SAW PALMETTO

Serenoa repens (W.Bartram) Small

Family

Arecaceae, the palm family.

Parts Used

Fruit.

Description

Saw palmetto is the most abundant native palm endemic to the south-eastern coast of North America (growing from the coastal plains of Louisiana, across the Florida peninsula and up to South Carolina). The small, low-growing woody shrub (occasionally a small tree), which produces impenetrable thickets, grows to a height of 0.6 to 2.1 metres, although it may reach up to 7.5 metres. It is characterised by evergreen, fan-shaped leaves, about one metre wide, lined with saw-like teeth along the margins of the petioles (the petiole is a stalk that connects the blade with the leaf base). These sharp spines give saw palmetto its common name. The harvest, therefore, is best done with heavy gloves to avoid getting cut. The flowers are cream-colored and fragrant. The dark succulent fruit is a drupe, green or yellow at immature stages, and black when ripe (between August and October), resembling black olives in size and shape with large seeds within. Their aroma is strongly aromatic, reminiscent of foul-smelling socks. It is adapted to a variety of habitats, thriving in sandy soils, often in dry conditions. Sometimes called "*sabal*", based on a now obsolete botanical name *Sabal serrulate*, saw palmetto is most common in Florida and adjacent Georgia. In the 1940s 10% of Florida's land surface (3.5 million acres) was covered in saw palmetto

however its natural habitat has greatly reduced (by 43%) due to conversion of saw palmetto scrub into citrus plantations, rangeland (cattle grazing), surface water drainage and suburban and urban development. The harvest volume is usually in the 4000 to 8000 metric tonne range, although that can almost double depending on the year. It is susceptible to environmental changes such as extensive rain (this interrupts the flowering period which happened in the 2018 harvest). From the point of view of sustainability, overall, there is enough fruit grown and harvested in an average year that can supply the dietary supplement market.[1] [2] [3]

Traditional Use

Saw palmetto is one of the most important North American medicinal plants of modern times. The fruits (berries) of saw palmetto were a staple food and medicine of the indigenous Floridians before European contact. The Seminole people of Florida used the fruit for food and the leaf stems to make medicine baskets. They prepared an aqueous infusion of the fruit to treat stomach-ache and dysentery. Other sources indicate that native Americans used the fruit as a diuretic and sexual tonic.[4]

A leader in the Eclectic medicine movement during the 19th and early 20th centuries, pharmacist John Uri Lloyd, observed that people became interested in saw palmetto fruit following its apparent effect on animals. In the 1870s investigations by physicians followed and it was then introduced into medical practice as a new remedy. It became one of the most important native remedial plants harvested from the south of America in the late 19th and early 20th centuries. Around 1884 to 1885 saw palmetto oil was being offered for sale as a substitute for cod liver oil. By the 1880s to 1890s various preparations were offered by Eclectic and allopathic drug manufacturers. The fruit was prescribed dispensed in an alcoholic fluid extract by physicians of the Eclectic system of medicine. The dosage range was wide, from one to 60 drops, apparently based on individual diagnosis.[5]

At first touted as a possible remedy for the treatment of coughs, colds and debility, it soon gained a reputation for treatment of various prostate conditions. It was an official drug, listed in two editions of the United States (US) Pharmacopoeia from 1906 to 1916. Multiple effects were reported, both digestive (stimulating appetite and providing nutrition) and reproductive (increasing the size and secreting ability of the mammary glands, decreasing ovarian and uterine irritability, relieving dysmenorrhoea, improving ovarian dysfunction, decreasing prostate enlargement etc.).[6] [7]

In Europe, particularly in France, Germany and Italy, saw palmetto products were a mainstay of homeopathic practice from the 1930s to the 1960s, after which saw palmetto-based phytomedicine products emerged as standard treatments for benign prostatic hyperplasia (BPH). These products were largely prescribed by physicians and dispensed by pharmacists. As more scientific evidence of safety and efficacy of saw palmetto products was published, interest increased in the early 1990s, particularly in Germany. Demand is still on the rise to this day.[8]

