Plant Path

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1. Accession	Agency Identification No.	5. Work Unit/Project No.	6. Status
0216305	2. CSREES 3. LA.B	**LAB93938**	**Annual Report**

7. Title

Environmental and Genetic Determinants of Seed Quality and Performance

12. Investigator Name(s) (Last Name and Initials)

Cohn, M. A.

20. Termination Date 09/30/2013

40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

One oral report and two posters have been presented at regional and national scientific meetings. One manuscript was published. Results have been collated in preparation for two forthcoming scientific meeting abstracts/presentations. Lecture materials have been prepared for undergraduate and graduate level courses. The project also has supported the training of one doctoral student (seed physiology, biochemical techniques, and mass spectroscopy. Faculty and students in the LSU AgCenter Coastal Plants Project were advised on the development of seed germination protocols for various marsh plant species.

Outcomes/Impacts:

This project has supported research to identify the causes of seed dormancy, seed desiccation intolerance (recalcitrance) and related problems of the marsh grass, Spartina alterniflora, which is an important component for successful maintenance and remediation of Louisiana coastal stabilization. Thirty-six heat-soluble, differentially expressed proteins between Spartina alterniflora (desiccation intolerant, DI) and Spartina pectinata (desiccation tolerant, DT) were found by two-dimensional gel electrophoresis between DT vs. DI species. These proteins were sequenced using mass spectrometry, and half of the sequences have significant homologue matches in existing protein databases. The expression patterns suggest that prevention of programmed cell death and protein stabilization by LEA (late embryogenesis abundant proteins) during seed drying, as well as detoxification of reactive oxygen species during subsequent germination, are important for viability of drying-tolerant seeds. Putative targets have been identified for improving seed stability of Spartina alterniflora.

Publications:

Chappell J.H. and M.A. Cohn. 2011. Corrections for interferences and extraction conditions make a difference: use of the TBARS assay for lipid peroxidation of orthodox Spartina pectinata and recalcitrant Spartina alterniflora seeds during desiccation. Seed Sci. Res. 21: 153-158.

Subudhi, P.K., A. Parco, P. Singh, T. DeLeon, and M.A. Cohn. 2011. Genetic dissection of seed shattering and seed dormancy in US red rice. Plant and Animal Genome Conference, San Diego, CA. January 15-19, 2011. http://www.intl-pag.org/19/abstracts/P05b_PAGXIX_267.html.

Wang Y. and M. Cohn. 2011. Comparative proteomics of recalcitrant seed death in Spartina alterniflora. Southern Section- American Society of Plant Biologists Annual Meeting. Ocean Springs, MS. http://www.ss-aspb.org/resources/2011-Titles-and-Abstracts-SS-ASPB-2011.pdf, p. 9.

Wang Y., A. Hasan, Z-y. Chen and M.A. Cohn. 2011. Comparative proteomics of recalcitrant seed death in Spartina alterniflora. Crop Science Society of American Annual Meeting, San Antonio, TX. http://a-c-s.confex.com/crops/2011am/webprogram/Paper65894.html.

Participants:

M.A. Cohn (PI), LSU AgCenter.

Target Audiences:

The seed conservation community; coastal preservation community; and undergraduate and graduate students in seed physiology and professional development courses.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date
BOY R USL		