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Evaluation of taxonomic status of *Munronia pinnata* (Wall.) Theob. (Meliaceae) in Sri Lanka and its antimalarial properties

By

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PhD 2011

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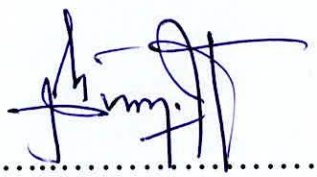
On 30th December 2011

Declaration

The work described in this thesis was carried out by me under the supervision of Dr (Mrs.) P.L. Hettiarachchi, University of Sri Jayewardenepura and Dr. G. A. S. Premakumara, Industrial Technology Institute and a report of this has not been submitted in whole or in part to any university or any other institution for another degree/diploma.

Signature of the candidate..... Date.25. 1. 2013

I/we certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the university for the purpose of evaluation.



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ABBREVIATIONS

ADH	-	Alcohol Dehydragenase
ANOVA	-	Analysis of Variance
CA	-	Correspondence analysis
DMRT	-	Duncan Multiple Range Test
DSD	-	District Secretariat Division
g	-	Gram
GAE	-	Gallic Acid Equivalents
GDH	-	Glutamate dehydragenase
GLM	-	General Linear Model
GN	-	Grama Niladhari
HTS	-	Herbal Technology Section
kg	-	Kilo gram
LC_{50}	-	Lethal concentration at 50% death
MDH	-	Malate Dehydragenase
ME	-	Malic Enzyme

mg	-	Milligram
mL	-	Milliliter
°C	-	Degree of centigrade
PCA	-	Principle Component Analysis
POD	-	Peroxidase
ppt	-	Parts per thousand
QE	-	Quercetin Equivalents
RBC	-	Red Blood Cells
R_f	-	Relative
SDS	-	Sodium Dodecyl Sulphate
SOD	-	Super oxide dismutase
TLC	-	Thin Layer Chromatography
UPGMA	-	Unweighted Pair Group Method with Arithmetic Means
UV	-	Ultra Violet
WPAEMP	-	Whole plant aqueous extracts of Munronia pinnata
µL	-	Micro liter

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PhD is a long journey of one's life with full of obstacles, problems, barriers and hardships to overcome. Although these are common to everybody, each journey is unique and should have taken individually. Therefore, during this period one must have the strong, enthusiasm and willpower to get a significant output at the end.

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Dedication

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Evaluation of taxonomic status of *Munronia pinnata* (Wall.) Theob. (Meliaceae) in Sri Lanka and its antimalarial properties

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ABSTRACT

Munronia pinnata (Wall.) Theob. (Meliaceae) is a therapeutically important medicinal plant species used for a series of ailments and hence, it has become a very expensive dry herb in traditional medicine in Sri Lanka. Present study describes island wide distribution and conservation measures, systematic identification, brine shrimp toxicity and antimalarial activity of *M. pinnata*. A survey was conducted in 395 Grama Niladari (GN) areas belonging to 68 Divisional Secretariat Divisions (DSD) in seven districts in Sri Lanka revealed that *M. pinnata* is abundant in 53 GN areas while in 217 GN areas, the plant is found in small scale and in 65 GN areas it was rarely found. However, in 8 DSDs it was absent. Ten new localities were also found. A higher diversity was found in Moneragala and Matale districts and populations collected from Madulla (MGMD-3), Nilgala (MGNG-3), Warakapola GPWP-3), Ritigala (APRG-5) and Haldummulla (BDHM-3) can be recommended for ex situ conservation while populations collected from Moneragala (MGMG-9), Wellawaya (MGWW-7), Mathurata (NEMR-3), Meemure (MTMM-5) and Kithulpe (NEKP-3) can be recommended for *in-situ* conservation. Results of the cluster analysis and Principle Component Analysis (PCA) revealed that population APRG-5 is distantly related to all other populations with 100 % distance in morphological,