



**Linköping University**

## RESEARCH CONFERENCES

ESF-LiU Conference

# The Changing Use and Misuse of Catha Edulis (Khat) in a Changing World: Tradition, Trade and Tragedy

Scandic Linköping Väst, Linköping • Sweden  
5-9 October 2009

Chair:

**Dr. Michael Odenwald**, University of Konstanz, DE

Vice-Chairs:

**Dr. Nasir Warfa**, Queen Mary University of London, UK

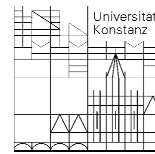
**Dr. Axel Klein**, University of Kent, UK

[www.esf.org/conferences/09274](http://www.esf.org/conferences/09274)

With support from



Riksbankens  
Jubileumsfond



Auswärtiges Amt



© Mara Fadrina Truog

## Conference Highlights

*Please provide a brief summary of the conference and its highlights in non-specialist terms (especially for highly technical subjects) for communication and publicity purposes. (ca. 400-500 words)*

Throughout the past decades, khat production, trade and use has been swiftly developing from a niche to a mass phenomenon and became an economic pillar of national economies. This situation is related to a multitude of challenges. In contrast to this boom, khat research is still a very small and fragmented field that is dispersed across different disciplines and currently is in the process of its formation. In the past decades, the emerging khat-related problems were mostly analyzed and solutions were proposed from the perspective of narrow evidence bases not referring to cross-disciplinary knowledge.

This ESF conference has been a unique platform for researchers that work on khat to find out about khat researchers from other disciplines, meet them and learn about their research findings. For the first time after 1983 when 30 experts had met in Madagascar, a group of 60 international experts on khat from very different academic disciplines as economy, geography, pharmacology, anthropology, medicine and psychology met, shared their knowledge and identified and discussed urgent questions. Thus, the conference was a major event in the process of the formation of a khat research field.

The conference was thematically organized around five themes, economy/ecology, culture, mental health, somatic health/pharmacology and the governance framework. In parallel, working groups were set up and to develop research recommendations for these five broad areas in self-organized discussions. Additionally, a working group was set up to develop research recommendations related to the topic migrant khat users in developed countries. The main themes of this conference were communication, exchange and discussion. Several difficult topics were openly discussed, among which the links between khat and sex and khat use in countries where it is legally restricted. In general, research findings from single disciplines were put into a broader context. The complexity of the khat phenomenon became evident to all participants, e.g. the economic incentives for producers and regional administrations that encourage khat production which contrast the negative ecological and macroeconomic consequences as well as health implications. It became very evident that khat has not just to be analyzed from a pharmacological, medical, ecological or anthropological point of view but also to be put into the context of distributional and resource conflicts as khat is related to livelihood and income for large groups of the population but it has disadvantages for other groups. In sum, suggestions and recommendations for the to-be-developed legal framework were put into this context and simple approaches were critically evaluated. Not surprising was that the experts identified many urgent but unresolved research questions e.g. the link between increasing khat production and food insecurity, the non-existing monitoring system for khat-related economic indicators, the overuse of agrochemicals and its consequences, the missing quality control and consumer protection, the disentangling of confounding factors and other methodological problems related to the verification of the clearly emerging health implications. Equally, the need for international cooperation in building up research and monitoring capacities in the low-income countries of the “khat belt” were noted. In sum, the need for high-quality khat research was underscored because it was regarded the only possibility to support a rational and informed approach to the emerging khat problems. This underscores the need for a regular exchange platform for khat experts and specific research funding schemes.

I hereby authorize ESF – and the conference partners to use the information contained in the above section on ‘Conference Highlights’ in their communication on the scheme.

# Scientific Report

## Executive Summary

---

(2 pages max)

The conference was the first international and interdisciplinary meeting of khat researchers since 1983 and probably a founding event of what can be called a contemporary khat research field. Despite the fact that participants came from different academic disciplines and despite the fact that the recent academic discourse on khat was characterized by contradictory positions (social sciences versus the medical and biological disciplines) the conference managed to achieve an open atmosphere that enabled the discussion across discipline borders.

