



**EFFECT OF *Piper nigrum* (BLACK PEPPER) CRUDE LEAF  
EXTRACT ON THE EMBRYONIC DEVELOPMENT  
OF *Danio rerio* (ZEBRAFISH)**

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### ABSTRACT

One of the plants widely used in Ayurvedic and Unani system of medicines is *Piper nigrum*, commonly known as black pepper, which treats various diseases such as toothaches and has anti-cancer, anti-inflammatory, and anti-microbial properties. However, its effect on the rate of growth and development on embryos has not been studied yet. This study aimed to determine the effects of *P. nigrum* crude leaf extract on the zebrafish embryo development. Embryos from its 30% epiboly to its 96th hour-stage were exposed to three different concentrations -  $T_1 = 3$  g/L,  $T_2 = 7$  g/L, and  $T_3 = 11.33$  g/L - of *P. nigrum* crude extract. Significant difference in terms of length was observed from the 18th to the 48th hour of development. Deformities on the head, tail, back, and yolk started to develop from the 18<sup>th</sup> to the 96<sup>th</sup> hour of development. Moreover, longer exposure and the higher the concentration of the crude extract resulted to retarded growth rate and arrested development. Among the three treatments,  $T_3$ , which has the highest concentration of 11.33 g/L significantly affected the rate of growth and development of the embryos. Therefore, *Piper nigrum* leaves are considered teratogenic to the embryos.

Key words: crude extract, embryos, deformities, development, teratogenic



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