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Insect invaders analysis pipeline: what happens to the genetic load when alien species become invasive?

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INSECT INVADERS ANALYSIS PIPELINE

WHAT HAPPENS TO THE GENETIC LOAD WHEN ALIEN SPECIES BECOME INVASIVE?

Barbara PORRO & Mathieu ZALLIO, Emeline DEULERY, Aurélie BLIN, Mathieu GAUTIER, Eric LOMBAERT & Martine DA ROCHA

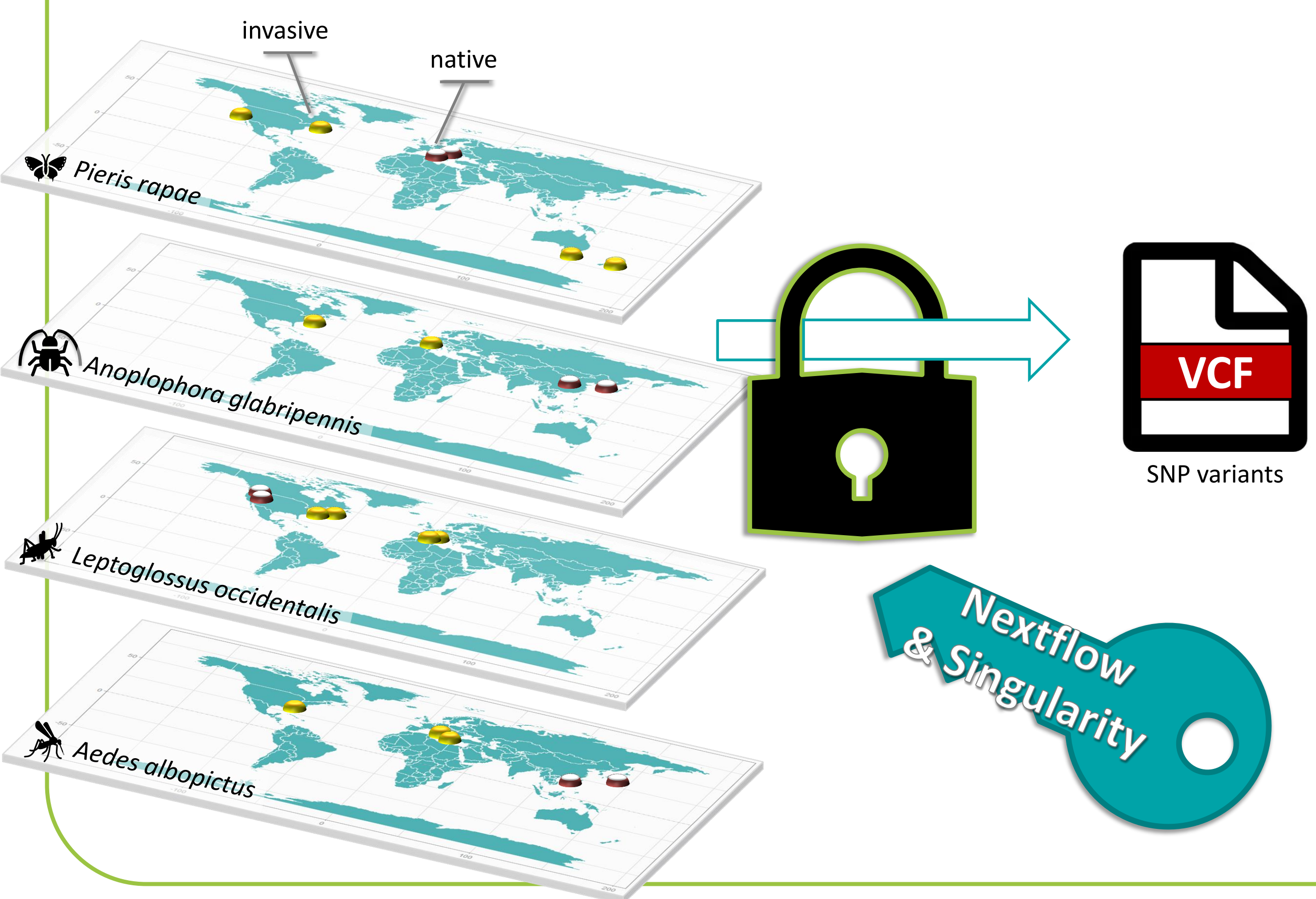
1 BIOLOGICAL INVASIONS

