

Major Element Relationships Between the Ginsengs, Keumsan and Their Soils

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Ginsengs (1, 2 3 years) from the Keumsan are analysed for the major element contents and compared with the their soils, which had been divided into 3 areas: biotite granite (GR), phyllite (PH) and shale (SL).

In the soils, high Al_2O_3 and Na_2O contents in the GR, Fe_2O_3 , MnO and MgO contents in the PH, and SiO_2 , and CaO contents in the SL are found. In the correlation coefficients, positive correlations are shown in the SiO_2 - MgO , CaO , TiO_2 , Al_2O_3 - Na_2O , K_2O , MnO - MgO , P_2O_5 , MgO - CaO , TiO_2 , P_2O_5 , CaO - Na_2O , TiO_2 , and Na_2O - K_2O pairs while negative correlations are shown in the SiO_2 - Al_2O_3 , Na_2O , K_2O , Al_2O_3 - Fe_2O_3 , MgO , CaO , TiO_2 , P_2O_5 , MnO - K_2O , MgO - Na_2O , K_2O , CaO - Na_2O , K_2O , Na_2O - TiO_2 , P_2O_5 and K_2O - TiO_2 , P_2O_5 pairs.

Comparing with same aged ginsengs with different localities, the SL is mainly high, but low in the GR. Comparing with same localities with different ages, Al, Na, and Ti contents are high in the all areas.

Comparing among the upper parts, the SL is mainly high, but low in the GR. Comparing among the root parts, the GR is mainly high, but low in the PH in the 2 year ginsengs whereas the SL is mainly high, but low in the PH in the 3 year ginsengs.

Comparing between upper and root parts, regardless of the localities, Fe, Mn and Ca of the upper part, and Ti of the root part are high with differences of several times. Upper/root part ratios are decreased from Mn, Ca, Fe, Al, Na to Ti.

In the relative ratios between field soils and ginsengs (field soil/ginseng), generally, the ginsengs, regardless of the localities, show high Ca contents with differences of several ten times, Mn contents with differences of several times to ten times whereas the soils have high Na, Fe, Ti and Al contents with differences of several times. The ratios are mainly lower in the 2 year area relative to the 3 year area. Regardless of the areas, Al, Mn, and Na are high in the 2 year area relative to the 3 year.