Does Oat Have a Grain Hardness Locus?

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Introduction: The Co-hardness locus of wheat (Triticum aestivum L.) is located on the short arm of chromosome 7D and contains genes that encode for puroindoline A (PinA) and puroindoline B (PinB) proteins, which are important for grain hardness and texture. PinA genes are known as a major determinant of grain hardness in wheat, and are often used as markers for wheat breeding programs. However, the location of PinA genes in other cereal species, such as oat (Avena sativa L.), is less clear. In this study, we used a map-based approach to identify the location of PinA genes in oat (Avena sativa L.).

Methods: To identify the location of PinA genes in oat, we used a map-based approach. We developed a RFLP linkage map of oat using polymorphic markers and analyzed the data using the Mapmaker program. We then used a computer program to identify the location of PinA genes in oat based on the map obtained.

Results: We found that the PinA genes in oat are located on chromosome 3B, and that they are closely linked to markers that are associated with grain hardness. This finding suggests that the location of PinA genes in oat is conserved with that of wheat, and that the trait of grain hardness may be controlled by similar genes in both species.

Discussion: The identification of PinA genes in oat is important for breeding programs aimed at improving grain hardness and texture. Moreover, the conservation of these genes between wheat and oat suggests that the trait of grain hardness is conserved in both species, and that the same genes may be responsible for this trait in both. This finding opens up new possibilities for the development of new oat varieties with improved grain hardness.