

Date palm juice: A potential new 'green' anti-corrosion agent for aerospace industry

September 26 2012

The search for a "greener" way to prevent corrosion on the kind of aluminum used in jetliners, cars and other products has led scientists to an unlikely source, according to a report in ACS' journal *Industrial & Engineering Chemistry Research*. It's the juice of the date palm—those tall, majestic trees that, until now, were noted mainly as sources of food and traditional medicines.

Husnu Gerengi points out that strong, lightweight [aluminum](#) alloys are used to make planes, cars and industrial equipment. Aluminum corrodes when exposed to air, but unlike rusting steel, the corrosion of aluminum's surface layer forms a protective film that prevents degradation of the underlying metal. However, that film breaks down in some harsh environments, like seawater, leaving the metal vulnerable. Engineers have developed coatings to protect aluminum in these applications, but many of these use potentially toxic chemicals. Previous research suggested that extracts of date palm leaves had an anti-corrosion effect. Gerengi decided to check date palm [juice](#).

He found that date palm juice inhibited [corrosion](#) of an aluminum alloy called AA7075, used in aerospace and other applications, in a salt solution. Gerengi noted that while an extract from [date palm](#) leaves is a known anticorrosive, this was the first test of the fruit's juice. The juice, which he reported adsorbed into the aluminum's surface, contains a number of sugars. Gerengi posited that these react with aluminum to form an anticorrosive film on the metal's surface.

More information: "Anti-Corrosive Properties of Date Palm (Phoenix dactylifera L.) Fruit Juice on 7075 Type Aluminium Alloy in 3.5% NaCl Solution" Ind. Eng. Chem. Res., Article ASAP. [DOI: 10.1021/ie301771u](https://doi.org/10.1021/ie301771u)

Abstract

The influence of date palm (Phoenix dactylifera L.) (PDL) fruit juice on 7075 type aluminum (AA7075) alloy in 3.5% NaCl solution was investigated by Tafel extrapolation and electrochemical impedance spectroscopy. It was found that PDL fruit juice acted as a slightly cathodic inhibitor, and inhibition efficiencies increased with the increase of PDL fruit juice concentration. The adsorption of the inhibitor on the metal surface was found to obey the Temkin adsorption isotherm and has a physisorption mechanism.

Provided by American Chemical Society

Citation: Date palm juice: A potential new 'green' anti-corrosion agent for aerospace industry (2012, September 26) retrieved 25 April 2024 from <https://phys.org/news/2012-09-date-palm-juice-potential-green.html>

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