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BOOK OF ABSTRACTS



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CANNABIS VIROME RECONSTRUCTION AND ANTIVIRAL RNAI CHARACTERIZATION BY SMALL RNA SEQUENCING

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Text

Hemp (*Cannabis* spp.) is a rich source of natural compounds and fiber for medicinal and industrial use. While fungal and bacterial pathogens of hemp are quite well characterized, virus infections have been reported and seen as an emerging threat for hemp cultivation only in recent years. In this work we used Illumina small RNA sequencing for virome reconstruction and characterization of the antiviral defense based on RNA interference (RNAi) in industrial hemp plants (monoecious) and dioecious plants cultivated for production of CBD/CBG cannabinoids. By de novo and reference-based assembly of small RNA reads we identified and reconstructed previously-reported viruses such as Cannabis cryptic virus (family *Partitiviridae*), Cannabis sativa mitovirus 1 (*Mitoviridae*) and Grapevine line pattern virus (*Bromoviridae*) as well as a putative new species of *Partitiviridae*. Members of both *Partitiviridae* and *Bromoviridae* families were targeted by antiviral RNAi generating predominantly 21 and 22 nt small interfering RNAs from both strands of the entire virus genome. In contrast, mitovirus-derived small RNAs belonged to a wider size range, with 16 and 21 nt size classes being the most abundant, and resembled *Cannabis* mitochondrion genome-derived small RNAs. Association of disease symptoms (if any) with identified viruses and/or relative abundance of viral sRNAs will be presented. To our knowledge, this is the first characterization of antiviral RNAi in hemp plants.

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OXIDATIVE STRESS AND ACTIVATED METHYL CYCLE-RELATED RESPONSES IN POTY-POTEXVIRUS SYNERGISM IN NICOTIANA BENTHAMIANA

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Text

Poty- and potexviruses are positive-sense RNA viruses that cause mixed infections leading to significant yield losses in important crop plants. We have studied molecular mechanisms underlying coinfection between potato virus A (PVA), a potyvirus, and potato virus X (PVX), a potexvirus, in *Nicotiana benthamiana*. Glutathione is a scavenger of radical oxygen species involved in relieving oxidative stress associated with virus infections. Glutathione biosynthesis pathway is tightly connected to the activated methionine cycle (AMC). PVA helper component proteinase (HCPPro) interferes with the key enzymes of AMC, S-adenosyl-