

# Khat (*Catha edulis*) Plant Abuse in Saudi Arabia

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## Research

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# Abstract

## Background

The khat (*Catha edulis*) shrub is cultivated in both the Arabian Peninsula and North Africa. The citizens of this region have carried the tradition of chewing khat leaves since the 15th century. This plant is a natural stimulant which contains two main substances, cathine and cathinone, which cause excitement, euphoria, and loss of appetite. Moreover, the khat trade is considered a source of income within countries of these regions. However, khat holds both benefits and negative aspects for mankind, society, and the environment. This article focuses on the issue of khat smuggling to Saudi Arabia, which has increased over between 2010 and 2016 according to the recent statistics.

## Method

Research on the problem of khat smuggling to Saudi Arabia was performed through the analysis of seven years of data (2010–2016) obtained by Saudi Customs and other governmental entities responsible for monitoring the smuggling of drugs, which includes data reflecting the amount of khat seized and smuggled to Saudi Arabia.

## Results

Khat smuggling has increased in Saudi Arabia over seven (2010–2016) years. The analysis of data on both the promotion and smuggling of khat were considered, and placed khat in third place among other drugs since the year 1999.

## Conclusion

Statistically, Jazan is the most vulnerable to the smuggling of khat. As such, the to design of intervention programs is recommended to address the problem of khat smuggling in the Jazan region. Additionally, awareness should be increased among the youth through cooperation between public education and higher education, which should include further research on this problem.

## Background

Substance abuse is a tragedy faced by every society and health system on earth, with the forms and patterns of abuse varying from one place to another. Khat (*Catha edulis*; Fig. 1) is also known as qat or the khat plant, with different spellings in some scientific literature. This plant is grown in Ethiopia and other countries. Notably, khat has stimulant effects similar to those of amphetamines [1]. During khat use, the leaves and the bark of the plant are chewed slowly over several hours, and the juice of masticated leaves is swallowed without the residues. Khat contains phenylpropylamine alkaloids, of which the main psychoactive constituent is S-(-)- $\alpha$  aminopropiophenone (cathinone), alongside the less psychoactive phenylpropanolamine diastereomers S-(+)-norpseudoephedrine (cathine) and R,S-(-)-norephedrine. Both cathine and cathinone are scheduled under the UN 1971 convention. Cathinone is regarded as an amphetamine like sympathomimetic amine. Khat affects human behavior by causing grandiose delusions, while chronic use can cause depression and suicide, hallucinations, paranoia, nightmares, euphoria, increased alertness and energy, hyperactivity, increased blood pressure and

heart rate, cardiac complications, insomnia, and gastric disorders. Notably, some studies have proven that khat users may become psychologically addicted to khat [2–7]. Hence, in 1980, the World Health Organization (WHO) categorized the khat plant as a drug of abuse that can create mild to moderate psychological dependence. Based on the WHO classification, many countries have controlled the use of khat by making its use illegal. Saudi Arabia is located in West Asia and constitutes the bulk of the Arabian Peninsula, with an estimated area of (2,150,000) square kilometers. The capital city of Riyadh is an important location on the international stage, and its large area requires more security to control smuggling routes. However, the abundance oil and minerals led to save money. With a population of over 29 million, a large proportion of residents are young people, and at least 7 million foreigners add to the purchasing power. All of these factors make Saudi Arabia the first *destination* for smugglers. The aims of smuggling include illegal gains, the weakening and dismantling of cultural and religious values, as well as domicile (urban or rural) and socio-economic factors in Saudi society. Moreover, the borders of the Kingdom are very close to Yemen, where the production of narcotics leads to ease of distribution and increased smuggling. However, based on examinations, the negative culture associated with narcotic drugs is increasing among the teenage proportion of the Saudi population. Therefore, seizures of smuggled drugs are causing alarm among both scientists and local authorities [7–12].

## Methods

In order to conduct research on the problem of khat in Saudi Arabia, we performed an analysis of data collected over seven years (2010–2016), which was obtained from Saudi Customs and other governmental entities responsible for preventing the promotion and smuggling of drugs. Namely, the data reflected the known amount of khat seized and smuggled into Saudi Arabia.

## Results

Results indicate that Khat smuggling has increased in Saudi Arabia over seven (2010–2016) years. The analysis of data on both the promotion and smuggling of khat were considered, and placed khat in third place among other drugs since the year 1999.

## Discussion

Kat placed third (97.74%) among the large volume of drug cases observed in Saudi Arabia. The annual growth rates in comparison to the size of base year seizures (1999) is presented in Table 1.

