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Research Note

Activity of the Extracts and Indole Alkaloids from *Alstonia scholaris* Against *Mycobacterium tuberculosis* $H_{37}Rv$

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The crude methanolic extract of *Alstonia scholaris* (L.) R. Brown demonstrated *in vitro* antituberculosis activity (89% inhibition against *Mycobacterium tuberculosis* $H_{37}Rv$ at 50 µg mL^{-1}) using Microplate Alamar Blue Assay (MABA). Gradient pH fractionation of the alkaloids gave three alkaloid extracts, AsA, AsB and AsC, which exhibited 69%, 99% and 99% inhibition, respectively. Group separation by silica gel vacuum liquid chromatography (VLC) of extracts AsA and AsB afforded fractions that showed 69–99% inhibition against the test mycobacterium. The previously reported indole alkaloids - 19,20*E*-vallesamine (1), a mixture of angustilobine B N_4-oxide (2) and N_4-methyl angustilobine B (3), 20*S*-tubotaiwine (4), 6,7-seco-angustilobine B (5) and (+)-manilamine (6) from the most bioactive alkaloid fractions with 98–99% inhibition - showed weak activities. Among the six compounds, only alkaloid 4 demonstrated the highest activity with a minimum inhibitory concentration (MIC) of 100 µg mL^{-1}. Compared with the standard rifampin (MIC 0.125 µg mL^{-1}), all alkaloids were considered inactive.

Key Words: *Alstonia scholaris,* antitubercular activity, *dita,* indole alkaloids, *Mycobacterium tuberculosis* $H_{37}Rv$

Abbreviations: FU - fluorescence unit, MABA – Microplate Alamar Blue Assay, MIC – minimum inhibitory concentration, VLC – vacuum liquid chromatography

INTRODUCTION

Tuberculosis (TB) is second among the leading infectious diseases in the world. About 2–3 million deaths occur in 7–8 million new cases of active TB. This condition has been escalated by the emergence of multi-drug resistant strains of the TB organism coupled by HIV-induced immunodepression (WHO 2004). To address this problem, new types of potent anti-TB phytotherapeutics are needed. It has been noted in several studies that several secondary metabolites of plant origin elicit interesting inhibitory activity against several species of mycobacteria (Okunade et al. 2004). As part of our continuing effort in the search of anti-TB constituents from Philippine medicinal plants, we have investigated *Alstonia scholaris* (L.) R. Brown (Apocynaceae), locally known as "*dita*."

The bark of *dita* is probably the most widely known drug in the Philippines. It is used all over the islands as a treatment for fever, chronic diarrhea and dysentery. In India, *dita* bark is known ethnomedically as an astringent tonic, antihelmintic, alterative, antiperiodic and as a valuable remedy for chronic diarrhea and dysentery