

**ELEMENTAL ANALYSIS AND HYPOTENSIVE ACTIVITY
STUDIES ON SOME MYANMAR INDIGENOUS MEDICINAL
PLANTS USED IN THE TREATMENT
OF HYPERTENSION**

Ph.D. DISSERTATION

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ABSTRACT

Study of Myanmar indigenous medicinal plants used in the treatment of hypertension was conducted. The samples studied were Gant-ka-lar (*Gisekia pharnaceoides*), Dant-da-lun (*Moringa oleifera*), Egayit (*Millingtonia hortensis*), Sue-pan (*Carthamus tinctorius*), Kauk-yoe-nwe (*Oxystelma esculentum*), Shauk (*Citrus medica*) Kyet-lei-san (*Vitex glabrata*) and Sin-ngo-myet (*Eleusine indica*). In all these samples, determination of potassium had been conducted through its natural ^{40}K activity by high purity germanium gamma counter and by NaI(Tl) selective channel and 'Aloka' gross gamma scintillation counters. Quantitative determination of the two elements (Na, K) and nine elements (Mg, Ca, Cr, Fe, Cu, Zn, As, Cd, Pb) in these samples were carried out by flame photometry and atomic absorption spectrophotometry (AAS), respectively. It was found that potassium is a major constituent (5.31-1.01%) in Gant-ka-lar, Sue-pan, Dant-da-lun, Egayit (leaves), Kauk-yoe-nwe and Sin-ngo-myet, and a minor constituent in Egayit (roots), Shauk (leaves) and Kyet-lei-san. Sodium is a minor constituent (0.62-0.03%) in all these samples. Calcium was found as a major constituent in Shauk (leaves) and Egayit (leaves). Magnesium was found as a minor constituent (0.79-0.13%) in all the samples. Iron was also found as a minor constituent in all the samples. Chromium (129-27 ppm), zinc (130-18 ppm), arsenic (505-24 ppb) were found as trace constituents in all the samples. Copper was found in Egayit (roots) and Shauk (leaves) as trace constituents. Cadmium and lead were not detected in all samples.

In addition, elemental analysis in these samples was conducted by using energy dispersive X-ray fluorescence (EDXRF) spectrometry. Moreover, organic compounds present in water extracts of Gant-ka-lar and Dant-da-lun were studied by phytochemical investigation. The hypotensive activities of different water extracts of Gant-ka-lar and Dant-da-lun were studied by using tail cuff method employing "Wistar-kyoto" rats as model. The findings were correlated and interpreted with the results obtained by elemental determination.

From the overall assessment of the present work, it may be deduced that Gant-ka-lar with high content of potassium (5.31 %), magnesium (0.79 %), iron (0.04 %) and zinc (110 ppm) (gamma spectrometry, flame photometry and AAS) than the remaining medicinal plants, exhibits the highest hypotensive activity (tail cuff method). In addition, water extract of Gant-ka-lar indicated the presence of alkaloids (positive with four alkaloidal reagents), amino acids, flavonoids, phenolic compounds, saponins and tannins (phytochemical assay methods) have contributions for abatement of hypertension. In Myanmar traditional medicinal formulation (TMF), Gant-ka-lar is one of the ingredients utilized for the treatment of hypertension. The present study has revealed that, in the scientific investigation of eight medicinal plants, Gant-ka-lar proved to be most effective in the treatment of hypertension. Thus the use of Gant-ka-lar as the potent material in TMF for hypertension has been justified.

Finally, findings, limitations and suggestions concerning this work are presented in this thesis.