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TO INVESTIGATE THE MEDICINAL POTENTIAL OF *PELTOPHORUM PTEROCARPUM (DC.) BAKER EX.K.HEYNE* USING AYUSH PROTOCOL

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ABSTRACT :- The world of plants has become a crucial asset in addressing illnesses and providing the global pharmaceutical supply. Diverse bioactive constituents including corticosteroids, isoprenoids, bioflavonoids, fundamental alkaloid classes, fats, and saponins have significantly contributed to advancing drug research and creation." *Peltophorum pterocarpum,* (DC.)Baker ex. K.Heyne known as Copperpod, Golden Flamboyant, Yellow Flamboyant, Yellow Flame Tree, Yellow Poinciana, and referred to as Radhachura in Bangla, belongs to the Fabaceae family. It originates from tropical southeastern Asia and is widely cultivated as an ornamental tree across the globe. This study presents the proximate and pharmacological analysis of *Peltophorum pterocarpum* through the extraction of leaf and pod powder using methanol and ethyl acetate." The methanolic leaf extract of *Peltophorum pterocarpum* (DC.)Baker ex. K.Heyne exhibits higher levels of total ash value, acid insoluble ash value, and water-soluble ash value, compared to its pod extract. On the other hand, when considering the ethyl acetate extract, the pod extract of *Peltophorum pterocarpum* shows greater amounts of total ash value, acid insoluble ash value, and water-soluble ash value. Comparatively, the ethyl acetate extract derived from *Peltophorum pterocarpum* (DC.)Baker ex. K.Heyne leaves displays elevated levels of extractive values, encompassing both alcohol-soluble and water-soluble constituents, when juxtaposed with its pod extract. Correspondingly, the methanolic extracts obtained from the leaves of *Peltophorum pterocarpum* (DC.)Baker ex. K.Heyne exhibit a greater abundance of extractive values when contrasted with the methanolic extract derived from its pods.

KEYWORD:- ashless filter paper, crucible, desiccator, muffle furnace, *Peltophorum pterocarpum* (DC) Backer ex. Heyne, soxhlet extraction unit.

INTRODUCTION:-*Peltophorum pterocarpum* (DC.) Baker ex Heyne is a deciduous tree widely recognized for its aesthetic appeal and its role in adorning avenues. This tree has a rich history of therapeutic utilization, offering remedies for a diverse array of conditions. These include the treatment of stomatitis, insomnia, skin ailments, constipation, and ringworm, with different parts of the tree serving specific medicinal purposes. Assessing ash values plays a crucial role in evaluating the quality and purity of raw medicinal materials, particularly when they are in powdered form. The primary purpose of subjecting a crude drug to ashing is to eliminate any remnants of organic substances that could potentially disrupt accurate analytical assessments. The total ash test provides valuable insights into the quality and purity of a drug. The measurement of acid insoluble ash value specifically highlights the presence of siliceous impurities. The ash value serves as a representation of the inorganic residue, encompassing compounds like phosphates, carbonates, and silicates within herbal drugs. These indices are of significant importance in depicting both the quality and purity of herbal medicine. The ash content provides insights into the mineral composition naturally present in medicinal plants, as well as any extraneous materials that might have been introduced during processing. The measurement of acid insoluble ash content specifically indicates the presence of fine soil and sand particles.

MATERIALS & METHODS:-

Collection of plant material:- The collection process involved gathering leaves from Peltophorum pterocarpum, followed by thorough cleaning and subsequent air drying under shaded conditions." The dried specimens underwent grinding into a powdered form utilizing a mortar and pestle, after which they were stored in airtight containers to facilitate subsequent analysis.

