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A Study on the Chemical Separation of *Ficus Rumphii* Blume Extract

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Abstract- *Ficus rumphii* Blume (Family: Moraceae), commonly known as “Gaiaswat” or “Pakar”, is widely used in Bangladeshi traditional medicine to treat various diseases including asthma, kill worms and in snake bite[1]. The present study was undertaken to separate the solution that is responsible for the antimicrobial agents whom we will further research later.

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A Study on the Chemical Separation of *Ficus Rumphii* Blume Extract

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Abstract- ***Ficus rumphii*** **Blume (Family: Moraceae), commonly known as "Gaiaswat" or "Pakar", is widely used in Bangladeshi traditional medicine to treat various diseases including asthma, kill worms and in snake bite[1]. The present study was undertaken to separate the solution that is responsible for the antimicrobial agents whom we will further research later.**

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I. Introduction

Ficus rumphii Blume (Family: Moraceae), commonly known as "Gaiaswat" or "Pakar", is a tree basically found around north-east of Bangladesh. They are not only useful for their local use in cuts and wounds but also it has some medicinal use. This medicinal use is to cure asthma, killing worms and also it is used to detoxicate snake bite. Its bark is really a useful thing. It is also used in burning sensation, leucoderma, ulcers, leprosy, itching, biliousness and diseases of blood. The leaves boiled in oil form good applications for wounds and bruises[2- 4].

II. Preparation of Extract

The bark of *Ficus rumphii* Blume was collected from Harinarayanpur, Purboabdalpur, Laksumpur & Modhupur village in the district of Kushtia of Bangladesh in June-July 2017 and identified by a plant taxonomist and voucher specimen has been deposited in Bangladesh National Herbarium.

The collected plants were separated from undesirable materials or plants or plant parts and then were washed several times with tap water to remove the adhering dirt. Then the stem barks was cut into small slices and were shade-dried for four week. The shade dried plant materials were dried in an electric oven at 40^{0}C for about 24 hours when the pieces were almost dry. The dried plant materials were ground into a coarse powder with the help of a suitable grinder (Capacitor start motor, Wuhu motor factory, China). The powder was stored in an airtight container and kept in a cool, dark and dry place until extraction with solvent and hydro distillation.

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Fig. 1: *Ficus rumphii* Blume plant

III. Isolation of Bark Essential Oil

The air-dried bark (200 g) of *F. rumphii* was subjected to hydro distillation for 3 hour using a Clevenger type apparatus. The oil was dried over anhydrous Na_2SO_4 and preserved in a sealed vial at 4^{0}C until further analysis.

IV. Preliminary Extraction from Powdered Plant Materials

The powdered plant materials (1300 gm) was placed in different reagent bottles (number of bottles is 13 and each contains 100 gm of powder plant materials) and extracted with petroleum ether (b.p. 40-60^{0}C), ethyl acetate (b.p 70-72^{0}C) and methanol (b.p 63-65^{0}C). The mixture was stirred by glass rod every day an hour. After 7 days the extract was filtered through a filter paper in several times. The residue remaining after extraction of above was further extracted at room temperature with ethyl acetate. The mixture was stirred by glass rod every day an hour. After 7 days the ethyl acetate extract was filtered through a filter paper in several times. The residue remaining after extraction of above was further extracted at room temperature with methanol. The mixture was stirred by glass rod every day an hour. After 7 days the ethyl acetate extract was filtered through a filter paper in several times. The solvent is added according to the polarity.

V. Investigation of Extract

The bark ethyl acetate extract (10 gm) of *F. rumphii* was subjected to column chromatography for fractionation. The column was run with solvent of

increasing polarity. Starting with 100% petroleum ether, polarity of the solvent (mobile phase) was increasing gradually by adding increasing by adding increasing proportions of ethyl acetate and methanol. The subsequent elutes were collected in 100 ml flasks.

All the fractions from ethyl acetate extract were tested on TLC under UV light, in iodine chamber and by vanillin-sulfuric acid spray. Similar fractions were tested depending on the TLC behavior and were classified into following groups, Group A (Fr. 1), Group B (Fr. 2), Group C (Fr.3 - 5), Group D (Fr. 6 - 8), Group E (Fr. 9), Group E (Fr. 10 - 15), Group F (Fr. 16 - 20), Group G (Fr. 21-26).

