

Hybrid bioproducts based on fish collagen and natural extracts

PhD Thesis Summary

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The main objective of the doctoral thesis **Hybrid bioproducts based on fish collagen and natural extracts** was to obtain hydrolyzed collagen from fish and natural extracts (essential oils), as well as their characterization, in order to obtain hybrid bioproducts.

The main original contributions of this thesis are related to the extraction of hydrolyzed collagen from fish skin (carp) by a method that uses neutral hydrolysis after a series of pretreatments with organic acids, alkaline treatment, subsequent degreasing and removal of pigments, obtaining biocompatible hydrolyzes of fish collagen, with characteristics suitable for potential applications in the food, cosmetics or pharmaceutical industries.

Lemon and lavender essential oils were obtained by both conventional hydrodistillation and microwave extraction. Those obtained by hydrodistillation showed the highest antimicrobial activity against clinical strains of *Staphylococcus epidermidis*, both in planktonics and in biofilm. It was also obtained by classical hydrodistillation and pink pepper essential oil, which was characterized by GC-MS to determine the chemical composition.

Fish collagen hydrolyzate and essential oils obtained previously were used for the preparation of several hybrid bioproducts: serum with collagen and AHA acid, oleogels with cosmetic applications based on vegetable oils and lavender essential oil, emulsions based on hydrolyzed collagen and natural extracts with anti-cellulite action, emulsions based on hydrolyzed collagen and natural extracts with potential anti-acne action, emulsions based on hydrolyzed collagen and natural extracts used as cc-cream or foundation.

Keywords: hydrolyzed fish collagen, biocompatibility, essential oils, antimicrobial activity, hybrid bioproducts