

Annex 1 - The plant and the drug

Mankind has cultivated cannabis for so long that the origin of the plant remains unclear. Most experts suggest Central Asia, where vast fields of wild cannabis can be found today, as its likely birthplace. But the plant has proven as adaptable as humanity itself, and it has spread, both by design and opportunistically, to all corners of the globe.

There is evidence for early recognition of its intoxicating effects, but historically it has been most widely cultivated as a fibre crop. Hemp, the fibre derived from the long stalks of the cannabis plant, was especially useful for the production of rope and sailcloth due to its strength and water-resistant qualities. The potency of feral cannabis is generally quite low, so it was probably first consumed in its concentrated form, as cannabis resin. But all this is speculative, and it is entirely possible that the drug qualities of cannabis have been re-discovered several times in different locations. Like so much about cannabis, its history is obscure and diffuse.

Cannabis: Many plants in one

Cannabis is an annual plant, completing its lifecycle in a single season and dying after reproduction.²¹⁸ It grows well under similar conditions as corn does. It prefers temperatures between 14 and 27 degrees Celsius, but can withstand freezing temperatures for brief periods of time. In latitudes from about 30 to 60 degrees in the Northern hemisphere, seeds are traditionally planted between March and May, and the plant flowers between September and November – about a six-month growth cycle, with only one crop possible.²¹⁹ Closer to the equator, however, it is possible to manage two annual crops off the same plot²²⁰ and it has been claimed that some tropical varieties will experience three or four growth seasons a year.²²¹ It prefers direct sunlight, as much as it can get. After the first six weeks, it can grow with little water as it possesses a powerful taproot, but it only flourishes with regular moisture. It requires well-drained soil or its roots will rot, however, so it does not grow well in clay.²²² While it can grow in difficult soil types, such as sand, it prefers loams rich in nitrogen, with a fairly neutral PH of between 6 and 7. Thus, while cannabis grows wild in a wide range of areas, rather specific conditions are required for optimal growth.

When intentionally cultivated, cannabis can be grown in most inhabited areas of the world, and cannabis survives in diverse climates by radically changing its shape,

ranging in appearance from a weedy shrub to a six metre tall ‘tree’. The plant’s extreme adaptive morphology has led to much debate around the taxonomic classification of cannabis, and it was reclassified several times before being given its own family, the *cannabaceae*, shared only with the hops plant.

It is still being debated whether there is only one species of cannabis or several. The scientific debate has had little influence on illicit cultivators who agree that cannabis has two or three distinct varieties, based on clear differences in the way the plants taken from specific regions appear and grow, as well as their divergent subjective effects.²²³

- ‘Cannabis sativa’ is the term applied to both the genus as well as to the most widespread variety, a tall, conical plant typically found in warmer, lowland climates (Thailand, Mexico and South Africa, for example).
- ‘Cannabis indica’ is a squat, bushy, highland plant, putatively originating in northern India.
- ‘Cannabis ruderalis’ is a more recently (and less widely) recognized variety,²²⁴ found growing wild in Central Asia. It is a small (less than 1 metre at full maturity), tough plant, able to withstand the harsh climate of the region. In some taxonomies, industrial hemp is also seen as a distinct species.

So different are these three that most casual observers would regard them as distinct plants. In addition to being different in appearance, strains of cannabis differ in their chemical composition. Cannabis contains over 400 chemicals, of which about 70 are chemically unique and are collectively referred to as cannabinoids. Delta-9 tetrahydrocannabinol (generally referred to simply as THC) is believed to be responsible for the most of the psychoactive effects of cannabis, although related chemicals are believed to also play a role. The precise way the various components of cannabis interact and influence the physiological and subjective effects of cannabis is a topic of ongoing research.

