

WILEY



---

TROPICAL PIONEER SEEDS HAVE DIFFERENT DORMANCY-DEFENSE SYNDROMES THAT HELP THEM TO SURVIVE IN THE SOIL SEED BANK

Author(s): Paul-Camilo Zalamea, Carolina Sarmiento, James W. Dalling, A. Elizabeth Arnold and Adam S. Davis

Source: *Bulletin of the Ecological Society of America*, Vol. 99, No. 4 (OCTOBER 2018), pp. 1-3

Published by: Wiley on behalf of the Ecological Society of America

Stable URL: <https://www.jstor.org/stable/10.2307/26501960>

---

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



Wiley and Ecological Society of America are collaborating with JSTOR to digitize, preserve and extend access to *Bulletin of the Ecological Society of America*

JSTOR

# TROPICAL PIONEER SEEDS HAVE DIFFERENT DORMANCY-DEFENSE SYNDROMES THAT HELP THEM TO SURVIVE IN THE SOIL SEED BANK

Paul-Camilo Zalamea , Carolina Sarmiento , James W. Dalling, A. Elizabeth Arnold and Adam S. Davis

## Study Description

Seeds of tropical pioneer trees use strategies to overcome the two challenges they face after dispersal: (1) stay alive until the right conditions to grow into a new plant occur and (2) avoid being eaten by predators or decayed by soil microbes. Many of the seedlings that are able to grow and survive come from seeds long buried in the soil. For the first time, we are making the connection between seed dormancy—the characteristics that make it possible for a seed to wait until environmental conditions are suitable and seed defenses—the characteristics the seed uses to avoid being eaten or decayed. We found that overall, pioneer tree species have three different strategies to survive in the soil. Species that adopt each of these strategies share common characteristics or *seed-defense syndromes*.

Zalamea, P.-C., C. Sarmiento, J. W. Dalling, A. E. Arnold, and A. S. Davis. 2018. Tropical pioneer seeds have different dormancy-defense syndromes that help them to survive in the soil seed bank. *Bull Ecol Soc Am* 99(4):e01451. <https://doi.org/10.1002/bes2.1451>

