Integrative taxonomy of the spleenwort fern (Aspleniaceae, leptosporangiate ferns) flora of Cuba

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I am conducting my PhD project on the evolution of the poorly known spleenwort ferns of the West Indies. I took advantage of the different taxonomic treatments published in the region, and ongoing morphological studies of Cuban species by Ledis Regalado (IES, Havana). In 2013, after the first spore counts and preliminary molecular phylogenetic analysis, I detected the existence of cryptic diversity in two species of *Asplenium* (*A. dentatum* and *A. heterochroum*) sampled in West-Central Cuba. This highlighted the need for genetic analysis in the group and suggested the need for an integrative taxonomic study of the family in Cuba. For this purpose I decided to extend the sampling to other localities on the island. To cover the transportation costs during field work, I applied for a Research Grant for Plant Systematics of the International Association for Plant Taxonomy (IAPT) in 2014.

Report

Between June 2014 and January 2015 I visited 14 localities of the western, central and eastern Cuba (Fig 1). In total 290 individuals from 22 species were sampled (see list of species below, Fig.2). From each individual sterile leaf tissue fragments were preserved for DNA extraction, and fertile leaves for spore measurement and culture experiments. Specimens of two individuals per species were collected in each locality. In total 112 vouchers were collected and deposited in the Herbario de la Academia de Ciencias, La Habana (HAC) and the Botanische Staatssammlung München (M).

List of species

Asplenium abscissum Willd.
Asplenium auriculatum Sw.
Asplenium auritum Sw.
Asplenium cristatum Lam.
Asplenium cuneatum Lam.
Asplenium dentatum L.
Asplenium dimidiatum Sw.
Asplenium erosum L.
Asplenium feei Kunze ex Fee
Asplenium formosum Willd.
Asplenium juglandifolium Lam.
Asplenium monodon Liebm.
Asplenium mortonii Duek.
Asplenium pumilum Sw.
Asplenium radicans L.
Asplenium rhomboidale Desv.
Asplenium salicifolium L.
Asplenium serra Langsd. & Fisch.
Asplenium serratum L.
Asplenium veneticolor L. Regalado & C. Sanchez
Hymenasplenium laetum (Sw.) L. Regalado & C. Prada
Schaffneria nigripes Fée

Figure 2. Selection of species of Aspleniaceae sampled between 2014 and 2015. (a) Asplenium auriculatum, (b) A. cuneatum, (c) A. dentatum, (d) A. erosum, (e) A. formosum, (f) A. juglandifolium, (g) A. Mortonii, (h) A. pumilum, (i) A. rhomboidale, (j) A. salicifolium, (k) A. veneticolor, (l, m) Hymenasplenium laetum, (n) Schaffneria nigripes
The sampling obtained during these field trips, together with previously collected material, will allow clarifying the taxonomy of several species complexes in Cuba and the Neotropics. I was able to collect 27 of the 35 species of spleenwort ferns recognized from Cuba. I produced DNA sequences of four chloroplast markers from the collected samples. In addition to that I compiled homologous DNA sequences stored in GenBank. I am currently analyzing all the gathered sequences to reconstruct the phylogenetic relationships of Neotropical spleenwort ferns using the most comprehensive global sampling available to date.

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