One of the most important secondary chemicals is cannabidiol (CBD), the biosynthetic precursor to THC, which converts to THC as the plant matures. This chemical is believed to ‘moderate’ the effects of THC, having a more sedative effect, as well as muscle relaxant

and anti-psychotic properties.²²⁵ In general, it is believed that sativa varieties exhibit high levels of THC relative to CBD, while for indicas, the opposite is true. Users report pure sativas to produce a greater ‘high’ with less of a ‘stoned’ feeling: i.e., they have more of a cerebral and less of a somatic effect, which is in keeping with what is understood about the nature of their chemical compositions.

Aside from shape shifting, cannabis is unusual in several other ways, which are important to appreciate in order to understand cultivation practices. Cannabis is ‘dioecious’, which means each individual plant is either male or female. Male plants fertilise females by means of wind-borne pollen. This is of great importance to cultivators, as the most potent cannabis comes from the flowers of the unfertilised female plant. Early in life, male plants have as much or more THC as females, but at the peak of ripeness, females far surpass males, particularly if unfertilised. As will be discussed below, unfertilised female flowers are referred to as ‘sinsemilla’ (Spanish: without seeds), and today they constitute a distinct drug product.

The plant flowers over time or when it detects the coming of autumn, as evidenced in the shortening of days. This photosensitivity allows plants that germinated late to complete their life cycle in an accelerated manner. The exact photoperiod required to induce flowering depends on the genetics of the plant, but a 12-hour night period is enough to induce flowering in most, if not all, varieties. This allows indoor cultivators to decide when their plants will blossom.

In fact, all of the above unusual characteristics (variability, adaptability, dioeciousness, wind-borne pollination, photo-period linked fertility) have implications for illicit cannabis production, and it is only recently that these qualities have been exploited to their greatest potential. These developments, and the impact they are having on both the market and public health, will be discussed in the final sections of this chapter.

Cannabis: Many drugs in one

Several drug products can be produced from cannabis, falling into three main categories:

- ‘herbal cannabis’, the leaves and flowers of the plant, also known as ‘marijuana’, ‘ganja’, and a host of other names;
- ‘cannabis resin’, the pressed secretions of the plant,

commonly referred to as ‘hashish’ in the Western countries or ‘charas’ in India.

- ‘cannabis oil’.

Herbal cannabis is most popular in North America and most of the rest of the world, while cannabis resin is most popular in much of Europe and a few traditional hashish-producing regions.

Herbal cannabis

As is discussed further below, the nature of herbal cannabis in the developed world has changed in recent years. This is the product of three distinct processes:

- In the past, most users were content to smoke various parts of the cannabis plant, including the large leaves, but growing consumer consciousness has led to demand for cannabis comprised of just the flowering heads and small leaves, or ‘buds’, which are the strongest part of the plant.
- In addition, cannabis breeders from the United States, the Netherlands, and Canada have worked tirelessly to produce more potent cannabis. The strains they have developed are known by their brand names (e.g., ‘White Widow’, ‘Afghan Haze’, ‘AK-47’) or generically as ‘skunk’ in countries such as Australia, France, New Zealand, and the United Kingdom.
- The method for cultivating cannabis crops consisting exclusively of unfertilised female plants (‘sinsemilla’), which are the most potent, has been re-discovered.

Today, the most potent forms of cannabis come from the unfertilised female (sinsemilla) flowers (buds) of plants bred for their high THC levels (skunk), and most premium products on the market today partake of all three of these characteristics. Of course, in most of the world, less refined products are the norm, but the technology is spreading through the mails and the Internet, and, as discussed below, premium products appear to be commanding increasing market share in the developed world.

Today, most, but by no means all, high-potency cannabis is produced indoors in developed countries, to service local markets or those in neighbouring states. Some of this indoor product is produced in soil and some is produced hydroponically (in a non-soil

medium, nourished through a nutrient bath). While premium cannabis can be produced more efficiently indoors and hydroponically, equally potent cannabis can be grown in soil.

Terms like ‘buds’, ‘sinsemilla’, ‘skunk’, and ‘hydroponic’ are often used as though they were interchangeable, and there are large areas of overlap. But each represents a distinct aspect of the ways high-end cannabis has changed in recent decades. Most high-end cannabis today consists only of buds. Most of this is sinsemilla, and, in developed countries, it is likely the beneficiary of breeding for high potency. Most high-potency sinsemilla is grown indoors, some of which is grown hydroponically. But even buyers of low-potency cannabis prefer buds today, there is some outdoor sinsemilla cultivation, and a good deal of indoor product is grown in soil.

In short, there are many herbal cannabis products today, though they are often discussed as though they are one and the same. This further adds to the confusion around the drug, and makes cross-cultural comparisons difficult.

Cannabis resin

In addition to the varieties of herbal cannabis, the drug can also be consumed in the form of a resin.²²⁶ As the plant flowers, glands called ‘trichomes’ produce a sappy, resinous substance in which much of the cannabinoid content of the plant is concentrated. The resin may be collected while wet (by hand) or once the plant has dried (by sieving), and is generally formed into balls, sticks, or bricks. Dried resin must be heated or pressed to make it malleable. Sale-ready hashish differs in colour from sandy to reddish to black. It differs in consistency from putty-like to brittle and dusty. It can also be found in solution, as ‘hash oil’, but the market for this drug is not widespread.

In hand rubbing, workers remove the gummy resin from the living plants by running their hands over the flowering tops. The resin adheres to the skin and has to be removed by forcefully peeling it away and rubbing it into little balls, which are combined and moulded into shapes for marketing. Hand-rubbed hashish may have been the first way cannabis was consumed, and it represents a rather inefficient and labour-intensive means of gathering the drug. Hand rubbing today is concentrated in India and Nepal.

Hand rubbing is not to be confused with hand pressing. The dust-like product produced by sieving becomes

malleable when heat and pressure are applied, and this can be done by hand or by machine in order to prepare it for storage and shipping. Sieving requires the plants to be dried first, which means an arid climate is essential. The resin and trichomes become powdery and brittle, and can be removed from the bulk of the plant matter by use of a screen and some percussive force. Traditionally, fabric is used as a screen and a basin or pot as a collection device. Light tapping produces the purest hashish, but greater quantities (including quite a lot of relatively inert plant matter) can be gathered by the application of more force. Thus, like olive oil, hashish is often “graded” depending on whether it is the first or subsequent “pressing”. The powdery resin that precipitates is either gently heated or manually or mechanically pressed to make it malleable. Lower grades may be adulterated with a range of oils and inert or active bulking agents, although the European Monitoring Centre for Drugs and Drug Addiction says such additives are ‘rare’ in European samples.²²⁷

Both of these processes are highly labour intensive and somewhat wasteful, so it is not surprising that some cannabis resin users have devised more efficient technologies. Many of these were piloted in the Netherlands. The potency of the hashish they produce (*nederhasj*) is much higher than through traditional methods. A third sort of hash – “jelly hash” – has also emerged in recent years. This appears to be a combination of *nederhasj* and cannabis oil, with a soft consistency and very high THC levels.

Smoked, baked, or vaporised?

As there are many forms of cannabis, there are also many ways of consuming the drug. The amount of THC delivered to the user depends a lot on the method of ingestion, so trying to get a sense of how much is consumed requires knowing exactly how it was consumed. And each technique is subject to local variations.

Most herbal cannabis is smoked, but there are many ways of doing this, and each culture where the drug is introduced comes up with its own techniques and terminology. Perhaps the most popular technique is to make a kind of cigarette (‘joint’) using specialty rolling paper or other material (such as scrap paper or the leaves of local plants). In Ireland, for example, 98 per cent of people who used cannabis (herbal or resin) in the last month said smoking joints was one of the ways they consumed cannabis, with the second most popular response being pipes (7 per cent).²²⁸ In Europe, a filter is often used, sometimes taken from a tobacco cigarette.

Cannabis is generally smoked with tobacco (in part to facilitate smooth burning) in Europe, parts of Asia, North Africa, Australia, and New Zealand, but this is unusual in most of sub-Saharan Africa and in the Western Hemisphere.

Other popular consumption techniques include:

- Pipes, including both specially made and tobacco pipes, often with a foil screen;
- Water pipes, hookahs, ‘hubble bubbles’ or bong, in which the smoke is cooled by passing through a water chamber;
- Cigars, which have been emptied of their tobacco contents and refilled with cannabis (referred to as ‘blunts’ in the United States after Philly Blunts, a popular cigar brand);
- Vaporizers, modern machines that heat, but do not burn, the cannabis, releasing the THC into a plastic bag for inhalation;
- Makeshift devices, such as hollowed out apples, beer-can bong, etc.
- More exotic techniques, such as the chillum (a large, horn-like, clay pipe used in India and Jamaica) and others.

Cannabis (typically resin) can also be eaten. THC is fat-soluble, and so cannabis can be included in a range of food products, and is typically consumed in baked goods. The subjective effects of eating cannabis are different from the experience of smoking, due to different metabolic processes involved in absorbing the drug. It is clear that the onset is slower and the duration longer when cannabis is eaten.

The amount consumed is related to the method of consumption. Vaporization is estimated to require twice as much cannabis, and eating four times as much, to produce the same effect.²²⁹ Bong is actually a more efficient way to consume cannabis than joints, as less material is lost in side-stream smoke. In Australia, surveys indicate that bong is more popular with younger users (who were also more likely to prefer buds), while joints were more popular with older users. This suggests that younger users prefer to ingest more THC, or at least to ingest their THC more quickly, as they choose the best parts of the plant and the most efficient means of consumption.²³⁰

Though there is considerable variation, the typical bowl on a bong is large enough to accommodate about 1/20th of a gram of cannabis, and most bong smokers will reload their bowls several times in a consumption session. Purpose-made cannabis pipes tend to have much smaller bowls than tobacco pipes. A good example is the ‘sebsi’ used in Morocco to smoke ‘kif’, a cannabis/tobacco mixture. The bowl of a sebsi is typically very small. In contrast, the chillum used in India and Jamaica can hold vast amounts of cannabis, but these are commonly used by people who consume the drug religiously, not casual users.

The amount of cannabis found in a joint is dependant on whether tobacco is included,²³¹ whether a single or multiple rolling papers are used, and the strength of the cannabis concerned. Studies of cannabis joint size in the United Kingdom in the 1970s suggested between a seventh and a third of a gram per joint,²³² and more recent research in the UK²³³ and Ireland²³⁴ has found that this has changed little over the years. This may be due to the local consumption culture: British and Irish joints are typically mixed with tobacco and a single rolling paper is used, so there is little room for more cannabis.

Joints in the Netherlands are typically comprised of the tobacco of one cigarette with a small amount of high potency cannabis. Dutch coffee houses offer pre-rolled joints with a filter containing about 0.1g of cannabis and 0.9 g of tobacco, and Dutch street joints average around 0.25 g cannabis.²³⁵ A study in the Netherlands showed life-sized pictures of joints to 400 frequent users and asked them to indicate which represented what they typically consumed. On this basis, 0.16 grams of cannabis per joint was found to be an average, or over 6 joints to the gram. This was much less than what users estimated they used when asked directly how many joints they thought they got from a gram – four, or 0.25 grams per joint.²³⁶ This tendency to overestimate consumption should be kept in mind in evaluating other self-reported use data.

