Solid Earth Discuss., 6, C1553–C1569, 2015
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Solid Earth
Discussions
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Interactive comment on "Co, Cr and Ni contents in soils and plants from a serpentinite quarry" *by* M. Lago-Vila et al.

M. Lago-Vila et al.

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(1) comments from Referees, General comments The paper submitted by Lago-Vila et al is interesting and it is under the scope of Solid Earth. However, despite this, the paper needs to be strongly rearranged. The paper introduction needs to be reorganized. There is a lack of references that supports the ideas presented by the author. Other important question is the number of samples and the analytical methods. The number of samples it is not enough to represent a site and in addition, composite samples, can mask the results obtained. I think that the samples should be analysed individually and not mixed. The paper can be considered for publication if the authors provide a good explanation. It is very likely that the authors used this methodology previously. In this case they should explain clearly why samples were mixed, especially considering that

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soil spatial variability can be high. The statistical analysis should be better explained and some results need to be better discussed.

(2) author's response, Thank you very much for your comments. We have taken most of them into account following your general comments but also minor comments from you and the other reviewer.

(3) author's changes in manuscript The introduction has been reorganized as well as new references have been included. Material and methods was clarified attending reviewer's comments. The discussion of the results has been improved attending reviewer's comments.

(1) comments from Referees, Minor comments Please put the full names of the chemical elements in the title

(2) author's response, Done.

(3) author's changes in manuscript The full names of the chemical elements are now included in the title.

(1) comments from Referees, Page 2 Abstract Line 1: Drop some lines about the study background.

(2) author's response, Done.

(3) author's changes in manuscript A brief sentence about the study background was included in the abstract of the manuscript.

(1) comments from Referees, Page 2 Abstract Line 6: phytostabilization of these areas or these heavy metals?

(2) author's response, Thank you.

(3) author's changes in manuscript The sentence was rewritten.

(1) comments from Referees, Page 2 Abstract Line 7-8: Which elements?

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(2) author's response, Most of the imbalances are due to the high Mg contents. This was clarified in the text. Potassium represents less than 2% in the ECE of soils S3, S4 and C5 and the ratio Ca/Mg is < 1 in S1, S2 and C5 soils, even less than 0.5 in some of them (considered as hipermagnesic soils).

(3) author's changes in manuscript The sentence was rewritten including the elements that produce the imbalances.

(1) comments from Referees, Page 2 Abstract Line 8-9: Which soils?, Please provide the information in the abstract

(2) author's response, The studied soils from the Penas Albas quarry as well as the control soil.

(3) author's changes in manuscript It was clarified in the text which soils are referred.

(1) comments from Referees, Page 2 Abstract Line 9-10: Change "Co, Cr and Ni" by "Cobalt (Co), Chromium (Cr) and Nickel (Ni)"

(2) author's response, Done.

(3) author's changes in manuscript We changed "Co, Cr and Ni" into "Cobalt (Co), Chromium (Cr) and Nickel (Ni)

(1) comments from Referees, Page 2 Abstract Line 10: Which guides?

(2) author's response, They are guides where soil guideline values are shown like DEFRA and Environmental Agency (2006) and RIVM (2001).

(3) author's changes in manuscript We have changed the sentence in order to clarify which guides are.

(1) comments from Referees, Introduction Line 22-23: provide a reference to this idea.

(2) author's response, We have selected one reference that supports the idea.

(3) author's changes in manuscript We have included the reference in the text and in

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the list of references.

(1) comments from Referees, Introduction Line 24-26: What thesis you refer. Please explain it and provide the citation for this.

(2) author's response, We have reorganized the sentence and including more information as well as the citation for this.

(3) author's changes in manuscript We have reorganized the sentence and including more information as well as the citation for this.

(1) comments from Referees, Introduction Page 3 Page 1-2: Soil erosion and pollution are a part of soil degradation. Delete soil erosion and pollution, or delete soil degradation.

(2) author's response, Thank you.

(3) author's changes in manuscript We deleted soil degradation in the text.

