

BUSINESS **B** INNOVATION

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Bee-io's cultivated honey – pure, baby-safe, bee-free

By ZACHY HENNESSEY

Israeli FoodTech company Bee-io Honey has begun scaling up development of its cultured honey production system, which aims to produce hundreds of kilograms of honey per week – without the involvement of bees. Bee-io Honey announced that they'll be able to start producing their cultured honey on an industrial scale by March 2022.

Bee-io is developing its cultured honey, under laboratory conditions, using natural nectar derived from plants. "It's all based on plants – we're able to produce high volumes of nectar from different kinds of plants," said Ofir Dvash, CEO at Bee-io. He explained that, due to the company's secret nectar production technique, it is able to produce a wide, exhaustive range of honey varieties and strains, each with up to 100% of its nectar derived from a single type of plant.

"We will be able to produce products that are very limited in nature," elaborated Dvash, whose last name is Hebrew for honey. "You've probably never tasted coffee honey, or manu-



BEE-IO CEO Ofir Dvash: 'We mimic the biological process that occurs in a honeybee's stomach; we're mimicking the enzymes themselves in the laboratory.' (Doron Lester)

ka honey, which is very expensive." In nature, he explained, it's almost impossible to produce honey that uses pollen from one type of flower.

"Even when we go to the supermarket and we buy eucalyptus honey, it's not 100% eucalyptus honey: it's maybe 20% or 30% eucalyptus flowers, and maybe wildflowers, citrus flowers – but it's not 100%," he said. "We're the first in the world to be able to produce cul-

ivated honey which is 100% mono-floral." A crucial part of the technology is the development of an artificial bee stomach: "We mimic the biological process that occurs in a honeybee's stomach; we're mimicking the enzymes themselves in the laboratory," Dvash said.

ture of their exploitation.

"We are keeping the same qualities that natural honey has: Natural honey is antibacterial, and our honey is the same,"

he said. "It has different vitamins, antioxidants, calcium, and many more materials that regular, natural honey has – but we're lacking the bad materials that are very common in natural honey," like chemicals and toxins. Because of its toxin-free composition, Bee-io's honey will be completely safe for consumption by babies.

Expert beekeeper and activist Yossi Aud says the current relationship between humanity and bees is fragile: "[It] began as a relationship of worship; it then became focused on the medical qualities; and most recently, it has been focused on using their honey as a sweetener."

Aud said that a solution for humanity's desire for honey must be found in order to preserve the honeybee's longevity. "The need to maximize the [honey] yield from the bees has therefore grown, and that has caused bees to disappear from the planet," he said.

Cannabis oil can help treat autism, Israeli study finds

By ROSSELLA TERCATIN

Medical cannabis oil can help treat autism, a study by researchers at Tel Aviv University published in the journal *Nature* has shown.

Recently, medical cannabis oils have been administered to children on the autism spectrum in Israel, and the therapy has sparked growing interest, but no significant clinical study has been conducted to test its positive effects and understand the mechanism behind them, Prof. Daniel Offen said.

"Autism is a very common condition, and there is no real treatment for it," he said. "Some people have started using medical cannabis but without a solid scientific basis. For this reason, we thought of looking into the issue, especially through the work of our PhD student Shani Poleg."

Autism is a neurodevelopmental disease with a wide spectrum of manifestations. Its symptoms can be mild or more severe, including problems in social interactions and compulsive behaviors. The causes can be both genetic and environmental.

The TAU researchers focused on autism caused by the mutation of a specific gene, *Shank3*, which is behind about 1% of overall cases.

The scientists worked on animal models, using mice, with the same gene mutation and administered them cannabis oils.

"We started by using oils containing CBD-enriched cannabis," Offen said. "CBD is one of the most important active ingredients in cannabis, and it has anti-inflammatory and anti-oxidation properties."

Medical cannabis usually includes a significant amount of CBD and very small quantities of THC, which is the active ingredient responsible for euphoria and other effects. It is not considered suitable for children.

The researchers found that CBD oil had positive effects on mice, with a reduction of behavioral symptoms.

"We also tried to administer the animal models oils containing no CBD at all but just a small quantity of THC, and to our surprise, we obtained even more positive results," Offen said.

The team believes the positive effects recorded in the study might be attributed only to THC and not to CBD.

In addition, they were also able to understand how the oil managed to have an impact on the mice, registering what mechanisms in the neurological system were affected and which neurotransmitters were influenced by the oil in the brain, in the spinal cord and elsewhere.

The group is working to determine the best composition of the oil to maximize its positive effects.

"This is, of course, an initial study," Poleg said. "But we hope that through our basic research we will be able to improve clinical treatments. Our study shows that when treating autism with medicinal cannabis oil, there is no need for high contents of either CBD or THC."

"We observed significant improvement in behavioral tests following treatments with cannabis oil containing small amounts of THC and observed no long-term effects in cognitive or emotional tests conducted a month and a half after the treatment began."

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