



Mardi 30 novembre 2021, 11:00
Salle de réunion (25 pers.) + visioconférence

PHYLOGENOMICS AND COMPARATIVE GENOMICS: THE CASE OF COEVOLUTION BETWEEN THE SWALLOWTAIL BUTTERFLIES (PAPILIONIDAE) AND THEIR HOST PLANTS.

par
Rémi Allio
INRAE, CBGP

🔍 For the past four years, I have been interested in understanding the association between the evolution of swallowtail butterflies and their respective host plants. Indeed, the mega-diversity of herbivorous insects is often attributed to their co-evolutionary associations with plants. However, despite abundant studies on insect-plant interactions, we do not know whether host-plant shifts have impacted both genomic adaptation and species diversification of insects over geological times.

🔍 Thanks to this study, we found that the antagonistic insect-plant interaction between swallowtail butterflies and the highly toxic birthworts began 55 million years ago in Beringia, followed by several major ancient host-plant shifts. This evolutionary framework has provided us a valuable opportunity to repeatedly test for genomic signatures of macroevolutionary changes and to estimate the different diversification rates across the phylogeny of swallowtail butterflies.

🔍 Through this, we found that host-plant shifts in butterflies are associated with both genome-wide adaptive molecular evolution (more genes under positive selection) and repeated bursts of speciation rates, contributing to an increase in global diversification through time. In that sense, our study links ecological changes, genome-wide adaptations and macroevolutionary consequences, lending support to the importance of ecological interactions as evolutionary drivers over long time periods.