



FUNDING PROGRAMME: ERANET-COFUND-MANUNET III, PN III, European and International Cooperation - Subprogramme 3.2 - Horizon 2020

PROJECT TITLE: Manufacturing of value-added textiles for aromatherapy and skin care benefits

ACRONYM: AromaTex

PROGRAMME WEB ADDRESS: <http://www.manUNET.net/>

CONTRACT UEFISCDI No.: 29/2018

PROJECT STARTING DATA: 01.02.2018 - PROJECT ENDING DATA: 31.12.2019

PROJECT PARTNERS:

- The National R&D Institute for Textiles and Leather - INCDTP (RO)
- "Gheorghe Asachi" Technical University of Iasi, Faculty of Textile Leather and Industrial Management (RO)
- Dogal Destek Urunleri Arastirma Sanayi ve Ticaret A.S. (TR)
- Magnum SX SRL (RO)
- UNITEKS Tekstil Gida Motorlu Araclar San.ve Tic.A.S. (TR)

PROJECT COORDINATOR: Popescu Alina alina.popescu@certex.ro

GENERAL OBJECTIVES:

The main objective of AromaTex project is to produce aromatherapeutic garments (sports and leisure wear) and skin/body care products (dresings and facial masks for microbial infections treatment and cosmetic pads for skin hydration and anti-acne) by using biologically path for essential oils and apiculture products.

SCIENTIFIC CONCEPT:

The AromaTex project builds on the commercial interest of SME partners in producing and selling of new textiles promoting wellbeing, by immobilization of biologically active compounds at the substrate surface and development of an efficient environmentally friendly functionalization bioprocesses for health care and stress management. The target applications are textiles used in close contact with human skin and that could benefit in terms of life quality, by being made of natural products & ecological processes. As a project results, tehnological knowledge of aromatherapy, biologically active compounds compatible to the textile fabrics and technological way of immobilization will be explained by laboratory simulated industrial process, up to pilot scale application and end-products developments. Application methods of the selected polymer bioactive compound systems will be optimized from technological, quality, ecological and therapeutically point of view.

TECHNOLOGICAL CHALLENGES:

- Development of polymer bioactive compound systems with tailored properties to be used for development of aroma therapeutic and skin/body care textiles;
- Optimization of the polymer bioactive compound systems adapted to an up-scalable technology for depositing on textile fabrics, with a particular focus on therapeutically desired effect and controlled release of essential oils;
- Prototype pilot scale up and validation of immobilization technology;
- Production of aroma therapeutic garments and skin/body care end-products.

EXPECTED EXPLOITABLE RESULTS & DELIVERABLES:

- A set of essential and fixed oils containing active substances & extraction protocol;
- A set of microparticle systems with controlled release of bioactive compounds & synthesis;
- A set of hydrogel and emulsions / dispersion systems containing essential oils & synthesis methods;
- Knitted and woven textile structures compatible to the selected application field.
- Optimized bioactive compound systems in form of emulsions and microparticles;
- Optimized technologies for immobilizations of polymer-bioactive compound systems on textile materials;
- Prototypes of aroma therapeutic microparticles obtained for pilot scale application;
- Prototypes of emulsions for skin/body care obtained for pilot scale application;
- Woven/ knitted textile materials prototypes containing aroma therapeutic microparticles and/or emulsions for skin and body care.

RESULTS:

OBTAINED RESULTS IN 2018:

- 4 Variants of biologically active systems in the forms of stable emulsions;
- 1 Report on synthesis methods of stable emulsion and its characterization;
- 3 Variants of woven textile structures and 19 variants of knitted textile structures for aromatherapy and / or skin care;

- 12 Variants of woven / knitted textile structures ecologically preliminary treated;
- 2 Laboratory technology for immobilization of the polymer-bioactive compound systems (emulsions) on textile materials;
- 36 Variants of textile materials (woven/knitted) treated with stable emulsions;
- 1 laboratory technology for immobilization of microcapsules containing bioactive compounds on different textile materials;
- 64 Variants of textile materials (woven/knitted) treated with dispersions of microcapsules with essential oils;
- 1 Report on complex characterization of textile materials for aromatherapy and skin care;
- 1 Project website;
- 1 Article accepted for publication in ISI rated journal - **INDUSTRIA TEXTILA**;
- 2 Articles published in proceedings volume of International Conferences BDI rated/un-rated;
- 7 Communications as oral presentations or posters at national and international conferences.



