

Jojoba Seed Pods: Scrubby Desert Shrub Could Be a New Fuel

Jojoba (*Simmondsia chinensis*) grows in the arid southwestern United States. A thick wax on the outside of the plant and in its seeds helps the plant conserve water, but that's not the only thing it's good for. The wax (commonly called jojoba oil) is made up of long-chain esters of fatty acids and alcohols, not triacylglycerols, which are more commonly found in plant oils and animal fats. The unique makeup of jojoba oil gives it a viscosity much greater than petroleum and allows it to be used in a wide variety of applications including cosmetics, pharmaceuticals, polishing, gardening, and industrial lubricants.

A research team, including ISTC's B.K. Sharma, took the wax a step further to determine the potential for its use as a biodiesel feedstock. The team prepared jojoba oil methyl esters (JME, aka jojoba biodiesel) from acid-catalyzed pretreated jojoba oil to look at fuel properties in comparison with soybean oil methyl esters (SME, aka soy biodiesel) and biodiesel fuel standards. Fuel standards were met when JME was tested alone and in blends with ultra-low sulfur diesel fuel (ULSD), and even displayed improved low-temperature properties compared with unblended ULSD and SME. The researchers concluded that jojoba oil has strong potential as an alternative, non-food feedstock for biodiesel production.



Their study, **Preparation and Evaluation of Jojoba Oil Methyl Esters as Biodiesel and as a Blend Component in Ultra-Low Sulfur Diesel Fuel**, was published in a 2009 issue of *BioEnergy Research*. A follow-up study indicated that jojobyl methyl acetate (JMA), a byproduct of jojobyl methyl ester (JME) production, also shows promise as a biodiesel product in its own right. That study, **Preparation of Biofuel Using Acetylation of Jojoba Fatty Alcohols and Assessment as a Blend Component in Ultralow Sulfur Diesel Fuel**, appeared in a 2010 issue of *Energy & Fuels*.

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- B.K. Sharma

Publications

- **Preparation and Evaluation of Jojoba Oil Methyl Esters as Biodiesel and as a Blend Component in Ultra-Low Sulfur Diesel Fuel**
- **Preparation of Biofuel Using Acetylation of Jojoba Fatty Alcohols and Assessment as a Blend Component in Ultralow Sulfur Diesel Fuel**



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