Short Communication

A comparative analytical study of Prasarani [Merremia tridentata Hallier. f. and Paederia foetida Linn.]

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Abstract

Prasarani is one of the drugs used in Vata Rogas such as Amavata, Avabahuka, etc. Among the different source plants of Prasarani, the plant Merremia tridentata Hallier.f. is mostly used in South India and the plant Paderia foetida Linn. in North India, hence taken in the present work for comparative analytical study. It was observed that there is a common constituent (having 350 mm absorbance maxima) present in both the drug samples indicating that both works on a similar disease. It was also found that the whole plant powder sample of P. foetida has more number of constituents than that of M. tridentata which indicates P. foetida may have a better efficacy than M. tridentata.

Key words: HPLC, Merremia tridentata, Paederia foetida, phytochemistry, Prasarani

Introduction

Prasarani is one of the drugs used for Vata Rogas such as Amavata, Avabahuka, etc. References about Prasarani are found in Charaka Samhita,[¹] Sushruta Samhita,[²] Ashtanga Sangraha,[³] Nighantus,[⁴] etc. Two species are being used as Prasarani mostly in South India and North India[⁵][⁶] viz,
• Merremia tridentata Hallier. f. (Convolvulaceae) [Figure 1].
• Paederia foedita Linn. (Rubiaceae) [Figure 2].

Therefore the present study has been undertaken to compare both the above drugs Analytically.

Materials and Methods

Aim of the study: To compare the the plants Merremia tridentata Hallier. f. and Paederia foetida Linn. under following parameters:-
1. Phytochemical Review
2. High Performance Liquid Chromatography (HPLC) Analysis
3. Colour Study
4. Determination of Ash Values

Phytochemistry

a) Merremia tridentata Hallier. f. – Flavanoids:- Diosmetin, Lutedin, dissymetin – 7-O-β-D- Glucoside.
b) Paederia foedita Linn. - Paederoside, Paederosidic acid, γ-Lactone, Rutin, 7-O-xylosil glucose, scandoside, Deacetyl asperuloside.[⁶][⁷]

Properties

Guna - Gura; Rasa - Tikta; Vipaka - Katu; Virya - Ushna; Doshaghnata - Kapha-Vatashamaka.[¹⁰]

Determination of Ash values

Ash values of both the plants was analysed for the present study at I.I.C.T., Hyderabad [Table 1].

Colour study

The Colour Study was conducted for the present work at I.I.C.T., Hyderabad under ordinary light and U.V. light for different solvent extractions of both the plants [Table 2].

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Figure 1: Merremia tridentata Hallier. f. plant with flowers
The samples of whole plant powders and Kwathas of both the samples were taken for analysis. HPLC analysis of samples of both the plants was conducted for HPLC analysis of samples of both the plants was conducted for HPLC analysis. Kwathas were prepared freshly from both the plants and were also taken for analysis.

Table 1: Physical analysis

| Particulars       | M. tridentata | P. foetida |
|-------------------|---------------|------------|
| Total Ash         | Not more than 6.85% | Not more than 9.3% |
| Acid insoluble ash| Not more than 2.25% | Not more than 2.65% |

Table 2: U. V. Analysis with different solvents

| Solvents         | M. tridentata | P. foetida |
|-------------------|---------------|------------|
|                   | Ordinary Light | U.V. Light | Ordinary Light | U.V. Light |
| Acetone           | Green | Orange | Dark green | Purple |
| Chloroform        | Green | Orange | Green | Purple |
| Ethanol           | Light green | Orange | Green | Purple |
| Ethyl acetate     | Light green | Orange | Green | Light purple |
| Methanol          | Light green | Orange | Dark green | Purple |
| Distilled water   | Orange | Dark green | Green | Purple |
| Plain             | Green | Light green | Green | Light green |

HPLC analysis

HPLC analysis of samples of both the plants was conducted for the present study at I.I.C.T., Hyderabad.

The samples of whole plant powders and Kwathas (decoction) of both the plants were taken for chromatographic analysis before the clinical study.

