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## Genetic analysis of preharvest sprouting tolerance in bread wheat (Triticum aestivum L. emend. Thell.)

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**Abstract:** Rains during grain ripening in wheat (Triticum aestivum L.) can cause preharvest sprouting (PHS), which drastically affects the grain yield and the baking quality of flour. In the present study, to screen 7 cultivars and 4 lines of spring bread wheat for PHS, germination tests were conducted with seeds obtained from wet spikes harvested immediately after natural rainfall. Germination tests were carried out as 3 different treatments: 1) seeds immediately germinated after hand-threshing on sampling day ($T_1$), 2) seeds germinated 1 week later after hand-threshing ($T_2$), and 3) 10 intact spikes kept on paper under laboratory conditions at room temperature, hand threshed and then put to germinate 7 days later ($T_3$). Red-grained cultivars Sagitario and Pandas, red-grained line F6 0314.76/Mrl, and white-grained cultivar Sunlin showed the higher PHS tolerance, while other wheat cultivars and lines were found to be susceptible to PHS under all treatment conditions. To evaluate the mode of inheritance and combining ability of PHS tolerance, a diallel cross was made between 3 white-grained (susceptible) and 2 red-grained wheat (resistant) cultivars. Analysis of variance for combining ability showed the predominance of an additive gene effect for PHS tolerance, as the variance of the general combining ability was higher than the specific combining ability for both percent germination and germination index. Pandas and Sagitario showed positive contributions toward increasing PHS tolerance in the $F_1$ progenies. Results presented in this study will provide useful information for wheat breeders about PHS tolerance or dormancy level in commonly grown wheat cultivars in the Mediterranean region of Turkey, and help them in the development of white wheat cultivars with an inherently higher sprouting tolerance.

**Key words:** Preharvest sprouting, germination index, diallel cross, genetic parameters, bread wheat, Mediterranean region

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