The increased demand for saw palmetto prompted the Florida Department of Agriculture and Consumer Services to officially put saw palmetto on the "Commercially Exploited Plant List" as of July 17, 2018. From this time a permit is required from the state of Florida to harvest, possess and transport saw palmetto fruit. Written permission from the landowner is required prior to harvest.[9]

According to botanical photographer and herbal medicine expert, the late Stephen Foster, harvesting saw palmetto fruit is gruelling work. Foster joined a harvesting crew of four in the mid-1990s for a photo shoot and wrote an account of it. They met at 4am and by 11am they had a full load, about half a tonne of the fresh berries. "To call saw palmetto harvest 'wildcrafting' would be like calling coal mining 'rock-sculpting'," he said. Depending upon the location the harvest begins in suffocating 35-plus degrees Celsius heat, and steamy humidity, under the hot Florida sun. The ripened fruit is primarily harvested between August and November (after the tomato season has ended) by migrant workers, often from the Caribbean Islands, Central America and Mexico. The workers call the fruit by the local Spanish name *bolita*. It is a short season, usually about two weeks. The fruits are very oily and have a peculiar fragrance (see Description). The smell is said to

permeate every pore. An account from the 1700s compares the taste of saw palmetto berries "to nothing else, but rotten Cheese steep'd in Tobacco." Not only can the leaf stalks, with their saw-like teeth, tear clothes to shreds, there is also the threat of alligators, venomous eastern diamondback rattlesnakes, panthers, bears and raccoons. Saw palmetto is an important forage food and cover for this wildlife, along with other wild mammal, reptile, bird, amphibian and insect species. The harvesters take the berries to sell at one of the nearby buying stations. The buyers then sell the berries to larger companies who clean the berries by sifting and blowing them to get rid of sticks and twigs. They can then be shipped to buyers. This herb is valuable not just because of its medicinal properties but also because of the labour and risks to human health involved in collecting it.[10] [11]

Today saw palmetto is the premier herbal treatment for BPH and has been lauded as 'the old man's friend'. BPH is one of the most common diseases in lower urinary tract symptoms (LUTS), which can cause urinary dysfunction in middle-aged and elderly men and may affect the normal life of patients.[12] [13]

While saw palmetto has historically been classified as the 'men's reproductive herb' it is also a beneficial herb for women's reproductive issues. British herbalist Anne McIntyre uses saw palmetto successfully with women as a reproductive tonic to increase sexual energy, fertility and for increasing milk flow in nursing mothers. She also prescribes it for relieving painful periods, to regulate the menstrual cycle and for inflammatory conditions such as salpingitis (inflammation of the fallopian tubes) and ovarian pain. McIntyre also mentions its affinity with the urinary system where it is used in both men and women for urinary infections, fluid retention, incontinence and bed wetting. Its expectorant properties make it a good remedy for chronic and congestive catarrhal conditions of the respiratory system such as asthma and bronchitis.[14]

Constituents

Ripe saw palmetto fruit contains 15 to 20% lipids, primarily free fatty acids, fatty acid esters, triglycerides and sterols. It is also rich in acidic polysaccharides. Additional compounds include phenolic acids, gallic acid, flavonoids (rutin, isoquercitrin, and astragalin) and carotenoids. Chief Science Officer for the American Botanical Council, Stefan Gafner, says additional constituents, that have not been studied yet, are the most interesting. "Some of the efficacies that we see in humans could be related to those ingredients that we haven't discovered yet. So I think that will be quite an exciting adventure," he said.[15] [16]

Actions

Anti-inflammatory, antiprostatic, male tonic, antispasmodic, expectorant, antiseptic, diuretic.

Pharmacological Activity

There are numerous controlled clinical studies that confirm the safe and effective use of saw palmetto preparations in treating the symptoms associated with BPH. There is also preliminary evidence suggesting that the herb may reduce prostate enlargement. Evidence that it may help prevent the onset of prostate cancer is lacking.

