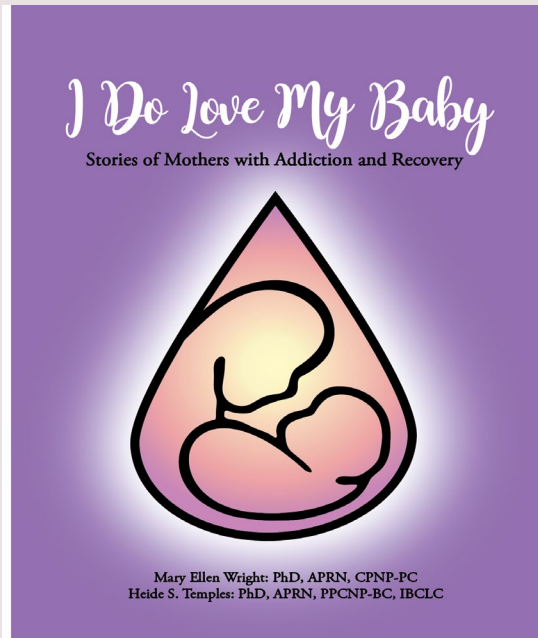

Outcomes of mothers and infants perinatally exposed to Kratom

Mary Ellen Wright, PhD, APRN, CPNP-PC

Clemson University

Study: Stories of Mothers with Addiction and Recovery



Data Analyzed Identifying:

Sources of calls for caring

Expressions of positive or negative support

System in which the support was sought

Co-occurrence of themes of positive support and seeking recovery from addiction.

Awarded Clemson University Research Foundation Innovation Award

What is Kratom?

Kratom, a derivative of *Mitragyna speciosa*, is in the coffee plant family and originated from Southeast Asia.

Kratom is sold as tea, capsules, tablets, raw leaves, and concentrated extracts.



History of Kratom Use

History of Use with
workers in Southeast
Asia.



Actions of Mitragynine and 7-Hydroxmitragynine

Mitragynine and 7-hydroxymitragynine act as partial agonists at the mu-opioid receptor (mOR).

7-Hydroxmitragynine has 5-23 times more binding affinity and 5-20 times more intrinsic activity (receptor activation) than does mitragynine.

For comparison, morphine has 8-10 times more binding affinity and 3 times more intrinsic activity than does 7-OH-mitragynine.

•Legally Sold in United States

Gas Stations; Head Shops;
Convenience stores; On-Line

Alaska: Legal to sell, produce and
distribute.

Midnight Vapor | Vape And Smoke
Shop ([Anchorage](#))

Planet X Vapor & Smoke Shop
(Anchorage)

Blazing Smokes (Anchorage)



