10-11 March

2022

LISBON CONGRESS CENTRE, PAVILION 3 PORTUGAL

FOCUS ON COSMETICS FUTURE

COSMETINNOV

Sociedade Portuguesa Ciências Cosmetológicas

LIVRO DE RESUMOS

ABSTRACTS BOOK

Organisers:

Sociedade Portuguesa Ciências Cosmetológicas

Step Exhibitions

Programme

08h30 – 09h00 – Registration

09h00 – OPENING SESSION

Rui Santos Ivo, President of *Infarmed – National Authority of Medicines and Health Products, Portugal*

Marta de Oliveira Ferreira, *President of the Portuguese Society of Cosmetic Sciences (SPCC), Portugal*

09h30m – 13h00m – SESSION 1 – "Looking to the Future"

Chair: Carlos Maurício Barbosa, *Faculty of Pharmacy of the University of Porto, Portugal*

09h30m – 10h00m – Conference "Future trends on cosmetics"

Madalena Gusmão, Caudalie, Portugal

10h00m – 10h30m – Conference "Cosmetics regulation: what's next?"

Roman Mokry, European Comission, Belgium

10h30m – 11h30m – Networking coffee-break, poster and exhibition visit

11h30m – 12h30m – Round-table "Focus on cosmetics future"

- Alexandra Moreira*, Infarmed, Portugal*

- Zoran Gavric, *European Cosmetics Responsible Person Association (ERPA), Holland*

- Ana Rocamora, *Spanish Society of Cosmetic Chemists (SEQC), Spain*

- Ana Maria Couras, *Association of Cosmetics, Perfumery and Body Hygiene Industries (AIC), Portugal*

- Marta de Oliveira Ferreira, *Portuguese Society of Cosmetic Sciences (SPCC), Portugal*

12h30m – 13h00m – Discussion

13h00 – 14h30 – Networking lunch

14h30m – 16h00m – SESSION 2 – "Towards the Sustainability and Ethics on Cosmetics"

Chair: Catarina Rosado, Universidade Lusófona, Portugal

14h30m – 15h00m – Conference "Trends and challenges on green cosmetics"

Isabel Ramos, *Ayuna Less is Beauty, Spain*

15h00m – 15h20m – BYO (Bring Your Own) Water beauty products, a new breed of sustainable products: just add water, but what type of water?

Joana Marto, iMed.ULisboa, Research Institute for Medicine, Faculty of Pharmacy of the University of Lisbon, Portugal

15h20m – 15h40m – The potential of Thymus x citriodorus hydrolate to reduce Cutibacterium acnes induced inflammation, bacterial association to skin cells and to improve wound healing

Ana Oliveira, University of Beira Interior, Portugal

15h40m – 16h00m – Assessing the anti-inflammatory properties of Cymbopogon citratus essential oil on human skin by the methylnicotinate challenge model

Sergio Andrade, CBIOS, Research Center for Biosciences & Health Technologies, Lusófona University, Portugal

16h00m – 16h20m – Discussion

16h20m – 17h20m – Networking coffee-break, poster and exhibition visit

17h20m – 18h30m - SESSION 3 - "Artificial Intelligence in Beauty Industry"

Chair: Ana Palmeira de Oliveira, Universidade de Beira Interior, Portugal

17h20m – 17h50m – Conference "The Role of Artificial Intelligence in Beauty and Cosmetics"

Catarina João Vieira, Faculty of Economics of the University of Porto, Portugal

17h50 – 18h10 – New emotional and sensorial evaluations of cosmetic products using an advanced virtual reality setup

Pedro Contreiras Pinto, PhD Trials, Portugal

18h10 – 18h30 – Discussion

18h30m – 18h45m – Awards and Closing Session
Marta de Oliveira Ferreira, *President of the Portuguese Society of Cosmetic Sciences (SPCC)*

Organizing Commitee

Marta de Oliveira Ferreira (President)

Carlos Maurício Barbosa

Catarina Fialho Rosado

Lidia Palma

Rita Figueiredo

Scientific Commitee

Carlos Maurício Barbosa (President)

Ana Palmeira de Oliveira

Catarina Fialho Rosado

Helena Margarida Ribeiro

Marta de Oliveira Ferreira

Rita Palmeira de Oliveira

ABSTRACTS BOOK

1. POTENTIAL SKIN BENEFITS OF TOPICAL FORMULATIONS WITH PORTUGUESE HONEYS

Alexandra M. Machado[1], Joana Marto[2], Lídia Maria Gonçalves[2], Helena Margarida Ribeiro[2], M. Graça Miguel[3], Miguel Vilas-Boas[4] and A. Cristina Figueiredo[1]

1 - CESAM Lisbon, Faculty of Sciences, University of Lisbon, Lisbon, Portugal

2 - iMed.ULisboa, Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal

3 - MED, Faculty of Sciences and Technology, University of Algarve, Faro, Portugal

4 - CIMO, Polytechnic Institute of Bragança, Bragança, Portugal

INTRODUCTION

Honey has been studied due to its bioactive properties, including wound healing, antioxidant, anticancer and anti-inflammatory activities. Although there are some works on the antioxidant properties of Portuguese honeys, no study includes topical formulations with Portuguese monofloral honeys.

AIM

This study aimed at assessing the potential skin benefits of topical formulations with Portuguese honeys.

METHODS

In this work two topical ointment formulations were produced with bell heather and strawberry tree honeys. The formulations were evaluated in vitro for antioxidant capacity and cytotoxicity in human keratinocytes cells (HaCaT). Both the concentration that reduces to half the reactive oxygen species (ROS) production, and the cell viability, for 10 mg/mL and 20 mg/mL, was evaluated according to a previously published procedure [1]. The rheological properties, viscosity and oscillation frequency sweep tests were also studied with a controlled stress Kinexus Lab+ Rheometer (Malvern), using a cone and plate geometry [2].

RESULTS AND DISCUSSION

The honey-based formulations showed antioxidant properties, with a ROS inhibitory concentration (IC50) of 2.2 ± 0.9 mg/mL for bell heather honey and 0.8 ± 0.4 mg/mL for strawberry tree honey formulations. Cell viability in the tested samples was 100%.

The apparent viscosity of both formulations decreases, simultaneously, with the increase of shear rate, a common behavior of non-Newtonian shear-thinning fluids and presented thixotropy. Bell heather honey is more viscous than strawberry tree honey. Concerning the oscillatory tests, the formulations resulted in G' > G'', evidencing the existence of a strong network. Nevertheless, they showed that can be easily rubbed into the skin. Both formulations showed a homogeneous, yellowish appearance, with a characteristic honey odor.

CONCLUSIONS

The results obtained so far for the Portuguese monofloral honeys-based formulations are promising, with good antioxidant properties, suitable and safe for skin care.

Acknowledgements: Thanks are due to FCT/MCTES for SFRH/BD/117013/2016, CEECIND/03143/2017, CEECINST/00145/2018, CESAM UIDP/50017/2020+UIDB/50017/2020+LA/P/0094/2020, iMed UIDB/04138/2020, MED UIDB/05183/2020, CIMO UIDB/00690/2020, through national funds.

[1] Marto J. et al., 2018, Cosmetics. 5(2), 26 : 1-12.

[2] Nunes A. et al., 2021, Pharmaceutics. 13(4) : 465.

2. IMPLEMENTATION OF GOOD MANUFACTURING PRACTICES IN THE BIOLOGICAL INDUSTRY: CHALLENGES AND OPPORTUNITIES

Ana Filipa Delicado[1], Susana Vila-Real[1]

1 – ALTRAN, Portugal

INTRODUCTION

Biological & organic cosmetics are trending. These products consider a more sustainable way of production for the environment and the ingredients used for the formulation are in its majority natural with lower percentage of synthetic compounds. Organic products have also shown to be less harmful for the consumers, increasing trust on the products and on the companies.

The compliance with the legislation and GMPs is mandatory for the production of cosmetic products, despite the profile or size of the company.

It is crucial for business development to ensure compliance with GMPs for cosmetic products, in accordance with Regulation (EC) No 1223/2009, and applicable harmonized standard EN ISO 22716:2007 as published in the OJEU 2011/C/123/04, 21 April 2011.

AIM

The aim is to explore the best strategies and methodologies to effectively implement GMP, using a client case.

METHODS

- Scope and expectations definition.
- Quality Planning (QMS implementation, pre-certification audits).
- Quality Assurance (monitor QMS, manage daily activities).
- Knowledge management.
- Quality Compliance (manage authorities' relationship, gather all relevant laws, regulations, policies and procedures).

RESULTS

Following the established methods:

- A QMS was built (procedures, templates and other). Advisory in several topics related to each part of the process was also helpful, in order to assure that all the process is covered.
- All employees within the company were trained, leading to the improvement of knowledge regarding how to act in a non-conformity situation, of safety behaviors within each area and understanding the importance to follow these practices.
- A close follow-up of the implementation of GMP was important to understand the evolution and the path still ahead.
- A final internal audit is also important to identify gaps, in order to establish corrective/preventive actions.

A general improvement of the quality, a well-organized process and the easiness of identifying and solving any non-conformity.

DISCUSSION AND CONCLUSIONS

GMP implementation in any cosmetic industry makes a difference within the daily work and improves the company's trust. It leads to:

- Process traceability.
- Strengthen of processes and product's quality.
- Reduction of non-quality costs.
- Increased consumers' safety and trust.

The correct implementation of EN ISO 22716:2007 has proven to provide to our client the change they were looking, resulting in a competitive advantage to enhance their business.

3. ASSESMENT OF SKIN BARRIER DAMAGE USING THERMAL IMAGING CAMERA

Ana Luísa Fonseca[1], Marta Monteiro[1] e Marta de Oliveira Ferreira[1]

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INTRODUCTION

Several in vivo models can be used to assess the skin barrier protection efficacy of skin care products, such as sodium lauryl sulfate (SLS) under an occlusive patch as chemical aggressor. To evaluate the skin barrier damage, different methods are applied. Transepidermal water loss (TEWL) is a widely used method however, measurements of TEWL are time-consuming and easily influenced by environmental conditions.

AIM

This clinical study aimed to evaluate the possibility of using skin temperature as an alternative method of skin barrier damage assessment through thermal imaging camera measurements.

