

Legal marijuana in Canada: new challenges for plant pathology

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On October 17th, marijuana (*Cannabis*) —a widely distributed plant in tropical and temperate regions— was legalized in Canada, becoming one of the few countries where recreational consumption, use for medical purposes and its cultivation are legal. Of course, there are still **restrictions** on the use of plants, but without doubt the opportunities to expand knowledge about marijuana are many. Precisely at the beginning of this year, the University of Saskatchewan, in Canada, hired the young researcher **Robert Laprairie** as part of the College of Pharmacy and Nutrition, to develop research related to the cannabinoid receptors, one of the active compounds of great importance in marijuana, demonstrating the growing interest in the plant and the products that are obtained from it. This university has also been a pioneer in other research concerning *Cannabis*, such as the study of its **genome and genes involved in the synthesis of cannabinoids**¹, but nevertheless, there is an area of vital importance that has been forgotten in Canada and other countries where marijuana is legal or decriminalized: *phytopathology*. The production in large quantities of any crop involves the arrival of pests and diseases and therefore losses in yield. In this area, Canada has experience given that the extensive production of canola in the Prairie provinces was seriously affected by the appearance of the **clubroot disease**. That is why, in view of the anticipated extensive production of marijuana, a coherent and effective phytopathological strategy is essential. But what is known about the pathogens and diseases affecting marijuana? —Almost nothing. In 2000, the book “Hemp Diseases and Pests, Management and Biological Control” was published by the CABI publishing house², but despite the publication date and the attractive title for the reader, this book uses very general information and studies of the early century as references, without counting the fact that **hemp** (also derived from *Cannabis sativa*) is not marijuana, despite sharing many common characteristics.

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Among the pathogens identified affecting *Cannabis sp.*, up to 13 species of fungi —such as *Phomopsis ganjae*, *Schiffnerula cannabis* and *Septoria neocannabine*—, were identified in the United States during a 12-year **study** investigating the *Cannabis*-fungus association³. In addition, pathogenic members of the Bacteria domain have also been identified affecting *Cannabis sp.*, like ***Xanthomonas campestris pv. cannabis*** in Romania and Japan⁴, and **phytoplasmas** causing the disease known as *witches' broom* in plants of **India**⁵ and **Iran**⁶. One of the very few studies found in the literature referring to plant pathogens affecting marijuana in Canada was made in the province of **British Columbia**, which identified pathogens affecting the roots (*Pythium dissotocum* and *Fusarium oxysporum*), bulbs (*Botrytis cinerea*) and leaves (*Golovinomyces cichoracearum*) of the plants.

Although cannabis can basically grow anywhere (just remember it is called “weed”), there are strains that have been identified as more suitable for **tropical environments**. In Latin America, marijuana has been **decriminalized** in several countries, mainly for recreational use, a change that although is important, is not enough to grow the plant as an extensive crop. Uruguay, in 2013, became the **first country legalizing marijuana** in the world, and to this day, there are no publications about local phytopathological studies. Very healthy plants or lack of interest by plant pathologists? Is still the plant a taboo? To date, nothing is known about the mechanisms involved in the *Cannabis*-pathogen interaction, there is no specific diagnostic method for a rapid and efficient detection of plant pathogens affecting marijuana and no studies have been carried out on the epidemiology and/or vectors that could be involved in the spread of diseases. The doors have opened to marijuana research and plant pathologists were ready! Just a few days before “legalization day”, in October, the Canadian Journal of Plant Pathology published two papers describing pathogens that affect marijuana’s **root and crown**⁷, as well as its **flower and foliage**⁸. I am completely sure that a lot more of research is coming in this area, and who knows, maybe in a few years I’ll switch from canola to marijuana phytopathology.

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Images

Marijuana leaves in Petri dish. Photograph by author.

Research Crop - U.Miss. Photo by **NIDA(NIH)** (U.S. Government Works)

References

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⁷Punja, Z. K., et al. (2018). Root and crown rot pathogens causing wilt symptoms on field-grown marijuana (*Cannabis sativa* L.) plants. *Canadian Journal of Plant Pathology*, DOI: 10.1080/07060661.2018.1535470

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