

Tracking gene flow in marine plant evolution

December 10 2012

A new method that could give a deeper insight into evolutionary biology by tracing directionality in gene migration has just appeared in *EPJ Data Science*. Paolo Masucci from the Centre for Advanced Spatial Analysis, at University College of London, UK, and colleagues identified the segregation of genes that a marine plant underwent during its evolution. They found that the exchange of genes, or gene flow, between populations of a marine plant went westward from the Mediterranean to the Atlantic. This methodology could also be used to estimate the information flow in complex networks, including other biological or social networks.

The authors focused on a plant called *Cymodocea nodosa*, found in a marine area ranging from the East Mediterranean to the Iberian-African Atlantic coast. They relied on molecular markers to retrace the plant's [gene flow](#), among distinct [plant populations](#) that are distant geographically. The idea was to infer the evolutionary pathways from datasets obtained by sequencing the plant, made of portions of non-coding DNA, called microsatellites.

Previous [population genetics](#) methods did not allow us to infer the direction of migration with such molecular data. Their statistical analyses require complex computing power, limiting the ability to explore simple evolutionary scenarios.

The authors restricted their analysis of a microsatellite genetic-markers dataset to those found in restricted island areas, among samples collected from the Mediterranean to the Atlantic. The team then inferred the past

history of the gene flow based on the geographical distribution of genetic variations.

Masucci and colleagues found that gene flow most likely occurred westward from the Mediterranean to the Atlantic. Dominant Mediterranean genetic variations penetrate into the nearest Atlantic sites, but the opposite is not true. Natural evidence and an independent cross analysis confirmed these findings.

More information: A. P. Masucci, S. Arnaud-Haond, V. M. Eguíluz, E. Hernández-García and E. A. Serrão, Genetic flow directionality and geographical segregation in a *Cymodocea nodosa* genetic diversity network, *EPJ Data Science*, 2012, 1:11, [DOI10.1140/epjds11](https://doi.org/10.1140/epjds11)

Provided by Springer

Citation: Tracking gene flow in marine plant evolution (2012, December 10) retrieved 26 March 2023 from <https://phys.org/news/2012-12-tracking-gene-marine-evolution.html>

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