



HAL
open science

Which phloem in *Cucumis melo* is exploited by *Aphis gossypii* ?

Pierre Sadon, Marie-Noëlle Corre, Pascale Mistral, Raphaël Lugan, Olivier Chevallier, Nathalie Boissot, Marie Noëlle Corre

► **To cite this version:**

Pierre Sadon, Marie-Noëlle Corre, Pascale Mistral, Raphaël Lugan, Olivier Chevallier, et al.. Which phloem in *Cucumis melo* is exploited by *Aphis gossypii* ?. Réunion scientifique plénière BAPOA, May 2022, Nice, France. hal-03657121

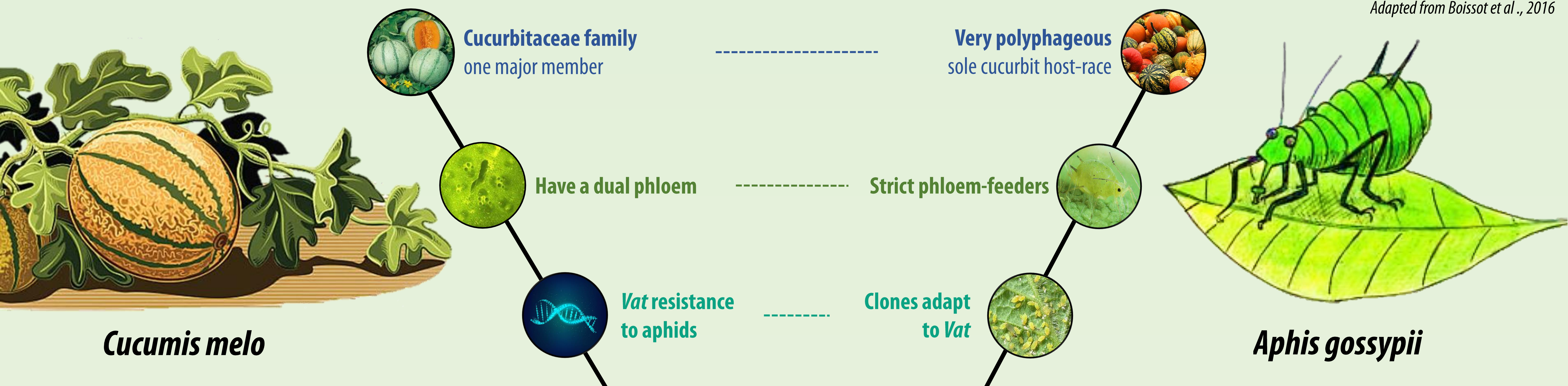
HAL Id: hal-03657121

<https://hal.inrae.fr/hal-03657121v1>

Submitted on 2 May 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Upon the wounds caused by aphids punctures : The classical phloem cloggs ... but NOT the particular one ! Also, on Vat plants, the classical phloem cloggs upon aphids punctures

