

WHY DOES THE PROTEIN TURN BLACK WHILE EXTRACTING IT FROM INSECTS BIOMASS?

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Abstract

The insects' human consumption issue and their use as farm animals fodder has been studied by the European Union Food Safety Authority (EFSA); and a report was published on their website, it revealed the risks and prospects of eating insects. Now the insects' cultivation is one of the most promising areas in food biotechnology; it is able to meet the needs of the growing population of the Earth.

The authors used Atomic force microscopy (AFM), Magnetic resonance imaging (MRI), centrifugation and computing modelling methods to study protein concentrate from *Zophobas morio* biomass, which was extracted by usage of the pulsed discharge technology.

It was found that the *Z. morio* larvae change their color to a darker shade when fed with melanin-containing fodder substance. It was also found that during the larvae homogenization, the protein fraction blackens rapidly, which is not described in the scientific literature. To explain this phenomena it was carried out the experiment with separation of protein from *Z. morio* biomass and its study. The chemical model of studied process is represented in the article.

Based on insects physiology study the authors suggested a hypothesis that color changing connected with the chitin and proteins with melanin (both external and internal, synthesized from their own phenols) complex formation processes. The phenomenon of insect's protein color changing should be considered in developing of new type food or feed product technology based on insect's biomass.

Key words: *Insects, Insectoprotein, Larvae, Zophobas morio, Purification.*