Review of Urrea et al.:

This is a very interesting and well-presented manuscript. The authors presented a concise, well-writen and complete phylogenetic re-study of a group of well-known group of fern with extant and fossil representatives. Their study includes an interesting evaluation of characters building and character dependence considered, and the use or not of weighted strategies of phylogenetic reconstruction. I am not a specialist on this taxonomic group but I consider this approach very useful to a broad public of phylogeneticist that frequently work with fossil and extant taxa. On one hand, the consideration of dependence-independence characters schemes is not widespread among systematic studies and this example and their discussion contributes to generating a useful resource to them. On the other hand, the discussion between character-dependence, weighted parsimony and systematic or taxonomic approaches is important for these researchers and their practices. I am happy to have reviewed this manuscript and hope that my comments will help to shape it better.

Introduction

Introduction has some minor shortcomings. Setting of the main features of the Osmundales fossil records has some problems: 1) there are contradictions with biochron of the group between Abstract and Introducion, 2) you established Osmundales having one of the most diverse fossil record and this broad statement need to be reviewed (the most diverse fossil record of plants? of ferns? of any fossil group?.

You introduce the concept of mosaicism as one of the main sources of problems for reconstructing Osmundales relationships. Perhaps this, you do not write any line about this and it might be interesting to expand it a bit.

Are there some examples of use of character dependence? If this is not the case, you can give more power to this from the introduction.

Use of italics and 'sp.'

This is a small issue. But it deserves more attention: scientific names should be italicised, and the 'sp.' should not be italicized. This is a frequent error but should be corrected.

k5 group in text, figures and supplementary information

There are a problem with the experimental design of the analyses. On Materials and Methods section you indicated to explore six groups of topologies, but explain only five: ew-nodep, ew-dep, k10-dep, k15-dep, and k20-dep. In following paragraphs, figures and supplementary material of the manuscript, you sometimes mentioned six and sometimes five groups. My guess is that at some point in the writing of the paper they added or removed the "k5-dep" group and that caused the problem.

I highlighted some mentions of this k5-dep group in the attached file. I suggest to review the text carefully and making a decision on k5-dep group. I think that keeping it does not change the results and the discussion.

Character dependence and diagnoses

The approach of exploring character dependence is an important novelty of the present study and one of the main contribution to a broad audience. The use of dependences lead to discuss the relationships between diagnoses and clade synapomorphies. These two types of characters (in a broad sense, not only phylogenetical) are frequently mixed or confused. Synapomorphies can be used to define diagnoses, but diagnoses do not strictly correspond to clade synaopomorphies.

You could include a brief sentence including this problem in the last paragraph to draw attention on this issue.

As is consulted above, are there another example of the use of character dependence? If is the case, this section of the discussion would be the best place to compare.

Discrepancies with Bomfleur et al's approach

This another important point of the discussion. Bomfleur et al. study is the main source of information about relationships and systematics on Osmundales, and the source of the imput of morphological data-matrix used in this analysis.

I understand to Bomfleur's analysis is not phylogenetic in concept. Is a network analysis with phylogenetic objectives. Bomfleur et al. considered the "standard" phylogenetic approach (cladistic-based systematics in their terms) unhelpful in this case. You are clear explaining the shortcomings of the Bomfleur's approach, but you could be more categorical. For example, Bomfleur et al suggests the use of paraphyletic groups as valid taxonomic units arguing that is a "consequence of tradition among cladists" (quote: "*presumably for no other reason than to be consistent with traditional assertions by early cladists*"). Contradictorily, above this mention Bomfleur et al assume classifications need to be phylogenetically meaningful (requiring "natural" groups).

I know it may seem aggresive suggesting this, but Bomfleur et al are more categorical and deserve a categorical response.

Table 1 visualization

This table is hard to visualize. Perhaps keeping repeated taxa on the same line or including separation lines between the different families and subfamilies.

Figure 2 explanation

Figure 2 is not self-explanatory. Groups of analyses represented in the boxes need to be indicated.

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-Los salarios más bajos de los últimos 20 años
-Suspensión de financiamientos para investigación
-No ejecución de fondos BID para la ciencia
-Congelamiento de los ingresos a carrera de investigador y promociones
-Fuertes recortes en becas doctorales

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