

Letter to the Editor

The Potential Role of Neuroprotective Effects of Kratom (*Mitragyna Speciosa*) on Brain Aging

Dear Editor

Data from World Health Organization (WHO) shows that the number of people aged 60 years old and above will increase from 605 million to 2 billion from the year 2000 to the year 2050 (Rahim et al., 2018). Malaysia is currently battling with the increasing number of elderly and aging people. By 2035, 15% of Malaysians will be considered senior citizens (Rahim et al., 2018). This is considered an issue because older adults tend to get more age-related diseases than younger ones.

Aging is a natural phenomenon. It reduces a certain number of presynaptic vesicles, nerve terminals, and nicotinic acetylcholine receptors (nAChRs) and increases motor endplate space in the neuromuscular junction (NMJ) function to move the muscles. This is why aged people have trouble doing extreme physical activity (Pour et al., 2017). Aging can be associated with immune system impairment and cognitive and motor deterioration. This is called brain aging. It is an irreversible process related to oxidative stress levels (Ma et al., 2019). Physical aging has its symptoms that can be seen, such as gloom and thinning of the skin (Pour et al., 2017). Whereas for brain aging, symptoms can be observed through their memory and behavioral changes. These changes can be seen through a few diseases like dementia, Alzheimer's disease (AD), and Parkinson's disease (PD).

One of the proposed mechanisms is the generation of oxidative stress due to a disturbance of the brain's prooxidant-antioxidant balance (PAB). Poor antioxidant defense and increased reactive oxygen species (ROS) will lead to progressive damage to the brain cell function physiologically (Mariani et al., 2005). ROS also commonly associated with aging due to its imbalance of oxygen-free radical metabolism.

Today, alternative treatment using plant or herb-based is widely being used. People tend to choose plant-based treatment because of its low toxicity, high efficacy, and low cost. Kratom (*Mitragyna speciosa*) is claimed to have high antioxidant levels (Meireles et al., 2019). Kratom is also known as Ketum, is easily found in Southeast Asia countries. It is used to be one of the traditional medicines used by the old folks to treat common diseases like fever or diarrhea due to its antibacterial and anticancer compounds (Meireles et al., 2019). The over usage and misuse of this herb are quite concerning. (Damodaran, et al., 2020). Due to the antioxidant properties of Kratom, we are proposing to use Kratom as the prevention treatment for brain aging. It needs to be explored for better insight since Kratom has addictive properties which might limit its therapeutic effects.

Acknowledgment

The authors are highly grateful to our colleagues and the individuals who have given their guidance and provided adequate facilities throughout this study, especially staff from MSU. This work was financially supported by MSU Research Seed Grant (SG-025-012019-IMS) from Management & Science University, Selangor.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

References

1. Rahim Abdul Hamid A, Muhamad NA, Zakaria R, Aminuddin E,

- Akmal Alwee A, Tok A. The challenges of the ageing population on the Malaysian construction industry. *J Phys Conf Ser* 2018;1049.
2. Pour MB, Joukar S, Hovanloo F, Najafipour H. Long-term Low-Intensity Endurance Exercise along with Blood-Flow Restriction Improves Muscle Mass and Neuromuscular Junction Compartments in Old Rats. *Iran J Med Sci.* 2017;42(6):569-76.
3. Ma J, Wang H, Liu B, Shan Y, Zhou H, Qi X, et al. Combination of chick embryo and nutrient mixture prevent D-galactose-induced cognitive deficits, immune impairment and oxidative stress in aging rat model. *Sci Rep.* 2019;9(1):4092.
4. Mariani E, Polidori MC, Cherubini A, Mecocci P. Oxidative stress in brain aging, neurodegenerative and vascular diseases: an overview. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2005;827(1):65-75.
5. Meireles V, Rosado T, Barroso M, Soares S, Gonçalves J, Luís Â, et al. *Mitragyna speciosa*: Clinical, Toxicological Aspects and Analysis in Biological and Non-Biological Samples. *Medicines (Basel).* 2019;6(1).
6. Damodaran T, Chear NJ, Murugaiyah V, Mordi MN, Ramanathan S. Comparative Toxicity Assessment of Kratom Decoction, Mitragynine and Speciociliatine Versus Morphine on Zebrafish (*Danio rerio*) Embryos. *Front Pharmacol.* 2021;12:714918.

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Please cite this article as: Alya Syarafina MS, Halim Sh, Ridzuan PM, Mahathir Mohd U, Ramli MD. The Potential Role of Neuroprotective Effects of Kratom (*Mitragyna Speciosa*) on Brain Aging. *J Cell Mol Anesth.* 2021;6(4):352-3. DOI: <https://doi.org/10.22037/jcma.v6i4.36211>