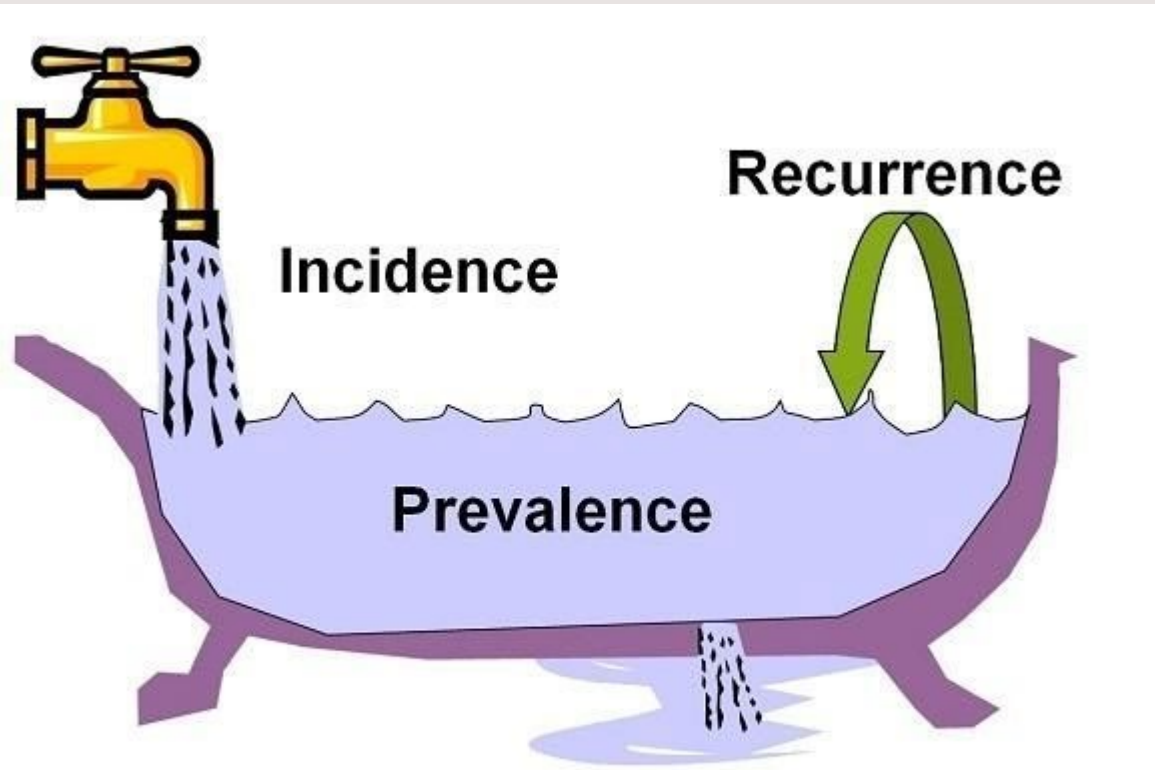
International Regulation



The Association of Southeast Asian Nations (ASEAN) bans kratom in herbal medicine or dietary supplements, but allows cultivation.

Kratom is legal in the United States at the federal level, but is considered a drug of concern by the US Drug Enforcement Administration.

Data on Kratom Use



The Substance Abuse and Mental Health Services Administration (SAMHSA) presents Key Substance Use and Mental Health Indicators in the United States:

The **2021** multimode data collection

69,850 respondents aged 12 or older completed the survey in person or via the web.

Use of Kratom in past 12 months 2021

The 2021 NSDUH asked respondents aged 12 or older. Use of kratom in the 12 months before the interview.

0.6 percent (or 1.7 million people) used kratom in the past year

By Age:

Adolescents aged 12 to 17 (0.2 percent or 45,000 people)

Young adults aged 18 to 25 (0.8 percent or 284,000 people)

Adults aged 26 or older (0.6 percent or 1.4 million people).

Types of Kratom

So far, there are over fifty strains, with more on the horizon

Color of the center vein changes as Kratom leaves mature
Signifying a corresponding change in their alkaloid content.

Immature leaves start **white**

Eventually turning **green**

Red when they're fully mature



Other factors that change type of Kratom

Farmers harvest the leaves at different times.

Kratom contains more than forty alkaloids, offering an almost endless supply of possible combinations.

Strains also break down beyond vein color, typically by their place of origin.

Other strains may have distinctions based on their leaves' shapes or growing techniques.

Color and Alkaloid Content

7-hydroxymitragynine, one of kratom's main alkaloids gives the red strains their color

White kratom strains are typically higher in mitragynine, the alkaloid responsible for kratom's energizing effects.



