

Medicinal Properties of Herbs and Their Applications

Dr. Romila Karnawat

SCRS Rajkiya Mahavidyalaya, Sawai Madhopur, Rajasthan, India

ABSTRACT

Here are some common medicinal herbs. Most herbs have not been completely tested to see how well they work or to see if they interact with other herbs, supplements, medicines, or foods. Products added to herbal preparations may also cause interactions. Be aware that "natural" does not mean "safe." It's important to tell your healthcare providers about any herb or dietary supplement you are using.

KEYWORDS: herbs, medicinal, properties, applications, supplements

INTRODUCTION

In general use, herbs are a widely distributed and widespread group of plants, excluding vegetables and other plants consumed for macronutrients, with savory or aromatic properties that are used for flavoring and garnishing food, for medicinal purposes, or for fragrances. Culinary use typically distinguishes herbs from spices. Herbs generally refers to the leafy green or flowering parts of a plant (either fresh or dried), while spices are usually dried and produced from other parts of the plant, including seeds, bark, roots and fruits.[1,2,3]

Herbs have a variety of uses including culinary, medicinal, aromatic and in some cases, spiritual. General usage of the term "herb" differs between culinary herbs and medicinal herbs; in medicinal or spiritual use, any parts of the plant might be considered as "herbs", including leaves, roots, flowers, seeds, root bark, inner bark (and cambium), resin and pericarp.

The word "herb" is pronounced /hɜːrb/ in Commonwealth English,^[1] but /ɜːrb/ is common among American English speakers and those from regions where h-dropping occurs. In Canadian English, both pronunciations are common.^[2] In botany, the noun "herb" refers to a "plant that does not produce a woody stem", and the adjective "herbaceous" means "herb-like", referring to parts of the plant that are green and soft in texture".^{[3][4]}

"What is a herb?" "The friend of physicians and the praise of cooks."

--Alcuin and his student Charlemagne^[5]

Chamomile

(Flower)

Considered by some to be a cure-all, chamomile is commonly used in the U.S. for anxiety and relaxation. It is used in Europe for wound healing and to reduce inflammation or swelling. Few studies have looked at how well it works for any condition. Chamomile is used as a tea or applied as a compress. It is considered safe by the FDA. It may increase drowsiness caused by medicines or other herbs or supplements. Chamomile may interfere with the way the

body uses some medicines, causing too high a level of the medicine in some people.

Chamomile for the skin (topical) may be used to treat skin irritation from radiation cancer treatments. Chamomile in capsule form may be used to control vomiting during chemotherapy.

Echinacea

(Leaf, stalk, root)

Echinacea is commonly used to treat or prevent colds, flu, and infections, and for wound healing. Many studies have looked at how well echinacea works to prevent or shorten the course of a cold, but none were conclusive. Some studies do show some benefit of using echinacea for upper respiratory infections.

Short-term use is advised because other studies have also shown that long-term use can affect the body's immune system. Always check with your healthcare provider about any interactions with medicines that you are already taking. People allergic to plants in the daisy family may be more likely to have an allergic reaction to echinacea. The daisy family includes ragweed, chrysanthemums, marigolds, and daisies.

Feverfew

(Leaf)

Feverfew was traditionally used to treat fevers. It is now commonly used to prevent migraines and treat arthritis. Some research has shown that certain feverfew preparations can prevent migraines. Side effects include mouth ulcers if the leaves are chewed and digestive irritation. People who suddenly stop taking feverfew for migraines may have their headaches return. Feverfew should not be used with nonsteroidal anti-inflammatory medicines because these medicines may change how well feverfew works. It should not be used with warfarin or other anticoagulant medicines.

Garlic

(Cloves, root)

Garlic has been used all over the world in cooking and for its many medicinal properties. The compounds isolated from garlic have been shown to have antimicrobial, cardioprotective, anticancer and anti-inflammatory properties. These properties may play a role in the belief that garlic helps lower cholesterol and blood pressure. Unfortunately, the evidence is conflicting. The FDA considers garlic safe. But it can increase the risk of bleeding and should not be used with warfarin, a blood thinner. For the same reason, large amounts should not be taken before dental procedures or surgery.