(1) comments from Referees, Introduction Page 3 Line 4-6: Stressefull environments to whom? To plants? If yes please write it.

(2) author's response, Yes, to plants and also other living organisms. Thank you.

(3) author's changes in manuscript It was included this information in the sentence.

(1) comments from Referees, Introduction Page 3 Line 4: Change "offer a stressful environment" by "are stressful environments"

(2) author's response, Done. Thank you.

(3) author's changes in manuscript "offer a stressful environment" was changed into "are stressful environments"

(1) comments from Referees, Introduction Page 3 Line 7: Change "5%" by "Five %"

(2) author's response, Done. Thanks!

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(3) author's changes in manuscript "5%" was changed into "Five %"

(1) comments from Referees, Introduction Page 3 Line 7-9: Provide a reference that supports this idea.

(2) author's response, Done.

(3) author's changes in manuscript The reference was included in the text (it was already included in the list of references).

(1) comments from Referees, Introduction Page 3 Line 9-14: Provide a reference that supports these arguments.

(2) author's response, Done.

(3) author's changes in manuscript There was introduced a reference in the text and in the list of references.

(1) comments from Referees, Introduction Page 3 Line 14-24 This should be placed in materials and methods (site description). Not in the introduction.

(2) author's response, Done.

(3) author's changes in manuscript We have deleted line 14-24 in page 3 of the introduction and it the information was included in the material section after being arranged to fit in.

(1) comments from Referees, Introduction Page 3 Line 24-28: You write "Spolic Technosols from this quarry", however, none of the references provided studied the spolic technosols from your study area. Please clarify it.

(2) author's response, Even Spolic Technosols share properties, we have deleted "from this quarry" to avoid confusion.

(3) author's changes in manuscript "from this quarry" was deleted.

(1) comments from Referees, Introduction Page 4 Line 4-5: Provide a reference that

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supports this argument (2) author's response, Done.

(3) author's changes in manuscript The reference Bidar et al., (2009) was included in the text and in the list of references.

(1) comments from Referees, Introduction Page 4 Line 6-11: Delete this. You already spoke before about soil pollution and degradation. Please order the introduction.

(2) author's response, Done.

(3) author's changes in manuscript Line 6-11 from page 4 was deleted.

(1) comments from Referees, Introduction Page 4 Line 12-16: Provide a citation or citations that support this idea. You have to have a criteria when yu are writing the chemical elements name. Or you write the abbreviation, or the full name. If possible do it as I suggested you before.

(2) author's response, We have included new references and the elements are written as you suggested.

(3) author's changes in manuscript New references are included (in the text and in the list of references) and the elements are written as the reviewer suggested.

(1) comments from Referees, Introduction Page 4 Line 17: The total content of what? Of soil heavy metals? If yes, please write it.

(2) author's response, Yes, the total content of heavy metals in soils.

(3) author's changes in manuscript The sentence was rewritten.

(1) comments from Referees, Introduction Page 4 Line 17-21: Rewrite this sentence. In the current form it is not understandable.

(2) author's response, Done.

(3) author's changes in manuscript The sentence was rewritten.

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(1) comments from Referees, Introduction Page 4 Line 22-25: The available content of what? Of metals? Please show the large number of factors.

(2) author's response, Done.

(3) author's changes in manuscript We have included examples of the factors of the contaminating element and the soil that influence the availability of heavy metals in soils.

(1) comments from Referees, Introduction Line 26-26: Where this methods were applied? In which studies

(2) author's response, We have included the reference in the text.

(3) author's changes in manuscript The reference was included in the text.

(1) comments from Referees, Introduction Page 6: Line 5: change "the aims of this study were" by "the aim of this study is"

(2) author's response, Done.

(3) author's changes in manuscript "the aims of this study were" was changed into "the aim of this study is"

(1) comments from Referees, Materials and Methods Line 18: Describe in the table 1 the slope inclination in % and linked it to the text.

(2) author's response, Done.

(3) author's changes in manuscript We have linked the table 1 to the text and included the slope inclination in % in the corresponding place in the table.