Biological invasions are becoming more and more frequent and impact human activities and biodiversity. A decrease in genetic diversity in the introduced populations compared to the native populations is observed during biological invasions. This is basically explained by a reduced number of individuals at the origin of the settlement of the new population. To explain the success of an invasion despite low genetic diversity, one hypothesis proposes a purging of the genetic loading (*i.e.*, a loss of deleterious mutations) in the introduced populations [1,2].

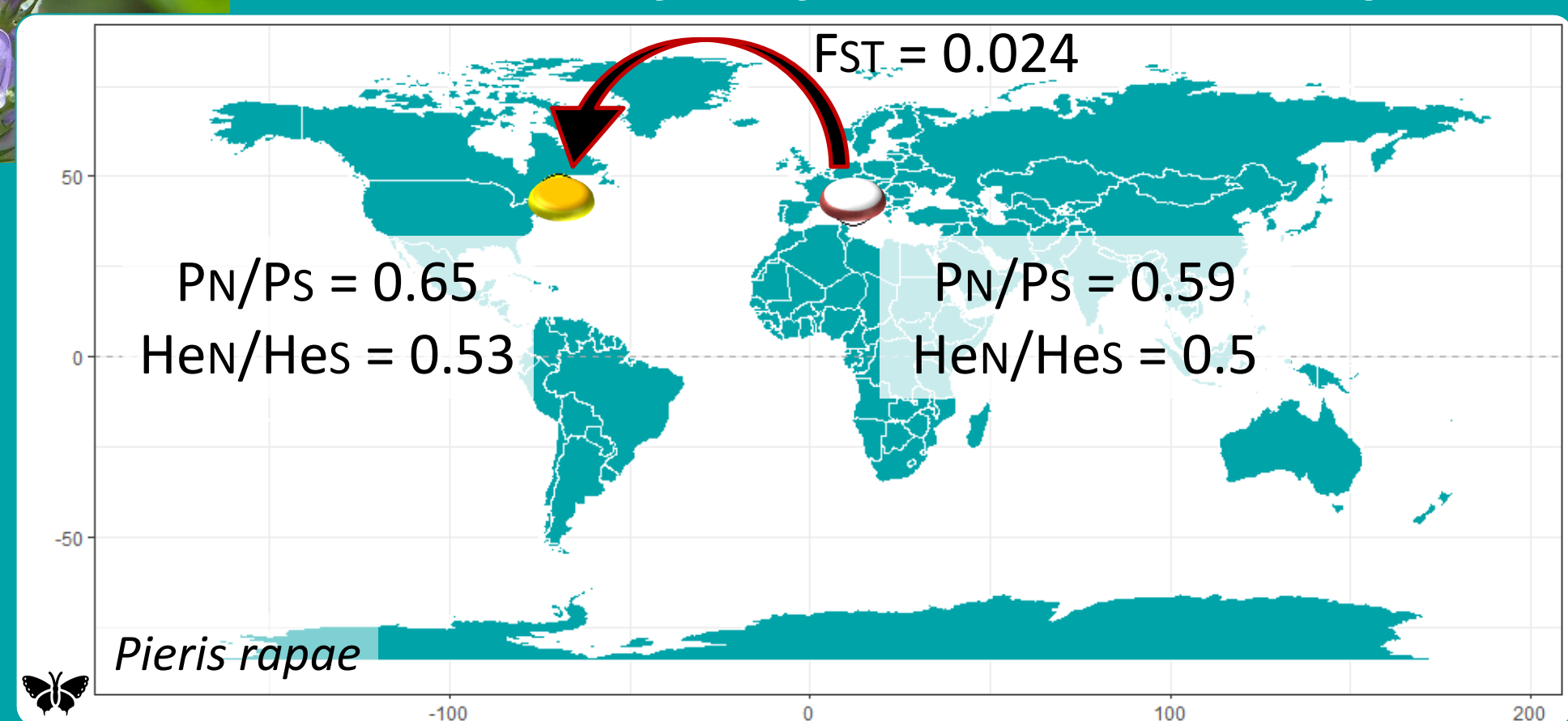
2 FROM POOLED INDIVIDUALS TO POPULATION GENETICS

