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Exocyst subunit VviExo70B is degraded by ubiquitin ligase VviPUB19 and they regulate drought and salt tolerance in grapevine

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|-------|---|
| 编号 | 040038505 |
| 推送时间 | 20230306 |
| 研究领域 | 森林培育 |
| 年份 | 2022 |
| 类型 | 期刊 |
| 语种 | 英语 |
| 标题 | Exocyst subunit VviExo70B is degraded by ubiquitin ligase VviPUB19 and they regulate drought and salt tolerance in grapevine |
| 来源期刊 | Environmental and Experimental Botany |
| 期 | 第385期 |
| 发表时间 | 20230201 |
| 关键词 | Vitis vinifera; Exocyst subunit; Ubiquitin ligase; Drought stress; Salt stress; ABA; |
| 摘要 | <p>The exocyst complex comprises secretory vesicle tethering proteins and Exo70 is a subunit of exocyst which is responsible for cell exocytosis and vesicle transport. In Arabidopsis, Exo70B1 and Exo70B2 positively regulate stomatal closure induced by ABA and non-ABA (mannitol) respectively, and the UNDPUB18 determines the ubiquitination of Exo70B1 and Exo70B2 by PUB18 and PUB22, respectively. While there is only one VviExo70B in grapevine. In our study, the cloning and functional characterization of VviExo70B from Vitis vinifera was performed. The overexpression of VviExo70B in grape callus and Arabidopsis enhanced the drought (mannitol) and NaCl tolerance and increased the sensitivity to ABA. It was confirmed that the ARM domain, rather than the UND domain, of ubiquitin ligase VviPUB19 determined the interaction with VviExo70B. The VviExo70B was ubiquitinated and degraded by VviPUB19, and the degradation was inhibited by MG132. Then the overexpression of VviPUB19 in grape callus and Arabidopsis reduced the drought (mannitol) and NaCl tolerance and decreased the sensitivity to ABA. Overall, our results suggested that in the evolutionary process, only one VviExo70B was needed in grapevine to exert drought and salt stresses tolerance through both ABA-dependent and ABA-independent pathways, with the UND domain of VviPUB19 not being as important as in Arabidopsis.</p> |
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