METHODS

This study was conducted in 30 healthy subjects with ages over 18 years old and no skin diseases. Subjects applied the negative (water type II) and positive (Avène Pédiatril diaper cream®) controls twice-daily during 7 consecutive days, on the respective skin site, in the volar part of the forearms. After this 7-days period (t7), the TEWL and the skin temperature were instrumentally assessed with Tewameter® TM 300 (Courage+Khazaka electronic GmbH, Germany) and Thermal Camera E60 (FLIR Systems, Inc., EUA), respectively. A controlled skin irritation was induced by applying the products followed by a paper filter disc soaked with SLS at 1% under occlusion for 24 hours, using an adhesive. The skin barrier damage was then instrumentally assessed with Tewameter® TM 300 and Thermal Camera E60 24 hours after the patch removal (t9).

RESULTS AND DISCUSSION

At t7 no statistically significant ($p>0.05$) differences were observed between the negative and the positive control neither for TEWL nor for skin temperature. At t9, it was observed a statistically significant ($p\leq0.05$) increase of the TEWL values on both skin sites, validating the skin barrier damage. Moreover, the increase was less significative on the positive control in comparison to the negative control, validating the use of TEWL as a primary endpoint for this type of studies. Using a new approach with a thermal imaging camera, no significant change on the skin temperature for the negative control was observed at t9. Statistically significant differences in the skin temperature variation were observed when comparing the positive control to the negative control site at t9. However, this result cannot be related with the skin damage.

CONCLUSION

Skin damage does not influence significantly the skin temperature and thus this biometrical measurement is not a good alternative for skin barrier protection efficacy studies.

4. BIOACTIVITY OF COMMERCIAL ESSENTIAL OILS OBTAINED FROM PORTUGUESE FOREST

Ana Ruas[1], Angelica Graça[2], Joana Marto[2], Ana Oliveira[3], Alexandra Nogueira da Silva[3], M. Pimentel[3], A. Cristina Figueiredo[1,4], Helena M. Ribeiro[2].

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INTRODUCTION

Landscaping of Eucalyptus globulus, Pinus pinaster, Pinus pinea and Cryptomeria japonica forest provide biomass wastes that can be used to extract essential oils (EOs).

AIM

The evaluation of EOs bioactivity obtained from biomass wastes resulting from Portuguese forest maintenance, and in a context of sustainability, is the aim of this work.

METHODS

Local producers supplied eleven EOs samples from E. globulus, P. pinaster, P. pinea and C. japonica. Using gas chromatography and gas chromatography associated with mass spectrometry, the EOs were chemically characterized as in [1]. Using the 2,2'-diphenyl-1-picrylhydrazyl (DPPH) assay [2], the antioxidant activity of these EOs was evaluated. The minimum inhibitory concentration (MIC) was assessed by the microdilution method for five ATCC strains, namely Staphylococcus aureus ATCC 6538, Pseudomonas aeruginosa ATCC 9027, Bacillus subtilis ATCC 6633, Escherichia coli ATCC 8739, and Candida albicans ATCC 10231.

RESULTS

Two P. pinaster EOs were dominated by α-pinene (37-45%), and one showed similar amounts of α pinene and β-pinene (27% and 28%, respectively). P. pinea EO was dominated by limonene (73%), and α-pinene (26%) was the main component of C. japonica EO.

C. japonica EO showed the highest antioxidant activity, whereas one of the E. globulus EO samples showed the lowest. Eucalyptus EOs showed the greatest efficacy against the selected strains while C. japonica EO had no antimicrobial activity against these strains.

DISCUSSION AND CONCLUSIONS

The bioactivity of all EOs samples is related to their composition. C. japonica EO antioxidant activity is probably due to the presence of appreciable amounts of, namely, sabinene, β myrcene, and γ-terpinene. P. pinea EO similar efficacy against B. subtilis ATCC 6633 as two of E. globulus EOs may be related to 1,8-cineole content, which shows antimicrobial properties.

It is possible to conclude from these results, that EO's studied have relevant antioxidant activity and promising antimicrobial activity, which can be a key benefit justified by their promising skin health properties.

Acknowledgments: Funded by the Fundação para a Ciência e Tecnologia, Portugal (CESAM UIDP/50017/2020 + UIDB/50017/2020, FEDER PT2020-Compete 2020, UIDB/04138/2020 and UIDP/04138/2020 to iMed.ULisboa, CEECINST/00145/2018 to J.Marto).

[1] A Neves, J Marto, A Duarte, LM Gonçalves, P Pinto, AC Figueiredo, HM Ribeiro. Flavour Fragr. J. 32 (2017) 392-402.

[2] AK Mishra, N Sahu, A Mishra, AK Ghosh, S Jha, P Chattopadhyay. Pharmacogn. J. 2 (2010) 25-28.

5. PERFUMING NATURALLY EMULSIONS WITH ESSENTIAL OILS OBTAINED FROM PORTUGUESE LOGGING RESIDUES AND THINNINGS

Ana Ruas[1], Joana Marto[2], Artur Mendes Moura[4], A. Cristina Figueiredo[1,3], Helena M. Ribeiro[2]

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INTRODUCTION

Nowadays, the demand of cosmetics with sustainable and natural origin ingredients is a common practice in the cosmetic industry. Essential oils (EOs) are natural sources of biologically active ingredients because of their chemical composition and broad application.

AIM

The aim of this study was to evaluate the sensoriality of Eucalyptus globulus, Pinus pinaster, Pinus pinea and Cryptomeria japonica EOs obtained from logging residues and thinnings in skin care emulsions. The EOs were obtained from producers in mainland Portugal and the Azores.

METHODS

Sensory double-blind evaluation was performed in 100 volunteers. The protocol was approved by the local Ethical Committee (nº 1_2022) and respected the Helsinki Declaration and Good Clinical Practice studies on cosmetic products. All participants gave their informed consent. A structured questionnaire was used to collect data about the perception and applicability's of different emulsions, and they were encoded with different colors (pink, blue, green, orange and lilac). Emulsions were prepared with 0.5% EO of selected samples.

RESULTS

The C. japonica emulsion odor was chosen as the most pleasant by 60% of the volunteers, followed by the P. pinaster emulsion odor with 53%. C. japonica emulsion was also the one chosen for improving the sense of well-being. Overall, 19% of the volunteers selected C. japonica and P. pinaster emulsions as their favorites.

DISCUSSION

These results can be related to EOs chemical composition. P. pinaster EOs were dominated by α-pinene and β-pinene that are referred as showing a fresh and earthy scent. P. pinea EO presented high limonene content (73%), which evokes citrus fruits aroma. α-Pinene (26%), with unmistakable fresh and earthy scent, was the main component of C. japonica EO. In addition, E. globulus EOs presents 1,8-cineole that is a colorless liquid with a camphor-like odor.

CONCLUSIONS

It can be concluded that these natural-based EOs address the demand for sustainable and responsibly sourced odor accepted by consumers.

Acknowledgments: Funded by the Fundação para a Ciência e Tecnologia, Portugal to CESAM UIDP/50017/2020+UIDB/50017/2020+LA/P/0094/2020, UIDB/04138/2020 and UIDP/04138/2020 to iMed.ULisboa, CEECINST/00145/2018 to J.Marto).

6. THE POTENTIAL OF *THYMUS X CITRIODORUS* HYDROLATE TO REDUCE *CUTIBACTERIUM ACNES* INDUCED INFLAMMATION, BACTERIAL ASSOCIATION TO SKIN CELLS AND TO IMPROVE WOUND HEALING

Ana Sofia Oliveira[1,2]; Gaspar, C [1,2,3]; Rolo, Jb; Palmeira-de-Oliveira, R [1,2,3,4]; Teixeira, JP [5,6]; Martinez-de-Oliveira, J [1,2]; Palmeira-de-Oliveira, A [1,2,3]

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5- National Institute of Health, Environmental Health Department, Porto, Portugal

6- EPIUnit - Instituto de Saúde Pública da Universidade do Porto, Porto, Portugal

INTRODUCTION

Acne vulgaris is a multifactorial disease of the pilosebaceous unit that presents several hallmarks that contribute to its progression, including, among others, skin inflammation and increased virulence of acne-related bacteria. Due to this multifactorial component, different drugs are used to tackle disease progression and therapy adjuvants are used to counteract side effects associated with chemical treatments. Therefore, there is a need for safer and active alternatives to control this disease.

Thymus x citriodorus (TC) hydrolate is the by-product of essential oil production, and the anti-acne potential of each of these plant preparations have been previously reported by our team.

AIM

With this work, we aimed to further investigate the anti-acne potential of TC hydrolate by applying it on co-culture cellular models that mimic disease events. We also aimed to study its potential to be used as therapeutic adjuvant to improve wound healing.

METHODS

Cutibacterium acnes-induced inflammation was studied by exposing macrophages (RAW 264.7) to the bacteria for 24h. The anti-inflammatory potential of the hydrolate was evaluated by measuring NO production, using Griess reagent.

The hydrolate's effect on bacterial-cell association was determined by exposing human keratinocytes (HaCaT cell line) to C. acnes. After 3h of contact, non-adherent bacteria were removed and the remaining bacteria were recovered for plating and CFU count. Wound healing was studied by scratch-wound assay using fibroblasts (L929 cell line).

RESULTS

TC hydrolate reduced C. acnes induced inflammation by impairing NO production by 35% and 80% at the tested concentrations of 1% v/v and 10% v/v, respectively. Regarding the effect on bacterial-cell interaction, the hydrolate (at 10% v/v) reduced bacterial association to keratinocytes by 20%. Finally, concerning an adjuvant

perspective, TC hydrolate presented a significant increase in fibroblasts migration (140%), when compared with control.

DISCUSSION AND CONCLUSION

These results contribute to deepen the knowledge about the anti-acne potential of TC, specifically of its hydrolate, thus increasing the value of this by-product and promoting circular economy. By acting on both acne induced inflammation and bacterial virulence, it highlights the ability to modulate different hallmarks of the disease. Also, by presenting wound healing potential, it uncovers an additional application for this plant preparation.

7. IMPROVING SKIN BARRIER DURING PANDEMIC TIMES WITH AN OPTIMIZED HYDROGEL SEMI-SOLID SHEET MASK: IN VITRO AND IN VIVO STUDIES

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INTRODUCTION

Prolonged mask use exerts pressure, friction, increase of humidity and temperature in the facial area, promoting skin outbursts in the general population. The current study aims to developed and test the efficacy of low-cost and easy to produce a hydrogel sheet-mask to place between the mask and the facial area to prevent skin lesions, by redistributing and reducing of the pressure triggered by mask.

