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Drinking Water
Engineering and Science
Discussions

Interactive comment on "Adsorption and Desorption studies of *Delonix regiapods* and leaves: Removal and recovery of Ni(II) and Cu(II) ions from aqueous solution" *by* Bolanle M. Babalola et al.

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Response to Interactive comments on "Adsorption and Desorption studies of Delonix regia pods and leaves: Removal and recovery of Ni(II) and Cu(II) ions from aqueous solution" by Bolanle M. Babalola et al.

The author's responses to the Interactive comments (RC1) on Bolanle M. Babalola et al. are as follows:

Anonymous Referee #1 General comments: Comments from referee A clear objective

(and knowledge gap) at the end of the introduction is still missing or weak. How does this relate to previous research in the area? Author's response A clear objective of the study has been included at the end of the introduction and the way it relates to previous research have been included (now in line 106-118). Comments from referee The"therefore" in line 99 is not well underpinned/ Author's response The "therefore" is now well underpinned (now in line 118). Comments from referee Language, including tenses, is of poor quality. - Redundant information should be deleted. Author's response Tenses have been revised and redundant information have been deleted. Comments from referee The discussion of the results is weak. How do the results link to other research? How are the results (including isotherm constants and kinetic constants) relate to other adsorbents? Author's response The results on the isotherm and kinetic studies have been linked and supported with other reported work (now in line 306-340; line 350-418). The kinetics, isotherm and removal efficiency of D. regia biomass are now compared with other agro-waste (e.g. now in line 337-340, Table 3 has been created for comparison, etc). Comments from referee The order of the presented results should be reconsidered. Better to start with the kinetic tests and equilibrium tests and then relate that to change in pH and structure of the pods and leaves. Author's response The order in which the experiment was conducted was reported. i.e. parameters where optimised at different stages, therefore, the rearrangement of the sequence will distort the manuscript.

Specific comments: Comments from referee Line 15: include stating that it were "batch tests" Author's response Batch test has been mentioned in line 14 Comments from referee Line 17-18: it is not relevant in the abstract if data fit a model. More important is how well the metals adsorb in relation to other adsorbents. Author's response How well Cu (II) and Ni (II) adsorb on the adsorbents has been mentioned in the abstract (line 22-26). Moreso, the authors have also added if a data fit a model, as this is the norm in all adsorption papers. Comments from referee Line 21-22: delete sentence, since a good economic study is not made Author's response The sentence (line 21-22) supports our studies and we have not deleted it. However, we have avoided the use of

the word “economics” in the entire manuscript.

Grammatical errors where checked and corrected in the entire manuscript. i.e Line 20: “concentrations” was been corrected Line 38: “of heavy metals” have been deleted Line 39: “and cause serious pollution” deleted Line 43: supply revised to resources Line 44: “production” (of glass, textiles, paper etc.) have been added Line 45: “apart from.. ecosystem” deleted Line 46: “human” (gills, liver: : :.) cannot be inserted, as the sentence refers to marine animals and not human Line 48: during = in the; of animal = in animals; have been revised Line 52: “also” (reported) has been added Line 53: “Like most heavy metals” deleted Line 54: “,” after “health” has been added Line 55: “,” after “compounds” and after “nickel”, have been added Line 58-61 have been revised Line 64: “,” after “value” has been added Line 66 and 67: “shells” has been corrected Line 68: “treat” = “remove” have been corrected Line 71: “,” after “biomass” inserted; “optimum conditions” = “dosage” have been corrected “at” was inserted before pH and the stirring speed was deleted Line 75-78: the sentence has been deleted Line 83: “seeds” has been revised Line 84: “the treatment : : :. To” has been revised; “reduce” = “reducing” has been revised Line 88-90: the sentence has been deleted Line 96-98: the sentence has been deleted

Comments from referee Line 99-: give knowledge gap, based on the previous research and explain reason to study selected material better. Author’s response The knowledge gap based on previous research have been provided i.e. line 106-118.

