

EXECUTIVE SUMMARY

“SCREENING AND IDENTIFICATION OF BIOACTIVE COMPOUNDS FROM MEDICINAL PLANTS OF RAMDURG REGION”

MINOR RESEARCH PROJECT

SUBMITTED

TO

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SCREENING AND IDENTIFICATION OF BIOACTIVE COMPOUNDS FROM MEDICINAL PLANTS OF RAMDURG REGION

The present study deals with the exploration of some species of medicinal plants found in Ramdurg region, Belagavi district of Karnataka state. 20 medicinal plants were collected from the local flora of four different locations of the Ramdurg region, namely Shabari Kolla, Megundeshwara Kolla, Mullur Ghat reserve forest and Narsapur reserve forest. These plants were subjected to solvent extraction using soxhlet apparatus. Out of the twenty plants, four plants namely *Euphorbia milii*, *Agave americana*, *Calotropis procera* and *Blumea lacera* were chosen for further studies based on results of preliminary studies, ethno-medicinal use and follow up of existing literature on the use of these species.

Root, stem, bark, flower and/or leaf of *Euphorbia milii*, *Agave americana*, *Calotropis procera* and *Blumea lacera* were subjected to soxhlet extraction using organic solvents in the increasing order of hydrophobicity. n- Hexane, Petroleum Ether, Toluene, Diethyl ether, Ethyl acetate, Acetone, n-butanol, Ethanol, Methanol, Water were the solvents used for the extraction of various phytochemicals.

Flowers of *Euphorbia milii* were extracted in Soxhlet apparatus with n-hexane, ethyl acetate, acetone, methanol and water respectively. Extracts thus obtained from the flowers of the plant by soxhlet extraction were used for the estimation of anti-

microbial activity, antioxidant activity and estimation of total Phenolic compounds. The Antimicrobial activity studies of hexane, ethyl acetate, acetone, methanol and water extracts of flowers of the plant *Euphorbia milii* were performed on gram positive organisms *Bacillus subtilis*, *Staphylococcus aureus*, and gram negative organisms namely *Escherichia coli* and *Proteus vulgaris* by using cup plate method.

The hexane, acetone and methanol extracts in the concentration of 5 μ g/ml, showed considerable inhibition zone on gram positive bacteria *Staphylococcus aureus* & *Bacillus subtilis* as compared to ethyl acetate and water extracts which was compared with the inhibition zone produced by standard rifampicin (1 μ g/ml).

The roots of *Agave americana* was subjected to successive extraction using soxhlet apparatus. The solvent according to the polarity index were been selected viz. Petroleum ether (60-80), Ethanol and Water. The ethanolic extract of *Agave americana* was subjected to the antimicrobial assay and minimum inhibitory concentration (MIC) determination by Disc Diffusion Method and Resazurin Microtitre-Plate Assay respectively

The root and bark of *Calotropis procera* was initially extracted and fractionated in organic solvents, n-hexane, ethyl acetate (EtOAc), and n-butanol (BuOH). After evaporating each solvent, 9.23 g dried hexane extract, 4.00 g dried EtOAc extract, and 7.08 g dried BuOH extract was obtained, respectively. n-hexane extract of *Calotropis procera* has shown activities against Gram positive bacteria, *Bacillus subtilis* and *Staphylococcus*

aureus (MICs 0.7 and 0.6 mg/ml), while it does not shown any response against *Salmonella setubal*, *Staphylococcus epidermidis* and *Escherichia coli* up to maximum concentration of 15 mg/ml. Roots extract was effective against one Gram positive bacteria *Bacillus subtilis* and one Gram negative bacteria *Salmonella setubal* (MICs 1.00 and 2.00 mg/ml) respectively but it has not shown any activity against *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Escherichia coli* up to maximum concentration of 15 mg/ml. It has been observed that both EtOAc and BuOH extract have free radical scavenging capacity but the BuOH extract was more active than EtOAc extract in scavenging free radicals.

Leaves of *Blumea lacera* were extracted with ethyl acetate (EtOAc), n-butanol (BuOH) and water (H₂O) separately in soxhlet apparatus. The temperature of heating mantle was adjusted to 65°C for methanolic extraction while 100°C for aqueous extraction and 55°C for chloroform extraction. The extracts were concentrated by gradually evaporating the respective solvent on hot water bath. The BuOH extract of *Blumea lacera* leaf inhibited bacterial cell proliferation most efficiently (IC₅₀ < 2.77 µg extract weight/ml medium, which corresponded to 250 µg dried leaf/ml). The IC₅₀s for the EtOAc and H₂O extracts were 16.65 µg/ml and 104.25 µg/ml, respectively (corresponding for both extract types to >7.5 mg dried leaf/ml). The chemical composition of the BuOH extract was analyzed by preparative TLC and quantified by HPTLC and it was estimated that it contained 3.73 µM substituted flavones and 1.51µM campesterol per 1 mg dried leaf. Substituted flavones showed an IC₅₀ < 1.87µM after 72 h of

incubation, while campesterol had no significant effect up to 4.68 μM .

The present study opens up the study of medicinal plants of Ramdurg region with promising results. The four plants *Euphorbia milii*, *Agave americana*, *Calotropis procera* and *Blumea lacera* have yielded several compounds with antimicrobial and antioxidant activities. The spectral analysis of these compounds after due purification forms the basis of further research.