

RADICAL SCAVENGING AND ANTI PROLIFERATIVE ACTIVITY OF *WOODFORDIA FRUTICOSA* KURZ ON HUMAN BLADDER CARCINOMA, 5637 CELL LINES

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ABSTRAK

Antiproliferative effect of ethanol extract from a plant used in folk medicine, *Woodfordia fruticosa* Kurz to human bladder carcinoma, 5637 cell lines. After incubation for 72 h with varying concentration of extract (0.343, 1.029, 3.086, 9.259, 27.78, 83.33 dan 250 µg/ml), anti proliferative effect was determined by the neutral red assay and reported in terms of cell viability. The ethanol extract, had a significant anti proliferation against 5637 cell lines with IC₅₀ values of 10.8 µg/ml. A high concentration of ethanol extract (10.8 µg/ml) rapidly reduced the number of 5637 cells. At lower concentrations of ethanol extract (0.343, 1.029, 3.086 µg/ml), the numbers of 5637 cells started to decrease markedly. Moreover, ethanol extract *Woodfordia fruticosa* Kurz was also tested on their antioxidant in vitro activity based on tests involving reactions with 2,2-diphenyl-1-picryl-hydrazyl (DPP). *Woodfordia fruticosa* Kurz showed a high potenz antioxidant effect with IC₅₀ values of 18 µg/mL. This is about the same with that of ascorbic acid as a positive control showed IC₅₀ values of 10 µg/mL. But *Woodfordia fruticosa* Kurz can not inhibit free radical nitric oxide with IC₅₀ values of 505,47 µg/mL. This is very small in compare with ascorbic acid as a positive control showed IC₅₀ values of 45.04 µg/mL.

Key words: anti proliferative effect, *Woodfordia fruticosa* Kurz, 5637 cell lines, antioxidant

BACKGROUND

Woodfordia fruticosa Kurz of the family Lythraceae is a plant of tropical and subtropical region with a long history of medicinal use. Extracts and metabolites of this plant, particularly those from flowers and leaves, possess useful pharmacological activities.

The plant is a well-known non-wood forest produce that has long been in regular demand amongst practitioners of traditional medicines in different South East Asian countries. In India, it is a much-used medicinal plant in Ayurvedic and Unani systems of medicines (Dymock et al., 1995). Although all parts of this plant possess valuable medicinal properties, there is a heavy demand for the flowers, both in domestic and international markets specialized in the preparation of herbal medicines (Oudhia, 2003).

A popular crude drug (called 'Sidowaya' or 'Sidawayah') of Indonesia and Malaysia chiefly contains dried flowers of *Woodfordia fruticosa* (Burkill, 1966). It has been used as an astringent to treat dysentery and sprue, and also for the treatment of bowel complaint, rheumatism, cancer, dysuria and hematuria in many South East Asian countries. It is also an ingredient of a preparation used to make barren women fertile (Burkill, 1966).

A series of publications have appeared on the structural characterization of the secondary metabolites of the plant. Most of the investigators studied the flowers, though there are a few publications on the constituents of the stems and leaves also. The compounds identified are predominantly phenolics, particularly hydrolysable tannins and flavonoids.

Until now the use of sidowaya as anticancer is only empirically by Indonesian and Malaysian people. That's way it was investigated the effect of sidowaya as anti proliferative on 5637 cellline and its antioxidant effect.

Recently, the neutral red test has been applied to the screening of a number of Indonesian plant extracts. The method used is based on the original procedure developed by Meyer et al. (1982). Neutral red uptake anti proliferative test is a cell survival/viability assay based on the ability of viable cells to incorporate and bind neutral red, a weak cationic supravital dye that readily penetrates cell membranes by nonionic diffusion and predominately accumulates intracellularly in lysosomes. Alteration of the cell surface or the sensitive lysosomal membrane lead to lysosomal fragility and other changes that gradually become irreversible. Such changes produced by toxic substances cause decreased uptake and binding of neutral red, making it possible to distinguish between viable or dead cells via spectrometric measurements. Several methods are commonly used for the screening of plant extracts and natural products for antioxidant properties. The reduction of the stable 2,2'-diphenyl-1-picrylhydrazyl (DPPH) radical is widely used to probe free radical scavenging potential. The objective of the present work was initially to evaluate an Indonesian plant extract, i.e. *Woodfordia fruticosa* Kurz for: 1) anti proliferative in neutral red test, 2) radical scavenging activity via reduction of DPPH and then as guide for the development of extraction procedures which furnished highly bioactive extracts in suitable yields for pharmaceutical use as an anticancer.