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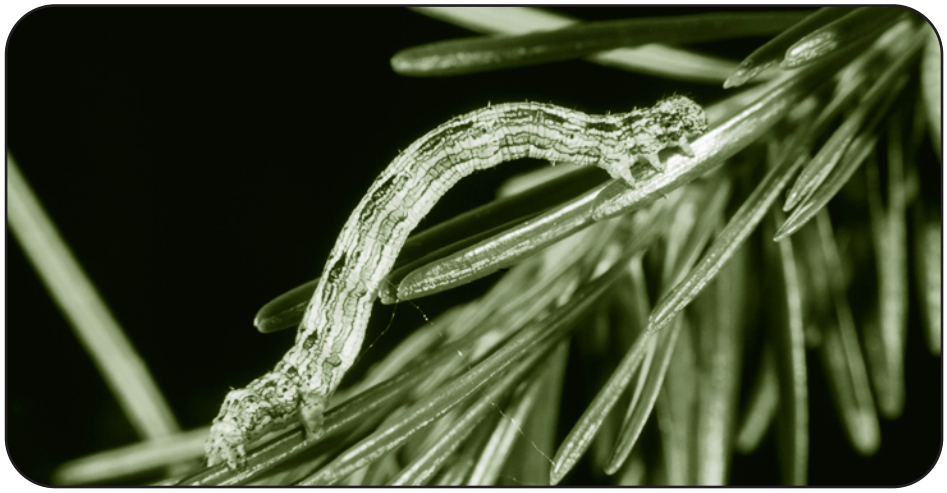
COLLAPSE OF HEMLOCK LOOPER OUTBREAKS: KEY ROLE OF *TELENOMUS*

The hemlock looper is an important defoliator of balsam fir and outbreaks of this pest can build up very rapidly. Trees that sustain severe damage may die within a season. Researchers at the Laurentian Forestry Centre of the Canadian Forest Service have found a direct link between the activity of *Telenomus*[1], parasitoids of the hemlock looper, and the collapse of an outbreak of this pest.

In the fall of 1996, a survey of hemlock looper populations indicated that a severe outbreak could be expected in the Gaspé Peninsula the following season. SOPFIM (Société de protection des forêts contre les insectes et les maladies) therefore set up a *Bacillus thuringiensis (B.t.)* spraying program to protect the thousands of hectares of commercial forest that would be at risk. In the end, however, there was no infestation and barely 8% of the area was treated. Sampling of hemlock looper eggs was carried out, revealing a high rate of parasitism by *Telenomus*. In fact, these parasitoids were found to be responsible for 77% of hemlock looper egg mortality.



Hemlock looper (larva).
Photo: Carole Germain

Hemlock looper (adult female).
Photo: Thérèse Arcand

1 Three species have been identified; the most abundant species is *Telenomus coloradensis*.

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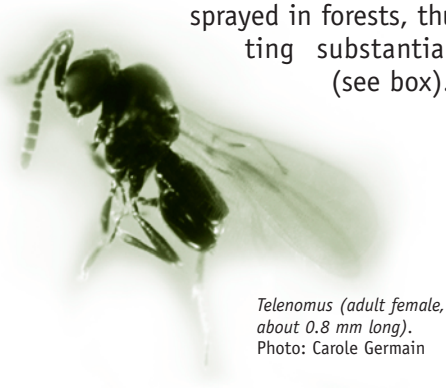
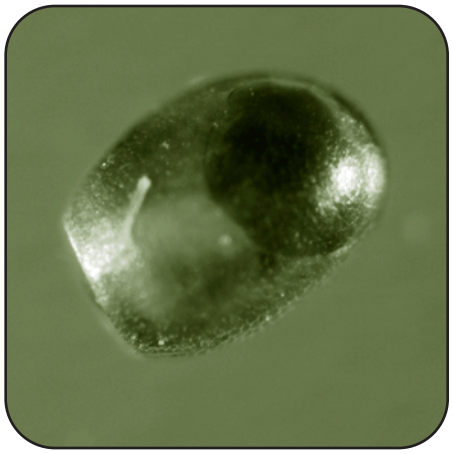
KEY ROLE OF *TELENOMUS*

In the past, the survey of hemlock looper eggs was conducted in the fall or the very early spring. Since this procedure did not take account of parasitism by *Telenomus*, which occurs primarily in spring, it may have caused an overestimation of hemlock looper density and survival.

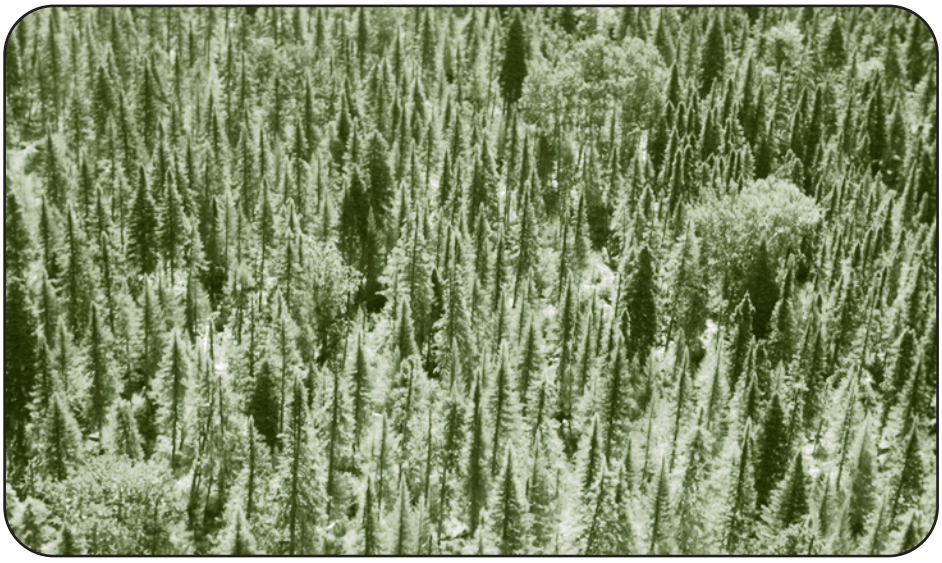
Therefore, to improve control measures for this pest, an additional egg count is required toward the end of the spring. This springtime survey could lead to a decrease in the surface areas treated and in the quantity of insecticides sprayed in forests, thus permitting substantial savings (see box).



Telenomus (adult female, about 0.8 mm long).
Photo: Carole Germain



Dorsal side of a Telenomus pupa in a hemlock looper egg.
Photo: Carole Germain



Fir stand on Anticosti Island in 1973. Damage caused by defoliation by the hemlock looper in 1971.
Photo: Luc Jobin

THE FIGHT AGAINST THE LOOPER

In 2001, SOPFIM cancelled its forest protection program in the Middle North Shore region, which was to cover 50,000 ha, owing to a sharp decrease in hemlock looper numbers in the spring. The egg hatch rate did not exceed 10%, a threshold indicating that an outbreak is collapsing. Parasitism by *Telenomus* was identified as the main cause of this collapse.

Additional research is currently being done, in collaboration with Université Laval, to learn more about the dynamics of the hemlock looper and *Telenomus*, particularly the effect of climate on interactions between the pest and its natural enemy. This work may result in the development of new biological control methods.

FOR FURTHER INFORMATION, PLEASE CONTACT:

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