Figures from the United States are much higher, because tobacco is rarely used, low-potency Mexican cannabis dominates the market, and ‘multi-skin’ (using several rolling papers) joints are common. Estimates range from 0.4 g,²³⁷ to 0.5 g²³⁸ to 0.8 g²³⁹ to an entire gram or more in a single joint.²⁴⁰ Blunts can contain up to 3 g of cannabis,²⁴¹ but the product used is typically low-grade. Jamaican ‘spliffs’ (joints) are about 10 centimetres long, and were once said to contain as much as two or three grams of cannabis.²⁴²

Table 3: Variation in sizes of joints

Country	Cannabis per joint	Tobacco added?	Mostly sinsemilla?	Joints per gram
Netherlands	0.1 g - 0.25 g	Yes	Yes	4 – 10
United Kingdom/Ireland	0.15 g – 0.33	Yes	Yes	3 – 7
USA	0.4 g – 0.5 g	No	No	2
Canada	0.2 g – 0.33 g	Sometimes	Yes	3 – 5
Jamaica	2 g – 3 g	No	No	0.5 – 0.33

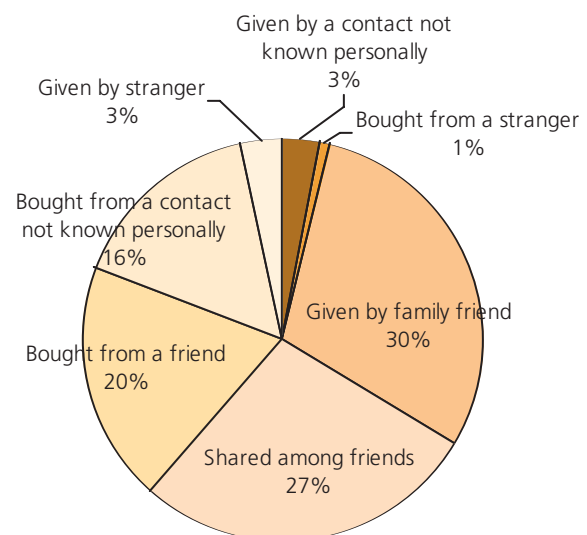
Cheap enough to share

For most users, a joint should not be seen as a unit of consumption because joints are usually consumed communally. In France, 82 per cent of occasional users (between one and nine incidents of use in the survey year) never consume the drug alone. Even among regular users (between 10 and 19 incidents of use per month), 20 per cent never consume alone, and only 20 per cent report they ‘often’ do so.²⁴³ In New Zealand in 2001, only 4 per cent of users polled said they smoked alone during a ‘typical’ consumption session.²⁴⁴ In the United States, a majority (57 per cent) of users said they got the cannabis they used most recently for free or that they shared someone else’s cannabis.²⁴⁵ In Ireland, the figure is 64 per cent.²⁴⁶ And this phenomenon is not unique to casual users: surveys among regular users in the UK show almost all of them (96 per cent) share joints at least some of the time.²⁴⁷ The tendency to share is related to the fact that an entire joint is too much for most casual users, a subject that is explored further below.

One of the reasons cannabis users can afford to be so generous is that, in most countries, cannabis is relatively cheap. In producer countries in the developing world, it is sometimes cheaper to get high on cannabis than to get drunk on beer. In South Africa, for example, the price of a matchbox full of cannabis buds is about four rand (just over 50 US cents), less than a bottle of beer in a bar. In Singapore, cannabis has been used in the past by worker communities as an inexpensive substitute for alcohol.²⁴⁹ As might be expected, prices are cheapest in various poor producer countries (India, Lao People’s Democratic Republic, Colombia, various African countries) and highest in the developed countries, especially where law enforcement is strong (Japan, Singapore,

