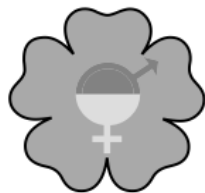


Note from the Editor

The abstract of one poster presented at the XII International Conference on Plant Embryology was not published in the supplement to *Acta Biologica Cracoviensia Series Botanica* Vol. 47 (2005). On behalf of the Organizers and the Editorial Board I apologize to the authors and readers for this unfortunate mistake.



XII INTERNATIONAL CONFERENCE ON PLANT EMBRYOLOGY 5-7 SEPTEMBER 2005, CRACOW, POLAND

Molecular evidence of natural hybridization between *Pinus mugo* and *P. sylvestris* as revealed by a chloroplast DNA marker

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The existence of spontaneous hybrids between *Pinus sylvestris* L. and *P. mugo* Turra has been postulated since the second half of the nineteenth century (Christ, 1864). The most recognized places in Europe where hybrid swarm populations of *P. mugo* × *P. sylvestris* have been reported to occur are Rila Planina and Rodopy in Bulgaria (Dobrinov, 1965), Nowotarska Valley in Poland (Staszkiwicz and Tyszkiewicz, 1969), Swiss Alps (Net-Sarqueda *et al.*, 1988) and Orava region in northern Slovakia (Viewegh, 1981). Molecular evidence has been provided illustrating continuation of introgressive hybridization between *P. mugo* and *P. sylvestris* on the locality 'Medzi Borami' near Habovka (830 m a.s.l.), northern Slovakia where both species occur sympatrically.

Molecular evidence for introgression was based on a previous finding of the species-specific *Hinf* I restriction profiles of cpDNA *trnV-trnH* region in *P. sylvestris* and *P. mugo* (Kormuták *et al.*, 2002) as well as on the original finding of the paternal inheritance of cpDNA in conifers (Wagner *et al.*, 1987). Simultaneous analysis of the respective cpDNA region using needles of a given tree along with the megagametophytes and embryos of individual seeds has accordingly enabled to score either the *P. mugo* or *P. sylvestris* haplotypes in the embryos illustrating gene flow between both species. The *P. mugo* haplotype consisted of 750, 650, 320, 300 and 190 bp fragments and essentially similar profile was also characteristic for *P. sylvestris* haplotype except for the 320 bp fragment which was replaced in the species by the 350 bp fragment. Restriction profiles of needles and megagametophytes of a given tree were identical, whereas the embryos exhibited either the intra- or interspecific nature of their haplotypes. Of the total number of 35 individuals of the putative hybrid population, 18 trees exhibited *P. mugo* haplotype and 17 trees *P. sylvestris* haplotype as evidenced by their needle and megagametophyte restriction profiles. In a group of 18 trees of *P. mugo* haplotype, 22 embryos shared the same haplotype as mother tree and 15 embryos were of *P. sylvestris* haplotype representing interspecific hybrids of *P. mugo* × *P. sylvestris*.

Similar situation has also been found within a group of 17 trees of *P. sylvestris* haplotype with 17 embryos of *P. sylvestris* haplotype and 19 embryos of hybrid nature representing reciprocal hybrid *P. sylvestris* × *P. mugo*. Introgression between *P. mugo* and *P. sylvestris* trees seems to be rather extensive on the locality as evidenced by the 40% share of the hybrid embryos of *P. mugo* × *P. sylvestris* among 18 trees of *P. mugo* haplotype and 52% proportion of the hybrid embryos of reciprocal combination among 17 trees of *P. sylvestris* haplotype.

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REFERENCES

- CHRIST H. 1864. Beiträge zur Kenntnis europäischer *Pinus* - Arten. III. Die Formen der *Pinus sylvestris* des Ober-Engadins (Ctn. Graubünden). *Flora* 22: 147-160.
- DOBRI NOV I. 1965. Study on natural hybrids between *Pinus sylvestris* and *Pinus mugo* var. *mughus* in Bulgaria. *Naučné Trudy Lesotechnického Institutu*, Sofia 13: 39-48.
- KORMUTÁK A, VOOKOVÁ B, SALAJOVÁ T, WANG WR, and SZMIDT A. 2002. Morphometric and genetic analyses of the putative hybrid *Pinus sylvestris* × *Pinus mugo* in Habovka. *Abstracts of IUFRO Symposium of Population and Evolutionary Genetics of Forest Trees*, 25-29 August 2002, Stará Lesná, Slovakia: 29.
- NET-SARQUEDA C, PLUMETTAZ CLOT AC, and BÉCHOLEY L. 1988. Mise en évidence de l'hybridation introgressive entre *Pinus sylvestris* L. et *Pinus uncinata* DC. En Valais (Suisse) par deux méthodes multivariées. *Botanica Helvetica* 98: 161-169.
- STASZKIEWICZ J, and TYSZKIEWICZ M. 1969. Natural hybrids of *Pinus mugo* Turra × *Pinus sylvestris* L. in Nowy Targ Valley. *Fragmenta Floristica et Geobotanica* 15: 187-212.
- VIEWEGH J. 1981. Variability of the hybrid swarms *Pinus mugo* × *Pinus sylvestris* on peat-bog in Zuberec, Orava. *Folia Dendrologica* 8: 41-59.
- WAGNER DB, FURNIER GR, SAGHAL-MAROOF MA, WILLIAMS SM, DANCİK BP, and ALLARD RW. 1987. Chloroplast DNA polymorphism in lodgepole pines and jack pines and their hybrids. *Proceedings of the National Academy of Sciences U.S.A.* 84: 2097-2100.

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Errata to Volume 46, 2004

MESJASZ-PRZYBYŁOWICZ J, NAKONIECZNY M, MIGULA P, AUGUSTYNIAK M, TARNAWSKA M, REIMOLD WU, KOEBERL C, PRZYBYŁOWICZ W, and GŁOWACKA E.

Uptake of Cadmium, Lead, Nickel and Zinc from Soil and Water Solutions by the Nickel Hyperaccumulator *Berkheya coddii*

p. 85 – in References – a paper listed below has to be included:

ROBINSON BH, LOMBI E, ZHAO FJ, and dMcGRATH SP. 2003. Uptake and distribution of nickel and other metals in the hyperaccumulator *Berkheya coddii*. *New Phytologist* 158: 279-285.