THE PHYSICOCHEMICAL STANDARDS OF DYEROPHYTUM INDICUM GIBS. EX WT AND PLUMBAGO ZEYLANICA L LEAF: A CO-COMPARISON

Richa Tyagi*,1, Ekta Menghani2, Meeta Masand1, Ruhal Dubey1

1Department of Biotechnology, Suresh Gyan Vihar University, Jaipur India.
2Department of Biotechnology, JECRC University, Jaipur India.

ABSTRACT

Aim of study: The main of the study conducted was to compare the two species of medicinal plants that is dyerophytum indicum Gibs. Ex Wt and Plumbago zeylanica L. For this comparison we have performed the physiochemical standards of both the plants for its leaf samples. With the help of following comparison we can say that dyerophytum indicum can be used as substitute for Plumbago zeylanica L. Method: for evaluating the physiochemical standards first, we collected the plant sample from arid zone of Rajasthan and submitted to Ethnomedicinal Herbarium, Centre of Excellence funded by DST, JECRC, Jaipur for identification. Then plant samples were crushed and extracts were made and Reducing sugar (Fehling’s Test), flavonoids, alkaloids, tannins and terpenoids (Salkowski Test) test were performed by using standard procedures, for reducing sugar extracts were added in boiling fehling’s solutions and according to procedure mayer’s solution was used for alkaloids. Result: The outcome indicates that in both the plants there is a presence of most of the secondary metabolites and both the plants shows positive result for some metabolites that is common to both plants and this result supports our finding that Dyerophytum indicum can be used as a substitute for plumbago zeylanica. Conclusion: The study indicates the presence of Reducing sugar, flavonoids, alkaloids, terpenoids and tannis in the both the plants. Dyerophytum indicum Gibs. Ex Wt can be used as a substitute for Plumbago zeylanica L and both the sample supports the literature available that states that these plants are an ample source of strong phytochemical.
KEY WORDS: Dyerophyutm indicum Gibs. Ex Wt, Plumbago zeylanica L, medicinal plants, traditional medicine, flavonoids Reducing sugar.

INTRODUCTION
Any plant in which one or more of its part contains substances that can be used for therapeutic purposes or which works as a precursors for chemo-pharmaceutical semi-synthesis are medicinal plants. All the healthcare practices and treatment of disease performed by traditional communities or local people in most of the third world nations are termed as traditional medicine.

All Medicare practices of whole mankind before the onset of modern medicine in 19th century were all traditional medicine. World Health Organization (WHO) defined traditional medicine as the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences of indigenous cultures. The term ‘complementary medicine’, alternate medicine and non-conventional medicine etc. are used interchangeably with traditional medicines in some countries. The raw materials for traditional medicines is mainly medicinal plants. Medicinal Plants are important components of biodiversity a product of 3500 million years of evolution life on Earth.

The current problem of herbal plants is lack of standardization so, the main emphasis should be on proper standardization of medicinal plants. In this paper an effort has made to compare two medicinal plants that is dyerophyutm indicum Gibs. Ex Wt and Plumbago zeylanica L by comparing its physiochemical standards.

Phytochemical is a normal bioactive complex instigate in plant that is an outcome of plant’s normal metabolic process. These substances are over and over again cited as “Secondary metabolities”. There is a huge class of these secondary metabolites counting with alkanoid, flavonoid, coumarins, gums, tannis, terpenes, phenols and so on. These phytochemicals instigates in plant food factual that device over nutrients and dietary fibre to safeguard body in contradiction of infections. They counterbalance free radicals and suppresses distressing enzymes that indorse carcinogens and activates enzymes that depollute carcinogens, Phytochemicals are described to aid in inhibition of diabetes, high blood pressure, and macular degeneration. [10] Research validates that phytochemicals is obligatory dietary part that metabolites composed with nutrients initiate in fruits, vegetables and nuts and these nutrients power to slothful the aging progression and deteriorate the hazard of several
infirmities, together with heart sickness, cancer, cataracts, stroke, high blood compression, osteoporosis, and urinary tract infections.

