leaves, lower – petiole, upper – sessile, green on top, covered with a delicate silver coating, gray on the un-

derside, hairy. Sections of leaves ovate, unevenly lobate-notched, often converging at the base. Petioles hairy, hairs white and gray, flowers placed on the tops of shoots, yellow petals. The common plant grows in forests, on their edges, in shrubs, on the banks of water, in gardens, and sometimes it occurs en masse.



Fig. 66. Greater celandine

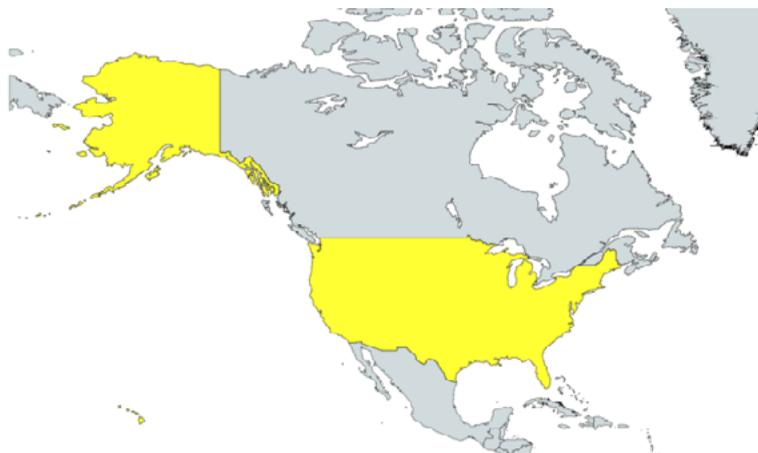
References

1. Teschke R, Frenzel C, Glass X, Schulze J, Eickhoff A. Greater Celandine hepatotoxicity: a clinical review. *Ann Hepatol.* 2012;11(6):838-848.
2. Zielińska S, Jezierska-Domaradzka A, Wójciak-Kosior M, Sowa I, Junka A, Matkowski AM. Greater Celandine's Ups and Downs-21 Centuries of Medicinal Uses of *Chelidonium majus* From the Viewpoint of Today's Pharmacology. *Front Pharmacol.* 2018;9:299.
3. Nawrot J, Wilk-Jędrusik M, Nawrot S, Nawrot K, Wilk B, Dawid-Pač R, Urbańska M, Micek I, Nowak G, Gornowicz-Porowska J. Milky Sap of Greater Celandine (*Chelidonium majus* L.) and Anti-Viral Properties. *Int J Environ Res Public Health.* 2020;17(5):1540.

California poppy

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California poppy (Latin: *Eschscholzia californica*) is a plant that grows naturally in California. Depending on the variety, the flowers can have different colors from white, through cream, yellow and orange, to pink and red. There are also plants with two-color, striped and shaded flowers, and even semi-double and full flowers.

Plants, however, delight not only with flowers, but also feathery, gray-green leaves, resembling dill leaves. Poppies grow up to about 25-50 cm and branch strongly, creating a nice, impressive clump with an openwork appearance. At night and on cloudy days, the flowers of the eszolation fold and do not please us with their charm.



Fig. 67. California poppy

References

1. Singh S, Jain L, Pandey MB, Singh UP, Pandey VB. Anti-fungal activity of the alkaloids from *Eschscholzia californica*. *Folia Microbiol (Praha)*. 2009;54(3):204-206.
2. Manglik A, Lin H, Aryal DK, et al. Structure-based discovery of opioid analgesics with reduced side effects. *Nature*. 2016;537(7619):185-190.
3. Pollack AJ, Gong X, Pollack JR. A common phytoene synthase mutation underlies white petal varieties of the California poppy. *Sci Rep*. 2019;9(1):11615.

Bocconia

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Bocconia (Latin: *Macleaya cordata*) is a genus of plants from the poppy family. It occurs naturally in Asia - in China and Japan. A large perennial, 1.8 - 2.5 m high, of the poppy family. Its long, stiff, upright shoots form dense and bushy clumps. The lobed leaves take a heart-shaped shape, and their edges are decorated with distinct teeth. They are characterized by interesting coloration -

green-blue at the top and light green at the bottom. In July and August, paniculate, beige-brown inflorescences appear, which gradually introduce the autumn aura to the garden with their delicate scent and color. The fruit is unique in the form of oval, flattened and rather large, hanging bags.



Fig. 68. Bocconia

References

1. Lunagómez LS, Santiago-Roque I, Gheno-Heredia YA, Corona-Morales AA, Bolado- García VE. Teratogenic effects of *Bocconia frutescens* L. *J Dev Orig Health Dis*. 2020;1-4.
2. Arango-Ocampo C, González F, Alzate JF, Pabón-Mora N. The developmental and genetic bases of apetalry in *Bocconia frutescens* (Chelidoniaceae: Papaveraceae). *Evodevo*. 2016;7:16.
3. Boucher S, Nishida K. Description and biology of two new species of Neotropical *Liriomyza* Mik (Diptera, Agromyzidae), mining leaves of *Bocconia* (Papaveraceae). *Zookeys*. 2014;(369):79-97.