Several mechanisms of action have been proposed including antiandrogenic action, an anti-inflammatory effect and an antiproliferative proapoptotic effect mediated through the inhibition of growth factors. However, the precise mechanisms of action are still to be described. In this regard, extrapolating the results of *in vitro* laboratory studies to the complex human situation requires caution and supplementary scientific evidence.[17]

In a Plants in Commerce webinar series by the Sustainable Herbs Program, CEO at US nutraceutical company Valensa International Umasudhan Pal, says the most widely used extraction process in the US for saw palmetto is supercritical CO2, and in Europe they use ethanol or hexane, the process used for the herbal medicine sold in France and which is the most studied saw palmetto preparation. It was first approved for the treatment of BPH in 1981, and efficacy similar to that of the 5α-reductase inhibitor finasteride (used in the treatment of BPH and male pattern hair loss) was established in early clinical trials. Other extracts have traditional use status. Synthesis research (comparison and contrast analysis), including systematic reviews of clinical trials, has previously reported excellent

results using saw palmetto for BPH while noting that discrepancies exist. More recently, some of these other saw palmetto extracts have been studied however there is concern that variations in chemical constituents may be a key factor behind the inconsistent results sometimes seen in clinical trials. The large variability in patient population, severity of disease and extraction or source of saw palmetto highlights some of the challenges in herbal medicine research when applying research results to individuals. Pal says "for the most part all three [methods of extraction] yield the same amount of fatty acid profile and the unique phytopigments and phytonutrients of saw palmetto." He added that there is a well-defined saw palmetto fingerprint (including fatty acids, the ratio of fatty acids (there are nine different ratios), total long chain fatty alcohols, carotenoids and sterols) in the US Pharmacopeia monograph with a tight range, and centuries of know-how, which has to pass testing. This is backed up by a 2019 study which found that "in spite of various concentrations of total fatty acid depending on saw palmetto products, the composition of saw palmetto prepared by a similar extraction method was found to be comparable. The percentage of the nine different single fatty acids (capric acid, caprylic acid, lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, linoleic acid, and linolenic acid) was similar in products prepared by a similar extraction method... Multiple rather than single mechanisms may be involved in the beneficial effects of saw palmetto in BPH treatment."[18 19 20 21]

This monograph will focus on a small selection of recent, human clinical studies of ethanolic extracts (if known) to demonstrate activity, rather than including preclinical trials or "borrowing" the scientific results obtained from the majority of trials using the hexane or CO2 extracts. This is due to the fact that there is conflicting evidence about variations in the chemical constituents from the different extractions so there is the potential to be misleading.

BPH Activity

A large number of papers have evaluated saw palmetto's efficacy in controlling BPH related lower urinary tract symptoms. A 2020 systematic review and meta-analysis indicated that saw palmetto had the same effect in treating BPH compared with tamsulosin (a drug known as Flomax used for BPH) after at least a six month treatment cycle. Four double-blind randomised controlled trials, and involving 1,080 patients (543 in the saw palmetto group and 537 in the tamsulosin group), were included in the meta-analysis.[22]

In a 2019 multicentre, randomised, double-blind, placebo-controlled trial saw palmetto was effective, safe, well-tolerated and clinically and statistically superior to placebo in the target LUTS/BPH population. In the study 354 patients with LUTS/BPH, from 19 institutions in China, were randomly assigned into the saw palmetto (320mg) or placebo groups for 24 weeks. Statistically significant improvement in the peak urinary flow, International Prostate Symptom Score, scores of storage symptoms and voiding symptoms, quality of life score, four-item male sexual function questionnaire score and International Index of Erectile Function score were observed in the saw palmetto group compared with those in the placebo group.[23]

A 2017 study found possible efficacy of an ethanolic extract of saw palmetto in patients with BPH. This was due to the mild improvements of the urine flow, prostate size and International Prostate Symptom Score during 12 months treatment with saw palmetto. The study was performed on 70 men, aged 40 to 79 years, with symptomatic BPH. They were divided into a group of 40 patients treated with saw palmetto extract (320mg per day of a commercial saw palmetto ethanolic extract) and a control group of 30 patients that received no treatment and were observed only (watchful waiting).[24]

