

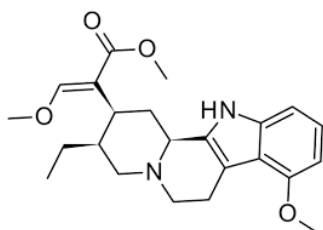
Short Communication for the Analysis of Mitragynine

Date: May 2020

Synonyms:

- (α E,2S,3S,12bS)-3-ethyl-1,2,3,4,6,7,12,12b-octahydro-8-methoxy- α -(methoxymethylene)-indolo[2,3-a]quinolizine-2-acetic acid, methyl ester
- 9-methoxy Corynantheidine
- Kratom

Structure:



Formula: C₂₃H₃₀N₂O₄

Molecular Weight (nominal mass): 398.5

Theoretical M+H accurate mass: 399.2278

Pharmacological Drug Class: Dependent on concentration. Low concentration; Central Nervous System Stimulant. Higher concentration; opioid-like analgesic.

Suggested LOD: 5 ng/mL

Suggested LOQ: 10 ng/mL

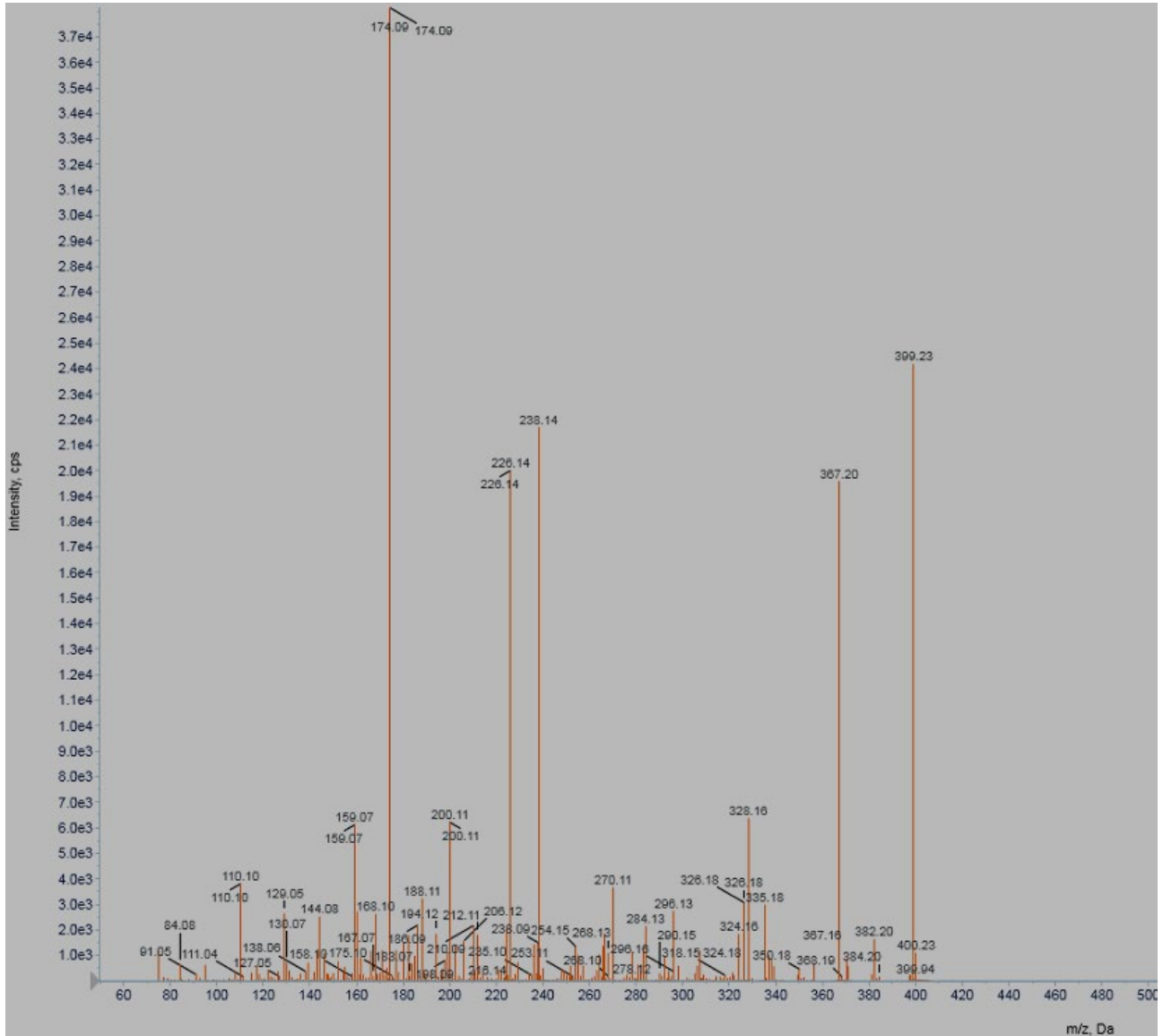
Mitragynine is an indole alkaloid from the plant *Mitragyna Speciosa* (also referred to as ‘Kratom’) and was originally used in Southeast Asia as a stimulant for manual labourers. It has both stimulant and opioid-like effects through action on the noradrenergic, serotonergic and opioid (mainly mu-) receptors. It can be ingested as a tea by boiling the leaves of the *Mitragyna Speciosa* plant or the leaves can be ground into a powder. It is not currently a scheduled substance in the USA nor is it a listed substance under the international Conventions.