The presentations covered the whole range of current khat research. In the first thematic block, the economic importance of khat production and trade was made clear by data from different low-income countries in which the livelihood of large parts of the population depend on income derived from khat. The presented data supported the hypothesis that the economic importance of khat production and trade is currently increasing and that production is currently being introduced in regions where it had not been prevalent some years ago.

In the second thematic block, presenters reported on the cultural impact of the spreading of the khat use habit in Eastern Africa and the Horn of Africa. The time of khat deliveries and use sessions more and more shape the public live in urban centers and become a central point in individual peoples' lives, related to addiction-like patterns of use. The spreading of the use habit contrasts with the public discourse on khat in these countries, which is often characterized by scientifically unsupported notions of the effects of khat use on sex, may it be increased sexual desire, male impotence or that female khat users and traders engage in sex work.

The third block dealt with khat effects on mental health. Presenters from different countries reported khat use among people with mental disorders and associations between khat use and mental health problems. It was made clear that the current evidence relying on cross-sectional data has limitations although evidence is growing that khat use is functionally used among individuals with anxiety and mood disorders and that excessive khat use is related with the development of additional psychotic symptoms and disorders.

In the section on somatic health the problem of confounding variables was highlighted that limits the interpretations of khat use as causal factor for somatic problems - although this causal association is frequently claimed. The presentation of the example of oral disorders and khat use was very instructive: The data from a very recent study showed clearly that confounding variables account for the association found in previous studies and that socio-economic variables and dental care habits fully explain oral disorders among khat users. Population-based studies with similar rigorous methods need to be done for coronary heart diseases and cancer. As alternative approach, laboratory paradigms can better isolate causal factors, like in the presented oral mucosa model.

In the session on the governance framework presenters reported on different aspects of khat regulation. The one attempt proposed in previous years, banning khat, was not regarded a promising approach because of the economic dependency of large parts of the population on khat. Regulation, monitoring, creation of alternative income and demand reduction were discussed. High standard research on medical consequences of khat use was regarded key for the implementation of regulatory frameworks because unambiguous evidence is necessary to convince policy makers and stakeholders.

In self-organized working groups participants discussed and developed during lunch breaks and

evenings research recommendations for five thematic fields. The groups presented their recommendations in the last session of the conference.

Keynote talks and outcomes of working group discussions will be published in a special issue of the Journal of Ethnopharmacology (Impact Factor 2.3). With the help of the University of Konstanz and German Federal Foreign Office, the papers will be available free in the internet. Participants developed networks during the conference and several joint research initiatives were initiated.

## Scientific Content of the Conference

(1 page min.)

- *Summary of the conference sessions focusing on the scientific highlights*
- *Assessment of the results and their potential impact on future research or applications*

In the opening of the conference, Dr. Odenwald, chair of the conference, called for open-mindedness and the willingness to listen and learn among participants in order to overcome the barriers that had paralyzed the discussion on khat throughout the past decades. He referred to an historical example, the 18<sup>th</sup> century “Gin Craze” in the UK and the related legal responses.

In the first keynote lecture, Dr. Paul Griffiths, head of the epidemiology unit of the European Monitoring Center for Drugs and Drug Addiction (EMCDDA, Lisbon) explained the European Union’s difficulty with khat as it is legal in some and illegal in other member states. He identified the weaknesses of the current European monitoring of khat trade and use: It is not clear how much khat enters the European Union via The Netherlands and the UK and how it is traded within the community. The seizures indicate a clear-cut increase in some member countries, notably in Germany. However, it is unclear where the main smuggling routes and consumer groups exist. He reviewed the areas where the European Monitoring Center has already come across khat, e.g. the internet-based illegal trade of natural drugs and the growing market of synthetic drugs, one of which is the psychoactive ingredient in the khat leaves (cathinone). He summarizes that much work has to be done to have a coherent and appropriate response to the emerging khat problem in Europe.