Line 106-108: sentence has been deleted

Comments from referee Lin 111: give concentrations of stock solutions Author’s response The concentrations of stock solutions was mentioned in line 116

Comments from referee Line 118-121: give pHs to be studied: give concentrations that are studied Author’s response pHs to be studied, concentrations that are studied were now given in line 153-162

Line 129: “use” = “used” has been revised Line 130-131: “is” = “was” (three times) have been revised Line 132: “are” = “were” has been revised

Comments from referee Line 129-137: explain procedure of the batch tests in detail (number of jars, concentrations, dosages); further explain the modelling part in the M&M section too. Author’s response The procedure of the batch tests has been reported in detail. The modelling part now transferred to the M&M section

Line 141: “structures, being potentially beneficial for the uptake” has been revised Line 143-144: “is” =“was” (two times) have been corrected

Comments from referee Line 144-145: what do these data indicate? Give discussion with literature Author’s response The EDS data represent the composition of the sample. However, It is used for qualitative analysis and not quantitative analysis, therefore there is no need to give a detail discussion of EDS. If it were to be XRF which provides the true quantitative analysis of the samples, a detail discussion might be required.

Comments from referee Line 156: how can we find the value in the Figure? - Line 158-159: why the authors have this opinion? Can they support this with literature? Author’s response The XRD has been replotted and discussed anew. The different peaks and what they correspond to, has been indicated in the new plot.

Line 167: “reveals” has been revised; “significant” has been deleted Line 168: “adsorbents” has been revised ; “very” (subjective) has been deleted; “increased” has been revised Line 169: sentence has been deleted Line 170: “is” = “was’ has been revised; “as the optimum pH and used” has been deleted Line 173: “, thus being in line with our findings” has been added

Comments from referee Line 175 (and further): do not connect data points with lines in figures (no meaning) Author’s response The lines connecting data have been removed in figures, except the trendline in the isotherm and kinetic plots.

Line 180: “for Cu(II) ions” has been deleted; “pH 4 was used : : : pods while pH 5 was”

= “which were further” has been revised. Line 181: “leaves and pods, respectively” has been revised

Comments from referee Line 182-184: discuss with literature what happened. Author’s response The results on the effect of pH has been discussed with literature

Line 184: “Thus: : : studies” has been deleted; “literatures” = “authors” has been revised Line 187: “Generally: : :. Media” has been deleted Line 188: reference has been given Line 189-191: “”when: : :.. particles” has been deleted Line 192: “the positive metal ions” has been added; “decreases” has been revised Line 194: “This will: : : adsorbent” has been deleted Line 201: “for” = “of” has been revised Line 203: the lines connecting data in Fig 5a have been removed, except the trendlines for the kinetic plot (5b).... the trendline is important for the displayed equations and R2 values. Also the lines connecting data in Fig 6 a, 7 and 8 were also removed Line 209: “interacting” = “interaction with” has been revised Line 212: “adsorbents” has been revised Line 213: “to” = “until” has been revised Line 217: How the work of Hansen supports the data has been briefly explained Line 221: “is a: : : fact” = “indicates” has been revised; reference for this statement has been provided.

Comments from referee Line 223-226: should be in Materials and methods section Author’s response The kinetic and isotherm equations have been transferred to the Materials and methods section

Line 225: “any” has been deleted Line 235: “decreased” has been revised; references have been given Line 246: “higher number” = “high concentration” has been revised; reference for this statement has been given Line 248-249: the sentence has been deleted

Comments from referee Line 250:263: should be explained in Materials and methods section Author’s response Line 250:263: now explained in Materials and methods section

Line 264- 267 has been revised Line 269: “The fit to the plot of the Langmuir isotherm suggests the possible monolayer: : : ha been revised Line 271: “slight” has been deleted Line 272-274: sentence has been delete Line 283: “The Freundlich isotherm is used to describe adsorptions onto..” has been revised Line 288-293 has been moved to Materials and methods section Line 321: “shows” has been revised Line 322: “biomasses” has been revised Line 322-325: the statement has been referenced Line 335: “concentrations” has been revised Line 336: “Was” = “were” has been revised Line 348: “application” = “use” has been revised Line 352-354 have been explained in the body of the manuscript

Comments from referee Line 357-359: this cannot be concluded because a thorough economic analysis is not made Author’s response We have avoided the use of the word “economics”. However, the fact stil remains that the biomass is an agricultural waste, the pods and leaves of D. regia litters the ground and rot. This has been mentioned in the introduction and concluding section.

The authors appreciate the editors and reviewers of this manuscript, the comments and suggestions received have greatly improve the quality of the manuscript.

Thank you.

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