Prostate Cancer Activity

LUTSs affects 75% to 80% of men undergoing radiation therapy for prostate cancer. Despite the drug interaction below, a recent study determined the safety, maximum tolerated dose and preliminary efficacy of saw palmetto for the management of LUTS during radiation therapy for prostate cancer. The results showed that 960mg may be a safe herbal supplement but its efficacy in managing LUTS during radiation therapy needs further investigation.[25]

LUTS Activity

A 2022 study is the first to demonstrate the potential of saw palmetto to mitigate LUTS in adult women. Overall, the multicentre, randomised, double-blind, placebo-controlled study revealed for the first time that saw palmetto may alleviate the symptoms of daytime frequency and nocturia (urinating frequently at night) in women. The daytime frequency score in the core lower urinary symptom score questionnaire was significantly lower in women with LUTS treated with saw palmetto for 12 weeks than in the placebo group. In the Japanese study 38 women took 320mg of saw palmetto embedded in gelatine capsules and 37 took a placebo.[26]

Hair Regrowth Activity

Saw palmetto has gained commercial popularity for its purported benefits on hair regrowth due to its antiandrogenic properties. A 2020 systematic review of saw palmetto in alopecia found that supplements containing saw palmetto may be a treatment option for patients with androgenetic alopecia, hair shedding (telogen effluvium) and self-perceived hair thinning, although robust high-quality data are lacking. Five randomised clinical trials and two prospective cohort studies demonstrated positive effects of topical and oral supplements containing saw palmetto (100 to 320mg) among patients with androgenetic alopecia and telogen effluvium. Sixty percent improvement in overall hair quality, 27% improvement in total hair count, increased hair density in 83.3% of patients and stabilised disease progression among 52% were noted.[27]

Indications

- Benign prostatic hyperplasia (BPH), erectile dysfunction, male infertility.
- Cystitis, urethritis, incontinence, bed wetting.
- Polycystic ovarian disease, infertility associated with elevated oestrogen and testosterone combined with low progesterone, ovarian pain, cystic acne, androgenic alopecia, hirsutism.
- Bronchitis, asthma, colds, congestion, coughs, irritated throats, whooping cough, acute and chronic catarrh, chronic laryngitis, chronic sore throat.

Energetics

Pungent, sweet, warming, moistening.

Use in Pregnancy

Use of saw palmetto during pregnancy is contraindicated due to the herb's hormonal effects. In clinical practice it is not used in pregnancy.[28]

Contraindications

Take with meals to avoid minor complaints such as gastrointestinal upset, constipation, nausea, abdominal pain and diarrhoea.

If symptoms of BPH worsen, blood is detected in the urine or acute urinary retention occurs, professional reassessment is required.[29]

Drug Interactions

Avoid saw palmetto if the patient is undergoing radiotherapy for prostate cancer as preliminary *in vitro* studies suggest it may radiosensitise normal prostatic cells by inhibiting normal DNA repair. See study above for conflicting clinical evidence.[30]

Caution with anticoagulant/antiplatelet drugs (such as warfarin) due to a theoretical increased risk of bleeding and bruising.

Caution with oestrogenic drugs (such as hormone replacement therapies and oral contraceptives) due to theoretical altered drug effects.

While the clinical significance is unclear, monitor for signs of decreased drug effects when taking androgenic drugs such as testosterone.

It is possible saw palmetto may have theoretical additive effects when taking finasteride and other drugs used for BPH. This combination may be beneficial which may improve disease management. While there is no evidence of negative interactions patients should be monitored when taking these drugs.[31]

