

Abstract

# The effects of Lead stress on flavonoid content and antioxidant activity from *Scrophularia striata* Boiss. †

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**Abstract:** *Scrophularia striata* Boiss., a local name of Teshnehdari, is used as a common medicinal infusion of the plant aerial parts in hot water. For decades, Teshnehdari has been used in diverse forms, including oral decoction, incense, and poultice for treating various diseases containing eye and ear infections, infectious wounds, colds, and boils. Recently, researchers have recommended applying *S. striata* for clinical studies on COVID-19 viral illness. One of the reasons for using plants in medicine is the presence of their metabolites and antioxidant activities. Different environmental stresses incredibly affect their antioxidant capacity and medicinal metabolites. The reactive oxygen species (ROS) production often increases in response to heavy metal pollution, especially Pb stress. Plants have a defense system that responds to the imbalance between oxidant and antioxidant activities by increasing antioxidant production. The research purposed to evaluate the effects of Pb stress on the flavonoid content and antioxidant activity of *S. striata*. The antioxidant activity was distinguished with the evaluation of scavenger enzymes, including guaiacol peroxidase (POD), superoxide dismutase (SOD), and catalase (CAT), using extraction of shoot samples with different collecting times (24, 48, and 72 hours). After 24 h treatment, POD was the predominant antioxidant enzyme and significantly increased compared to control groups. However, SOD and CAT showed a significant increase in modulating the oxidative status at 72h after Pb stress. Statistical analysis showed a negative correlation between POD with CAT and SOD. Based on HPLC analysis of genistein flavonoid, a non-enzymatic antioxidant, meaningfully increased at 24 and 72 h after treatment. Also, Correlation coefficient analysis showed a significant negative relationship between genistein and antioxidant activity (CAT and SOD). Overall, *S. striata* can be a good source of enzymatic and non-enzymatic antioxidants with application in the pharmaceutical industry.

**Keywords:** *Scrophularia striata* Boiss.; Flavonoid content, Antioxidant activity, Pb stress

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