

Effect of Turmeric on Memory Curves of Planarians: An Investigation into Chemical Memory

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The concept of chemical memory is supported by research showing memories passing between *Dugesia dorotocephala* (planarian) specimens. My previous year's research demonstrated *C. longa* could quicken learning in *D. dorotocephala* through classic conditioning. Therefore, this investigation combines these two concepts and explores chemical memory of *D. dorotocephala* and its interactions with antioxidants in *Curcuma longa* (turmeric). *D. dorotocephala* specimens were divided into two groups. Only one group was exposed to a maze. All specimens were decapitated and each regenerated either a head or a tail in the presence of *C. longa* or negative control (*Capsicum annum*, red chili). A specimen from each group (n=10) was placed in the maze under light stress and the time taken to exit the maze was recorded in a blinded manner. T-Test determined statistical significance. Previously exposed specimens performed significantly more quickly than unexposed specimens, suggesting the presence of chemical memory. Regenerating or retaining a head did not significantly impact time spent in maze. Neither *C. longa* nor negative control, *C. annum*, showed any significant effect in most cases. *C. longa* showed a significant difference in specimens exposed to the maze that retained the head, suggesting that memory pathways of the brain wherein *C. longa* interacts differ fundamentally from those of chemical memories. Bioinformatics analysis revealed largely un-annotated motifs in planarian genes and significant homology with human genes involved in the brain and its disorders. These results provide a glimpse into chemical memory, and these concepts can be extrapolated in neurobiological research and medical treatment.