(1) comments from Referees, Materials and Methods Line 21-27: Three samples per sub-areas are too little to be representative of each place. In addition you mixed the samples. What is not understandable is that after sieve the soil you divided again in three different samples. My question is, would not be easier to analyse each sample

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individually and do not mix them. From this point I have many doubts about these results. Maybe you used this methodology in previous works. However in my point of view it is not correct. If you used before, please cite it.

(2) author's response, We deleted the part where it says it is representative of the whole area. We agree and it was quite ambitious. The taken samples were relatively close to each other (less than 1 meter distance), we mixed the samples to avoid any problems caused by higher stoniness and to have a more representative soil sample than if we only take one. Plant samples, especially when roots are higher enough take nutrients not only from where the stem is, we took soil samples in order to take this fact into account. Maybe we introduce confusion when we indicated that they are three sub-areas, but the distance is not big among samples. It can be considered as an only soil sample, but the truth is we take three different points close to the plant we selected and of course we are not sure because of the heterogeneity of them, it is supposed that selected plants can take nutrients from the samples we took.

(3) author's changes in manuscript We have deleted the part of the text where it says it was representative of the whole area.

(1) comments from Referees, Materials and Methods Page 7 Line 2-3: Did you use the Munsell color Chart. If yes please write it

(2) author's response, Yes, we used the Munsell Soil Color Chart.

(3) author's changes in manuscript We included the reference for Munsell Soil Color Charts in the text and in the list of references.

(1) comments from Referees, Materials and Methods Line 15 and 19: Write the full names of the chemical elements. If is the ïňĄrst time that you mention it in the text, write the abbreviation in parenthesis.

(2) author's response, Done.

(3) author's changes in manuscript The full names of the chemical elements are now

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included in the text.

(1) comments from Referees, Materials and Methods Line 14: At which level, signiïňĄcant differences were identiïňĄed? At p<0.05? If yes, please show it in the text.

(2) author's response, Yes, it was p<0.05.

(3) author's changes in manuscript p<0.05 is included in the text.

(1) comments from Referees, Materials and Methods Line 16: At which level, signiïňĄcant correlations were identiïňĄed? At p<0.05? If yes, please show it in the text.

(2) author's response, Done.

(3) author's changes in manuscript The level of the correlations is included in the text.

(1) comments from Referees, Page 10: Line 1-4: Discuss better these results. Linking it to the tables is not enough, neither clear to the reader.

(2) author's response, Done. Thank you.

(3) author's changes in manuscript We have included a new paragraph explaining better the results and linking them to the tables.

(1) comments from Referees, Page 10: Line 13-14: Provide a reference that supports these arguments

(2) author's response, Done.

(3) author's changes in manuscript A new reference was included in the text and in the list of references.

(1) comments from Referees, Page 10: Line 18-25: You do not need to refer the values, they are in the table. Use the same criteria when you are describing the results.

(2) author's response, Done. Thank you.

(3) author's changes in manuscript We have deleted the values when possible and they

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are now referred to the corresponding table.

(1) comments from Referees, Page 10: Line 20: What is the level for the soils be consider “hypermagnesic”.

(2) author’s response, The level for being considered hypermagnesic is, according to Chardot et al. (2007), when Mg/Ca ratio is higher than 3. They are considered magnesic soils when this ratio is higher than 1.

(3) author’s changes in manuscript The sentence was rewritten in order to clarify the results.

(1) comments from Referees, Page 10: Line 20-21: Provide a reference that supports these arguments

(2) author’s response, Done.

(3) author’s changes in manuscript The reference was included in both the text and the list of references.

(1) comments from Referees, Page 11: Line 2: Change “Ni” by “Nickel”

(2) author’s response, Done.

(3) author’s changes in manuscript “Ni” was changed into “Nickel” according to reviewer′s comments.

(1) comments from Referees, Page 11: Line 5: What do you mean by “higher plants”.

(2) author’s response, Higher plants are the vascular plants.

(3) author’s changes in manuscript No changes were made.