The first thematic block of the conference was related to developmental economics, agriculture and ecology. Dr. Peer Gatter from the German Developmental Service and the University of Tübingen, Germany, presented unique data that had been gathered in several years’ work by the Worldbank, UNDP and the German Technical Cooperation in Yemen. Since the reunification of both parts of the country in 1990 and the civil war in 1994, khat maintains to be grown in the former North Yemen. At the same time, markets have been developed in the former South Yemen, a process which is closely related to political dominance of former northern over southern Yemen. He illustrated the khat boom and the related problems with survey and observational data. Based on the existing economic indicators he estimated that 30% of the 24 million Yemenis live to different degrees from khat-derived income. He added some basic data on khat-related ecological problems, mainly the overuse of ground water of which khat irrigation farming is the main driver. Dr. Gessesse Dessie from the Wondo Genet College of Forestry and Natural Resources in Ethiopia presented basic data on khat growing in his country, indicating that the production is swiftly increasing, especially in the few remaining regions where the natural forest cover is relatively intact. In his research he studied possible mechanisms how khat production is related to forest decline in Wondo Genet, where the forest cover has decreased from 16% in 1972 to 2.8% in 2000. He identified several interrelated driving factors responsible for this decline, among which is increasing population density and changing crop preferences due to climate changes. In field studies he used a combination of survey techniques and spacial as well as temporal data (satellite



images, GIS). He proposed several stages and mechanisms how khat production contributes to forest decline, e.g. because of land pressure, farmers use the state-owned forests to plant khat trees among already existing trees, which starts a process by which the forest are gradually changed and finally turned into plantations.

In a paper presentation, Dr. Wario Adano Robe (Max-Planck Institute for Social Anthropology, Halle, Germany) reported his field studies from the Kenyan Masabit Mountain region, where khat growing had been introduced only some years ago. His data shows that it became swiftly the most important pillar of household income and the local economy due to returns that are higher compared to traditional crops.

The second thematic block was dedicated to the culture and social anthropology of khat use. In her keynote lecture, Dr. Susan Beckerleg (Warwick University, UK) reported from her anthropological field work in Eastern Africa on discourses on khat and sex. She identified that the public discourse in Kenya and Uganda strongly reflects the notion that khat increases sexual desire and potency and that female users and traders are driven into sex work due to the psychopharmacological effects. Her research demonstrated that the scientific evidence base of these discourses is vague and that it is driven by unsound media reports. In her field work with female khat sellers she identified income-generation as most important motive for starting a khat business and that this group of women rarely engages in sex work. For several reasons khat selling is a very attractive business for women who are the main income earners of their families, e.g. the immediate returns, low skills prerequisites and the secure margin.

Several authors using anthropological research techniques focused on aspects of the current khat use cultures, e.g. the use patterns and development of addiction among university students (Dr. Rogers, Wright University, USA), the adjustment of the timing of public life by the strongly emerging khat use culture in Ethiopia (Dr. Anteh, Basel University, Switzerland) and the role of khat chewing in the political system of Somaliland (Dr. Hansen, Danish Institute on International Development).

In his Keynote lecture, Prof. Günther Schlee (Director, Max-Planck Institute for Social Anthropology, Halle, Germany) gave a brief introduction into khat-related conflicts, from the individual to the international level. In his review he identified gaps of knowledge and urgent research questions.

The second day started with the thematic block on mental health. Prof. Kamaldeep Bhui (Queen Mary University of London, UK) reported on studies among migrant khat users in the UK that demonstrate an association between khat use and different mental health indicators. He noted that the current studies suffered from methodological shortcomings, among which the control of confounding variables such as traumatic experiences and stress related to the current living situation, such as unemployment. He stressed the need to better understand the place of khat in people's lives.

