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Biogeosciences Discussions

Interactive comment on "Artificial Radionuclides in Squid from northwestern Pacific in 2011 following the Fukushima accident" *by* Wen Yu et al.

Anonymous Referee #3

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The study investigates the radionuclides (both natural and artificial ones) in the neon flying squids from east Japan following the Fukushima disaster in 2011. It has merits and deserves publication but some points need to be modified before its acceptance. In particular, the calculations of internal doses and human exposure for polonium should be based on studies dedicated to squid as well to avoid biased estimations (see below). Also, the ms should have been prepared with more care as there are many mistakes all along the text which should have been avoided by a careful reading.

Specific points:

The title suggest a general approach on "squid" but only one single species is used

in the study. I suggest to modify the title by including the name of the squid as follow "Artificial radionuclides in the neon flying suid Ommastrephes bartramii from. . .."

Line 10. The correct name of the species is Ommastrephes bartramii. This is to be changed consistently throughout the ms. Also specify here "neon flying squid" Line 14. It should be easier for the readers to write 2.9 104. This should be used consistently throughout the ms. Line 22. I agree that cephalopods constitute an important commercially group but here you considered only one single species and it may be somewhat tricky to extrapolate the present result to the whole group, especially to nectobenthic species (cuttlefishes) and to coastal benthic ones (octopuses). Do you believe that similar results are to be found for such Orders? Line 32 and Line 38. The years are missing for the references. Line 38. M&M. Where the sexes considered when grouping the individuals? Sexual dimorphism occurs in this species so it can results in grouping individuals of similar size/weight but with different ages. How did you manage this? Line 72. Gut tissues is very vague and seems to mainly refer to organs and tissues involved in the digestive processes. If this is true, it means that other tissues such as the gills, heart, gonads and associated glands were not considered. Can you please clarify? Line 74. Define HPGe here and remove it at Line 78. Lines 79-80. Detection efficiencies for the other radionuclides should be also provided here. Line 112. "yr-1" Line 118 and Line 119. Spaces are missing before and inside the references. Please prepare you ms with more care. Line 124. "activity of a radionuclide" Line 127. As for CRWB:water, define CRWB:Tissue Lines 130-140. This paragraph should move to the M&M section: it is not "results" but just a description of the sampling which was missing in the M&M section. Page 6. The table is a duplicate of Table 1 page 9. Remove it from page 6. Line 147. Do you mean independently of the size classes? Line 160. CF factor has been determined experimentally for cuttlefish by Bustamante et al. 2006 in JEMBE with lower values than reported here. Line 171. Change Bustamante et al 2004 (dedicated to Ag and Co) by Bustamante et al. 2006 (dedicated to Cs and Am). Line 174. One important aspect is that the digestive gland is the storage tissue independently of the exposure pathway (food or seawater). Line 175. Is this significant?

Line 179. Provide a reference. Line 180. Add Bustamante et al. 2006 as a reference for Cs. Page 9, Table 1. “Statistics” in the title is not appropriate here; there is no statistics in this table but activities of the radionuclides only. For “small individuals”, means and standard deviation have been calculated with only 2 individuals, which is not fully correct. Page 11. *** is not applied to Cs, so it should be limited to Ag. Line 216. The value of 15Bq/kg seems a bit high compare to what it is found for muscle in squids. In the cited review (Carvalho 2011) , the value is 1.61 Bq/kg wwt, so I guess you took the wrong value in the table. See also for example Waska et al 2008 in STOTEN who reported 5.7 Bq/kg dry wt (so approx. 5 times less when expressed relatively to the fresh weight) in the squid Todarodes pacificus from the Japan Sea. Also, Heyraud et al. 1994 reported values of 15 to 21 Bq/kg dry wt (so between 3 to 4 in wet wt) in Loligo vulgaris from South Africa. Revise your dose calculation accordingly. Line 231. Do you mean “0.010 mSv” ? Line 234-243. Calculations to be revised according to relevant Po values. References. The bibliographic references should be homogeneous. For example, Line 276, the journal title is not in full as for the other references.

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