

Abstract (EN)

Vernix caseosa is a white creamy substance that covers the skin of a newborn. It is produced during the third trimester by the skin of the baby and remains there until the age of one or even two weeks. It is uniquely human. In utero, vernix protects the skin from maceration, during the birth it serves as a lubricant and after the delivery it protects the baby against infection and regulates the temperature. As vernix is produced in third trimester, prematurely born infants lack it and this may lead to, among other things, suffering from desiccation and therefore heat loss. It is important to study it thoroughly and to find a suitable substitute of vernix for the preterm infants. Vernix consists of lipids, proteins and 80 % water.

This project is aimed at the lipids. Vernix is composed of 10 % of lipids. Basic analytical methods of processing vernix were searched. The methods of isolation, separation and transesterification have been optimized for the lipids. For separation, thin-layer chromatography has been chosen. The method of the lipid analysis of intact molecules by MALDI-TOF MS has been optimized for these lipids. The results were confirmed using fragmentation spectra and transesterification. Esterified lipids were measured by gas chromatography coupled with mass spectrometry detection. For a large amount of lipids, the extraction according to Folch has been adopted. The obtained lipid extract was separated using the column chromatography.

The above described methods were used for the series of 20 vernix samples. Gender-related differences were found in the spectra. Different quantitative patterns of wax esters and triacylglycerols in male and female samples were observed. It was proved that the longer-chain fatty acids are more abundant in girls.

This study is the cornerstone of further vernix research. Suitable analytical methods for vernix have been described. Furthermore, four less polar lipid classes of vernix were characterized by means of mass spectrometry. Along with better knowledge, new questions about vernix caseosa have arisen that may define further studies of the subject.