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Modern Marijuana Is Often Laced With Heavy Metals and Fungus

Medical and recreational marijuana use is increasingly legal—
but do consumers know what they're smoking?

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In the U.S., legal hurdles have long hampered research into marijuana. But as more states approve medical and even recreational marijuana, scientific inquiries have spiked, especially studies aimed at finding out what exactly is in today's weed—and what it does to our bodies.

In Colorado, which made marijuana legal in November 2012, the latest results show that the pot lining store shelves is much more potent than the weed of 30 years ago. But the boost in power comes at a cost—modern marijuana mostly lacks the components touted as beneficial by medical marijuana advocates, and it is often contaminated with fungi, pesticides and heavy metals.

“There's a stereotype, a hippy kind of mentality, that leads people to assume that growers are using natural cultivation methods and growing organically,” says Andy LaFrate, founder of Charas Scientific, one of eight Colorado labs certified to test cannabis. “That's not necessarily the case at all.” LaFrate presented his results this week at a meeting of the American Chemical Society (ACS) in Denver.

LaFrate says he's been surprised at just how strong most of today's marijuana has become. His group has tested more than 600 strains of marijuana from dozens of producers. Potency tests, the only ones Colorado currently requires, looked at tetrahydrocannabinol (THC), the psychoactive compound that produces the plant's famous high. They found that modern weed contains THC levels of 18 to 30 percent—double to triple the levels that were common in buds from the 1980s. That's because growers have cross-bred plants over the years to create more powerful strains, which today tout colorful names like Bruce Banner, Skunkberry and Blue Cookies.

Those thinking that stronger pot is always better pot might think again. **Breeding for more powerful marijuana has led to the virtual absence of cannabidiol (CBD), a compound being investigated for treatments to a range of ills, from anxiety and depression to schizophrenia, Huntington's disease and Alzheimer's.** Much of the commercially available marijuana LaFrate's lab tested packs very little of this particular cannabinoid. “A lot of the time it's below the detection level of our equipment, or it's there at a very low concentration that we just categorize as a trace amount,” he says. Consumers specifically seeking medical benefits from cannabis-derived oils or other products may have a tough time determining how much, if any, CBD they contain, because Colorado doesn't currently require testing.

“I’ve heard a lot of complaints from medical patients because somebody claims that a product has a high level of CBD, and it turns out that it actually doesn’t,” LaFrate says. Colorado also does not yet require testing of marijuana for contaminants. Washington, the second state to legalize recreational marijuana, does require such testing for microbial agents like *E. coli*, salmonella and yeast mold, and officials there rejected about 13 percent of the marijuana products offered for sale in 2014.

“It’s pretty startling just how dirty a lot of this stuff is,” LaFrate says. His team commonly found fungi and bacteria in the marijuana products they tested. But for now it’s unclear just how much marijuana growers need to clean up their product. “Like ourselves, this plant is living with bacteria that are essential to its survival. In terms of microbial contamination, it’s kind of hard to say what’s harmful and what’s not,” he adds. “So the questions become: What’s a safe threshold, and which contaminants do we need to be concerned about?”

At the top of that list would be chemical contaminants in products such as concentrates, like the hard, amber-colored Shatter, which contains more than 90 percent THC, LaFrate suggests. Concentrates and edibles (think brownies) make up perhaps half of the current Colorado market. Their makers sometimes suggest that their chosen products are healthier than standard weed because they don’t involve frequent smoking. But some manufacturers employ potentially harmful compounds like butane to strip the plant of most everything but THC. Tests also show that marijuana plants can draw in heavy metals from the soil in which they are grown, and concentrating THC can increase the amounts of heavy metals, pesticides or other substances that end up in a product. That means regulations for their production still need to be hammered out, LaFrate says.

“People use all kinds of different methods to produce concentrates,” LaFrate says. “They allow people to use rubbing alcohol and heptane. But what grade of solvents are they using? Are they buying heptane on eBay, and if so, what exactly is in there? There are a whole bunch of issues to figure out, and right now there are not enough resources and really no watchdog.” ■

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