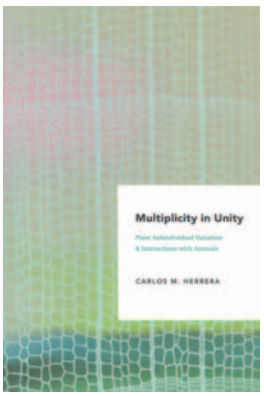
Book Review

Annals of Botany **00**: i–i, 2012
Available online at www.aob.oxfordjournals.org

doi:10.1093/aob/mcs279



Multiplicity in unity. Plant subindividual variation & interactions with animals
Carlos M. Herrera. 2009.
University of Chicago Press. $40 (paperback). pp. 448.

Differences between individuals are one of the things that all humans learn early in life; babies soon grasp the important differences between daddy and mommy. In general terms, however, variability within an individual is not so obvious because most animals lack repetitive structures. But organisms such as plants or corals do exhibit intra-individual variability – a common characteristic often displaying marked differences between individuals or populations. Traditionally, research in biology and ecology has concentrated on studying the mean of these entities, but in trying to understand processes that distinguish two types of individuals, populations, communities or ecosystem processes, most investigations have tried to put the variance under the carpet. In *Multiplicity in unity*, Carlos Herrera gives an elegant and detailed explanation on why we have to take into account variation around the mean, because variation itself gives information about individuals, populations and communities. It is this variation that is under natural selection pressure.

The author focuses on plants to explain how variation around a character trait is not only related with individuals, but that there is substantial intra-individual variation related with ontogeny. The author emphasizes the importance of the ontogenetic contingency for plants that is determined by the interplay between position of a particular organ, developmental history, and internal and external environment.

An interesting discovery when considering variation around the mean in addition to the mean itself, is that sampling one plant population or one character once is no bad thing, since for many organs or characters (e.g. seed size, fruit diameter, water content) inter-annual variation is very low while simultaneous variation is very high. Therefore when studying natural populations on a single occasion you may be capturing all the variation present in the entity without the necessity of sampling several times.

The information presented throughout the book is abundant with examples and has good graphic companions that reinforce the arguments presented. Therefore it is a good text that can be used by students and researchers interested in the topic. The first chapters explain how intra-individual variation occurs, the plant organs that present the variability with higher frequency, the importance of environment for intra-individual variation and, most importantly, highlights the fact that this variation has a genetic origin and therefore can respond to selective pressures. Subsequent chapters give examples on how this variability determines the strength and type of interaction with herbivores, pollinators and seed dispersers. Interestingly, the author highlights the fact that very few studies have taken into consideration this variability and many open questions remain to be studied.

Throughout, the author emphasizes the consequences of within-plant variation for interactions with animals, and proposes that intra-individual variation is the pivotal element for mutualistic and antagonistic interactions. As a result, Herrera's book offers an excellent overview of the evolutionary ecology of plant–animal interactions with different approaches, while highlighting the relative lack of emphasis given to intra-individual variation in classical studies on this topic. For anyone interested in the ecology or evolutionary biology of plant–animal interactions this book therefore provides a new way of looking at an old question.

Ek del-Val
E-mail ekdelval@oikos.unam.mx