Dr. Odenwald relied in his presentation on data from a series of studies in Somalia and Kenya. His data support that khat is frequently used as attempt to self-medicate anxiety and depression, e.g. among patients with Posttraumatic Stress Disorder. He postulated a causal mechanism by which anxiety and depression leads to increased khat use which in turn causes paranoia; he reported first empirical support for this hypothesis.

Different authors reported short papers that illustrated that khat use is prevalent among psychiatric patients in South Africa (Prof. Rataemane, Limpopo University, South Africa), Kenya (Dr. Othieno, Prof. Ndeti), UK (Dr. Palazidou) and Denmark (Mrs Kraagegarard, Mr. Jensen). Two initiatives were presented how migrant khat users with mental problems were integrated into health services in the UK and Denmark.

The fourth thematic block was dedicated to physical health and pharmacology. In the first keynote presentation, Dr. Kalix (University of Geneva, Switzerland) reported on the history of detecting the active psychopharmacological principles in the khat leaves and on the studies to determine their neurobiochemical effects. He clearly concluded that cathinone is an amphetamine-like substance. Prof. Ahmed Al-Motarreb (Sana'a University, Yemen) reviewed the noxious somatic effects of khat use, mainly focusing on the coronary system. Khat chewers have a higher risk for coronary heart diseases and the temporal clustering of incidences of heart attacks indicates a close association to khat chewing sessions. The main problem in this field is the methodological difficulty to control for confounding variables such as smoking.

In the third keynote lecture in this block, Prof. Ray Croucher (Queen Mary University, UK) reported on the frequently claimed association between khat use and oral problems, including periodontal disease and oral cancers. In his detailed review he highlighted the methodological problems of the existing literature, especially the failure for controlling of confounding factors, that limits the causal interpretation of the research outcomes. In a very recent study in Sheffield he tried to overcome these problems by carefully selecting Yemeni respondents (N= 225) and assessing confounding variables (e.g. habitual dental care behavior, socio-economic status, tobacco use). In a Logistic regression analysis he found no support for khat use being a risk factor for oral problems but that socio-economic variables were the most important factor.

In a paper presentation, Dr. Tullu (Addis Abbaba University, Ethiopia) presented first results from his recent cross-sectional study (N=4.000) on blood pressure in the general population. He assessed tobacco, alcohol and khat use. First analysis of his data revealed that khat and other drug use behaviors were associated with higher levels of the measured somatic indicators and that the combination of khat use with other drug use increases this risk significantly.

In a second paper presentation, Dr. Lukandu (Ministry of Public Health, Kenya) reported on a newly developed experimental laboratory paradigm to study the effects of khat extract on the oral mucosa. The results clearly indicate specific khat-induced effects on different cell layers.

In the last thematic block, three presenters discussed aspects related to the governance framework. Dr. Axel Klein (University of Kent, UK), reviewed different regulatory frameworks in the context of illegal drugs and the different experiences with controlling khat use since colonial times. Based on his review, he suggested specific regulatory mechanisms that can be flexibly implemented on a local level to address the specific contexts. He reported on his recent involvement in regulation of khat use in the UK - he suggested taxation and regular inspection of khat use places (Mafrishes), e.g. in relation to sanitary facilities and air conditioning.

Ms Villora-Williams from the Worldbank presented her institution's very recent program to reduce khat demand in Yemen. The Worldbank sees the conflicting evidence-base for khat-related health effects as one of the main problems to implement a national khat policy. She encouraged researchers to conduct high-standard research and suggested an initiative to fund khat research. The third speaker of this afternoon, Mr. John Corkery (St. George's University, UK) has worked for decades in the monitoring of drug-related deaths in the UK (Home Office) and currently leads a project to monitor khat-related deaths. He presented the category system underlying this monitoring activity, the procedures and some instructive cases.