Common bugloss

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Common bugloss (Latin: *Anchusa officinalis*) - a species of plant from the borage family. The medical dye has its roots in Europe and Turkey, hence it spread to other continents. The medical dye is a perennial with a strongly raised, compact habit. Reaches 30 to 90 cm in height. On a fairly thick, oval-shaped, hairy stalk

there are parallel green lanceolate leaves. The leaves are also hairy. Dybnik's flowering period lasts from May to October. Spherical-bell-shaped, violet-blue flowers are placed on long stalks. In autumn, fruits appear on the plant - folded splits with seeds inside. The plant is strongly honey-bearing.



Fig. 69. Common bugloss

References

1. Mulder PPJ, Klijnstra MD, Goselink RMA, van Vuuren AM, Cone JW, Stoopen G, Hoogenboom RLAP. Transfer of pyrrolizidine alkaloids from ragwort, common groundsel and viper's bugloss to milk from dairy cows. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess.* 2020;37(11):1906-1921.
2. Mulder PP, de Witte SL, Stoopen GM, van der Meulen J, van Wikselaar PG, Gruys E, Groot MJ, Hoogenboom RL. Transfer of pyrrolizidine alkaloids from various herbs to eggs and meat in laying hens. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess.* 2016;33(12):1826-1839.

Dictamnus

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Dictamnus (Latin: *Dictamnus albus*) is a perennial belonging to the *Rutaceae* family. It occurs in the wild from southern Europe to Siberia and northern China. It is often called the bush of Moses. It is a long-lived, tall (80-120 cm) plant with an upright and bushy habit, forming clumps. Produces thick inflorescence stalks

covered with black glands. It has dark green, pinnate leaves (3-5 pairs) growing up to 8 cm long and attractive clusters. Dictamnus flowers are medium-large - up to 5 cm in diameter and come in white or pink colors. The plant blooms from June to July. Its fruit is a bag containing black seeds.



Fig. 70. Dictamnus

References

1. Martínez-Francés V, Rivera D, Heinrich M, Obón C, Ríos S. An ethnopharmacological and historical analysis of "Dictamnus", a European traditional herbal medicine. *J Ethnopharmacol.* 2015;175:390-406.
2. Lv M, Xu P, Tian Y, Liang J, Gao Y, Xu F, Zhang Z, Sun J. Medicinal uses, phytochemistry and pharmacology of the genus *Dictamnus* (Rutaceae). *J Ethnopharmacol.* 2015;171:247-263.
3. Gao P, Wang L, Zhao L, Zhang C, Zeng KW, Zhao MB, Zhang QY, Jiang Y, Tu PF, Guo XY. Three new compounds from *Dictamnus dasycarpus* and their anti-inflammatory activities. *J Asian Nat Prod Res.* 2020;22(8):716-723.

Coriander

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Coriander (Latin: *Coriandrum sativum*) is an annual plant belonging to the celery family (*Apiaceae*). Coriander seed comes from the Mediterranean basin. It produces raised, branched stems up to 50 cm high (thick-berry varieties) or up to 120 cm (small-berry varieties). The lower leaves are single or split on long petioles, while the upper leaves are pinnate. From June to July, small inflo-

rescences with white or pink flowers appear on the tops of the stems in the period from June to July. It is a honey plant. The fruit is a spherical, ribbed, aromatic cleft. The plant grows best in sunny and wind-protected positions. He likes dry and warm summers. It grows well in relatively light soils with good culture.



Fig. 71. Coriander

References

1. Laribi B, Kouki K, M'Hamdi M, Bettaieb T. Coriander (*Coriandrum sativum* L.) and its bioactive constituents. *Fitoterapia*. 2015;103:9-26.
2. Sardar R, Ahmed S, Yasin NA. Role of exogenously applied putrescine in amelioration of cadmium stress in *Coriandrum sativum* by modulating antioxidant system. *Int J Phytoremediation*. 2021;10:1-8.
3. Prachayasittikul V, Prachayasittikul S, Ruchirawat S, Prachayasittikul V. Coriander (*Coriandrum sativum*): A promising functional food toward the well-being. *Food Res Int*. 2018;105:305-323.

Common oat

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Common oat (Latin: *Avena sativa*) is a type of cereal belonging to the family of grasses. Common oat is a cereal that grows wild in the Mediterranean and Central Asia. It is an annual plant with naked, raised, stiff stalks. In the initial stage of development, young oat leaves are

twisted to the left. It has long, stiff, sheathing leaves, and its inconspicuous flowers form drooping two-flower spikelets covered with long chaff. They bloom in scattered panicles on the tops of the stems. The fruit is an elongated grain.



Fig. 72. Common oat

References

1. Nowak-Węgrzyn A, Katz Y, Mehr SS, Koletzko S. Non-IgE-mediated gastrointestinal food allergy. *J Allergy Clin Immunol.* 2015;135(5):1114-1124.
2. Nowak-Węgrzyn A, Jarocka-Cyrta E, Moschione Castro A. Food Protein-Induced Enterocolitis Syndrome. *J Investig Allergol Clin Immunol.* 2017;27(1):1-18.
3. Nigam SK, Bush KT, Martovetsky G, Ahn SY, Liu HC, Richard E, Bhatnagar V, Wu W. The organic anion transporter (OAT) family: a systems biology perspective. *Physiol Rev.* 2015;95(1):83-123.