	ENERGY	MOOD	PAIN RELIEF	SEDATION	ANXIETY RELIEF
RED ASIA KRATOM	●●	●●●●	●●●●●	●●●●●	●●●●●
RED BORNEO KRATOM	●●	●●●●	●●●	●●●●●	●●●●●●
RED DRAGON KRATOM	●●●	●●	●●●	●●●	●●●●●
RED HORN KRATOM	●●	●●●●	●●●●●	●●●	●●●
RED MAENG DA KRATOM	●●●●●	●●●●●●	●●●●●	●●●●●	●●●●●
RED MALAY KRATOM	●●●	●●●●●	●●●●●	●●●●●●	●●●●●
RED SUMATRA KRATOM	●●●	●●●●●●	●●●	●●●●●●	●●●●●●
RED BETUANGIE KRATOM	●●	●●●●	●●●●●	●●●●●	●●●●●●
RED ELEPHANT KRATOM	●●●	●●●●	●●●	●●●●●	●●●
RED HULU KRATOM	●●●●●	●●●●●●	●●●●●	●●	●●●
RED INDO KRATOM	●●	●●●●	●●●●●	●●●●●	●●●
RED JONGKONG KRATOM	●●●	●●	●●●	●●●	●●●
RED KALI KRATOM	●●	●●●●	●●●●●	●●●●●	●●●
RED PAPUA KRATOM	●	●●●●	●●●●●	●●●●●●	●●●●●
RED RIAU KRATOM	●	●●●●	●●●	●●●	●●●
RED BALI KRATOM	●●	●●●●	●●●●●	●●●●●●	●●●●●
RED SUNDA KRATOM	●	●●●●●	●●●●●	●●●●●●	●●●●●
RED THAI KRATOM	●●●●●	●●●●	●●●●●	●●	●●●
RED VIETNAM KRATOM	●	●●●●●	●●●●●	●●●●●●	●●●●●

Withdrawal and Kratom

Cross-sectional surveys in Southeast Asia and the US

One-half to three quarters of chronic daily kratom users report difficulty in stopping their kratom use and experience opioid-like withdrawal symptoms when they do stop

Occurring within 48 hours of stopping.

Kratom withdrawal find use patterns of up to 15-20 g daily of kratom products.

Brief Data on Medically Serious Conditions

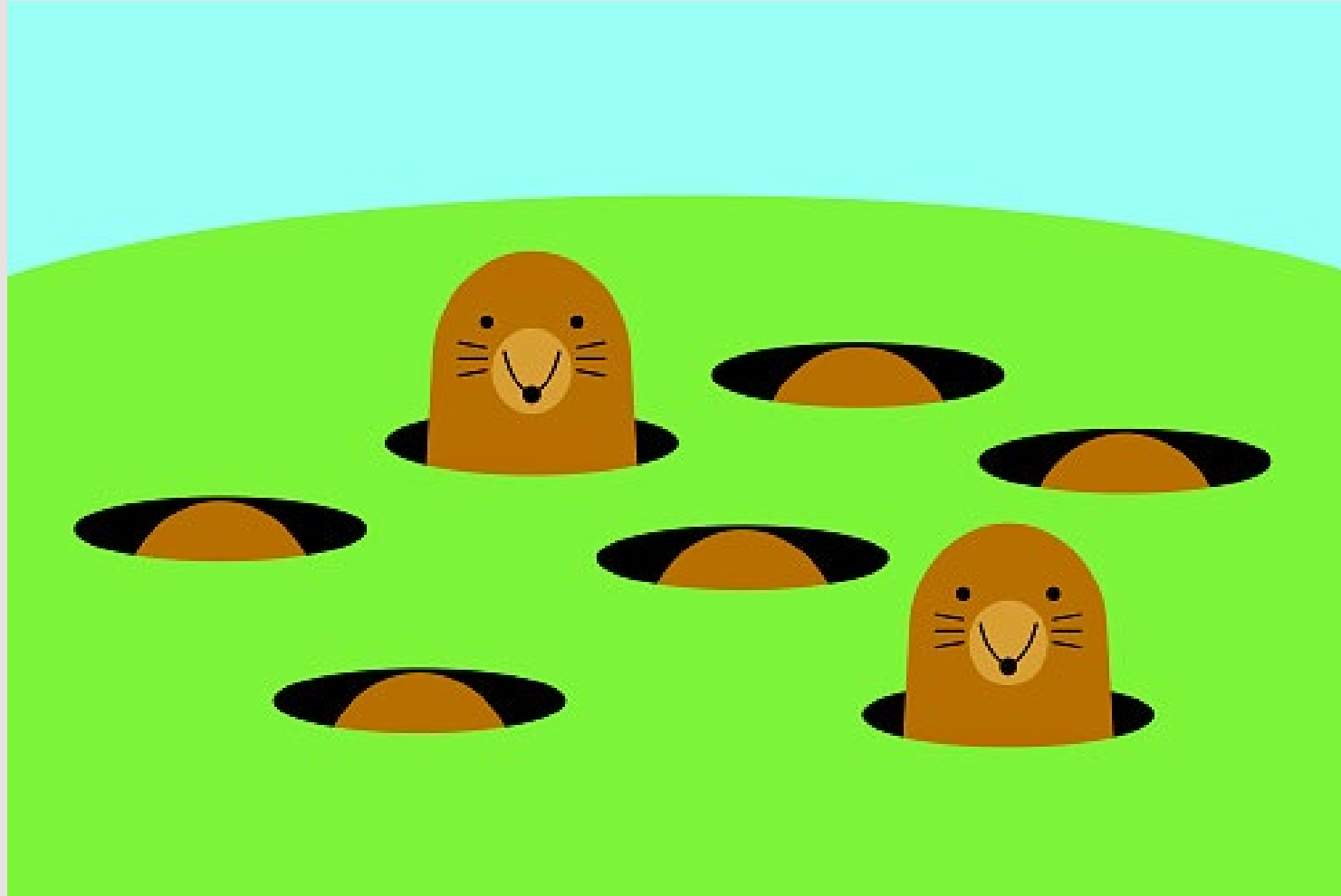
300 deaths associated with kratom have been reported since 2010

