Identification of potential mating-type genes in the arbuscular mycorrhizal fungi

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INTRODUCTION

Arbuscular mycorrhizal fungi (AMF) are obligate symbionts of land plants that were always believed to have reproduced clonally, by means of mitosis. Recent evidence suggests that AMF possess the necessary genes to take part in a sexual life cycle that could involve mating, thus refuting the theory that there is absence of meiosis. High Mobility Group (HMG) proteins have functions related to sexual reproduction such as establishing cell identity in many fungi. Here we report the existence of over 80 HMG genes present in the genome of *Rhizophagus irregularis*.

OBJECTIVE

Identify intra-isolate variation at the multiple HMG protein loci.

METHODS

- Based on their genotypic dissimilarity, three isolates were selected (A4, B3, and C2).

- The HMG genes were amplified by Polymerase Chain Reaction and Sanger sequenced.

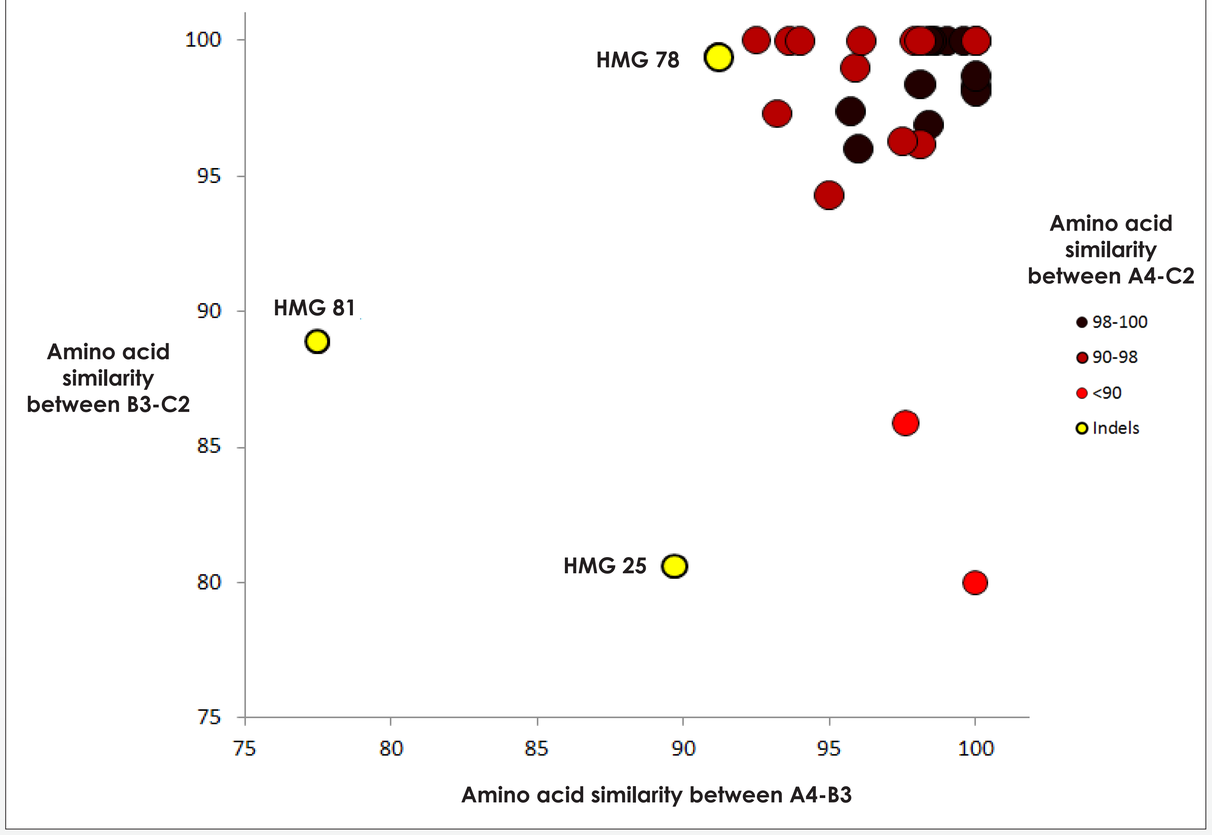
- Intra-isolate variation was identified by aligning HMG sequences obtained from each isolate.

RESULTS

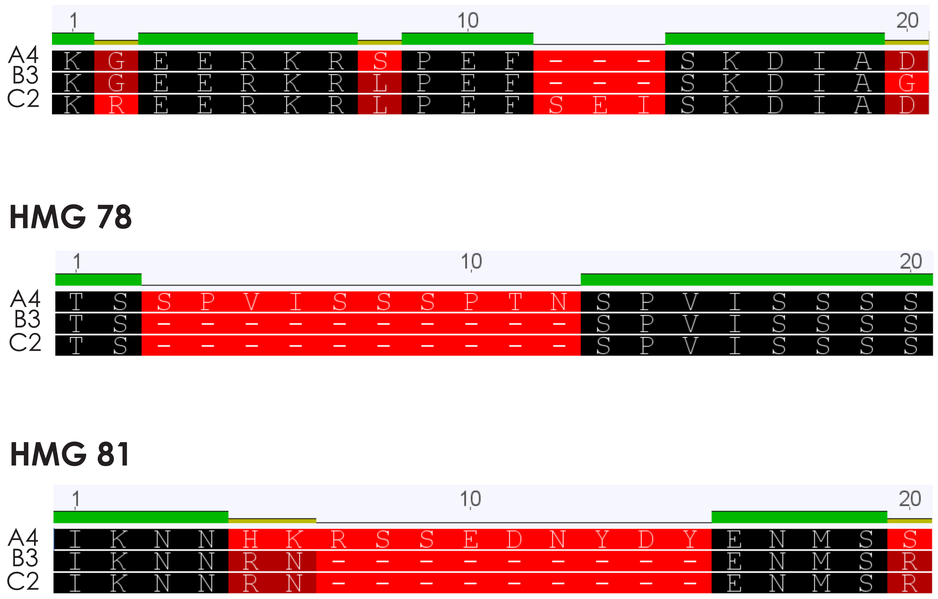
- Many of the HMG proteins showed strong similarities in their amino acid sequences.

- Some were very divergent due to presence of insertions and deletions that were not consistent among all isolates.

Comparison of HMG amino acid chain similarity between isolates



HMG sequences presenting insertions and deletions



DISCUSSION

The HMGs that show strong variation (presence of insertions and deletions of numerous amino acids) are important since the divergence in between all three isolates could suggest the presence of mating-types in *R. irregularis*.

CONCLUSION

To further investigate the hypothesis that these genes are involved in mating-types in AMF, our lab group is determining the pattern of expression of these variable HMG genes when isolates containing them grow individually compared to when they are growing together and interacting thus providing functional evidence of the role of these loci.

REFERENCES

- Corradi N and C Charest. 2011. Some like it toxic. Molecular Ecology.
- Riley R and N Corradi. 2012. Searching for clues of sexual reproduction in the genomes of arbuscular mycorrhizal fungi. Fungal Ecology.

ACKNOWLEDGEMENTS

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