

Abstract of the research paper (Accepted)

Paper_1

Polymorphism in Some Egyptian Wheat Varieties Based on SSR-Markers

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In this study 312 Microsatellite markers were used to analyze DNA polymorphism of three Egyptian wheat aiming to develop specific molecular markers useful in future Egyptian wheat breeding programs. DNA was extracted using the CTAB method and PCR products were separated in an ABI 3730 DNA analyzer. Data were scored using GeneMarker and 2.5% Agarose gel. A Total of 477 fragments were detected and among 312 simple sequences repeat markers 162 were proved to be polymorphic. The percentage of genetic polymorphism ranged from 33% to 100 % and fragment size from 112 to 535 bp. Results of these experiments consider the first step in the effective detection of polymorphism among some Egyptian wheat varieties in order to correct choose for parents in future.

Keywords: Wheat; MAS; SSR; PCR; polymorphism.

Paper 2 (under final evaluation)

Marker Assisted-selection of major traits in Egyptian bread wheat (*Triticum aestivum* L.) and wild wheat (*Aegilops ventricosa* Tausch)

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Twenty simple sequence repeats (SSRs) were used to screening five Egyptian bread wheat (*Triticum aestivum* L.) and one wild wheat (*Aegilops ventricosa* Tausch) that differ in many important traits including drought, aluminum tolerance, quality of gluten (Low and high molecular weight), fungal disease resistance (stem, stripe, leaf rust, preharvest sprouting resistance and Fusarium head blight resistance). DNA was extracted using the CTAB method and 0.8% Agarose gel to evaluated DNA quantity. PCR products were separated in an ABI 3730 DNA analyzer and data were scored using GeneMarker. These microsatellites were previously reported to be associated with these traits. Polymorphic level is high (90%) across all wheat genotypes, especially between wild and domesticated wheat. A total of 110 alleles were detected, 89 alleles were specific for traits (81%). The high level of polymorphism could be attributed to selection of genotypes with diverse characteristics. SSRs markers are powerful research tools that make it possible to determine the genetic makeup of plants also serve as reference points to compare differences in DNA sequence and consequently. The study indicated the presence of specific markers in wheat genotypes using SSR markers opens up a possibility to apply marker-assisted selection (MAS) in developing new Egyptian wheat cultivars. Current research may be a useful reference and initial step for conventional wheat plant breeders in Egypt to decrease the cost and time and to develop molecular markers associated with some different traits. These results indicated that some selected markers were able to screen the Egyptian wheat genotypes for some major traits.

Keywords: Marker Assisted-selection, traits, Biotic, Abiotic stress, Wheat, Egypt