Whole-genome Illumina short reads from pool-sequencing of **native** and **invasive** populations of a **dozen insect species** [3] designed to have 50 individuals/pool and 100X depth.

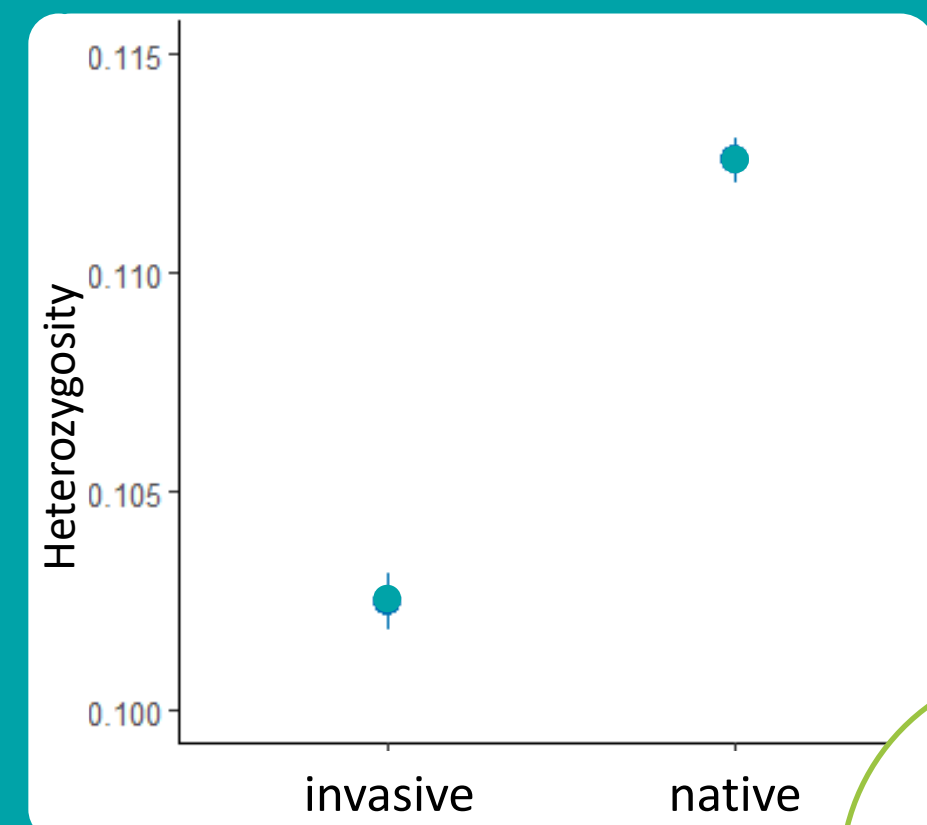
Huge amount of data to analyse and need for an homogeneous treatment of the data



2 populations test -> 10 712 252 SNPs
335 148 Non-synonymous vs. 451 571 syn. variants