Common tomato

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Common tomato (Latin: *Solanum lycopersicum*) a species of plant in the nightshade family. The plant comes from Central and South America. The tomato, as an annual plant, grows from 30 to 200 cm (greenhouse varieties). From May, inflorescences in the form of twists, consisting of five to fifteen flowers, appear in the leaf axils. The peduncles are shorter than 1.5 cm and have hair

similar to the stems. The petals of the crown are yellow. The fruits of the common tomato are berries 1.5 to 2.5 cm in diameter, but much larger in cultivars (up to more than 10 cm). The shape of the berry can be spherical, elongated (like a plum or pear) or ribbed. The primary red color may be orange, yellow, green or black in various varieties.



Fig. 73. Common tomato

References

1. Farinetti A, Zurlo V, Manenti A, Coppi F, Mattioli AV. Mediterranean diet and colorectal cancer: A systematic review. *Nutrition*. 2017;43-44:83-88.
2. Gao L, Gonda I, Sun H, et al. The tomato pan-genome uncovers new genes and a rare allele regulating fruit flavor. *Nat Genet*. 2019;51(6):1044-1051.
3. Nishimura M, Tominaga N, Ishikawa-Takano Y, Maeda-Yamamoto M, Nishihira J. Effect of 12-Week Daily Intake of the High-Lycopene Tomato (*Solanum Lycopersicum*), A Variety Named "PR-7", on Lipid Metabolism: A Randomized, Double-Blind, Placebo-Controlled, Parallel-Group Study. *Nutrients*. 2019;11(5):1177.

Common currant

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Common currant (Latin: *Ribes rubrum*) common or common currant belonging to the gooseberry family. It comes from Western Europe and has spread to other regions as well. Red, small, sour-tasting berries are used to make homemade preserves, rich in vitamins, organic

acids, fiber, pectins and tannins. The fruit, apart from its nutritional value, has healing properties. Small berries can be found on bushes that grow up to 2 m in height. Red currant bushes need to be grown in sheltered places, in sunny and slightly shaded places.



Fig. 74. Common currant

References

1. Kendir G, Süntar I, Çeribaşı AO, Köroğlu A. Activity evaluation on *Ribes* species, traditionally used to speed up healing of wounds: With special focus on *Ribes nigrum*. *J Ethnopharmacol.* 2019;237:141-148.
2. Laczkó-Zöld E, Komlósi A, Ülkei T, Fogarasi E, Croitoru M, Fülöp I, Domokos E, Ștefănescu R, Varga E. Extractability of polyphenols from black currant, red currant and gooseberry and their antioxidant activity. *Acta Biol Hung.* 2018;69(2):156-169.
3. Orsavová J, Hlaváčová I, Mlček J, Snopek L, Mišurcová L. Contribution of phenolic compounds, ascorbic acid and vitamin E to antioxidant activity of currant (*Ribes* L.) and gooseberry (*Ribes uva-crispa* L.) fruits. *Food Chem.* 2019;284:323-333.

Common tansy

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Common tansy (Latin: *Tanacetum vulgare*) – a species of plant belonging to the *Asteraceae* family. The area of occurrence of this perennial is Europe, Asia. Tansy is a perennial plant whose stems can grow up to 1.5 m in height. It has strong roots, branched rhizomes and stiff stems with dark green, feathery leaves. The stems at the top are crowned with an umbellate inflorescence.

The flowers, arranged in baskets, are dark yellow. Tansy blooms from July to September. The fruit is a brown-gray achene, up to 2 mm long, with a very short calyx. Tansy has an intense camphor smell. They are collected at the beginning of flowering (from mid-July to September), cut with a knife or scissors.



Fig. 75. Common tansy

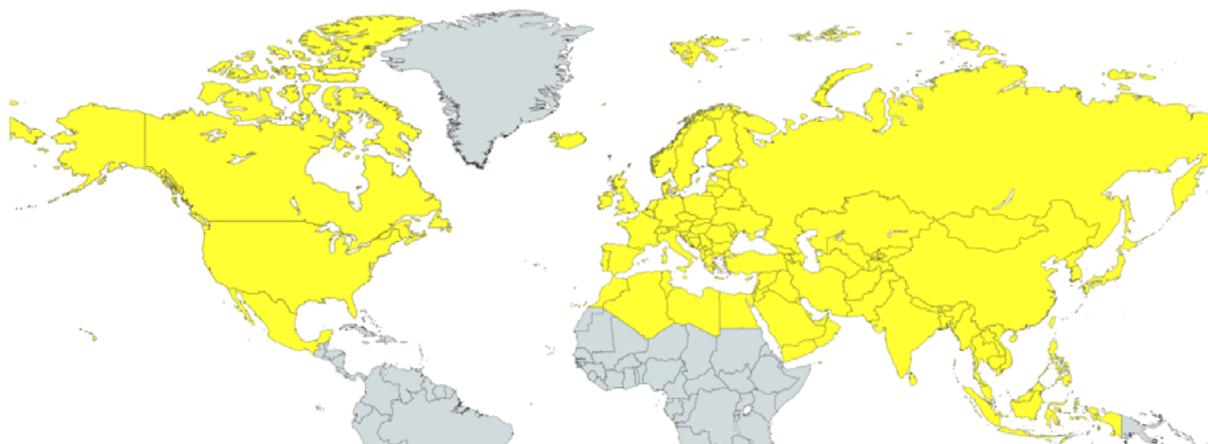
References

1. Izzo AA, Hoon-Kim S, Radhakrishnan R, Williamson EM. A Critical Approach to Evaluating Clinical Efficacy, Adverse Events and Drug Interactions of Herbal Remedies. *Phytother Res.* 2016;30(5):691-700.
2. Johnston KC, Bruno A, Pauls Q, et al. Neurological Emergencies Treatment Trials Network and the SHINE Trial Investigators. Intensive vs Standard Treatment of Hyperglycemia and Functional Outcome in Patients With Acute Ischemic Stroke: The SHINE Randomized Clinical Trial. *JAMA.* 2019;322(4):326-335.
3. Ak G, Gevrenova R, Sinan KI, et al. *Tanacetum vulgare* L. (Tansy) as an effective bioresource with promising pharmacological effects from natural arsenal. *Food Chem Toxicol.* 2021;153:112268.