MATERIALS AND METHODS

The polymeric film-forming system is a gelatin-based hydrogel composed with polyvinyl alcohol, silica, betaine and glycerin, biodegradable and low-cost ingredients. Design of Experiment (DoE) with a Quality by Design approach (QbD) was used for development studies. Compression, adhesive and tribology studies were performed to evaluate the adaptability of the hydrogel sheet-mask under conditions provided by the mask use using a Kinexus Lab+ Rheometer A target force of 0.5N and 1.5N were used to simulate the pressure exerted by surgical and N95 mask, respectively. To comprehend the lubricant properties, a constant force was exerted using a three-ball-on-plate tribometer with and without sweat and at 25ºC and 32ºC. Ongoing biometric in vivo studies are being performed to access the efficacy of the hydrogel sheet-mask when used underneath a N95 mask during 4 hours. To infer the pressure relief provided by the hydrogel sheet-mask the assessment of red spots was performed by VISIA-CA™. Skin water content was evaluated by a MoistureMap system, the facial skin temperature was assessed using Flir E50bx®, and the trans-epidermal water loss (TEWL) was measured using a Vapometer®.

RESULTS

The QbD approach was useful to optimize the formula and the manufacturing process for an easier, economical and reproducible scale-up process. Compression test demonstrated complete elastic recovery with adhesive properties. Tribology has demonstrated similar friction values for both temperatures and a slight decrease in values when sweat was added (1.1x10-2±4.3x10-4 N.m at 0.5N and 2.0x10-2±2.8x10-3 N.m at 1.5N without sweat, and 1.0x10-2±9.9x10-5 N.m at 0.5N and 1.6x10-2±8.0x10-4 N.m at 1.5N with sweat). Regarding the biometric in vivo methodology, the tests performed so far, indicated a statistical difference in skin hydration which increased with the use of hydrogel sheet-mask underneath the mask.

CONCLUSION

The resistant physical properties of this hydrogel sheet-mask and attenuation the physiological alterations in the facial area during its use are good indicatives that this cosmetic can prevent skin lesions and promote a healthier skin during pandemic times.

8. CHARACTERIZATION OF LIPID EXTRACTS FROM HERMETIA ILLUCENS LARVAE AND ASSESSMENT OF THEIR POTENTIAL USE IN COSMETIC FORMULATIONS

Cíntia Almeida[1], Márcia Filipe[1], Daniel Murta[2], Rui Nunes[2], Patrícia Rijo[1], Catarina Rosado[1]

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2 - Ingredient Odyssey, Santarém, Portugal

INTRODUCTION

There is a growing trend for new cosmetic products based on natural ingredients, since they can act to improve the biocompatibility of formulations and can be produced in a sustainable way. The Hermetia illucens larvae biomass has promising applicability as source of added-value products to be used in the health and cosmetic products industries due to its high content in mono and polyunsaturated fatty acids (mainly lauric acid).

AIM

The present work aimed to evaluate the chemical compositions of extracts obtained from H. illucens larvae biomass and to conduct a preliminary screening of enzymatic activities envisioning a cosmetic application.

METHODS

Different extraction techniques were compared (decoction, microwaves, ultrasound and maceration) using different solvents. In addition, the lipid fraction composition from the extracts was analysed by gas chromatography (GC/FID). The assays for enzymatic activity were carried out with collagenase enzyme to assess the extract applicability as a potential anti-aging ingredient.

RESULTS

The results showed that, despite employing different extraction techniques and solvents, similar fatty acids composition profiles were obtained. Higher concentrations of lauric acid were achieved and this fatty acid amounted to 41% to 62% of the extract. Significant amounts of palmitic, oleic and linoleic acids were also obtained. Despite having low yields when compared to those obtained using organic solvents (4% from decoction against 39% using hexane), the aqueous extraction provided slightly higher concentrations of lauric acid and PUFA, which have a great potential in skincare cosmetics. The different lipid extracts achieved collagenase inhibition activities between 47-68%.

DISCUSSION AND CONCLUSION

The results obtained so far have shown that with different extraction techniques it is possible to extract the same profile of fatty acids from the larvae biomass, with slight concentrations variations according to the technique and solvent used. This blend of fatty acids can be further explored for its potential applicability as a cosmetic ingredient, since a good skin biocompatibility is foreseen and several FA are already known for their positive effects in the skin. It should also be highlighted that this preliminary work indicates that this ingredient can be obtained by a relatively economical, simple, and sustainable technique. Other studies are, thus, ongoing to ascertain the safety and efficacy of the larvae lipid extracts.

Acknowledgements: This work was financially supported by Fundo Europeu de Desenvolvimento Regional (FEDER) through of Programa Operacional Competitividade e Internacionalização e Programa Operacional Regional de Lisboa, through NETA

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9. DEVELOPMENT OF LIPID NANOPARTICLES BASED ON INSECT LARVAE BIOMASS FOR SKIN DELIVERY

Cíntia Almeida[1,2], Catarina Pereira-Leite[2,3], Catarina Rosado[2]

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3- LAQV, REQUIMTE, Chemical Sciences Departament, Faculty of Pharmacy, University of Porto, Porto, Portugal

INTRODUCTION

Fatty acids (FA) are critical components of the stratum corneum in skin barrier function. The lipidic fraction of the Hermetia illucens larvae biomass contains a blend of FA, mainly those that are saturated such as lauric acid, that can be a potential new ingredient for topical formulations. The development of lipid nanoparticles made up of fatty acids that are similar to those present in the epidermis may be a good strategy for the management of skin barrier disorders, since they can combine optimized delivery with an emollient protective effect.

AIM

The present work aimed to develop and characterize nanoformulations using the lipid extracts obtained from H. illucens larvae biomass.

METHODS

Solid lipid nanocarriers (SLN) were prepared with lipid extract or a mixture of the extract with commercial solid lipids (Precirol® ATO 5, Gelucire®, Stearic Acid), in different proportions. Different amounts of surfactant were also tested, and after the addition of the aqueous phase, the nanoformulations were subjected to ultrasonication. The stability of the nanoformulations was evaluated during 30 days at room temperature and characterized in terms of size and polydispersity index (PDI).

RESULTS

Nanoparticles containing the lipid extract of the larvae had a size under 200 nm and a PDI<0.25, whereas the nanoformulations containing Gelucire®, Precirol®, and Stearic Acid displayed higher values of particle size and PDI. Increasing the amount of surfactant in the nanoformulations resulted in a reduction of particle size, except for stearic acid. The nanoformulations with the extract showed good stability after 30 days, maintaining the size and PDI values.

CONCLUSION

Our results suggest that nanoformulations made of crude lipid extract from H. illucens larvae are feasible and can be further developed as a strategy employing nanoparticles for actives encapsulation combined with skin protection.

Acknowledgements: This work was funded by national funds through FCT - Foundation for Science and Technology, I.P., under the UIDB/04567/2020, UIDP/04567/2020 and EXPL/BTM-MAT/0112/2021 projects attributed to CBIOS, by the research grant attributed to C.A. (UI/BD/151423/2021) and through NETA POCI-01-0247-FEDER-046959 project. Additionally, the authors would like to acknowledge Gattéfosse Company for the lipid samples used in this study.

10. NATURALLY-DERIVED SURFACTANTS IN SHAMPOOS FOR PETS

Maria Santos[1], Joana Marto[1], Pedro Pinto[1,2], Helena M. Ribeiro[1]

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INTRODUCTION

Nowadays, the demand for pet hair care products has been growing. Owners are no longer satisfied with an ordinary shampoo and are looking for the most suitable product for their four-legged friend, according to the type of hair, color, allergies, fragrance, desired effect and at the same time valuing the product's sustainability.

AIM

The present study explores the development of shampoo formulations for dogs with natural derived sulfate-free surfactants, and conditioning ingredients that allow cleansing and easier combing effects.

METHODS

Two shampoo formulations were prepared: a shampoo with a nonionic surfactant (decyl glucoside) – DG-Sh - and another one with sodium laureth sulfate (SLES-Sh) that was used as control. Both shampoos contain an "anti-frizz" conditioner, amodimethicone, trideceth-12, cetrimonium chloride. Apparent viscosity (AMETEK Brookfield, viscometer), pH (pH meter InoLab 730, WTW, Weilheim, Germany), foaming (vortex Heidolph, Schwabach, Germany), and contact angles (goniometerKSV CAM 100, Biolin Scientific, Sweden) were determined. The conditioning efficacy was studied by in vitro hair combing force assays (dynamometer coupled with Advanced Force Gauge (Multitest DV, Mecmesin, Germany).

RESULTS

The pH values of the formulations developed in this study varied between 5.01 (DG-Sh) and 4.07 (SLES-Sh). The SLES-Sh presented higher foamability and apparent viscosity when compared to DC-Sh that has higher contact angle value (71.5±0.6), while SLES-Sh has 60.5±0.6. In general, it was observed that both shampoos formulations showed a lower and easier hair combing force, when compared to control (only rising water). DG-Sh reduced the strength needed for combing the hair in 80% and SLES-sh reduced 75%.

DISCUSSION AND CONCLUSION

These favorable outcomes clearly support the use of these ingredients in shampoo formulation design. The results obtained allow us to conclude that decyl glucoside based shampoo containing and anti-frizz conditioning ingredient present physic-chemical characteristics and conditioning efficacy proving that besides their satisfactory outcome they will also have a good acceptance by consumers, willing a promising future in the cosmetics for veterinary use.

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11. SPOTLIGHTING THE LABELLING OF SUSTAINABLE MOISTURIZERS: CASE STUDIES

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INTRODUCTION

Nowadays, customers are more informed, looking for more sustainable and environmentally friendly alternatives and are actively searching for a healthier lifestyle. Choosing cosmetics that are kind to the planet is more important for today's consumers than ever – yet many brands may not be providing sufficient information on their packaging to help them make the eco-friendly choice.

AIM

This research aims exploring the clear information concerning eco-responsibility of four commercial moisturizers.

METHODS

For this analysis, brand commitments, product claims, packaging labelling and certifications was collected from four body commercial moisturizers .Brands' websites and one cosmetic from each brand marketed in Portuguese pharmacies, align themselves with these new trends, were analyzed.

RESULTS

The most common information on the labeling is related to their ingredients and packaging materials: “Formula XX% of natural origin”; “No ingredients from animal origin”; “Bottle 25% recycled PET”; “Bottle in plant-based plastic”; “Label - PP, 100% recyclable”. However, and despite the mention on the percentage of natural ingredients and their non-animal origin, synthetic/vegetable origin it is not mentioned, which does not allow the consumer to answer this question by itself. Beyond this, all products presented an extensive list of ingredients, with some ingredients involved in controversy, despite their complying with the regulation (ex: furocoumarins, polyacrylate-13, PEG’s, etc). Furthermore, no certification or ISO compliance is displayed, besides the ECOCERT and “1% for the planet”.

