

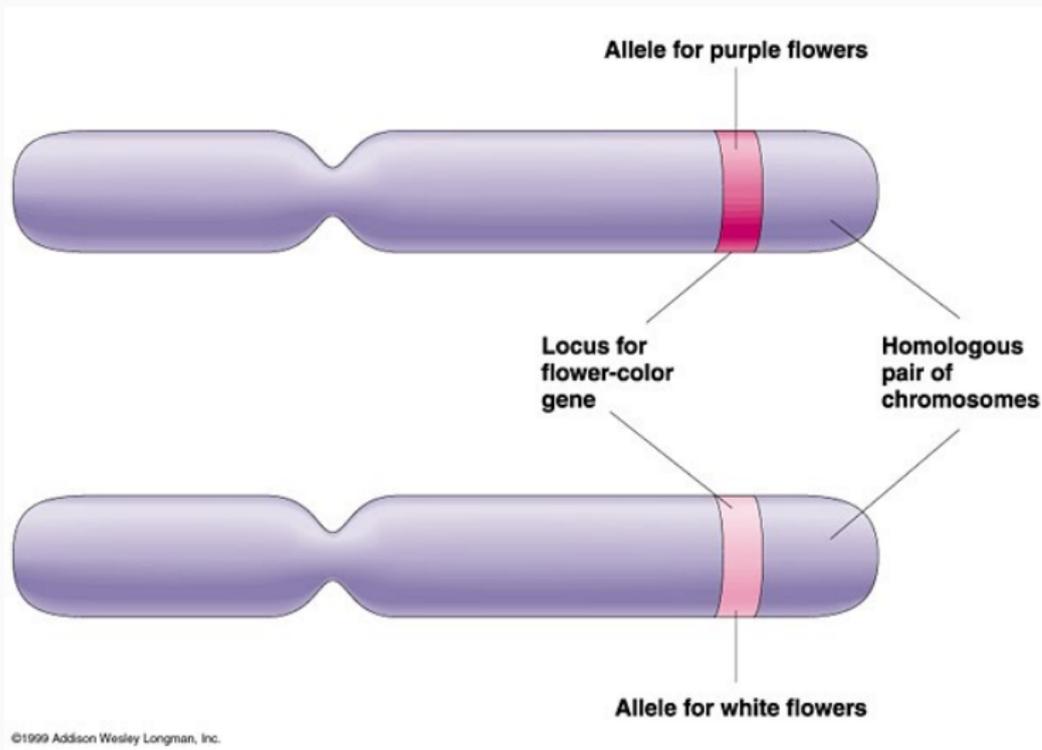
L'étude du pangénome chez le riz : approches et apport en amélioration variétales

