Short Communication

Bioactivity assay of extracts from Calocedrus macrolepis var. formosana bark

Louis Kuoping Chao a, Kuo-Feng Hua b, Hsien-Yeh Hsu b, Yu-Chang Su c, Shang-Tzen Chang d,*

a Department of Biological Science and Technology, Chung Hwa College of Medical Technology, Tainan 717, Taiwan
b Faculty of Biotechnology and Laboratory Science in Medicine, Institute of Biotechnology in Medicine, National Yang-Ming University, Taipei 112, Taiwan
c Division of Wood Cellulose, Taiwan Forestry Research Institute, Taipei 100, Taiwan
d School of Forestry and Resource Conservation, National Taiwan University, Taipei 106, Taiwan

Received 21 June 2005; received in revised form 17 October 2005; accepted 23 October 2005
Available online 15 December 2005

Abstract

Alcoholic extracts from bark of Calocedrus macrolepis var. formosana Florin (Cupressaceae) were extracted successively using n-hexane, dichloromethane, ethyl acetate, 1-butanol and water, which gave 34.8%, 34.1%, 24.1%, 3.3% and 3.7% soluble fractions, respectively. Antioxidation activity of these fractions by DPPH assay and dissimilar IC_{50} values of the DPPH showed that ethyl acetate fraction had the best antioxidant activity; its IC_{50} was 2.6 \mu{g/ml}. Analyses of the composition and anti-inflammatory activity of the subfractions from n-C_{6}H_{14} fraction showed that the T3 and H5 ppt had the best anti-inflammatory activity in LPS-stimulated murine macrophage J774A.1 cells, respectively; moreover, their major constituent was sugiol (T3 37.1%, H5 ppt 81.1%), which at dosages of 10 \mu{g/ml} inhibited proIL-1\beta protein production completely. Furthermore, the T1 also exhibited anti-inflammatory activity, and its major constituent was ferruginol (above 85.6%).

© 2005 Elsevier Ltd. All rights reserved.

Keywords: Calocedrus macrolepis var. formosana; Extracts; Antioxidant activity; Anti-inflammatory capacity

1. Introduction

Lipopolysaccharide (LPS) is the major wall component of Gram-negative bacteria (Raetz and Whitfield, 2002), which is able to activate monocytes/macrophages to secrete various inflammatory cytokines. Interleukin-1 beta (IL-1\beta) is one of the major mediators of inflammatory response mainly secreted from LPS-stimulated macrophages (Hsu and Wen, 2002; Wang et al., 2003). The Calocedrus macrolepis var. formosana Florin (Cupressaceae) is a native tree that grows at elevations of 800–1500 m in Taiwan’s central mountains, whose bark is always discarded in the forestry industry. In addition, the bark of C. macrolepis var. formosana has been the prevailing folklore medication in Taiwan’s countryside in the past. Our recent research demonstrated that alcoholic extracts from C. macrolepis var. formosana exhibited a significant inhibitory activity against the DPPH radical (Wang et al., 2004). To further explore its potential as a source of natural drugs, the purpose of this study was to investigate the effective composition and anti-inflammatory capacity of the alcoholic extracts from barks of C. macrolepis var. formosana by using a murine macrophage model (J774A.1 cell).

2. Methods

2.1. Extraction and fractionation

The samples of C. macrolepis var. formosana were collected in September 2003 from the Lien Hua-Chin...