Table 1  
Annual growth rates of khat from 1999 until the end of 2016.

Year	Kat (grams)	Quantities (tons)	Annual growth rate	Growth rate compared to base year (1999)
1999	220234965.880	220.2	-	-
2010	373860260.010	373.9		69.8%
2011	418727313.110	418.7	12.0%	90.1%
2012	3240246213.440	3240.2	673.8%	1371.3%
2013	2977811765.650	2977.8	8.1%	1252.1%
2014	2971698306.480	2971.7	0.2%	1249.3%
2015	3153051094.196	3153.1	6.1%	1331.7%
2016	4922925312.250	4922.9	56.1%	2135.3%
<b>Total</b> <b>(khat seizures 2010–2016)</b>	<b>18058320265.136 g</b>	<b>18278.5 tons</b>		

The amount of khat seized in the year 1999 was approximately 220 tons. The level of khat seizures increased until 2010 (approximately 373 tons)—an increase of 70% from the base year, while the number of seizures in 2011 increased by 90% over the base year. The quantity of khat seized in 2012 was very high, reaching approximately 3240 tons—an increase of 1371% compared to 1999, which caused worry among authorities. Khat control between 2013 and 2016 has remained very high compared to normal levels of khat control. This increase in seizures is likely due to a number of factors, including planned targeting and re-application of sanctions applied before the introduction of the anti-narcotics system on khat issues on the southern border. By 2012, the level of seized khat quantity increased by 1371% from 1999. This high level of khat seizures continued until 2016, reaching approximately 5000 tons (Fig. 2).

## Seizures according to customs ports

Due to the importance of seizure analysis in identifying, preparing for, and responding to smuggling strategies, a detailed analysis of the Customs Department's data is conducted in order to arrive at more in-depth conclusions. The data from 2010 to 2016 was analyzed to identify seizures by port. The highest quantity of khat was seized through customs at the port of Tawal through customs clearance (97.8%). This indicates that the port of Tawal is the target of smuggling khat from the other customs outlets. This is followed by Altadena Port (1.6%) and Jizan Port (0.2%) customs. The remaining customs outlets have not experienced khat smuggling, which can be explained by the fact that khat dries rapidly, which thus requires smuggling to the nearest point of cultivation for rapid distribution and use. Yemen is a country famous for khat cultivation, and their producers target those seeking consumption through Tawal Port, as shown in Table 2.

Table 2  
Drug seizures (khat) in kilograms across outlets in Saudi Arabia from 2010 to 2016.

Port name	2010	2011	2012	2013	2014	2015	2016	Total	% of total
Tawal	44.212	46.158	1890.26	11.538	7.104	2.445	0	2001.72	97.8
Alwadeha	27.715	0.15	0.115	0.4	0.013	2.302	2.910	33.61	1.6
Jizan	0	5.02	0	0	0	0	0	5.02	0.2
King Abdulaziz International Airport	0.99	0.817	0.387	0	0	0	0.625	2.82	0.1
Green Customs	0.436	0.4	0.674	0.347	0.135	0.026	0	2.018	0.1
Alab	0	0.223	0.333	0	0	0	0	0.56	0.0
King Khalid International Airport	0.1	0	0	0	0	0	0	0.1	0.0
King Fahd Causeway	0	0	0.04	0	0.016	0	0	0.06	0.0
Albataha	0	0	0	0	0	0	0	0	0.0
Alhadethah	0	0	0	0	0	0	0	0	0.0
Khafji	0	0	0	0	0	0	0	0	0.0
Durra	0	0	0	0	0	0	0	0	0.0
Al-Raqi	0	0	0	0	0	0	0	0	0.0
Dry Port in Riyadh	0	0	0	0	0	0	0	0	0.0
Port of Ammar	0	0	0	0	0	0	0	0	0.0
Salwa	0	0	0	0	0	0	0	0	0.0
King Khalid International Airport (Riyadh Post)	0	0	0	0	0	0	0	0	0.0
King Fahad International Airport	0	0	0	0	0	0	0	0	0.0
King Fahd International Airport (Central Post Office)	0	0	0	0	0	0	0	0	0.0