C. Tranchant-Dubreuil, C. Monat, N. Dang & **Francois Sabot**

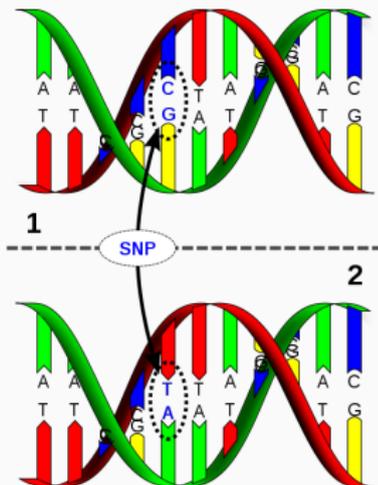
18 Octobre 2018

UMR DIADE, Université de Montpellier - IRD

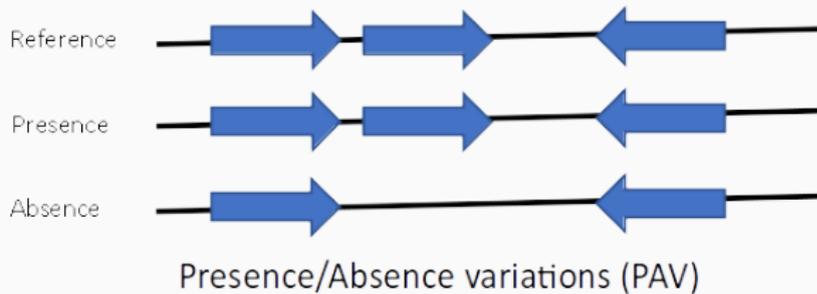
Introduction



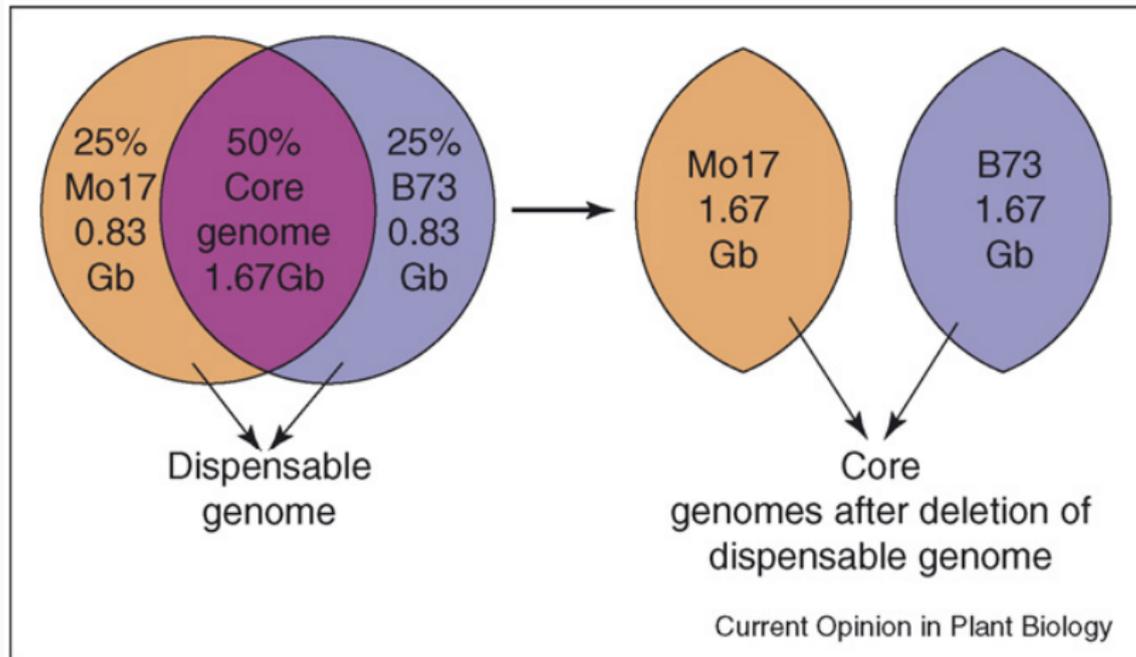
From Canadian Academy & Wiley



