Virus-detecting analysis kit developed

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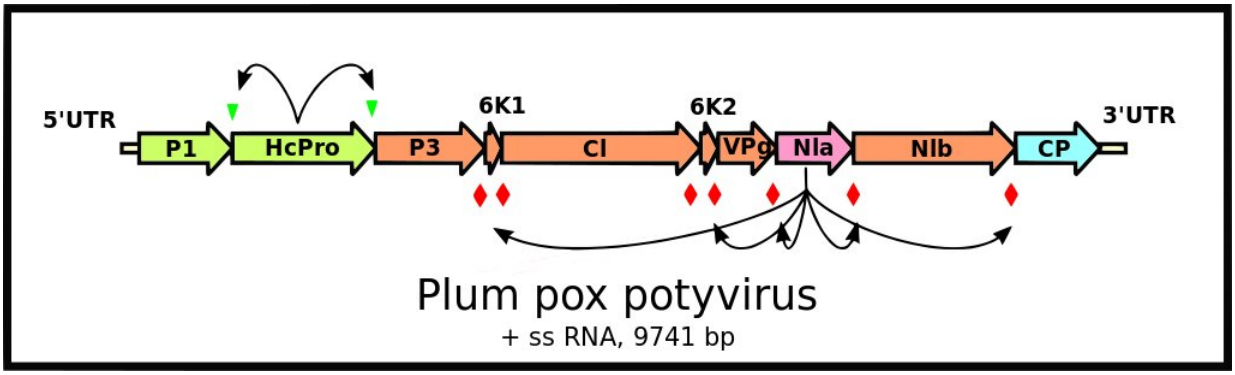

PPV genome structure, A Sharka virus genome. Credit: Wikimedia Commons

Researchers at the Institute of Cellular and Molecular Biology of Plants (IBMCP), a joint venture of Valencia's Polytechnic University (UPV) and the Spanish National Research Council (CSIC), have developed a new analysis kit that makes it possible to detect all Potyvirus species, comprising the largest vegetable virus genus, with just one test and at a reduced cost.

The Potyvirus genus is comprises 148 species, some of which threaten a large part of fruit and vegetable crops. "They represent the largest threat for potato production in the world, and can decrease crop efficiency by up to 90 percent. Furthermore, it causes the most destructive stone diseases for fruits worldwide," explains Jesús Ángel Sánchez, researcher at the IBMCP.

A majority of the systems currently available to detect viruses are based on a combination of serological tests field inspections for visual symptoms. These methods require a lot of time or are expensive. "Our kit makes it possible to detect all the species of a virus genus in a quick, simple way and with just one test," says Jesús Ángel Sánchez. Furthermore, the possibility to reuse specific probes enables large-scale prospecting at an affordable price.

The device developed by the IBMCP relies on non-radioactive molecular hybridisation and the ability to detect several genetic sequences.

The kit uses a tandem fusion of nucleic acid fragments that enable the detection of complementary sequences with high sensibility (picograms), increasing its efficiency and success rate. Fifty-degree hybridisation detects all sequences that share at least 68 percent of their identity. Furthermore, this process is carried out with little use of materials, which reduces analysis cost and optimises its completion time.

The new kit is able to detect all viruses in the Potyvirus genus, and could also identify new types of virus that have not been described previously. It could be used to detect practically all viruses of interest to agronomists, such as those belonging to the Potexvirus (41 species), Tospovirus (25) or Begomovirus (108).

"The use of several specific probes on the same type of crop (pepper and tomatoes are some of the most affected vegetables) could link all viruses that affect that specific crop, and in the long term, could be expandable and adaptable to detect any type of virus, not just those related to agronomy," concludes Jesús Ángel Sánchez.

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