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Poster Abstract – C.16

KDC2, A NEW INWARD POTASSIUM CHANNEL FROM CARROT IS INVOLVED IN SALT STRESS RESPONSE

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Potassium is the most important cation in plant cell and is involved in several key process, from photosynthesis to plant growth. Its concentration is tightly regulated by potassium transport proteins, such as voltage gated channels belonging to the *Shaker* family.

Salinity affects crop production in many countries since sodium causes K^+ leakage from cells inferring plant growth and biomass. Potassium transport proteins are responsible of the high K^+/Na^+ ratio in the cytoplasm, essential condition for cell health. Hence, the isolation of potassium channels and their physiological and molecular characterisation in presence of high concentrations of salt and heavy metal can contribute to a better understanding of the potassium transport and to improve the growth of plants in stress conditions.

Recently we isolated a new *Shaker*-like potassium channel from carrot, KDC2, that seems to be involved in stomatal movements and embryo development. In fact, *KDC2* expression pattern during somatic embryogenesis, proceeds along with the establishment of the polar axes and the settlement of the hypocotyl region. Indeed, in mature plants, *KDC2* transcript is localized at the shoot level, in the epidermis and guard cells, as its *Arabidopsis* homolog *KAT1*.

Under salt stress physiological conditions, *KDC2* expression profile changes and its transcript is detectable, by *in situ* experiments and semiquantitative RT-PCR, not only in shoot but also in roots. Since *Shaker* channels are tetrameric structure made of identical (homotetramers) or different subunits (heterotetramers), we assayed the gene expression profile of the other potassium channels isolated from carrot, KDC1 and DKT1, that we know to be involved in potassium absorption from the soil.

The results suggest that, in salinity conditions, carrot plants can modulate potassium absorption varying potassium channel gene expression by allowing the assembling of different heterotetrameric potassium channels with different physiological and molecular properties.