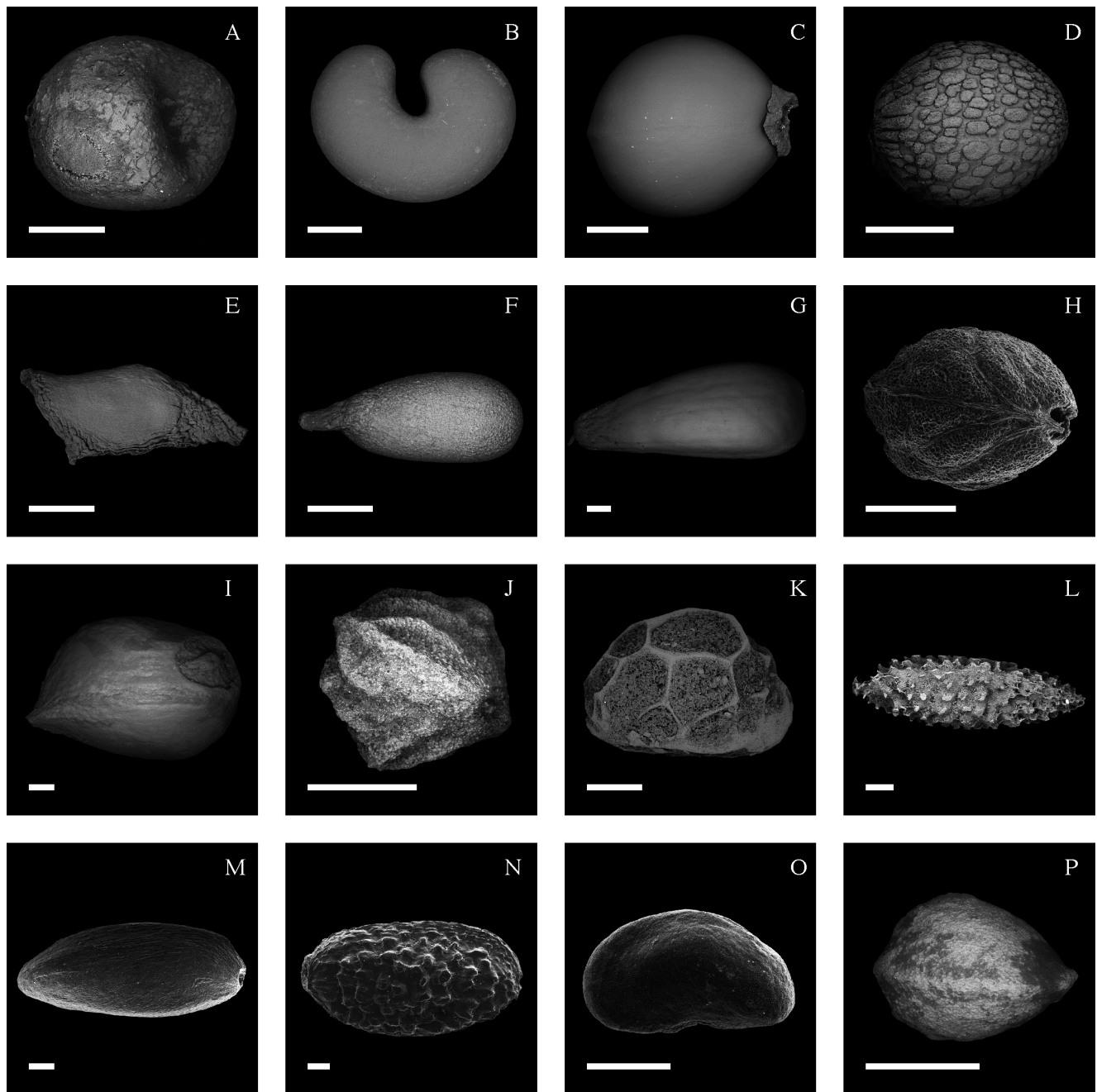


Fig. 1. Scanning electron microscopy images of fresh seeds of pioneer trees. The seeds correspond to the 16 species used in this study, and images are organized according to their seed dormancy defense syndrome. Species corresponding to the *physically dormant* defense syndrome are as follows: (A) *Apeiba membranacea*, (B) *Cochlospermum vitifolium*, (C) *Colubrina glandulosa*, (D) *Guazuma ulmifolia*, (E) *Luehea seemannii*, and (F) *Ochroma pyramidale*. Species corresponding to the *physiologically dormant* defense syndrome are as follows: (G) *Annona spraguei*, (H) *Hieronyma alchorneoides*, (I) *Lindackeria laurina*, (J) *Trema micrantha* “black,” and (K) *Zanthoxylum ekmanii*. Species corresponding to the *quiescent* defense syndrome are as follows: (L) *Cecropia insignis*, (M) *Cecropia longipes*, (N) *Cecropia peltata*, (O) *Ficus insipida*, and (P) *Trema micrantha* “brown.” Scale bars correspond to 1 mm, except for the three species of *Cecropia* in which the bars correspond to 200  $\mu$ m. Images credit: Paul-Camilo Zalamea and Carolina Sarmiento.

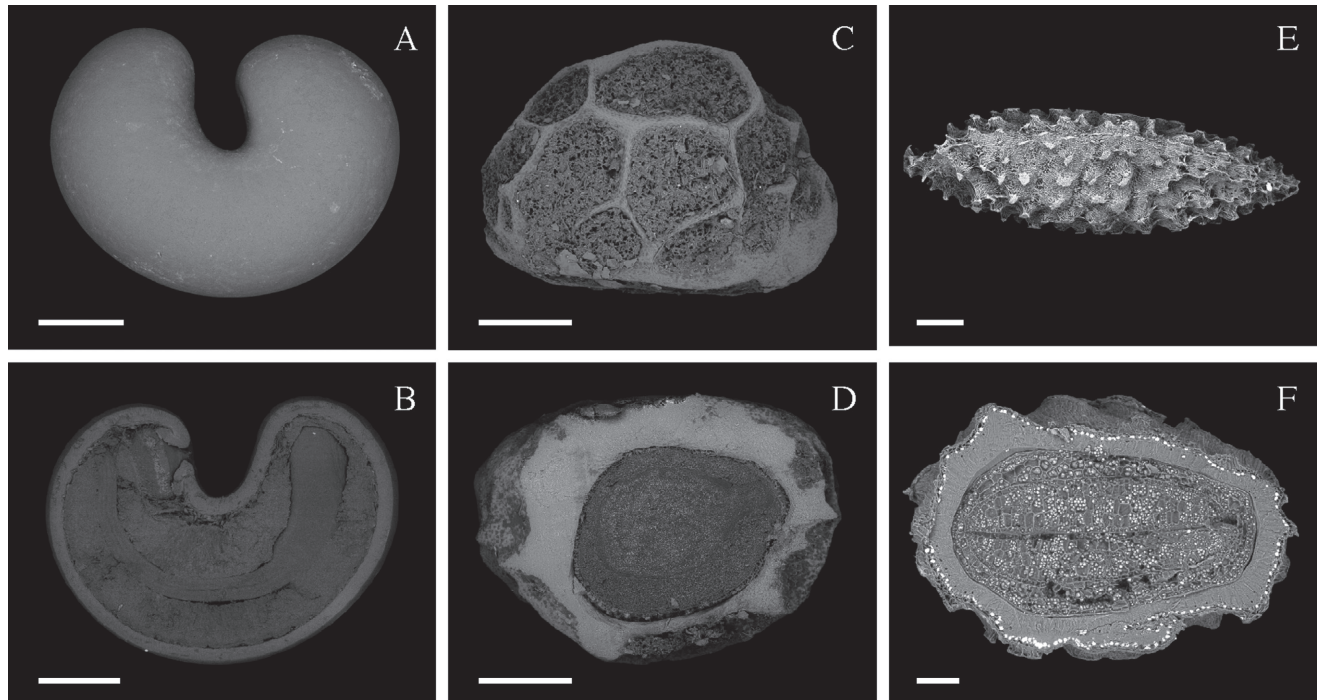


Fig. 2. Scanning electron microscopy images of fresh seeds of pioneer trees. (A) Seed surface and (B) longitudinal section of *Cochlospermum vitifolium*, which is a representative species of the *physically dormant defense syndrome*. (C) Seed surface and (D) longitudinal section of *Zanthoxylum ekmanii*, which is a representative species of the *physiologically dormant defense syndrome*. (E) Seed surface and (F) transverse section of *Cecropia insignis*, which is a representative species of the *quiescent defense syndrome*. Scale bars correspond to 1 mm for *C. vitifolium* and *Z. ekmanii* and 200  $\mu$ m for *C. insignis*. Images credit: Paul-Camilo Zalamea and Carolina Sarmiento.

These photographs illustrate the article “Dormancy-defense syndromes and trade-offs between physical and chemical defenses in seeds of pioneer species” by P-C. Zalamea, J.W. Dalling, C. Sarmiento, A.E. Arnold, C. Delevich, M.A. Berhow, A. Ndobegang, S. Gripenberg, and A.S. Davis, published in *Ecology*. <https://doi.org/10.1002/ecy.2419>