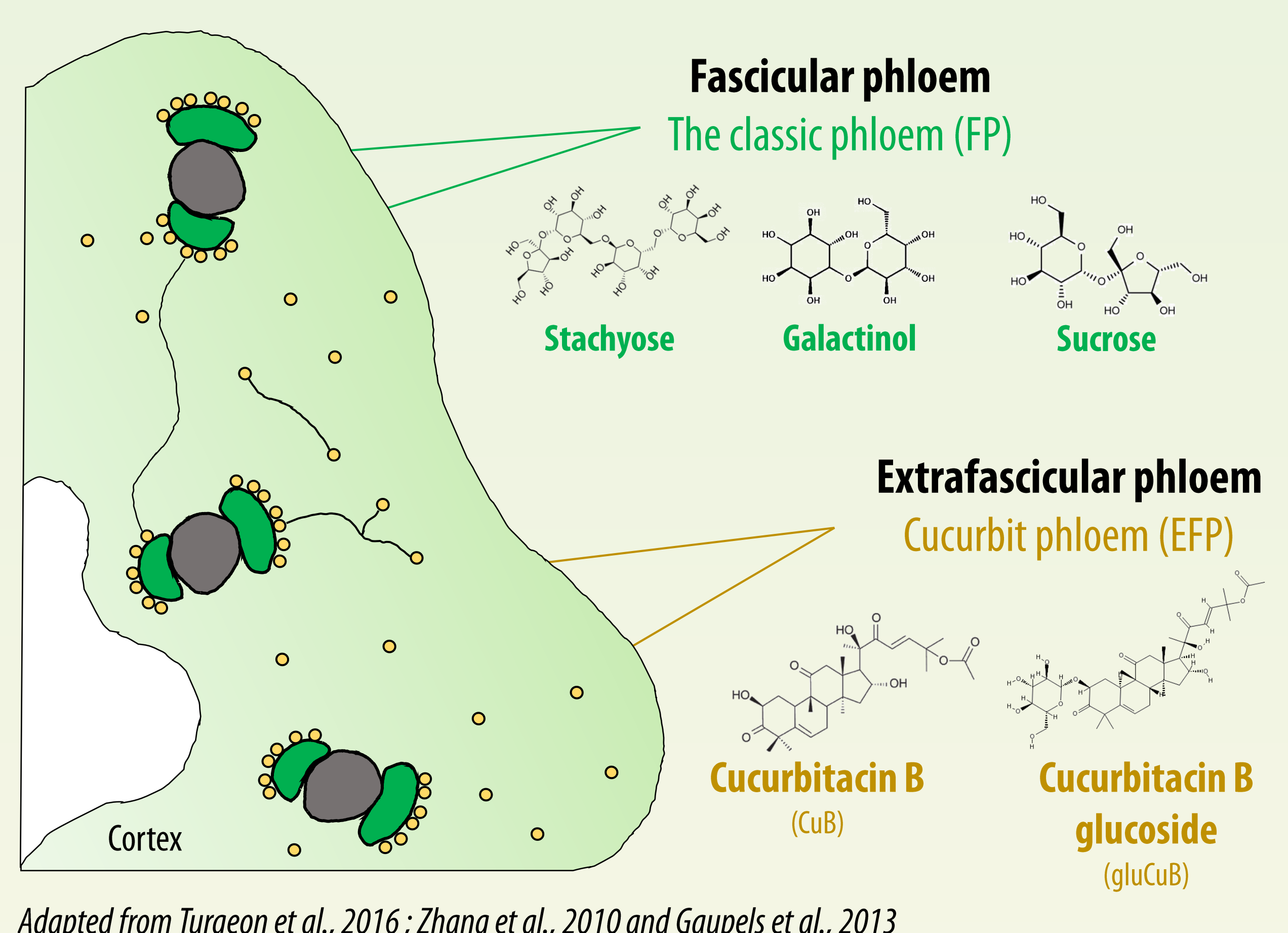
Do the clones adapt to Cucurbit/Vat through the usage of the particular phloem of the cucurbits ?

The strategy :

Infer source phloem with metabolite markers detection in aphids !

