

I. INTRODUCTION

Egypt is facing tangible shortage of wheat for local consumption, so that more than 55% of the national need is imported. During the last decade, great efforts have been made by Egyptian scientists to improve wheat productivity. This is in order to increase the production and reduce the gap between the production and consumption of wheat within of its sufficient production among the mandate of food security. However, such gap is relatively still wide.

Wheat (*Triticum aestivum L.*) is the world's leading cereal grain and the most important food crop all over the world especially for the developing countries. In Egypt improvements of wheat yield and grain quality; modifications of its plant's architecture; and increasing its tolerance to drought and, lodging and resistance to insects and pathogens are being done properly. Many wheat cultivars have been released. The ability to discriminate between such cultivars is a fundamental to the operation of the modern seed industry and seed trade as the basis of modern crop production. All sectors of seed industry from breeding through variety testing, registration, seed production, seed quality control, distributors, farmers, growers, and benefit from cultivars verification during their activities.

Recently, seed authority in Egypt recognized the importance of field inspection as a supportive method to seed analysis. Unfortunately, necessary information on phenotypic characteristics is not fully furnished to assist such inspection.

very quick way to distinguish among plants and varieties and to determine relationships (De loose and Gheysen, 1995).

One of the recent advances in genetic purity testing is based on the Polymerase Chain Reaction (PCR) technique, which is known by random amplification of polymorphic DNA or RAPD. This technique uses a single arbitrarily oligonucleotide primer that hybridizes the genomic DNA template of individual seeds at two different sites, one of each strand of the complementary DNA under appropriate temperature alternations; a thermostable DNA polymerase synthesizes discrete DNA products(usually 200-2000 base pairs long). Each primer can consistently amplify several unique DNA fragments that can be separated on an electrophoretic gel. Some of these fragments are characteristic of a genotype and be useful in genetic purity tests.

For the above reasons, the aim of the present investigation was to evaluate morphological and biochemical traits differentiation tests of vegetative and reproductive organs of ten important wheat cultivars grown under the prevailing Egyptian environmental conditions.

Cultivars identification is carried out by observation and recording a range of morphological (botanical) characters as reported in the internationally recognized descriptor of **the International Union for Protection of New Varieties (UPOV, 1994)**, where wheat variety descriptors provide a standardized tool for variety identification by (UPOV, 1994). The decimal code for the growth stages of cereals was recorded according to (Tottman, 1987 and UPOV guidelines, 1990). In addition, morphological description can be expensive and time consuming process, and some used characters are continuous, and their expression are affected by the environmental factors. To supplement the morphological description, gel electrophoresis as a genetic fingerprinting technique was utilized. Gel electrophoresis methods are now well established as an effective means of analyzing seed and / or seedling proteins, isozymes and subsequently identifying cultivars.

Moreover, electrophoresis methods are relatively easy to perform and do not require sophisticated laboratory facilities. Electrophoresis methods proved to be extremely useful for routine applications as in seed quality control for genetic purity verification, variety identification and for research purposes. By using electrophoresis identification techniques, it became possible to detect directly specific fragments of genetic information and to follow these fragments in breeding and maintenance programs. This will make the breeding process more efficient and faster. The electrophoresis techniques also make it possible to characterize and identify individual plants, ecotypes and varieties at the genotypic level. This provides a