Lavandula Angustifolia



Mentha piperita



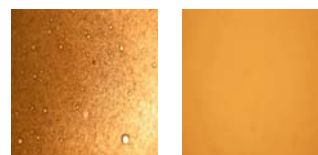
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Rosemarinus Officinalis



Optical analysis of emulsions



a) b)
Optical microscopy Optical microscopy

DISSEMINATION ACTIONS OF THE PROJECT:

PUBLISHED ARTICLES:

- **DANILA Angela, ZAHARIA Carmen, SUTEU Daniela, MURESAN Emil Ioan, LISA Gabriela, KARAVANA Sinem Yaprak, TOPRAK Ali, POPESCU Alina, CHIRILA Laura, Essential mint oil - based emulsions: preparation and characterization**, accepted article in *Industria Textila* - ISI rated journal, No. 3/2019, ISSN: 1222-5347, Bucharest, Romania;
- **PRICOP Floarea, POPESCU Alina, RASCOV Marian, CHIRILA Laura, Scarlat Razvan, BUZDUGAN Maria, CEREMPEI Angela, MURESAN Emil, Study on the aromatherapeutical effects of textiles functionalized by herbal extracts**, article published on *Proceedings Volume of the 7th International Conference on Advanced Materials and Systems*, 18-20 October, Bucharest, Romania, pp. 147-153, ISSN: 2068-0783;
- **MURESAN Augustin, ZAHARIA Carmen, DANILA Angela, SUTEU Daniela, MURESAN Emil Ioan, POPESCU Alina, CHIRILA Laura, CEZAR Radu Doru, Preliminary research on preparation emulsions mint oil**, published on *Proceeding Volume of The XXII th International Conference of Inventics "Inventica 2018"*, Iasi, 28th June - 29th June 2018, pp. 27-35, ISSN: 1844-7880, Romania.

COMMUNICATIONS:

- **MURESAN Augustin, ZAHARIA Carmen, DANILA Angela, SUTEU Daniela, MURESAN Emil Ioan, POPESCU Alina, CHIRILA Laura, CEZAR Radu Doru, Preliminary research on preparation emulsions mint oil**, poster presentation at *The XXII th International Conference of Inventics "Inventica 2018"*, Iasi, 28th June - 29th June 2018, Romania;
- **DANILA Alina, CHIRILA Laura, COSTAN Lenuta Irina, Kinetic modeling on rosemary essential oil release from beeswax matrix**, poster presentation at *The 7th International Technical Textiles Congress-ITTC2018*, 10-12 October, 2018, Izmir, Turkey;
- **PRICOP Floarea, POPESCU Alina, RASCOV Marian, CHIRILA Laura, Scarlat Razvan, BUZDUGAN Maria, CEREMPEI Angela, MURESAN Emil, Study on the aromatherapeutical effects of textiles functionalized by herbal extracts**, poster presentation at *7th International Conference on Advanced Materials and Systems*, 18-20 October, Bucharest, Romania;
- **PRICOP Floarea, POPESCU Alina, CHIRILA Laura, RASCOV Marian, BUZDUGAN Maria, Nature vibration in textile materials treated with plant extracts**, oral presentation at the seminar *"Textile and Leather Industry through Tradition to Sustainability by Research-Development-Innovation"*, organized within *MODEXPO FAIR*, 27 September 2018, Bucharest, Romania;
- **MURESAN Augustin, DANILA Angela, MURESAN Emil Ioan, POPESCU Alina, CHIRILA Laura, RADU Cezar Doru, Emulsion stability of lavender essential oil in beeswax matrix**, poster presentation at *17th Romanian Textiles and Leather Conference - CORTEP 2018*, 7-9 November 2018, Iasi, Romania;
- **ZAHARIA Carmen, DANILA Angela, MURESAN Emil Ioan, SUTEU Daniela, Preliminary analysis of emulsions based on beeswax-rosemary essential oil used for manufacturing of value-added textiles for aromatherapy and skin care benefits**, poster presentation at *Confence of Chemistry Faculty of Iasi - IasiChem 2018*, 25-26 October, 2018, Iasi, Romania;
- **ZAHARIA Carmen, DANILA Angela, MURESAN Emil Ioan, SUTEU Daniela, Emulsion based on beeswax-essential vegetal oil used for manufacturing of value-added textiles**, poster presentation at *International Fair of Inventions and Practice Ideas - Invent Invest 2018*, Chisinau, Republica Moldova.