Analytical difficulties come from other constituents of *Mitragyna Speciosa*, speciogynine and speciocilatine, that are isomers of mitragynine. Retention time separation must be present to distinguish the drugs. 7-Hydroxymitragynine is a metabolite of mitragynine which has more than 40 times the opioid effects of mitragynine and should also be included in toxicological analysis (suggested LOD: 2 ng/mL and LOQ: 5 ng/mL).

From the United Nations Office on Drugs and Crime (UNODC) ToxPortal, Kratom (as mitragynine and/or 7-hydroxymitragynine) has been reported 137 times from June of 2016 until the end of 2019. Over 100 of those cases are from the United States with the rest occurring in Europe, Asia and Australasia. Reported blood concentrations range from 10 – 970 ng/mL for DUID cases and 10 –

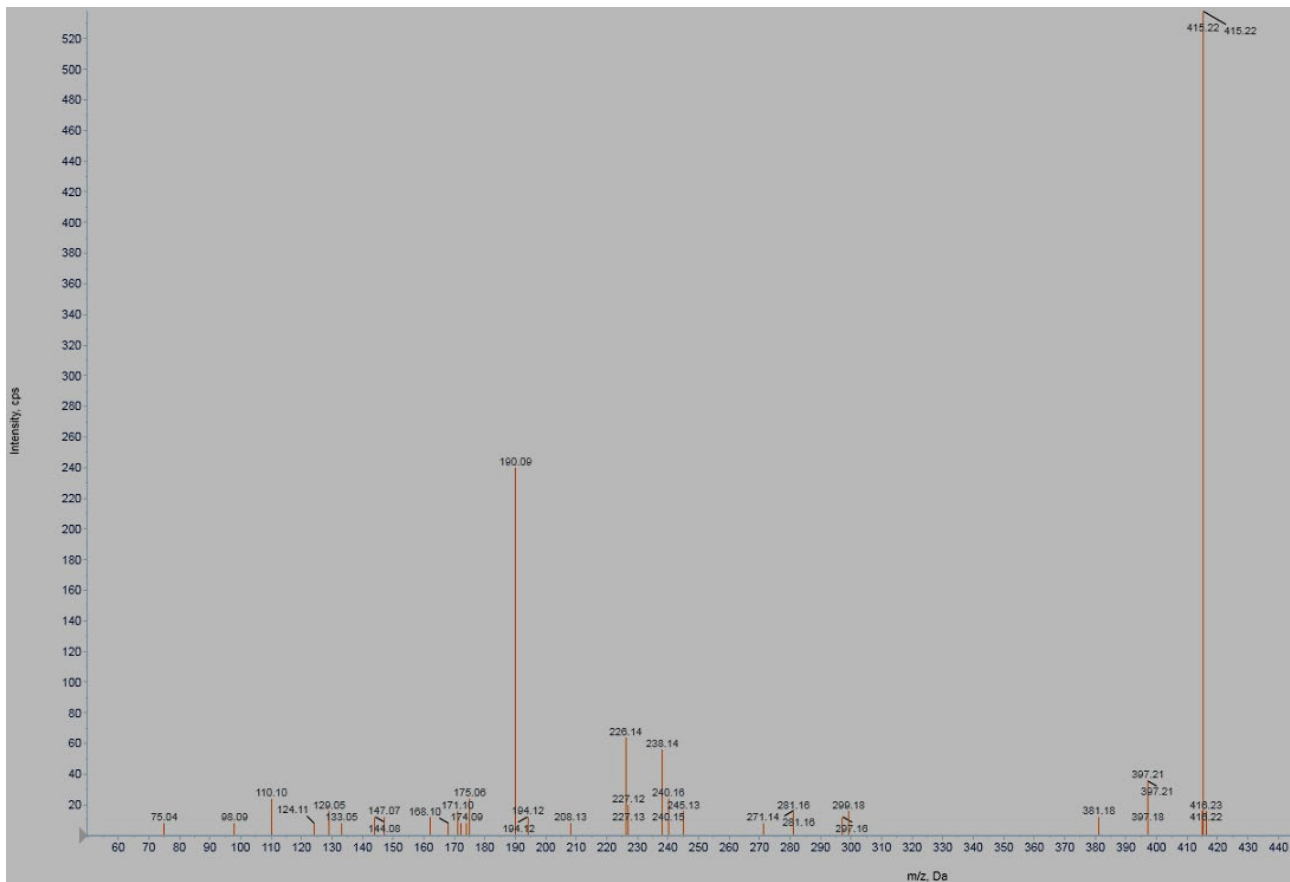
4310 ng/mL for death investigation cases. Reported concentrations in literature have ranged from 5.6 – 29,000 ng/mL of mitragynine. Tissue mitragynine concentrations have been reported in literature and can be found in the references below. 7-hydroxymitragynine concentrations are rarely reported.

Mitragynine LC-MS Spectrum:



[source: Sciex X500R, Orange County Crime Laboratory, California, USA]

7-Hydroxymitragynine LC-MS Spectrum:



[source: Orange County Crime Laboratory, California, USA]

Some Additional References:

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United Nations Office on Drugs and Crime (UNODC) January 2020
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