

REVIEWER: prof. Ing. František Buňka, Ph.D.

SUBJECT: Review on Dissertation

“Hydrogel-based bioactive food packaging material for agro products”

submitted by

Smarak Bandyopadhyay, M.Sc.

to the

Tomas Bata University in Zlin

STUDY PROGRAM:	Chemistry and Materials Technology
DEGREE COURSE:	Technology of Macromolecular Compounds
SUPERVISOR:	prof. Ing. Petr Sába, CSc.
CONSULTANT:	doc. Nabanita Saha, M.Sc., Ph.D.
DATE:	July 28 th , 2020
OPINION:	Recommended

The dissertation thesis of Smarak Bandyopadhyay, M.Sc., was developed at the Centre of Polymeric System, University institute in the period 2016 – 2020. The chosen topic dealt with application of multicomponent materials for food packaging and study of material parameters (films) under several conditions including under practical usage for berries storage. The dissertation, its results and conclusions are very actual and up-to-date because they could enrich our knowledge about biodegradable packaging materials.

The dissertation thesis was formalized in an abstract, a general introduction, experimental design, motivation and aims of the doctoral thesis and brief discussion of doctoral thesis work. Abstract (page 1 and 2) contained general describing of aims of the studies and pointed out the most important findings and outcomes. In the future work, I would recommend avoiding to abbreviations usage and/or definition of abbreviation. The general introduction summarized up-to-date knowledge about biopolymers available for food packaging and its properties, advantages and disadvantages during food package applications. In this part, I missed a legislation point of view of this topic (especially Regulation (EC) No. 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC and following acts). Polyhydroxybutyrate (PHB) is written with “i” – page 12 in the table, the last column. Page 18 (line 5) – it is not clear if the author meant the absolute value of the pressure or the value of overpressure. Besides of the above-mentioned concerns, in these chapters, contribution of the author in the field and also benefits of this work and practical application of the results were shown and highlighted.

In the whole text, the Latin names (e.g. names of microorganisms) shall be written in italics. I recommend to use molarity during expression of concentration instead of normality

(see page 33 and following). Page 43 – *Bacillus cereus* and *Staphylococcus aureus* are Gram-positive microorganisms and *Escherichia coli* and *Klebsiella pneumoniae* are Gram-negative. Pathogenic and spoilage microorganisms are not “typically” present in dairy products – they are contaminants. The suppliers of microbiological media should be presented.

The thesis was supplemented by list of symbols and abbreviations, list of publications and appendices containing four published.

From the submitted thesis is obvious that Smarak Bandyopadhyay, M.Sc. dissertation were drafted in the English language and were handled transparently and properly structured. A few insignificant mistakes in typewriting and/or writing of taxonomical names were detected. I also positively evaluate the tabular and graphical presentation of the results of the individual experiments.

The “Closing Remarks and Contribution” part is written in a clear way and are summarized the main outcomes of the thesis and also future plans in this field. The content of the above-mentioned part arose especially from proved experiments. Furthermore, I have some questions to the author that can initiate discussion during and after the defense.

1. Could you present the main legislative EU acts (and/or acts in USA and your country) and definition of “active food contact materials and articles”?
2. You dealt with the cellulose content in your raw materials and/or intermediate products. Did you analyze also the cellulose content in primary raw materials?
3. You enriched the basic medium with some minerals as is shown e.g. in page 33. Could you explain why?
4. Which type of cheese was used in publication IV?

I am glad to say that Smarak Bandyopadhyay, M.Sc. did a great job and demonstrated an ability of independent scientific work. Smarak Bandyopadhyay, M.Sc. in the present work has met all the criteria prescribed for dissertation thesis defense which are in accordance with § 47, paragraph 4, of Law No. 111/1998 Coll., and has demonstrated his ability and readiness for independent work in research and/or development.

For the above reasons, I **recommend** to accept the submitted dissertation thesis for a proper defense in the study program **Chemistry and Materials Technology**, degree course **Technology of Macromolecular Compounds**.



prof. Ing. František Buňka, Ph.D.
Department of Logistics
Faculty of Military Leadership
University of Defence in Brno
Kounicova 65
662 10 Brno
Czech Republic
frantisek.bunka@unob.cz