Table1: Solvent ratio used in column chromatography of bark extract of *Ficus rumphii* Blume

Solvent	Ratio	Volume (ml)	Fractions collected in the beaker
Petroleum ether	100 %	100	1
Petroleum ether: Ethyl acetate	9 : 1	100	2
Petroleum ether: Ethyl acetate	8: 2	100	3 - 5
Petroleum ether: Ethyl acetate	7 : 3	100	6 - 8
Petroleum ether: Ethyl acetate	6 : 4	100	9
Petroleum ether: Ethyl acetate	5 : 5	100	10
Petroleum ether: Ethyl acetate	4 : 6	100	11
Petroleum ether: Ethyl acetate	3 : 7	100	12
Petroleum ether: Ethyl acetate	2 : 8	100	13
Petroleum ether: Ethyl acetate	1 : 9	100	14
Ethyl acetate	100 %	100	15
Ethyl acetate: Methanol	9 : 1	100	16
Ethyl acetate: Methanol	8 : 2	100	17
Ethyl acetate: Methanol	7 : 3	100	18
Ethyl acetate: Methanol	6 : 4	100	19
Ethyl acetate: Methanol	5 : 5	100	20
Ethyl acetate: Methanol	4 : 6	100	21
Ethyl acetate: Methanol	3 : 7	100	22
Ethyl acetate: Methanol	2 : 8	100	23
Ethyl acetate: Methanol	1 : 9	100	24
Methanol	100 %	200	25- 26

VI. Result

Based on bio-assay, the ethyl acetate bark extract was selected for the purification of the compounds. The bark extract (12 gm) was subjected to column chromatography over silica gel (230-400 mesh ASTM, Merck, Germany) to give 26 fractions. The two compounds obtained from the fraction 4 are designed as compound AB1 by TLC using solvent ratio of petroleum ether: ethyl acetate 8.75: 1.25. The one compound obtained from the fraction 9 is designed as compound AB2 by TLC using solvent ratio of petroleum ether: dichloromethane 8.3: 1.7.

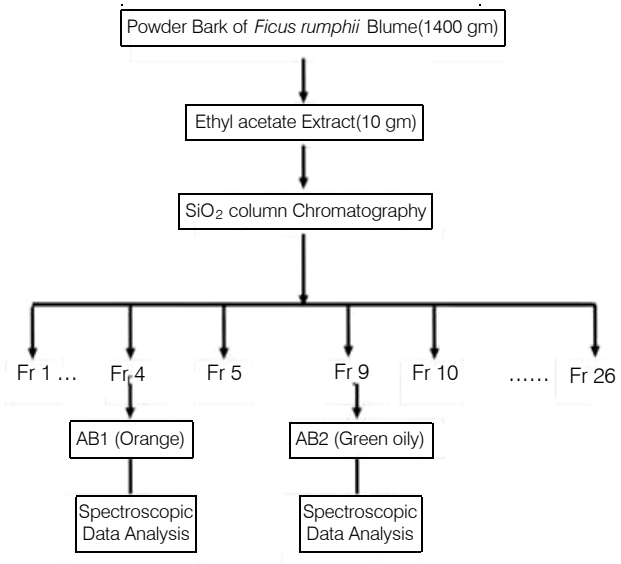

Diagram 1: Scheme for Isolation and purification of compounds AB1 & AB2 Green oily from Extract of *Ficus rumphii* Blume bark

Fig. 2: Separation by column chromatography

VII. Discussion

The antimicrobial activity of the petroleum ether, ethyl acetate and methanol extracts will be carried out against various gram positive and gram-negative bacteria. The zone of inhibition formed against these microorganisms will be measured for the determination of the antibacterial efficacy of the different plant extracts of significant antibacterial potential against *Bacillus subtilis*, *Sarcina lutea, Escherichia coli* and *Pseudomonus* sp.

Acknowledgement

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References Références Referencias

1. Ghani A, Medicinal Plants of Bangladesh, 1st edition, published by Asiatic Society, pp.13 (1998).
2. K. M. Nadkarni, Indian Materia Medica, Popular Prokashon, Mumbai, India, p. 554 (2000).
3. R. N. Chopra, S. L. Nayer and C. Chopra, Glossary of Indian Medicial Plants, Publication and Information Directorate, New Delhi, India, p 119 (1999).
4. S. Ajmal and M. Iqbal, *Ann. Bot*.,60, 649 (1987).

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