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Poster Abstract – G.21

RESISTANCE BEHAVIOR TO ANTHRACNOSE DISEASE BY *GNOMONIA LEPTOSTYLA* (FR.) CES. IN *JUGLANS* SPP.

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Among fast growing *Juglans* species, *J. regia* L. is an indigenous species of Eurasia, characterised by high quality wood, *J. nigra* L. is native to North America, with valuable wood, and the *J. major* (Torr.) Heller is close to *J. nigra* species. Anthracnose by *Gnomonia leptostyla* (Fr.) Ces. is one of the most important diseases of *Juglans regia* L. reducing both nut and wood production. In order to select resistant genotypes toward the anthracnose disease, the performance of the two interspecific hybrids, NG23 (*J. nigraN23 x J. regia*) and MJ209 (*J. major x J. regia*), was compared with the pure species, *Juglans nigra* (Eastern black walnut) and *Juglans regia* (Persian walnut). The correlation between this resistance and the growth of the genotypes was also taken into account. During the 2002 summer seventy five 15-years-old plants for each species and hybrids, were sampled in a experimental field of CRA-Forest Research Unit, Poplar Research Institute, in Rome. In each tree, fifteen leaves from upper and lower part of crow were collected, in order to score the number of necrosis spots and detect the percentage of leaf necrosis area. The tree growth was quantified measuring the height and the diameter (DBH). In addiction all necessary steps for a preliminary NBS (Nucleotide binding site)-profiling application in *J. regia*, *J.nigra* and hybrids were carried out in order to provide molecular markers tightly linked to R-gene and RGAs involved in anthracnose resistance. NBS-profiling approach is based on PCR amplification using simultaneously, an adapter primer matching a restriction enzyme site and a degenerate primer targeting the conserved domains present in the NBS.

During the vegetative season of 2002, the rainfall was abundant and therefore anthracnose incidence was very significant. Both the average number of necrosis spots and the percentage of leaf necrosis area were useful tools to evaluate the disease incidence. Our resulted proved that *J. regia* was highly susceptible species, although a wide variability was observed among genotypes; in addiction they proved that *J. nigra* is always resistant. The interspecific hybrids showed an intermediate behaviour toward *Gnomonia leptostyla* infection. Particularly NG23 hybrid behaviour was similar to *J. nigra*, while MJ209 to *J. regia*. A significant correlation between the disease incidence and growth ability was found only in *J. regia* and NG23. It proved that in case of severe attacks, anthracnose disease can limit the growth of tree more attacked in *J. regia* and hybrid NG23 and consequently affect their timber production. The practical application of these results are discussed.

A total of 4 primer-enzyme combinations (RsaI-NBS1, RsaI-NBS5A6, MseI-NBS1 and MseI-NBS5A6) amplified in *Juglans* spp. These primers were designed from a part of the conserved P-loop motif for NBS1 and of kinase-2 for NBS5A6. Out of the total (341 bands), 89 fragments were

common to *J. nigra* and *J. regia* and were labelled as “common”. In addition, 254 fragments amplifying in *J. nigra* and 128 in *J. regia* only, were classified as species “private NBS-bands”. No private NBS-bands were observed in the interspecific hybrids. This is the starting point to find an correlation between the NBS markers amplified in walnut germplasm and the resistance for anthracnose diseases.