Ginger

(Root)

Ginger is most commonly known as an herb for easing nausea and motion sickness. Research suggests that ginger may relieve the nausea caused by pregnancy and chemotherapy. Other areas under investigation in the use of ginger are in surgery and as an anticancer agent. It's wide range of actions may be due in part to its strong anti-inflammatory and antioxidative effects.

Reported side effects may include bloating, gas, heartburn, and nausea in certain people.

Ginkgo

(Leaf)

Ginkgo leaf extract has been used to treat a variety of conditions such as asthma, bronchitis, fatigue, and tinnitus. It is also used to improve memory and to prevent dementia and other brain disorders. Some studies have supported its slight effectiveness. But exactly how ginkgo works isn't understood. Only extract from leaves should be used. Seeds contain ginkgo toxin. This toxin can cause seizures and, in large amounts, death. Because some information suggests that ginkgo can increase the risk of bleeding, it should not be used with nonsteroidal anti-inflammatory medicines, anticoagulants, anticonvulsant medicines, or tricyclic antidepressants.

Ginseng

(Root)

Ginseng is used as a tonic and aphrodisiac, even as a cure-all. Research is uncertain how well it works, partly because of the difficulty in defining "vitality" and "quality of life." There is a large variation in the quality of ginseng sold. Side effects are high blood pressure and tachycardia. It's considered safe by the FDA. But it shouldn't be used with warfarin, heparin, nonsteroidal anti-inflammatory medicines, estrogens, corticosteroids, or digoxin. People with diabetes should not use ginseng.

Goldenseal

(Root, rhizome)

Goldenseal is used to treat diarrhea and eye and skin irritations. It is also used as an antiseptic. It is also an unproven treatment for colds. Goldenseal contains berberine, a plant alkaloid with a long history of medicinal use in both Ayurvedic and Chinese medicine. Studies have shown that goldenseal is effective for diarrhea. But it's not recommended because it can be poisonous in high doses. It can cause skin, mouth, throat, and gastric irritation.

Milk thistle

(Fruit)

Milk thistle is used to treat liver conditions and high cholesterol, and to reduce the growth of cancer cells. Milk thistle is a plant that originated in the Mediterranean region. It has been used for many different illnesses over the last several thousand years, especially liver problems. Study results are uncertain about the actual benefits of milk thistle for liver disease.

Saint John's wort

(Flower, leaf)

Saint John's wort is used as an antidepressant. Studies have shown that it has a small effect on mild to moderate

depression over a period of about 12 weeks. But it is not clear if it is effective for severe depression. A side effect is sensitivity to light, but this is only noted in people taking large doses of the herb. St. John's has been shown to cause dangerous and possibly deadly interactions with commonly used medicines. It is very important to always talk with your healthcare provider before using this herb.

Saw palmetto

(Fruit)

Saw palmetto is used to treat urine symptoms from benign prostatic hypertrophy (BPH). But recent studies have not found it to be effective for this condition. Side effects are digestive upset and headache, both mild.

Valerian

(Root)

Valerian is used to treat sleeplessness and to reduce anxiety. Research suggests that valerian may be a helpful sleep aid, but the evidence is not consistent to confirm it. In the U.S., valerian is used as a flavoring for root beer and other foods. As with any medicinal herb, always talk with your healthcare provider before taking it.[4,5,6]

DISCUSSION

In botany, the term herb refers to a herbaceous plant,^[6] defined as a small, seed-bearing plant without a woody stem in which all aerial parts (i.e. above ground) die back to the ground at the end of each growing season.^[7] Usually the term refers to perennials,^[6] although herbaceous plants can also be annuals (plants that die at the end of the growing season and grow back from seed next year),^[8] or biennials.^[6] This term is in contrast to shrubs and trees which possess a woody stem.^[7] Shrubs and trees are also defined in terms of size, where shrubs are less than ten meters tall, and trees may grow over ten meters.^[7] The word herbaceous is derived from Latin herbaceus meaning "grassy", from herba "grass, herb".^[9]

