Reviewer's report

Title: Concentrations versus amounts of biomarkers in urine: a comparison of approaches to assess pyrethroid exposure

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Reviewer: Birger Heinzow

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Major Compulsory Revisions
The authors address a well known dilemma of human biomonitoring, normalize or not to normalize urinary biomarkers?
This question dates back more than 40 years (Elkins 1965) and the interesting work presented by the Marie-Chantale Fortin and co-workers adds another piece to the puzzle. The observations and conclusions are as expected and helpful for those studying substances where the amount in urine might be used as a surrogate for dose and risk-assessment, back-extrapolating to the tolerable daily intake. The problems of creatinine adjustment are shown and a useful and practical recommendation to cope with this the dilemma is given.

However, the work hides some other very useful information and I suggest that the authors go back to their treasure data and add or discuss the following points to make the paper more valuable:

1. A basic recommendation, when using urine samples is to exclude outliers, i.e. to use only samples with a creatinine concentration between 0.5 and 2.5 g/l. Has this been done?

Since a histogram of the distribution of creatinine in urine was not given one does not see or know if this applies here, but it is necessary to discuss this aspect.

With very diluted or concentrated urine, creatinine adjustment will increase the uncertainty of the measurement.

2. In terms of individual data the results show that intra-individual variation can be rather large and single results resemble house-numbers rather than precise assessments. However looking at the results one might conclude that using the mean exposure, results are similar and variation small.

I recommend to calculate the variation between single samples and 24 hr urine for different creatinine ranges (e.g. 0.3 - 3, 0.5 - 2.5 and 0.75. - 2 g/l) Another worthy calculation would be to include the 5. and 95. percentile in the table respectively.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests