

## INTRODUCTION

Khat (*Catha edulis*), also known as Quat and Chat, is a leafy evergreen shrub, cultivated in Eastern Africa and the Arabian Peninsula. It is abused for the stimulant effects that result from chewing its leaves, which contain cathinone ( $\beta$ -ketoamphetamine) and cathine (norpseudoephedrine) (figure 1).



Figure 1. The chemical structures of Cathinone (L) and Cathine (R)

The more pharmacologically active component, cathinone, has half the potency of amphetamine. It is unstable and breaks down to the less active cathine and norephedrine, so the effects of khat are greatest when the leaves are chewed fresh, within 48 hours of picking. To preserve its potency khat is usually sprinkled with water and packaged in plastic bags or wrapped in banana leaves (figure 2). As khat loses its potency fairly rapidly after harvesting, its use has largely been confined to those countries where it is grown, but khat chewing is becoming more common in the UK due to migration and developments in transportation. It is estimated that approximately 7 tonnes enters the UK each week via London Heathrow.



Figure 2. Khat is wrapped in banana leaves to keep the leaves fresh

## LEGALITY

There is disparity in the legislation surrounding khat. Whilst khat is controlled in the US and parts of Europe, including Ireland, it is not yet controlled in the UK. However, its active ingredients cathinone and cathine are classified as Class C drugs under the Misuse of Drugs Act 1971 and are internationally restricted under schedule I and schedule III, respectively, of the UN Convention on Psychotropic Substances 1988. With cheaper, more powerful, stimulant drugs readily available, it is unlikely that khat will become attractive to groups not already culturally accustomed to it. None the less there are concerns about the morbidity and mortality of this currently legal drug.

### The Law: Summary

Import, possession and sale of unprepared khat:

**Controlled:** Canada, USA, East Africa, Norway, Denmark, Finland, Sweden, Switzerland, Italy, France, Germany, Ireland

**Restricted:** Australia (Import licence)

**Uncontrolled:** Czech Republic, Cyprus, Greece, Malta, Netherlands, Portugal, UK

**Cathinone & Cathine = Class C Misuse of Drugs Act 1971**

## EFFECTS OF KHAT

**Positive:** mild euphoria, talkativeness, calming effects, alertness, energy, concentration, social cohesion.

**Negative:** impaired concentration and judgement, mood swings, depression, psychosis, confusion, disorientation, nervousness, tension.

**Physical:** impotence, reduced birth weight, inhibited lactation, inflammation of oral cavity, oral cancer, GI problems, anorexia, MI, hyperthermia, insomnia, nightmares, dependence.

## UK KHAT FATALITIES

Between 2004-8, 10 khat related deaths were brought to the attention of the National Programme on Substance Abuse Deaths (np-SAD):

Characteristics	Frequencies
Year of death	2004 = 2; 2005 = 2; 2006 = 4; 2007 = 0; 2008 = 2
Geographical area	East London = 1; West London = 2; North London = 6; Hampshire = 1
Gender	All male
Marital status	Married = 2; with partner = 1; divorced = 1; single = 1; not known = 5
Age at death (years)	Mean = 34, range = 21 to 41
Ethnicity/Nationality	Somali = 8; Eritrean = 1; Polish = 1
Length of UK residence (years)	3 = 1; 5 = 1; 11 = 1; 15 = 1; Not known = 6
Occupation	Unemployed = 5; manual employed = 3; student = 1; invalidity benefit = 1
Living arrangements	Alone = 2; partner & children = 2; self & children = 1; with partner = 1; with sibling = 1; with friends = 1; psychiatric in-patient = 1; not known = 1
Significant medical history	No = 4; yes = 2; not known = 4
Known psychiatric history	Yes = 2
Known khat using history	Yes = 6
Evidence of using khat	Yes = 8
Place of death	Home = 3; hospital = 3 (inc. 1 following traffic accident); railway station = 2; street = 1; outside flats = 1
Coroner's verdict	Self-harm = 2; suicide = 1; open = 1; accidental = 2; misadventure = 1; non-dependent abuse of drugs = 1; narrative = 2 (inc. 1 natural causes)

Table 1: Main characteristics of 10 khat-related fatalities, UK, 2004-8

Case	Cause(s) of death	Role/association
1	1a Severe chest, abdominal and pelvic injuries	Paranoid psychosis associated with history of khat use => traumatic suicide (none in body at death)
2	1a Multiple injuries [fall from a height]	Possible suicide/accidental fall whilst judgement impaired (found in body)
3	1a Hanging 1b Stab wounds to neck	Possible history of excessive use => traumatic murder and traumatic suicide
4	1a Acute pulmonary oedema 1b Ingestion of khat	Ingestion of khat => high norephedrine levels => left ventricular failure => pulmonary oedema
5	1a Sub fulminant liver failure 1b Hepatic necrosis 2 Khat toxicity	Long term khat use => hepatic necrosis => sub-fulminant liver failure
6	1a Multiple injuries	Drug-induced psychosis/psychosis exacerbated by use of 'skunk' and khat over long period => traumatic suicide
7	1a Chest injuries	Ingestion of khat (possibly no longer active), alcohol consumption => intoxication, impaired judgement/lack of co-ordination => traumatic road traffic accident (pedestrian)
8	1a Multiple injuries	Alcohol and khat in system => impaired judgement/co-ordination => loss of control of vehicle => traumatic road traffic accident (driver)
9	1a Morphine intoxication	Overdose of injected heroin, but khat also in system
10	1a Sub acute liver failure 1b Khat ingestion 2 Auto immune hepatitis	Abused khat => jaundice, night sweats, pyrexia => sub-acute liver failure

Table 2: Role of khat in death for 10 khat-related fatalities, UK, 2004-8

### Khat Overview:

**Appearance:** Fresh leaves, dried leaves, bark, paste, powder

**ROA:** Chewed, smoked, brewed into tea

**Onset:** 20 mins

**Dosage:** 50-200g (over several/4-5 hrs)

**Cost:** Approx £3-6 (€3.5-7)/small bunch

## CONCLUSION

Khat chewing is becoming more popular in the UK due to migration. There are a number of concerns about the long term health risks of using this currently legal drug. The UK case studies presented here illustrate some of the key issues related to the consumption of khat. These include: (a) psychological effects – (i) impaired judgement leading to accidents and violence, (ii) causing or exacerbating psychoses or causing depression leading to suicide and even homicide; (b) physiological effects – toxicity (i) causing heart problems leading to fatal heart attacks, and (ii) liver failure; (c) mechanical problems e.g. choking on pieces of the plant.

In April 2004 Cardiff Bioanalytical Services Ltd, circulated a UKNEQAS blood sample containing cathinone, cathine and norephedrine for quantitative toxicology. Only one participant returned a result for each analyte, suggesting that most laboratories either do not routinely screen for khat or do not have methodology in place for its detection. Given the rise in usage and the abuse potential of this herbal drug, toxicology laboratories should have in place methodology for its detection.