Another sense of the term herb can refer to a much larger range of plants,^[10] with culinary, therapeutic or other uses.^[6] For example, some of the most commonly described herbs such as sage, rosemary and lavender would be excluded from the botanical definition of an herb as they do not die down each year, and they possess woody stems.^[8] In the wider sense, herbs may be herbaceous perennials but also trees,^[10] subshrubs,^[10] shrubs,^[10] annuals,^[10] lianas,^[10] ferns,^[10] mosses,^[10] algae,^[10] lichens,^[8] and fungi.^[8] Herbalism can utilize not just stems and leaves but also fruit, roots, bark and gums.^[8] Therefore, one suggested definition of an herb is a plant which is of use to humans,^[8] although this definition is problematic since it could cover a great many plants that are not commonly described as herbs.

History

Ancient Greek philosopher Theophrastus divided the plant world into trees, shrubs, and herbs.^[11] Herbs came to be considered in three groups, namely pot herbs (e.g. onions), sweet herbs (e.g. thyme), and salad herbs (e.g. wild celery).^[8] During the seventeenth century as selective breeding changed the plants size and flavor away from the wild plant, pot herbs began to be referred to as vegetables as they were no longer considered only suitable for the pot.^[8]

Botany and the study of herbs was, in its infancy, primarily a study of the pharmacological uses of plants. During the

Middle Ages, when humoral theory guided medicine, it was posited that foodstuffs, possessing their own humoral qualities, could alter the humoral temperaments of people. Parsley and sage were often used together in medieval cookery, for example in chicken broth, which had developed a reputation as a therapeutic food by the 14th century. One of the most common sauces of the age, green sauce, was made with parsley and often sage as well. In a 14th-century recipe recorded in Latin "for lords, for settling their temperament and whetting their appetite" green sauce is served with a dish of cheese and whole egg yolks boiled in watered down wine with herbs and spices.^[12]

Reproduction

Perennial herbs are usually reproduced by stem cuttings, either softwood cuttings of immature growth, or hardwood cuttings where the bark has been scraped to expose the cambium layer. A cutting will usually be approximately 3 to 4 inches in length. Plant roots can grow from the stems. Leaves are stripped from the lower portion up to one half before the cutting is placed in growth medium or rooted in a glass of water. This process requires high humidity in the environment,^[7,8,9] sufficient light, and root zone heat.^[13]

Uses

Culinary

Culinary herbs are distinguished from vegetables in that, like spices, they are used in small amounts and provide flavor rather than substance to food.^[14]

Herbs can be perennials such as thyme, oregano, sage or lavender, biennials such as parsley, or annuals like basil. Perennial herbs can be shrubs such as rosemary (*Rosmarinus officinalis*), or trees such as bay laurel (*Laurus nobilis*) – this contrasts with botanical herbs, which by definition cannot be woody plants. Some plants are used as both herbs and spices, such as dill weed and dill seed or coriander leaves and seeds. There are also some herbs, such as those in the mint family, that are used for both culinary and medicinal purposes.

Emperor Charlemagne (742–814) compiled a list of 74 different herbs that were to be planted in his gardens. The connection between herbs and health is important already in the European Middle Ages--The *Forme of Cury* (that is, "cookery") promotes extensive use of herbs, including in salads, and claims in its preface "the assent and advisement of the masters of physic and philosophy in the King's Court".^[5]

Teas

Some herbs can be infused in boiling water to make herbal teas (also termed tisanes).^{[6][10]} Typically the dried leaves, flowers or seeds are used, or fresh herbs are used.^[6] Herbal teas tend to be made from aromatic herbs,^[11] may not contain tannins or caffeine,^[6] and are not typically mixed with milk.^[10] Common examples include chamomile tea,^[10] or mint tea.^[11] Herbal teas are often used as a source of relaxation or can be associated with rituals.^[11]

Medicine

Herbs were used in prehistoric medicine. As far back as 5000 BCE, evidence that Sumerians used herbs in medicine was inscribed on cuneiform.^[16] In 162 CE, the physician Galen was known for concocting complicated herbal remedies that contained up to 100 ingredients.^[17]

