

The effects of *boophone disticha* extract on the nervous system, cardiovascular system and the development of embryos: a Zebrafish model.

Hartman PC¹, Botha TL², Xhakaza NK¹

¹Department of Anatomy and Histology, School of Medicine, Sefako Makgatho Health Sciences University, Ga-Rankuwa, South Africa.

²Department of Zoology, University of Johannesburg, Johannesburg, South-Africa.

Women in South Africa are at a higher risk of depression than women in other countries, especially during pregnancy and after childbirth (Mulondo et al., 2024).

Fluoxetine, a selective serotonin reuptake inhibitor (SSRI), is most commonly prescribed to manage depression in pregnant women (Bairy et al., 2007). Serotonin plays an important role in many physiological systems, including embryonic development, cardiovascular function and neurogenesis (Correia et al., 2022). The inadequate release of maternal serotonin during early embryonic development has been reported to be associated abnormal cardiovascular and neural development (Nebigil, 2001, Vitalis and Parnavelas, 2003). *Boophone disticha* is the most common member of the Amaryllidaceae, a South African medicinal plant used traditionally by several indigenous groups, contains alkaloids such as buphanamine and buphanidine, which may interact with serotonin transporters due to their affinity for SERT. (Nair and Van Staden, 2014, Lekoma et al.; 2022).

This study will investigate the developmental effects of *Boophone disticha* extract and fluoxetine on zebrafish embryos and juveniles. Zebrafish (*Danio rerio*) will be bred at the University of Johannesburg and embryos exposed to five concentrations of *Boophone disticha* extract and fluoxetine from 4 to 120 hours post fertilization (hpf). After exposure, embryos will be raised until 14 days post fertilization (dpf) in clean holding tanks. Observations of development, spontaneous movement, and morphological anomalies will be conducted using stereomicroscopy and EthoVision software. At 5 dpf, feeding will commence, and behavioural analysis will continue. Following hatching, juveniles will be further exposed to the substances for 21 days, with media renewed every 3 days. Behavioural, neurological, and physiological indicators will be assessed, and after euthanasia, cardiovascular and neurological tissues will be harvested for histological tissue analysis. This study aims to investigate the histopathology and therapeutic relevance of *Boophone disticha* in comparison to fluoxetine during embryonic development of the cardiovascular- and nervous system.