Majority since 2015 and almost all in the US and Western Europe

Attributing causality to kratom can be difficult, as most cases involve multiple substances and few cases involved comprehensive toxicology

In one large case series, **23% of deaths had no other substances identified or considered contributory**

3,484 kratom-associated cases reported to the US National Poison Data System from 2014-2019, in 63% kratom was the only identified substance. Among these, only 0.8% were considered medically serious (including death).



Identification of Novel Psychoactive Substances “Whack a Mole”

Research to develop Toxicology using Umbilical Cord Tissue for Mitragynine Speciosa

United States Drug Testing Lab

Liquid Chromatography Tandem Mass
Spectrometry

(LCMSMS)

First Validated test for MS in Umbilical Cord
Tissue using LCMSMS

Of 56 convenience samples 19 tested positive
with 3 of the 19 testing positive for
polysubstances

Wright, M.E.; Coy, D., Jones, J., Sukta, A., Racines, A., Jones,
M. The Identification of Prenatal Exposure to Mitragynine
Using Umbilical Cord Tissue [American Journal of Analytical
Chemistry > Vol.13 No.4, April 2022](#)

DOI: [10.4236/ajac.2022.134011](https://doi.org/10.4236/ajac.2022.134011)

Perinatal Substance Use of Kratom

Six case studies of kratom prenatal exposure five infants that exhibited withdrawal symptoms were pharmacologically treated with a morphine weaning protocol.



Prenatal Exposure to Kratom and/or Gabapentin on Rat Offspring

Measured the presence, severity and timing of withdrawal symptoms of rat offspring prenatally exposed to Kratom/ Gabapentin.

Measured the growth of the exposed offspring.

Measured the presence of Kratom and Gabapentin in the Breastmilk.



Wright, M.E.; Parker, V.; Whitcomb, J. (2022). Prenatal Exposure to Kratom and/or Gabapentin on Rat Offspring. Funded by Clemson University Seed Grant.



Signs of Withdrawal were observed in Kratom only; Gabapentin Only and Kratom/Gabapentin exposed rat offspring

- Tremors
- Strobe tail
- Locomotion
- Wall Climbing
- Mouthing
- Vocalization

Wright, M.E.; Parker, V.; Whitcomb, J. (2022). Prenatal Exposure to Kratom and/or Gabapentin on Rat Offspring. Funded by Clemson University Seed Grant.

Rat Offspring Study of Kratom Perinatal Exposure

Presences of MS using Tissue Toxicology in Brain, Liver, Kidneys of rat offspring.

Presence of MS in Breast Milk at 2 – 3 weeks post birth tested by toxicology

Brain weights significantly smaller in Kratom Exposed Rat Offspring, currently conducting follow-up studies

Wright, M.E.; Parker, V.; Whitcomb, J. (2022). Prenatal Exposure to Kratom and/or Gabapentin on Rat Offspring. Funded by Clemson University Seed Grant.

Questions or Discussion?

Thank You

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