

Functionalization of Sanitary Pads with Probiotic Paste

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Abstract : The textile industry is gaining increasing importance in the field of medical materials. Therefore, presented research is focused on textile materials for external (out-of-body) use. Such materials could be various hygienic textile products (diapers, tampons, sanitary napkins, incontinence products, etc.), protective textiles and various hospital linens (surgical covers, masks, gowns, cloths, bed linens, etc.) wound pillows, bandages, orthopedic socks, etc. Function of tampons and sanitary napkins is not only to provide protection during the menstrual cycle, but their function can be also to take care of physiological or pathological vaginal discharge. In general, women's intimate areas are against infection protected by a low pH value of the vaginal flora. High pH inhibits the development of harmful microorganisms, as it is difficult to be reproduced in an acidic environment. The normal vaginal flora in healthy women is highly colonized by lactobacilli. The lactic acid produced by these organisms maintains the constant acidity of the vagina. If the balance of natural protection breaks, infections can occur. In the market, there exist probiotic tampons as a medical product supplying the vagina with beneficial probiotic lactobacilli. But, many users have concerns about the use of tampons due to the possible dry-out of the vagina as well as the possible toxic shock syndrome, which is the reason that they use mainly sanitary napkins during the menstrual cycle. Functionalization of sanitary napkins with probiotics is, therefore, interesting in regard to maintain a healthy vaginal flora and to offer to users added value of the sanitary napkins in the sense of health- and environmentally-friendly products. For this reason, the presented research is oriented in functionalization of the sanitary napkins with the probiotic paste in order to activate the lactic acid bacteria presented in the core of the functionalized sanitary napkin at the time of the contact with the menstrual fluid. In this way, lactobacilli could penetrate into vagina and by maintaining healthy vaginal flora to reduce the risk of vaginal disorders. In regard to the targeted research problem, the influence of probiotic paste applied onto cotton hygienic napkins on selected properties was studied. The aim of the research was to determine whether the sanitary napkins with the applied probiotic paste may assure suitable vaginal pH to maintain a healthy vaginal flora during the use of this product. Together with this, sorption properties of probiotic functionalized sanitary napkins were evaluated and compared to the untreated one. The research itself was carried out on the basis of tracking and controlling the input parameters, currently defined by Slovenian producer (Tosama d.o.o.) as the most important. Successful functionalization of sanitary pads with the probiotic paste was confirmed by ATR-FTIR spectroscopy. Results of the methods used within the presented research show that the absorption of the pads treated with probiotic paste deteriorates compared to non-treated ones. The coating shows a 6-month stability. Functionalization of sanitary pads with probiotic paste is believed to have a commercial potential for lowering the probability of infection during the menstrual cycle.

Keywords : functionalization, probiotic paste, sanitary pads, textile materials

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