

EFFECTS OF KHAT (*Catha edulis* Forsk) ON ELECTROPHYSIOLOGIC PROPERTIES OF THE HEART AND OF THE LUNG FUNCTION INDICES

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www.unisa.it/Centri_e_Vari/pharmacologyonline/archives2008.php

ESF-LIU Conference, Linköping, Sweden (05-09 October 2009)

Khat (Chat, Gat, Mirra, etc) commonly known as the leaves, young shoots or stem tips of *Catha edulis* Forsk is an evergreen shrub of the Celastraceae family (Rudolf, Brenneisen, 1985; Dagne, 1984). Sample Beleche Khat shrub is shown in figure 1. The fresh leaf is traditionally chewed mainly by people living near the cultivation areas in East Africa and the Arabian Peninsula to attain a state of euphoria and stimulation (Al Meshal et al, 1985; Kalix, 1996). However the habit of Khat use has nowadays rapidly transformed from cultural ritual to high commercial commodity—Tradition/Trade/Tragedy!

The chewing and ingestion of fresh and young leaves of Khat produces observable alterations in the physical, physiological and psychological wellbeing of man. The aim of this study was to assess the effects of *Catha edulis* Forsk on, lung function indices and electrocardiographic profile of the casual user.

Sixty healthy adult men who were casually chewing Khat leaves were randomly selected from 10 localities in Addis Ababa using inclusion and exclusion criteria. The mean age (\pm SD) was 31 ± 2 years; their mean body weight was 70.8 ± 3.8 , their BMI was 22.3 ± 0.6 kg/m². None were smokers and their frequency of chewing and ingestion of khat leaves was on the average 1.7 times per week. All study subjects had normal history, vital signs, LFI (lung function indices) and ECG profile prior to the khat session.

Each of the study subjects chewed and ingested 200 gram of fresh “Beleche” Khat leaves over a period of two hours.

Measurements of VCIN, FVC, FEV1, FEF and PEFR showed statistically significant differences between pre-test and post-test values ($P<0.001$). The mean value of the post-test FEV1% showed significant increment in only about 70% of the study subjects. The changes in VCIN, FVC, FEV1 and PEFR appeared to be relatively more consistent and significant ($P<0.001$).

Other changes observed in this study were ECG profiles. The ventricular depolarization and conduction velocity (QRS) increased by 11%; the cardiac cycle length (R-R interval) and the ventricular depolarization and repolarization time (QT interval) was shortened by 9% and 4.5% respectively.

The chewing of Khat leaves caused sympathetic-like effects on the conductivity, rhythmicity and excitability of the heart, and similar effects on the volumes and ventilatory capacity of the lungs.



Fig 1. “Beleche Khat”, Ethiopia.

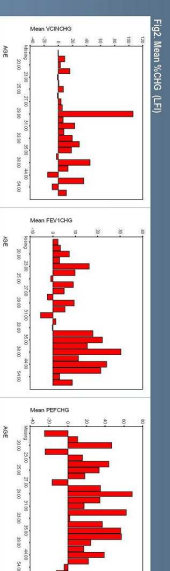


Table 1. Means and SD of the LFI before and 2 hours after oral ingestion in 60 study subjects. P-value represents level of significance and the magnitude of effect size. Small (0.2-0.9), Medium (0.5-0.8), Large (0.8+).

Variable	Pre Test	Post Test	Mean % CH	Effect size	Magnitude of Evidence
VCIN	2.90(0.99)	2.91(0.76)	15.6	0.8	Moderate
FVC	3.80(0.45)	3.70(0.53)	9	0.8	Moderate
FEV1	2.88(0.40)	3.27(0.51)	10	0.74	Moderate
FEV1%	67.59(7.84)	88.98(6.35)	2	0.18	Small
PEF	6.01(1.83)	7.23(1.58)	20	0.8	Moderate
FEF75%	1.90(0.84)	2.05(0.99)	8	0.18	Small
FEF50%	4.14(1.23)	4.54(1.47)	10	0.33	Small
FEF25%	5.51(1.72)	6.39(1.10)	16	0.3	Moderate

Table 2. Prepost Khat ECG profile. The data are expressed as difference \pm SE.

Variable	Pre Test	Post Test	Mean % CH	Evidence
HR	80.56	130.16	212	12.54
PR	0.75	0.01	0.68	0.01
QR	0.12	0.002	0.13	0.001
QRS	0.09	0.002	0.10	0.001
QT	0.35	0.01	0.33	0.01
QRS/QT	51.88	1.23	66.69	1.19