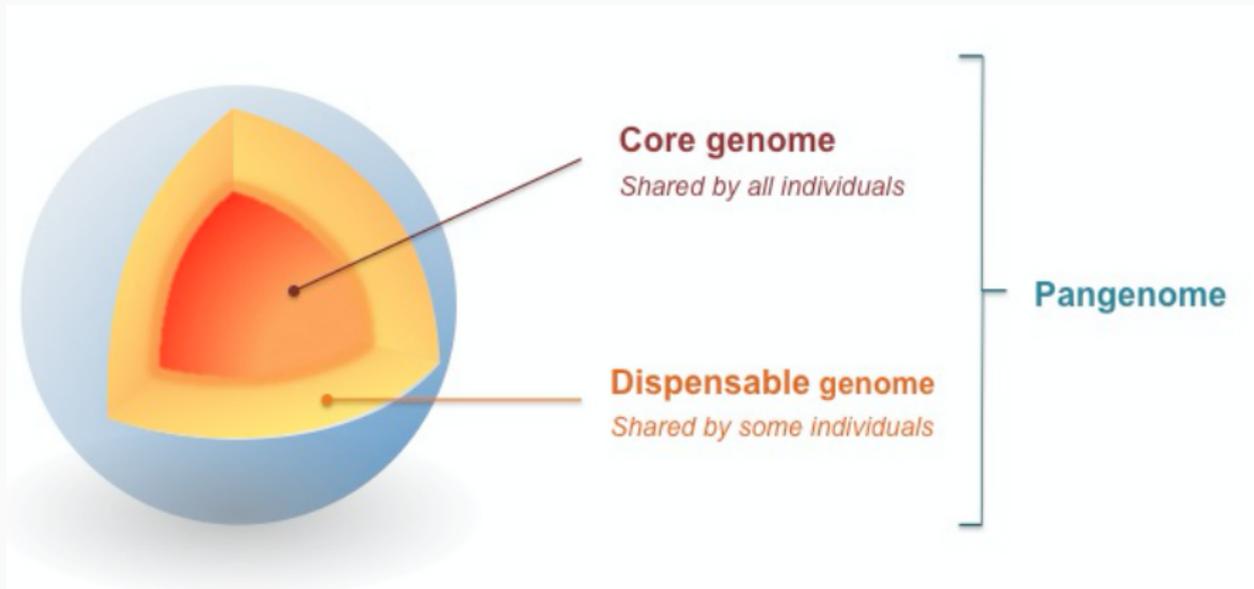
From <https://isogg.org/w/index.php?curid=583>



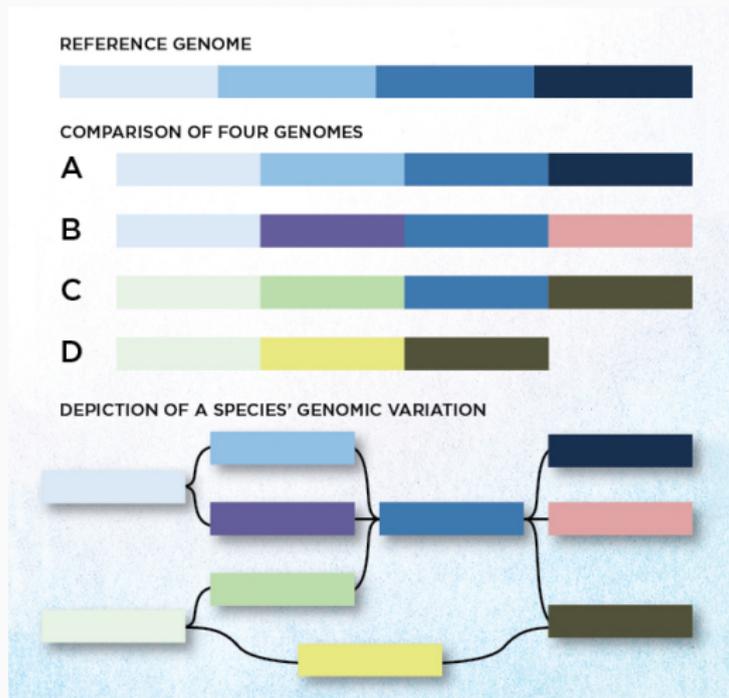
From N. Dang



From Morgante et al, 2007



From Tranchant-Dubreuil et al, *in revision*



From The Scientist

- Well described in bacteria (ex *Lactobacillus sp.*)