1. **Extraction:-** Powdered samples were extracted in methanol and ethyl acetate solution using Soxhlet extraction unit.
2. ***D*etermination of ash values:-**(General Guidelines For Drug Development of Ayurvedic Formulations)

(1)- Analysis of Total Ash:- Accurately weigh approximately 2 to 3 grams of the finely ground medicinal substance and incinerate it in a platinum or silica dish that has been pre-weighed (tared). Ensure that the incineration process does not exceed a temperature of 450 degrees Celsius, continuing until all carbon has been completely eliminated. After the incineration, allow the dish and its contents to cool, and then record the final weight. In cases where achieving a carbon-free ash proves challenging, the next step involves leaching the charred material with hot water, capturing the residue on an ashless filter paper, and then incinerating both the residue and the filter paper. Subsequently, combine the filtrate, evaporate it to dryness, and incinerate it at a temperature not exceeding 450°C. Finally, determine the proportion of ash as a percentage relative to the weight of the air-dried medicinal substance as the reference point.

(2)- Analysis of Acid insoluble ash:- Ash Incorporate 25 ml of dilute hydrochloric acid into the crucible containing the total ash. Gather the insoluble substances by using an ashless filter paper (preferably Whatman 41) and rinse them with hot water until the filtrate attains a neutral pH level. Subsequently, transfer the filter paper, bearing the insoluble components, back into the original crucible. Then, employ a hot-plate to thoroughly dry the filter paper,

followed by igniting it until a constant weight is achieved. Once the residue has cooled in a suitable desiccator for approximately 30 minutes, promptly record its weight. Finally, compute the acid-insoluble ash content relative to the weight of the air-dried medicinal substance.

(3)- Analysis of Water-soluble Ash:- Heat the ash in a boiling water bath for a duration of 5 minutes, using 25 ml of water. Gather the components that remain insoluble by employing either a Gooch crucible or an ashless filter paper. Thoroughly wash these components with hot water and proceed to ignite them for 15 minutes, being careful not to exceed a temperature of 450 degrees Celsius. Then, subtract the weight of the insoluble matter from the original weight of the ash. The resulting difference in weight accounts for the water-soluble ash. Calculate the percentage of water-soluble ash concerning the weight of the air-dried medicinal substance as a reference point.

Assessment of Extractive values:- (General Guidelines For Drug Development of Ayurvedic Formulations):-

(1.) Analysis of Alcohol-soluble Extractive:- Take 5 grams of the air-dried medicinal material, coarsely ground, and place it in a sealed flask along with 100 ml of alcohol of the prescribed concentration. Let this mixture macerate for a full day, shaking it periodically over a six-hour span and allowing it to settle undisturbed for another eighteen hours. Subsequently, perform a swift filtration while ensuring that no solvent is lost. Concentrate 25 ml of the filtrate by evaporating it to dryness in a flat-bottomed dish that has been pre-weighed. Then, dry it at a constant temperature of 105°C until it reaches a consistent weight. Calculate the percentage of alcohol-soluble extract relative to the weight of the air-dried medicinal material.

(2.) Analysis of water- soluble Extractive:- Place 5 grams of the air-dried medicinal substance, coarsely powdered, into a sealed flask along with 100 ml of chloroform of the designated potency. Allow this mixture to macerate for a full day, shaking it periodically for six hours and then leaving it undisturbed for another eighteen hours. Afterward, swiftly filter it, ensuring that no solvent is lost. Concentrate 25 ml of the filtrate by evaporating it to dryness in a pre-weighed flat-bottomed dish. Then, dry it at a consistent temperature of 105°C until a constant weight is attained. Calculate the percentage of chloroform-soluble extract with respect to the weight of the air-dried medicinal material.

