PA-40

Effect of Growth Characteristics on Luteolin Contents of Peanut Shells in Different Resources

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[Introduction]

Peanut is grown worldwide in the tropics and temperate zones primarily as an oilseed crop. But peanut shell is one of the potent natural source of luteolin, having possibility of industrialization for food and medicine material. Recently, luteolin is reported as a strong anti-inflammatory and anticancer substance. In this study, we tried to find the optimal peanut source with high luteolin contents in the peanut shell from germplasms and breeding lines.

[Materials and Methods]

A total 294 peanut resources, two sources with 147 germplasms and 147 peanut lines, in this experiment were used to analyze shell luteolin contents. Peanut shell sample, planted late April, were prepared in Autumn after harvest in 2016. The outer shells except for peanut grain were ground for this analysis. After 80% ethanol extraction for 1 hour with sonication, luteolin was analysed by HPLC.

[Results and Discussions]

This experiment studied on the variation between growth characteristics and peanut shell luteolin contents in 294 resources, 147 germplasms and 147 breeding lines, harvested in 2016.

Distribution of main stem length, branch length and branch no. of peanut plant between two sources varies considerably. Over-growed germplasms in main stem have the average value of 55.9cm ranged the lowest 32 to the highest 104cm, in the branch 79.7cm ranged 51 to 103cm, and in the branch no. 27.7 ranged 5 to 80 no. and improved breeding lines show the average 29.6cm ranged 15 to 45cm, 36.9cm ranged 21 to 65 cm and 16.8 no. ranged 5 to 33 no. respectively. The distribution of luteolin contents in 147 germplasms have the average 1008.2㎍/g ranged 0.9 to 4496.1㎍/g and in 147 breeding lines 2300.2±772.9㎍/g ranged 812.7 to 4418.6㎍/g. Regression coefficiences between luteolin contents and main stem length, branch length, and branch no. in source germplasms are significant as 0.2802*, 0.2702*, -0.2674* and in sources breeding lines have negative significances with -0.2140*, -0.2944*, and −0.2587*, respectively. The luteolin contents between plant types in source breeding lines have similar amounts with the average 2106.3㎍/g ranged 993.3 to 3817.3㎍/g in Virginia bunch type and the average 2385.8㎍/g ranged 812.7 to 4418.6㎍/g in Shinpung plant type. Lutelin contents in source germplasms show some differences among plant types with the average 511.1㎍/g ranged 0.9 to 850.0㎍/g in Virginia type, 993.1㎍/g ranged 351.2 to 2085.4㎍/g in Shinpung type, 1150.8㎍/g ranged 297.9 to 1910.4㎍/g in Valencia type, and the average 1464.0㎍/g ranged 1.8 to 4496.1㎍/g in Spanish type. Though the luteolin contents of peanut shell is changeable according to sources, those of breeding lines have evidently improved as growth characteristics have improved to short plant types. Spanish plant type should be also considered for developing the industrial luteolin for food and medicine.

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