

# Effects of AM fungi on selenium accumulation and selenium utilization efficiency of winter wheat (*Triticum aestivum* L.) under different fertilization time

Jiao Li, Fuyong Wu\*

College of Natural Resources and Environment, Northwest A&F University, Yangling, Shaanxi Province  
712100, PR China

\* Presenting author email: lijiao0829@126.com

## Abstract

Arbuscular mycorrhizal fungi (AMF) are ubiquitous in the soil that can form symbiotic associations with roots of the majority of plant species. In the present study, we investigated the effects of mycorrhizal inoculation on the distribution, transformation of selenium (Se) fractions in the rhizosphere soil, and the accumulation and availability of Se in each part of winter wheat. A pot experiment was conducted using different concentrations of exogenous selenate (0.25, 0.5 and 1.0 mg Se kg<sup>-1</sup> soil) at different growth stages in wheat. The results demonstrated that inoculation with AMF had no significant effect either on wheat biomass or grain yield ( $P < 0.05$ ). Se distribution in different parts of wheat plant ranked decline as grain > leaf > husk > stem > root with selenate treatment. The inoculation of AMF significantly increased available Se (SOL-Se + EXC-Se) content by 0.34 -6.80 times, respectively, compared with the control. In addition, the dominant Se fraction in all treatments was EXC-Se, accounting for 34.46%-56.23%. The results indicated that the availability of Se in rhizosphere soil was influenced by mycorrhizal inoculation. The results indicated that inoculation with arbuscular mycorrhizal fungi (AMF) significantly ( $P < 0.05$ ) increased Se accumulation in grain when selenium fertilizer was added at jointing stage. Mycorrhizal inoculation effectively improved Se absorption by activating soil available Se. AMF has the potential to increase the Se content in wheat grain and would be a new strategy improves the dietary of residents living on wheat as a staple food.

**Keywords:** Mycorrhizae; Selenate; rhizosphere soil; Se speciation; winter wheat.