



## Taxonomic identity of the Iranian diploid *Triticum* as evidenced by nrDNA ITS analysis

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### Abstract

This study concerns the taxonomic investigation of the Iranian diploid *Triticum* gene pool using morphology and PCR-SSCP analysis of ITS nrDNA. A co-occurrence of two character states of leaf indumentum and anther length was found to be diagnostically significant among these taxa. Three SSCP profiles were detected among our specimens. Sequencing the representatives of different SSCP patterns detected three new nrITS haplotypes. Based on the results of this study we concluded that the genus *Triticum* at diploid level is represented by two taxa in Iran : *T. monococcum* subsp. *aegilopoides* and *T. urartu*, which is a new taxonomic interpretation of the former taxon. The phylogenetic neighbor-joining tree based on nrITS confirms this interpretation.

**Key words:** Morphology, SSCP profile, taxonomy

### Introduction

The vital importance of wheat improvement markedly enhances the value of wild diploid gene pool of *Triticum* Linnaeus (1753: 85) in its putative centre of origin, the Fertile Crescent, which in part overlaps Iran (Kilian *et al.* 2010). Despite the simplicity that appears to be the case in the treatment of a few diploid *Triticum* taxa, the taxonomy of these plants suffers from enormous confusion and complexities, the consequence of using different classifications, constructing poor taxonomic keys and using insufficient samples for study (Gupta & Baum 1989, Morrison 1993, Rahiminejad & Kharazian 2005). Accordingly the identity of the Iranian diploid *Triticum* taxa is a matter of great controversy especially in terms of taxonomic ranks from a “lumper” to a “splitter” point of view (Table 1).

The molecular tools, particularly highly conserved fragments of the internal transcribed spacer (ITS) sequences of nuclear ribosomal DNA (nrDNA), have proven to be very effective when dealing with relationships among closely related groups and blurred classical taxonomic treatments (Hillis & Dixon 1991, Baldwin *et al.* 1995, Lembiec *et al.* 2010, Vizintin *et al.* 2012). In plant population studies where a high number of accessions need to be sequenced and the majority of them likely carry the same sequence, single strand conformation polymorphism (SSCP) analysis can be considered a cost effective method for screening mutations before the costly direct genomic sequencing is begun (Ort *et al.* 1997, Sunnucks *et al.* 2000, Salmaso *et al.* 2004).

This study aims to provide more information on the taxonomic identity of the Iranian diploid *Triticum* taxa and to highlight differences between them at the molecular level via SSCP profiles and nrDNA sequencing.

2003; Lorestan, 20 km to East of Dorud, 1650 m, 13 June 1997. *Southwest*: Chaharmahal & Bakhtiari, between Gandoman and Lordegan, 2150 m, 20 June 2001; Kohgiluyeh & Boyer-Ahmad, 10 km to Yasuj, 1800m, 11 May 2000. All the herbarium specimens studied were collected by Rahiminejad *et al.* and deposited in the herbarium of the University of Isfahan.

**Elevation:**—From 1330 m (Kermanshah, Harsin) to 2420 m (Isfahan, Bouin-miandasht to Aligudarz).

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