INTRODUCTION    Khat is known in Somalia as "qaad" or "jaad". It is a plant whose leaves and stem tips are used as stimulant or medicine in certain areas of East Africa, Madagascar and Arabia. The consumers get a feeling of well-being and mental alertness with loquacity, excitement and sometimes anxiety (Halbach 1972). To achieve the climax of such feeling, they continue chewing for four to six hours or even more. The after-effects are usually insomnia, numbness, lack of concentration and anorexia. We have detected these and other effects during our research. Extensive descriptions are those reported by Halbach (1972), Hughes (1973) and by a WHO Advisory Group (Vol. XXXII No. 3 of Bulletin on Narcotics, 1980). The above studies point out in summary the following effects: constipation probably due to the astringent effect of tannins, anorexia, stomatitis, oesophagitis, gastritis, meteorism and paralytic ileus, cardiovascular effects such as tachycardia, palpitation sometimes with extrasistoles, hypertension, myocardial insufficiency, cerebral haemorrhage, migraine, hyperthermia, sweating (due probably to the hyperthermia itself and the high environmental temperature preferred by chewers), mydriasis, impairment of sexual activity in men, pulmonary oedema, hepato-toxic effects thought to be related to the tannic acid, etc. Cathinone induces behavioural and EEG changes in experimental animals. The patterns of change have been reported by I. Khan and P. Hughes 1979, Abdullahi S. Elmi et al., 1980, A. Berardi et al., 1980, Zelger et al., 1980 and others.

Both cathine and cathinone enhance electrically stimulated noradrenergic neurotransmission; the mechanism of action of both amines is believed to be the release of transmitter at the end of noradrenergic neurons (Report of a WHO Advisory Group "Review of the Pharmacology of Khat", Vol. XXXII, No. 3 Bulletin on Narcotics, 1980).

The excessive use of khat induces some degree of psychic dependence (Eddy et al., 1965); reactive depression, anxiety and irritation seem to be the most serious psychic effects (Hughes 1972). Nevertheless, toxic psychosis and aggressive behaviour have been also reported.

KHAT CHEWING IN SOMALIA

A) Spread of the Habit
KHAT: CONSUMPTION AND PROBLEMS IN SOMALIA

Written by A.S. Elmi

Khat chewing started at different times in different parts of Somalia. Chronologically, it started first in the Northern Regions. In the north-western part of the country, not far from Harar, the use of khat seems to date back to several centuries age. There are no written documents in this regard according to our knowledge. However, judging from factors such as the common culture and the proximity to the original zone of plant action, the nomadic character of the majority of the people living in this area and histories transmitted orally, one is reasonably induced to accept that hypothesis. In the northern regions (a former British protectorate), as a whole, the great diffusion of khat chewing started after the Second World War.

In the southern regions, prior to independence and reunification with the northern regions (July 1960), khat chewing was exceptional. But over the last 20 years, the khat chewing habit has also spread widely in the south. The prevalence of the phenomenon is, however, still higher in the north.

B) Varieties, Prices and Transportation Means

Khat prices are subject to the law of demand and supply, so these change from one day to the next. Since the country is wide, and about 3000 km separate the northern end from the southern reaches, prices and khat varieties are different. Prices vary according to the distance from the origin of the drug.

In the northern regions khat is partly grown in the country and the remainder imported from Jigjiga and Harar provinces of Ethiopia. The variety is known as "Harary" and nowadays it reaches as far south as Beled Weyne. Khat of this variety is sold in bundles or "marduuf", tightly wrapped in banana leaves. The "marduuf" is made up of four smaller bundles, each of which is known as "majin". Each majin weighs around 80 grs.

The main point of entry of the imported portion of this variety is Wajaleh. The khat grown in the northern regions of Somalia is of the same variety as the one from Ethiopia, and is preferred by chewers because of its stronger effects. The average price in Hargeisa and nearby towns for one "majin" of imported khat is 60.- Somali Shillings (1 US$ = 15.6 Shillings), while for the local product the price is 80 schillings per majin. Two to four majins make up an effective dose. In the central part of the country, the price for "harary" is around 70 - 80 Shillings per majin.
The khat consumed in the southern regions comes almost exclusively from Kenya. It is commonly known as "mirow". This variety reaches as far north as Dhusamareb. "Mirow" has smaller leaves and is prepared in "marduufs" with the difference that in each "marduuf" there are ten majins. Usually 7-10 majins are consumed per person in one session. The average price in Mogadishu is around 120 schillings for one "marduuf".