In terms of product claims, some products are supported by the respective efficacy tests, which complies Regulation No. 655/2013, while for others no tests are available. “Free from” claim is still being used which goes against the regulation.

DISCUSSION AND CONCLUSION

This analysis allowed us to verify how the formulations are adapted to new sustainable brand’s commitments, mainly from analysis of Cosmetic Ingredient Review’s reports and how product claims comply with regulations and guidelines. It is still impossible for consumers to understand the origin and the life cycle of most of the ingredients used. Furthermore, some eco-credentials, sustainable or ISO 16128 compliance could increase consumer's trust.

12. STRATUM CORNEUM LIPIDS AS THE BASIS OF NANOPARTICLES FOR EPIDERMAL REGENERATION

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INTRODUCTION

The stratum corneum (SC) ensures skin integrity and hydration, and changes in the constitution of the lipid matrix are linked to several skin pathologies1. The lipid matrix of the SC is composed of three main classes of lipids: cholesterol, fatty acids, and ceramides, and disturbances in their organization and/or composition contribute to the impairment of this function, favoring the appearance of dysfunctions, such as sensitive skin syndrome (SPS)2. SPS is a cosmetic condition or psychosomatic alteration, characterized by several unpleasant skin sensations3.

AIM

This project aimed to develop solid lipid nanoparticles (SLNs) and nanostructured lipid carriers (NLCs), consisting of SC-like fatty acids, to promote a skin barrier reinforcement and regeneration in individuals with SPS.

METHODS

SLN and NLC were produced using the ultrasonication method. Firstly, a preliminary study was performed to optimize the qualitative and quantitative composition of lipids and surfactant to be incorporated and the production process. Subsequently, the nanoformulations were characterized according to their size and polydispersity index (PDI). The viscosity and pH of the nanoformulations were evaluated before and after undergoing accelerated stability studies. To evaluate the cutaneous compatibility, in vivo tests were also performed.

RESULTS

The results obtained showed that the solid lipids incorporated have impact on the physicochemical properties of the nanoformulations, as well as the type of lipid nanoparticle and the amount of surfactant incorporated. The formulations showed promising and interesting properties for cutaneous application, presenting a size lower than 300 nm, PDI lower than 0.3, viscosity between 1.5-10 mPa.s, and pH values compatible with skin application. The formulations also demonstrated stability after being subjected to stress conditions. Moreover, the in vivo assays showed that all nanoformulations present a good skin compatibility, when applied openly or under occlusion, with no changes in hydration or transepidermal water loss, or any erythema.

CONCLUSION

Overall, the developed nanoformulations showed potential for cosmetic application in individuals with SPS.

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13. DIFFERENCES IN SKIN PHYSIOLOGY BETWEEN VEGETARIAN-VEGAN AND OMNIVORES – AN EXPLORATORY APPROACH

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INTRODUCTION

Vegetarian-vegan diets, which involve a reduction or elimination of animal product consumption, are believed to be more "healthy" facilitating weight control. It is also believed that those diets might help reducing the incidence and clinical course of different chronic diseases. However available information e.g. reviews and metanalysis focusing these issues are still insufficient.

AIM

To examine the total body composition, the distribution of visceral and subcutaneous fat tissue, and to perform a preliminary assessment of skin biomechanics among vegetarians-vegans and omnivores individuals.

METHODS

A cross-sectional study involving 14 participants of both sexes (31,43+7.97years old) was conducted, in compliance with good clinical practices. Body composition was assessed using a dual-energy x-ray absorptiometry (DXA Lunar Prodigy Advance - General Electric Healthcare®) while skin characterization was achieved by non-invasive measurements of hydration, cutaneous barrier, sebum secretion, as well as elastic and viscoelastic parameters (CK Electronics GmbH). Other descriptive variables were also collected such as dietary habits, weight, height, physical activity practice, and abdominal perimeter.

RESULTS

We found no significant differences between these two groups for weight, height, BMI, smoking status, and physical activity. The same regarding total bone mass, fat mass, lean mass, tissue mass, and fat-free mass. Nevertheless, vegetarian-vegan individuals consistently showed higher adipose tissue content (VAT and SAT; p-value>0.05) compared to the omnivores group. Concerning the cutaneous condition of the different dietary groups, no statistically significant differences were established in the skin properties assessed.

DISCUSSION AND CONCLUSION

This exploratory study revealed some (not statistically significant) differences between healthy volunteers following vegetarian-vegan and omnivorous dietary patterns. Vegetarian-vegan participants have shown lower bone and fat-free mass volumes and higher levels of fat mass, lean mass, tissue mass, total mass, subcutaneous and visceral adipose tissue when compared with the omnivore group. These differences will be further confirmed in subsequent studies.

14. REVIEW OF EU REGULATORY STATUS OF ENDOCRINE DISRUPTORS IN COSMETIC PRODUCTS

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INTRODUCTION

An endocrine disruptor is an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism. Exposure to endocrine disruptors can occur from different sources including cosmetic products. Cosmetic Products Regulation (CPR) does not specifically lay down any regulatory consequences for endocrine disruptors. Nevertheless, for substances other than CMRs identified or considered to be potential endocrine disruptors within REACH Regulation, the CPR foresees a risk assessment where a potential risk to human health is evaluated.

AIM

To carry out a review of the regulatory and safety procedures taken to determine the endocrine disrupting potential of cosmetic ingredients.

METHODS

We searched the European Commission documents and the SCCS Mandates and Opinions between the years 2018 and 2022.

RESULTS AND DISCUSSION

The Commission created a priority list of potential endocrine disruptors, setting a list of 28 substances that are not already covered by the bans laid down on CPR. From these 28 substances, 14 substances earned higher priority status for assessment; the remaining substances will be subjected to a second call for data. Considering the high priority list, 10 substances have already been assessed for their endocrine disrupting potential. As for the outcome of this assessment, for 4 substances it was not possible to attest on their safety whether due to lack of information or because the information provided pointed to an endocrine disrupting potential; the remaining 6 evaluated substances were considered safe up to certain levels and/or to specific type of products and will be subjected to restrictions to be adopted as amendment of the CPR.

CONCLUSION

ECHA has identified an array (~600) of chemicals with endocrine disrupting potential, nevertheless the European Commission identified 28 of these chemicals to have impact in the Cosmetic Industry. Safety assessments by the SCCS are actively being performed to determine their safe use in cosmetic products. This review approached the status of these assessments and verified that the majority of the substances already evaluated can continue to be used safely under restrictions to be set out. It is important that the stakeholders are aware of the dynamic evolution and changes regarding endocrine disruptors so to carry on the placing of safe products on the European Union market.

15. REVIEW OF EU REGULATORY STATUS OF MICROPLASTICS IN COSMETIC PRODUCTS

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INTRODUCTION

Microplastics are solid plastic particles composed of mixtures of polymers and functional additives which can be unintentionally formed or deliberately manufactured and added to products for specific purposes. Microplastics do not biodegrade, are persistent in the environment and difficult to remove. Microplastics are intentionally added in cosmetics and are used for a variety of purposes, although the most well-known functions are exfoliating and cleansing.

AIM

To carry out a review of the regulatory procedures taken to restrict the use of microplastics at EU level and review the measures that Member States have already set out, namely Portugal. Methods: We searched the ECHA topics, ECHA news, ANNEX XV RESTRICTION REPORT PROPOSAL FOR A RESTRICTION, Committee for Risk Assessment (RAC) reports and Committee for Socio-economic Analysis (SEAC) reports between the years of 2018 and 2022.

RESULTS AND DISCUSSION

In 2019, ECHA proposed a wide-ranging restriction on intentional uses of microplastics in products placed on the EU market to avoid or reduce environmental pollution, following the European Commission request to assess the scientific evidence for taking regulatory action at the EU level on microplastics. RAC and SEAC issued a report supporting the restriction on the use of intentionally added microplastics. The proposal for a restriction includes harmonisation of the definition of microplastic, as well as phase-out transition periods with regards to the different industries where microplastics are used. For cosmetic products, it has been proposed a 4-year transition period for rinse-off products and a 6-year transition period for leave-on product, from the entry into force (EiF) of the legislation. Member States are already taking measures to prohibit use in some products, including Portugal. In July 2021, Portugal adopted a Decree-Law which prohibits the placing on the market of cosmetic products containing plastic microspheres used to exfoliate, polish or clean in a concentration equal to or greater than 0.01% w/w.

CONCLUSION

Microplastics have been found in marine, freshwater and terrestrial ecosystems as well as in food and drinking water contributing to the pollution of the ecosystems. This review approached the regulatory status within EU and Portugal and it was verified that efforts are being made to provide sustainable and environmentally friendly cosmetic products, which will be consolidated upon publication of the legislation.

16. IS THERE A NEED FOR DERMAL ABSORPTION STUDIES TO ENSURE COSMETIC REGULATION COMPLIANCE?

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INTRODUCTION

The Regulation (CE) no 1223/2009 is the regulatory instrument for European cosmetic products allowing the free circulation of safe cosmetics and ensuring consumer public health. The dilemma between regulatory compliance and the effects of cosmetics is a challenging issue, as there are no mandatory standards. However, compliance with this regulation requires, among others, supporting evidence of the effect stated by the cosmetic. Thus, it is crucial to verify regulatory compliance with the definition of cosmetics available on the market, using, for example, dermal absorption tests.

AIM

The aim of this research was the evaluation of the influence of two commercial cosmetics (serum and cream), in the release and permeation studies.

METHODS

In vitro release and permeation studies were performed using vertical Franz diffusion cells (n=6) with Tuffryn® and Strat-M® membranes, respectively. Rhodamine B (125 mg/g) was incorporated in both vehicles as a fluorescent probe. The donor phase consisted of 200 mg of each formulation. The system was maintained at 32±1ºC for about 30 min before the experiment started. The samples were collected at specific time points and the volume was replaced with fresh receptor phase (PBS solution). Rhodamine B was assayed at 580 nm in a Fluostar Omega microplate reader (BMG Labetch, Ortenberg, Germany).

RESULTS

The percentages of release studies obtained after 6 h were 51.37± 1.11% for the cream and 30.62± 2.12% for the serum. The results are in accordance with permeation studies, where a significantly higher permeation at 24 h was observed when testing the cream (27800±567 g/cm2), compared to the serum (7524±258 g/cm2).

DISCUSSION AND CONCLUSION

It is important to highlight the fact that Rhodamine B has a molecular weight of 479.0 g/mol, which presents characteristics favorable to permeate. In the used experimental conditions, there was a higher release and cutaneous permeation from the cream than the serum, due to the presence of skin permeation enhancers, like alcohol denatured. This reinforces the need to conduct dermal absorption studies to ensure the regulation compliance, namely the definition of cosmetic product.