In the last keynote presentation of the conference Dr. Ezekiel Gebissa (Ketterling University, USA) presented his perspective on the future of khat at the Horn of Africa. He put the plant in the context of other natural stimulants that underwent the process of commodification since colonial times to become internationally traded goods, like coffee, tobacco, tea, cocoa and sugar. Reason for this is among others the restricted way of use that is not easy to integrate into consumer habits in high-

income countries. In his opinion khat use will remain a regional phenomenon not transcending the border to be an internationally traded good. At the same time, he argued that the limited medical evidence and the high economic importance of khat will not lead to a general ban of the production and consumption. Thus, khat will be consumed in African and Arab countries, expanding its incidence only in low-income countries of the khat region.

On the first day of the conference, five working groups were set up in order to discuss and develop recommendations for future research. These groups worked independently and self-organized, meeting after dinner or in the lunch break to discuss the gaps of knowledge and the methodological challenges in their fields. At the last evening of the conference, the groups presented their recommendations to the conference.

## Forward Look

---

(1 page min.)

- *Assessment of the results*
- *Contribution to the future direction of the field – identification of issues in the 5-10 years & timeframe*
- *Identification of emerging topics*

### **Assessment of the result:**

The conference has been a milestone.

It was the first international meeting of khat researchers and probably the founding of what can be called a research field. The most important result was in my eyes, as Chair of the Conference, the atmosphere of discussion and openness. It has to be noted that in the past decades, a deep barrier had developed between anthropological (and other social science) researchers and medical/pharmacological experts, the first focusing on the cultural and economic value of khat while the latter underscore the drug-like effects and medical consequences. Consequently, recommendations and suggestion for regulatory action and legislation from both sides had been contradictory. At the ESF conference, prominent representatives of both sides listened to and discussed with each other. Repeatedly, I noticed that representatives of both groups admitted that they now understood better the arguments of the other side.

The scientific side of the outcomes was not only the overview over nearly the whole field. The cross-disciplinary links had been missing in most publications and attempts to address the khat-related problems of the past years. Thus, another very important outcome was the interdisciplinary discussion of research and methodological shortcomings. For example, research from the medical field was confronted with the critique that the control of confounding variables was not convincing and, thus, the evidence base for areas like khat-related oral and coronary problems was regarded insufficient. This is, of course, important in the context of medicalization of the khat phenomenon, i.e. that medical disciplines claim to be the leading disciplines when it comes to understand the khat phenomenon. Researchers were motivated to use better designs and methodological approaches.

One important outcome of the conference will be the special issue of the highly respected Journal of Ethnopharmacology (Impact Factor 2.3) dedicated to the conference. The journal was selected because it is the publication organ of the International Society for Ethnopharmacology, which is a neutral and strictly scientific organization with interests in traditional plants and their use. The publication in a more specialized journal (for example Addiction, PLoS Medicine) would have put the whole publication into a too narrow focus. It was possible to acquire 1.950€ from the University of Konstanz and 1.950€ from the German Federal Foreign Office to cover the costs of an unlimited free online access to and download of all articles published in this special issue. This is especially

important as most khat researchers work in developing countries where access to high-impact publications is mostly unavailable. All keynote speakers are invited to contribute to this special issue, thus, we'll have a broad overview of the khat research field reflecting the heterogeneity of the field.

### **Contribution to the future direction of the field:**

The research recommendations worked out by five working groups have to be regarded a very important scientific outcome (see attachment). In five thematic fields, gaps of knowledge, methodological challenges and important aspects of the research conditions were elaborated in a consensus-oriented discussion. This document will be published in the above-mentioned special issue.

A number of cross-disciplinary research collaborations could be established during the conference: Members of the in December 2009 to be officially founded and US-sponsored International Khat Research Program (KRP) introduced their research agenda to the conference participants and invited conference participants to become part of a khat research network.

