Dr Eduardo Fernández-Pascual

Royal Botanic Gardens, Kew,

Wellcome Trust Millennium Building,

Wakehurst Place, West Sussex, UK

March 2, 2017

**Re: Submission of a*n Application* to *Methods in Ecology & Evolution***

Dear Professor Freckleton,

We present our paper, a **Standardised measurement of seed functional traits: automated calculation of germination cardinal temperatures and thermal time using R** for consideration as an *Application*.

Plant traits are taking on an unprecedented scale of compilation and cooperation in online databases, which creates the opportunity to study global patterns of functional diversity as never before. But regeneration traits have largely been limited to seed mass, and recent articles have highlighted the lack of integration between seed biology and plant functional ecology. There is an increasing recognition of the necessity for a wider selection of relevant seed traits. Last October there was a seed traits symposium at Kings Park Botanic Garden, Australia, the organisers of which have been mobilising to initiate a seed traits database. Nevertheless, the lack of standardised trait measures is holding back the inclusion of germination traits.

Physiological time models are an excellent way to measure germination in a mechanistic way, but require complex calculations and current methods are disjointed. The method we present here has three advantages over existing approaches: (1) It removes user judgement and bias when selecting breaking points in the data; (2) it is much faster; and (3) it is based on open-source software. More importantly, it will standardise calculations and help seed biologists to produce high quality germination trait data for comparative and global meta-analyses. To the best of our knowledge no previous article has undertaken such standardisation of germination traits. We believe that this method will help to meet the increasing demand for germination traits in all fields of plant ecology.

We recognise the word count is a little long, but we strive to give introductory level help to maximise the uptake of the technique by a community which is relatively unaccustomed to R. As disseminating new methods is an attractive focus of *Methods in Ecology & Evolution,* we have selected it as the ultimate choice to publish our work. To assist in your review we suggest two potential referees who wrote the pivotal R packages we apply to this problem, and two who are experts in germination thermal time traits, and physiological aspects of the models. We trust that this letter and the enclosed manuscript will be received favourably and look forward to hearing from you in the near future.

Yours Sincerely,

Emma Ladouceur, Hugh Pritchard and Eduardo Fernández-Pascual

The Native Seed Science Technology and Conservation Initial Training Network (<http://nasstec.eu>)