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Research Brief

Research shows that, genetically, high-CBD "hemp" plants are mostly marijuana

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After assembling a complete genome from a new breed of cannabis, University of Minnesota and Sunrise Genetics researchers found that high-CBD "hemp" plants have a mostly marijuana genome.

Published in the journal <u>New Phytologist</u>, the researchers found that high-CBD plants inherit about 90% of their genes from drug-type cannabis and the rest from hemp. Traditionally, cannabis plants are split into two varieties: a drug-type grown for psychoactive or intoxicating properties (i.e., marijuana) and a hemp-type used to make industrial products like fiber.

"Over the past decade, we've seen a surge in demand for CBD and we wanted to better understand how plant breeders created high-CBD plants to meet rising demand," said study coauthor George Weiblen, who is a professor in the College of Biological Sciences (CBS) and the science director at the Bell Museum.

The researchers examined different types of cannabis, including drug-type varieties that produce large amounts of psychoactive tetrahydrocannabinol (THC). Plant breeding has increased the THC level to the point where it can account for up to a quarter of a plant's total weight. The scientists found that breeding high-THC plants with hemp-type plants can swap a few genes and make a new plant that produces high levels of CBD instead.

"This poses a challenge, though," said study co-author and CBS graduate CJ Schwartz of Sunrise Genetics. "The genes that allow for the production of CBD are also a bit 'leaky.' This can result in about 5% of the product ending up as THC instead of 100% CBD."

Researchers say this means that when high-CBD plants are grown to full maturity, farmers interested in producing hemp for CBD run the risk of their crop crossing over the federal, legal limit of 0.3% THC.

"These high-CBD plants are genetically marijuana for the most part and they can't be expected to meet the legal definition of industrial hemp in every situation," said Weiblen. "This means that CBD products — such as flowers, extracts and edibles — that are labeled 'hemp' could be incorrectly labeled and falsely branded. Fiber hemp and products made from hemp seeds, however, are drugfree."

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