ABSTRACT

The supplementation of fish diets with herbal medicines aimed at improving growth and antioxidant status is an attractive subject in fish nutrition research. Licorice *(Glycyrrhiza glabra)* is a medicinal herb having sweet flavour that has been used in different traditional medicines to enhance the functioning of digestive tract and may have a good impact on feed digestion and assimilation in human and animals. The objective of current research was to evaluate how licorice containing diet affected growth performance, digestive enzymes actvity, and antioxidant status (*Ctenopharyngodon* idella) in grass carp. In replicate treatments, grass carp were randomly allocated into glass and fibre tanks. Fish were fed twice a day with licorice supplemented diets containing 0g LRP (control), 5% LRP (D1), 10% LRP (D2) and 20% LRP (D3) for period of 2 months. Growth performance, digestive enzymes activity and antioxidant status were assessed at the end of experiment. The results revealed that fish in the experimental group with licorice supplementation had greater average final weight, weight gain (WG), % weight gain (%WG), standard growth rate (SGR), and thermal condition factor (TCF) than those in the control variant, but there was significant increase observed in group 4 (with 20g% LRP) followed by others fed with 10g and 5g licorice. The condition factor (CF) does not differ significantly between the control and licorice-treated groups. In addition, activity of antioxidants (SOD, GSH, and GST) and digestive enzymes (Protease, amylase, and lipase) were significantly enhanced in the experimental groups ($P < 0.05$) than the control. Maximum activity of antioxidants in liver, kidney and intestine was observed in 20% licorice group but 5% licorice showed maximum GST activity in intestine of fish. Protease, amylase, and lipase activities in the intestine were significantly higher in 20%, 5% and 10% licorice treated groups respectively. According to these findings, Dietary LRP increased the growth, digestive and antioxidant capacities of fish. Consequently, the current study discovered that using LRP in a diet at a rate of 20 g/kg feed can be advised for grasscarp to get the best antioxidant and digestive enzyme responses, as well as high growth indices.