Variations in Concentration and Distribution of Health-Related Elements Affected by Environmental and Genotypic Differences in Rice Grains [PDF]

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摘　要：A research work was conducted to investigate the variations in concentration and distribution of health-related elements affected by environmental and genotypic differences in rice grains. The grain of Xieqingzao B (indica rice variety) and Xiushui 110 (japonica rice variety) were divided into: hull, bran and milled rice, based on the conventional rice consumption and process. Xieqingzao B was grown at four different locations, and at one location, it was planted in the same field and season as Xiushui 110. In addition, another four indica and four japonica varieties were cultivated in the same field and time to analyze the elements in milled rice. The average concentrations of total P and phytic acid P were the highest in the bran, followed by milled rice and hull; Zn, K, Mg, and As concentrations were the highest in bran, followed by hull and milled rice, while Fe, Ca, and Cu concentrations were the highest in the hull, but similar in bran and milled rice. The result indicated that genotype and environment significantly affected the concentrations of all the tested elements, while the distribution of the above elements in grains was not in the same order as concentration. Moreover, all the elements except 97.7% of Cu and 93.2% of Fe was deposited in the hull on average, were mostly distributed either in the bran (37.3% and 57.7% for K and phytic acid P) or in milled rice (41.7%, 42.6%, 40.3%, 49.8% for Zn, Mg, As, total P, respectively).

关键词：distribution; concentration; micronutrient mineral; biofortification; breeding; rice
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