PC-38

Secondary metabolites and antioxidant potentials in six Korean peanut seed, sprout, and shell

Bishnu Adhikari[1], Muhammad Waqas Ali[1], Sanjeev Kumar Dhungana[1], Il-Do Kim[2] and Dong-Hyun Shin[1]*

[1]School of Applied Biosciences, Kyungpook National University, Daegu 41566, KOREA
[2]International Institute of Agriculture Research & Development, Kyungpook National University, Daegu 41566, KOREA

[Introduction]
Peanut and its products are also rich in different secondary metabolites and functional food components. Secondary metabolites are good antioxidants and play significant roles in protection against various diseases like diabetes, asthma, cardiovascular diseases, cancers, aging, and infections. Sprouts can easily be grown from many crop seeds at the household or industrial level without any expensive equipment. Peanut sprouts contain a higher amount of carbohydrates, amino acids, minerals, and phenolic compounds than the seeds. Moreover, peanut sprouts are a good source of resveratrol, a natural phytoalexin phenolic compound that is found only in few crop species. Peanut shells comprise about one third by weight of peanut pod and are quite abundant and inexpensive products and have many bioactive and functional compounds.

[Materials and Methods]
Daekwang, Akwang, Baekjung, Alogi, Pungan, and Heugttangkong are the six Korean peanut cultivars taken in the present study. For the study of peanut shell, shells were deshelled using hands. Peanut sprouts were grown at room temperature for 9 d. Sprout lengths and yields were recorded from day 5-9. The sprouts were separated into two sprout parts as sprout cotyledons (SC) and sprouts without cotyledon (SWC). The peanut seed, sprout, and shell were also separately ground into powders and the powdered samples were extracted in absolute methanol and the supernatants were filtered. Antioxidant potentials (DPPH and ABTS radical scavenging activity) and secondary metabolites (polyphenol, flavonoid, and resveratrol) content of seed, shell and sprout extract were determined.

[Results and Discussions]
Alogi and Pungan had the significant increase in sprout yield and length than other cultivars. DPPH and ABTS of SC and SWC varied significantly among cultivars from day 5 through 9. During peanut shell study, Akwang and Heugttangkong showed significantly higher DPPH and ABTS radical scavenging activity than other cultivars. The trend for total polyphenol content was similar to that for total flavonoid content in all the six cultivars. Significant variations were found for the resveratrol contents on seed and sprout components among the six cultivars. SWC had more resveratrol content than the SC of all six cultivars during this period. After day 9, sprouts of all the six cultivars had large lateral roots and epicotyl length which might be less preferred for consumption. The sprouts of six peanut cultivars showed considerable variations in their growth and yield, antioxidant potentials, and phenolic compounds and resveratrol contents from day 5-9. Antioxidant activities of sprouts of all the six cultivars were significantly increased with extended germination period. Overall evaluation of the sprouts of 6 peanut cultivars suggested that more appropriate time for sprout consumption for Alogi and Pungan was day 5-7 and that for Daekwang, Akwang, Baekjung, and Heugttangkong was day 5 to 8. Findings of the present study provide valuable information for further research on peanut sprouts utilizing as a source of nutritional and functional food. Peanut shells had also shown high antioxidant activities and secondary metabolites and could be used as safe a raw material in various industrial applications including food, pharmaceutical, and cosmetics.

[Acknowledgements]
This work was supported by Kyungpook National University research fund 2017.

*Corresponding author: Tel. +82-53-950-5707, E-mail. dhshin@knu.ac.kr