

# **Skin Benefits Associated with Hydrolyzed Jojoba Esters in an Astringent**

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## Introduction

Jojoba (*Simmondsia chinensis*) is a perennial shrub native to Arizona, California, and Northwestern Mexico.<sup>A</sup> The oil from this plant, jojoba seed oil, is a wax ester that has been used in the past as a folk remedy for renal colic, sunburn, chafed skin, hair loss, headache, wounds, sore throats, psoriasis, and acne (e.g., sulfurized jojoba).<sup>B,C</sup> The ester is composed of long-chain linear fatty alcohols, 20 to 24 carbons in length and long-chain linear fatty acids, 18 to 22 carbons in length. Nearly all of the acid and alcohol moieties are  $\omega$ -9 monounsaturated.<sup>D</sup> More recently, Floritech has hydrolyzed this wax ester for use in various commercial cosmetic and personal care formulations such as lotions, body washes, hand sanitizers, toners, and nonwoven wipes for make up removal and facial cleansing.

## Clinical Design

**Objective:** A small, vehicle controlled, cross-over clinical study was carried out to explore the benefits associated with incorporating Floraesters K-20W Jojoba [INCI: hydrolyzed jojoba esters (and) water (aqua)] into an astringent formula that would be applied to the face utilizing a nonwoven wipe (air laid). (The astringent formula contained 20% ethanol, 4% glycerin, and 4% witch hazel.)

**Design:** Each astringent (approximately 30mg drop-wise applied to the nonwoven wipe and rubbed over the entire face) was applied to the face of 26 healthy female subjects twice daily (AM/PM) for two weeks. Three day washouts occurred prior to the first test article and between test articles.

**End Points:** The following evaluations were made at baseline (prior to test article use) and after two weeks of test article use.

- Changes in skin hydration as measured by the Corneometer<sup>®</sup> CM 825<sup>E</sup>
- Changes in skin firmness as measured by the MPA Cutometer<sup>®</sup> F
- Pore health parameters as measured by counts of open comedones (defined as a partially blocked pore, i.e. blackhead), *P. Acnes* (*Propionibacterium acnes*) pores (defined pores with an altered pH level that creates a breeding ground for acne), inflamed pores (defined as a pore with irritation due to an accumulation of excess sebum), and enlarged pores (defined as an enlarged pore that meets the detectable size threshold of >0.5mm) using the Clarity Pro Advanced skin analysis system with the Facial Stage DM-3<sup>G</sup>
- Consumer preference as measured by scores from a perception questionnaire

## Increased Skin Hydration

Figure 1: Increased Skin Hydration

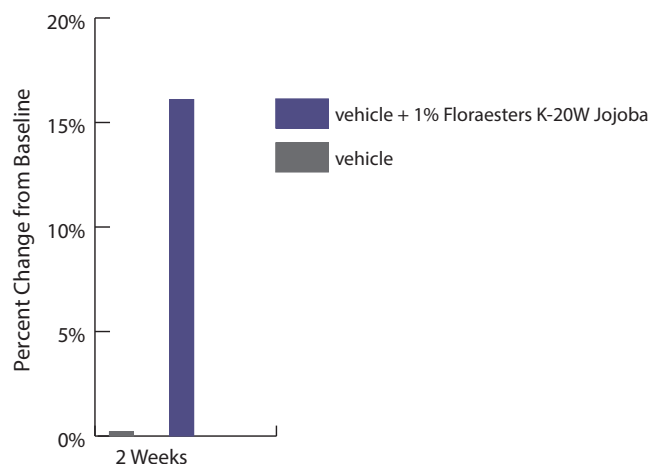


Figure 1. The addition of 1% **Floraesters K-20W Jojoba** produced statistically significant increases ( $p < 0.0001$ ) in skin hydration over the vehicle and over baseline after two weeks of test article use.

## Increased Skin Firmness

Figure 2: Increased Skin Firmness

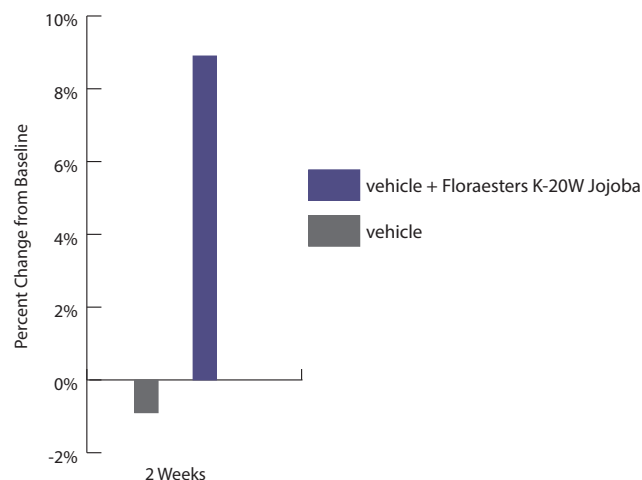


Figure 2. The addition of 1% **Floraesters K-20W Jojoba** produced statistically significant ( $p < 0.0001$ ) increases in skin firmness over the vehicle and over baseline after two weeks of test article use.

