



## Review

# Traditional and non-traditional uses of Mitragynine (Kratom): A survey of the literature



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## ABSTRACT

*Introduction:* The objective of the paper was to highlight the differences in the traditional and non-traditional users of kratom in the South East Asian and Western contexts.

*Method:* A literature survey of published kratom studies among humans was conducted. Forty published studies relevant to the objective were reviewed.

*Results:* Apart from the differences in the sources of supply, patterns of use and social acceptability of kratom within these two regions, the most interesting finding is its evolution to a recreational drug in both settings and the severity of the adverse effects of kratom use reported in the West. While several cases of toxicity and death have emerged in the West, such reports have been non-existent in South East Asia where kratom has had a longer history of use. We highlight the possible reasons for this as discussed in the literature. More importantly, it should be borne in mind that the individual clinical case-reports emerging from the West that link kratom use to adverse reactions or fatalities frequently pertained to kratom used together with other substances. Therefore, there is a danger of these reports being used to strengthen the case for legal sanction against kratom. This would be unfortunate since the experiences from South East Asia suggest considerable potential for therapeutic use among people who use drugs.

*Conclusion:* Despite its addictive properties, reported side-effects and its tendency to be used a recreational drug, more scientific clinical human studies are necessary to determine its potential therapeutic value.

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## 1. Introduction

*Mitragyna speciosa* is a tree that has been reportedly found in the Philippines islands, Borneo and New Guinea (Lee, 1957).<sup>1</sup> However, most published works in the past have focussed on its use in Thailand and Northern Malaya. More recently, reports of kratom use in the West have emerged.

*Mitragyna speciosa* Korth (*M. speciosa*) from the Rubiaceae family is a tropical plant and *mitragynine* and *7-hydroxymitragynine* are the active compounds of *M. speciosa*. Both these alkaloids produce dose-dependent narcotic effects, stimulant effects at lower doses and sedative-like effects at higher doses (Babu et al., 2008). There have been other studies that have reviewed the properties of kratom in detail (Jansen and Prast, 1988a; Hassan et al., 2013; Babu et al., 2008; Adkins et al., 2011; Rosenbaum et al., 2012; Prozialeck et al., 2012 and Cinosi et al., 2015). The tree has been known variously as Katawan, Kratawm, Tawn, in Thailand and as Ketum, Kutum, Bia or Biak in Malaysia (Burkill, 1935). In this paper we will use the widely used name, Kratom, derived from the Thai names for the tree.

This paper provides a broad survey of the well documented traditional uses of kratom and the less well known, non-traditional uses of kratom in Thailand and the northern states of peninsula Malaysia (collectively referred to as South East Asia for convenience) and the US and Europe (collectively termed Western countries). In doing so, we highlight the major differences in the use of kratom in these two different regional contexts.

## 2. Method

A literature review search was conducted through PubMed, Science Direct and Scopus to gather published articles on kratom use. Some of the keywords that were used to assist in the literature search include: “Kratom” and “*Mitragyna speciosa*”. Forty published articles describing kratom use in humans were found; seventeen articles on kratom use in Malaysia and Thailand and twenty three articles on kratom use in the West (USA; Germany; Sweden; Norway and UK). Interestingly; although there were repeated references in the literature to kratom being found in other parts of South East Asia such as the Philippines; Myanmar and the Borneo states; published studies of kratom use are confined to Thailand and Malaysia.

The types of studies were divided by their study design; surveys which included internet surveys (10); review papers (8); case reports (17); qualitative in-depth interviews (2); reference text (1); short communications (2); and experimental design (1).

## 3. Results

### 3.1. Modes of supply

In Thailand, regular users have their own trees hidden in their rubber plantations, rice fields, fruit garden, yards of homes, ditches or near fishing ponds. While fresh kratom could also be purchased from the market in the past, this mode is no longer available as the plant is illegal. This has been replaced by the kratom salesman who delivers the product to known users.

