

## Responses from authors Árnason et al.

### Interactive comment on “Spatial genetic structure of the Sea Sandwort on Surtsey: an immigrant’s journey” by S. H. Árnason et al.

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The authors present a nice study on island colonization by a polyploid plant with robust past knowledge of the colonization history. The sampling and methods are appropriate to address their hypotheses. The questions I raised during the earlier stage of revision were well addressed and the new version is now well improved.

p4 l15-27: recent literature on island biogeography (Whittaker, Triantis & Ladle 2008 JBI, 35(6) 977-994) show that not only island size or isolation act on diversity but also island age (General Dynamic Model) which is of particular interest here as the Surtsey is a very young island. One sentence about it could be mentioned in the introduction and might be useful to enhance more your own results.

minor corrections:

page 3 : sentence 1, replace "if Iceland" by "of Iceland"

section 2.3. page 16 line 17: I would remove the "of" between July 2010 and May 2011.

same sentence replace ", of these" by "from which" Line 19: I think it might be clearer for the reader to replace "This includes;" by "The 12 locations are : five on Surtsey (SC: located...,...), two on Heimaey" and so on; and I would put all the descriptions of locations between parentheses.

page 21 line 3 : misspelling in between

Page 19 line 2 : misspelling in heterogeneity

Interactive comment on Biogeosciences Discuss., 11, 10045, 2014

#### Authors' response to A Désamuré:

We thank you very much for the constructive and helpful comments throughout the review process. The suggested reference about the island age model is greatly appreciated. A new paragraph has therefore been added to the Introduction section citing Whittaker et al. 2008 (BGD page 10048, after line no. 28.) and a sentence in the Discussion section (BGD page 10061, at line no. 14).

Diversity is not only affected by island size and isolation, but also by island age. According to the general dynamic model (GDM) of oceanic island biogeography (Whittaker et al., 2008), a loss of physical and topographic capacity together with an increase in biotic interactions and competition can lead to a decline in species richness or diversity as an island ages. In this context the young island of Surtsey provides an ideal environment, both spatially and temporally, to test whether the ecological opportunity provided by the vacant niche space on the island can have a positive effect on the genetic diversity of colonizing species. Most studies to date however, involve old islands, which presumably are in the declining phase of the diversity curve

This development fits the general dynamic model (GDM) of oceanic island biogeography relatively well regarding young and small islands (Whittaker et al. 2008).

All minor comments have been corrected, see Materials and Methods section 2.3 (BGD page 10051).

# Interactive comment on “Spatial genetic structure of the Sea Sandwort on Surtsey: an immigrant’s journey” by S. H. Árnason et al.

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In figure 2 it would be more clear to have a "network" look of the unrooted NJ trees since the presentation now is not showing clearly how, in the b part, SF group together with SE and SK. Attached is a sketch of how I would have presented the b part of figure 2.

In the second last line in the figure text following Figure 1 there is a misspelling, "Cluste-  
l"

## Authors' response to S Heiðmarsson:

We would like to thank the reviewer for his very constructive advise on how to improve Figure 2, the NJ trees (BGD page no. 10081). Please see here below the new and improved version of this figure. The one spelling error in legend of Figure 1 has been corrected.

