

**UNIVERSITI TEKNOLOGI MARA**

**ANTIOXIDANT PROPERTIES OF PYCNOGENOL  
(MARITIME PINE BARK)**

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## ABSTRACT

Pycnogenol is an extract from French maritime pine (*Pinus pinaster*) that has known to be a potent antioxidant in cosmetics and pharmaceutical products. It also has been used for herbal remedy due to its health benefits. In this study, the antioxidant properties of Pycnogenol was determined using ferric-reducing antioxidant power (FRAP) method, where an extract with high reducing power possess high antioxidant properties. Besides that, Pycnogenol also accessed through total phenolic contents and total flavonoid contents contents to see whether there is relationship between total flavonoid contents and total phenolic contents with the antioxidant properties of the Pycnogenol.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

Extract of bark French maritime pine was found to exhibit an antioxidant activity. It consists of procyanidins between 65-75% that built from catechin and epicatechin subunits. It contains wide types of procyanidin ranging from single subunit of catechin and taxifolin to oligomers that consist of 7 or more flavonoid subunits (Rohdewald, 2002). Besides that, bioflavonoid and organic acid are also available in the French maritime pine extract.

Packer, et al., (1999) has reviewed that Pycnogenol possesses antioxidant activity due to the presence of phenolic acid, polyphenol and in particular flavonoids, which composed of one or more aromatic ring that bearing a few numbers of hydroxyl group that able to quench free radicals. In addition, it is also found to has an anti-inflammatory effect which inhibit the mediator that involve in the inflammation reaction (Grimm, et al., 2004). On the other hand, it is also shown to reduce the symptom and hyperactivity of attention deficit disorder in children (Dvoráková et al., 2006).