数据资源： 林业专题资讯

The integration of ACS2-generated ACC with GH3-mediated IAA homeostasis in NaCl-stressed primary root elongation of Arabidopsis seedlings

编号	040018804
推送时间	20190527
研究领域	森林培育
年份	2019
类型	期刊
语种	英语
标题	The integration of ACS2-generated ACC with GH3-mediated IAA homeostasis in NaCl-stressed primary root elongation of Arabidopsis seedlings
来源期刊	Plant Growth Regulation
期	第188期
发表时间	20190419
关键词	ACS2; ACC; IAAconjugation; NaCl; Rootgrowth;
摘要	Plant root growth is controlled by auxin (IAA) and ethylene. The appropriate IAA concentration is regulated by many events, such as IAA biosynthesis, conjugation, and degradation. The levels of ethylene and its precursor 1-aminocyclopropane-1-carboxylic acid (ACC) depend on the activity of ACC synthases (ACSs). However, some questions have been raised: can ACS family members specifically regulate the ACC concentration in response to NaCl stress, and if so, how? How does ACC production affect IAA homeostasis during the root growth of Arabidopsis seedlings? Here, our observations showed that NaCl inhibition of root growth was greater in the ACS2-deficient mutants acs2-1 and acs2-2 because of the reduction of ACC and IAA accumulation in their root tips, while this reduction was rescued in transformants, including acs2 complementary (ACS2/acs2-1) and ACS2 overexpression (ACS2-OE) lines. The data showed that the decreased IAA levels resulted from increased activity of IAA conjugation enzymes, such as GH3.5 and GH3.9. These results suggest that ACS2 activity is an early response factor in the signaling pathway of NaCl-inhibited root growth.
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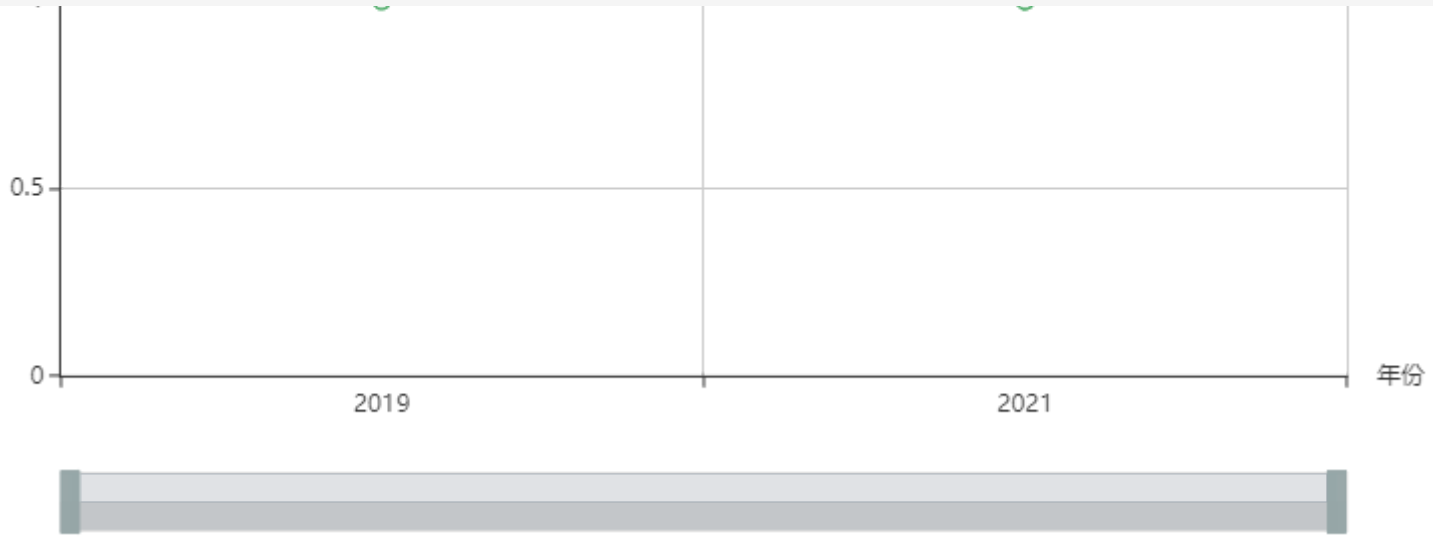

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