P85

Effects of Silk Fibroin on Oxygen radicals and Their Scavenger Enzymes in Brain of SD Rats

Jong-Soo Lee*, Dae-Ik Kim, Jeung-Min Kim, Soo-Hyun Park, Jin-Ho Choi, Weon-Ki Cho[1], Kwang Gill Lee[2], Joo Hong Yeo[2] and Yong Woo Lee[2]

Lab. of Biochemistry, Faculty of Food Science and Biotechnology, Pukyong National University; [1]Choa Pharmacy Co. Ltd., [2]Dept. of Sericulture & Entomology, National Institute of Agricultural Science & Technology, RDA, Suwon 441-100, Korea

This study was designed to investigate the effects of silk fibroin (Mw 500) powder (SFP) on oxygen radicals and their scavenger enzymes in brain membranes of rats. Sprague-Dawley (SD) male rats (160±10g) were fed basic diet (control group), and experimental diets (SFP-2.5 and SFP-5.0 groups) added 2.5 and 5.0 g/kg BW/day for 6 weeks. Hydroxyl radical (·OH) levels resulted in a considerable decreases (6.6% and 9.7%, 2.8% and 11.9%, respectively) in brain mitochondria and microsomes of SFP-2.5 and SFP-5.0 groups compared with control group, but were significantly decreased in these membranes of SFP-5.0 group only. Superoxide radical ($O_2^{\cdot -}$) levels were a slightly decreased (2.0% and 9.1%, respectively) in brain cytosol of SFP-2.5 and SFP-5.0 groups compared with control group. Lipid peroxide (LPO) levels were significantly decreased (12.9% and 21.9%, 13.2% and 22.5%, respectively) in brain mitochondria and microsomes of SFP-2.5 and SFP-5.0 groups compared with control group. Oxidized protein (OP) levels were significantly decreased (16.7% and 15.7%, respectively) in brain microsomes of SFP-2.5 and SFP-5.0 groups compared with control group, but significant difference between in brain mitochondria of these two groups could not be obtained. Mn-SOD activities were remarkably increased (11.2% and 24.2%, respectively) in mitochondria of SFP-2.5 and SFP-5.0 groups. Cu,Zn-SOD activities were effectively increased (7.7% and 19.6%, respectively) in brain cytosol of SFP-2.5 and SFP-5.0 groups, but significant difference between control and SFP-2.5 groups could be not obtained. GSHPx activities were considerably increased (5.3% and 11.7%, respectively) in brain cytosol of SFP-2.5 and SFP-5.0 groups compared with control group. These results suggest that anti-aging effect of silk fibroin may play an effective learning and memory role in a attenuating a oxidative stress and increasing a scavenger enzyme activity in brain membranes.