(1) comments from Referees, Page 11: Line 15: Please show the implications of this.

(2) author’s response, Done. We have included a sentence showing what means that these contents are higher than the limits for intervention showed in several guides.

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(3) author's changes in manuscript We have included a sentence showing what means that these contents are higher than the limits for intervention showed in several guides.

(1) comments from Referees, Line 18: Can you specify the "doses"?

(2) author's response, We have deleted this paragraph according yours instructions (below).

(3) author's changes in manuscript Line 18-19 was deleted.

(1) comments from Referees, Line 10: Change "Cr" by "Chromium"

(2) author's response, Done.

(3) author's changes in manuscript "Cr" was changed into "Chromium".

1) comments from Referees, Page 11: Line 18-19: Delete it.

(2) author's response, Done.

(3) author's changes in manuscript Line 18-19 was deleted.

1) comments from Referees, Page 11: Line 22-25: This seems to be evident, so why you studied the reagent extractions?

(2) author's response, Thanks! We have included the explanation.

(3) author's changes in manuscript It was included a sentence explaining the reason why the reagent CaCl2 extractions are used.

1) comments from Referees, Page 11: Line 27: Please provide a reference that supports this idea.

(2) author's response, It is not an idea, the sequence is different when soils with or almost without organic matter are extracted. Nevertheless, the extractions that extract higher (CaCl2 and EDTA) are the same in both cases. The same happens with BDW that extracts the lesser amounts of Ni in all studied soils. But we agree that maybe the

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sentence can create confusion and we have changed in order to clarify it.

(3) author's changes in manuscript The sentence was rewritten in order to avoid confusion.

(1) comments from Referees, Page 12 Line 15: Please discuss these results. Why some extraction methods were best than others.

(2) author's response, We have included a new sentence. The low amount of Cr releasead is indicative of no availability.

(3) author's changes in manuscript A sentence is now included to better explain the results.

(1) comments from Referees, Page 12 Line 19: Explain here the data of the table 4 (Metal extracted from the soils).

(2) author's response, The sections "soil extractions and extraction efficiency" where rewritten and more comments related to table 4 and figure 2 are now introduced.

(3) author's changes in manuscript The sections "soil extractions and extraction efficiency" where rewritten and more comments related to table 4 and figure 2 are now introduced.

(1) comments from Referees, Page 13: Line 1-8: Please describe the results. Do not repeat information.

(2) author's response, Done.

(3) author's changes in manuscript The text was deleted and a new sentence was introduced.

(1) comments from Referees, Page 13: Line 15: You write several authors, but you cite only one. Please clarify it. Or you add more authors or you delete several authors.

(2) author's response, Thanks.

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(3) author's changes in manuscript We have corrected the sentence

(1) comments from Referees, Page 13: Line 17: What mechanisms?

(2) author's response, This is an observation that Li et al (2009) showed in their work as it is already indicated in the paper. It is also indicated that the absorption of Co by the roots involves active transportation through the cell membranes but the molecular mechanisms involved are not known yet.

(3) author's changes in manuscript No changes were made in the manuscript.

(1) comments from Referees, Page 14: Line 10-11: Please explain why.

(2) author's response, Authors cited in the text indicated that Cr distribution in crops is stable and does not depend on soil properties and concentrations of this element. We have included this result in the text.

(3) author's changes in manuscript We have included this result in the text

(1) comments from Referees, Page 14: Line 13: Change "Nickel" by "Ni"

(2) author's response, Done.

(3) author's changes in manuscript "Nickel" was changed into "Ni"

(1) comments from Referees, Page 15: Line 3-4: The total content of what? Please provide a reference that supports this idea.

(2) author's response, The total heavy metal content in soils.

(3) author's changes in manuscript We have indicated that it is the total content of heavy metals in soils and included the reference.

(1) comments from Referees, Page 15: Line 25-27: Why this happens? Please explain it.

(2) author's response, Done.

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(3) author's changes in manuscript A new sentence that explains why LMWOA is the best extractant that predicts the bioavailability ofr Cr, Ni, and Co was introduced.

