Population epigenomics in plants

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Abstract

Epigenetic inheritance is relatively common in plants, where the germline arises from somatic cells exposed to developmental and environmental cues, and reprogramming in the gametes and early zygote is only partially complete. Heritable changes in epigenetic states (i.e. epimutations) therefore arise frequently in plant genomes and shape patterns of population epigenomic variation over time. The extent to which such epimutations occur independently of genetic changes, their effects on plant fitness and whether they are stable enough to respond to natural or artificial selection are key questions when assessing their evolutionary and agricultural implications. Here I review recent population epigenomic studies in various plant species and show that these studies have begun to shed important insights on these questions. I will argue that the application of recent theoretical models to epigenomic data of natural populations promises to further deepen our understanding of the evolutionary role of epigenetic inheritance in plant adaptation.

Keywords: epigenetics, epigenomics, plants, population genetics, selection, bioinformatics

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