Chapter 11
Secondary Metabolites of Carob Tree (Ceratonia siliqua L.): Potential Applications

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ABSTRACT

Research into these bioactive compounds will allow us to better understand their contribution to health benefits. Carob (Ceratonia siliqua L.) is a Mediterranean species rich in secondary metabolites such as polyphenols, flavonoids, and other bioactive compounds. These secondary metabolites confer important antioxidants, anti-inflammatory, and antimicrobial properties to carob, offering multiple applications in the food and pharmaceutical industries. This chapter reviews the main secondary metabolites present in carob fruits and leaves and their potential applications.

1. INTRODUCTION

Secondary metabolites are a class of organic compounds that are not essentially involved in or necessary for survival, growth or reproduction, although often crucial to the plants' own metabolism and thereby a key element in ecological systems. The familiar adage that 'Plants produce primary metabolites to grow and reproduce but synthesize secondary metabolites to survive and adapt' is a useful simplification but an overstatement of the issue, given that many secondary metabolites contribute to the health of an organism and its offspring (Lv et al., 2024) .Bioactive compounds of different classes, such as polyphenols, flavonoids, tannins, alkaloids and terpenes, play specific roles in the protection mechanisms of plants like defense against herbivores and pests, tolerance of environmental stresses, and adaptation to environmental change (Lv et al., 24). Plants often create secondary metabolites because of their defensive function or other interaction with other organisms in their environment, including pathogens, herbivorous animals, or competing plants. However, in recent