

PB-2

Selection of Resistant Varieties to *Aspergillus flavus* by Determination of Aflatoxin B1 Content in Korean Peanut (*Arachis hypogaea* L.) AccessionsSeungah Han¹, Byeong-Cheol Kim², Kunyan Zou¹, Min-jae Choi¹, Jungmin Ha², Tae-Hwan Jun^{1*}¹Department of Plant Bioscience, Pusan National University, Miryang, Republic of Korea²Department of Plant Bioscience, Gangneung-Wonju National University, Gangeung 25457, Korea**[Introduction]**

Aflatoxins that adversely affect peanut production are the most poisonous mycotoxins generated by *Aspergillus* species. *Aspergillus flavus* (*A. flavus*) is a fungus that produces aflatoxin B1 (AFB1) and B2 (AFB2). AFB1 is one of the substances known to cause mutations, carcinogens, malformations, and liver cancer in humans. IARC (International Agency for Cancer Research) classifies aflatoxin as a Group 1 human carcinogen. Therefore, this study was conducted to evaluate the aflatoxin resistance of 102 peanut accessions and to identify accessions resistant to AFB1.aflatoxin B1.

[Materials and Methods]

One hundred one Korean accessions and 55-437 (aflatoxin resistant accession) from the RDA-GenBank Information Center were planted in 2020 on a farm affiliated with Pusan National University (35° 30 07.5 N, 128° 43 16.2 E), Miryang. *Aspergillus flavus* strain KACC 45068, producing aflatoxin B1, was obtained from the Korea Agricultural Culture Collection (Jeonju, South Korea), and the conidia were cultured on potato dextrose agar medium in a 90-mm petri dish at 29 ±1 °C for 14 days. After disinfecting the seeds with 75 % ethanol, 2 × 10⁶ CFU/mL of *A. flavus* conidial suspension in a 0.05 % Tween-20 solution was inoculated at 100 µL per seed for 7 days. Modifying a previously published method (Yu et al., 2019), the exterior infection of each seed was determined by visual inspection at four distinct levels. Based on the Korean food code (2022) and AOAC Method 991.31, AFB1 concentrations in peanuts were determined quantitatively (AOAC, 2000). The quantitative analysis of AFB1 is determined by UPLC-PDA. To identify resistant cultivars for aflatoxin B1 content, the K-means algorithm was used with R software.

[Results and Discussion]

After 7 days of inoculation with *A. flavus*, the AFB1 concentration of 102 peanuts harvested in 2020 ranged between 0.599 and 3.554 µg/g. In addition, the PSII (Percent Seed Infection Index), a measure of external infection, ranged from 26.67 to 100 percent. To identify cultivars resistant to AFB1, the K-means algorithm was employed to cluster into four groups, and 34 accessions were selected for the resistance group. The selected accessions will be served as genetic resources to develop improved peanut cultivars with AFB1 resistance..

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