

REACTIVE OXYGEN SPECIES SCAVENGING ACTIVITY OF FERMENTED PAPAYA PREPARATION AND ITS PROTECTIVE EFFECT ON DNA DAMAGE IN BRAIN OF IRON-INDUCED EPILEPTIC RATS

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Fermented papaya preparation (PS-501, SAIDO CO., FUKUOKA & PROUT CO., GIFU) is a natural functional health food by yeast fermentation of *Carica Papaya* Linn. In a previous study we found that PS-501 had scavenging activity on hydroxyl radical and inhibited lipid peroxide formation in rat brain. In this study we examined scavenging activity of oxygen species including singlet oxygen by PS-501 along with its protective effect from DNA damage of the brain of iron-induced epileptic rats. Scavenging activity of PS-501 against the reactive oxygen species generated by photosensitization of riboflavin was analyzed using an electron spin resonance (ESR) spectrometer. 8-Hydroxy-2'-deoxy-guanosine (8-OHdG) is a main product of oxidatively damaged DNA, and 8-OHdG was assayed using high-performance liquid chromatography. PS-501 scavenges reactive oxygen species including singlet oxygen as well as hydroxyl radicals. Levels of 8-OHdG were found to be elevated in the brain 30 min after FeCl₃ solution injection into rats' left sensory motor cortex of an experimental animal model of post-traumatic epilepsy. However, the administration of PS-501 in the rats' drinking water for 4 weeks decreased the elevation of 8-OHdG levels in the brain. This observation suggests that PS-501 has a protective effect on DNA damage in the brain after iron injection. In conclusion, these results showed that PS-501 has scavenging activity on reactive oxygen species including singlet oxygen and that some active scavenging components may easily pass the blood brain barrier and protect DNA damage in the brain induced by FeCl₃ injection.