17. THE FUTURE OF UV FILTERS: SAFE PROTECTION FOR HUMANS AND THE ENVIRONMENT

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INTRODUCTION

Investigations on the declining coral reefs in the U. S. Virgin Islands and Hawaii showed that oxybenzone present in sunscreens induced coral bleaching, was genotoxic and an endocrine disruptor to coral larvae. After these findings, more research in UV-filters and ecotoxicity was conducted and, as a result, from January 1st 2021 Hawaii prohibited sunscreens containing UV-filters such as oxybenzone. However, this kind of organic compounds have been shown to be toxic to life in all aqueous systems, inhibiting embryonic development in sea urchins, gender shift in fish, bioaccumulation in sea turtles and endocrine disruptors to mammals. In Gran Canaria, different UV-filters were detected in sea and wastewater being oxybenzone the most recurrent compound. In the Portuguese coast UV-filters were detected in wild mussels at levels higher than expected.

AIM

Review of toxic effects known of UV-filters and novel ingredients to formulate safer sunscreens.

METHODS

Literature review using PubMed, ScienceDirect and Google Scholar databases.

RESULTS AND DISCUSSION

Currently, mineral sunscreens with non-nano zinc oxide have shown to be environmentally safe. Yet often they leave a white cast on the skin not appealing to consumers, but advances on optimized micro zinc oxide particles are being made to overcome this. In another aspect, it was shown that the use of more polar emollients could optimize UVA protection. Novel UV-filters inspired in nature's photoprotection mechanisms have been studied. Mycosporine like-aminoacids (MAAs), UV-absorption compounds isolated from cyanobacteria, microalgae and algae, show great promise. Its remarkable properties could allow the development of sun protection products, derived from natural sources, safe for the environment and efficient against UV damage. Nowadays, Gelyma and Mibelle have on the market extracts rich in MAAs that can be used in formulations. Still there are some regulatory constraints that need to be overcome in order to allow the use of innovative ingredients as UV filters.

CONCLUSION

There is an emerging concern with the potential ecotoxicity of ingredients present in sunscreens. Still, the use of sunscreen when exposed to UV radiation is essential to prevent skin cancer. Thus, understanding the mechanisms by which these molecules are toxic and the discover and design of new UV-filters will allow the formulation of safer sunscreens.

18. A WATERLESS LIFE CYCLE FOR COSMETICS: INCREASING SUSTAINABILITY IN THE COSMETIC INDUSTRY

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INTRODUCTION

The cosmetic industry has intensely relied on water as a critical element of the formulation and manufacture of cosmetic products. As freshwater is becoming a rare resource due to limited supplies allied to climate change, pollution and overexploitation, cosmetic companies and consumers are increasingly concerned about the environmental impact of their everyday beauty and personal care products. Due to the need for more sustainable products in cosmetics industry, waterless beauty is a current fast-rising trend that addresses the concerns around water scarcity.

AIM

Unravel the role of the cosmetics industry on water scarcity and what can be done to improve the sector's water-related sustainability, sensitizing consumers and producers.

METHODS

Discuss strategies to reduce water consumption in every stage of a cosmetic product life cycle – from the initial formulation design through sourcing of raw materials, manufacturing process, packaging, distribution, consumer use and final disposal, acknowledge the efforts already being made by some companies, and discuss examples of 'waterless products' currently available in the market.

RESULTS

Based on a Life Cycle Thinking approach, companies can act in multiple strands to save water, from developing new waterless products (e.g., bars, sticks, powders) and fast rinse-off and non-rinse formulas, responsible sourcing ingredients and finding alternative water sources, implementing optimized production processes and adopting circular water management in their facilities, designing biodegradable, recyclable and reusable packaging, adapting their transport practices and reducing the frequency of deliveries, to finally educate consumers to use and sustainably dispose of the products. Besides all the benefits to the planet, waterless products offer many advantages to consumers as they tend to be more concentrated, richer, lighter, economical and lasting longer.

DISCUSSION AND CONCLUSION

By adopting a waterless life cycle for cosmetic products, companies will surely be able to reduce their water footprint with the potential to achieve long-term cost savings and a more resilient future while enabling consumers to benefit from safe and effective products with better sustainability profiles. The cosmetic industry must continue its journey to guarantee access to water-friendly products and look for innovative ways to progress.

19. MULTISPECTRAL OPTOACUSTIC TOMOGRAPHY (MSOT) – A NEW TOOL IN EXPERIMENTAL DERMATOLOGY

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INTRODUCTION

Multispectral optoacoustic tomography (MSOT) is an emergent technology based on the photoacoustic effect caused by tissue illumination with ultrashort laser pulses and subsequent detection of ultrasonic waves generated by thermoelastic expansion of the scanned tissue. This technology enables to differentiate tissue chromophores in depth (up to 15mm) that might be useful in experimental dermatology.

AIM

To explore the applicability of MSOT in experimental dermatology.

METHODS

A convenience sample of 6 healthy volunteers was selected. All procedures were conducted according to the ethical principles accepted for human research, and previously approved by the institutional Ethics Committee. Real time MSOT functional images were obtained from the ventral aspect of the human forearm. Analysis focused main chromophores related with microcirculation and melanin using the viewMSOT software.

RESULTS AND DISCUSSION

Oxygenated haemoglobin (HbO2), deoxygenated haemoglobin (Hb), or the mean saturation of oxygen (mSO2) are quantifiable parameters regarded as endogenous biomarkers of microcirculatory function. Melanin can also be visualised and used as a marker to identify the skin superficial plexus vessels.

CONCLUSION

MSOT seems to be a useful tool with potential interest for safety and efficacy applications in experimental dermatology.

20. RENEW POTENTIAL USE IN DERMOCOSMETICS OF SKIN TRADITIONAL USED METHANOLIC PLECTRANTHUS SPP. EXTRACTS

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INTRODUCTION

The search for natural products as active ingredients in cosmetics has gained increased interest among the scientific community in recent years. Plectranthus spp. is a well-known genus used in traditional medicine for skin conditions. It belongs to the Lamiaceae family and is distributed in tropical areas of the globe.

AIM

The aim of this work was to scientifically validate the uses of these species in skin disorders and to probe potential applications in cosmetic formulations. Therefore, we assessed and evaluated the biological activity of the eight spp. of Plectranthus (P. ambigerus, P. barbatus, P. cylindraceus, P. ecklonii, P. fruticosus, P. grandidentatus, P. hadiensis, P. madagascariensis) cited as traditional used for skin conditions.

METHODS

All species were previously collected and dried at room temperature and methanolic ultrasound-assisted extracts were prepared (10 %, w/v). The antioxidant activity was evaluated by the DPPH method at 10 mg/mL. All extracts were screened for their antimicrobial activity, using microdilution assay at 10 mg/mL, against Gram-positive bacteria and yeast strains related to skin microbiota. The general toxicity was tested using the Artemia salina L. model at 0.1 mg/mL. The collagenase inhibition activity was assessed in vitro for all the eight extracts (1:10 in tricine buffer).

RESULTS

P. ecklonii and P. grandidentatus extracts showed high antioxidant activity with 98.15 % and 72.34 %, respectively. A moderate antimicrobial activity was demonstrated for P. ambigerus, P. fruticosus, P. grandidentatus, P. hadiensis and P. madagascariensis. None of the extracts showed relevant general toxicity. Collagenase inhibition activity of P. fruticosus and P. cylindraceus was significant, with inhibition zones of 91.0 % and 95.3 %, respectively.

CONCLUSION

Overall, these skin traditional used Plectranthus extracts seem to be promising raw material for use in the development of dermocosmetic formulations, such as those with antiageing activity. More studies are ongoing to probe other relevant biological activities and to further ascertain the safety of the extracts.

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21. THE IMPACT OF REPLACING INGREDIENTS WITH POTENTIAL ENDOCRINE-DISRUPTING PROPERTIES BY SAFER ON THE STRUCTURE OF EMULSIONS: PRESERVATIVES

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INTRODUCTION

Parabens are well-known preservatives that have been used through the years in cosmetics. It was defined by the Scientific Committee on Consumer Products (SCCP) that methylparaben and ethylparaben are safe in topic formulations up to 0.4%. However, risk assessment studies of propylparaben showed that this substance has effects in the endocrine system. Endocrine active substances are compounds that have an effect on the development or reproduction of biological species. Thus, it is necessary to replace these substances by safer ones, maintaining the quality and performance of the cosmetic products.

AIM

The present work aims to study the impact of replacing preservatives like parabens by safer preservatives on the structure and stability of cold-processed oil/water (O/W) emulsions.

METHODS

An o/w emulsion containing Sodium methylparaben (0.18%) and Sodium propylparaben (0.02%) – F0 - was used as a control. Four o/w emulsions were prepared differing on the preservative, as follows: F1 – Benzyl alcohol (1%); F2- Gluconolactone (and) Sodium Benzoate (1.5%); F3 – Methylpropanediol (and) Caprylyl Glycol (and) Phenylpropanol (3%); F4 – Butylene Glycol (and) Pentylene Glycol (and) Hydroxyphenyl Propamidobenzoic Acid (2%). Structural experiments were performed with a controlled stress Kinexus Lab+ Rheometer (Malvern). Rotational viscosity was determined using a cone and plate geometry, with an angle of 4º, at 25ºC. Viscosity ramp up/ramp down tests were performed from 0-100 s-1, in 5 minutes. Oscillation frequency sweep tests were performed at frequencies ranging between 0.1 and 100 Hz. Droplet size distribution was determined using a Malvern Mastersizer (Hydro 2000) and photomicrophotos were obtain using a Nikon Eclipse Ci microscope.

RESULTS

All emulsions showed a shear-thinning behavior, however, only F4 show similar rheological profile to the control. Regarding the oscillatory test, in all formulations, the G'□ G'', meaning these formulations have the elastic module superior to the viscous module and presenting strong network. Concerning droplet size distribution, all formulations show a similar profile, however, only F4 show similar droplet size profile to the control, which was confirmed by photomicroscope images.

DISCUSSION AND CONCLUSION

The replacement of parabens for safer preservatives has effectively an impact on structural properties of emulsions. The viscosity has a great impact on emulsions' performance and stability.

22. GYNECOLOGICAL STUDY TO EVALUATE THE EFFICACY AND TOLERANCE OF A COSMETIC PRODUCT ON THE REDUCTION OF VULVAR DRYNESS

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INTRODUCTION

Vulvovaginal atrophy (VVA) affects women's quality of life, being vulvar dryness the most described symptom. Most of the time, lubricants and moisturizers are not sufficient to treat this condition and pharmacological approaches are used. Many women reject hormonal treatments due to the risks of side effects and continue to live their life with the shame and stress caused by this condition.