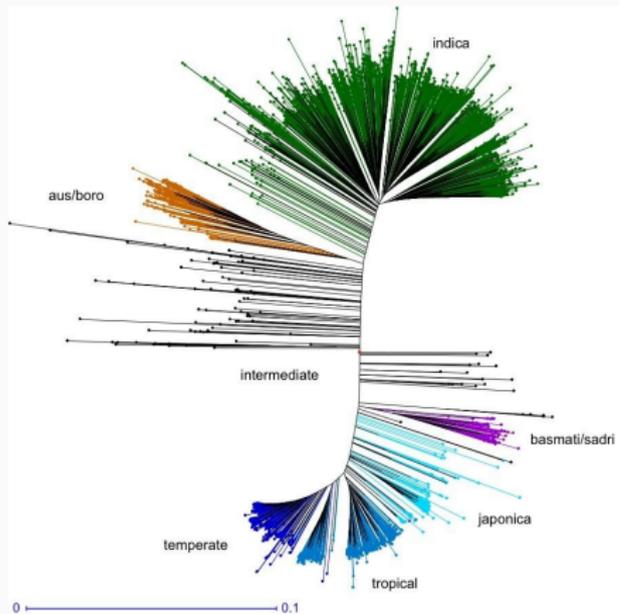
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- Ecogenome idea
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- Impacts on
 - Recombination abnormalities
 - Intra-specific sterility
 - Sympatric speciation
 - Flowering delay

Some data on Rices

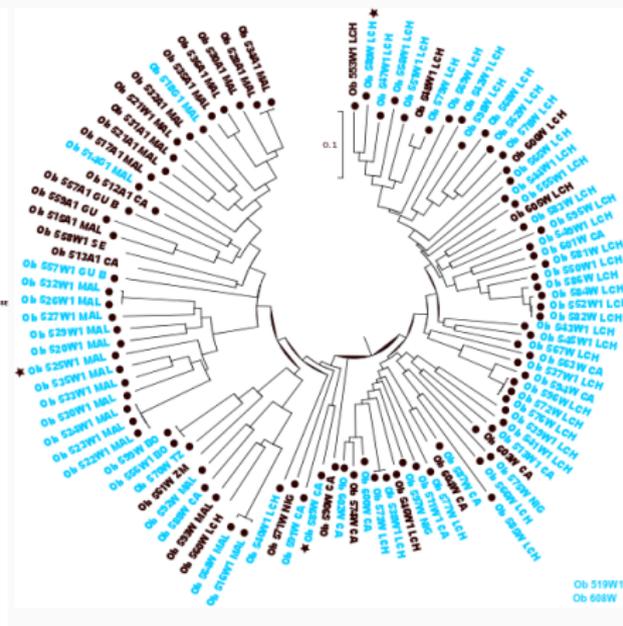
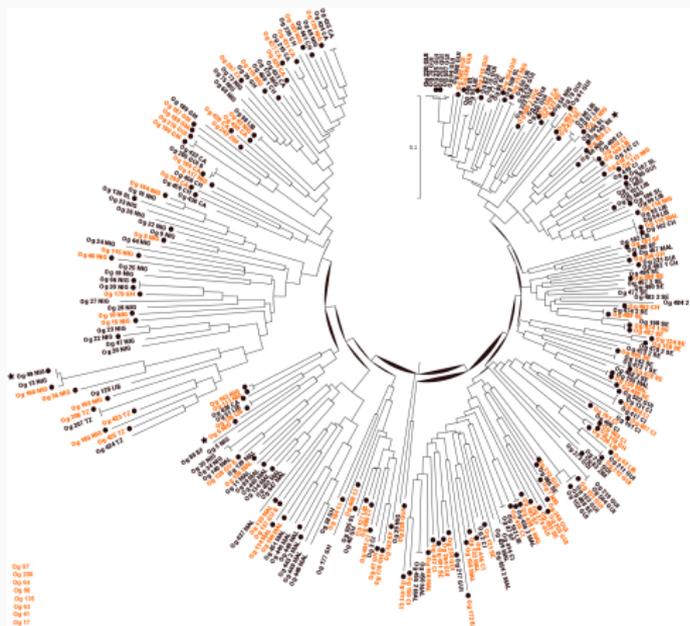
45 *O. rufipogon* Illumina Pair-end data, 45-65x, from IRIGIN
450 *O. sativa* Illumina Pair-end data, 15-30x, from 3kRGP



