



University of Novi Sad



Institute of Lowland Forestry and Environment

ISBN: 978-86-900741-1-2

COST Action CA18111
Genome Editing in Plants

PLANTED

1st PlantEd Conference Plant Genome Editing - State of the Art

Book of abstracts

Venue: University of Novi Sad, Central Building
Date: 5-7 November 2019

1st PlantEd Conference Plant Genome Editing - State of the Art

Organized by

Institute of Lowland Forestry and Environment, Novi Sad, Serbia

University of Novi Sad



Published by

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Cover page

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Printed by

DIV Print, Sremski Karlovci
Press: 120

Exploitation of genetic resources in breeding of Brassica species

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The Brassicaceae family (Cruciferae Juss.) is one of the 10 most economically important plant families. The most prominent members are *Brassica napus* L., with globally widespread cultivars with low-erucic acid content, known as canola, and several types of mustard (*Brassica* spp. and *Sinapis* spp.). IFVCNS is the only research institute in Serbia dealing with the cultivation of oil crops from the Brassicaceae family. The breeding of *Brassica* species from the collection resulted in the introduction and spread of black and white mustards and false flax (*Camelina sativa* (L.) Crantz) cultivation areas. These species are rarely grown and used in Serbia. Rapeseed collection consists of 11 cultivars and 20 lines of spring rapeseed, as well as 56 cultivars and 980 lines of winter rapeseed. All IFVCNS genotypes are phenotypically and cytogenetically characterized, with specific regard to their phenology, morphology of the flowers, pollen characteristics and the number of chromosomes, resistance / sensitivity to diseases and pests, as well as seed quality (oil, protein content, fatty acid and composition tocopherol). Significant genetic variations were found. Because commercial rapeseed breeders are directly engaged in the assessment and selection of the material, the collection is a valuable resource for a more detailed characterization of other traits important for breeding. The constant and systematic use of this collection with the application of conventional breeding methods, combined with various modern molecular techniques, is an effective tool in the development of IFVCNS cultivars and hybrids adapted to changing environmental conditions and market requirements. The novel gene editing instruments can enhance exploitation of genetic resources in the development of productive genotypes as renewable raw materials to produce food and non-food oils, particularly in low-input systems and marginal soils suitable for conventional and organic farming systems.

Acknowledgement: This study was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (project no. 31025) and by the COST Action CA18111.