Some plants contain phytochemicals that have effects on the body. There may be some effects when consumed in the

small levels that typify culinary "spicing", and some herbs are toxic in larger quantities. For instance, some types of herbal extract, such as the extract of St. John's-wort (*Hypericum perforatum*) or of kava (*Piper methysticum*) can be used for medical purposes to relieve depression and stress.^[18] However, large amounts of these herbs may lead to toxic overload that may involve complications, some of a serious nature, and should be used with caution. Complications can also arise when being taken with some prescription medicines.^[10,11,12]

Herbs have long been used as the basis of traditional Chinese herbal medicine, with usage dating as far back as the first century CE and far before. In India, the Ayurveda medicinal system is based on herbs. Medicinal use of herbs in Western cultures has its roots in the Hippocratic (Greek) elemental healing system, based on a quaternary elemental healing metaphor. Famous herbalist of the Western tradition include Avicenna (Persian), Galen (Roman), Paracelsus (German Swiss), Culpepper (English) and the botanically inclined Eclectic physicians of 19th century/early 20th century America (John Milton Scudder, Harvey Wickes Felton, John Uri Lloyd). Modern pharmaceuticals had their origins in crude herbal medicines, and to this day, some drugs are still extracted as fractionate/isolate compounds from raw herbs and then purified to meet pharmaceutical standards.

There is a record dated 1226 for '12d for Roses for Baron's Chamber and in 1516 for flowers and rushes for chambers for Henry the 9th^[6]

Certain herbs contain psychoactive properties that have been used for both religious and recreational purposes by humans since the early Holocene era, notably the leaves and extracts of the cannabis and coca plants. The leaves of the coca plant have been chewed by people in northern Peruvian societies for over 8,000 years,^[19] while the use of cannabis as a psychoactive substance dates back to the first century CE in China and northern Africa.^[20]

Indigenous Australian peoples developed "bush medicine" based on plants that were readily available to them. The isolation of these groups meant the remedies developed were for far less serious diseases than the western illnesses they contracted during colonisation. Herbs such as river mint, wattle and eucalyptus were used for coughs, diarrhea, fever and headaches.^[17]

Ritual

Herbs are used in many religions. During the monastic era, monks would cultivate herbs alongside vegetables, while others would be set aside in a physic garden for specific purposes.^[21] For example, myrrh (*Commiphora myrrha*) and frankincense (*Boswellia* species) in Hellenistic religion, the nine herbs charm in Anglo-Saxon paganism, neem (*Azadirachta indica*) leaves, bael (*Aegle marmelos*) leaves, holy basil or tulsi (*Ocimum tenuiflorum*), turmeric or "haldi" (*Curcuma longa*), cannabis in Hinduism, and white sage in Wicca. Rastafari also consider cannabis to be a holy plant.

Siberian shamans also used herbs for spiritual purposes. Plants may be used to induce spiritual experiences for rites of passage, such as vision quests in some Native American cultures. The Cherokee use both white sage and cedar for spiritual cleansing and smudging.^[13,14,15]

Cosmetics

Originally there was always doubt in ancient societies, especially in the sceptical medium of western traditions, as

to the efficacy of herbal medicines. The use of herbal cosmetics dates back to around six centuries ago in the European and Western countries. Mixtures and pastes were often concocted to whiten the face. During the 1940s, herbal cosmetics took a turn with the emerging red lipstick color, with every year gaining a more intense red. Herbal cosmetics come in many forms, such as face creams, scrubs, lipstick, natural fragrances, powders, body oils, deodorants and sunscreens. They activate through the epithelium of sebaceous glands to make the skin more supple. Ayurvedic oils are widely used in India, prized for their natural health-giving properties.^[22]

One method and perhaps the best, used to extract natural oils from herbs to make lipstick is partition chromatography. The process involves separation in watery solution, and then the injection of colour under pressure.

Other

Strewing herbs are scattered (strewn) over the floors of dwelling places and other buildings. Such plants usually have fragrant or astringent smells, and many also serve as insecticides (e.g. to repel fleas) or disinfectants. For example, meadowsweet (*Filipendula ulmaria*) was sometimes strewn across floors in the middle ages because of its sweet smell.^[10]

RESULTS

Herbal medicine has its origins in ancient cultures. It involves the medicinal use of plants to treat disease and enhance general health and wellbeing.