RESULTS:- The amount of plant yield extract, proximate analysis in methanoloic extract in leaf and pod, proximate analysis in ethyl acetate extract , Extractive value in methanolic and ethyl acetate are given below in the table:-

The dry weight of leaf extracts obtained through methanolic extraction is 1.525, while the dry weight of pod extracts from the same method is 0.837. In contrast, the dry weight of leaf extracts obtained using ethyl acetate is 0.695, and the dry weight of pod extracts in ethyl acetate is 1.367.(Table:1)

Proximate analysis of methanolic extract of plant:-

The ash content in leaves is higher at 1.81% compared to the pod, which has an ash content of 1.36%. Regarding acid insoluble ash, the leaf contains 1.47%, while the pod has a slightly

lower percentage at 1.12%. However, the water-soluble ash is significantly higher in the leaf, measuring 1.68%, whereas the pod contains 1.09% of water-soluble ash.(Table:2)

Proximate analysis of ethyl acetate extract of plant:-

The total ash content in the ethyl acetate extract of the plant leaf is 1.20%, while in the pod, it is slightly higher at 1.48%. For acid insoluble ash, the leaf contains 1.29%, and the pod has a slightly higher percentage of 1.45%. In terms of water-soluble ash, the leaf contains 1.53%, and the pod has a higher value of 1.87%.(Table:3)

Extractive value of methanolic plant extract:-

The alcohol extractable content in the leaf is 21.125%, while in the pod, it amounts to 20.899%. On the other hand, the water extractable value in the leaf is 22.5%, whereas in the pod, it is notably lower at 9.67%. (Table:4)

Extractive value of ethyl acetate plant extract:-

The ethyl extract of the leaf contains 28.69% alcohol-extractable content, whereas in the pod, this figure is slightly lower at 25.30%. Conversely, the water-extractable content in the leaf is higher at 26.28%, while in the pod, it is significantly lower at 20.16%. (Table:5)

DISCUSSION:-

The identification of various chemical components within the crude drug involves a method of successive solvent extraction, where the substances are separated based on their increasing polarity. Following this extraction process, the resulting extracts are thoroughly dried and stored within a vacuum desiccator. Qualitative chemical tests are employed on these desiccated extracts to reveal their particular chemical components. Additionally, parameters such as the percentage of extracted compounds, coloration, and texture are assessed for each extract. In contrast to the ethyl acetate leaf extract from *Peltophorum pterocarpum*, the methanolic leaf extract displayed elevated levels of proximate parameters, such as total ash, acid-insoluble ash, and water-soluble ash. Conversely, for the pod of *Peltophorum pterocarpum*, the ethyl acetate extract displayed elevated values across all parameters compared to its methanolic extract. The extractive value of *Peltophorum pterocarpum* demonstrates greater levels within the ethyl acetate leaf extract when contrasted with its methanolic leaf extract. Likewise, the pods of *Peltophorum pterocarpum* display elevated extractive values in the ethyl acetate pod extract in comparison to the methanolic pod extract.

CONCLUSION:-

This investigation into the therapeutic capabilities of *Peltophorum pterocarpum* (DC) Backer ex. Heyne is poised to offer valuable insights for the advancement of pharmaceuticals. The physicochemical criteria deliberated upon in this context can serve as pivotal benchmarks for verifying and confirming the authenticity of the medicinal substance.

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CONFLICT OF INTEREST:-

The author asserts the absence of any conflicts of interest in their work, signalling a commitment to transparency and impartiality. This declaration is a standard practice in scholarly and professional writing, reassuring readers that external factors, such as financial or personal affiliations, have not compromised the integrity of the presented information.

AUTHOR'S DECLARATION:-

The author affirms that the content presented in this article is entirely original, and they willingly accept responsibility for any claims related to the article's content. This statement underscores the author's commitment to the authenticity of their work and emphasizes their accountability for the information presented.