The amount of khat grown in the Lower Shabelle Region is negligible compared to what is consumed. The main point of entry of khat from Kenya is Bulo Hawo followed by El-Wak and Liboi. It is mainly transported by road using fast cars. Expert drivers are used who keep a very high speed throughout the trip and are of dangers being constantly under the influence of khat.

C) Patterns of Use

Khat chewing has become some kind of social institution. The chewing usually takes place in sessions or parties with special patterns. These are organised in special rooms where chewers are seated on comfortable mattresses with their elbows resting on large pillows and leaning against the wall. European style clothes are uncomfortable in this position, so consumers wear a light vest and "hoosgunti", a traditional garment which resembles the Scottish kilt. With this clothing chewers suffer less from the high temperature in the chewing chamber. Some prefer to have in the centre of the room a brazier with live charcoal in which incense is now and then burned. Friends gather after the working hours holding conversations and discussions on various subjects. Often music is played. Parties with only men are more common. It is not rare, however, to see mixed parties with two or more couples sitting together.

Only tender leaves and stems are chewed and the juice is swallowed with the saliva. The residue is not spat out immediately, but gathered in the cheek and kept usually for the whole period of chewing. The bolus thus accumulated makes a characteristic bulge in the cheek of the chewer. During khat chewing, considerable amounts of liquids (tea and soft drinks), are ingested. The need for liquids is due to the fact that some principal active ingredients of khat provoke dryness of the mouth.

Quite often, in khat parties organised by well-to-do people, singers and/or poets are invited and the drug is consumed to the sound of a guitar and listening to Somali melodies and poems.
Some chew khat during the working hours. This is the case especially of long distance truck drivers who use the drug in order to remain awake and increase their alertness. Also some students and intellectuals consume the drug with studying or working.

D) Search for Khat

The search for khat is enervating for chewers when supplies fall short or are lacking. For some the problem borders on tragedy. On Thursday afternoons or days preceding holidays, thousands of of people lay siege to the khat markets. If khat is not available, the waiting at the market is characterised by a sense of sorrow interrupted by moments of hope following news (sometimes false) that the khat supply is about to arrive. The atmosphere completely changes with a sudden explosion of joy when the air is filled with the loud and characteristic sound of a klaxon, that of the car full of khat. Soon exciting purchase-sale operations start. Each buyer after having selected his khat hastily and paid for it, disappears quickly gripping his bundles firmly to join his friends in the "majlis" (chewing place). Many do not resign themselves to the non-arrival of khat, and wait and hope until late evening.

In spite of the unrestrainable desire for khat, if the drug does not appear on the market, no serious reactions on either the individual or collective levels take place. The main problem, for the majority in these cases, seems to be a sense of sadness for the missed pleasure and how to pass the following four to six hours. For heavy chewers, the problem is more serious. In the rare cases, when no consistent supplies of khat get to the market, a retailer with few "marduufs" of khat, may ask and get 1000 Somali Shillings for one marduuf especially on a day before a holiday.

Research on Epidemiology of Khat in Somalia

OBJECTIVES: The objectives intended to reach with this research were:

i) to get a rough estimate of the percentage of khat chewers among the Somali population;

ii)
definition of the social characteristics of the group or groups of

khat consumers;

iii) Pinpointing its effects on the individual and the society.

METHODS: These results were not easy to obtain because of difficulties of correct sampling. However, we did our best at random collection of data that might reflect the real situation. As the area of research, we chose Mogadishu (M) and Hargeisa (H) and their suburbs. In view of their geographical location and cultural background, these two areas may reasonably be considered as representatives of the southern regions.

RESULTS AND DISCUSSIONS: The number of people interviewed was 7,485 (4,526 male and 2,959 female). Their age ranged between 16 and 78. The interviews were made randomly at hospitals, homes, schools, factories, places of work and entertainment, etc. The distribution of the people interviewed in the two areas was 4,136 in M and 3,349 in H.

