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The distinctiveness in diploid cultivars of Westerwolths ryegrass (*Lolium westerwoldicum* Breakw) revealed by fosfoglucoase-isomerase (PGI) and diaphorase (DIA) polymorphism

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Lolium westerwoldicum is an important forage grass originated from the Netherlands. It has been selected by farmers of Westerwolde from local rapid growing Italian ryegrass types within the populations of local variety. Westerwolths ryegrass is the shortest-life form of all annual ryegrasses. Genetic examination of this interesting species is very limited. One-month seedlings of *L. westerwoldicum* cultivars originated from different European countries: France (Barcomet, Gipsyl, Suxyl and Melword), Germany (Duccado, Grasser and Nerissa), Belgium (Mendoza), Netherlands (Bartimo and Gepetto) and Poland (Mowester) were treated as populations and investigated in terms of the two dimeric enzyme systems: phosphoglucose isomerase (PGI; EC 5.3.1.9) and diaphorase (DIA; EC 1.6.4.3). From each cultivar, minimum 30 plants were examined in 11% starch gel (SIGMA), prepared on the basis of lithium-boric buffer system. Electrophoretically detected phenotypes were created by four alleles of one locus in PGI and two alleles in one locus in DIA were used to calculate the genetic parameters like heterozygosities (H_e and H_o) and polymorphic index (P_g). When all populations were compared according to PGI allozymes frequency, all populations show high polymorphism from $P_g=0.53$ for Mowester till $P_g=0.81$ for Gepetto. Polymorphic indices calculated for DIA are fluctuating from $P_g=0.50$ for Bartimo till $P_g=0.65$ for Ducado. All populations were compared on the basis of alleles frequency using Unweighted Pair Groups Method with Arithmetic Mean (UPGMA) and illustrated by dendrograms constructed for both: PGI and DIA enzyme systems. Dendrogram constructed for PGI allozymes shows two groups of populations: one composed of two cultivars: Mendosa (Belgium) and Melword (France) and the second group composed of 8 varieties. Population Bartimo from Holland is visibly separated. Dendrogram constructed for DIA on the basis of alleles frequency shows three groups: two composed of three populations and one of five populations. The first is formed by Bartimo from Holland as well as Suxyl and Gipsyl from France). The second three-species group is composed of Meword (France), Mowster (Poland) and Ducado (Germany). It is visible that connections between populations do not indicate regional similarity.

Biography

Maria Krzakowa works as Professor Senior at Adam Mickiewicz University in Poznań, Poland. Some years ago she did one- year training as Post Doc at the University of California Davis. She learned there enzymes detection by horizontal gel electrophoresis. At first, her scientific activity was concerned about genetic variation of natural populations of Bryophytes (different species of Hepatics and Mosses) and later on forest trees: Scots pine (*Pinus sylvestris*), beech (*Fagus sylvatica*) and ash-tree (*Fraxinus excelsior*). In the meantime she developed investigations on grasses, for example *Apera spica-venti* and *Alopecurus myosuroides*. Her main achievement was the first description of dimeric peroxidase in reed (*Phragmites australis*). It was some kind of discovery, as dimeric peroxidase was known earlier only from the rice (*Oryza sativa*). Now, she is working on European collection of Italian and Westerwolds ryegrasses (*Lolium* spp.) considering biochemical and molecular polymorphism of these important forage grasses.

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