Bioplastics incorporated with antioxidant additives: a literature review

Bioplásticos incorporados com aditivos antioxidantes: uma revisão de literatura

Driely Vitoria Maximiano de Souza
Gabriella Medeiros Souza de Oliveira
Isabella dos Anjos Rocha
Pedro Henrique Pereira da Cruz
Aline Fioratto Barcellos
Maira Akemi Casagrande Yamato
ETEC Dr. Celso Giglio; contato: driikaviitoria@gmail.com; gabriella.s.o.medeiros@gmail.com; isabellaanjosr@gmail.com; pedro7enrique@gmail.com

INTRODUCTION

The discovery and use of plastics for packaging brought a revolution to the industry, including food, precisely because of its multiple capabilities in technological and marketing terms, however, its life span can vary from a short life to an extremely long life, as pointed out by Ward and Reddy (2020), and for this reason the environmental concern moves new studies for the creation of materials with similar characteristics, and mainly, that have a shorter life span and environmental impact, therefore, the creation of bioplastics was created, which presented a viable and advantageous alternative for the environment and the industry (KAPPLER, et al., 2019).

In addition, with the notorious results that bioplastic has achieved, bioplastics with additives have followed, mainly for the improvement of food packaging, and antioxidants have been proving to be the best suitors requested in the industry (DEUS, 2020).

METHODOLOGY

This study is presented as bibliographical research, since it is based on materials already published. The keywords used to perform the search, contain anywhere in the document the terms "plastic", "bioplastic", "antioxidant" and "packaging", published in the periods from 2010 to 2020, published on the platforms Google academic, Scielo and Portal de periódicos da Capes.

RESULTS AND DISCUSSION

Due to the great demand for plastic packaging for food storage and the various packaging innovations for the industry, less polluting alternatives to the environment have been researched, such as bioplastic packaging. New technologies are emerging and are being increased in the world of packaging, innovations that contribute not only to consumers but also to industries, and with them we have active packaging (FREIRE et al., 2020). According to Braga and Silva (2017) active packaging seeks to actively influence

the product, they take substances that interact with the food to be consumed, thus being able to maintain the quality, integrity and guarantee the safety of the food.

Thus, several substances can be attributed to active packaging, depending on the food and the objective of the researcher or manufacturer (ARAUJO, 2005).

Among the substances that can be added to the packaging and thus transforming them into active packaging, there are those with antioxidant properties, they are very useful because oxidation is one of the most common reactions in the food degradation process (MÜLLER, 2016).

CONCLUSION/FINAL CONSIDERATIONS

It is concluded that with the advances of the industry in relation to packaging technology it becomes feasible to produce a biodegradable packaging with antioxidant additives as an alternative to reduce the impact caused by the use of conventional plastics. Aiming at modernization in the industrial scenario and promoting bioplastics incorporated with antioxidant additives as a solution to avoid degradation to the environment.

Table 1 - Summary of the most relevant studies used in this literature review

Author, year	Title	Overview
SOARES, 2009	New developments and applications in food packaging.	Antioxidant active packaging is a very promising technology to preserve food from oxidation. This technology consists of the incorporation of antioxidant compounds into plastic films, whether bioplastic or not, where the antioxidant substances will be released to protect the food from oxidative degradation.
PAYNE, 2019	Polymer degradation and stability.	As much as the bioplastic is more advantageous for the environment, there is a need for more research and investment, for the creation of a more resistant bioplastic, since its low resistance to heat becomes an obstacle for its use.
	Active packaging: a new approach to food packaging.	Active packaging seeks to actively influence the product, they carry substances that interact with the food to be consumed, thus being able to maintain the quality, integrity and guarantee the safety of the food.

REFERENCES

BRAGA, L. R.; SILVA, F. M. Embalagens ativas: uma nova abordagem para embalagens alimentícias. Brazilian Journal of Food Research, Campo Mourão, v. 8, n. 4, p. 170-186, 2017. DEUS, Isabella. Filmes de quitosana com óleo essencial de citrus limonia: propriedades físicas, morfológicas e atividade antibacteriana. 2020.

FREIRE B. C. F; RABELO J. L. G; MACÊDO R. C. B. S; SOARES K. M. P. Inovações e atualidades em tecnologia de embalagens para alimentos: uma revisão.

KAPPLER, Fabiane; VOLTAIRE, SANT'ANNA; DOS SANTOS NUNES, Marta Regina. Avaliação de bioplásticos produzidos com amido de milho e extrato de jabuticaba (Plinia Jaboticaba. In: IX siepex-ix Salão Integrado de Ensino, Pesquisa e Extensão. 2019.

MÜLLER, Priscila. Desenvolvimento de embalagem ativa biodegradável de amido de pinhão e de mandioca com antioxidantes e antimicrobianos naturais para conservação de manteiga orgânica. 2016. 179 f. Tese (Doutorado em Engenharia de Alimentos) - Universidade Federal do Paraná, Curitiba, 2016.

WARD, Collin P.; REDDY, Christopher M. Opinião: precisamos de melhores dados sobre a persistência ambiental dos produtos plásticos. Proceedings of the National Academy of Sciences,v. 117, n. 26, pág. 14618-14621, 2020.