Some herbs have potent (powerful) ingredients and should be taken with the same level of caution as pharmaceutical medications. In fact, many pharmaceutical medications are based on man-made versions of naturally occurring compounds found in plants. For instance, the heart medicine digitalis was derived from the foxglove plant.

Active ingredients and herbal medicine

Herbal medicines contain active ingredients. The active ingredients of many herbal preparations are as yet unknown. Some pharmaceutical medications are based on a single active ingredient derived from a plant source. Practitioners of herbal medicine believe that an active ingredient can lose its impact or become less safe if used in isolation from the rest of the plant.

For instance, salicylic acid is found in the plant meadowsweet and is used to make aspirin. Aspirin can cause the lining of the stomach to bleed, but meadowsweet naturally contains other compounds that prevent irritation from salicylic acid.

According to herbal medicine practitioners, the effect of the whole plant is greater than its parts. Critics argue that the nature of herbal medicine makes it difficult to give a measured dose of an active ingredient.

Medicinal uses for specific herbs

Herbal medicine aims to return the body to a state of natural balance so that it can heal itself. Different herbs act on different systems of the body.

Some herbs that are commonly used in herbal medicine, and their traditional uses, include:

- **Echinacea** – to stimulate the immune system and aid the body in fighting infection. Used to treat ailments such as boils, fever and herpes.

- **Dong quai (dang gui)** – used for gynaecological complaints such as premenstrual tension, menopause symptoms and period pain. Some studies indicate that dong quai can lower blood pressure.
- **Garlic** – used to reduce the risk of heart disease by lowering levels of blood fats and cholesterol (a type of blood fat). The antibiotic and antiviral properties of garlic mean that it is also used to fight colds, sinusitis and other respiratory infections.
- **Ginger** – many studies have shown ginger to be useful in treating nausea, including motion sickness and morning sickness.
- **Ginkgo biloba** – commonly used to treat poor blood circulation and tinnitus (ringing in the ears).
- **Ginseng** – generally used to treat fatigue, for example during recovery from illness. It is also used to reduce blood pressure and cholesterol levels, however overuse of ginseng has been associated with raised blood pressure.
- **Hypericum perforatum** – commonly known as St John's Wort. Studies have suggested that St John's Wort is just as effective as some pharmaceutical antidepressants in treating mild to moderate depression. It is also used for anxiety and insomnia. However, St John's Wort can interact with a number of prescription medications, including the oral contraceptive pill, and stop them from working properly.

Do not self-diagnose ailments

It is very important that people do not self-diagnose any health conditions. Any medication (herbal or otherwise) should be taken under the supervision of a knowledgeable and qualified practitioner.^[16,17,18]

Special considerations for herbal medicine

Herbal medicines can be mistakenly thought to be completely safe because they are 'natural' products. This is not always correct.

Herbal medicines may produce negative effects that can range from mild to severe, including:

- allergic reactions and rashes
- asthma
- headaches
- nausea
- vomiting
- diarrhoea.

Like other prescription medications, herbal medicine should always be prescribed by a qualified and registered practitioner. Contact the professional association for your chosen therapy and ask for a list of members in your area. This may include:

- Australian Health Practitioner Regulation Agency (AHPRA) – Chinese medicine practitioners, chiropractors, osteopaths
- Naturopaths and Herbalists Association of Australia (NHAA) – Western herbalists and naturopaths
- Australian Acupuncture and Chinese Medicine Association – the peak body for Chinese medicine, acupuncturists, herbalists and traditional remedial massage practitioners.

During the first visit with your practitioner, ask about their training and qualifications. Be very cautious about any practitioner who advises you to abandon your conventional medical treatment.

Always tell your herbal medicine practitioner:

- which over-the-counter, herbal medicines, complementary medicines and prescription medications you are taking
- any allergic reactions you have experienced
- if you are pregnant, planning to become pregnant, or breastfeeding.

Be aware herbal medicine can interact with other medications

Herbal medications and supplements may interact in harmful ways with over-the-counter or prescription medicines you are taking.

Taking herbal supplements may increase or decrease the effectiveness of other drugs you are taking or may increase the risk of negative side effects. For example, St John's Wort mostly decreases the effectiveness of other medicines but increases the effects of antidepressants.

