Effects of Curcumin and Piperine on Embryological Development in Danio rerio

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Turmeric (Curcuma longa), the common South Asian spice, has long been utilized for its therapeutic properties which are attributed to the active ingredient curcumin. Due to its low bioavailability, turmeric is often consumed with black pepper (Piper nigrum) because piperine, the active ingredient in black pepper, increases curcumin absorption. More research regarding the negative effects of curcumin and curcumin in combination with piperine is needed. Thus the purpose of this experiment was to investigate the effects of curcumin and piperine on embryological growth and development in Danio rerio (zebrafish). Zebrafish were bred in a controlled environment, and fertilized embryos were collected and stained with methylene blue. After three days, an equal number of embryos were placed in solutions of curcumin and or piperine: 3.0 μM curcumin, 6.5 μM curcumin, 0.79 μM piperine, 3.0 μM curcumin with 0.25 μM piperine, and 6.5 μM curcumin with 1.08 μM piperine. Mutations in spinal curvature were observed in both curcumin solutions, and in the 6.5 μM curcumin with 1.08 μM piperine solution. Greater mutated embryos were observed in the curcumin and piperine solution than the curcumin solutions. Thus curcumin may cause spinal curvature mutations in zebrafish and piperine may increase the rate of these mutations.

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