

Antistress Effects of Hydrangeae Dulcis Folium on Net Handling Stress-Induced Anxiety-Like Behavior in Zebrafish: Possible Mechanism of Action of Adrenocorticotropin Hormone (ACTH) Receptor

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Abstract : In this study, the anti-stress effects of the ethanolic extract of Hydrangeae Dulcis Folium (EHDF) were investigated. To determine the effects of EHDF on physical stress, changes in the whole-body cortisol level and behaviour were monitored in zebrafish. To induce physical stress, we used the net handling stress (NHS). Fish were treated with EHDF for 6 min before they were exposed to stress, and the fish were either evaluated via behavioural tests, including a novel tank test and an open field test or sacrificed to collect body fluid from the whole body. The results indicate that increased anxiety-like behaviours in the novel tank test and open field test under stress were recovered by treatment with EHDF at 5, 10 and 20 mg/L ($P < 0.05$). Moreover, compared with the normal group, which was not treated with NHS, the whole-body cortisol level was significantly increased by treatment with NHS in the control group. Compared with the control group, pre-treatment with EHDF at concentrations of 5, 10 and 20 mg/L for 6 min significantly prevented the increase in the whole-body cortisol level induced by NHS ($P < 0.05$). In addition, adrenocorticotropin hormone (ACTH) challenge studies showed that EHDF completely blocked the effects of ACTH (0.2 IU/g, IP) on cortisol secretion. These results suggest that EHDF may be a good anti-stress candidate and that its mechanism of action may be related to its positive effects on cortisol release.

Keywords : net handling stress, zebrafish, hydrangeae dulcis folium, whole-body cortisol, novel tank test, open field test

Conference Title : ICBFBS 2017 : International Conference on Biotechnology, Food and Beverage Sciences

Conference Location : Amsterdam, Netherlands

Conference Dates : February 07-08, 2017