

Accepted Manuscript

Title: *OsHSD1*, a Hydroxysteroid Dehydrogenase, Is Involved in Cuticle Formation and Lipid Homeostasis in Rice

Author: Zhe Zhang Zhi-jun Cheng Lu Gan Huan Zhang
Fu-qing Wu Qi-bing Lin Jiu-lin Wang Jie Wang Xiu-ping Guo
Xin Zhang Zhi-chao Zhao Cai-lin Lei Shan-shan Zhu
Chun-ming Wang Jian-min Wan



PII: S0168-9452(16)30074-7
DOI: <http://dx.doi.org/doi:10.1016/j.plantsci.2016.05.005>
Reference: PSL 9410

To appear in: *Plant Science*

Received date: 2-3-2016
Revised date: 6-5-2016
Accepted date: 8-5-2016

Please cite this article as: Zhe Zhang, Zhi-jun Cheng, Lu Gan, Huan Zhang, Fu-qing Wu, Qi-bing Lin, Jiu-lin Wang, Jie Wang, Xiu-ping Guo, Xin Zhang, Zhi-chao Zhao, Cai-lin Lei, Shan-shan Zhu, Chun-ming Wang, Jian-min Wan, *OsHSD1*, a Hydroxysteroid Dehydrogenase, Is Involved in Cuticle Formation and Lipid Homeostasis in Rice, *Plant Science* <http://dx.doi.org/10.1016/j.plantsci.2016.05.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 ***OsHSD1*, a Hydroxysteroid Dehydrogenase, Is Involved**
 2 **in Cuticle Formation and Lipid Homeostasis in Rice**

3 Zhe Zhang^{a,1}, Zhi-jun Cheng^{a,1}, Lu Gan^a, Huan Zhang^b, Fu-qing Wu^a, Qi-bing Lin^a,
 4 Jiu-lin Wang^a, Jie Wang^a, Xiu-ping Guo^a, Xin Zhang^a, Zhi-chao Zhao^a, Cai-lin
 5 Lei^a, Shan-shan Zhu^a, Chun-ming Wang^b, Jian-min Wan^{a,b,*}

6 ^a National Key Facility for Crop Gene Resources and Genetic Improvement, Institute of Crop
 7 Science, Chinese Academy of Agricultural Sciences, Beijing 100081, P.R. China

8 ^b National Key Laboratory for Crop Genetics and Germplasm Enhancement, Nanjing
 9 Agricultural University, Nanjing 210095, P.R. China

10

11 * Corresponding author at: National Key Facility for Crop Gene Resources and Genetic
 12 Improvement, Institute of Crop Science, Chinese Academy of Agricultural Sciences, Beijing
 13 100081, P.R. China

14 E-mail: wanjianmin@caas.cn

15 Telephone: +86-10-82105848 Fax: +86-10-82105837

16 ¹ These authors contributed equally to this manuscript

17 **Abstract**

18 Cuticular wax, a hydrophobic layer on the surface of all aerial plant organs, has essential roles in
 19 plant growth and survival under various environments. Here we report a wax-deficient rice
 20 mutant *oshsd1* with reduced epicuticular wax crystals and thicker cuticle membrane.
 21 Quantification of the wax components and fatty acids showed elevated levels of very-long-chain
 22 fatty acids (VLCFAs) and accumulation of soluble fatty acids in the leaves of the *oshsd1* mutant.
 23 We determined the causative gene *OsHSD1*, a member of the short-chain dehydrogenase
 24 reductase family, through map-based cloning. It was ubiquitously expressed and responded to
 25 cold stress and exogenous treatments with NaCl or brassinosteroid analogs. Transient expression
 26 of *OsHSD1*-tagged green fluorescent protein revealed that OsHSD1 localized to both oil bodies
 27 and endoplasmic reticulum (ER). Dehydrogenase activity assays demonstrated that OsHSD1 was

Download English Version:

<https://daneshyari.com/en/article/8357182>

Download Persian Version:

<https://daneshyari.com/article/8357182>

[Daneshyari.com](https://daneshyari.com)