Common hogweed

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Common hogweed (Latin: *Heracleum sphondylium*) - a species of plant from the celery family. This plant is found in Europe, Asia, northern Africa, and North America, where it was introduced. It is a biennial plant, sometimes a perennial with an erect, grooved, wind-blown stem growing up to 1.5 m in height. The leaves

are triple or pinnate. White or pinkish flowers are gathered in large umbels 15-20 radial. Blooms from June to September. The fruit is cleft. All parts of the plant, especially the fruit, have a strong, specific, not very pleasant smell.



Fig. 76. Common hogweed

References

1. Hoseinifar SH, Zoheiri F, Lazado CC. Dietary phytoimmunostimulant Persian hogweed (*Heracleum persicum*) has more remarkable impacts on skin mucus than on serum in common carp (*Cyprinus carpio*). *Fish Shellfish Immunol.* 2016;59:77-82.
2. Dostál P, Müllerová J, Pyšek P, Pergl J, Klinerová T. The impact of an invasive plant changes over time. *Ecol Lett.* 2013;16(10):1277-1284.
3. Schindler S, Rabitsch W, Essl F, Wallner P, Lemmerer K, Follak S, Hutter HP. Alien Species and Human Health: Austrian Stakeholder Perspective on Challenges and Solutions. *Int J Environ Res Public Health.* 2018;15(11):2527.

Common walnut

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Common walnut (Latin: *Juglans regia*) belongs to the walnut family (*Juglandaceae*). In the wild, it occurs in Europe and Asia. It is a large tree that can grow up to 20 m tall, although in gardens it usually grows half the size. The bark on the trunk is smooth, gray-gray. The leaves are large and pinnate, composed of smaller leaflets, the

top leaf being the largest. The fruit is spherical, with a smooth green skin that cracks when ripe to reveal a light brown walnut shell with an edible interior at the center. It is worth knowing that the inside of the walnut fruit consists of 2 large, thick and oily cotyledons and they are so eagerly eaten by us. Nuts ripen in October.



Fig. 77. Common walnut

References

1. Gunton KB, Wasserman BN, DeBenedictis C. Strabismus. *Prim Care*. 2015;42(3):393-407.
2. Vogt NM, Kerby RL, Dill-McFarland KA, et al. Gut microbiome alterations in Alzheimer's disease. *Sci Rep*. 2017;7(1):13537.
3. Halperin JJ. Neuroborreliosis. *Neurol Clin*. 2018;36(4):821-830.

Strawberry

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Strawberry (Latin: *Fragaria ananassa*) - a hybrid plant of two species of wild strawberries from the rose family (*Rosaceae* Juss). Probably it arose completely by accident at the beginning of the 18th century in the aristocratic Versailles. The actual fruit of a strawberry are small nuts

visible on the surface of the apparent fruit. After pollination, the bottom of the flower grows to form a collective fruit or berry. The apparent berry can reach a diameter of about 3 cm.



Fig. 78. Strawberry

References

1. Giampieri F, Forbes-Hernandez TY, Gasparrini M, Alvarez-Suarez JM, Afrin S, Bompadre S, Quiles JL, Mezzetti B, Battino M. Strawberry as a health promoter: an evidence based review. *Food Funct.* 2015;6(5):1386-1398.
2. Afrin S, Gasparrini M, Forbes-Hernandez TY, et al. Promising Health Benefits of the Strawberry: A Focus on Clinical Studies. *J Agric Food Chem.* 2016;64(22):4435-4449.
3. Morales-Quintana L, Ramos P. Chilean strawberry (*Fragaria chiloensis*): An integrative and comprehensive review. *Food Res Int.* 2019;119:769-776.

Common beet

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Common beet (Latin: *Beta vulgaris*) belongs to the family of quinoids or amaranths, depending on its source. The plant comes from the wild beet, which grows in the Middle East, and is grown as a vegetable in the form of two cultivar groups: red beet (root) and leaf beet (so-called chard). In the first year of cultivation, red beet forms a thickened, fleshy, usually red storage root (round or cylindrical) and produces a rosette of triangular, large, soft, green leaves with red veins, mounted on

long, stiff, red petioles. In the second year of cultivation, the beet blooms, losing its utility value. The less popular leaf beet looks a bit different. The plant is also biennial and produces a rosette of leaves in the first year and blooms in the second. Contrary to the red beet, it does not form a thickened root, but very large, triangular in outline, strongly wrinkled leaves, set on thick, long, stiff, fleshy petioles