Similarly, researchers with a thematic focus on Ethiopia founded at the conference the Ethiopian Khat Research Forum, which already has a lively online discussion ([ekrf@googlegroups.com](mailto:ekrf@googlegroups.com)). Among conference participants were members of The Worldbank and the German Technical Cooperation (GTZ) – both international organizations have a great interest to reduce khat demand and promote alternative incomes for khat farmers. Both organizations initiated contacts with researchers at the conference in order to initiate a program-based concomitant research activities. Among the conference participants were representatives of the European Monitoring Center on Drugs and Drug Addictions and the German Ministry of Health. At the conference, both institutions contacted researchers for cooperation in specific dissemination activities, informing policy makers and health practitioners in Europe and Germany about khat.

The editorial board of one of Africa's most important journals in the field of addiction, the African Journal on Drug and Alcohol Studies (ADJAS), passed the information that they will especially encourage khat researchers to submit their papers.

### **Identification of emerging topics:**

In general, the need for interdisciplinary research emerged clearly. A number of strategic topics emerged during the discussions at the conference. Most of these topics are related to the development of very basic research and monitoring methods:

- Development of methods for standardized assessment of units of khat use in field studies
- Develop methods for monitoring of khat-related economic indicators
- Provide an empirical data base for international definition of critical values for maximum concentrations of noxious chemicals in khat leaves, e.g. pesticides and cathinone.
- Develop applicable methods for the use of quality control of traded khat, e.g. rapid tests for cathinone content.
- Longitudinal research that studies the effects of khat use on health parameters
- Controlling for confounding variables (e.g. smoking and pesticide contamination) in studies which investigate the health impact of khat use.
- Effects of increasing khat production on food security in low-income countries
- Khat production, trade and regulation in the context of distributional and resource conflicts in the region
- Development and evaluation of interventions that want to reduce khat demand (e.g. awareness campaigns)
- Development and evaluation of khat addiction treatment programs in low-income countries



---

▪ Is there a need for a foresight-type initiative?

There is a great need for a foresight-type initiative. I highlight this in the context of three issues:

The khat research filed is currently in the process of its formation. There's not yet a scientific organization nor a platform that binds together this interdisciplinary group of researchers and offers the possibility to exchange and discuss. It is highly needed to create such a platform in the form of (preferably biannual) conferences. In this context, it would be preferable to have both, the broad interdisciplinary coverage of topics and the more specific focus, e.g. special sessions dedicated to emerging and important topics.

Currently, the khat boom in several countries in the world sharply contrast to the relatively low number of research initiatives related to khat. Most of the urgent questions cannot be answered because of missing research. Khat research is urgently needed, e.g. to meet the existing challenges related to current challenges, among which khat regulation, in order to have sound evidence base for informed and rational political decision making. Research funding, in this context, will be a crucial topic for the future. Donor organizations should specifically design call for proposals that address urgent khat-related questions.

Building-up of capacities in low-income countries: Most of the research on khat needs to be done in the countries where its use reaches the highest level. These countries belong to most poor countries of the world. Thus, international cooperation is urgently needed to build up research capacities and to train existing researchers to employ high standard research designs and methods. In this context, joint North-South research projects or cooperation between universities in European and low-income countries should be supported.

## Atmosphere and Infrastructure

---

▪ *The reaction of the participants to the location and the organization, including networking, and any other relevant comments*

Venue: Conference participants were at first astonished because the venue looked like a motel, being situated next to a gasoline station and a motorway outside Linköping town. The rooms were very simple and some complained that they were too small, especially as two people shared one room.

However, the conference facilities were good and easily enabled small group discussion and retreat because several rooms with seating accommodation were available. The food was regarded excellent, especially the international participants found that their food requirements were met. The hotel's restaurant and bar made it easy for participants to meet and discuss in the evenings. The internet access (Wireless LAN and Free internet computer in the lobby) was very good.

Organization: The organization of the conference was excellent. Thanks to Ms Kelly and Victoria Ibberston for their great work.