

# SAW PALMETTO: BRIEF OVERVIEW



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## SAW PALMETTO



**Saw palmetto plant**

Saw palmetto products are derived from the ripe fruits (berries) of *Serenoa repens* (commonly known as dwarf palm, American dwarf palm tree, cabbage palm, sabal). Saw palmetto (so named for its fan shaped leaves) is native to and grows wild in North America, in sandy soils from Texas and Louisiana, east to South Carolina, Georgia and south to Florida, as well as in various islands in the Bahamas and Cuba.

The plant is an evergreen shrub, usually 2 to 10 feet tall, with creeping or horizontal rhizomes and occasionally reaches the size of a small tree, up to 20 to 25 feet<sup>1,2,3</sup>. The shrubs bloom from April through June and the fruits begin to ripen in mid- August. As ripening occurs, fruits turn in color from green (May-June) to yellow (mid-August), to orange (September), and then to bluish-black (September-October) when ripe.

The major chemical constituents of the ripe fruits include phytosterols, fatty acids, carbohydrates, monoacylglycerides, and other compounds. The biologically active compounds are the phytosterols, fatty acids and their ethyl esters, and monoacyl-glycerides. Commercial products from saw palmetto fruits include dried or partially dried fruit powder or liposterolic extracts in liquid or powder form standardized to contain predetermined levels of fatty acids (capric acid, caproic acid, caprylic acid, lauric acid, myristic acid, oleic acid, linoleic acid, linolenic acid, palmitoleic acid, palmitic acid, and stearic acid). As reported in the USP monograph, a mixture of 11 methyl esters of fatty acids (methyl laurate, methyl oleate, methyl myristate, methyl palmitate, methyl palmitoleate, methyl linoleate, methyl linolenate, methyl caproate, methyl caprylate, methyl caprate, and methyl stearate) serve as marker compounds to confirm the identity of saw palmetto<sup>4,5</sup>.

### POTENTIAL TOPICAL APPLICATIONS

Although no actual clinical data are available, saw palmetto extract is believed to be beneficial in conditions such as androgenetic alopecia and for topical use in anti-acne formulations. These potential applications are based on the fact that in *in vitro* studies, saw palmetto extract was shown to inhibit both known isoforms of the enzyme 5-alpha-reductase. 5-alpha-reductase catalyzes the conversion of



testosterone to dihydrotestosterone (DHT)<sup>6,7,8,9</sup>. The biological role of DHT in androgen related disorders is well documented. Animal model and human clinical data validate the beneficial effects of saw palmetto extract in the management of benign prostatic hyperplasia (BPH)<sup>10</sup>, an androgen-mediated disorder for which treatment measures are based on the inhibition of 5-alpha-reductase. However, the authors of one *in vitro* study that investigated the effects of the extract on primary cultures of fibroblasts and epithelial cells from the prostate, epididymis, testes, kidney, skin and breast reported that saw palmetto extract was an effective inhibitor of 5-alpha-reductase only in prostate cells, suggesting the selectivity and specificity of the lipido-sterolic extract<sup>11</sup>.

### **DHT and hair homeostasis:**

Caspases are enzymes that degrade DNA during programmed cell death (apoptosis), and some specific caspases are believed to function as mediators of the hair growth cycle. A recent study established the role of DHT in selectively regulating the caspase genes which play an important role in signaling programmed cell death, affecting the hair growth cycle. The authors of this study postulated that DHT may be signaling greater expression of caspases, inducing apoptosis in androgenetic alopecia<sup>12</sup> (male pattern baldness /scalp hair loss in females).

### **DHT and skin conditions:**

Conditions such as unwanted hair growth (idiopathic female hirsutism), acne and seborrhoea (excessive secretion of sebum) result from the action of androgens on the skin. The severity of these effects are dependent upon androgen production by the ovary or adrenal gland and the bioavailability of androgen to peripheral tissues. This in turn is related to transport of plasma androgens by specific binding proteins and to peripheral metabolism of testosterone and androstenedione to the more potent DHT. An effective anti-androgen is one which blocks the androgen receptor-mediated actions of testosterone and DHT on skin<sup>13</sup>.

Isotretinoin, used to treat severe acne, has been shown to induce hormonal changes, especially to reduce 5 alpha-reductase in the production of the tissue-derived dihydrotestosterone (DHT) metabolite 3 alpha-Adiol G<sup>14</sup>. Serum levels of 3 alpha-Adiol-G reflect the extent of androgen action in peripheral tissues<sup>15</sup>. Another potential application is in the management of idiopathic female hirsutism. According to researchers, an excess of skin 5 alpha-reductase activity may be considered to be a cause of hirsutism<sup>16</sup> and therefore this condition could benefit from the use of 5-alpha-reductase inhibitors.



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#### Company Profile:

Sabinsa Corporation, founded in 1988, is a manufacturer and supplier of herbal extracts, cosmeceuticals, minerals and specialty fine chemicals. Sabinsa's mission is to provide alternative and complementary natural products for human nutrition and well-being. Over the past ten years, Sabinsa has brought to market more than 50 standardized botanical extracts and privately funded several clinical studies in conjunction with prestigious institutions in support of these products. Its present operations have grown to employ 1000 people worldwide in ten manufacturing, R&D and/or distribution facilities. Additionally, botanical cultivation efforts undertaken by the organization now total nearly 40,000 acres to ensure sustainable supplies on its key products. All products intended for human consumption are certified Kosher.

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