Fig. 79. Common beet

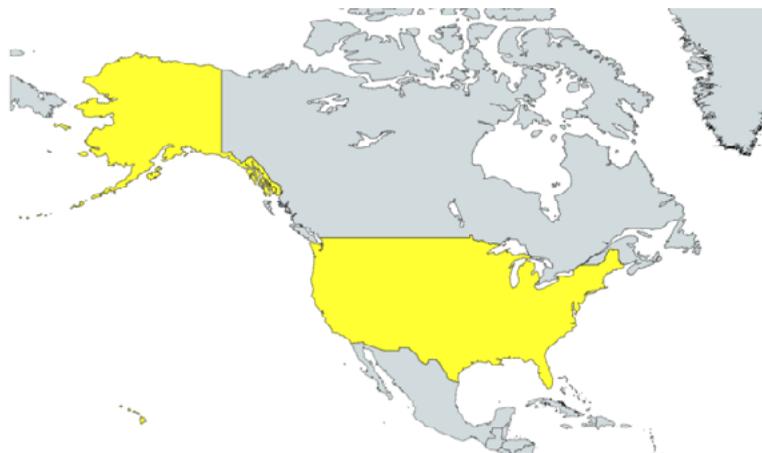
References

1. Gallardo EJ, Coggan AR. What's in Your Beet Juice? Nitrate and Nitrite Content of Beet Juice Products Marketed to Athletes. *Int J Sport Nutr Exerc Metab.* 2019;29(4):345-349.
2. Moreira LSG, Fanton S, Cardozo L, Borges NA, Combet E, Shiels PG, Stenvinkel P, Mafra D. Pink pressure: beetroot (*Beta vulgaris rubra*) as a possible novel medical therapy for chronic kidney disease. *Nutr Rev.* 2021:nuab074.
3. Hadipour E, Taleghani A, Tayarani-Najaran N, Tayarani-Najaran Z. Biological effects of red beetroot and betalains: A review. *Phytother Res.* 2020;34(8):1847-1867.

Zucchini

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Zucchini (Latin: *Cucurbita pepo*) is a vegetable from the gourd family. Zucchini is native to North America, especially the central and southern regions of the United States today. Depending on the variety, it can be dark green, yellow or striped. It is a monoecious plant with

female and male flowers in its central part. The edible parts of zucchini include its club-shaped, cylindrical and elongated fruit. A vegetable can grow up to about 40 cm in length, but it is best to pick zucchini earlier, when it is about 15-20 cm and is the most delicate.



Fig. 80. Zucchini

References

1. Vitiello A, Molisso D, Digilio MC, Giorgini M, Corrado G, Bruce TJA, D'Agostino N, Rao R. Zucchini Plants Alter Gene Expression and Emission of E- β -Caryophyllene Following *Aphis gossypii* Infestation. *Front Plant Sci.* 2021;11:592603.
2. Almohaimed HM, Albadawi EA, Mohammedsaleh ZM, Alghabban HM, Seleem HS, Ramadan OI, Ayuob NN. Brain-derived Neurotropic factor (BDNF) mediates the protective effect of *Cucurbita pepo* L. on salivary glands of rats exposed to chronic stress evident by structural, biochemical and molecular study. *J Appl Oral Sci.* 2021;29:e20201080.
3. Ayuob N, Shaker SA, Hawuit E, Al-Abbas NS, Shaer NA, Al Jaouni S, Mahdi MR. L. *Cucurbita pepo* Alleviates Chronic Unpredictable Mild Stress via Modulation of Apoptosis, Neurogenesis, and Gliosis in Rat Hippocampus. *Oxid Med Cell Longev.* 2021;2021:6662649.

Cucurbita maxima

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Gourd (Latin: *Cucurbita maxima*) is an annual plant belonging to the *Cucurbitaceae* family. The vegetable comes from Central and South America, where it has been cultivated for millennia. The plant has creeping shoots, which can reach 10 m in length. The leaves are unusually large and lobed. Pumpkin flowers are dioe-

ciuous - female flowers are large and yellow individually, and male, inconspicuous, appear in bunches in the leaf axils. The fruit of the plant - colloquially called simply a pumpkin, is a false berry. Depending on the variety, it may vary in shape, color and size. Usually they weigh 40-60 kg.



Fig. 81. Gourd

References

1. Paul M, Sohag MSU, Khan A, Barman RK, Wahed MII, Khan MRI. Pumpkin (*Cucurbita maxima*) seeds protect against formaldehyde-induced major organ damages. *Heliyon*. 2020;6(8):e04587.
2. Atta AH, Saad SA, Atta SA, Mounieir SM, Nasr SM, Desouky HM, Shaker HM. *Cucumis sativus* and *Cucurbita maxima* extract attenuate diabetes-induced hepatic and pancreatic injury in a rat model. *J Physiol Pharmacol*. 2020;71(4). doi: 10.26402/jpp.2020.4.06.
3. Tolstyko E, Lezzhov A, Solovyev A. Identification of miRNA precursors in the phloem of *Cucurbita maxima*. *PeerJ*. 2019;7:e8269.

Green beans

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Green beans (Latin: *Phaseolus vulgaris*) are common beans grown for green or yellow pods. It is an annual plant belonging to the *Fabaceae* family. It has been cultivated in its home country (Latin America). Currently, there are around 200 species of beans. The beans produce long (depending on the variety from 60 to 120 cm), woody stalks. The bean leaves are three-lobed. The

plant wrapping on supports is characteristic - it does not have any special sticking "structures", so without support poles it will spread over the ground and yield worse. Butterfly flowers are gathered in clusters of white, lilac or pink (ornamental varieties may have more intense colors). The fruit - pods, set about 2 months after sowing.



