

# Opponent's evaluation

of the Dissertation Thesis submitted by Ms. Tereza Slámová, MSc. Titled “**Influence of Cambodian traditional smoking practices on the concentration of PAHs in smoked fish processed in Tonlé Sap area, Cambodia**”.

The submitted thesis addresses the effect of traditional smoking practices of fresh water fish from the Tonlé Sap area in Cambodia, and discusses the effect of these practices on the formation and concentration of polycyclic aromatic hydrocarbons (PAH) in the final product.

The thesis is written in English and consists of 146 pages including 10 pages of the Abstract, Preface, Table of Contents, List of Tables, List of Figures, List of Abbreviations and 136 pages of the Introduction, Objectives, Material and Methods, Results and Discussion, Conclusions, References.

The objectives of the thesis are divided in two parts:

- I. The first objective investigates the traditional practices of smoke-curing fish in the Tonlé Sap lake area, Cambodia, and monitors the concentrations of selected contaminants in the final product, particularly polycyclic aromatic hydrocarbons (PAHs).
- II. The second objective deals with challenges in determination of polycyclic aromatic hydrocarbons (PAHs) in smoked food of animal origin due to its high fat content (e.g. lipids, triglycerides and fatty acids), which makes the extraction of PAHs from these complex matrices usually laborious and is often not effective enough. Therefore, the author aims to develop an effective sample preparation procedure with less solvent and time input for the determination of PAHs in smoked fatty products of animal origin, particularly smoked fish.

## **Evaluation:**

The Introduction commences on page 1 and points out the most important aspects in the field of the conducted research. I very much appreciate the complexity with which the author assesses the current state of art and how she addresses the issue technological impact on food safety, especially the formation of PAHs, which are well-recognised carcinogenic, teratogenic, and mutagenic compounds.

I, furthermore, appreciate the potential direct impact of the outcomes of this thesis, since, the topic and results are very actual in the scope of population growth and related food sources.

The objectives of the thesis are stated on page 45 and frames the scope of study conducted in this thesis.

The Materials and Methods chapter commences on page 46 and complies with the standards of a doctoral thesis. The level of detail of the methods and techniques used in the thesis corresponds to the standards .

The main part of the thesis consists of the Results and Discussion section, which commences on p. 59. The authors thoroughly discusses her findings with available literature. Due to the absence of some level of hypothesis, thus, I miss the implications and consequences of individual findings in relation to these. However, I do, appreciate the approach and level of detail devoted to chapter 5.3 General evaluation of total PAH concentrations in smoke-cured fish in Cambodia, which presents novel approaches in evaluating PAHs in very complex matrixes.

The conclusions of the thesis on page 98 and 99 summarises the obtained results. Findings discussed in the conclusion section met the objectives of this study. I find it very interesting, but at the same time very concerning, that there are still parts on our planet where the lack of knowledge has such a huge impact on the quality of nutrition. Therefore, I trust that this thesis has a huge responsibility in sharing this important knowledge that can have an impact and make a positive change to people from the Tonlé Sap area in Cambodia.

#### Comments and questions:

In chapter Results and discussions, section 5.3.3 it is a pity that the temperature data in the kilns is missing, since temperature is one of the most important factors for PAH formation. I would strongly recommend, should the study continue to monitor this aspect and put it in relation to the formation of individual PAHs. In addition, as correctly stated in the thesis, it would be of great value to measure the combustion temperature and temperature of the smoke and product throughout the whole process and discuss that into relation with the formation of various PAHs.

Moreover, I would like to point out the high level of standard

Although many aspects have already been addressed, I would like to ask these additional questions:

- What is the relation of  $\Sigma$ PAH4 and  $\Sigma$ PAH12 concentrations to overall fat content of individual fish species?
- Could the author please explain, in case of samples *Xenentodon cancila*, *Hypsibarbus malcolmi*, *Osteochilus schlegeli* etc., (see Table 6, p84), where only one sample was collected, how was the fat content measured and calculated including a standard deviation?

#### Conclusion:

Based on the comprehensive evaluation of the submitted dissertation thesis of **Tereza Slámová, MSc.** meets the requirements of a doctoral thesis. I recommend the thesis to be presented at the defence committee and that Ms. **Tereza Slámová, MSc.** receives the academic title **Doctor of Philosophy** abbreviated as **Ph.D.** in case of a successful defence.

In Prague, April 21<sup>st</sup>, 2021

Ing. Bc. Bo-Anne Rohlik, Ph.D.