From the ancient literature it is revealed that since ages *Dyerophytum indicum* was used as one of the substitute for *Plumbago zeylanica* L to cure various ailments. *Plumbago zeylanica* L is commonly known as chitrak and used to cure various malfunctioning of body abortifacient, appetite depressant, vermifuge. Cough, dyspepsia, leprosy, skin problems, and swellings. As per the ethno-medicinal survey it was also reported that people from Mt. Abu have using this ancient drugs *Dyerophytum indicum* as a substitute for *Plumbago zeylanica* L to cure various ailments

*Plumbago zeylanica* L was used by rural people in old times to get rid of every disease. *Plumbago zeylanica* L root own active chemical compound called as plumbagin. This chemical is reported to have restorative properties. India Pharmacopia also supports this theory.

*Plumbago zeylanica* L commonly known as “Lead wort-white flowered” and “Ceylon Lead wort” is an innate to South Asia. In India it is scattered in central India to West Bengal, Maharashtra, and Uttar Pradesh to some parts of South India. The common name of the plant is Chitrak. [1, 2] It is a primogenital herb that was castoff in Ayurveda for numerous syndromes over thousands of years. It develops wild in India and also cultured commercially. *P. zeylanica* L whole plant has been described to have marvellous pharmaceutical goods, but most of them directs the valuable use of roots. Plumbagin is the main active compound existing in this plant and most of the plumabgin accumulates in roots only. [3] countless diseases have been testified to medicate with the assistance of this plant. A Fresh paste of this plant is applied to cure skin problems like sores and scabies. [4, 5] countless studies indicate that *P. zeylanica* L is best to cure anaemia, malaria, internal and external trauma, rheumatism, abdominal vermin, , toxic inflammation and can be cured with this plant. [5, 6, 7, 8] It is also used in contradiction of dysentery, diarrhoea, diuretic, and peptic ulcers and intestinal parasite, [9]

*Dyerophytum indicum* Gibs. Ex Wt is commonly known as Rato chitrak, or chittral. It is found in open forest areas and particular on dry rocky hill slopes. It is also found in waste land in dry areas with saline soil, like as salt flats and sea coasts, especially in western and tropical Asia. This plant was formerly recognized from Oman, only and the people from
Oman listed this plant in endangered species. The flowers are white in colour and flower bloom all year. So the present phytochemical screening of *Plumbago zeylanica* L was carried out along with *Dyerophytum indicum* Gilb. Ex Wt so that a co- comparison of both the plant species could be done. The present study has revealed that *Dyerophytum indicum* Gilb. Ex Wt could be used as a substitute for *Plumbago zeylanica* L. Both the samples showed positive results for almost all phytochemicals, All extracts showed presence of reducing sugar in it, flavonoid is also present in all the extract of *Plumbago zeylanica* L and was absent in chloroform extract of *Dyerophytum indicum* Gilb. Ex Wt In the results of this finding clearly states that *Dyerophytum indicum* Gilb. Ex Wt can be used as a substitute for *Plumbago zeylanica*. Both the plants have beneficial phytochemical in it, that can be used to cure so many diseases.

2. MATERIAL AND METHOD

2.1 Collection: Plants *P. zeylanica* and *D. indicum* was collected from Mt. Abu that is arid zone of Rajasthan. Rural people who are surviving near tribal pouches uses these herbal plants for their day to day need.

2.2 Identification: To check the authentication and for identification the plant was acquiesced to Ethnomedicinal Herbarium, Centre of Excellence funded by DST, JECRC, Jaipur (Rajasthan).

2.3 Preparation of test extracts: The dries and crushes powder of roots sample consecutively soxhlet extracted. Far along, all the homogenates were clarified and the remainder was re-extracted twofold for whole exhaustion, the excerpts were kept at airy position to cool down separately. All filtrate was focussed to dryness *in vitro* and re liquefied in individual solvents, were put in storage at 4°C in a freezer, till screened for physiochemical activity.

