

A Review of the Role of Saw Palmetto Extracts and Importance of Extract Quality to Help Manage Lower Urinary Tract Symptoms (LUTS) and Benign Prostatic Hyperplasia (BPH)

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USPlus® is a genuine, pure Saw Palmetto extract offered exclusively from Valensa International. USPlus® is produced utilizing a vertically integrated supply chain. Valensa works directly with harvesters, land owners and driers to ensure the integrity and quality of each berry harvested while using patented Deep extract® supercritical CO₂ extraction in their Eustis, Florida facility to provide the highest quality, solvent free extract possible. USPlus® is of superior quality, meeting USP and EU monographs while ensuring an unadulterated product that provides unrivaled consistency in potency, containing 4-30x higher levels of carotenoids and increased phytosterol content when compared to other extracts on the market. Valensa International has created the gold standard for Saw Palmetto extracts with USPlus®, providing a supercritical CO₂ extracted clean ingredient, Non-GMO, unmatched potency and a transparent supply chain. Saw Palmetto extracts, which are sold as dietary supplements in the USA (and also sold as drugs in Europe), have primarily been used to support prostate health.

Benign prostatic hyperplasia (BPH) is the nonmalignant enlargement of the prostate gland, a common occurrence in older men which can cause lower urinary tract symptoms (LUTS).¹ The enlarged prostate can impede the flow of urine from the bladder and can cause urine retention, leading to the need to urinate frequently during the day and night. Standard of care in the U.S. and Europe² is for men with mild lower urinary tract symptoms associated with BPH to enter a “watchful waiting” period to monitor the course of the condition, during which time the Physician monitors the symptoms to check if they are stable or progressing from moderate to more severe. If BPH is progressive, Physicians will recommend one of three options: medication, in-office BPH therapy, or surgery.³ Men who remain stable with mild to moderate symptoms often remain in the watchful waiting phase. It is during this early stage of BPH symptoms that phytotherapies have been found to play a role in prostate health. A key natural phytotherapy is the ripe berries extract of *Serenoa repens*, known as saw palmetto extract.



Saw Palmetto is a small palm, growing up to 7-10 feet tall and native to parts of the South-eastern United States, primarily Florida. The fruit (berries) of saw palmetto contain a number of important phytonutrients, especially free fatty acids, phytosterols and carotenoids, which have known beneficial effects. In fact, traditional therapies for lower urinary tract symptoms associated with mild to moderate BPH include saw palmetto extract.² For decades in Europe, the high-quality saw palmetto extract prescription product, Permixon[®], has been approved for use in mild to moderate BPH.^{2,4} Permixon[®] is a hexane extract of the saw palmetto berry, with a 320 mg daily dose. Permixon[®] has been clinically established for efficacy in treatment of lower urinary tract symptoms associated with BPH.^{5,6}

In the United States, saw palmetto extract and berry powders are available in dietary supplements, without a prescription. As a distinction, the saw palmetto extracts (not the ground saw palmetto berry powders) have been shown to have clinical efficacy on mild to moderate BPH. Established standards for extract quality are specified by the United States Pharmacopeia (USP), which sets strict guidelines for the fatty acid ratios and phytosterol content to ensure authenticity.⁷

Figure 1. Analytical values for saw palmetto extract products compared to the USP Monograph standards.

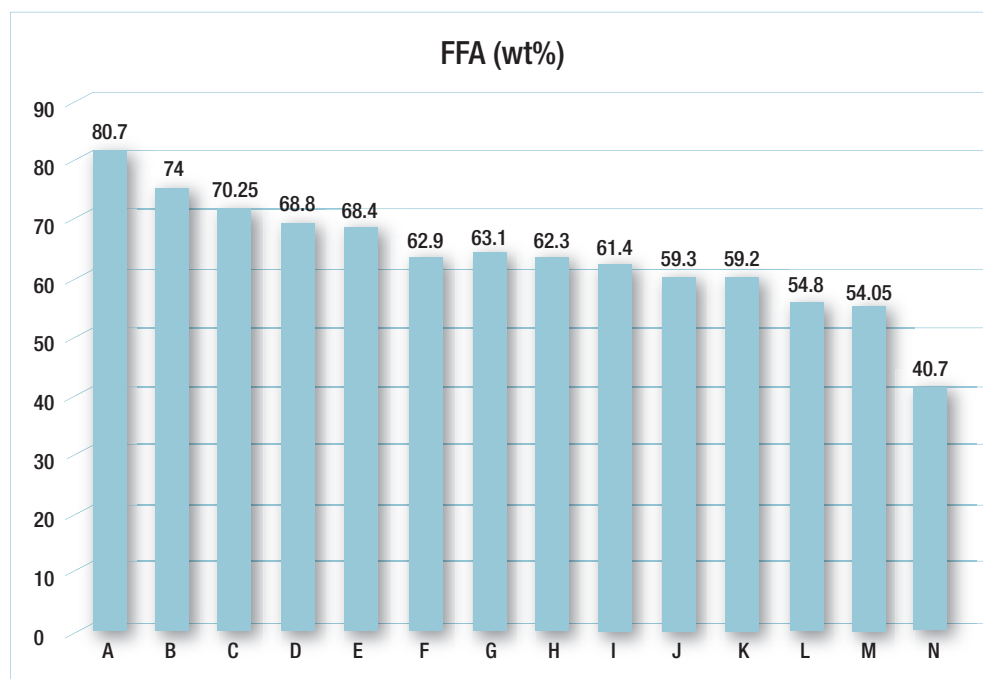
Parameter	USP Monograph	Valensa USPlus	Typical Imported Extract
Lauric Acid Ratio Identification			
Capric	9 - 16	10	16
Caproic	9 - 40	13	124
Caprylic	8.5 - 17.5	12	11
Linoleic	4 - 8	7	5.6
Linolenic	35 - 60	38	19
Myristic	2.2 - 2.8	2.6	3.2
Oleic	0.60 - 1.15	0.9	1.1
Palmitic	2.8 - 3.9	3.4	3.1
Stearic	13 - 20	16	14
Total Fatty Acids	min. 80%	90%	91%
Free Fatty Acids		71%	23%
Phytosterols	min. 0.2%	min. 0.34%	0.30%
Fatty Alcohols	min. 0.15%	0.23%	0.001%
Peroxide Value		0.6%	6.5%

