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The oil extracted from drupe's mesocarp of the oil palm (Elaeis guineensis) is the world's leading vegetable fat source with a yield of 5t/ha/year. Oil palm needs a large amount of mineral nutrients provided through fertilization what represents up to 70% of palm grove maintenance cost. Among the various nutrients supplied, potassium is a mineral ion essential for drupe's development and plays a key role in the plant growth. Palm fruits ripen around 160 days after anthesis (daa). The first stages of fruit's development consist to a cell division and expansion step followed by a latent period. From 120 daa, the fruit starts to ripen with a strong simultaneous increase in ethylene and ABA and the production of fatty acids. K+ content increases gradually during the early stages of fruit formation and then decreases before lipid biosynthesis. In oil palm, few data are available on potassium transport and its specific involvement on cluster's development and yield. In order to better understand the molecular determinants of K+ transport in oil palm, the characterization of the Shaker potassium channel EgKT2 that belongs to the AKT2-like subfamily is reported here for the first time. Analysis of the gene expression level by RT-qPCR showed that EgKT2 is strongly expressed in leaves, meristem, and young fruits (30 - 60 daa) coinciding with the increase of K+ in the early steps of fruit development. The localization of EgKT2 transcripts was performed by *in situ* hybridization. The functional characterization of EgKT2 by electrophysiology revealed that this channel is a weakly rectifying channel, mediating both inward and outward K+ currents with unique features of its own. This work provides a first insight for understanding the potassium transport mechanism in oil palm and it opens new perspectives for further research in this area for a K+ fertilizers reduction.