The results obtained show that 18.26% in M and 54.96% in H are habitual consumers (at least once every three days); in 12.61% and 18.76% respectively the consumption is sporadic (about once fortnightly) while 8.30% in M and 10.50% in H are occasional consumers. The remaining 60.83% in M and 15.78% in H are non-consumers. It might then be deduced that approximately 39% of the people of M and 84% of that of H (over 16) have tried khat.

Considering the use of khat in the two sexes (fig.1), it has been observed that khat consumption is greater among men. In M over 80% of the female population has never tried khat, while in H it stands at 46.35%. The habitual consumers among men are 21% in M and 64% in H. The total female habitual and sporadic consumers of khat are 25.45% and 10.60% respectively in H and M.

As for age, it is clear that in M, khat chewing is fare more frequent in the 20-40 age bracket. This may be explained by the fact that strong diffusion of khat started in M after 1960. Since young people are more susceptible to changes and new fashions, it may be considered that the habit grew more on those who were in their twenties in 1960 and those who followed. In H, where khat consumption started earlier, there are no great differences in the age groups above 20. Nevertheless, consumption, to a certain extent seems to increase with age. The percentage of those who never tried khat never exceeds 30% in the different age groups in H, while the
same in M ranges between 57.68% (20-30) and 87.62% (under 20).

Fig. 3 shows the relationship between khat consumption and occupation. In M the khat habit is more rooted among traders and businessmen and the unemployed. The greater consumption in businessmen may be related to their greater earnings and to the fact that khat parties are good occasions for business transactions. Among the jobless, the need to overcome frustration probably plays an important role in their khat chewing habit. In H, khat chewing is found in all professions. Habitual chewing is the highest among businessmen and the unemployed (75%), while it is markedly low among students (18.01%).

With regard to education, in M khat consumption is more prevalent among graduates where the total of habitual and occasional consumers adds up to 50.13% while at the same time the percentage of non-consumers is the lowest observed (fig. 4). In H, the peak of khat chewing is seen in those with no education and among graduates.

Khat is usually consumed during leisure time, 72.47% in M and 60.86% in H and during daytime (afternoons), 58.31% in M and 87.36% in H (fig. 5). Chewing in groups prevails over solitary consumption of the drug. The ratio in M is 70.23 to 29.77% and in H 88 to 12% (fig. 6).

What are the main motivations? The main reasons stated for the initiation are the desire to follow the example of friends or other family members (58.34% in M and 80.70% in H) and the whim of trying the effects on the drug. The need to share one's own time together with others (41.34% in M and 30.29% in H) and the pleasant stimulation given by khat (38% in both areas). These are the main causes that justify the persistence of the habit. Other reasons claimed are to improve working (or studying) efficiency (18.20% in M and 3.49% in H), health reasons (1.67% in M and 6.7% in H) and to improve sexual performance (4.63% in M and 2.68% in H).

What might have a great influence in social and family life is the effect on sex. In this regard, about 60% of the male population report increase of libido which, however, is not sustained by an equal increase of sexual potency. In fact only 18.78% have reported improvement of sexual performance, while a good 61% have denounced it as an impairment (fig. 7). The situation in the female population is very different; the increase of sexual desire (71.71%), is in fact followed by improvement of performance (78.26%) (fig. 7). Some 61% of the male population report either spermaturia or precocious ejaculation.
The stimulant effects of khat are somewhat comparable to those of amphetamines. The main effects indicated by the interviewees are increase of concentration (76.95%), loquacity (66.76%), decrease of inhibition (63.54%), general state of well-being (57.64%) and improvement of thought and ideation (63.52%). The after-effects reported are constipation (54.16%), anorexia (57.64%), lack of concentration (47.70%), malaise (38.34%), insomnia (33.51%) and headache (28.95%). The interviewees did not suffer from any particular disease. Chronic diseases among them were hypertension 6.08%, bronchitis 4%, gastritis 4% and gastric ulcer 1%.

Problems of Khat

If khat were consumed moderately and with long intervals, it might perhaps represent only a small economic problem. Unfortunately people tend to abuse the drug the extent of which spreading rapidly. Khat chewing is, today, a real plague for many countries and constitutes serious problems of social, economic and health nature.