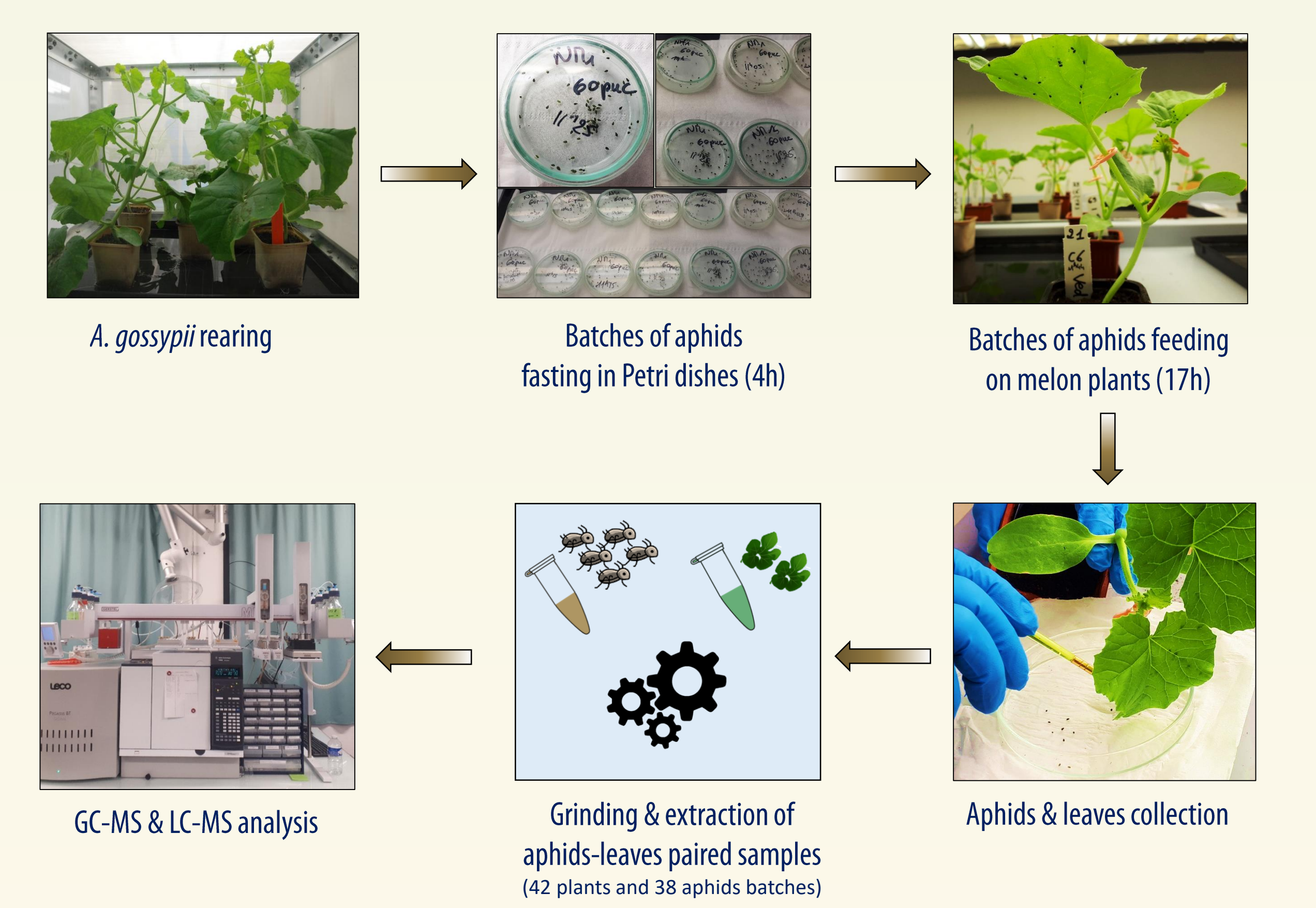
Results :

What do the aphid-ingested metabolites tell us ?



Adapted from Turgeon et al., 2016; Zhang et al., 2010 and Gaupels et al., 2013

Materials and methods :



