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STUDY OF A MAIZE VIVIPAROUS MUTANT IMPAIRED IN THE LAST STEP OF ABA BIOSYNTHESIS AND IN THE Moco PATHWAY

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ABA, Moco, viviparous

*vp*404* is a viviparous mutant with light green seedlings, reduced chlorophylls and carotenoids content and lower ABA level in both embryo and seedling tissues when compared to wild-type.

Because of the analogies between the phenotype of this mutant and the one of *vp10* and *vp15*, impaired in the Molybdenum Cofactor (Moco) pathway, we crossed the *vp*404* mutant with TB-10L and 5L, uncovering *vp10* and *vp15* respectively. We also performed a complementation test with all viviparous mutants with green seedlings reported in the literature.

The result of both complementation and TB-A tests suggest that *vp*404* defines a new *vp* gene whose product is presumably involved in Moco biosynthesis. Candidate genes are *Zmcnx* genes encoding CNX proteins involved in Moco-O biosynthesis and the gene encoding Moco Sulfurase that transforms Moco-O to Moco-S.

Moco-O is required for the activity of both Nitrate Reductase (NR) and Sulphite Oxidase (SO), whereas moco-s is required for the activity of Abscisic Aldehyde Oxidase (AAO), involved in the last step of ABA biosynthesis, as well as for Xanthine Dehydrogenase (XDH) activity.

To verify the possibility that *vp*404* is a mutation of one of the candidate genes, we compared SO as well as AAO, and XDH enzyme activity, in wild-type and mutant embryo tissues.

In the mutant, analysis of AAO (directly involved in ABA biosynthesis) and XDH, both requiring Moco-S, shows that their activity is almost undetectable when compared to the one of wild type tissues. On the other hand the SO enzyme, requiring Moco-O, shows significant activity even in the mutant.

These results are expected if *vp*404* is impaired in the Moco pathway, in addition the high SO activity in the mutant points to a block in the step where Moco Sulfurase transforms Moco-O in Moco-S. To verify this hypothesis we are performing further molecular and genetic analysis.