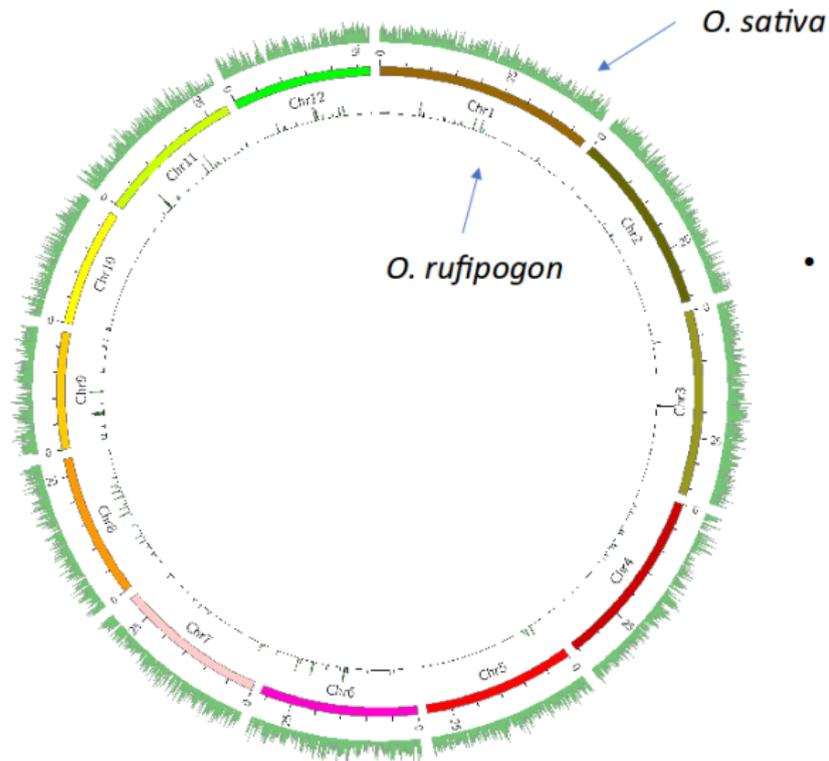
From 3,000 Rice Genome Project

85 *o. barthii* Illumina Pair-end data, 30-65x, from IRIGIN

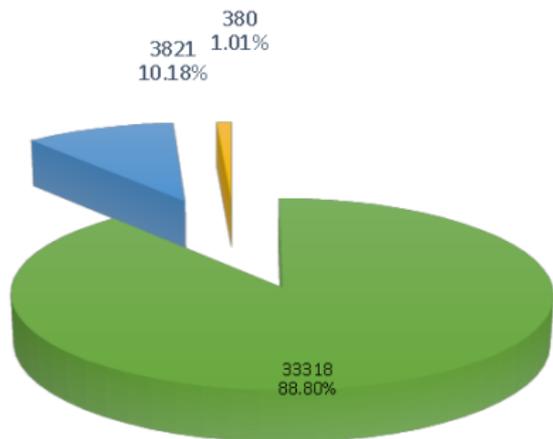
180 *o. glaberrima* Illumina Pair-end data, 22-45x, from IRIGIN