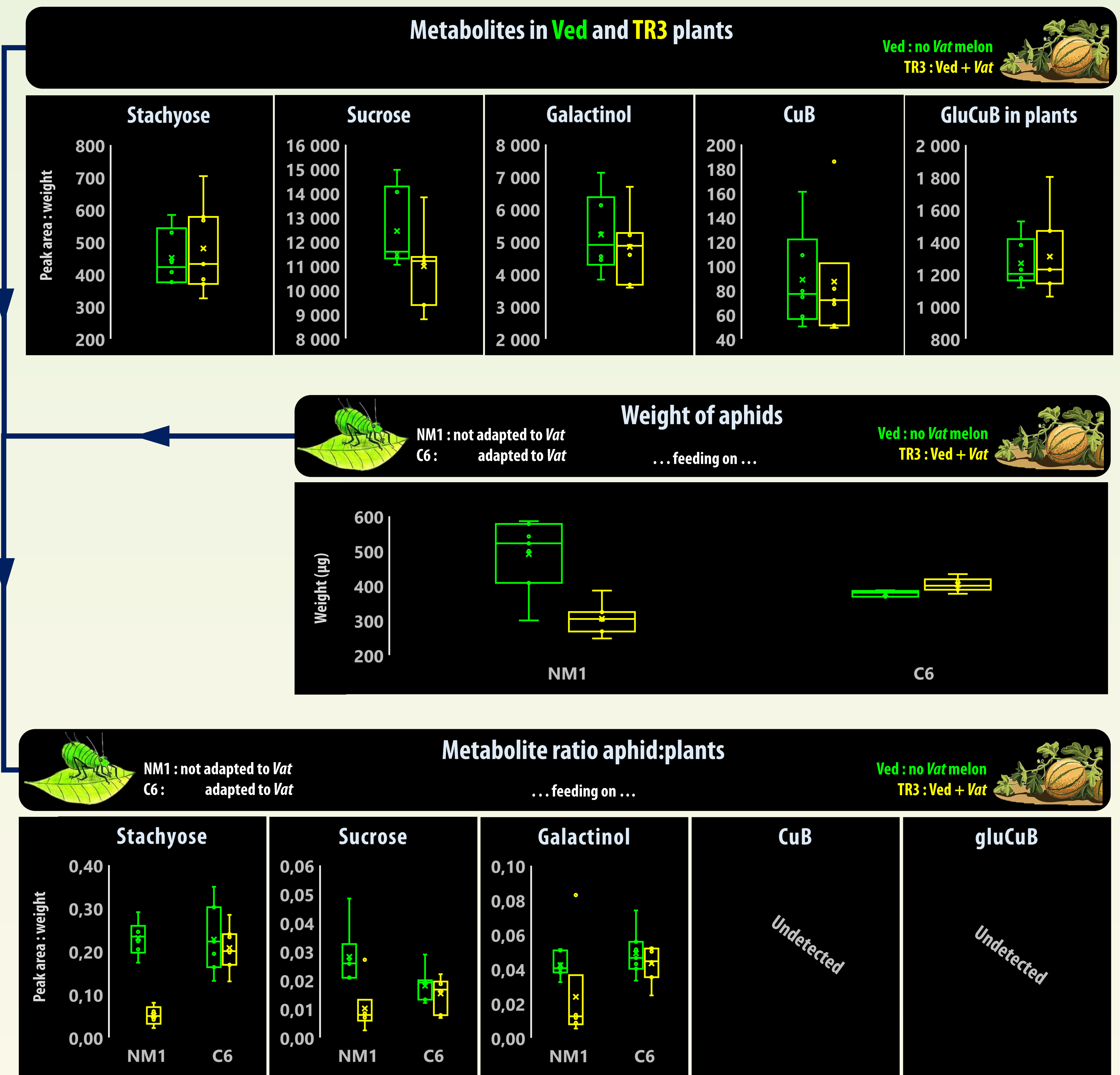
References

Boissot, N., Schoeny, A., & Vanlerberghe-Masutti, F. (2016). Vat, an amazing gene conferring resistance to aphids and viruses they carry: From molecular structure to field effects. *Frontiers in Plant Science*, 7(September2016), 1–18. <https://doi.org/10.3389/fpls.2016.01420>

Gaupels, F., & Ghirardo, A. (2013). The extrafascicular phloem is made for fighting. *Frontiers in Plant Science*, 4(JUN), 2–5. <https://doi.org/10.3389/fpls.2013.00187>

Turgeon, R. (2016). Phloem Biology of the Cucurbitaceae. *Plant Genetics and Genomics: Crops and Models*, (October), 291–311. <https://doi.org/10.1007/7397>

Zhang, B., Tolstikov, V., Turnbull, C., Hicks, L. M., & Fiehn, O. (2010). Divergent metabolome and proteome suggest functional independence of dual phloem transport systems in cucurbits. *Proceedings of the National Academy of Sciences of the United States of America*, 107(30), 13532–13537. <https://doi.org/10.1073/pnas.0910558107>



So what ?

- Control Vat and no-Vat plants had a similar amount of each sugar and cucurbitacin respectively
 - On no-Vat plants, both NM1 and C6 ingested sugars but no cucurbitacin :
On sensitive plants, both adapted and not adapted clones fed from FP and not from EFP
 - On Vat plants, NM1 lost weight, ingested sugars but no cucurbitacin :
On resistant plants, the not adapted clone had a restricted access to FP and did not fed from EFP
 - On Vat plants, C6 maintained its weight, ingested sugars but no cucurbitacin :
On resistant plants, the adapted clone comfortably fed from FP but did not from EFP
- In a near future : we will confirm our results with a second set of clones ...**