Meeting the US Pharmacopeia (USP) monograph for a saw palmetto extract requires several factors to be met. Green, or immature saw palmetto berries have not fully developed and the phytonutrient profile (lauric acid ratio, phytosterol and fatty alcohol level) that can be achieved in the lipid fraction (lipidosterolic extract) does not meet the standards established by the USP.

Despite these guidelines, numerous saw palmetto products currently available are produced by a variety of extraction methods, use un-ripened berries with low free fatty acids, are adulterated/diluted with undeclared vegetable oils or are sold as plain crushed berry powder. These variances in product quality result in a lack of equivalence which contributes to confounding clinical trial and consumer results. In 2014 Booker et al. compared the fatty acid content of six saw palmetto products being marketed and “reported a – 97% to +140% difference compared with the label claim. Half of the samples tested contained less than 25% of the stated amount.”⁸ This wide variation of fatty acid content amongst saw palmetto extracts can explain some differences in clinical trial outcomes.

In 2004 Habib et. al. tested the fatty acid content of fourteen brands of saw palmetto extracts.⁹ The percentage of free fatty acids varied widely from 80% to 40%, as seen in the chart below

Figure 2. Free fatty acid comparison of saw palmetto extracts.⁹

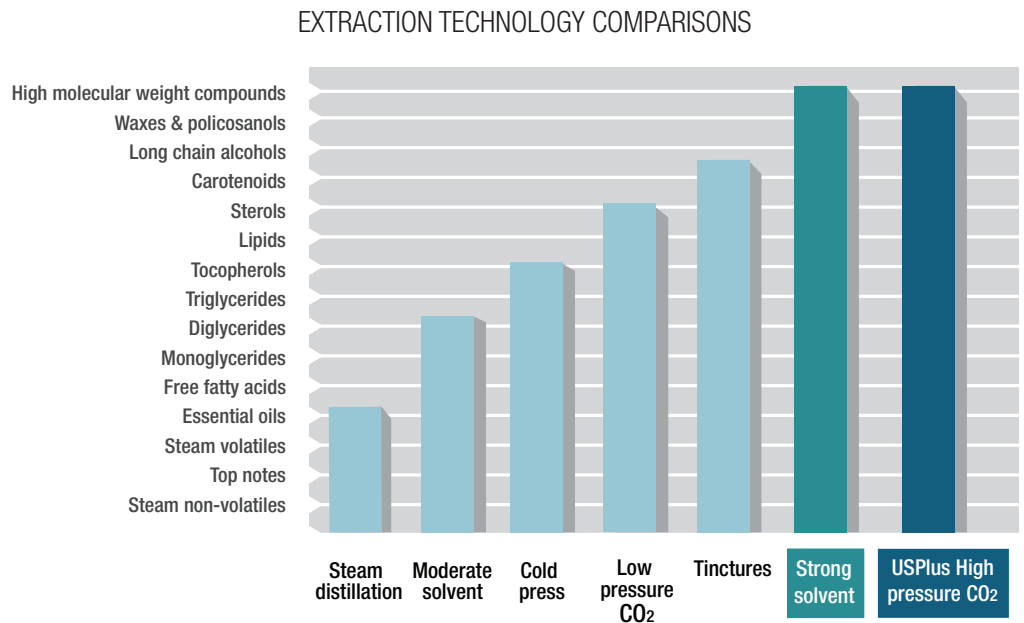


The variability reported by Habib et. al. illustrates why it so important to ensure the saw palmetto berries are extracted using properly ripened berries, with proper methodology and standardized to the USP and/or European Pharmacopeia monographs.^{7,10}