Large PAV in cultivated



- 16,111 PAVs in *O. sativa* and 178 PAVs in *O. rufipogon*



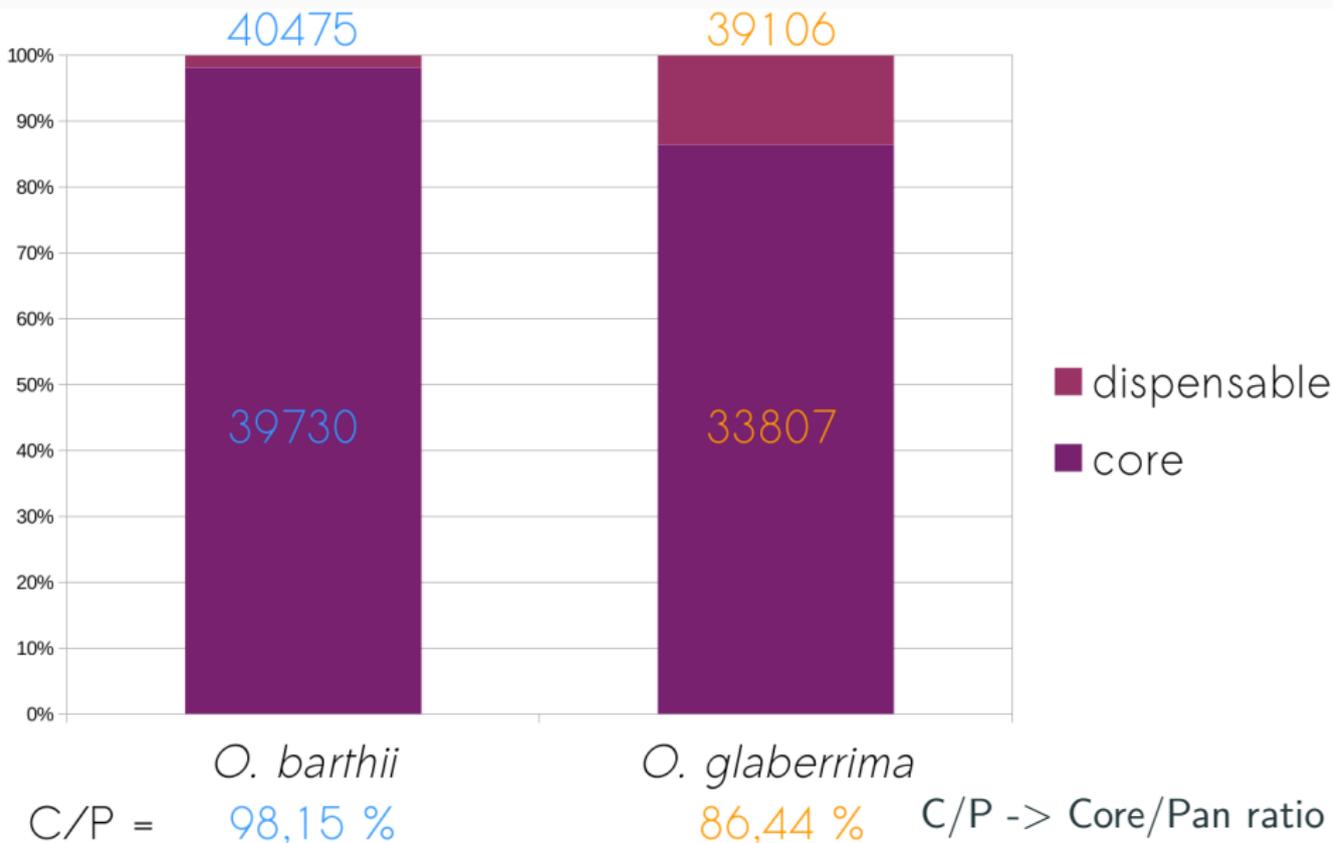
■ Core-genome ■ Dispensable-genome ■ Unknown

