

# Andrzej G. Górny

## Scientific Background:

- M.Sc., Agric. University, Poznań, major: plant genetics and breeding, 1971
- D.N.Sc., Silesian University, Katowice, Faculty of Biology and Environmental Protection, major: genetics, 1977
- D.hab., Institute for Plant Breeding and Acclimatization, Radzików, major: agronomy – genetics and plant breeding, 1992.

## Employment:

Institute of Plant Genetics, Polish Acad, Sci., Poznań, from 1971 to present:  
1971-1973, sci. assistant  
1973-1977, senior assistant  
1978-1992, adjunct  
1993-present, assist. professor

## Scientific experience and last activities:

- Over 15 years on the genetics of root systems in barley, oat, rye and wheat.
- Over 17 years on the genetics of cereal nutrition and adaptation to water and mineral stresses.

Previously, considerable expertise in rhizotronic methods for studying the genetic variation of the root system in cereals was developed. A new area of researches was initiated as associated with inheritance of root characters under different environmental conditions and their use in the breeding process.

More recently, the range and pattern of the genetic variation in nutrients uptake and the efficiency of water, nitrogen and phosphorus utilization in grain mass formation among various cereal collections was established. Novel attractive sources of the efficiency and stress tolerance were identified among wild and/or exotic germplasms of the *Triticum* and *Hordeum* genera. In numerous pot and field experiments, inheritance of various morpho-physiological traits that contribute to the efficiency and tolerance (rooting parameters, photosynthetic activity of leaves, transpiration efficiency at the leaf and whole-plant level, N and P uptake, components of nutrient utilization efficiency) was investigated. Under diverse soil moisture and/or nutrients supply, the manner in which the root and shoot characteristics are inherited as well as effects of the environmental factors on the expression of gene actions were established. Potential donors of enhanced combining abilities for Polish breeding programs were identified. Now, molecular markers are used to identify and localize the genes (QTLs) that are responsible for the efficiency and tolerance components in wheat and barley. This work is ongoing and has already resulted in the identification of efficiency loci in various regions of wheat genome. Cooperative agreements have been arranged with land breeding centres to use the efficiency characteristics as direct selection criterion and to use the AFLP and SSR markers in the future selection processes concerning with more effective cultivars of improved adaptation to water shortages and to agriculture of reduced fertilization input.

## Other responsibilities:

- a member of the Polish Genetic Society,
- editor (plant genetics) in the Journal of Applied Genetics

## Last important publications:

BANDURSKA H., GÓRNY A.G., ZIELEZIŃSKA M. 2008. Effects of water deficit on the relative water content, proline accumulation and injury of cell membranes in leaves of old and modern cultivars of winter wheat. Z.P. Post. Nauk Rolniczych 524: 115-126.

GÓRNY A.G., GARCZYŃSKI S. 2008. Nitrogen and phosphorus efficiency in wild and cultivated species of the *Aegilops* and *Triticum* genera. J. Plant Nutrition 31: 263-279.

- GÓRNY A.G., RATAJCZAK D. 2008. Efficiency of nitrogen and phosphorus utilization in progenies of factorial crosses between European and exotic cultivars of spring barley. *J. Appl. Genet.* 49: 349-355.
- GÓRNY A.G., GARCZYŃSKI S., BANASZAK Z., ŁUGOWSKA B. 2006. Genetic variation in the efficiency of nitrogen utilization and photosynthetic activity of flag leaves among the old and modern germplasm of winter wheat. *J. Appl. Genet.* 47: 231-237.
- GÓRNY A.G., GRZESIAK M., GRZESIAK S. 2006. Response of wheat cultivars and their diallel hybrids to drought and nitrogen shortage. II. Inheritance of root characters. (in Polish), *Z. P. Post. Nauk Rolniczych* 509: 111-124.
- GRZESIAK S., GÓRNY A.G., GRZESIAK M.T. 2005. Physiological and morphological responses of winter wheat cultivars and their diallel hybrids to soil drought and nitrogen deficiency. *Acta Physiol. Plant.* 27(4): 46-47.
- GÓRNY A.G. (ed.) 2005. Genetics of cultivated maize, *Zea mays* L., and Genetics of oat (*Avena* L.). in: *Genetics of Cereals, v. 2, Triticale, Maize and Oat.* (in Polish). IPG PAS Poznań, s. Treatises and Monographs 14: 123-277 and 311-422.
- GÓRNY A.G., GARCZYŃSKI S., BANASZAK Z., ŁUGOWSKA B., GRZESIAK S., BANDURSKA H., KOMOSA A. 2004. Photosynthetic activity and efficiency of gas exchange of the upper leaves in field-grown cultivars of winter wheat under varied nitrogen nutrition. *Z. P. Post. Nauk Rolniczych* 496: 61-72.
- GÓRNY A.G. (ed.) 2004. Genetics of barley (*Hordeum vulgare* L.). in: *Genetics of Cereals, v. 1, Barley, Wheat and Rye* (in Polish). IPG PAS Poznań, s. Treatises and Monographs 13: 14-180.
- GÓRNY A.G. 2004. Genetics and physiology of cereal roots in response to water and nutrient shortages. *Z. P. Post. Nauk Rolniczych* 496: 35-60.
- KRZEMIŃSKA A., GÓRNY A.G. 2003. Genotype-dependent variation in the transpiration efficiency of plants and photosynthetic activity of flag leaves in spring barley under varied nutrition. *J. Appl. Genet.* 44: 481-490.
- GÓRNY A.G., GARCZYŃSKI S. 2002. Genotypic and nutrition-dependent variation in water use efficiency and photosynthetic activity of leaves in winter wheat (*Triticum aestivum* L.). *J. Appl. Genet.* 43: 145-160.
- GÓRNY A.G., GARCZYŃSKI S. 2002. Water use efficiency and response to nutrient shortage in mature plants of *Aegilops* and *Triticum* species. *Z. P. Post. Nauk Rolniczych* 481: 115-122.
- GÓRNY A.G. 2001. Variation in utilization efficiency and tolerance to reduced water and nitrogen supply among wild and cultivated barleys. *Euphytica* 117: 59-66.
- GÓRNY A.G., SODKIEWICZ T. 2001. Genetic analysis of the nitrogen and phosphorus utilisation efficiencies in mature spring barley plants. *Plant Breeding* 120: 129-132.
- GÓRNY A.G. 2000. Effect of the substituted A and B chromosomes of *Triticum dicoccoides* on the nitrogen, phosphorus and water use efficiency in the 'Langdon' durum wheat (*T. turgidum* L. var. *durum*). *Cereal Research Comm.* 28 (3): 293-298.
- GÓRNY A.G. 2000. The influence of nutrient shortage on the expression of combining ability effects for root characters in spring barley (*Hordeum vulgare* L.). *J. Appl. Genet.* 41 (2): 63-73.