North-Africa-ICARDA Partnership on Food Legumes Research for Development: Present Status and Future Strategy. F. MAALOUF[1,*], S. KUMAR[1], M. IMTIAZ[1], S. AHMED[1], M. NAWAR[1], M. KHARRAT[2] and Z. EL ABIDINE-FATEMI[3]. [1]*International Center for Agricultural Research in the Dry Areas (ICARDA), P.O Box 5466, Aleppo, Syria.* [2]*National Institute for Agricultural Research in Tunisia (INRAT), Ariana, Tunisia.* [3]*National Institute of Agronomic Research (INRA), BP. 578, VN 50000, Meknes, Morocco.* **E-mail: F.maalouf@cgiar.org*

Food legumes are important crops for human food, animal feed and services for sustainable agriculture. They are the rich sources of protein and micronutrients, thus contributing significantly to the health and nutritional security of low-income consumers. Cool season food legumes (e.g. faba bean, chickpea, pea, lentil) are cultivated on 1.1 m ha area in North Africa (NA), out of which faba bean is grown on 442,000 ha, chickpea on 128,000 ha and lentils on 48,000 ha. These crops suffer significant yield losses due to various biotic and abiotic stresses in the region, making them less remunerative to small-holder farmers. Some of the major biotic and abiotic stresses in the region are *Orobanche spp.* infestation, weeds, fungal diseases, and severe and recurrent drought. In addition, non-availability of quality seed of improved varieties, lack of improved varieties suitable for machine harvest, high production costs, and government priorities are other key constraints to higher productivity. Research conducted by ICARDA in collaboration with National Research System (NARS) of NA countries has resulted in the development of improved germplasm, which combines high yield with resistance to key stresses and other desirable traits like suitability to machine harvest and improved seed quality. Winter or early spring sown chickpea technology, which clearly demonstrated its yield superiority in the region, could not be adopted by farmers because of a lack of timely availability of seed of appropriate varieties and limited technology transfer efforts. Collaborative research has also resulted in the development of faba bean varieties with tolerance to *Orobanche*. Breeding for wilt resistance has been successful in releasing improved lentil varieties. ICARDA's relations with national programs have strengthened through bilateral and regional collaborative research projects, and through support to specific food legume research networks. The regional networks in the Nile Valley program and with NA-NARS are good examples of such collaboration. However, collaboration on food legumes research for development needs further strengthening to respond to the needs of the small holder farmers, especially under climate change.

Papers presented at the Student competition

Identification of quantitative trait loci for specific mechanisms of resistance to *Mycosphaerella pinodes* in pea. E. CARRILLO*, D. RUBIALES and S. FONDEVILLA. *CSIC, Institute for Sustainable Agriculture, Córdoba, Spain.* **E-mail: ecarrillo@ias.csic.es*

Resistance to *Mycosphaerella pinodes* in pea is a polygenic trait, with a number of quantitative trait loci (QTLs) identified. However, the position of these QTLs should be further refined in order to facilitate the identification of the molecular markers most closely linked to the resistance genes. Resistance is a multi-component event, being the observed symptoms the consequence of a battery of resistance mechanisms acting at different phases of the infection process. However, screenings are usually based on resistance indexes that consider only final symptoms. We have previously histologically identified several mechanisms of resistance acting against *M. pinodes* in *Pisum* spp., including *P. sativum* ssp. *syriacum* accession P665. Here we evaluated these mechanisms in the RIL population P665 × Messire, previously used to identify QTLs associated with a resistance index to this pathogen. This approach allows a more accurate assessment of the resistance and is expected, after a new QTL analysis, to result in a better definition of the genomics region involved in the resistance and to enable the association of the QTLs identified with specific mechanisms of resistance.

Genetic control of architectural traits and partial resistance likely to reduce ascochyta blight epidemics on pea (*Pisum sativum* L.). C. GIORGETTI*, G. DENIOT, H. MITEUL, F. MOHAMADI, G. MORIN, C. ONFROY, M.L. PILET-NAYEL, J.P. RIVIERE, B. TIVOLI and A. BARANGER. *INRA, UMR 1349 IGEPP (Institute of Genetics, Environment and Plant Protection), BP 35327, 35653 Le Rheu cedex, France.*
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Mycosphaerella pinodes is the causal agent of ascochyta blight, one of the most damaging foliar diseases in pea. Only partial resistance is available which underlying mechanisms are still unknown. Previous work has shown the effect of plant and canopy architectural traits on epidemics development, as plant height and leaf area index. Moreover QTL mapping studies showed co-localizations between QTL of partial resistance and QTL controlling earliness, plant height and aerial biomass. Our main objective is to consider the potential link between architectural traits and partial resistance genetic control. Our strategy was to (i) conduct QTL analysis in a recombinant inbred line population derived from a cross between JI296 (susceptible) and FP