

# Effect of Acute Exposure of Belladonna Mother Tincture on Zebrafish Embryonic Development

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## Sharma *et al.*: Effect of Belladonna on Zebrafish Embryos

*Atropa belladonna* is a highly poisonous plant which contains variety of active alkaloids such as atropine, scopolamine and many others. In homeopathy, its preparation is used to cure a number of health conditions such as baby teething, pain or infection and many others. However, due to its toxic nature and adverse teratogenic effect, it is important to investigate the possible toxicity and safety level of belladonna mother tincture. In this study, zebrafish embryos were used to evaluate fetal embryo toxicity of the belladonna mother tincture. Briefly, eggs were exposed to different concentration (1, 5 and 10 %) of belladonna mother tincture and ethyl alcohol for 1 h. Different parameters like mortality, hatching rate, somites, tail detachment and morphological malformations were recorded till 72 h of post fertilisation and behaviour parameters were also recorded after 7 d post fertilisation. Results showed that exposure to belladonna mother tincture at higher concentration (5, 10 %) cause embryonic malformation including pericardial edema, increase in body length, eye width and heart rate, while decrease hatching rate with no effect on mortality. The behavioural parameters revealed that belladonna mother tincture increases the locomotor activity of larvae at its 1 % concentration rather than 5 and 10 % in comparison to control. In summary, belladonna mother tincture and alcohol may cause developmental embryonic changes at higher concentration while no major development changes were found at 1 %. Further developmental toxicity studies on animals need to be carried out to validate use of belladonna mother tincture clinically in low concentration or high dilution.s.

**Key words:** *Danio rerio*, embryo, developmental toxicity, homeopathy, malformation

The application of natural drugs is increasing day by day in every field and recent scientific community have been focused for drugs from natural sources in drug discovery due to their meagre side effects. Homeopathy is one of the alternative medicinal systems used globally, which employs drugs prepared from natural origin for the management of diseases. Due to low or negligible concentration of the chemical constituents at higher dilutions/potencies, homeopathic drugs are generally found to be safe. Now a days, for scientific validation and global acceptance of homeopathic drugs, *in vitro* as well as *in vivo* pharmacological evaluation of these drugs has been greatly increased<sup>[1]</sup>. Since origin of most of the homeopathic drugs are plant based and raw materials for many homeopathic drugs are known to be toxic, the safety evaluation should not be ignored specifically when using low concentrations of a toxic starting material.

Belladonna is one of the most popular homeopathic drugs used in baby teething, sudden severe pain and pain with inflammation or infection<sup>[2]</sup>. It is prepared from plant *Atropa belladonna*, commonly known as 'deadly nightshade' known to be most poisonous plant in world<sup>[3]</sup>. Belladonna was the subject of the first homeopathy publication in the Journal Lancet in 1829\* on its prophylactic and therapeutic efficacy for scarlet fever<sup>[4]</sup>. It is used in traditional treatments for an assortment of conditions including headache, menstrual symptoms, peptic ulcer, histaminic reactions,

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