

# Cannabis potency

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## How strong is cannabis?

The main ingredient in cannabis that is responsible for the psychoactive, or mood altering, effects is a 'cannabinoid' called delta-9-tetrahydrocannabinol, or 'THC' for short. In combination with other cannabinoids the amount of THC in cannabis determines the strength of the effect of the drug. The level of THC in cannabis is not always the same. It can vary depending on the strain or variety of the plant, the way in which the plant is grown, the part of the plant that is used, and the way the plant is prepared for use and stored.

## Strain and Cultivation technique

The way in which cannabis is grown can affect the amount of THC in the plant, and therefore the potency. *Cannabis sativa* is the species of plant that most commonly produces the drugs known as marijuana, hash or hashish. Normally, the male cannabis plant fertilises the female plant. If female plants are grown in isolation, then the flowering tops of the plant remain unfertilised. These unfertilised flowering tops, known as *sinsemilla*, have particularly high THC levels. Crossbreeding and genetic modification can also produce strains of the cannabis plant that have particularly high levels of THC.

Some argue that cannabis grown hydroponically, which refers to the method of growing plants under artificial light, is stronger than 'bush weed', which refers to cannabis grown out doors in natural light. It is argued that the plant has a greater chance of reaching its full genetic potency potential when grown in this way. Users of the drug say they can tell when they are using 'hydro' cannabis versus bush weed because the effects are so much stronger. However, some people do not believe that hydroponic cultivation itself makes cannabis stronger. Large scale hydroponic cultivators may be more likely to use more potent strains and grow plants to their full potential. The only published Australian test of the differences in potency between cannabis that was naturally grown, hydroponically grown and cannabis grown indoors in soil used ten plants and showed great variation. In that small study no growing technique was clearly more capable of producing more potent plants.

## Part of plant used

The flowering tops, or 'buds' of the female cannabis plant have the highest concentrations of THC, followed by the leaves. Much lower THC levels are found in the stalks and seeds of the cannabis plant.

## Preparation for use

The cannabis plant can be prepared in different ways for use, and these different forms have different potency. The strongest preparation is known as 'hash oil', which is made by extracting THC from the cannabis plant in oil. Hash oil has been found to contain 15% to 30% THC. The resin secreted from the plant can be dried to make 'hash', which is the second strongest preparation. Hash has THC concentrations ranging from 10% to 20%. The form with the lowest THC level is the

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dried buds and leaves of the plant, commonly known as marijuana. Marijuana is the most common form of cannabis available in Australia and can vary in potency from less than 1% to 20%.

## Has cannabis become stronger?

Some people say that the cannabis that is used nowadays is a lot stronger than it used to be. There have been media reports of cannabis being up to 30 times stronger today than during the 1970s. It would be concerning if cannabis was a lot stronger because this could lead to more negative side-effects of cannabis use. There has been an increase in health problems related to cannabis in Australia over the last 20 years but it is not clear whether this is because cannabis has become stronger.

It cannot be definitively determined whether the cannabis used here in Australia has become more potent over time because there is no data on this. The increase in health problems is more likely to be due to the increased popularity of using stronger parts of the plant. While cannabis users in the 1970s were most likely to smoke the leaves, cannabis users today prefer to smoke the more potent flowering tops, or buds of the plant. Furthermore, there is good evidence that the age at which people commence using cannabis has, until recently, been going down. Research shows, that young regular (daily or near daily) users are most at risk of many of the adverse effects of cannabis including mental health problems and dependence.

In the USA, THC levels of cannabis have risen over the last 25 years. According to data recently released, cannabis potency has risen from about 4% to 9% since 1983. In New Zealand, the potency of THC has not changed. In Europe, cannabis potency appears to have remained the same in most places, except the Netherlands, where an increase has occurred. Certain varieties of cannabis such as sinsemilla have also recorded increased potency in the UK.

## So what's the story?

Long-term users of cannabis in Australia report that cannabis appears to be stronger than in the past. On the available evidence it would appear that the strength of cannabis has increased to some extent over the last 25 years, but is not 30 times stronger as is sometimes claimed.

It would appear that the main difference nowadays is the part of the plant people smoke and the age at which people commence regular use. It is more common for people today to smoke the flowering heads of the plant which are much more potent than the leaf product. In addition, people are more likely to smoke cannabis in a 'bong'. These changes in the patterns of use may result in users of today taking in higher levels of THC than in the past. Additionally, the younger people start and the more regularly they use, the more likely they are to be adversely affected by cannabis. Simply focusing on cannabis potency may obscure the fact that young regular users are most at risk of cannabis related harm.