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## Pore Size and Health

**Figure 3: Change in Pore Health**

Pore Health Parameter	Test Article	Mean Difference (count)	Subjects that showed a decrease (%)
Open Comedones	Vehicle + K-20W	-20.9	52%
	Vehicle	-8.6	44%
<i>P. Acnes</i> Pores	Vehicle + K-20W	-83.3	56%
	Vehicle	25.6	27%
Inflamed Pores	Vehicle + K-20W	-20.6	52%
	Vehicle	-9.0	44%
Enlarged Pores	Vehicle + K-20W	-14.2	44%
	Vehicle	91.0	39%

**Figure 3.** The addition of 1% **Floraesters K-20W Jojoba** did not result in a negative impact on unhealthy pore counts, and **produced directionally significant decreases ( $p < 0.1$ ) in pore size** (as measured by enlarged pore counts) over the vehicle after two weeks of product use.



**Figure 4: *P. Acnes* Pores (vehicle)**



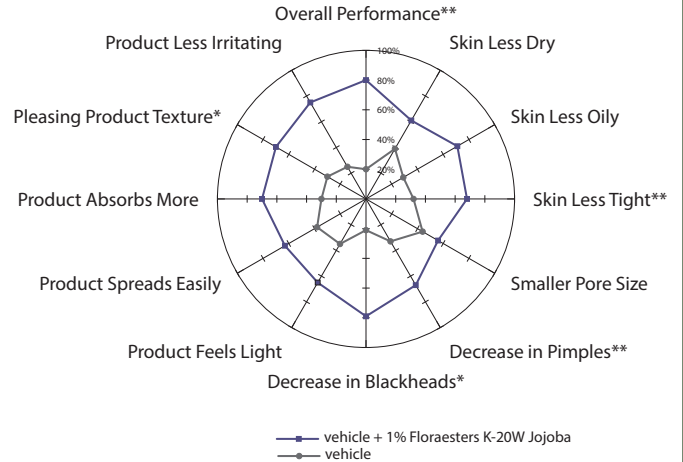
**Figure 5: *P. Acnes* Pores (vehicle + K-20W)**

**Figures 4 and 5.** The astringent with 1% **Floraesters K-20W Jojoba** (Figure 5) shows fewer ***P. Acnes* pores** (indicated with green dots), particularly within the T Zone, than the astringent without (Figure 4), both after two weeks of test article use.

● *P. Acnes* Pores

## Consumer Preference

**Figure 6: Increased Consumer Preference**



**Figure 6.** The test article containing 1% **Floraesters K-20W Jojoba** was preferred in all of the above cases. Statistical (\*\*) and directional (\*) significance was apparent where indicated ( $p < 0.05$  and  $p < 0.1$ , respectively).

## Conclusions

When included in an astringent which was then applied to a nonwoven wipe, Floraesters K-20W Jojoba:

- increased skin hydration (in combination with glycerin)
- increased skin firmness
- did not have a negative impact on pore health
- decreased pore size (as measured by enlarged pore counts)
- increased consumer preference

## References / Footnotes

- Ed. Kartesz, John T. Natural Resources Conservation Service - PLANTS Profile. United States Department of Agriculture Web. 30 January 2009. [http://plants.usda.gov/java/profile?symbol=SICH]
- Yaron, A. "Metabolism and Physiological Effects of Jojoba Oil." The Chemistry and Technology of Jojoba Oil. Ed. J Wisniak. Champagne, IL: American Oil Chemists' Society Press, 1987. 251-65. Print.
- Mosovich, B. "Treatment of Acne and Psoriasis." Proceedings of the Sixth International Conference on Jojoba and Its Uses. Ed. J Wisniak and J Zabicky. Beer Sheva, Israel: University of the Negev, 1985. 393-7. Print.
- Wisniak, J. The Chemistry and Technology of Jojoba Oil. Champagne, IL: American Oil Chemists' Society Press, 1987. 42-45. Print.
- Corneometer is a registered trademark of Courage + Khazaka Electronic GmbH (Köln, Germany).
- Cutometer is a registered trademark of Courage + Khazaka Electronic GmbH (Köln, Germany).
- The Clarity Pro Advanced skin analysis system with the Facial Stage DM-3 is a product of BrighTex Bio-Photonics, LLC, San Jose, California).

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