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THE CHRISTMAS TREE AND ITS GENOME HAVE REMAINED VERY MUCH THE SAME OVER THE LAST 100 MILLION YEARS

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Friday December 14, 2012



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A study published by Université Laval researchers and their colleagues from the Canadian Forest Service reveals that the genome of conifers such as spruce, pine, and fir has remained very much the same for over 100 million years.

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This remarkable genomic stability explains the resemblance between today's conifers and fossils dating back to the days when dinosaurs roamed the Earth. Details of this finding are presented in a recent issue of the journal *BMC Biology*.

The team supervised by Professor Jean Bousquet, who holds the Canada Research Chair in Forest and Environmental Genomics, came to this conclusion after analyzing the genome of conifers and comparing it to that of flowering plants. Both plant groups stem from the same ancestor but diverged some 300 million years ago.
Researchers compared the genome macrostructure for 157 gene families present both in conifers and flowering plants. They observed that the genome of conifers has remained particularly stable for at least 100 million years, while that of flowering plants has undergone major changes in the same period. "That doesn't mean there haven't been smaller scale modifications such as genetic mutations," points out Jean Bousquet. "However, the macrostructure of the conifer genome has been remarkably stable over the ages," adds the professor from the Université Laval Faculty of Forestry, Geography, and Geomatics.
This great stability goes hand in hand with the low speciation rate of conifers. The world is currently home to only 600 species of conifers, while there are over 400,000 species of flowering plants. "Conifers appear to have achieved a balance with their environment very early," remarks Professor Bousquet. "Still today, without artifice, these plants thrive over much of the globe, particularly in cold climates. In contrast, flowering plants are under intense evolutionary pressure as they battle for survival and reproduction," he concludes.

In addition to Bousquet, the study's coauthors are Nathalie Pavy, Betty Pelgas, Jérôme Laroche, Philippe Rigault, and Nathalie Isabel.

This project was made possible thanks to the financial support of Genome Canada, Génome Québec, Natural Resources Canada, and the Natural Sciences and Engineering Research Council of Canada.

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