Forty years ago, 144 scientists from 22 countries met in Bari, Italy, to discuss for the first time advances in Genetics and Breeding of Durum Wheat. Organized by Gian Tommaso Scarascia Mugnozza from the University of Bari under the auspices of Eucarpia, the meeting included invited lectures and presentations which highlighted the crop's problems in the different cultivation areas and research progress in Genetics and Cytogenetics, Genetic Resources, Male-Sterility, Breeding for yield, diseases and pest resistance, nutritional and technological quality.

Since Bari, scientists have met in several conferences/symposia and regional networks have been organized under the auspices of different regional and international organizations. These meetings, their proceedings and scientific reviews and papers produced a comprehensive compilation of durum wheat knowledge for scientists, from the species' origins in the Fertile Crescent to its current role as one of the most important cereals in human consumption. The last of such international meetings took place in Bologna in 2008 under the name "From seed to pasta" and highlighted the latest research findings with emphasis on the use of modern scientific tools in strategic and applied research on this crop.

However, whereas options and interest for its utilization are increasing, the scientific community needs to recognize that factors challenging durum wheat production and its global sustainability remain unresolved and require continued mobilization. Durum Wheat is a main staple food crop in some marginal areas where it is critical to food security and income generation for resources limited farmers. Traditional diseases, pests and environmental stresses continue to heavily limit crop production and to downgrade the commercial and utilization value of its harvested grain. Climate change will not only worsen these constraints but is also pushing durum wheat cultivation toward higher latitude areas, where it will experience unfamiliar pests, diseases, weeds and different soil types. The range of products made from durum wheat is widening and their consumption increasing in regions where it is not cultivated and/or its products were not part of traditional consumption, pushing us to reconsider the key characteristics needed to obtain suitable processing quality. At the same time, advances in science are providing better research options and breeding strategies that can be used in developing varieties able to provide a sustainable production under these scenarios of more constraining environments and changing consumption trends.

In this context, the Accademia Nazionale delle Scienze detta dei XL in collaboration with the Consiglio Nazionale delle Ricerche, ICARDA, CIMMYT, FAO, CIHEAM and ENEA, and the support of CRA, SIGA, Syngenta, Barilla, Società Italiana Sementi, Divella, Perten Instruments, Rummo and Wintersteiger has organized the present International Symposium on "Genetics and Breeding of Durum Wheat". Dedicated to the late President of the Accademia Nazionale delle Scienze, Gian Tommaso Scarascia Mugnozza, the meeting provides an opportunity for the international durum wheat scientists community to gather and share results of research activities and progress made in the area of durum wheat genetics and breeding and discuss ways to address local, regional and international challenges that jeopardize the sustainability of durum wheat production.

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Thinking about tomorrow.

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Symposium Secretariat

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International Symposium

Genetics and Breeding of Durum Wheat

Rome, May 27 - 30 2013

CNR - National Research Council Piazzale Aldo Moro, 7 - Roma















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MONDAY, 27 MAY

8:00-9:00 Registration

09:00-11:00 Welcome addresses

11:00-12:30 Session 1. Origin and evolution of Durum Wheat Chairmen: K. Ghosh; D. Pignone

Levy A. A., Lessons from 12,000 years of wheat evolution under domestication

Goncharov N. P., *Biodiversity of tetraploid wheats: taxonomy, studying, increasing and preservation*

Papa R., Evolutionary metabolomics of durum wheat domestication

Hoen-Sorteberg H.G., *Conserved genetic control of the cell wall* cytoskeleton with fundamental roles from stem cells via growth to seed

Kudryavtsev A. M., *Global durum wheat diversity: structure and origin revealed by means of the gliadin markers*

12:30 - 13:00 Discussion

13:00 – 14:30 Lunch and poster hanging (Aula Marconi)

14:30 – 16:00 Session 2. *Genetics Resources and Durum Wheat Germplasm Enhancement*

Chairmen: J. Clarke; S. Ravaglia

Qualset C.O., *Genetic Resources for Durum Wheat Improvement: Wild relatives and Landraces*

David J., *Broadening the genetic basis of durum wheat*

Börner A., *Maintenance and evaluation of plant genetic resources – the durum view*

Zaharieva M., *Towards Efficient use of cultivated emmer genetic resources in durum wheat breeding*

16:00-16:30 Break

16:30 – 18:00 Session 2 *cnt.*

Ceoloni C., *Today's durum wheat chromosome engineering: finely tailoring alien transfers enhances the crop potential to meet the challenges of a changing world*

Al-Tabbal J., Intra-population variation for agronomic characteristics in the durum wheat landrace "SAFRA MA'AN" (Triticum turgidum L. var. durum)

Bari A., Searching for climate change related traits in plant genetic resources collections using Focused Identification of Germplasm strategy (FIGS)

Rhrib K., *Exploring landraces genetic diversity for germplasm enhancement in durum wheat breeding*

17:45-18:30 Discussion

TUESDAY, 28 MAY

8:30-10:30 Session 3. *Strategies and Tools in Durum Wheat Genetics and Breeding*

Chairmen: P. Ruckenbauer: F. Salamini

Langridge P., Genomic approaches to improve abiotic stress tolerance

Ghavami F., *Developing improved durum wheat germplasm by altering the cytoplasmic genome*

De Pace C., *The progeny from the [(T. turgidum x Dasypyrum villosum) amphiploid x T. aestivum] hybridization is an effective source of new durum wheat inbred lines*

Bassi R., Integrated crop solution as new approach to combine genetics and other innovative inputs in wheat varieties development

Nachit M. M., *Breeding durum for abiotic stresses and climate changes constraints in the mediterranean region*

10:30-11:00 Break

11:00 -12:15 Session 3 cnt.