If you are considering taking herbal medicines, it is always a good idea to talk to your doctor about possible side effects and interactions with other medications you are taking.

Purchase herbal medicine products from a reputable supplier

Not all herbal medicines that are sold are safe. Always purchase from a source that stocks products from a reputable manufacturer or supplier, such as health food stores, supermarkets, pharmacies or from a reputable practitioner.

Be careful about purchasing herbal medicines over the internet. Unregulated herbal medicines from overseas may not be manufactured to the same quality and standard as regulated medicines. In some cases, products purchased online have been found to have dangerous levels of lead, mercury or arsenic, which can cause serious health problems.

Herbal medicines made in Australia are subject to regulations. Consult with your pharmacist about the safety and effectiveness of the herbal medicine or supplements you are thinking of buying. If you are considering taking herbal medicine, it is recommended that you:

- Never stop taking prescribed medications without consulting your doctor.
- Always tell your doctor if you are planning to start a course of herbal medicine for your condition.
- Seek advice from your qualified health practitioner, your doctor or your pharmacist about the herbal medicine's safety, quality and effectiveness.
- Always purchase products from a reputable source. Be cautious about buying herbal medicines or supplements manufactured overseas.
- Take all herbal medicines strictly as prescribed and consult your health practitioner immediately if you experience any side effects.[19,20,21]

CONCLUSIONS

A guide to herbal remedies

Herbal remedies are plants used like a medicine. People use herbal remedies to help prevent or cure disease. They use them to get relief from symptoms, boost energy, relax, or lose weight.

Herbal remedies are not regulated or tested like medicines.

How can you know what you are getting and if it is useful? This guide can help you choose and use herbals safely.

Herbals are not Medicines

You have to be careful when using an herbal remedy. Herbal remedies are a type of dietary supplement. They are not medicines. Here are some things you should know about herbals:

- Herbals are not regulated like medicines.
- Herbals do not need to be rigidly tested before they are sold.
- Herbals may not work as claimed.
- Labels do not need to be approved by any authority. It may not list the correct amount of an ingredient.
- Some herbal remedies may contain ingredients or contaminants not listed on the label.

Natural Does not Mean Safe

Many people think that using plants to treat illness is safer than taking medicine. People have been using plants in folk medicine for centuries. So, it is easy to see the appeal. Yet "natural" does not mean safe. Unless taken as directed, some herbals can interact with other medicines or be toxic at high doses. Also, some may cause side effects.

Here are some examples:

- Kava is an herb used for anxiety, insomnia, symptoms of menopause, and other ailments. Some studies show it may work for anxiety. But kava can also cause severe liver damage. The FDA has issued a warning against its use.
- St. John's Wort may work for mild to moderate depression. However, it can interact with birth control pills, antidepressants, and other drugs. It can also cause side effects such as stomach upset and anxiety.
- Yohimbe is a bark used to treat erectile dysfunction. The bark can cause high blood pressure, increased heart rate, anxiety, and other side effects. It can interact with certain medicines for depression. Taking it in high doses or for a long time can be dangerous.

Of course, some herbals have been tested and work well for their intended purpose. Many are also quite safe, but the word "natural" will not tell you which ones are safe and which ones are not safe.

How to Choose and use Herbal Remedies Safely

Some herbals can make you feel better and help keep you healthy. But you need to be a smart consumer. Use these tips when choosing herbal remedies.

- Look closely at the claims made about the product. How is the product described? Is it a "miracle" pill that "melts away" fat? Will it work faster than regular care? Is it a secret your health care provider and drug companies

don't want you to know? Such claims are red flags. If something sounds too good to be true, it probably is not.