In 2014 De Monte, et. al. provided a review of extraction techniques used for 12 different brands of *Serenoa repens* (saw palmetto) and the impact on the presence of the key beneficial components: free fatty acids, esterified fatty acids and other compounds such as phytosterols.¹¹ In his publication, De Monte reported that the Supercritical CO₂ (SCCO₂) extraction method is non-toxic, non-flammable, and easy to remove and recycle at the end of the process (eco-friendly) unlike solvent extraction techniques. In addition, SCCO₂ also draws an important profile of bioactive phytonutrients from the saw palmetto berry to achieve beneficial amounts of actives.¹²

Figure 3: A comparison of the actives extracted by various extraction methods. The deepest extracts are obtained by strong solvents (hexanes) or high-pressure supercritical CO₂ extraction.
[Source: Internal Valensa data]



Considering the variability in quality of saw palmetto extracts on the market, it is important to look at quality and standards as essential for product to have benefit when used. Indeed, in 2012 Ricco et al. published a review of a clinical trial which was critical of saw palmetto efficacy and concluded that “It is not possible to be absolutely certain that these findings apply to all saw palmetto extract preparations, given the unknown active ingredients ...”.^{13,14} This re-emphasizes the need to look to established standards for the quality of the saw palmetto extract, such as the US Pharmacopeia standards, for effective use in lower urinary tract symptom management when mild to moderate BPH is present.

An examination of published review papers, and randomized clinical trials (RCTs) that were conducted with a 320 mg dose per day of USP or EU compliant saw palmetto extract is summarized below. The papers support the conclusion that saw palmetto extract can be effective in reducing symptoms resulting from mild to moderate BPH when an effective dose (320 mg) of a quality product, meeting standard guidelines is used.

Table 1: Summary of studies assessing supercritical CO₂ and hexane extracts of saw palmetto for lower urinary tract symptoms associated with BPH

Studies of Supercritical CO ₂ & Hexane Extracted Saw Palmetto for Treatment of LUTS Associated With BPH				
Study	Publication Year	Type	Extraction Method	Outcome
Gerber et al. ¹⁵	2001	RCT	Unknown but standardized to 85% - 95% FA	Saw palmetto led to a statistically significant improvement in urinary symptoms in men with lower urinary tract symptoms compared with placebo.
Latil et al. ¹⁶	2015	RCT	Hexane	Patients with evidence of inflammation responded better to saw palmetto extract than others.
Alcaraz et al. ¹⁷	2016	RCT	Hexane	Saw palmetto extract formula showed an equivalent efficacy to α -adrenergic blockers and 5- α -reductase inhibition with fewer side effects.
Novara et al. ⁶	2016	Review of RCT's	Hexane	Meta-analysis on Permixon hexane extracted saw palmetto showed decreased nocturnal voids and increased Qmax compared with placebo and had efficacy in relieving LUTS similar to tamsulosin and short-term finasteride.
Moringa et al. ¹⁸	2018	RCT	Supercritical CO ₂	Treatment with saw palmetto extract formula was not inferior to tadalafil 5 mg for improving IPSS and Qmax in men with LUTS
Vela-Navarrete et al. ⁵	2018	Review of RCT's	Hexane	Saw palmetto extract appears to be an efficacious and well-tolerated therapeutic option for the long-term medical treatment of LUTS/BPH

Conclusions

Studies using supercritical CO₂ and hexane extracts of saw palmetto berries are both successful in treating symptoms of BPH and LUTS. Supercritical CO₂ and hexane extracts obtain the highest percentages of fatty acids and correspondingly have the highest 5- α -reductase activity. This is responsible for the successful therapeutic effects seen in BPH and LUTS clinical trials. Twenty-seven studies, including 15 randomized controlled trials and twelve observational studies had successful results at treating BPH and LUTS. The recommended therapeutic dose of USP compliant saw palmetto extract is 320 mg per day. When a consumer in the “watchful waiting” period of his BPH and/or LUTS condition chooses a brand of saw palmetto berry extract, he should check that the product meets the USP or European Pharmacopeia monograph. Consumers should be aware that consuming saw palmetto crushed berry powder does not have appropriate concentrations of fatty acids for treating BPH or LUTS and has no clinical data supporting its use. Standardized powdered extracts should be dosed to provide at least 320 mg of saw palmetto berry derived fatty acids per day.

Valensa International's USPlus[®] Saw Palmetto extract provides a high quality, gold standard ingredient that is Non-GMO, supercritical CO₂ extracted, with the highest potency on the market, all while utilizing a highly engaged, transparent supply chain.

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