

表 1 高等植物 Shaker 家族钾离子通道的分类及功能特性(有改动) (Gambale and Uozumi, 2006)

Table1 Classification and functional properties of Shaker-type potassium channels in higher plants (modified) (Gambale and Uozumi, 2006)

蛋白 Names of the proteins	物种 Plant species	蛋白种类 Protein types	表达部位 Expression of organ/tissue	蛋白功能 Protein function	参考文献 References
Shaker 家族, Group I Shaker family, Group I					
AKT1	拟南芥 <i>Arabidopsis thaliana</i>	内向整流型 Inward rectifying	根, 叶 Root, leaf	根部钾吸收 K ⁺ uptake into the roots	Lagarde et al., 1996; Hirsch et al., 1998; Xu et al., 2006
AKT5	拟南芥 <i>A. thaliana</i>		花, 发育的角果 Flower, developings siliques		Lacombe et al., 2000
SPIK	拟南芥 <i>A. thaliana</i>	内向整流型 Inward rectifying	花粉, 花粉管 Pollen, pollen tube	花粉管钾吸收, 影响花粉活力 Contributes to pollen tube growth	Mouline et al., 2002
SKT1	马铃薯 <i>Solanum tuberosum</i>	内向整流型 Inward rectifying	根, 保卫细胞 Root, guard cells	根部钾吸收 K ⁺ uptake into the roots	Zimmermann et al., 1998
LKT1	番茄 <i>Lycopersicon esculentum</i>	内向整流型 Inward rectifying	根(根毛) Root (hairs)	根部钾吸收 K ⁺ uptake into the roots	Hartje et al., 2000
TaAKT1	小麦 <i>Triticum aestivum</i>	内向整流型 Inward rectifying	根 Root	根部钾吸收 K ⁺ uptake into the roots	Buschmann et al., 2000
OsAKT1	水稻 <i>Oryza sativa</i>	内向整流型 Inward rectifying	根, 胚芽鞘, 叶 Root, coleoptile, leaf	根部钾吸收 K ⁺ uptake into the roots	Fuchs et al., 2005
ZMK1	玉米 <i>Zea mays</i>	内向整流型 Inward rectifying	胚芽鞘 Coleoptile	参与胚芽鞘生长 Participates in coleoptile growth	Philippar et al., 1999
Shaker 家族, Group II Shaker family, Group II					
KAT1	拟南芥 <i>A. thaliana</i>	内向整流型 Inward rectifying	保卫细胞 Guard cells	调控气孔运动 Stomata regulation	Anderson et al., 1992; Hoshi, 1995; Dreyer et al., 1998; Pilot et al., 2001
KAT2	拟南芥 <i>A. thaliana</i>	内向整流型 Inward rectifying	叶, 花 Leaf, flower	调控气孔运动 Stomata regulation	Ivashikina et al., 2001; Piolt et al., 2001
KST1	马铃薯 <i>S. tuberosum</i>	内向整流型 Inward rectifying	叶, 花 Leaf, flower	调控气孔运动 Stomata regulation	Hoth et al., 1997; Hoth et al., 2001
SIRK	葡萄 <i>V. vinifera</i>	内向整流型 Inward rectifying	叶, 浆果 Leaf, berry	调控浆果中的钾装载及水分 散失 Regulation of K ⁺ loading and/or water loss in berry	Pratelli et al., 2002
ZmK2.1	玉米 <i>Z. mays</i>	内向整流型 Inward rectifying	叶 Leaf	介导钾向韧皮部流动 Contribution to K ⁺ -dependent inward conductance	Su et al., 2005
Shaker 家族, Group III Shaker family, Group III					
AKT2	拟南芥 <i>A. thaliana</i>	弱内向整流型 Weakly rectifying	叶, 根, 茎, 花 Leaf, root, stem, flower	响应干旱胁迫, 介导钾在韧皮 部的装载及卸载 Plant responses to drought. Phloem loading/unloading	Marten et al., 1999; Lacombe et al., 2000; Chérel et al., 2002; Deeken et al., 2003

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VFK2	蚕豆 <i>Vicia faba</i>	弱内向整流型 Weakly rectifying	茎, 韧皮部 Stem, phloem	钾在韧皮部的装载 K ⁺ loading in the phloem	Ache et al., 2001
ZMK2	玉米 <i>Z. mays</i>	弱内向整流型 Weakly rectifying	胚芽鞘, 初生叶 Coleoptile, primary leaf		Philippart et al., 1999
Shaker 家族, Group IV Shaker family, Group IV					
AtKC1	拟南芥 <i>A. thaliana</i>	调控亚基 Regulate subunit	根, 叶 Root, leaf	参与调节根部钾吸收, 响应盐胁迫 Participates in K ⁺ -uptake as a modulatory subunit. Contributes to adaptation to salt stress	Dreyer et al., 1997; Reintanz et al., 2002; Pilot et al., 2003 Downey et al., 2000; Formentin et al., 2004; Picco et al., 2004
KDC	胡萝卜 <i>Daucus carota</i>	调控亚基, 内向钾通道? Regulate subunit, inward rectifying?	根 Root	调控钾通道 α 亚基, 参与调节根部钾吸收? 平衡膜电势? Modulates α -subunits of other K channels. Participates in K ⁺ uptake and modulation of membrane potential?	Dreyer et al., 1997; Reintanz et al., 2002; Pilot et al., 2003 Downey et al., 2000; Formentin et al., 2004; Picco et al., 2004
Shaker 家族, Group V Shaker family, Group V					
SKOR	拟南芥 <i>A. thaliana</i>	外向整流型 Outward rectifying	根, 花粉粒 Root, pollen grain	介导钾向木质部释放 K ⁺ release into xylem sap towards the shoots	Gaymard et al., 1998; Lacombe et al., 2000; Mouline et al., 2002 Ache et al., 2000; Ivashikina et al., 2001
GORK	拟南芥 <i>A. thaliana</i>	外向整流型 Outward rectifying	保卫细胞, 根表皮, 根毛 Guard cells, root epidermal cells, root hairs	介导保卫细胞中钾向外释放 Potassium release from guard cells	Gaymard et al., 1998; Lacombe et al., 2000; Mouline et al., 2002 Ache et al., 2000; Ivashikina et al., 2001