SAFETY EVALUATION OF CHRYSATHEMUM INDICUM L. FLOWER OIL BY ASSESSING ACUTE ORAL TOXICITY, MICRONUCLEUS ABNORMALITIES, AND MUTAGENICITY

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Chrysanthemum indicum is widely used to treat immune-related and infectious disorders in East Asia. C. indicum flower oil contains 1,8-cineole, germacrene D, camphor, α-cadinol, camphene, pinocarvone, β-caryophyllene, 3-cyclohexen-1-ol, and γ-curcumene. Flowers oil of C. indicum was characterized as having prominent (> 3%) contents of α-pinene (14.63%), 1,8-cineol (10.71%), germacrene D (5.25%), (-)-sinularene (3.95%), β-bisabolene (3.95%), bornyl acetate (3.64%), β-elemene (3.18%), and borneol (3.02%). We evaluated the safety of C. indicum flower oil, acute oral toxicity, bone marrow micronucleus, and bacterial reverse mutation tests. Mortality, clinical signs and gross findings of mice were measured for 15 days after the oral single gavage administration of C. indicum flower oil. There were no mortality and clinical signs of toxicity at 2,000 mg/kg body weight/day of C. indicum flower oil throughout the 15 day period. Micronucleated erythrocyte cell counts for all treated groups were not significantly different between test and control groups. Levels of 15.63–500 µg/plate did not induce mutagenicity in S. typhimurium and E. coli, with or without the introduction of a metabolic activation system. Our results suggest that C. indicum flower oil produces no bone marrow micronucleus abnormalities, mutagenicity, or chromosomal aberration, and thus might be considered a functional food or medicinal ingredient. However, further detailed studies, such as in vivo animal studies that further define toxicological properties, are required to understand the potential of adverse health effects from routine ingestion by humans.