- Remember "real-life stories" are not scientific proof. Many products are promoted with real-life stories. Even if the quote comes from a provider, there's no proof that other people will get the same results.
- Before trying a product, talk with your provider. Ask for their opinion. Is the product safe? What are the chances it will work? Are there risks? Will it interact with other medicines? Will it interfere with your treatment?
- Buy only from companies that have certification on the label, such as "USP Verified" or "ConsumerLab.com Approved Quality." Companies with these certifications agree to test the purity and quality of their products.
- Do not give herbal supplements to children or use them if you are older than age 65 years. Talk to your provider first.
- Do not use herbals without talking to your provider if you are taking any medicines.
- Do not use them if you are pregnant or breastfeeding.
- Do not use them if you are having surgery.
- Always let your provider know what herbals you use. They can affect the medicines you take as well any treatment you receive.[22]

REFERENCES

- [1] "Herb". *Cambridge Advanced Learners' Dictionary & Thesaurus*. Cambridge University Press.
- [2] "'H' an ingredient of modern herb". *Toronto Star*. 12 October 2009. Retrieved 2 June 2022.
- [3] *Carolin, Roger C.; Tindale, Mary D. (1994). Flora of the Sydney region (4th ed.). Chatswood, NSW: Reed. p. 23. ISBN 0730104001.*
- [4] "Glossary of Botanical Terms". *Royal Botanic Garden Sydney*. Retrieved 8 March 2021.
- [5] *Freeman, Margaret B. (1943). Herbs for the Medieval Household, for Cooking, Healing and Divers uses. New York: The Metropolitan Museum of Art. pp. ix-x.*
- [6] The Royal Horticultural Society encyclopedia of gardening (2nd ed.). *Dorling Kindersley*. 2004. pp. 404, 679. ISBN 9781405303538.
- [7] *Allaby, Michael (2012). A Dictionary of Plant Sciences. Oxford University Press. ISBN 9780191079030.*
- [8] *Stuart, Malcolm (1989). The Encyclopedia of herbs and herbalism. Crescent Books. p. 7. ISBN 978-0517353264.*
- [9] *Oxford dictionary of English (3rd ed.). Oxford University Press. 2010. p. 819. ISBN 9780199571123.*
- [10] *Bown, Deni (1995). Encyclopedia of herbs & their uses. Dorling Kindersley. pp. 10, 11. ISBN 978-0751302035.*
- [11] *Bremness, Lesley (1994). The complete book of herbs. Viking Studio Books. p. 8. ISBN 9780140238020.*
- [12] *Health and Healing From the Medieval Garden. The Boydell Press. 2008. p. 67. ISBN 9781843833635.*
- [13] *Tucker, Arthur; Debaggio, Thomas. The Encyclopedia of Herbs. London: Timber Press.*
- [14] *Small, E.; National Research Council Canada (2006). Culinary Herbs. NRC Research Press. p. 1. ISBN 978-0-660-19073-0. Retrieved 9 October 2018.*
- [15] Patrick Curry: "Culpeper, Nicholas (1616–1654)", *Oxford Dictionary of National Biography* (Oxford, UK: OUP, 2004)
- [16] *Wrench, Ruth D. (1992). The Essence of Herbs. University Press of Mississippi. p. 9.*
- [17] *Tapsell LC, Hemphill I, Cobiac L, Sullivan DR, Fenech M, Patch CS, Roodenrys S, Keogh JB, Clifton PM, Williams PG, Fazio VA, Inge KE (2006). "Health benefits of herbs and spices: The past, the present, the future". Medical Journal of Australia. 185 (4): S1-S24. doi:10.5694/j.1326-5377.2006.tb00548.x. PMID 17022438. S2CID 9769230.*
- [18] *Adele G Dawson (2000). Herbs, Partners in Life: Healing, Gardening and Cooking with Wild Plants. Bear & Co. pp. 5-6.*
- [19] *Dillehay T, Rossen J, Ugent D, Karathanasis A, Vásquez V, Netherly P (2010). "Early Holocene coca chewing in northern Peru". Antiquity. 84 (326): 939-953. doi:10.1017/S0003598X00067004. S2CID 162889680.*
- [20] *Ernest Abel (1980). Marihuana: The First Twelve Thousand Years (PDF). New York: Springer. ISBN 978-0-306-40496-2. Retrieved 2018-07-25.*
- [21] *Cooper, Guy; Taylor, Gordon I. (1986). English Herb Garden. Random House.*
- [22] *Panda, H. (2015). Herbal Cosmetics Handbook (3rd ed.). Asia-Pacific Business Press.*