Pozniak C.J., Application of Genomic Technologies to Durum Wheat Improvement in Canada – Current Status and Future Prospects

Tuberosa R., QTL cloning in durum wheat: still a long and winding road

Duwayri M., Association mapping of genes for salt tolerance in durum wheat

12:15 - 13:00 Discussion

13.00-14.30 Lunch and Poster viewing

14:30-16:00 Session 4. *Genetics and Breeding for Durum Wheat Yield and Sustainability*

Chairmen: A. Benbelkacem; A. Bozzini

Monneveux P., Durum Wheat adaptation and sustainability: ensuring accurate phenotyping for improving abiotic stress tolerance and yield stability

Hafsi M., Durum wheat evaluation by using carbon isotope discrimination under semi arid conditions of eastern Algeria

Ozberk I., Durum wheat vs bread wheat in the southeast Anatolia

Palamarchuk A. I., Yield potential and grain yield stability in durum winter wheat varieties in Ukraine

16:00-16:30 Break

16:30- 18:00 Session 4 *cnt.*

Cattivelli L., Adaptation of Durum Wheat to a changing environment

Habash D.Z., *Global responses of gene expression to progressive water stress in durum wheat genotypes*

Mohammadi R., Agro-physiological traits related to yield and drought tolerance in durum breeding lines

Nagel M., *Genetic analysis of osmotic stress at the seedling stage and its connection to drought conditions in the field*

17:45-18:30 Discussion

18:45 Departure for cultural event: Visit to Imperial Fora, Rome

WEDNESDAY, 29 MAY

8:30-10:30 Session 5. *Genetics and Breeding for Durum Wheat Diseases and Pest Resistance*

Chairmen: E. Elias; L. Rossi

Olivera, P.D., *Genetic resources for stem rust resistance in cultivated and wild tetraploids*

Sai Prasad S. V., *Pyramiding of resistance genes Sr36 and Sr2 in durum wheat background (HI8498) through marker –assisted selection for resistance to stem rust race 117-group pathotypes*

Madariaga R., Unusual detection, molecular characterization and mycotoxigenic habilities of fusarium isolated collected on triticum durum heads in chile during 2012 13 crop season

Acevedo M., Evaluation of Triticum durum germplasm collections for resistance to Puccinia triticina

Kassem M., Identifying resistance gene(s) to Puccinia striiformis f.sp. tritici in Durum Wheat (Triticum durum Desf.)

Hamza S., Multigenic restance in an old local Durum Wheat 'Agili' to Tunisian Mycosphaerella graminicola Pathotypes

10:30-11:00 Break

11:00-12:30 Session 5 *cnt*.

El - Bouhssini M., Progress in host plant resistance in durum wheat to insect pests in North Africa, West and Central Asia

Kadkol G.P., Breeding Durum Wheat for Crown rot tolerance

Mishra A.N., *Diverse sources of resistance to Indian pathotypes of Stem Rust and Leaf Rust in Durum Wheat*

12:00-12:45 Discussion

12:45-14:30 Photo, Lunch and poster viewing

14:30-16:00 Session 6. *Genetics and Breeding for Nutritional* and Technological quality

Chairmen: A. Abugalieva; A. Blanco

Lafiandra D., Improvement of technological and nutritional quality in durum wheat: achievements and perspectives

Atallah M., Durum Wheat Production Chain: Research, Quality and Future Challenges

Daalloul Bouacha O., *Quality in durum wheat: comparison between landraces and high-yielding varieties*

Gazza L., Breeding and quality of soft textured durum wheat

16:00-16:30 Break

16:30-18:00 Session 6 *cnt*.

Gadaleta A., Molecular characterization of candidate genes involved in nitrogen metabolism and relationship with the grain protein content of wheat

Royo C., Mediterranean Durum Wheat landraces as a source of variability for quality improvement

Khlestkina E., Durum Wheat gene for purple grain color: mapping, isolation functional role and practical value

Babay E., *Biochemical and molecular approaches for the technological quality assessment of durum wheat varieties*

18:00-18:30 Discussion

19:30 Social Dinner

Social Dinner

THURSDAY, 30 MAY

8:30-10:30 Session 7. *Perspectives in Structural and Functional Genomics*

Chairmen: V. Echenique; M. Morgante

Comai L., *Basic insights and learning from the court of King Triticum to the other plants*

Giorgi D., A new and "open access" chromosomes approach to complex genomes: flow sorting of FISH labelled chromosomes in suspension

Ranwez V., *Genotyping by sequencing polyploidy wheat using RNAseq: Pitfalls and perspectives*

Ruan Y., Utilization of the chromosome 3B sequence to localize SST1, a stem solidness gene in wheat

Galeffi P., From Creso durum wheat to the omics sciences, new applications and future strategies: there is no future without past

Fahima T., The potential of wild emmer wheat genetic resources for improvement of durum wheat

- 10:30-11:0 Discussion
- 11:00-11:30 Break
- 11:30-12:30 Closing session
- 12:30-14:00 Lunch

14:00 Departure for visit to Experimental fields (organized by M.G. D'Egidio and R. Papa – C.R.A. Italy)

