

SENSORY EVALUATION OF NEAR ISOGENIC LINES DERIVED FROM THE FABADA MARKET CLASS A25 LINE

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The sensory value of dry beans (*Phaseolus vulgaris* L.) is one of the traits that most influence consumer's choices. It is often argued that the process of genetic improvement might reduce the sensory value of dry beans through negative genetic correlations among traits or through the remnants of the donor genome that are interspersed with the recipient genome through backcrossing. However, there are no experimental data to document these theoretical changes.

Since 1990, breeding programs have been underway in Asturias to improve the fabada commercial type (very large (100g/100 seeds) white oblong seeds) by incorporating genes to improve resistance to anthracnose (genes *Co-2* and *Co-9*), BCMV (gene *I*), BCMNV (gene *bc-3*), and to modify the architecture of the plant (gene *fin*). Near isogenic lines (NILs) obtained from the A25 line, derived from individual selection in the fabada-type commercial variety Andecha, are currently available. Lines A2806 (*Co-2+I+bc-3*) and A2418 (*I+bc-3*) were obtained by backcrossing with A25 as the recurrent parent. The characteristic indeterminate growth pattern of the fabada type was modified by the cross V203 x A25 to obtain the determinate-growth Xana line. Later, genes that brought resistance to anthracnose were incorporated into Xana by backcrossing, to obtain the line X1319 that contains the gene *Co-9* and the line X1358 that contains the gene *Co-2*.

To identify possible differences in the sensory quality of these NILs, line A25 and the lines derived from it A2806, A2418, Xana, X1319, and X1358 were cultivated in two locations (Argüelles and Villaviciosa, Asturias, northern Spain). The sensory characteristics of the seeds harvested were evaluated by a trained panel. Significant differences between the two locations were detected for '*roughness of the seed coat surface*', '*seed coat perception*', and '*mealiness*'. On the other hand, no differences were found in the trait '*flavor*'. Only the trait '*mealiness*' had a significant *location x variety* interaction.

Xana and its derivative NILs were different from A25 and its derivative NILs in the trait "*roughness of the seed coat*". No differences in the trait '*seed coat perception*' were observed between Xana and A25; however, the seed coats of lines X1319 and X1358 derived from Xana were more perceptible than the rest. Xana was less mealy than the other lines, all of which fell into a single group of significance. Finally, lines X1319, A2806, and A2418 had a less intense flavor than A25.

The results indicate that there are sensory differences in the NILs derived from the breeding program, although these differences do not necessarily result in worse quality. The changes identified may be due to remnants from the donors, recombination, epistasis or pleiotropy.

References

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