Administration and Dosage

Liquid Extract:	1:2
Alcohol:	65%
Weekly Dosage:[32]	15 to 30mL

References

1. Foster S. Saw Palmetto in Commerce. Part 1: Revelations from European Contact to 1990. Sustainable Herbs Program American Botanical Council. (accessed 8 Sep 2022). Available https://sustainableherbsprogram.org/saw-palmetto/
2. Gafner S. Saw palmetto extract laboratory guidance document. Austin, TX: ABC-AHP-NCNPR. Botanical Adulterants Prevention Program. 2019.
3. Foster S, Gafner S, Fletcher E, Pal U. Saw Palmetto: A Conversation on Sustainability, Quality. Plants in Commerce Webinar Series. Sustainable Herbs Program and American Botanical Council. Oct 8 2020. Available from https://sustainableherbsprogram.org/webinar/
4. Saw palmetto berry. Excerpt from Herbal Medicine: Expanded Commission E Monographs. American Botanical Council c2022. (accessed 10 Oct 2022). Available from https://www.herbalgram.org/resources/expanded-commission-e/saw-palmetto-berry/
5. Saw palmetto berry. Excerpt from Herbal Medicine: Expanded Commission E Monographs. American Botanical Council c2022. (accessed 10 Oct 2022). Available from https://www.herbalgram.org/resources/expanded-commission-e/saw-palmetto-berry/
6. Geavlete P, Multescu R, Geavlete B. Serenoa repens extract in the treatment of benign prostatic hyperplasia. Ther Adv Urol. 2011 Aug;3(4):193-8. doi: 10.1177/1756287211418725. PMID: 21969849; PMCID: PMC3175703.
7. Saw palmetto berry. Excerpt from Herbal Medicine: Expanded Commission E Monographs. American Botanical Council c2022. (accessed 10 Oct 2022). Available from https://www.herbalgram.org/resources/expanded-commission-e/saw-palmetto-berry/
8. Foster S. Saw Palmetto in Commerce. Part 1: Revelations from European Contact to 1990. Sustainable Herbs Program American Botanical Council. (accessed 8 Sep 2022). Available https://sustainableherbsprogram.org/saw-palmetto/
9. Foster S. The Historical Interplay of Plant Biology, Trade, and Human Interactions with Saw Palmetto. Herbalgram. The Journal of the American Botanical Council. Nov 2021-Jan 2022. 132:36-67. Available from http://herbalgram.org/media/16957/hg132-feat-sawpalmetto-wcvr.pdf
10. Foster S. Saw Palmetto in Commerce. Part 1: Revelations from European Contact to 1990. Sustainable Herbs Program American Botanical Council. (accessed 8 Sep 2022). Available https://sustainableherbsprogram.org/saw-palmetto/
11. Foster S. The Toil of the Harvest: Saw Palmetto. Sustainable Herbs Program American Botanical Council. (accessed 8 Sep 2022). Available from http://herbalgram.org/explore/plants-in-commerce/saw-palmetto-in-commerce/saw-palmetto-harvesting/
12. Cai T, Cui Y, Yu S, Li Q, Zhou Z, Gao Z. Comparison of Serenoa repens With Tamsulosin in the Treatment of Benign Prostatic Hyperplasia: A Systematic Review and Meta-Analysis. Am J Mens Health. 2020 Mar-Apr;14(2):1557988320905407. doi: 10.1177/1557988320905407. PMID: 32274957; PMCID: PMC7153190.
13. Foster S. The Historical Interplay of Plant Biology, Trade, and Human Interactions with Saw Palmetto. Herbalgram. The Journal of the American Botanical Council. Nov 2021-Jan 2022. 132:36-67. Available from http://herbalgram.org/media/16957/hg132-feat-sawpalmetto-wcvr.pdf
14. McIntyre A. The Complete Woman's Herbal. Gai Books Limited:London. 1994. p. 105
15. Braun L, Cohen M. Herbs and Natural Supplements. 3rd ed. Sydney: Churchill Livingstone Elsevier; 2010. p. 875
