Journal of Chemical Technology and Metallurgy, 52, 6, 2017, 1135-1139

CONFUSARIN AND NUDOL, TWO PHENATHRENE GROUP COMPOUNDS, FROM *Dioscorea esculenta* L. AND THEIR ANTIOXIDANT ACITIVITIES

Nanik Siti Aminah, Ratih Hidayah, Mulyadi Tanjung

Dept. of Chemistry, Faculty of Science and Technology, Universitas Airlangga
Komplek Kampus C UNAIR, Jl. Mulyorejo, Surabaya, East Java, Indonesia
E-mail: nanik-s-a@fst.unair.ac.id

Received 05 January 2017
Accepted 20 July 2017

ABSTRACT

Two phenathrene group compounds namely: confusarin and nudol are isolated from Dioscorea esculenta L. This species belongs to Dioscoreaceae family. The two compounds extraction is conducted by the maceration method using methanol solvent and partition with n-hexane and ethyl acetate. The ethyl acetate extract is purified using various chromatographic techniques yielding pure compounds. The latter structure is determined by spectroscopic methods including UV/Vis, IR, 1D and 2D NMR. Confusarin and nudol are tested for their antioxidant activity against DPPH radical scavenging. They show IC_{50} of 19,63 ± 0,09 and 37,91 ± 0,08 ppm, correspondingly.

Keywords: phenanthrene, confusarin, nudol, Dioscorea esculenta L., antioxidant.

INTRODUCTION

Dioscorea esculenta L. with the local name "*gembili*" is one of species belonging to *Dioscorea* genus. In Indonesia, this plant is one of species used by the community as a substitute for rice [1]. *Dioscorea*, a genus in Dioscoreaceae family, is comprised of about 600 species. It has been reported that various kinds of phenolic compounds are contained in *Dioscorea* genus, such as: stilbenoid, dihydrostilbene, phenantrene, dihydrophenantrene, diarylheptanoid and acetophenone [2 - 6]. Secondary metabolite of compounds from *Dioscorea* genus show [7-11] an interesting biological activity, such as: antiinflamatory, antibacterial, antimicrobial, anticancer, antiallergenic, antifungal and antioxidant ones.

Based on previous studies, the methanol extract of *D. esculenta* shows an antioxidant activity [12]. But a phytochemical study of the secondary metabolite compounds as well as an antioxidant activity of pure compounds from this species has not been so far reported. The present communication presents two phenolic compounds, namely confusarin (1) and nudol (2) isolated from *D. esculenta* and verifies their antioxidant activity using DPPH reagent.

EXPERIMENTAL

Gravitation column chromatography (GCC) was carried out using Merck Si gel 60 (700-200 mesh), radial chromatography was conducted out using Merck Si gel 60 PF_{254}, while pre-coated Si gel plates (Merck Kieselgel 60 GF_{254}, 0.25 mm) were used for TLC analysis. UV and IR spectra were recorded with a Shimadzu UV-1800 and FT IR Spectrum One Perkin-Elmer instruments, respectively. ^{1}H and ^{13}C-NMR spectra were obtained with JEOL ECA 400, operating at 400 (^{1}H) and 100 (^{13}C) MHz, using residual and deuterated solvent peaks as reference standards. The determination of the antioxidant activity was based on the inhibition of free radical against DPPH using a spectroscopy method.

Samples of *Dioscorea esculenta* tuber were collected from Pengampon District, Kabuh, Jombang, East Java, Indonesia. The plant was identified by the staff of the Herbarium Bogoriense, Bogor Botanical Garden, Bogor, Indonesia, and a voucher specimen were deposited in the herbarium.