Fig. 82. Green beans

References

1. Hayat I, Ahmad A, Masud T, Ahmed A, Bashir S. Nutritional and health perspectives of beans (*Phaseolus vulgaris* L.): an overview. *Crit Rev Food Sci Nutr.* 2014;54(5):580-592.
2. Celleno L, Tolaini MV, D'Amore A, Perricone NV, Preuss HG. A Dietary supplement containing standardized *Phaseolus vulgaris* extract influences body composition of overweight men and women. *Int J Med Sci.* 2007;4(1):45-52.
3. Hafsah H, Iriawati I, Syamsudin TS. Dataset of volatile compounds from flowers and secondary metabolites from the skin pulp, green beans, and peaberry green beans of robusta coffee. *Data Brief.* 2020;29:105219.

Carrots

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Carrot (Latin: *Daucus carota*) - a species of plant from the celery family. It occurs in the wild, commonly in Europe, Asia and North Africa. In the first year of vegetation, ordinary carrots form a rose leaf and a thick root. The stem is erect, branched, hollow and roughly hairy. Leaves 2 or 3 times pinnate. The edible carrot root has an extensive storage crumb, which is used to store nu-

trients. In wild plants, the root is white to cream, and in cultivated varieties it is whitish to yellowish to orange-red (the richest in carotene) and purple in color. In the second year, an inflorescence shoot breaks out of the root. The flowers are small, white, gathered in umbel at the top of the plant. Carrots bloom from June to autumn, it is an insect-pollinating and honey plant.



Fig. 83. Carrot

References

1. von Lintig J. Eat Your Carrots! β -Carotene and Cholesterol Homeostasis. *J Nutr.* 2020;150(8):2003-2005.
2. Patel HJ. Peas and carrots, apples and oranges: Not all malperfusion is the same. *J Thorac Cardiovasc Surg.* 2018;156(1):25-26.
3. Vergauwen D, De Smet I. Down the Rabbit Hole-Carrots, Genetics and Art. *Trends Plant Sci.* 2016;21(11):895-898.

Spinach

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Spinach (Latin: *Spinacia oleracea*) – an annual plant of the *Amaranth* family. It probably comes from northern Persia. Vegetable spinach produces dark green leaves on long petioles. Initially, they are arranged in a down-to-earth rosette, and then alternately on the stem. The leaf blades are ovate to triangular pointed, up to 12 cm long.

A strongly shortened stem in the first growth phase grows up to 50-100 cm in height over time. It is erect, yellowish green to light green, not very branched. Reddish, less often white tap root can reach even more than one and a half meters deep into the ground.



Fig. 84. Spinach

References

1. Roberts JL, Moreau R. Functional properties of spinach (*Spinacia oleracea* L.) phytochemicals and bioactives. *Food Funct.* 2016;7(8):3337-3353.
2. Kandel SL, Mou B, Shishkoff N, Shi A, Subbarao KV, Klosterman SJ. Spinach Downy Mildew: Advances in Our Understanding of the Disease Cycle and Prospects for Disease Management. *Plant Dis.* 2019;103(5):791-803.

Chives

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Chives or garlic chives (Latin: *Allium schoenoprasum*) is a perennial plant belonging to the *Amaryllidaceae* family. It comes from the mountainous regions of Europe, Asia and North America. Perennial forms short (25-40 cm) compact clumps with tubular, hollow leaves.

It is known for producing up to 8 new leaves in one season. The inflorescence shoots are slightly higher than the leaves. The flowers of chives are white, pink, lilac or purple, gathered in umbels. Garlic and chives bloom from May to August and are very often visited by bees.



Fig. 85. Chives

References

1. Cortinovis C, Caloni F. Household Food Items Toxic to Dogs and Cats. *Front Vet Sci.* 2016;3:26.
2. Nicastro HL, Ross SA, Milner JA. Garlic and onions: their cancer prevention properties. *Cancer Prev Res (Phila).* 2015;8(3):181-189.
3. Hata FT, Ventura MU, Béga VL, Camacho IM, de Paula MT. Chinese chives and garlic in intercropping in strawberry high tunnels for *Neopamera bilobata* Say (Hemiptera: Rhyparochromidae) control. *Bull Entomol Res.* 2019;109(4):419-425.

Potato

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Potato (Latin: *Solanum tuberosum*) - belongs to the nightshade family. The potato comes from South America. Bushy habit, stems 50–80 cm high, known as haulm when dry; single-pinnate intermittent leaves, composed of the terminal section and several lateral pairs, separated by ovate sections. In the lower part of the stems, underground shoots, known as stolons, are formed,

15–20 cm long, the ends of which thicken to form tubers (balls). There are so-called meshes with 3 to 4 shoots; white, pink or purple flowers. Fruit - roundish, two-chambered, green berry; all parts of the potato, especially the green ones, contain the poisonous glycoside solanine.



Fig. 86. Potato

References

1. Sun W, Ma Z, Chen H, Liu M. MYB Gene Family in Potato (*Solanum tuberosum* L.): Genome-Wide Identification of Hormone-Responsive Reveals Their Potential Functions in Growth and Development. *Int J Mol Sci.* 2019;20(19):4847.
2. Akyol H, Riciputi Y, Capanoglu E, Caboni ME, Verardo V. Phenolic Compounds in the Potato and Its Byproducts: An Overview. *Int J Mol Sci.* 2016;17(6):835.
3. Stokstad E. *The new potato.* *Science.* 2019;363(6427):574-577.

