

Verification of pleiotropic disease resistance in spring wheat based on phenotypic and molecular markers

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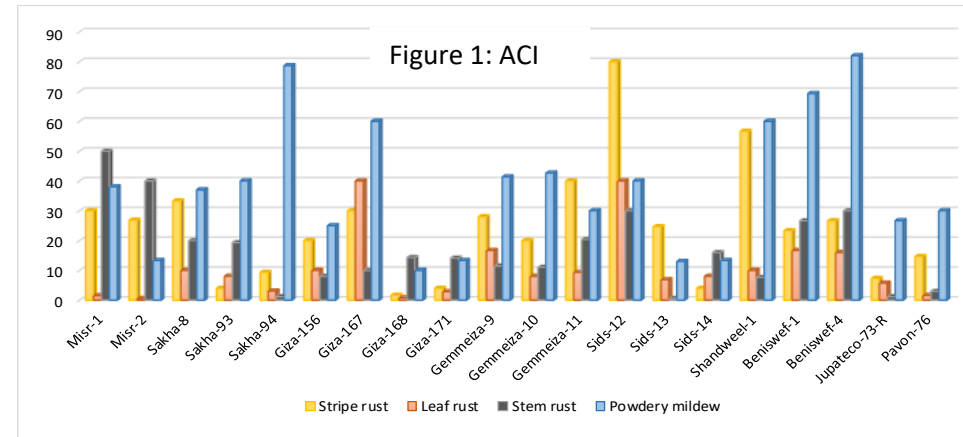


Preface: Pleiotropic resistance to stripe rust (*Puccinia striiformis* f. sp. *tritici*), leaf rust (*P. triticina*), stem rust (*P. graminis* f. sp. *tritici*) and powdery mildew (*Blumeria graminis* f. sp. *tritici*) is in demand.

Phenotypic markers

Levels of PAPR (low, moderate, high) were associated with the presence of phenotypes LTN₁, LTN₂ and PBC in 18 Egyptian cultivars (Fig. 1).

Methodology: I. Field screening of Egyptian wheat cultivars for pleiotropic adult plant resistance (PAPR) associated with phenotypes leaf tip necrosis (LTN) and pseudo black calf (PBC).



Methodology: II. Molecular screening of pleiotropic resistance genes, *Lr34/Yr18/Sr57/Pm38/LTN₁*, *Lr46/Yr29/Sr58/Pm39/LTN₂* and *Sr2/Yr30/Lr27/PBC*

Molecular markers

- Fourteen cultivars possessed *Lr46/Yr29/Sr58/Pm39* linked to LTN₂
- Both genes *Lr34/Yr18/Sr57/Pm38* (LTN₁) and *Sr2/Yr30/Lr27* (PBC) were present in three cultivars each.
- A strong association between phenotypic and molecular markers

Conclusion

Egyptian wheat cultivars were first demonstrated to possess phenotypic markers associated with the presence of PAPR genes individually or in combination which would be a good source to facilitate future breeding for pleiotropic resistance.