AIM

This clinical study aimed to evaluate the efficacy of a cosmetic product on the reduction of vulvar dryness as well as its tolerance and impact in quality of life.

METHODS

This study was conducted in 44 female subjects suffering from vulvar dryness. The product tested is based on blackcurrent oil and free from preservatives, thus preventing changes on the vaginal pH and damages of vaginal microbiota. Different clinical signs and symptoms were scored by a gynaecologist (M.D.) at the beginning of the study (T0) and after 21 (T21) and 42 (T42) consecutive days of product's application. A questionnaire was filled by the subjects to assess the influence of this oil-based product on the subjects' quality of life and to assess the subject's acceptability, tolerance, efficacy and intention of future use towards the product. A placebo effect of -38.89% for the most described symptom (vulvar dryness) was estimated based on a published clinical study.

RESULTS AND DISCUSSION

After 21 (T21) and 42 (T42) consecutive days of product's application, it was observed a statistically significant ($p \leq 0.05$) reduction of the most described symptom (vulvar dryness) of -63.02% and -80.63%, respectively, in comparison to the baseline (T0) and to the estimated placebo effect. Additionally, it was observed a statistically significant ($p \leq 0.05$) reduction of different clinical signs (cutaneous thinning and erythema) and symptoms (stinging, burning, itching and heating) at T21 and T42. This oil-based product improved the odour, the worry, frustration and the embarrassment about vulvar symptoms, as well as the women's quality of life, namely in their interaction with others, self-esteem and sexual relationships.

CONCLUSION

The daily use of this oil-based product was effective in relieving symptoms of vulvovaginal atrophy, namely vulvar dryness, and was well tolerated by the subjects. Given the benefits of avoiding the use of hormonal treatments and/or lubricants, this oil based cosmetic product is an attractive alternative for women with vulvovaginal atrophy.

23. QUANTITATIVE AND QUALITATIVE ANALYSIS OF PORTUGUESE PRESS COVERAGE REGARDING COSMETIC PRODUCTS: A PILOT TEST FOR A CASE STUDY

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INTRODUCTION

Cosmetics are widely used products which contribute to consumers health and well-being. However, they are subject to many misconceptions which may affect their safe use, as well as consumers' informed choices. Among the available sources of information, newspapers are usually regarded as trustworthy, and they can influence consumers' knowledge, attitudes, and behavior.

AIM

To test and refine a grid of analysis for news pieces regarding cosmetic products in Portuguese press, including assessment criteria and data extracted from each article; and to obtain preliminary results for a 1-year case study.

METHODS

From November to December 2021, press titles were selected according to their themes and circulation data from 2020. News pieces authored by the editorial staff of selected titles relating to cosmetic products were included, whenever they intended to convey scientific information related to products or ingredients. Quantitative and qualitative data was extracted, namely news' identification, authors, sources, product recommendations, pictures, subjects, and information quality.

RESULTS

Three generalist newspapers were selected (one daily quality newspaper, one daily popular newspaper, and one weekly quality newspaper), as well as eight targeted magazines concerning beauty, fashion and lifestyle. From these titles, fourteen news pieces met the inclusion criteria, mainly from targeted titles (93%). All the news occupied at least one page, showing within the article a predominance of product recommendations (78%) and references to product benefits (93%), but much less frequently to product harms (29%). Half the news cited appropriate scientific sources, of those 57% are specialized (e.g. doctors, pharmacists), with a median of one source per news piece. Nearly all articles concerned skincare (93%), with 7% referring to haircare. As for information quality, 64% of the news were classified as "Confuse", and 36% as "Correct".

DISCUSSION AND CONCLUSION

News pieces' selection was challenging due to the mixture of information regarding cosmetic products, lifestyle, and product recommendations. Overall, the tested grid of analysis proved to be adequate for this study. Most news pieces portrayed a positive view of cosmetic products, but risks related to ingredients and products' use were also discussed. Specialized news sources seem to be valued by journalists. However, most of the news contained conflicting information, which may misinform readers.

24. NEW EMOTIONAL AND SENSORIAL EVALUATIONS OF COSMETIC PRODUCTS USING AN ADVANCED VIRTUAL REALITY SETUP

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INTRODUCTION

Human skin is one of the first sources of information that connects to the brain, to supply sensorial information when the human body is exposed to visual stimulus such as images, videos or events. No matter whether we are stressed, nervous, fearful, stoked, baffled, or surprised – whenever we are emotionally aroused, the electrical conductivity of our skin subtly changes and other biometric parameters also change. AFETS is a modular system which enables, by using virtual reality stimulus, to measure emotional arousal (using Galvanic Skin Response - GSR), Heart Rate Variability and facial expressions detection and eye tracking movement.

AIM

The present work shows how to evaluate sensorial qualities of a cosmetic product based on the analysis of basic emotions and reactions triggered by its application using advanced image techniques such as virtual reality.

METHODOLOGY

In order to capture emotional responses, the test product is evaluated among 4 calibrated products. 15 healthy subjects (men and women, mean age: 28 y.old) gave their informed written consent to perform a sensorial VR study. The calibration products are distributed in 4 quadrants, as Calm and Exciting (positive response), Adverse and Boring/neutral (negative responses). Based on these quadrants distribution, 4 different standard virtual reality environments were defined and the subject was asked to wear a VR headset (HTC VIVE PRO Eye) during which they should smell the different products, randomly, and choose the environment that feels more related with them. An Artificial Intelligence algorithm was used to classify the valence during the products presentation. This system integrates eye tracking detection, to obtain several metrics about the visualization of the stimulus and combining with GSR evaluation. All the statistical analysis were performed using SPSS 23. A 95% confidence level was adopted.

RESULTS AND DISCUSSION

Test product show a high valence level (>1) and a high arousal, detected by GSR peak detection and Heart Rate variability. At the same time in the VR environment the arousal and the heatmap detected was significantly correlated with the VR scene that is defined as excited. By using the calibration procedure and the sensorial circumplex we can validate that test product is therefore considered as Excited.

CONCLUSION

Using these techniques, we develop a sensitive tool to evaluate the sensorial qualities of cosmetic products during an advanced but safe stimulus presentation.

25. POLUTION AND SKIN: ALEGATIONS IN ANTIPOLUTION COSMETICS

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INTRODUCTION

The skin is one of the main organs affected by exposure to pollutants and other environmental factors. Despite that, cosmetic formulations with anti-pollution claims have no standardization of efficacy.

OBJECTIVE

The aim of this study is to verify which active ingredients are associated with cosmetic anti-pollution claims, within the active ingredients of anti-pollution dermocosmetics present in the market.

METHODOLOGY

Observational, descriptive, cross-sectional study. We resorted to 11 websites for the search of cosmetic products, in March 2020, with antipollution claim, using the keyword: "antipollution" in Portuguese and English languages. Results that did not meet the inclusion criteria were excluded. Results corresponding to duplicate products were also excluded. The analysis of the ingredients list considered: identification of the pharmaceutical form, search and identification of the actions of each ingredient and search of the scientific evidence for the cosmetic claim "antipollution".

RESULTS AND DISCUSSION

The ingredients with cosmetic action corresponding to: filmogenic agents, moisturizers, depigmenting agents, antioxidants, photoprotectants, collagen synthesis stimulants and repairers were counted. A total of 95 products were included, with 18% of the ingredients classified as antioxidants (the most predominant category). Glycerin was the most frequently found active ingredient. Most of the active ingredients analyzed had a scientific basis to support anti-pollution claims.

CONCLUSION

This study showed the prevalence of active ingredients with antioxidant action in the formulation of the analyzed products and supporting rationale. However, for some active ingredients, further studies are needed to prove their actions and applicability in anti-pollution preparations.

26. HAIR AND KERATIN PEPTIDES

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INTRODUCTION

Chemical straightening of curly human hair fibres involves the use of strong reducing agents at alkaline pH. Human hair is made of keratin, and the fixation of fibre shape involves the reduction and reformation of new disulphide bonds between keratin molecules.

AIM

Here, we propose an alternative and green methodology using keratin peptide sequences (10–13 residues) derived from the human genome.

METHODS

In a previous study, we analysed 1235 cysteine-containing peptides encoded by all human genes of hair keratin and keratin associated proteins. These peptide fragments have been designed by nature to interact with keratin. Here we tested eight peptides, which were select based on their affinity for human hair keratin solution as shown by Matrix-Assisted Laser-Desorption Ionization Time-of-Flight Mass Spectrometry (MALDITOF/TOF) and by molecular dynamics simulation. The peptides were characterized in detail regarding their ability to act as hair straightening modulators and to improve the tensile strength and elasticity of hair.

RESULTS

Of the eight tested peptides, 3 peptides showed the highest ability to interact with a keratin peptide model, and to improve hair mechanical properties and straightening efficiency.

DISCUSSION AND CONCLUSION

The proposed solutions presented here will replace harsh reducing agents at alkaline pH by peptide formulations acting at neutral pH to change hair shape through the re-conformation of disulphide bonds. Here, we provide experimental evidence which explains at a molecular level how keratin decapeptides can interact with large keratin molecules in human hair, opening an innovative green approach to changing the shape of hair fibre.

27. DEVELOPMENT OF A SNIFFING STICK FOR TESTING OLFACTORY PERFORMANCE

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INTRODUCTION

Assessing olfactory performance is essential for selection/training of odour panellists for sensory evaluation in different fields, such as cosmetics. Sniffing tests are also used to identify anosmia or reduced odour perception, e.g. due to ageing or disorders of the olfactory system. Smell impairment is also an early and sensitive marker of the preclinical phase of neurodegenerative disorders, allowing to identify subjects at increased risk, thus enabling early therapeutic interventions.

AIM

To develop and characterise a novel nasal stick suitable for testing the ability to identify and quantify odours.

METHODS

Sticks were prepared by fusion and moulding and characterised regarding organoleptic characteristics, dimensions, resistance to deformation and melting properties. Various waxes and consistency modulators were evaluated.

Odoriferous ingredients n-butanol (for assessing odour threshold), menthol and vanillin (both for assessing odour identification) were incorporated in selected formulation.

To improve the stick's odour retention, fixative agents were evaluated – benzyl benzoate, Foralyn™ 5020-F, sucrose acetate isobutyrate (SAIB) and Ambroxide. Besides the sensory analysis, sticks were submitted to a gravimetric analysis to assess mass variation, therefore the evaporative loss of volatile compounds.

Stability tests were carried out at room temperature.