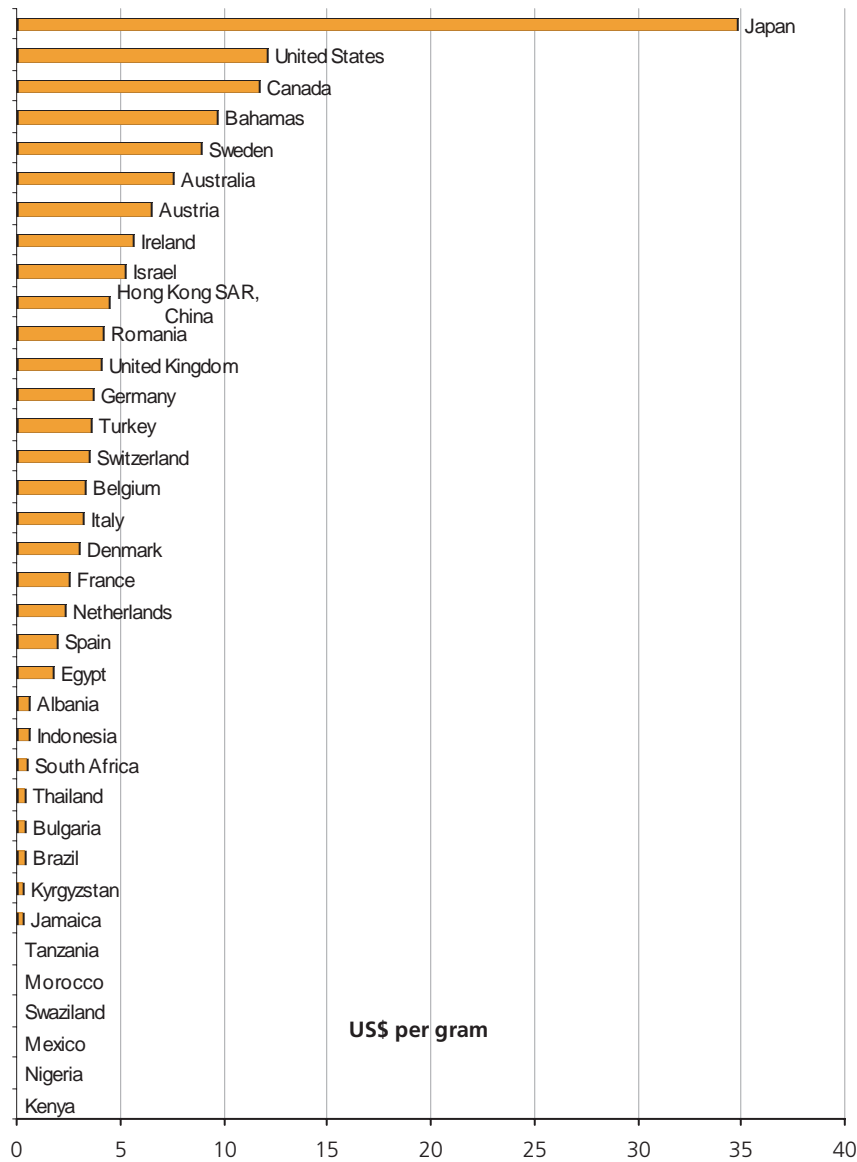
Sweden, United States,). The United States is one of the more expensive places in the world to buy cannabis, and an average United States price of US\$300 an ounce (28 grams) sounds substantial, until it is pointed out that a dose sufficient to get a casual user high costs less than US\$5. And despite enforcement efforts, the price of cannabis in the US has been relatively stable, between US\$10 and US\$20 per gram for small buyers throughout most of the 1980s and 1990s.²⁵⁰

Cannabis is also used together in cocktails with other drugs. In South Africa, the ‘white pipe’ combination of methaqualone, tobacco, and low-grade cannabis is the primary way methaqualone is consumed. In Guyana,

Fig. 13: Where cannabis was obtained on the last occasion of use in Ireland

Source: National Advisory Committee on Drugs (2005)²⁴⁸

Fig. 14: Selected herbal cannabis prices



Source: Annual Reports Questionnaire Data.

Suriname, Haiti, Jamaica, Martinique, Dominica, Saint Kitts and Nevis as well as Guatemala – cannabis joints are occasionally spiked with cocaine base, with each country having its own name for this combination.