



Detection of quantitative trait loci for ear row number in F₂ populations of maize

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ABSTRACT. Ear row number (ERN) is not only a key trait involved in maize (*Zea mays* L.) evolution but is also an important component that is directly related to grain yield. In this study, quantitative trait loci (QTLs) for ERN were detected across two F₂ populations that were derived from a same cross between B73 with 16 rows (N = 233) and SICAU1212 with four rows (N = 231). As a result, 33 QTLs were associated with 12 agronomic traits: three plant traits, four ear-related traits, and five kernel-related traits. The total phenotypic variation explained by the QTLs for each trait ranged from 8.60 to 72.67%, and four QTLs were identified for ERN in the two populations. Each QTL explained between 6.78 and 36.76% of the ERN variation. Notably, three of the four QTLs (*qERN2-1*, *qERN4-2*, and *qERN8-1*) were associated with ERN, and *qERN8-1* simultaneously influenced grain yield, plant diameter, ear diameter, and kernel length. In addition, only one significant epistatic interaction was detected in all 33 QTLs. This study should provide a foundation for further fine-mapping and map-based cloning of these consistent QTLs, and for controlling maize ERN by marker-assisted breeding.

Key words: Maize; QTL; Ear row number; Grain yield