Table 1: Plant Yield Extract (gm/gm dry weight)

Solvent	Dry weight of the extract		%Yield % Yield= dry weight of the plant extract/mother solvent)× 100
Methanol	Leaf	1.525	15.25
Ethyl Acetate	Leaf	0.695	6.95
Methanol	Pod	0.837	8.37
Ethyl Acetate	Pod	1.367	13.67

Table 2: Proximate Analysis of Methanolic Extract of Plant

Plant part	Total ash in percentage	Acid insoluble ash in percentage	Water soluble ash in percentage
Leaf	1.81%	1.47%	1.68%
Pod	1.36%	1.12%	1.09%

Table 3: Proximate Analysis of Ethyl acetate Extract of Plant

Plant part	Total ash in percentage	Acid insoluble ash in percentage	Water soluble ash in percentage
Leaf	1.20%	1.29%	1.53%
Pod	1.48%	1.45%	1.87%

Table 4: Extractive Value of Methanolic Plant Extract		
Plant part	Alcohol Extractive Value	Water Extractive Value
Leaf	21.125%	22.5%
Pod	20.899%	9.67%

Table 5: Extractive Value of Ethyl Acetate Plant Extract		
Plant part	Alcohol Extractive Value	Water Extractive Value
Leaf	28.69%	26.28%
Pod	25.30%	20.16%

Comparison of proximate and extractive value of leaves and pods of *Peltophorum pterocarpum* in methanolic and ethyl acetate extract

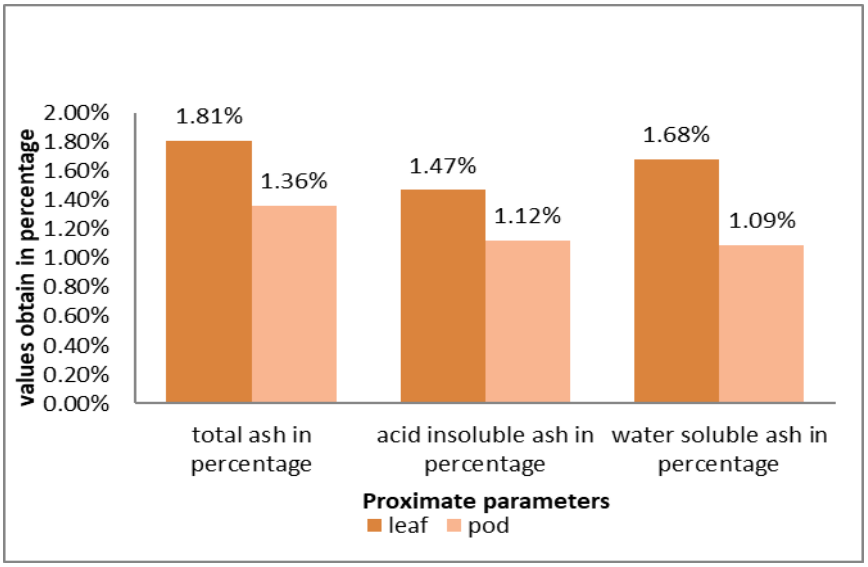

Fig1:- Comparative graphical representation of proximate analysis In methanolic plant extract

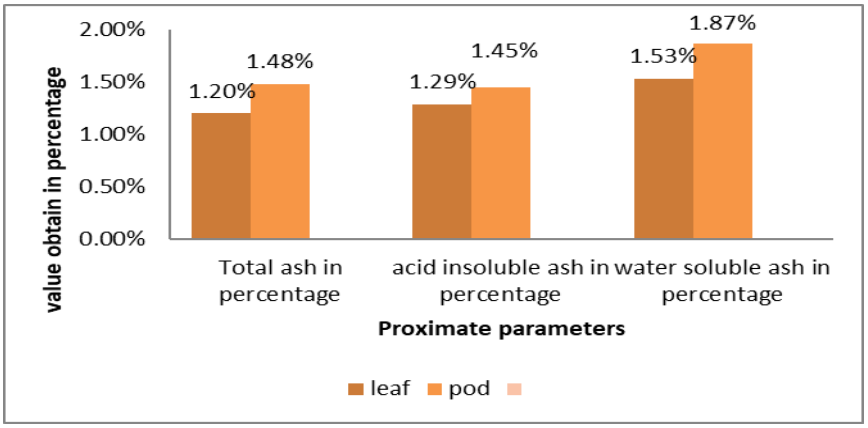

Fig 2: - Comparative graphical representation of proximate analysis In ethyl acetate extract