In this present study, a HPLC with a gradient system of pumps (LC-IOATvp of Shimadzu); a Photo-diode Array Detector PDA (SPD-M10 A vp Shimadzu) and a software based data processor (Class-LC 10 vp Shimadzu); a Photo-diode Array Detector PDA detector has helped to select a suitable wavelength for chromatography.

Observations and Results

The chromatograms were found to contain constituents having a general absorbance maxima at 225 nm. All the chromatograms of whole plant powders and Kwathas of both the samples were printed at same wavelengths. It was found that the whole plant powder sample of P. foetida has more number of constituents than that of M. tridentata. This indicates that P. foetida could have a better efficacy than M. tridentata. The U.V spectra of Kwatha of P. foetida sample showed a constituent at 4.1 minute which was not found in the M. tridentata Kwatha sample. It was observed that Kwatha of M. tridentata sample also contain a good number of constituents. Hence the efficacy could be almost equal to that of P. foetida. It was observed that there is a common constituent present in both the samples having same absorption spectra at 350 nm absorbance maxima indicating a common efficacy of both the plants.

Discussion

HPLC Studies: In the present study, even though a thorough chemical analysis was not conducted, the samples under study were analysed on HPLC which is an excellent method for analyzing the natural products.

The common constituents (having 350 nm absorbance maxima) indicates that both the plants M. tridentata and P. foetida work on a similar disease. Even though the constituents between 0 and 10 minutes are found to be similar, the presence of the constituents between 20 and 30 are more in the plant P. foetida than in M. tridentata and hence makes the difference. Chromatographical studies were helped to monitor the commonality of chemistry between both the plants.

In the M. tridentata sample, three molecules at 45 minutes were with λ. max at 280 and 310 nm which were found to be absent in the plant P. foetida. And even though both the plants contain common constituents absorbing at 225 nm, M. tridentata appears to have more number of constituents absorbing in the range of 250 to 350 nm. This indicates that the plant M. tridentata may show more Balya property than the plant P. foetida.

In the present chromatographic study, the analysis helped to know the difference of efficacy between the two samples due to the variation of chemical constituents. The present method may hence be useful for the quality control of the above two plant species.

By the results obtained, it is can be said that both the plants M. tridentata and P. foetida may be useful in treating the Vatarogas. It can be said that among the two, the plant P. foetida may be little more effective than the plant M. tridentata.

Conclusion

The plant Prasarani is in medicinal use since Samhita Period.
• HPLC studies helped to monitor the commonality of chemistry between both the plants
• It was observed that there is a common constituent (having 350 mm absorbance maxima) present in both the drug samples of M. tridentata and P. foetida indicates that both work on a similar disease.
• It was found that the whole plant powder sample of P. foetida has more number of constituents than that of M. tridentata. This indicates that P. foetida may have a better efficacy than M. tridentata.

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हिंदी सारांश
प्रसारणी (मेरेम्यिा ट्रायिडेंटाटा और पेदेरियिा फोटिडा) के रासायनिक संघटन का तुलनात्मक अध्ययन
एन. राजशेरक, पी. वसन्त, डी. विजयकुमार
प्रसारणी का प्रयोग प्राचीन काल से आमबात, अवबाहुक जैसे बात रोगों में होता आया है। दक्षिण भारत में मेरेम्यिा ट्रायिडेंटाटा और उत्तर भारत में पेदेरियिा फोटिडा को प्रसारणी के रूप में उपयोग करते हैं। प्रस्तुत शोधपत्र में इन दोनों द्रव्यों के रासायनिक संघटन का तुलनात्मक अध्ययन किया गया है। इस अध्ययन में दोनों द्रव्यों में एक जैसा पाया गया रासायनिक घटक (350 एम.एम.एलोबेस्म माक्सिमा) इन दोनों ऊष्म विनस्पितियों के एक ही प्रकार के रोग में उपयोग को सुचित करता है। अधिक रासायनिक घटक होने से पेदेरियिा फोटिडा द्वारा अधिक लाभ मिल सकता है।