1) SOCIAL PROBLEMS

The use of khat causes various social problems such as the following:

a) Corruption - Khat consumption seems to promote corruption and similar criminal practices because the habit is quite costly (considering the per capita income) and the consumer is compelled to earn more money in order to satisfy his vice. The khat addict tends to abuse his position to make undue favours in exchange of money or khat. Social injustice and mis-administration arise from this. If this phenomenon reaches bigger proportions, the whole social life and the economy will suffer.

b) Family instability - Families are usually large in developing countries, and the heavy economic burden of the chewer will reflect on them. Family members feel that they are unable to satisfy many needs and solve serious economic problems and, at the same time they see that a considerable portion of the income is diverted to a habit which is of no use to any of them.
This causes dissatisfaction and negative reactions. Moreover, the chewer, often, shows irritability and spends much of the time away from home thus threatening the unity of the family. Many chewers, as seen above, show impairment of sexual potency after khat consumption. This may lead to further blows on family stability.

c) Encouragement of prostitution - Many khat parties are mixed, with men and women chewing together. Sometime they are married couples; in other cases girls and young women are invited and male and female partners chew together. The pleasant stimulation and the easy passage of time are very tempting. This puts many girls on the path towards prostitution.

2) ECONOMIC PROBLEMS

First of all, the diversion of the scarce resources (human and material), towards the production or importation and marketing of khat is obviously having a negative impact on the economies of khat consuming countries. The problem appears all the more serious, if one considers the fact that the production and supply of essential foodstuff is bad and tends to be deteriorating in the concerned countries. For Somalia khat importation represents a serious balance of payments problem. Habitual khat chewers' working hours are often reduced. Apathy and time needed to prepare for the next session draw much of his time. Khat causes financial constraints and strains in families with addicted members.

3) HEALTH PROBLEMS

Not all khat health hazards have been clearly assessed. If continuously consumed it certainly produces ill effects on healthy people. Following are the medical effects that we have observed:

a) Effects on teeth and oral problems: Somalis very much value the appearance of their mouths. During childhood everyone gets a lot of education on oral hygiene. Unfortunately khat is spoiling this tradition. Stomatitis and periodontal diseases by khat are very common. It is widespread opinion among chewers that the variety for khat from Kenya, produces much more marked irritations and teeth loosening effects. In fact buccal lesions are more serious in khat consumers coming from Kenya and those of the southern regions of Somalia where in the last five years the variety "mirow" is almost exclusively used. The problem is also serious in the northern regions, though perhaps to a lesser extent.
b) Gastrointestinal disturbances: In Somalis, gastrointestinal disturbances are quite common. In recent years a great increase of ulcers, especially in the duodenum, is seen. The factors involved may be different. The role of khat in this matter has not yet been scientifically assessed. Nevertheless, it is the opinion of many clinicians that the spread of khat has contributed to the increase of these ailments. Khat chewers suffer from chronic constipation. This is certainly due to the astringent effects of tannins and the sympathomimetic effects of the phenylalkylamines.

c) Liver diseases: Liver diseases have increased to an alarming extent in the last few years. More than one factor may account for this. Alcohol is to be excluded as a major cause, since the great majority of liver patient are observant Muslims who do not drink. Instead, the tannic acid's hepato-toxic effect may well be one of the factors.

d) Cardiovascular effects: During khat chewing, various effects on cardiovascular apparatus are observed. During our research we have detected the following acute effects in all our subjects: increased systolic and diastolic blood pressure, tachycardia, palpitations and sometimes extra-systoles. The effects last for some hours and after 18 hours initial values are restored. These effects though reversible in healthy subjects, might be dangerous for chronic khat users and deleterious for patients with cardiovascular defects.

e) Insomnia: One of the well known characteristics of khat is that it induces insomnia. Chronic that chewers often refer to hospitals complaining of insomnia and requiring tranquillizers and hypnotics. This, obviously, would not do anything but worsen their condition.

f) Venereal and infectious diseases: The pattern of use of khat which requires many excited and talkative people sitting side by side for long hours in a closed environment, favours the transmission of some infectious diseases. It is worthwhile to note that in the countries where khat is used, the prevalence of infectious diseases, especially chest diseases, is very high. After khat consumption, many men and women like the company of persons of the opposite sex. This increases certainly the risk of sexually transmissible diseases.

g) Malnutrition: Khat is known to strongly decrease the appetite of the user. Heavy consumers
tend to have poor meals or not to have them at all for long periods. Cases of severe malnutrition following chronic khat chewing are reported in hospitals.