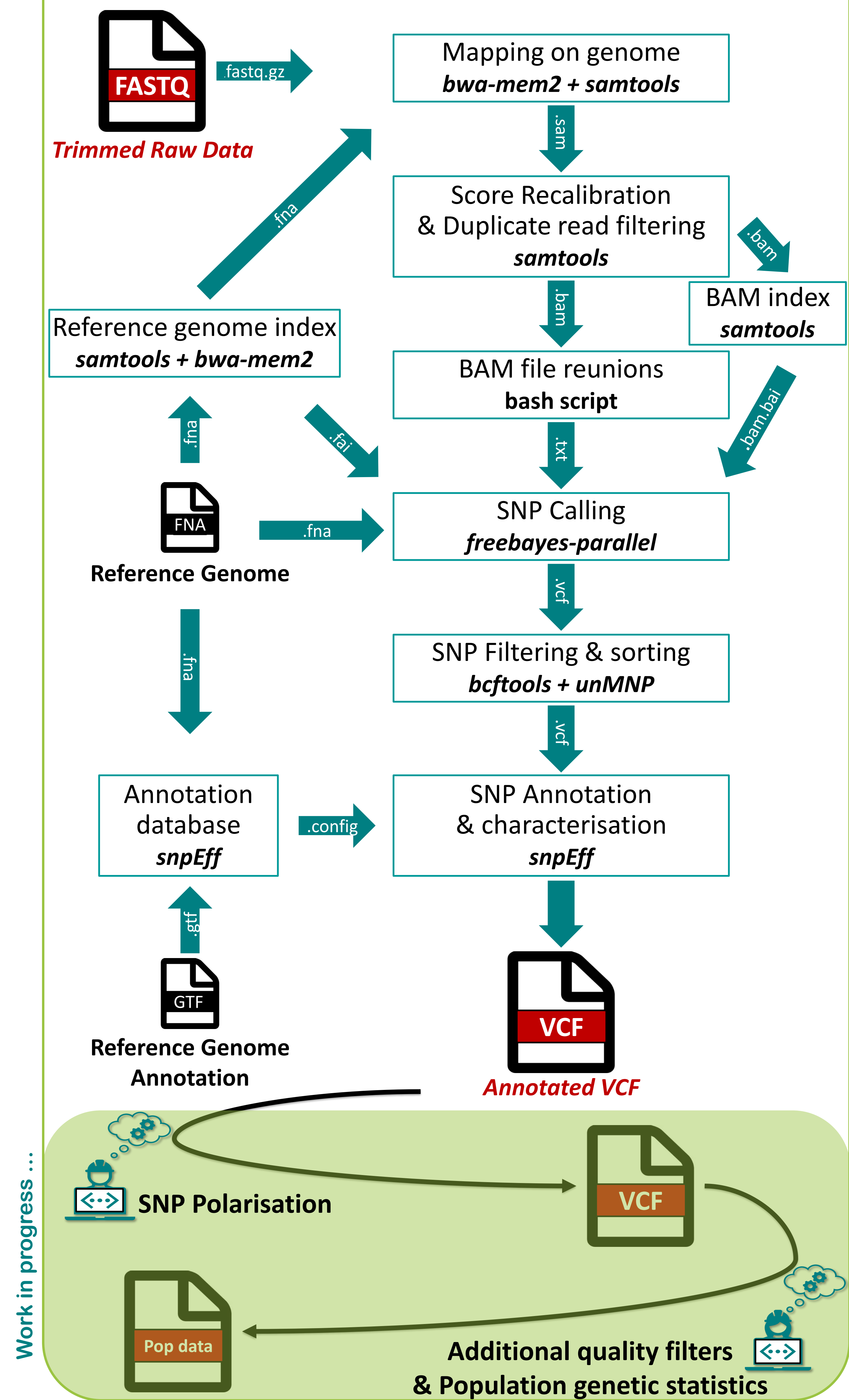
Differential selective pressure on the genetic load



Loss of genetic diversity

Non neutral evolution of the genetic load

3 A REPRODUCIBLE FAST WORKFLOW !



UNDERSTANDING THE INFLUENCE OF THE GENETIC LOAD ON THE EVOLUTION OF INVASIVE SPECIES

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