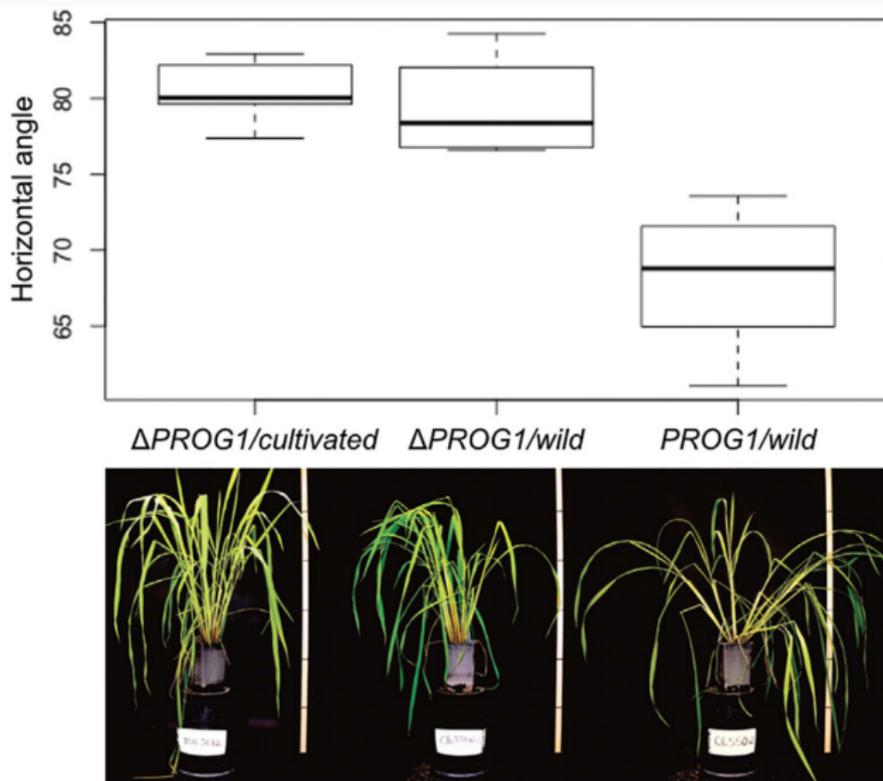
GO analysis

- **Core – 35030 genes:** mainly basic functions
- **Dispensable - 4139 genes:** enrichment in organic cyclic compound and nucleoside triphosphatase activity...

From N. Dang

African Rices, Global Scale





From Cubry et al, 2018

- From 20 to 40Mb difference between 2 individuals (5-10%)

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- But also genes (linked to local adaptation)

Discussion



High Core,
Small Dispensable

Small Core,
High Dispensable

- Cultivated highly variable for PAV

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- The main diversity is OUTSIDE the reference...
- Adaptative changes, really fast (2-10,000 generations)

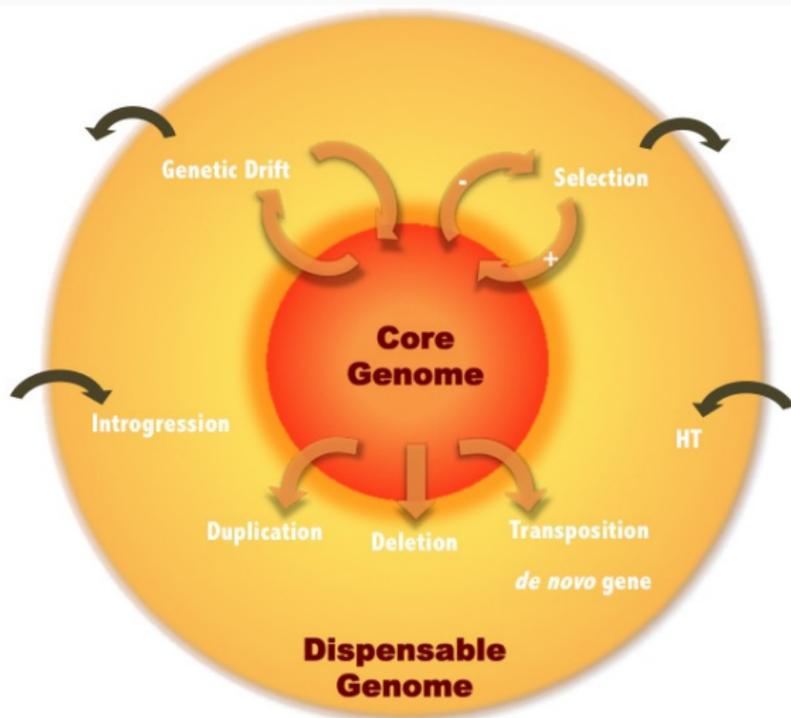
Conclusions & Perspectives

- Need to know variability outside of few markers or SNPs

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- Need to know genome for each sample to optimize
- Third generation sequencing will provide more gene sequences to optimize crosses
- Non-core sequences will provide genes for resilient plants



From Tranchand-Dubreuil et al, *in revisions*

Thanks for your attention



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