# Effects of phycocyanin administration on some hormones and thermogenic factors related to metabolism in old mice

Didem KORKMAZ[1]*, İrem ALKAN[2], Hülya YILDIZ[2] & Ayşe Gül MUTLU[1]

[1]Molecular Biology and Genetics Department, [2]Biology Department, Faculty of Science and Literature, Burdur Mehmet Akif Ersoy University, Burdur, Turkey

*Received 16 July 2024; revised 05 March 2025*

Maintaining metabolic homeostasis in elderly individuals is crucial for preventing metabolic diseases, as age-related metabolic irregularities, including insulin resistance, are common. Phycocyanin (PC), a phycobiliprotein derived from Spirulina, is known for its various bioactive properties and its applications in medicine, pharmacy, aquaculture, and the cosmetic industry. Given its potential as a nutritional supplement, this study aimed to investigate the effects of PC on key metabolic-regulating hormones; ghrelin, leptin, adiponectin, and resistin and thermogenic factors; SIRT1 and UCP1 in old mice. A total of 15 male C57BL/6 mice, aged 12-15 months, were randomly assigned to two groups: a control group (n=7) and a phycocyanin-administered group (n=8). PC was administered through drinking water at a dose of 150 mg/kg for a period of two weeks. Blood serum and adipose tissue samples were collected for subsequent analysis of hormone and thermogenic factor levels. According to our results, PC a significant increased adiponectin levels (1.98 ng/L) and a significant decreased ghrelin levels (1.48 ng/L). Considering the metabolic changes mediated by adiponectin in muscle and liver tissue, the fact that PC increases adiponectin levels in old mice is promising that it can compensate for some metabolic irregularities, especially insulin resistance, that develop with old age. Although the clinical effect of PC in reducing ghrelin levels in aged mice is not fully known, it may be useful in preventing weight gain that occurs with aging.

**Keywords:** Spirulina, Aging, Leptin, SIRT1