2.4 Physiochemical Examination: Physiochemical screening was done by applying regular procedure:

2.4.1 Test for Reducing sugar (Fehling’s Test): The aqueous quotation (0.5gm in 5 ml of water) was added to boiling fehling’s solution (A and B) in a test tube and then colour was observed was a result of reaction.
2.4.2 Test for Flavonoids: 4ml of extract solution was treated with 1.5ml of 50% methanol solution. The solution was heated and addition of metal magnesium was done. Then in the solution, supplementary 5-6 drops of concentrated Hydrochloride acid was poured and red colour was detected for flavonoids and orange colour for flavones.

2.4.3 Test for Alkaloids: When a few drops of Mayer’s reagents was further poured to the sample solution, if alkaloids are present the solutions produce white yellowish precipitate. Maximum alkaloids forms turbidity from neutral or slightly acidic solution by adding Mayer’s regent. Then the solution was given high temperature on a boiling water bath with 2% hydrochloric acid. Afterward when the alcoholic solution cools down, the mixture was sieved and addition limited drops of Mayer’s reagent was added. The mixture was then detected for the precipitate or yellowish turbidity.

2.4.4 Test for Tanins: About 0.5 g of extract was boiled in 10 ml of water in a test tube and then filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or a blue black colouration.

2.4.5 Test for Terpenoids (Salkowski Test): To 0.5 gm extracts of every sample was added to 2ml of chloroform. A layer was observed when concentrated sulphuric acid (3ml) was cautiously added. Reddish brown colouring pattern of the crossing point designates the existence of terpenoids.

3. RESULTS and DISCUSSION
Physiochemical evaluation of *Plumbago zeylanica* L and *Dyerophytum indicum* Gibbs. Ex Wt leaf marches that the plant have plenty amount of beneficial metabolites in it. This following table demonstrates the significance of test achieved.

### Physiochemical evaluation of the plant *Plumbago zeylanica* L (chitrak) and *Dyerophyutm indicum* Gibbs. Ex Wt (Rato chitrak) leaf sample [(+: present) (-: absent)]

<table>
<thead>
<tr>
<th>Plant Extract</th>
<th>Reducing sugar</th>
<th>Flavonoids</th>
<th>Alkaloids</th>
<th>Tanins</th>
<th>Terpenoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet. ether</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
</tr>
<tr>
<td>Benzene</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
<td>+ve</td>
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<tr>
<td>Chloroform</td>
<td>+ve</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
<td>+ve</td>
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<tr>
<td>Ethyl acetate</td>
<td>+ve</td>
<td>+ve</td>
<td>+ve</td>
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<tr>
<td>Pet. ether</td>
<td>+ve</td>
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<tr>
<td>Benzene</td>
<td>+ve</td>
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<td>-ve</td>
<td>+ve</td>
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<tr>
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<td>-ve</td>
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<tr>
<td>Ethyl acetate</td>
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<td>+ve</td>
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<tr>
<td>Distilled Water</td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
<td>-ve</td>
<td>-ve</td>
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</tbody>
</table>

4. CONCLUSION

The results showed above in the table indicates the presence of Reducing sugar, flavonoids, alkaloids, terpenoids and tannis in the both the plants. *Dyerophytm indicum* Gibs. Ex Wt can be used as a substitute for *Plumbago zeylanica* L and both the sample supports the literature available that states that these plants have an ample source of strong phytochemical. The above result indicates that reducing sugar is present in all the extracts of both the plants. Whereas flavonoid is present in the sample except distil water in Chitrak and in *Rato chitrak* it is present in all samples except chloroform and distil water. So, these results clearly states the *Rato chitrak* can be used as a substitute for *Chitrak*. This conclusion support theory and literature available that states the *Plumbago zeylanica* L and *Dyerophytm indicum* Gibs. Ex Wt are beneficial curative herb and both the plants are capable to supress the reactive oxygen species that induces early aging, and reported to induce many diseases. The study reveals the occurrence of above phytochemicals in *Plumbago zeylanica* L and *Dyerophytm indicum* Gibs. Ex Wt leaf samples.

5. ACKNOWLEDGEMENT

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