

Powered by olive stones? Turning waste stones into fuel

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Olive stones can be turned into bioethanol, a renewable fuel that can be produced from plant matter and used as an alternative to petrol or diesel. This gives the olive processing industry an opportunity to make valuable use of 4 million tonnes of waste in olive stones it generates every year and sets a precedent for the recycling of waste products as fuels. Researchers from the Universities of Jaén and Granada in Spain show how this can be achieved in a study published in the latest edition of the Society of Chemical Industry's (SCI) *Journal of Chemical Technology & Biotechnology*.

"The low cost of transporting and transforming olives stones make them attractive for biofuels," says researcher Sebastián Sánchez.

Bioethanol is increasingly used in cars, but its production from food crops such as corn is controversial because it uses valuable land resources and threatens food security. In addition, it makes use of only a small part of the whole crop. By contrast, extracting energy from olive stones uses food industry by-products.

The olive stone, produced in processing of olive oil and table olives, makes up around a quarter of the total fruit. It is rich in polysaccharides (cellulose and hemicellulose) that can be broken down into sugar and then fermented to produce ethanol.

"This research raises the possibility of using of olive stones, which would otherwise be wasted, in producing energy. In this way we can make use

of the whole food crop," says Sánchez.

The team pre-treated olive stones using high-pressure hot water (essentially a pressure cooker) then added enzymes which degrade plant matter and generate sugars. The hydrolysate obtained from this process was then fermented with yeasts to produce ethanol. Yields of 5.7kg of ethanol per 100kg of olive stones have been reached,

The quantities of stones produced are relatively small in comparison with other agricultural and forestry wastes. However, if similar principles were employed across all agricultural industries, energy gains would be significant.

Source: Wiley

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