



# Branching out

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## Fungal endophytes: unsuspected potential

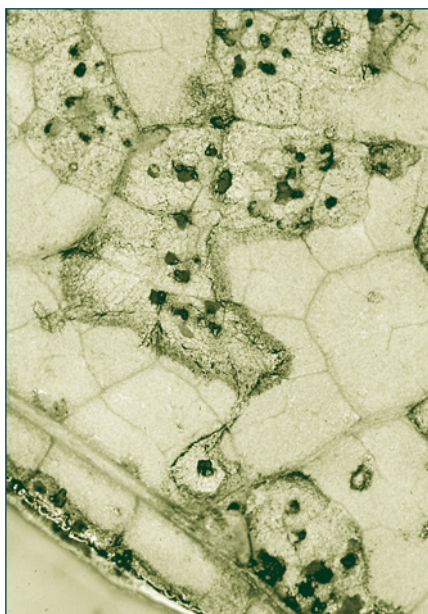
**In natural forests, trees interact with countless microorganisms such as fungi and bacteria. Fungal endophytes are an important part of these microorganisms.**

Fungal endophytes are microscopic fungi that live undetected in the leaves, branches, trunks and roots of trees. We still know very little about them because they generally cause no problems to their host. However, they are an important reservoir of biodiversity in forest ecosystems.

Many fungal endophytes have beneficial effects on the trees in which they live. They can enhance the trees' protection against disease and leaf-eating insects. For example, a fungal endophyte makes white spruce needles less appetizing to the spruce budworm. Furthermore, fungal endophytes (*Microshaeropsis arundinis*) are the only known potential biological control agent for white pine blister rust.

Such specific effects could be both ecologically and economically significant. However, certain forest practices risk eradicating some extremely rare fungal endophytes. Eighteen species identified in Quebec in 2002 in black spruce trees seem not only unique in the world, but

they have only been detected in very limited areas. A harvesting system such as cutting with protection of regeneration and soils (CPRS) currently performed in boreal forests could quickly annihilate such small populations.



*Microshaeropsis arundinis* attacking white pine blister rust fungi on a red currant leaf.  
Photo: J. Bérubé (SCF)

Therefore, in addition to better known organisms such as birds, fish or plants, biodiversity conservation efforts must encompass microscopic and invisible species whose potential as biological control agents against forest pests could be enormous.

### FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

#### Jean Bérubé

Natural Resources Canada  
Canadian Forest Service  
Laurentian Forestry Centre  
1055 du P.E.P.S.  
P.O. Box 10380, Stn. Sainte-Foy  
Québec, Quebec G1V 4C7  
Phone: 418-648-7174  
Fax: 418-648-5849  
E-mail: [jean.berube@nrcan.gc.ca](mailto:jean.berube@nrcan.gc.ca)  
Web site: [cfs.nrcan.gc.ca/regions/lfc](http://cfs.nrcan.gc.ca/regions/lfc)

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