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Review Article

A review on phytotherapy of saw palmetto for reproduction

Arash Abdolmleki¹, Mehwish Iqbal², Muhammad Akram³, Abid Rashid⁴, Umme Laila³, Rida Zainab³, Muhammad Talha Khalil³, Momina Iftikhar³, Nimra Shahid³, Marc Moboladji Bankole⁵, Abolanle AA Kayode⁶, Fethi Ahmet Ozdemir⁷, Gawel Sołowski⁷, Ebrahim Alinia-Ahandani⁸, Marcos Altable⁹, Babutunde Oluwafemi Adetuyi¹⁰, Naheed Akhter¹¹, Naheed Akhtar¹², Aymen Owais Ghauri¹³, Chukwuebuka Egbuna^{14,15}, Fariba Mahmoudi¹⁶, WalaaFikry Elbossaty¹⁷, Adonis Sfera¹⁸, Pragnesh Parmar¹⁹

¹Department of Biophysics, Faculty of Advanced Technologies, University of Mohaghegh Ardabili, Namin, Iran

²Institute of Health Management, Dow University of Health Sciences, Karachi Pakistan

³Department of Eastern Medicine, Government College University Faisalabad, Pakistan

⁴Faculty of Medical Sciences, Government College University Faisalabad, Pakistan

⁵African Centre of Excellence (World Bank) Public Health and Toxicological Research (ACE-PUTOR) University of Port Harcourt, Rivers State, Nigeria

⁶Department of Biochemistry, Babcock University, Ilishan Remo, Ogun State, Nigeria

⁷Department of Molecular Biology and Genetics, Faculty of Science and Art, Bingol University, Bingol, 1200, Türkiye

⁸Department of Biochemistry, Payame Noor University of Tehran, Tehran, Iran

⁹Department of Neurology, Neuroceuta, (Virgen de Africa Clinic), Spain

¹⁰Department of Natural Sciences, Faculty of Pure and Applied Sciences, Precious Cornerstone University, Nigeria

¹¹Department of Biochemistry, Government College University Faisalabad, Pakistan

¹²Department of Pharmacy, Faculty of Medical and Health Sciences, The University of Poonch, Rawalakot, Azad Jammu and Kashmir, Pakistan

¹³Department of Eastern Medicine, Jinnah University for Women, Karachi, Pakistan

¹⁴Department of Biochemistry, Faculty of Natural Sciences, Chukwuemeka Odumegwu Ojukwu University, Uli, Anambra State, Nigeria

¹⁵Nutritional Biochemistry and Toxicology Unit, World Bank Africa Centre of Excellence, Centre for Public Health and Toxicological Research (ACE-PUTOR), University of Port-Harcourt, Port Harcourt, Rivers State, Nigeria

¹⁶Department of Biology, Faculty of Science, University of Mohaghegh Ardabili, Ardabil, Iran


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¹⁷Department of Biochemistry, Damietta University, Egypt

¹⁸University of California Riverside, Patton State Hospital, USA

¹⁹Additional Professor and HOD, Forensic Medicine and Toxicology, AIIMS, Bibinagar, Telangana, India

*Corresponding author email: makram_0451@hotmail.com

	International Archives of Integrated Medicine, Vol. 10, Issue 9, September, 2023. Available online at http://iaimjournal.com/ ISSN: 2394-0026 (P) ISSN: 2394-0034 (O)
	Received on: 24-8-2023 Accepted on: 1-9-2023 Source of support: Nil Conflict of interest: None declared. Article is under creative common license CC-BY
How to cite this article: Arash Abdolmleki, Mehwish Iqbal, Muhammad Akram, et al. A review on phytotherapy of saw palmetto for reproduction. IAIM, 2023; 10(9): 19-26.	

