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Ceapro Inc. Announces Publication of Results for a New PGX Processed Chemical Complex in the Journal of Supercritical Fluids

Successful impregnation of gum arabic-CoQ10 bolsters Ceapro's efforts to develop innovative delivery systems composed of new chemical complexes

EDMONTON, ALBERTA – December 17, 2019 – [Ceapro Inc.](#) (TSX-V: CZO; OTCQX: CRPOF) (“Ceapro” or the “Company”), a growth-stage biotechnology company focused on the development and commercialization of active ingredients for healthcare and cosmetic industries, announced today that results from a collaborative project with University of Alberta researchers have been accepted for publication in the [Journal of Supercritical Fluids](#) in an article titled “[Preparation of PGX-dried gum arabic and its loading with coQ10 by adsorptive precipitation](#),” authored by Couto R., Wong E, Seifried B, Yépez B, Moquin P and Temelli F.

The main objective of this study was to investigate the preparation of coenzyme Q10 (coQ10) loaded gum arabic (GA) using the Pressurized Gas eXpanded (PGX) liquid technology and adsorptive precipitation processes. It was found that PGX could effectively dry, purify and increase the surface area of GA. Using adsorptive precipitation, coQ10 was homogenously loaded on the large surface area of PGX processed GA leading to the formation of a new chemical complex (coQ10-iGA) that, upon solubilization into water, formed stable aqueous dispersions of coQ10. This study allowed Ceapro's scientists to compare coQ10-iGA with the previous study where coQ10 was loaded on PGX-processed oat β -glucan leading to the formation of coQ10-iBG. The coQ10-iBG was the complex that won the 2018 award for most innovative raw material at the Cosmetic 360 salon in Paris.

Given similarly obtained stable aqueous dispersions of coQ10 upon solubilization of both coQ10-iGA and coQ10-iBG in water, this study confirms that PGX processing shows great potential for the drying of biodegradable and water-soluble biopolymers and their loading with lipid soluble bioactives as delivery systems. Other studies using different carriers like alginate and chitosan have also been conducted and will be the subject of future publications.

“These results are of the utmost importance for Ceapro's strategy aimed at developing preservative free delivery systems. Should the efficacy of this new chemical complex coQ10-iGA, or other ones currently in preparation for evaluation be similar or even better

than coQ10-iBG, Ceapro would be in a position to offer new and less expensive carriers than oat beta glucan which is currently produced in liquid formulation before PGX drying process. Furthermore, given that these new carriers can be found in readily available powder formulations, findings from these studies enable Ceapro to choose amongst various locations for the implementation of larger scale PGX unit(s)," commented [Gilles Gagnon, M.Sc., MBA, President and CEO](#).

Ceapro has conducted research on various biopolymer samples from different sources. These studies conducted in collaboration with Dr. Feral Temelli's team at University of Alberta further demonstrate the versatility of PGX and adsorptive precipitation technologies. Results of these studies illustrate the potential to dry, purify, micronize, functionalize and load proteins, peptides, and polysaccharides that can lead to the development of highly potent bioactive delivery systems with desirable characteristics.

About Pressurized Gas eXpanded Liquid Technology (PGX)

The Company's patented Pressurized Gas eXpanded (PGX) is a unique and disruptive technology with several key advantages over conventional drying and purification technologies that can be used to process biopolymers into high-value, fine-structured, open-porous polymer structures and novel biocomposites. PGX is ideally suited for processing challenging high-molecular-weight, water-soluble biopolymers. It has the ability to make ultra-light, highly porous polymer structures on a continuous basis, which is not possible using today's conventional technologies. PGX was invented by Dr. Feral Temelli from the Department of Agricultural, Food & Nutritional Science of the University of Alberta (U of A) along with Dr. Bernhard Seifried, now Senior Director of Engineering Research and Technology at Ceapro. The license from U of A provides Ceapro with exclusive worldwide rights in all industrial applications.

About Ceapro Inc.

Ceapro Inc. is a Canadian biotechnology company involved in the development of proprietary extraction technology and the application of this technology to the production of extracts and "active ingredients" from oats and other renewable plant resources. Ceapro adds further value to its extracts by supporting their use in cosmeceutical, nutraceutical, and therapeutics products for humans and animals. The Company has a broad range of expertise in natural product chemistry, microbiology, biochemistry, immunology and process engineering. These skills merge in the fields of active ingredients, biopharmaceuticals and drug-delivery solutions. For more information on Ceapro, please visit www.ceapro.com and connect with the Company on [Twitter](#), [Facebook](#) and [LinkedIn](#).

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