Chickpeas

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Chickpeas (Latin: *Cicer arietinum*) - belongs to the bean family. It comes from Western Asia. Chickpeas are an annual plant. It has a bushy, slightly upright habit. On average, it grows up to 50-100 cm in length. The chickpea stalk is stiff and angular. The leaves are small, odd-pinnate, composed of egg-shaped leaves with ser-

rated edges. The flowering of chickpeas begins in May or June and lasts up to a month. The flowers are inconspicuous, purple, pink, white or purple in color, growing in the leaf axils. As befits a plant from the *Fabaceae* family, the fruit is a fairly large, hanging, pear-shaped pod with seeds inside. It is most often yellow-brown in color.



Fig. 87. Chickpeas

References

1. Rachwa-Rosiak D, Nebesny E, Budryn G. Chickpeas—composition, nutritional value, health benefits, application to bread and snacks: a review. *Crit Rev Food Sci Nutr.* 2015;55(8):1137-1145.
2. Shim YY, Mustafa R, Shen J, Ratanapariyanuch K, Reaney MJT. Composition and Properties of Aquafaba: Water Recovered from Commercially Canned Chickpeas. *J Vis Exp.* 2018;(132):56305.
3. Tassoni A, Tedeschi T, Zurlini C, et al. State-of-the-Art Production Chains for Peas, Beans and Chickpeas-Valorization of Agro-Industrial Residues and Applications of Derived Extracts. *Molecules.* 2020;25(6):1383.

White mustard

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White mustard, light mustard (Latin: *Sinapis alba*) - belongs to the *Brassicaceae* family. In nature, it occurs in the Mediterranean region and in Western Asia and Pakistan. White mustard is often sown as a green fertilizer plant, has a short growing season and grows very

quickly (as a green fertilizer it can be used for any crop, except cruciferous vegetables). White mustard is an annual plant, growing up to 60 cm in height. Forms a straight, branched stem with pinnate leaves. It blooms yellow from late May until August.



Fig. 88. White mustard

References

1. Mitrović PM, Stamenković OS, Banković-Ilić I, Djalović IG, Nježić ZB, Farooq M, Siddique KHM, Veljković VB. White Mustard (*Sinapis alba* L.) Oil in Biodiesel Production: A Review. *Front Plant Sci.* 2020;11:299.
2. Anupriya C, Shradha N, Prasun B, Abha A, Pankaj S, Abdin MZ, Neeraj S. Genomic and Molecular Perspectives of Host-pathogen Interaction and Resistance Strategies against White Rust in Oilseed Mustard. *Curr Genomics.* 2020;21(3):179-193.
3. Porter JA, Morey A, Monu EA. Antimicrobial efficacy of white mustard essential oil and carvacrol against *Salmonella* in refrigerated ground chicken. *Poult Sci.* 2020;99(10):5091-5095.

Cucumber

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Cucumber (Latin: *Cucumis*) is a genus of annual plants from the gourd family. It comes from India, where you can still find its wild-growing varieties today. Cucumber produces creeping plants with hairy, palmate and five-flap leaves. Vertical cultivation at supports is also possible. Yellow flowers emerge from the leaf axils and

are divided into three types of sex: male (with stamens), female (with a pistil) and hermaphroditic (female and male organs). The fruit is a berry more or less elongated, of various sizes, with a smooth or warty skin, filled with seeds. The color of the fruit varies from dark green to yellow.



Fig. 89. Cucumber

References

1. Mukherjee PK, Nema NK, Maity N, Sarkar BK. Phytochemical and therapeutic potential of cucumber. *Fitoterapia*. 2013;84:227-236.
2. Chai L, Fan H, Liu C, Du C. [Advances in *Agrobacterium tumefaciens*-mediated transgenic cucumber]. *Sheng Wu Gong Cheng Xue Bao*. 2020;36(4):643-651.
3. Che G, Zhang X. Molecular basis of cucumber fruit domestication. *Curr Opin Plant Biol*. 2019;47:38-46.

Common sunflower

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Common sunflower (Latin: *Helianthus annuus*) is an annual plant growing up to 2.5 m tall, belonging to the Asteraceae family. It comes from the western areas of North America. This is one of the most important oil plants. Sunflowers have a single stem with a spongy core

inside. The leaves are large and heart-shaped. The most decorative part of the sunflower are its huge, characteristic inflorescences - with yellow, ligulate outer flowers and brown inner tubular flowers. It blooms from July to October. The fruit is achenes in a woody shell.



Fig. 90. Common sunflower

References

1. Carr A, Watson J, Bowes C. The sunflower lanyard. *Br Dent J.* 2020;228(12):906.
2. Cabrera Mederos D, Torres C, Bejerman N, Trucco V, Leonardon S, Leiva Mora M, Giolitti F. Phylodynamics of sunflower chlorotic mottle virus, an emerging pathosystem. *Virology.* 2020;545:33-39.
3. Cvejić S, Radanović A, Dedić B, Jocković M, Jocić S, Miladinović D. Genetic and Genomic Tools in Sunflower Breeding for Broomrape Resistance. *Genes (Basel).* 2020;11(2):152.

