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QTL Mapping of Mineral Element Contents in Brown Rice using Introgression Lines Derived from an Interspecific CrossCheryl Adeva¹, Yeo-Tae Yun², Kyu-Chan Shim¹, Luong Ngoc Ha¹, Hyun-Sook Lee³, Sang-Nag Ahn^{1*}¹Department of Agronomy, College of Agricultural and Life Sciences, Chungnam National University, Daejeon 34134, Korea²Chungcheongnam-do Agricultural Research and Extension Services, Yesan, 340-861, Korea³Crop Breeding Division, National Institute of Crop Science, Rural Development Administration, Wanju, 55365, Korea

Mineral elements greatly play an important role in human health. Rice (*O. sativa*), one of the most essential and commonly consumed cereal crops globally, provides carbohydrates, starch, proteins, and nutrients needed by the human body. However, rice grain has comparatively lower amount of some essential nutrients like iron, zinc, and calcium compared to other staple crops like corn, wheat, legumes, and tubers. Thus, improving the nutritional value of rice is becoming one of the focal targets of breeding program to address and overcome malnutrition. Wild rice establishes an extended gene pool that can be employed for rice cultivar improvement. In this study, 96 introgression lines (ILs) derived from a cross between the Korean elite *O. sativa japonica* cultivar ‘Hwaseong’ and *O. rufipogon* (IRGC 105491) was developed to identify quantitative trait loci (QTLs) associated with rice grain mineral elements. The ILs were evaluated in two locations. The iron (Fe), zinc (Zn), manganese (Mn), and calcium (Ca) contents in brown rice grains were measured in both trials. In this study, we identified seven QTLs for Fe, Zn, Mn, and Ca contents by single marker analysis. The trait enhancing alleles of most identified QTLs were derived from *O. rufipogon*. The identified QTLs on chromosome 10 greatly influenced the mineral element contents in ILs. Highly significant and positive correlations at phenotypic level were observed between Fe and Zn and between Mn and Ca across locations. The favorable *O. rufipogon*-derived QTLs identified in our study will be helpful in improving the nutritional quality of rice for human health.

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