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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Distribution and sources of bioaccumulative air pollutants at Mezquital Valley, Mexico, as reflected by the atmospheric plant *Tillandsia recurvata* L." *by* A. Zambrano García et al.

Anonymous Referee #1

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This manuscript contains interesting data on the analysis of metals, PaH, 13C and 15 N in a specific type of moss that is extended from Southern USA to South America. The study uses the bio-accumulative characteristics of this type of moss to identify sources of pollution in an industrialized area of Mexico that is also polluted by the use of recycled waste water for irrigation. The comparison of the levels measured in the study with other data from other studies, the spatial variation of levels of pollutants and the factor analysis are used to: a) determine the degree of pollution; b) the location of hotspots; c) the impact areas for different emission sources; d) the 5 main sources

(or in some cases mixture of sources) affecting levels of measured pollutants. The methodology is appropriate for the objective, the discussion well based on results and well organized and presented.

Based on the above considerations I recommend publication in APCD with minor revision based on the following comments:

1. Page 3 giva sigma 13C values for petroleum signature. 2. Page 4, consider what may be the impact on 15N when atmospheric deposition of NH4NO3 (or trapping of this pollutant by moss). You only discuss on NHy or NOx is influencing moss, but in aerosols these are present usually as ammonium nitrate. 3. Page 5. 'small and large' by 'different size'; 'electricity' by 'power'; 'open sky mining operations' by 'quarries'; 'tries' by 'tires' 4. Page 5. How is it possible to pollute moss with natural contributions? Do you mean soil dust? Quarry dust? Wind blown rock basement dust? The two first are anthropogenic, the third may be natural, but the contribution may be very low compared to the others. 5. Page 5: How exposure time to pollution is controlled? In the last line of this page you state that this may be one to 2 years. But this may represent a factor of concentration near to x2. It is this considered when comparing results from sampling sites. Would it not be better to grow the moss or to pick it up from very low pollution areas and expose it at the different sites for a similar period of time? 6. Page 6: Clarify what are 'clean samples' 7. Page 9: Take care with igneous rock composition. You have to know if the igneous rocks of your area are acidic or basic and select the mean composition of one or the other type for normalization, otherwise the range of concentrations may be very wide. 8. Page 9:'Other geochemically major elements' by 'Other geological major elements' 9. Page 10:' like Ni' by 'such as Ni' 10. Page12. r=.7 by r=0.7 and r=.39 by r=0.30 11. Page 13: apply discussion on previous comment #2 here. 12. Page 13: clarify NH4, NO3, NO3+ ??? or NH4+, NO3-???? In different parts of text. 13. Page 14: Title 3.4: Distribution of pollutants and identification of major emission sources 14. Page 14, last line: Specify in brackets the values for the north. 15. Page 17: Apply previous comment #12 here. 16. 'electricity' by 'power' 17.

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Page 17. 64% of the variance explained is not very high. Why you did not get higher explained variance? 18. Review using of units: ppm, mg kg-1, mg/kg. The tree types are used in text, figure and tables. Select one and correct along text, figure axis and figure and table headings, accordingly 19. Why sulfur levels were not analyzed using ICP-OES and presented??? It is very easy!!! Also the NO3- and Cl- levels would be interesting to be measured in water leachates. 20. Table 8: Why local soil does not contain Ca and only Mg, Mn, and Zn????? 21. F2 contains high Cu, usually enriched in sludge. 22. Give units in headings of Figures 3, 4, 6 and 8 23. Correct sigma in title of axis Y in figure 4 24. What type of normalization used in Figure 5?? State in Y axis and heading. 25. Figure 9: identify, first, second and third circles. Why Ca is not in soil? End of report

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 5809, 2009.