Pilosella officinarum

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Pilosella officinarum (Latin: *Hieracium pilosella*) - from the *Asteraceae* family. Its home area is Europe and part of the territory of Asia (Caucasus, Transcaucasia, Dagestan and Western Siberia). *Pilosella officinarum* is a perennial and easy to recognize plant. Reaches a height of 30 cm. The straight, cutter-shaped stem ends with a characteristic yellow flower during the flowering

period, which lasts from May to October. The fruit is an achene which turns into a fluffy ball after it fades. The seeds provided with umbrella-shaped remiges can travel long distances. That is why the white hawk can grow very quickly, increasing its numbers and the area it occupies each year. Interesting, blue-green oblong leaves covered with white hairs are also noteworthy.



Fig. 91. *Pilosella officinarum*

References

1. Płachno BJ, Kapusta M, Świątek P, Stolarczyk P, Kocki J. Immunodetection of Pectic Epitopes, Arabinogalactan Proteins, and Extensins in Mucilage Cells from the Ovules of *Pilosella officinarum* Vaill. and *Taraxacum officinale* Agg. (*Asteraceae*). *Int J Mol Sci.* 2020;21(24):9642.
2. Płachno BJ, Świątek P, Kozieradzka-Kiszkurno M, Szląg Z, Stolarczyk P. Integument cell gelatinisation-the fate of the integumentary cells in *Hieracium* and *Pilosella* (*Asteraceae*). *Protoplasma.* 2017;254(6):2287-2294.
3. Willer J, Zidorn C, Juan-Vicedo J. Ethnopharmacology, phytochemistry, and bioactivities of *Hieracium* L. and *Pilosella* Hill (*Cichorieae*, *Asteraceae*) species. *J Ethnopharmacol.* 2021;281:114465.

Valerian medicine

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Valerian medicine (Latin: *Valeriana officinalis*) is a species that includes several to a dozen or so species with a similar therapeutic effect. In nature, it occurs as a two-year perennial and its occurrence is recorded throughout Eurasia with the exception of the arctic and desert

zones. Cultivated in North America and very common in Poland. Valerian medicine exudes a sweet, honey fragrance and contains numerous biologically active substances: esters of isovaleric acid, valereic acid, valer-anone, valeranal and others.



Fig. 92. Valerian medicine

References

1. Amaral de Brito AP, Galvão de Melo IMDS, El-Bachá RS, Guedes RCA. Valeriana officinalis Counteracts Rotenone Effects on Spreading Depression in the Rat Brain in vivo and Protects Against Rotenone Cytotoxicity Toward Rat Glioma C6 Cells in vitro. *Front Neurosci.* 2020;14:759.
2. Leach MJ, Page AT. Herbal medicine for insomnia: A systematic review and meta-analysis. *Sleep Med Rev.* 2015;24:1-12.
3. Sudati JH, Fachinetto R, Pereira RP, Boligon AA, Athayde ML, Soares FA, de Vargas Barbosa NB, Rocha JB. In vitro antioxidant activity of Valeriana officinalis against different neurotoxic agents. *Neurochem Res.* 2009;34(8):1372-1379.

Alchemilla monticola

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Alchemilla monticola (Latin: *Alchemilla monticola*) - a plant from the rose family. The main area of occurrence is Europe. The stems of the alchemilla can be 10 to 15 cm long. Its leaves are gray-green and the flowers are

light green. Mugwort flowers appear in summer, in the period from May to September. The herb is also harvested in the summer. It is characterized by a balsamic fragrance and a tart, slightly sweet taste



Fig. 93. *Alchemilla monticola*

References

1. Krivokuća M, Niketić M, Milenković M, Golić N, Masia C, Scaltrito MM, Sisto F, Kundaković T. Anti-Helicobacter pylori Activity of Four Alchemilla Species (Rosaceae). *Nat Prod Commun.* 2015;10(8):1369-1371.
2. Mladenova SG, Vasileva LV, Savova MS, Marchev AS, Tews D, Wabitsch M, Ferrante C, Orlando G, Georgiev MI. Anti-Adipogenic Effect of *Alchemilla monticola* is Mediated Via PI3K/AKT Signaling Inhibition in Human Adipocytes. *Front Pharmacol.* 2021;12:707507.

Lily of the valley

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Lily of the valley (Latin: *Convallaria majalis*) is a perennial plant belonging to the *Asparagaceae* family. It occurs in Europe and Asia. In Europe, the May Lily of the valley is known by many folk names. In addition to its medicinal properties used in herbal medicine, it has often been associated with witchcraft and alchemy because of its poisonous effects. Lily of the valley is a plant

known for its very vital rhizomes. The plant produces large leaves with parallel veins. The stalk is produced by two-year-old rhizomes. The pendulous, white flowers of the plant are gathered in a one-sided cluster. They have the shape of spherical bells with 6 bent teeth. The fruits of the lily of the valley are red berries.



Fig. 94. Lily of the valley

References

1. Lu QX, Gao J, Wu JJ, Zhou X, Wu X, Li MD, Wei YK, Wang RH, Qi ZC, Li P. Development of 19 novel microsatellite markers of lily-of-the-valley (*Convallaria*, *Asparagaceae*) from transcriptome sequencing. *Mol Biol Rep.* 2020;47(4):3041-3047.
2. Dasgupta A, Bourgeois L. Convallatoxin, the active cardiac glycoside of lily of the valley, minimally affects the ADVIA Centaur digoxin assay. *J Clin Lab Anal.* 2018;32(8):e22583.