h) Accidents: Drivers, especially long distance truck drivers, make abundant use of khat. When a person is under the stimulant effects of khat, reflexes are good and reactions time is decreased. Nevertheless, he is over confident and sometimes tries dangerous manoeuvres when driving. Such behaviour is the cause of many accidents.

i) Psychic effects: Khat produces various psychic effects. The day after a night of khat chewing the person feels a sense of malaise and often suffers from migraine. Irritability and reactive depression are also seen. Habitual users show psychic dependence. In the mental hospitals of Mogadishu and Hargeisa, many cases of acute toxic psychosis have been admitted. This latter effect is presented by heavy khat chewers who often suffer also from malnutrition. In the clinic for mental and nervous diseases of Mogadishu, few cases of patients with hallucination, delirium and aggressive behaviour (when under the effects of the drug) followed by unpleasant withdrawal symptoms have been reported.

j) Reproductive system: Our epidemiological survey showed impairment of sexual performance after khat consumption in over 60% of the male population. Spermatorrhoea and precocious ejaculation were also reported by the majority. It is the opinion of chewers that the occurrence and extent of such effects vary in accordance to the variety of khat. Though the above effects are reversible, in khat addicts they may degenerate in to impotence.

k) Other effects: Other acute effects observed during our research are hyperthermia, sweating, mydriasis and increased respiratory rate. As for the relationship between khat and level of glyceamia, a recent study carried out in our laboratory shows that khat does not influence to any significant extent the blood glucose levels in man.

CONCLUSION

The habit of khat chewing has spread tremendously in the last 20 years. Some factors hindered the spread of khat up to the early sixties. Among these were the vastness of the
country, poor roads and transportation means which made the fresh availability of this perishable product impossible to all parts of the country. Other factors were the prohibition of the use of the drug which was in force up to the late fifties and moral and religious prevention. The latter two points have undergone deep changes in the last two decades. Today, although some of the public still considers khat the same as alcohol from the Islamic point of view, the majority of the population is convinced that khat chewing is not against the principles of Islam.

Khat consumption is a serious economic problem in Somalia. Some 80% of the khat chewed is imported. This "luxury" habit drains, in terms of hard currency, billions of Shillings needed for production and supply of essential goods. Neglect for work by khat chewers is another problem as the daily working period of the typical khat addict does not exceed 3 hours.

From the social point of view, khat is a real scourge. Abuse of khat fosters corruption, prostitution, family disintegration and other criminal acts.

Various ill effects on health are produced by khat. Many body organs suffer from chronic khat chewing. Among these are tissues and organs of cardiovascular, gastrointestinal, nervous, reproductive and respiratory systems. Khat causes psychic dependence. Other findings mention cases of serious psychotic effects and withdrawal syndromes. On the other hand, not a single chronic condition has been proven to benefit from khat.

The Somali Government is making efforts to discourage the use of khat. The anti-khat campaign was intensified in 1982. Negative propaganda is aired through the radio and printed on papers. Anti-khat arguments are very often raised in speeches of high-ranking government officials. An important measure taken by the government is the strong limitations of the areas in which khat cultivation is permitted. This latter measure, is essential to protect other crops destined for nutrition and export.

In view of the fact that other serious problems may arise from the abrupt prohibition of khat, stronger measures have not been adopted. The Solna Government, as I have been assured by the responsible authorities, will welcome positive suggestions leading to the solution of the problems of khat. Countries touched by the problem of khat, should be on the front line in research on khat and in finding problem-solving strategies. However, since research capabilities are limited in these countries, they must be assisted with other means and expertise.
Some khat effects seem to vary quantitatively and qualitatively with the variety and origin of the drug. A comparative study of khat from different areas would be appreciable.

In Somalia, the Department of Pharmacology, in spite of the limited means, has done a lot on the study of epidemiological, pharmacological, medical and social aspects of khat chewing. We now have course studies on psychic, gastrointestinal, stomatological and physiological effects of khat. Also the negative impact on the economy is being fully evaluated.

Our department and the faculty of medicine of Somali National University, would welcome and actively join a collaborative study coordinated by an international organization with the objectives of improving the knowledge on the various aspects of the abuse of khat and studying control mechanisms of this spreading plague.