



Branching out

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Laurentian Forestry Centre



DNA: A PRINT TO IDENTIFY PESTS

Increased trade, transport, tourism and climate change result in the introduction into Canada of exotic pests that threaten the balance of forest ecosystems. To detect these pests before they become established and to prevent their spread, researchers at the Canadian Forest Service, in collaboration with Genevision Inc. (Warnex Inc.), have developed a simple diagnostic method based on the presence of the DNA of pests on the host plant.

The first kit is being marketed (2002) under the name SCLEROTEST™; it helps detect *Gremmeniella abietina*, the fungus that causes scleroderris canker. This simple technique involves the extraction and amplification of DNA from coniferous seedlings and the use of specific fluorescent probes, or “molecular beacons”, that emit a light signal only when a targeted

DNA, such as that of *G. abietina* for example, is present. The light signal is then detected by a photoelectric receptor.

The advantages of this biotechnology are numerous: it requires little infrastructure and it can be carried out rapidly by staff trained in molecular biology, compared with traditional methods that could take weeks or months and that require extended knowledge of taxonomy. In fact, in only six hours, the analysis not only shows whether the pathogen is present in the seedling, but it also helps determine whether it is from the American (indigenous) or European (exotic) strain. Importers, exporters, nursery farmers and anyone responsible for ensuring the safety of seedlings or plants can now benefit from this advanced tool.



Preparing a mixture for DNA amplification.
Photo: C. Moffet

All living organisms have DNA: it is the basis for molecular diagnostics methods. When a DNA segment specific to a given pest causes light to be



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Mixture for DNA extraction.
Photo: C. Moffet

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emitted from the molecular beacons, other diseases and threatening insects can easily be detected and their spread prevented or slowed down. In response to, among other things, the urgent needs of the Canadian Food Inspection Agency (CFIA), which is responsible for plant protection at borders, researchers are currently working on developing

quick-diagnostic kits for white pine blister rust, Sudden Oak Death, and brown spruce longhorn beetle.

Some new miniaturization technologies could help detect several pests in one sample directly on site. This tool would be very useful for forest tree producers to quickly detect affected lots before using them and thus avoid spreading diseases and insects on a large scale.

THE TEAM

Researchers at the Canadian Forest Service, in collaboration with Genevision (Warnex), the ministère des Ressources naturelles du Québec, Agriculture and Agri-Food Canada's Biosystematics Research Institute, and the Canadian Food Inspection Agency worked on developing the molecular diagnostic kits.

USEFUL LINK

Warnex Inc.
www.warnex.ca



Reading DNA gel.
Photo: C. Moffet

FOR FURTHER INFORMATION, PLEASE CONTACT:

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