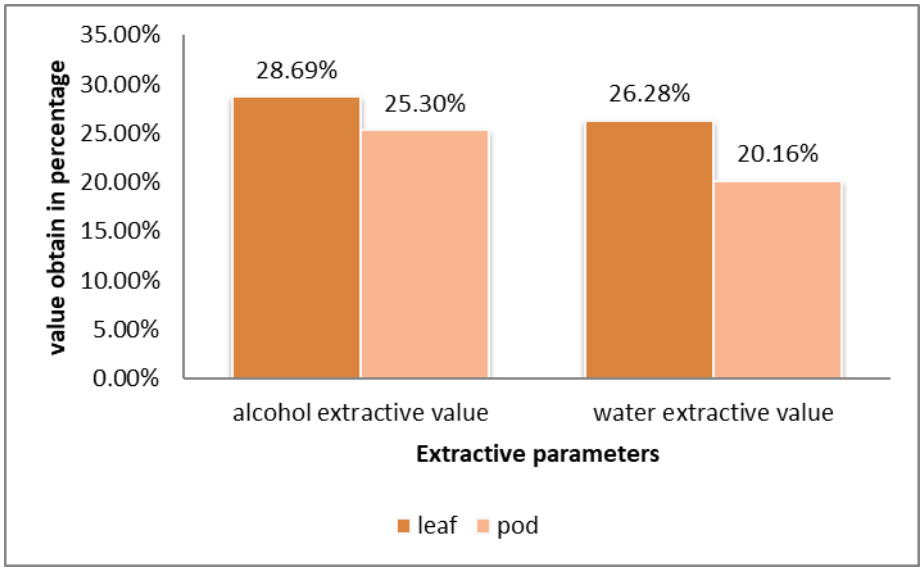

Fig 3: - Comparative graphical representation of extractive value in Ethyl acetate extract

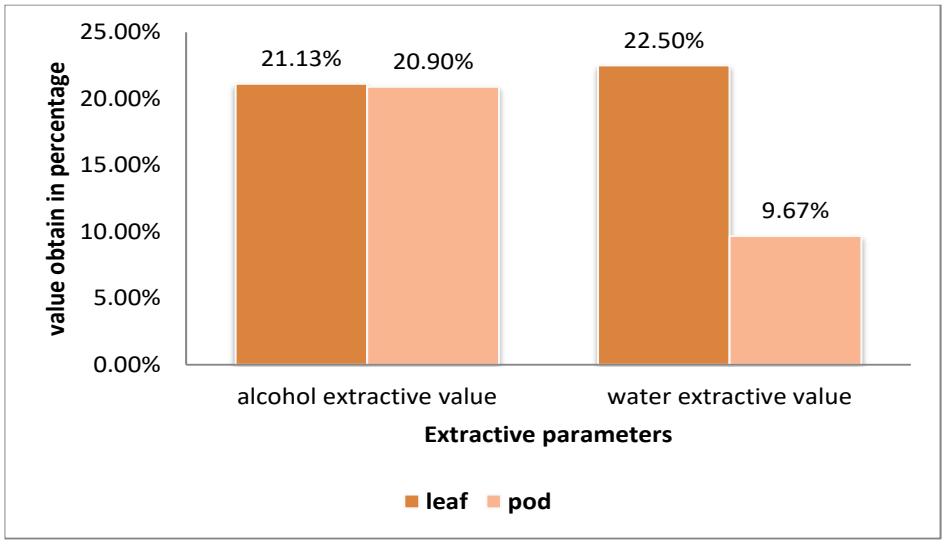

Fig 4: - Comparative graphical representation of extractive value in Methanolic plant extract

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