

## Review

### *Ecotoxicological profiling of PM generated by urban heating and transport*

PhD dissertation

Tsend-Ayush Sainnokhui, PhD candidate

As I already explained in my review of the earlier version of the dissertation, the chosen topic is relevant and important. The main focus of the work presented in the dissertation is to adapt and optimize a quick ecotoxicological biotest on samples collected from different exhaust gases, burned domestic waste, different types of plastic bottles and other containers, and in-and outdoor air sampled in different seasons and locations. the latter part is especially important chapter of the dissertation as indoor air samples were collected in Mongolia, meaning a direct link between the Candidate's current PhD project and his home country.

Overall, the dissertation is adequately written, the English is acceptable, although it still contains unclear sentences, mixed active and passive English, etc., however, as it is the final, printed copy, I will not list or mark these parts.

The document is 124 pages long with 115 numbered pages. It contains 27 figures and 8 tables. It follows the usual structure of a PhD dissertation, however, as in the earlier version, every subchapter in the Results and Discussion section has its own conclusion subsection. It is somewhat unusual, but definitely helps the reader to understand the findings of the different experiments, so, in my opinion, it is acceptable. Along with the dissertation, the Candidate presented a 15-pages long thesis booklet, which is a short version of the dissertation.

The Introduction chapter is detailed, contains the relevant, up-to-date scientific background to build a solid basis for the planned and executed experiments. The Materials and Methods chapter describes the experiments properly, the chosen methodology is correct, the data analysis approach is acceptable. The Results and Discussion chapter contains not only the results, but

the Candidate delivers a critical comparison of his findings with the relevant scientific literature as well.

As I revealed in my previous review, there were some parts of the dissertation that required further work, correction or even deletion. The Candidate followed my advices and suggestions in most cases, but the final document still has some parts that can be criticized. The Candidate starts with a mistake of his supervisors' names, the order of the first and last names is English style in one case, while Hungarian in the other.

The Abstract ends with unclear statements, which sound rather unfinished: "Based on analytical measurement and Vibrio test outputs, indoor PM in each non-smoking household appears and elevated risk to inhabitants. The results of the dissertation reveal that the whole-aerosol had excellent discriminative power in different environments." – a last round of proofreading was missing here.

In my previous review I criticized the quality of the figures. Although the Candidate did try to make his figures similar, the dissertation still contains several figure styles, including unnecessary 3D (fig.22.). Figure 15. shows three data points only, in my previous review I suggested that these should be presented in the text only (in the previous version these data were shown on a figure and presented in the text as well – I criticized the double presentation). The Candidate decided to keep the figure and erase the text – the opposite of my suggestion.

Subchapter 6.5.1 contains strange units of measure ( $\mu\text{g m}^{-3}$ ) – what does that mean?

The dissertation contains five, non-numbered new scientific results. As I already indicated in my previous review, I accept these as the Candidate's own, novel results.

My question is – considering the highly toxic nature of the indoor air samples collected in rural Mongolia, is there any possibility to improve the quality of life of those who live under such conditions? If yes, what kind of actions should or could be carried out?

The scientific activity of the Candidate (six full papers in Q1-3 journals, being first author in one) is acceptable.

I declare that the doctoral dissertation by Tsend-Ayush Sainnokhoi is an independent work of his own, which can be submitted to a public defense. In case of a successful defense, I recommend the dissertation for acceptance (“*elfogadásra javaslom*”) and recommend the awarding of the PhD title to Tsend-Ayush Sainnokhoi.

Keszthely, 20.01.2024.

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