Abstract

In alternative medicine, Saw palmetto is used in the treatment of many diseases, as it is effective in treating urinary system diseases through anti-androgen effects and effects on involuntary receptors in the lower urinary tract, in addition to being used in the treatment of patients with benign prostatic hyperplasia and cancer Prostatitis, chronic prostatitis (CP) and erectile dysfunction (ED). Scientific research has proven that Saw palmetto is considered a herbal remedy because it contains 3 phytosterols, 14 fatty acids, and SRM3251 contains 3 phytosterols, 17 fatty acids, β -carotene, and γ -tocopherol. It also played an important role as an anti-androgen as 5α -dihydrotestosterone (DHT) is converted from testosterone by the action of 5α -reductase, and this helps in the development of male sexual characteristics, transcription of androgen-regulating genes, prostate enlargement. Also, it affects on enzymes and chemokines that effect on the inflammatory process. Saw palmetto is used in the treatment of Chronic Prostatitis (CP) and Chronic Pelvic Pain Syndrome (CPPS). In this review, the phytochemical content of Saw palmetto will be highlighted and the pharmacological effect on male hormones, urinary system diseases and infections will be studied.

Key words

Saw palmetto, Anti-androgen, Cancer Prostatitis, Urinary system, 5α -dihydrotestosterone (DHT).

Introduction

Saw Palmetto also known as *Serenoa repens* Sabalserrulatum, fits into the family of Arecaceae (joannebarness). The primary use of the extract is ascribed to the indigenous Americans, for genitourinary disorders [1]. In the 1870s, the berries established to be explored for their therapeutic properties. Saw palmetto develops as a small shrub, seldom a little tree with slithering, horizontal, branched stems, typically to a height of 2 to 7 feet (0.6-2.1 m),

though it may get to till 25 feet. The stem systems run correspondingly to the surface of the soil, ultimately stemming under the substrate to structure rhizomes. Leaves of Saw palmetto are evergreen, fan-shaped, and about three feet (1 meter) broad. The edges of the petioles are bordered with pointed spines that have given saw palmetto its familiar name. The mature berries of the American dwarf palm (*Serenoa repens*) have been traditionally utilized to manage genitourinary complaints; to increase production

of sperm, size of breast, or sexual drive; and as a lenient diuretic [2]. Moreover Berries of Saw palmetto have also traditionally been consumed by American Indians to alleviate irritations of mucous membrane, enhance testicular function etc. [3]. In early *Materia Medica*, the fruit of saw palmetto were consumed by non-Indians to manage all ailments of the reproductive glands, as are lying agent to problems of digestion, and to fight colds and chronic bronchitis of pulmonary asthma [4]. These days saw palmetto is utilized to encourage urination, decrease inflammation and for management of prostate diseases such as benign prostatic hyperplasia, an expanded prostate gland condition frequently seen in older men [5] because Extract of saw palmetto is thought to be extremely efficient anti-androgen as it holds phytoesters. This has been the matter of immense deal of research with regards to the management of benign prostatic hypertrophy [6], polycystic ovarian syndrome [7] and androgenic alopecia [8].

Pharmacognosy and phytochemistry of saw palmetto

Serenoarepens berries are primarily sweet, then strong, pungent, and soapy [9, 10 11]. The smell is powerfully aromatic and fetid, similar to the smell of foul socks. Serenoarepens extracts also have a diverse aromatic and fetid smell. The blooms are cream-colored and aromatic, with 3 petals at the last part of stemmed panicles that develop from the axils of the leaf. The berry is a drupe, yellow or green at unripe stages, and black when matured, similar to black olives in shape and size [12 13]. The plant is prevalent to the southeastern United States, developing from the coastal plains of Louisiana across the Florida peninsula and up to South Carolina [12]. The principal constituents of the fruits are diverse fats, sterols and FFAs, essential oils, carotenoids and polysaccharides [14]. In the period of 1960's 3phytosterols were identified by TLC [15]. The FFAs and their ethyl esters are believed to be accountable for aminimization of 5-alpha-

reductase [16]. In pharmacological researches an antiphlogistic effect has been demonstrated for the acid polysaccharides separated from extracts of Serenoarepens berries. Saw palmetto extracts are compound mixtures comprised primarily of FFAs (85%) or EFAs (around two percent methyl-ethyl esters and five to six percent triglycerides). Other minor components are given in Table - 1 [17, 18, 19, 20, 21]. 3 categories of Serenoarepens extract are accessible commercially: sCO₂, Hexanic, and ethanolic extracts, by many brands. In accordance with the European medicines agency, only hexanicsaw palmetto extract are believed to be as herbal therapeutic products for the symptomatic management of benign prostatic hypertrophy because of their positive clinical effectiveness. According to Peng TS, et al. [22], young fruits have decreased concentrations of FAs than grown-up berries, and roughly the similar quantities of oleic and lauricacids (In contrast with older berries, where concentrations of oleic acid are greater than those of lauric acid) [22]. The most important phytosterols found in saw palmetto are stigmasterol (8-9%), β -sitosterol (68-72% of overall sterols) and campesterol (20-23%) [21, 23].

Saw palmetto for management of BPH in men

The occurrence of histopathologic benign prostatic hypertrophy is age reliant, with preliminary development typically occurring after forty years of age [24]. By sixty years of age, its occurrence is superior of fifty percent and by age 85, the frequency is as high as ninety percent. The two major forms of globally acknowledged medicinal management for benign prostatic hypertrophy are reducers of 5 alpha reductase, for instance finasteride and alpha 1 adrenoceptor antagonists, with the latter being more effectual [25]. Of the thirty plants identified to have been utilized historically in plant therapy for symptoms of benign prostatic hypertrophy, Serenoarepens has been the most extensively consumed.

Saw palmetto for management of lower urinary tract symptoms in men:

In Austria and Germany, phytotherapy is the 1st line management for mild to reasonable LUTS and corresponds to verninety percent of all medicines advised for the management of benign prostate hypertrophy [3].

Male reproductive health issues and saw palmetto:

Typical medical and laboratorial assessments are not sufficient to discover the reasons behind a lot of the male infertility patients [26]. It can vary from neuronal or hormonal discrepancies, disruptions in reproductive tissue to quantitative and qualitative worsening of semen. Oxidative stress provoked by reactive oxygen species is a chief contributing factor in male infertility [27, 28]. The grown-up spermatozoa are enclosed in polyunsaturated membrane of lipid which is in danger to the oxidative injury stimulated by reactive oxygen species, and this, in turn, can harm spermatogenesis and decrease sperm motility quality and morphology [26, 29]. The regulation of hypothalamic pituitary gonadal axis is the chief controller of male reproductive function where the hypothalamus synthesizes GnRH to encourage the secretion of follicle-stimulating hormone and LH from the anterior pituitary gland. The secreted follicle stimulating hormone and Luteinizing hormone proceed on the Leydig cells and Sertoli cells, correspondingly to stimulate testosterone and spermatogenesis [29, 30, 31]. The botanical therapies are better pointed to propose additional holistic approaches to advance reproductive health in males. As European and American civilizations are trained about American Indian phytotherapy, the fruit of serenoarepens came to be utilized to develop sexual strength to enhance production of sperm; as a mild diuretic; to alleviate urinary complexities, for instance pressure-to-urinate and night-time enuresis in both women and men [32]. Lipophilic extracts from the fruits of Serenoarepens have an