Port name	2010	2011	2012	2013	2014	2015	2016	Total	% of total
King Fahad International Airport (Express Mail)	0	0	0	0	0	0	0	0	0.0
Yanbu Airport	0	0	0	0	0	0	0	0	0.0
Port of Yanbu	0	0	0	0	0	0	0	0	0.0
King Abdulaziz International Airport (Jeddah Post)	0	0	0	0	0	0	0	0	0.0
Jeddah Islamic Port	0	0	0	0	0	0	0	0	0.0
Port of Deba	0	0	0	0	0	0	0	0	0.0
Prince Nayef bin Abdulaziz Airport	0	0	0	0	0	0	0	0	0.0
Taif Airport	0	0	0	0	0	0	0	0	0.0
King Abdul Aziz Port	0	0	0	0	0	0	0	0	0.0
Prince Mohammed bin Abdulaziz Airport	0	0	0	0	0	0	0	0	0.0
	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>73.453</b>	<b>52.768</b>	<b>1891.807</b>	<b>12.285</b>	<b>7.268</b>	<b>4.773</b>	<b>3.535</b>	<b>2045.889</b>	<b>100.0%</b>

## Conclusions

The results of the present study highlight the significant of understanding the increased smuggling of large quantities of khat into Saudi Arabia. Our findings suggest that Jazan is the port most vulnerable to khat smuggling. As such, designing intervention programs to address the problem of khat and smuggling in the Jazan region is recommended. Saudi Arabia is experiencing a serious problem with khat smuggling due to the existence of 30 customs ports on the border over a large area, thus making control difficult.

## Declarations

# Availability of data and materials

Not Applicable.

## Ethics approval and consent to participate

Not Applicable

## Consent for publication

Not Applicable.

## Competing interests

The author has not declared any conflict of interests.

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Authors' contributions

Not Applicable

Author details

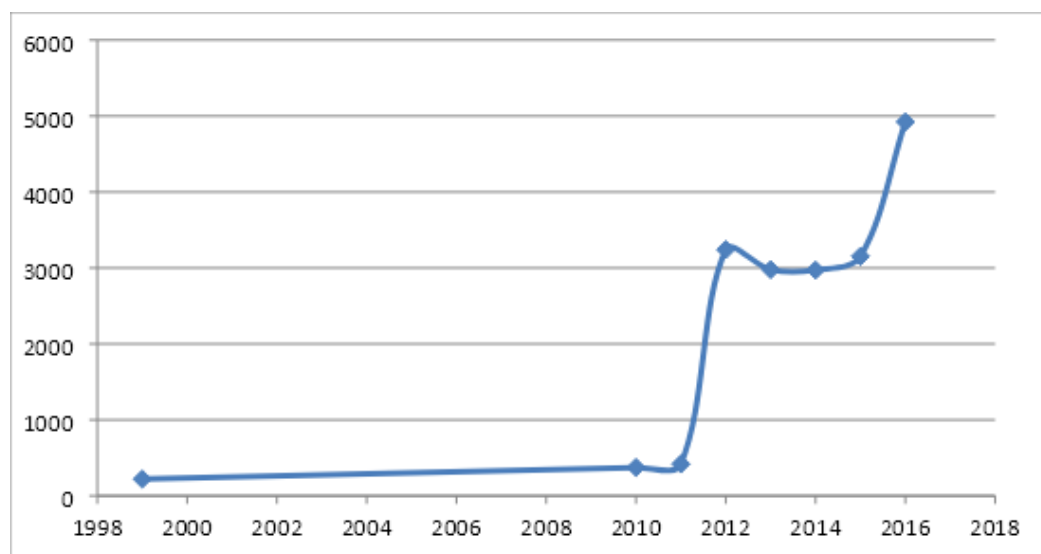
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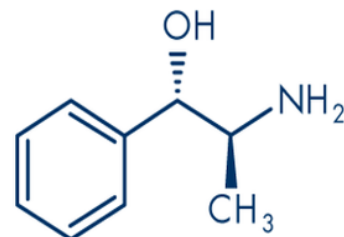
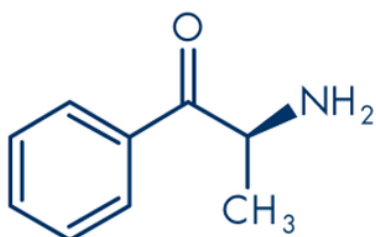
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## Figures



**Figure 1**

The annual growth rate of seized khat quantities from 1999 until the end of 2016.





**Figure 2**

Chemicals structures of Cathinone (C<sub>9</sub>H<sub>11</sub>NO, MW 149-left) and Cathine (C<sub>9</sub>H<sub>13</sub>NO, MW 151- right)



**Figure 3**

Bundles of khat, as typically traded.