RESULTS AND DISCUSSION

The formulation containing 2.5% carnauba wax, 20% white wax, 10% ozokerite, 5% lanolin, 2% cetyl alcohol, 3% liquid paraffin, 3% isopropyl myristate, 49% castor oil, 5% glycerine and 0.5% tocopheryl acetate was the most suitable, producing odourless and pale yellow sticks, not melting in contact with the skin and with an intermediate resistance to deformation. This formulation had the lowest melting and mass solidification temperatures (79.6 ± 0.5oC and 64.0 ± 0.9oC, respectively), which is positive for incorporation of volatile components.

Sticks containing odorous substances maintained initial odour for 2 weeks and those with the highest concentration of menthol or vanillin (10%) retained the odour for 4 weeks.

Fixative agents were tested in sticks with the lowest concentration of menthol (2.5%). The presence of 0.5% benzyl benzoate increased from 2 to 4 weeks their ability to retain initial odour. Gravimetric test showed that mass loss was reduced by the presence of 0.5% benzyl benzoate or 2% SAIB.

CONCLUSION

The developed nasal stick is suitable for olfactory testing, it can be easily prepared and used for at least 4 weeks.

28. EX VIVO ASSESSMENT OF AN EMOLLIENT EFFECT IN UROCANIC ACID ISOMERIZATION ON THE STRATUM CORNEUM AFTER UV STRESS

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INTRODUCTION

The natural moisturizing factor (NMF) is an endogenous mixture that keeps the skin in its moisture homeostasis and is located in the stratum corneum. The NMF components include several compounds, among them urocanic acid (UCA). UCA is an imidazole derivative present in the stratum corneum which has different roles, being isomer-dependent. As a NMF constituent, UCA is also important for maintaining the pH of the stratum corneum. The ultraviolet (UV) exposure turns the trans-UCA into the cis-UCA, which has immunogenic effects.

AIM

The aim of this study was to investigate the impact of the pre-treatment with an emollient cream in the UCA isomers of the stratum corneum exposed to UV stress.

METHODS

In 12 healthy volunteers (21-50 years old; Fitzpatrick types II–IV), aliquots of 2 mg/cm2 of the cream (caprylic-capric acid 15%, crodafos CES 6%, optiphen 1%, and water as vehicle) were applied for 2 hours on delimited area of the volar forearm. Following this pre-treatment, the stratum corneum was extracted by tape stripping using ten tapes. The tapes were irradiated in a solar simulator chamber. HPLC was applied to quantify UCA isomers from striped stratum corneum extract. The Wilcoxon matched-pairs signed rank test (p 0.05) was used to analyze the data.

RESULTS

Trans-UCA concentration was 0.66 ± 0.48 and 1.12 ± 0.75 µg/mL on untreated (control) and pre-treated stratum corneum, respectively. Considering the cis-UCA, the untreated stratum corneum presented 0.5985 ± 0.3816 g/mL of this isomer and cream-treated one 1.1452 ± 0.8705 g/mL. The concentration ratio between control and treated stratum corneum with the emollient cream was 1.69 and 1.91 for trans- and cis-UCA, respectivel. We observed a significant increase in the total UCA concentration on the pre-treated stratum corneum in comparison with the control (Fig.1). However, no differences in cis/trans UCA ratio were found between the different stratum corneum samples when stressed by the UV irradiation (Fig. 2).

CONCLUSION

The concentrations of both UCA isomers were almost twice higher in the stratum corneum treated with the emollient cream. Skin pre-treatment with the cream for 2 hours increased the UCA concentration in the

cutaneous tissue, however, it did not prevent the UCA isomerization after UV exposure, since no differences were found among the cutaneous cis/trans ratio.

29. COSMETICS USE DURING PREGNANCY: HABITS AND PERSPECTIVES OF CONSUMERS AND HEALTH PROFESSIONALS IN A PORTUGUESE POPULATION

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INTRODUCTION

Pregnancy is related to several hormonal and physical changes that can affect the skin and its appendages influencing the use of cosmetic products.

AIM

This study aimed to identify the habits and perceptions of pregnant women regarding the use of cosmetics and the perspective of health professionals, according with their area, on this topic.

METHODS

Two anonymous and confidential questionnaires comprising closed and semi-open questions. The first was aimed at pregnant women and the second was aimed at health professionals (family medicine doctors, obstetricians, nurse-midwives, and community pharmacists).

RESULTS

A total of 385 pregnant women completed the online questionnaire. The results showed that almost all women used cosmetic products before pregnancy (90,39%). 68,57% of women recognized the need to change habits in the use of cosmetics during pregnancy, while 50,39% reported having fears and/or uncertainties regarding the use. However, only 36,36% of women mentioned seeking advice on the use of cosmetic products during pregnancy. Among women who mentioned avoiding cosmetic care during pregnancy (N=220), 33,44% avoided hair care and 28,83% nail care. Of all women surveyed, 303 women reported implementing new cosmetic care during pregnancy. Regarding health professionals, a total of 236 complete responses were obtained. The results showed that 85,6% of community pharmacists advise pregnant women on the use of cosmetics, as do 52,2% of family doctors, 61.8% of obstetricians, and 56,9% of nurse-midwives. However, of these only 28,6% of community pharmacists, 8,3% of family doctors, 4,8% of obstetricians, and 24,4% of nurse-midwives mention having specific training to provide this type of advice. We have discovered that most health professionals within each area (>79%) have difficulty finding information in the literature on this topic and most health professionals feel the need for specific training to provide this type of counseling.

CONCLUSION

A significant number of women report fears and/or uncertainties regarding the use of these products during pregnancy, therefore more information is needed. Health professionals require specific training to be prepared to inform and guide pregnant women about the safety of using cosmetics during pregnancy. It is necessary to

designs training strategies, options, and tools on this subject to be made available to pregnant women and health professionals to advise pregnant women in this area.

30. HAMAMELIS VIRGINIANA EXTRACTS AS COSMETIC INGREDIENTS: AN OVERVIEW OF COSMETIC PRODUCTS MARKETED IN PORTUGUESE COMMUNITY PHARMACIES

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INTRODUCTION

Hamamelis virginiana originating from Virginia was one of the favorite medicinal plants of indigenous people. It is incorporated in pharmaceutical preparations due to its documented bioactivities (anti-inflammatory, antioxidant, antimicrobial, wound healing and prevention of complications from chronic venous insufficiency).

AIM

To characterize the use of H. virginiana extracts as cosmetics ingredients in products marketed in Portuguese community pharmacies. To critically analyze the claims of such products in relation to known bioactivities of this plant.

METHODS

Detailed information on marketed cosmetic products was collected through community pharmacies (north and center regions of Portugal); direct contact (e-mail/telephone) with pharmaceutical distributors and by e-mail contact with Information Centers that support pharmacies.

RESULTS AND DISCUSSION

Among 135 products containing H. virginiana, 85% (n=114) were cosmetics. Regarding their classification according to area of application and purpose, 26% were for face care. As for the permanence time, 87 were rinse-off products. Regarding the part of the plant used, 71 incorporated the leaf of H. virginiana. About 111 cosmetics were intended for cutaneous administration dosage forms and were presented in different dosage forms and presentation forms. Thus, the predominant pharmaceutical form was gel (semi-solid pharmaceutical form). Most of these products (27%) only incorporated 2 plant extracts, so correlations between the claim of each product and the recognized bioactivities of H. virginiana were studied. Overall, 92 products claimed: actions on the skin (cleansing, moisturizing, healing and regeneration, anti-aging effect and antioxidant action); and actions on appendages: antiperspirants and deodorants, hair and sensitive scalp care, and for hygiene of the oral cavity. This plant is also incorporated in cosmetics that are intended to relieve heavy, swollen legs, improve circulation and muscle discomfort. These claims are concordant with the recognized bioactivities of this plant. The remaining 12 cosmetics didn't present indications scientifically documented, namely: 8 intimate hygiene products intended for vulvar cleaning and 4 products that claim to help in the growth of eyelashes and eyebrows and regeneration of damaged nails.

CONCLUSION

H.virginiana extracts are used widely as cosmetic ingredients in marketed products for skin, hair and oral care for its relevant bioactivities.

31. UPCYCLED INGREDIENTS FOR NATURAL DECORATIVE COSMETICS

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INTRODUCTION

Nowadays consumers are increasingly demanding for natural and sustainable cosmetic products which fostered the search for naturally derived cosmetic ingredients. Albeit a plethora of studies about natural cosmetic ingredients, the study of upcycled agro-ingredients for decorative cosmetics is still limited and needs further investigation.

AIM

The aim of this study was to characterize an upcycled agro-ingredient exploring its potentialities as a pigment for makeup foundations.

METHODS

Several features were characterized namely moisture content, granulometry, apparent density, colour and particle size. The moisture content was analysed on an infrared moisture determination balance at 80ºC during 10 minutes. Granulometric distribution was analysed using different sieves following agitation for 8 minutes. The apparent density was determined by measuring the volume that a given mass of powder occupied in a graduated cylinder. Colour was measured with a colorimeter (Chroma Meter CR-400) according to the Colour Space L*a*b*. Particle size was determined in a laser diffraction particle size meter (Mastersizer 3000). Additionally, the content of heavy metals was measured by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS). For comparison, a pigment widely used in decorative cosmetics (brown iron oxide) was also characterized with the same methodologies.

RESULTS

The powder presented the following features: moisture content less than 15%, about 80% of the particles lower than 180 µm, an apparent density less than 1 g/ml, brownish colour and a mean particle size around 140 µm. The content of heavy metals was lower than 2 ppm. As for iron oxide, similar results were obtained for colour and lower values were found for the other parameters analysed.

DISCUSSION AND CONCLUSION

The results suggest that this upcycled by-product has interesting properties to be used as a pigment in decorative cosmetics. Further studies need to be carried out to confirm its potentialities for application in foundations and other decorative cosmetics.

32. SEARCH FOR NATURAL INGREDIENTS FOR USE IN COSMETICS: A STUDY IN DROSOPHILA MELANOGASTER

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INTRODUCTION

Topical treatment with cosmeceutical can improve skin rejuvenation. The aging of the skin is primarily associated with the intrinsic genome. However, diet, lifestyle, drug and alcohol history, and environmental exposures are other factors that influence skin aging by affecting DNA. Natural occurring antigenotoxicity in natural ingredients could strongly counteract genome instability. Several studies have shown antigenotoxicological potential in natural ingredients, such as almonds (Prunus dulcis), elderberry (Sambucus nigra), olives (Olea europaea), and grapes (Vitis vinifera). These natural ingredients have been shown to possess a variety of biological activities and to hold therapeutic promise. These ingredients are the most common in the Trás-os-Montes region from Portugal. This region has the most organic farmers and has climatic, topographic, and pedological differences that contribute to agriculture diversity.