antiandrogenic effect as of their phytosterols substances [33]. Androgens themselves have a different range of consequences in both males and females and their dysregulation can give augment a range of medical disorders [34]. The antiandrogenic effect is particularly developed in the tissues of prostate without controlling the concentrations of testosterone, follicle stimulating hormone and luteinizing hormone in the plasma and without disturbing the sex-hormone system [35]. Some researches have explained a considerable progress in the score of global Index of Erectile Function after treatment with saw palmetto extracts. Concerning sexual function, the considerable improvement of the international index of erectile function score throughout the 1st year revealed the benefit of phytotherapeutic agents over the further therapeutic treatment options for benign prostatic hypertrophy-associated lower urinary tract symptoms. If we take into account that the backward ejaculation and decreased ejaculate volume associated with alpha blockers, or erectile dysfunction and declined libido associated with five alpha reductase inhibitors, are commonly linked with therapeutically managed benign prostatic hypertrophy patients' dissatisfaction, Extract of saw palmetto becomes feasible substitute in selected cases [36, 37, 38, 39]. Two years treatment with 320 milligram ethanolic extract of saw palmetto recovered in a statistically considerable manner international prostate symptom score, quality of life and Q max. It also decreased the proportion of patients with remaining urinary volume. The improvement of international prostate symptom score was correlated with a comparable evolution of both its subsets – obstructive and irritative scores.

Saw palmetto and issues of reproductive tract in females:

It is also used by women to treat urogenital diseases, for instanceen largement of ovaries, dysmenorrhoea etc. [32]. Saw palmetto has

established to be efficient in the management of androgenetic alopecia. Apart from the principal mechanism of action of five alpha-reductase obstruction [40], Saw palmetto is considered to reduce the uptake of dihydro testosterone by the hair follicles [41] and reduce its attachment to androgenic receptors. Though Saw palmetto hair grow this commonly seen over the temporal and frontal regions of the scalp [42]. The potential of saw palmetto in managing hirsutism have not been investigated adequately. Researches demonstrate that it reduces five alpha reductase and as outcome prevents the change of testosterone to dihydrotestosterone [43]. A research had been done in which using a cream holding saw palmetto extract two times a day for two months in thirty one women with idiopathic hirsutism on Face demonstrated a twenty nine percent decline in hair counts two months after treatment which is statistically considerable ($P < 0.0001$) [44]. Though, additional studies maybe required to establish the efficacy of saw palmetto extract for this condition. As saw palmetto decreases the levels of dihydrotestosterone, it manipulates the synthesis of sebum by decreasing the too much oils conferring to the development of acne [45]. In PCOS, there are amplified levels of adrenal androgens. Moreover, the marginal tissues such as liver, skin, and adipose tissue also take part in synthesis of androgen by changing the weaker androgens into, the more strong ones. Androgen receptor activation takes place only with circulating testosterone and dihydrotestosterone. Adrenals and ovaries produce 25% of testosterone. The residual fifty percent is by the marginal conversion from androstenedione [46]. Serenoa repens extremely effective hormone stabilizer for poly cystic ovarian disease. The extracts prepared from this botanical have been effectively utilized in regulating the levels of estrogen in the female body. The excessive production of estrogen hormone is one of the indications most commonly linked with poly cystic ovarian syndrome. Additionally to restore

the usual equilibrium of estrogen–testosterone in the blood, this natural medicine also aids weight loss and enhances sexual drive [47, 48]. It indicates that saw palmetto extract demonstrates anti androgenic activity and is beneficial in managing the symptoms of infertility and polycystic ovarian disease simultaneously reducing the secretions of prolactin hormone, hence can contribute to enhance the reproductivity in patients of poly cystic ovarian disease however further researches are still needed to verify its pharmacological actions and use in reproductive endocrinology.

Conclusion

The use of Saw Palmetto (SPE) has spread in the pharmaceutical field, as there are more than 20 supplements of it scattered in Western markets. Where research has proven its effectiveness in treating many diseases, especially urinary tract diseases, anti-androgen effects, anti-inflammatory, in addition to its use in the treatment of benign prostate cancer, so it is used as a complementary treatment in the treatment of cancer. It has been demonstrated that SPE improves sexual function and increases the rate of erections by increasing iNOS and decreasing PDE5.

Therefore, Saw Palmetto has been included as an effective herbal remedy in the treatment of many diseases, especially those related to urinary tract diseases and male genital diseases.

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