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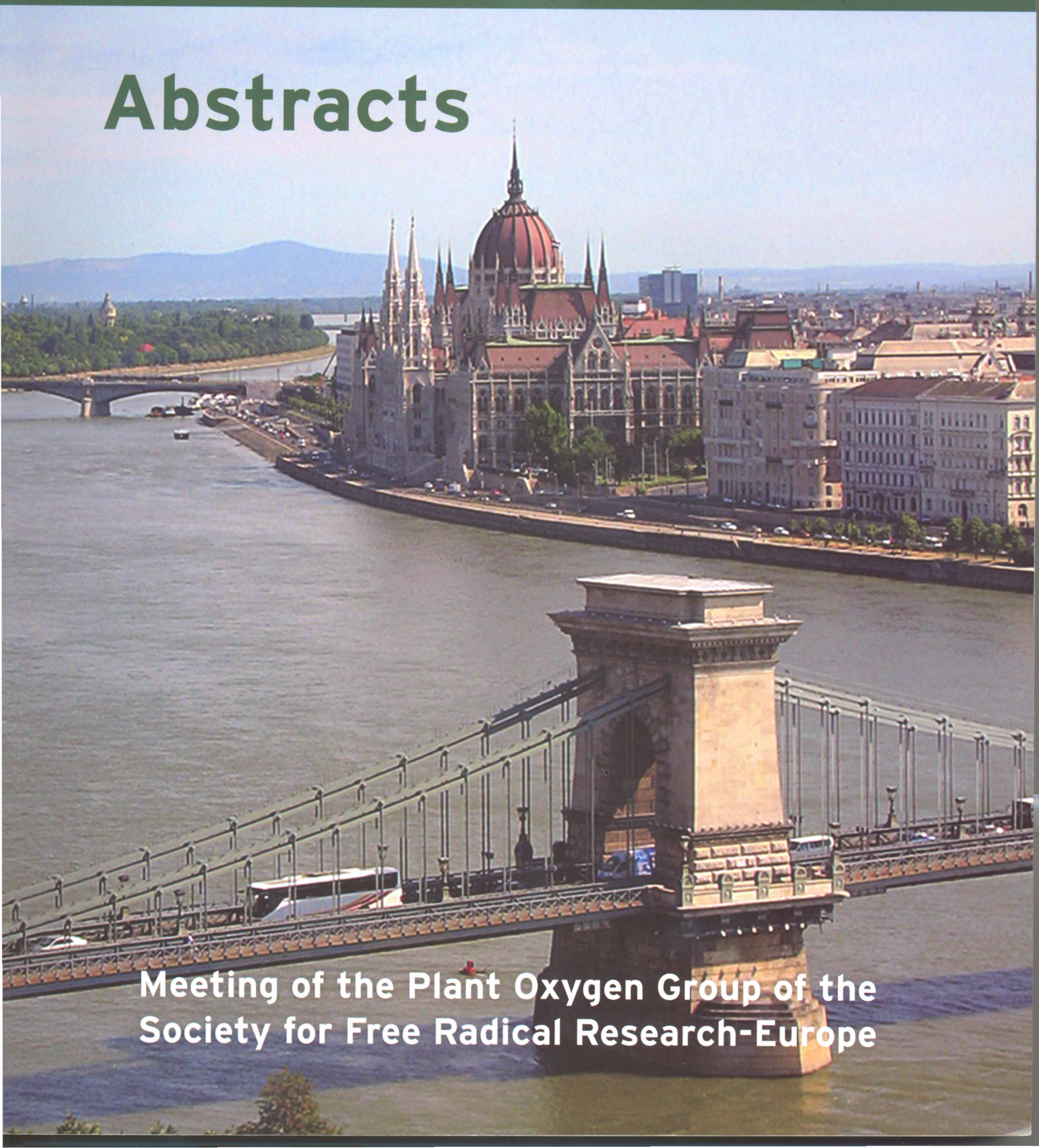

Abstracts

Meeting of the Plant Oxygen Group of the Society for Free Radical Research-Europe

P-137. NITRIC OXIDE REGULATES PROLINE AND POLYAMINE BIOSYNTHESIS IN *MEDICAGO TRUNCATULA* PLANTS

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Nitric oxide (NO) is a bioactive molecule involved in numerous biological events that has been reported to act as a signalling molecule regulating a variety of key processes in plants. The present study attempts to examine the effect of application of low (100μM) and high (2.5mM) concentrations of sodium nitroprusside (SNP), a NO donor, on the biosynthesis of proline and polyamines, which are known to confer protective characteristics to plants under stress conditions. Analyses were carried out in two developmental stages of *Medicago* plants (mature and senescing). Spectrophotometric and chromatographic approaches revealed that higher concentrations of SNP induced significant increases in proline and putrescine content following SNP application in both mature and senescing leaves (further induced in older tissues), although spermidine and spermine levels remained unaltered. Increases in proline and putrescine content were supported by increased activities of biosynthetic enzymes P5CS and ADC respectively, although ODC activity displayed similar patterns to control samples. Quantitative real-time RT-PCR data examining proline and polyamine biosynthetic gene (*P5CS, ADC, ODC, SPMS, SPDS, SAMDC*) expression levels suggest that NO plays a key role in the regulation of the relevant transcriptional pathways. Overall, strong evidence suggests that nitric oxide regulates key protective metabolite levels in plants via enzymatic and transcriptional modulation of proline and polyamine biosynthesis pathways, thus potentially improving the plant's capacity to cope with free oxygen and nitrogen radicals.

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