AIM

This study aimed to evaluate, in vivo, the effect of the natural ingredients on longevity, prolificacy, and genotoxicity/antigenotoxicity in D. melanogaster, Oregon K strain.

METHODS

To assess those effects, flies were subjected to different concentrations of the natural ingredients in a drosophila culture medium. To determine the natural ingredients' antigenotoxicological potential, the Somatic Mutation and Recombination Test (SMART) and Comet Assay was performed.

RESULTS AND DISCUSSION

The results showed that these ingredients do cause changes in longevity and prolificacy. It also showed that the natural ingredients have antigenotoxic potential.

CONCLUSION

The use of natural and organic cosmetics has become increasingly important. Identifying ingredients with antigenotoxic effects is among the most promising area of research in recent years since it might protect against DNA damage and its consequences.

33. EFFECTS OF A FORMULATION CONTAINING CYMBOPOGON CITRATUS ESSENTIAL OIL ON HUMAN SKIN

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INTRODUCTION

Cymbopogon citratus (DC) Stapf, also known in the popular culture as lemongrass, is an aromatic plant. Its essential oil is used in traditional medicine for the treatment of inflammation and allergy. However, scientifically based information about the impact of this esssential oil of C. citratus (EOCC) on human skin could not be found. Aim: The aim of this study was to evaluate the effects of a formulation containing EOCC on skin's physiology in healthy volunteers.

METHODS

A Carboxymethyl Cellulose (CMC) Gel containing 5% EOCC was prepared. A convenience sample of twelve healthy volunteers (4 men and 8 women) mean age 36.2 ± 16.3 years old was selected. All procedures were conducted according to the ethical principles accepted for human research, and previously approved by the institutional Ethics Committee (CEECTS.04/13). Two areas (9cm2 each) were drawn using both participant's forearms. After randomisation the formulation containing EOCC was applied in one area while in other one was used as control (gel with no EOCC). Applications took place for 14 days, 2 times per day. Biometric measurements took place before (t0) and in end of experiment (t14) involving the quantification of TEWL (Transepidermal Water Loss) with an evaporimeter (Tewameter TM300 CK electronics), epidermal hydration using MoistureMeters (Delphin Technologies) and biomechanics by Cutiscan CS100 (CK electronics).

RESULTS AND DISCUSSION

A significant decrease of Transepidermal Water Loss (TEWL), as well as a significant increase of epidermal hydration, were observed in those areas treated with the formulation containing EOCC compared with control. A significant increase in firmness and elasticity was also noted. Conclusion: results suggest that formulations containing EOCC are safe for topic application and could improve and protect skin suggesting promising utilization in cosmetic products. Our results confirm the interest of this EOCC to improve epidermal water dynamics and topical care.

34. ASSESSING THE ANTI-INFLAMMATORY PROPERTIES OF CYMBOPOGON CITRATUS ESSENTIAL OIL ON HUMAN SKIN BY THE METHYLNICOTINATE CHALLENGE MODEL

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INTRODUCTION

Essential oils (EOs) have been recognized as materials of interest to industry for dermatological applications. The Cymbopogon citratus (DC) Stapf, also known in the popular culture as lemongrass, produces an essential oil that is used in traditional medicine for its skin protective properties suggesting an interesting “anti-inflamatory” capacity. However, these claims are poorly supported by scientific evidence.

AIM

To evaluate the ant-inflammatory properties on the human skin of a formulation containing Cymbopogon citratus essencial oil (EOCC) through a microinflammation methyl nicotinate (MN) model.

METHODS

A Carboxymethyl Cellulose (CMC) Gel containing 5% EOCC was prepared. A convenience sample of twelve healthy volunteers (4 men and 8 women) mean age 36.2 ± 16.3 years old was selected. All procedures were conducted according to the ethical principles accepted for human research, and previously approved by the institutional Ethics Committee (CEECTS.04/13). Two areas (9cm2 each) were marked using both participant's forearms. On day 0 skin microcirculation (measured by laser Doppler flowmetry, PERIMED5000, Perimed AB) and trans-epidermal water loss (TEWL, TM300 CK electronics GmbH) were measured in both sites. After randomisation, the formulation containing EOCC was applied in one area while another one was used as control (gel without EOCC). Applications took place for 14 days, 2 times per day. By the end of the applications, the microinflammation methylnicotinate-model was applied in both sites. A 95% confidence level was adopted.

RESULTS AND DISCUSSION

MN evokes a change of all skin layers, from the epidermal barrier to the dermal plexus. These effects are short term and mediated by prostaglandins and local neurogenic components. This site exposed to the EOCC formulation did not reveal significant signs of irritation observing the values of local blood perfusion and TEWL. Comparing with the non-treated site a lesser microinflammatory reaction was clearly noted.

CONCLUSION

These findings suggest that formulations containing EOCC present a potential to treat skin inflammatory conditions. Further studies are needed to look deeper into these properties.

35. INNOVATION IN COSMETICS: SOLAR FILTERS

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INTRODUCTION

Taking into account the occurrence of a high number of skin cancer cases annually all over the world, caused by unprotected exposure to solar radiation, the development of sun protection products has grown exponentially in recent years. Sunscreens have in their composition filters that are able to disperse, reflect and absorb the solar radiation, preventing the harm caused by it.

AIM

The aim of this work is to present a literature review of the effects of solar radiation in the skin and the advances made in the formulation of sunscreens.

METHOD

To develop this work, a bibliographic search was made using different search engines such as PubMed and ScienceDirect.

RESULTS AND DISCUSSION

Sunscreens, whether organic or inorganic, provide direct protection against solar radiation. These filters have been improved so that they are able to protect the skin not only against UVB and UVA radiation, but also against visible and infrared radiation. The incorporation of antioxidants in sunscreens has been shown to increase the solar protection provided by UV filters as well as to minimise the damages caused by solar radiation on the skin. Also, the inclusion of DNA repair enzymes supplies additional protection against the damage induced by radiation. Additionally, research has been also conducted to create alternatives to the already approved UV filters. Progress in formulation of sunscreen has also been made to improve the efficacy and photoprotection provided by these products.

36. PROSPECTING FOR THE PHOTOPROTECTIVE PROPERTY AND CLINICAL EFFICACY OF ROSMARINIC ACID IN DERMOCOSMETIC FORMULATIONS OPTIMIZED FOR QUALITY BY DESIGN (QBD)

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INTRODUCTION

Progressively growing diagnoses of skin cancer have triggered consumer and public health concerns about excessive sun exposure, awareness of the deleterious effects of ultraviolet (UV) radiation on the skin, and an increase in use of sunscreens. Studies show that bioactive molecules, with special attention to phenolic compounds, such as rosmarinic acid, may act to potentiate the photoprotective and antioxidant activity of cosmetic formulations.

AIM

This project is based on the application of the concepts of quality by design (QbD) and process analytical technology (PAT) to evaluate the critical parameters of quality and development of optimized cosmetic formulation with rosmarinic acid by means of understanding of product design space. Initially, the FMECA (failure mode, effects and criticality analysis) tool was used, associated to the critical analysis of the quality attributes of the product.

METHODS

The formulations were developed using a DoE (Design of Experiments) and physically and physico-chemically characterized and evaluated for in vitro antioxidant activity and photoprotective efficacy in vitro, as well as for the photostability presented by them through artificial irradiation.

RESULTS AND DISCUSSION

The rosmarinic acid presented antioxidant activity, alone or in the formulations, demonstrating, also, phototabilizing potential in the photoprotective samples. Regarding the value of FPS, it was verified that the formulations containing the bioactive molecule showed no increase in photoprotection. However, they presented greater photostability when submitted to the photostability chamber. As a complement to the proposed investigation, the formulations were characterized as to the antioxidant/anti-inflamatory efficacy in vivo, through a methodology employing Laser Doppler flowmetry to measure the vasodilatory response to topical application of methyl nicotinate. Therefore, the putative antioxidant / anti-inflammatory effect is based on the ability of the formulations to decrease the extent of an erythema-induced response. The set and interpretation of the obtained results intend the orientation of rosmarinic acid in cosmetic products, providing dual activity to the developed formulations (antioxidant and photoprotective).

37. BYO (Bring Your Own) Water beauty products, a new breed of sustainable products: just add water, but what type of water?

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INTRODUCTION

The cosmetics industry has been researching sustainability solutions to address water resources issues. Several dry products for in-house preparation have been developed, such as the "Bring Your Own" (BYO) Water cosmetics, designed to be reconstituted at home by adding water. These products offer a promising solution, but their quality and safety must always be ensured. Because the properties of drinking water vary so much with the geographical location, their influence on the properties of the reconstituted product must be evaluated.

AIM

This work aimed to evaluate the influence of drinking water physicochemical properties (pH, turbidity, mineralization) on the quality and effectiveness of powder to liquid soaps after reconstitution.

METHODS

Two powder to liquid soaps (PLS) with different surfactants (PLS1, Sodium Lauryl Sulphate; PLS2, Sodium Cocoyl Glutamate), after reconstitution with four different drinking waters with different physicochemical properties (pH, turbidity, total hardness and mineral profile). The pH, turbidity, conductivity, and foaming capacity were evaluated for each reconstituted cosmetic product. Purified water was used as reference.

RESULTS AND DISCUSSION

The different reconstituted products had pH values from 6.52 to 9.79 for SL1 and 5.33 to 5.60 for SL2. Visible turbidity was only evident for PLS1 reconstituted with very hard water; for the other PSL1 and PSL2 products the values varied between 0.41 to 186 NTU. Products reconstituted with softer waters had higher foamability, lower conductivity and lower turbidity than those reconstituted with harder waters. Thus, the physicochemical parameters of the water, mostly the mineral profile (hardness), influenced the macroscopic aspect and physicochemical properties of PLS, mainly detergency and foaming, affecting their quality and efficacy. During reconstitution, a significant amount of surfactant intended for cleansing initially reacts with cations Ca^{2+} and Mg^{2+}, thus products reconstituted with harder waters must have higher concentrations of surfactants, to achieve the same cleansing result as those reconstituted with softer waters. Moreover, water hardness hinders foam formation, particularly at surfactant concentrations below the CMC.

CONCLUSIONS

In conclusion, the water's potability used in the reconstitution of the BYO Water cosmetics guarantees their safety but not their effectiveness and, consequently, their quality. These cosmetics aim to address growing sustainability concerns in the industry, but the path to ensure a good product formulation and quality cannot be overlooked.