(1) comments from Referees, Page 15: Line 12-14: This should be placed in the materials and methods not here.

(2) author's response,

We think this is a result and must be placed in the results section not in the material and methods.

(3) author's changes in manuscript No changes were made.

(1) comments from Referees, Figures Figure 1: Change "Study zone" by 'Study area"

(2) author's response, Done

(3) author's changes in manuscript "Study zone" was changed into "Study area"

(1) comments from Referees, Figures Figure 2: Please do the ïňĄgures in colour. What means the hanging bars? Write it in the ïňĄgure caption

(2) author's response, Done.

(3) author's changes in manuscript Color figures are now included instead of the black and white ones. The meaning of the hanging bars is now included in the figure caption.

(1) comments from Referees, Tables Table 1: Provide the reference of the soil classiïňĄcation and the % of species distribution.

(2) author's response, The reference of the soil classification is included in each soil. The % of species distribution is not included since it was not measured and the result will not be accurate.

(3) author's changes in manuscript The reference of the soil classification is included in each soil in the table.

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(1) comments from Referees, Tables Table 2 and 3: What is the value that you have in brackets? Please write it in the table caption. Add a column with the ANOVA results and the p value. In the table 3 write the full name of all elements. To use the same criteria, do it also in the rest of the tables.

(2) author's response, There are no values in brackets. We have included a better explanation of the results shown in the table in the table caption. The p value is already included in the bottom of the table. The full name of the elements is now included. in all tables.

(3) author's changes in manuscript Table captions have been rewritten and the full name of the elements is now included in Table 3.

(1) comments from Referees, Tables Table 4: Provide the results of ANOVA . The table were you present the results of the metals extracted from the soils and the plant metal content should be separated. Please write the table caption accordingly.

(2) author's response, Results of ANOVA are included with letters. We consider that to split the table is not needed. Data are more illustrative if they are included together.

(3) author's changes in manuscript No changes were done.

(1) comments from Referees, Tables Table 5: Show the number of samples used to calculate the coefïňĄcient of correlation (N=. . .). Please substitute "Correlation is signiïňĄcant at level 0.05" by "Correlation is signiïňĄcant at p< 0.05". Do the same for 0.01.

(2) author's response, Done

(3) author's changes in manuscript We have included the number of samples used and changed "Correlation is signiïňĄcant at level 0.05" by "Correlation is signiïňĄcant at p< 0.05". Also for 0.01.

(1) comments from Referees, Tables Table 6 : What is the value that you have in

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brackets? Please write it in the table caption. Add a column with the ANOVA results and the p value.

(2) author's response, The table shows the mean values and the standard deviation. The p value is already included. (3) author's changes in manuscript

We have clarified the results in the table caption.

Interactive comment on Solid Earth Discuss., 6, 3361, 2014.

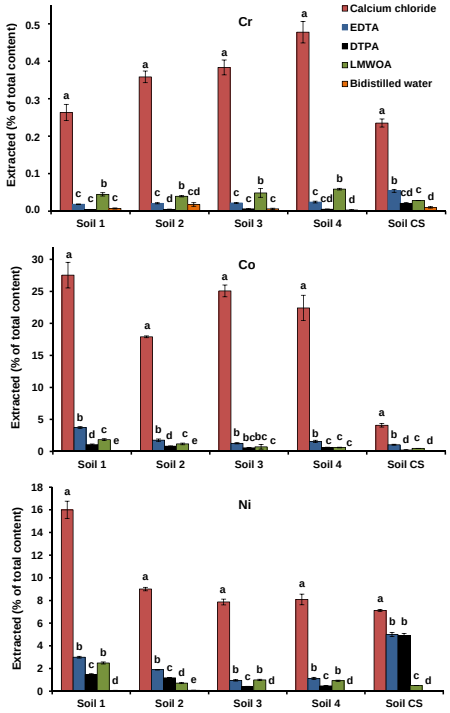

Fig. 1. Figure 2

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