16. Foster S, Gafner S, Fletcher E, Pal U. Saw Palmetto: A Conversation on Sustainability, Quality. Plants in Commerce Webinar Series. Sustainable Herbs Program and American Botanical Council. Oct 8 2020. Available from https://sustainableherbsprogram.org/webinar/
17. Geavlete P, Multescu R, Geavlete B. Serenoa repens extract in the treatment of benign prostatic hyperplasia. Ther Adv Urol. 2011 Aug;3(4):193-8. doi: 10.1177/1756287211418725. PMID: 21969849; PMCID: PMC3175703.
18. Blair, H.A. Hexanic Extract of Serenoa repens (Permixon®): A Review in Symptomatic Benign Prostatic Hyperplasia. Drugs Aging. 2022. 39:235–243. https://doi.org/10.1007/s40266-022-00924-3
19. Gafner S. Saw palmetto extract laboratory guidance document. Austin, TX: ABC-AHP-NCNPR
20. Botanical Adulterants Prevention Program. 2019.
21. Kwon Y. Use of saw palmetto (Serenoa repens) extract for benign prostatic hyperplasia. Food Sci Biotechnol. 2019 Apr 17;28(6):1599-1606. doi: 10.1007/s10068-019-00605-9. PMID: 31807332; PMCID: PMC6859144.
22. Sarris J, Wardle J. Clinical Naturopathy, 2nd ed. Chatswood:Elsevier. 2014. p.501
23. Cai T, Cui Y, Yu S, Li Q, Zhou Z, Gao Z. Comparison of Serenoa repens With Tamsulosin in the Treatment of Benign Prostatic Hyperplasia: A Systematic Review and Meta-Analysis. Am J Mens Health. 2020 Mar-Apr;14(2):1557988320905407. doi: 10.1177/1557988320905407. PMID: 32274957; PMCID: PMC7153190.
24. Ye Z, Huang J, Zhou L, Chen S, Wang Z, Ma L, et al. Efficacy and Safety of Serenoa repens Extract Among Patients with Benign Prostatic Hyperplasia in China: A Multicenter, Randomized, Double-blind, Placebo-controlled Trial. Urology. 2019 Jul;129:172-179. doi: 10.1016/j.urology.2019.02.030. Epub 2019 Mar 14. PMID: 30880074.
25. Saidi S, Stavridis S, Stankov O, Dohcev S, Panov S. Effects of Serenoa repens Alcohol Extract on Benign Prostate Hyperplasia. Pril (Makedon Akad Nauk Umet Odd Med Nauki). 2017 Sep 1;38(2):123-129. doi: 10.1515/prilozi-2017-0030. PMID: 28991765.
26. Wyatt GK, Sikorskii A, Safikhani A, McVary KT, Herman J. Saw Palmetto for Symptom Management During Radiation Therapy for Prostate Cancer. J Pain Symptom Manage. 2016 Jun;51(6):1046-54. doi: 10.1016/j.jpainsymman.2015.12.315. Epub 2016 Feb 16. PMID: 26891611.
27. Yamada S, Shirai M, Ono K, Kageyama S. Beneficial Effects of Saw Palmetto Fruit Extract on Urinary Symptoms in Japanese Female Subjects by a Multicenter, Randomized, Double-Blind, Placebo-Controlled Study. Nutrients. 2022 Mar 11;14(6):1190. doi: 10.3390/nu14061190. PMID: 35334848; PMCID: PMC8953103.
28. Evron E, Juhasz M, Babadjouni A, Mesinkovska NA. Natural Hair Supplement: Friend or Foe? Saw Palmetto, a Systematic Review in Alopecia. Skin Appendage Disord. 2020 Nov;6(6):329-337. doi: 10.1159/000509905. Epub 2020 Aug 23. PMID: 33313047; PMCID: PMC7706486.
29. Braun L, Cohen M. Herbs and Natural Supplements. 3rd ed. Sydney: Churchill Livingstone Elsevier; 2010. p. 879
30. Braun L, Cohen M. Herbs and Natural Supplements. 3rd ed. Sydney: Churchill Livingstone Elsevier; 2010. p. 878
31. Braun L, Cohen M. Herbs and Natural Supplements. 3rd ed. Sydney: Churchill Livingstone Elsevier; 2010. p. 878
32. Hechtman L. Advanced Clinical Naturopathic Medicine. Elsevier Australia:Chatswood. 2020. p. IT-66
33. British Herbal Medicine Association's Scientific Committee. British Herbal Pharmacopoeia. BHMA, Bournemouth, 1983.