Secret purchases can also be made from those with trees, a tea shop or from other villages (Saingam et al., 2012).

Also in Malaysia some users were found to be cultivating their own trees; most however obtained their supply from familiar suppliers or local coffee shops where it is sold openly, despite the ban

on kratom. Coffee shops sell a prepared solution which is ready for immediate consumption (Vicknasingam et al., 2010). The common element is that both in Thailand and Malaysia, the quality of the product is known as are the sources of supply and suppliers.

In contrast, purchases in the West are made without personal contact with the supplier or knowledge regarding the quality of the kratom product being supplied. In the US, powdered kratom leaves can be purchased from head shops, kava bars and via the internet. The largest volume of sales appears to be via the internet (Babu et al., 2008; Rosenbaum et al., 2012) probably because it ensures anonymity of the buyer. It is also sold in the form of tablets, capsules, gums, leaves for chewing or brewing and extracts for smoking (cited in Warner et al., 2016).

It is usually marketed as a dietary supplement (Boyer et al., 2007, 2008; Sheleg and Collins, 2011). The safety of many of the internet acquired kratom product has been compromised by insufficient information regarding the product, its side effects and warnings about possible toxicity. Many users are led to believe that kratom can be used as a safe herbal remedy (Schmidt et al., 2011; Rosenbaum et al., 2012).

### 3.2. Modes of consumption

In South East Asia, kratom leaves are smoked, chewed or brewed and ingested as an herbal solution. The chewing of kratom leaves is common among the Thais, while in Malaysia it is commonly consumed as a juice. Habitual users usually consume kratom juice at least 3 times a day in varying quantities (Suwanlert, 1975; Ahmad and Aziz, 2012). Kratom has a bitter taste and therefore some individuals prefer to mix their kratom drinks with sweet beverages (e.g. Coca-Cola, Pepsi, etc.). There have also been occasions where kratom users spike their drinks with other potentially harmful substances such as cough syrup and sleeping pills (Tungtananuwat and Lawanprasert, 2010).

Modes of consumption in the West are less clear but can be inferred from the nature of preparations available for sale. These include leaves for chewing and brewing, powders, gums, capsules, pills and extracts for smokers (cited in Warner et al., 2016).

### 3.3. Uses of kratom

In South East Asia, kratom leaves have been traditionally used for its medicinal value in treating mild medical problems such as fever, diarrhoea, diabetes, pain and as a wound poultice (Hassan et al., 2013). Kratom use is widespread among rural-folk in the Northern Peninsular states of Malaysia and Southern Thailand (Burkill, 1935; Suwanlert, 1975; Cinosi et al., 2015). Apart from its healing properties, male manual labourers (such as farmers, rubber-tappers, fisherman, and machine operators) commonly use kratom leaves for its coca and opium-like effects to enhance physical endurance and as a means to overcome stress (Suwanlert, 1975; Assanangkornchai et al., 2007a; Saingam et al., 2012; Vicknasingam et al., 2010; Ahmad and Aziz, 2012). Some also reported that it heightened sex desire (Vicknasingam et al., 2010).

Females normally use kratom for its curative properties in the treatment of mild cases of fever, diarrhoea and pain. In fact, while male users face no censure or stigma in society, female kratom addicts are not accepted (Suwanlert, 1975; Assanangkornchai et al., 2007a). There is also an early record of kratom being used in Malaya as an affordable opium substitute (Burkill, 1935). Tanguay (2011) cites a claim that kratom was also being used to ease opiate withdrawal in Thailand, as early as in the 1940s. However, subsequent Thai studies have not reported any evidence of this practice (Suwanlert, 1975; Assanangkornchai et al., 2007a). The first report of the common use of kratom as a cheap substitute for reducing dependence on other illicit substances like cannabis, morphine and

<sup>1</sup> Mistakenly cited as Thuan (1957) in almost all papers.

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