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A REVIEW ARTICLE ON STANDARDIZATION AND QUALITY CONTROL OF TRIPHALA CHURNA

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ABSTRACT

The increasing popularity of herbal medicines has controlled to the development of new approaches of treating various diseases. This field has also been targeted by the WHO. Methods: Additionally, it is utilised to treat other gastrointestinal issues like constipation. A of prepared thriphala churna was standardised and its quality checked against market references. The macro and microscopic properties, powder flow property, extractive values and physicochemical properties, Detaction of heavy metal content, qualitative and quantitative determination of alkaloids also tanniens, TLC fingerprint, in-vitro anti-oxidant activity and cytotoxic activity were evaluated for the standardisation of the formulations mentioned above in order to evaluate the quality, safety, and therapeutic activity. Results: The flow qualities in the aforementioned parameters are subpar. The results of the early phytochemical tests indicated the presence of many bioactive ingredient types. Water extract has an extremely high concentration of tannins and flavonoids, as well as good anti-oxidant and in vitro cytotoxic action. Therefore, several chronic disorders including cancer may be treated with Triphala extracts prepared in an Ayurvedic manner.

INTRODUCTION:

An important part of the trend toward alternative medicines is herbal medicine. Nature has long been referred to be a shining example of how to magnify the remarkable symbiotic occurrence. Every nation is establishing its own system of herbal medicine. It covers certain countries' ancient civilizations, such as China, Egypt and India. Ayurveda, an indian medical system, also emerged at this time. According to the WHO, 80% of individuals in underdeveloped nations depands on traditional medicines, primarily plant-based treatments, for their basic medical requirements, additionally, at least 25% of the medications in contemporary Pharmacopoeias are still derived from plants, and many more are synthetic equivalents constructed from plant-derived prototype chemicals. Additionally, the herbal substance utilised in the procedure needs to be standardised. For the purpose of evaluating the superiority of medications based on the absorption of their active principle, polyherbal formulation is a crucial component of standardisation. The chemical composition and, thus, the clinical effect of plant material utilised in large quantities may alter depending on the collecting batches. In order to support member conditions in their efforts to develop national rules on conventional medicine and to study their potential suitability, including estimation of their quality, safety and efficacy, WHO has developed advanced guidelines that take into

account the position of medicinal plants for community health care in advanced nations. It is a technique to assess the quality and purity of unprocessed pharmaceuticals via different criteria, such as morphological, microscopic, physical, chemical, and biological observation. Quality control parameters used for herbal formulations

(i) Physical Parameters: Color, appearance, odour, clarity, viscosity, moisture content, ash values, pH, disintegration time (D.T), friability, hardness, flow property, flocculation, sedimentation and settling rate are all included.

(ii) Chemical Parameters: It contains extractive values; chemical assays for active ingredients, heavy metal limit tests, and other things.

(iii) Chromatographic examination of herbals: It can be passed out using TLC, HPLC and HP.

(iv) Microbiological parameters: It contains every usable material, all mould, and all enterobacteria. Morphology. One of the significant Ayurvedic Triphala Churnas was standardised for the current investigation. Churnas are preparations made of finely ground pharmaceutical substances and can be either simple or complex. A compound churna has more than one ingredient, whereas a simple churna contains just one. The Churna concept is applied because most compounds have a significantly higher therapeutic efficacy when concentrated to a very fine stage of unit.

Triphala churna and its composition: Emblica Officinalis is active in treating dyspepsia, amlapitta (peptic ulcer), and hepatotoxicity. In rabbits and rats, this fruit has hypolipiadaemic and anti-atherosclerotic properties. Any strain of Salmonella typhimurium exposed to certain directly acting mutagens has antimutagenic action in emlica extract. The extract from the alma also possesses antibacterial qualities. Amlaki contains significant quantities of super oxide dismutase, which may be the reason for its free radical scavenging and antioxidant capabilities. It has been demonstrated that lignin extracted from Terminalia bellirica possesses anti-HIV, antimalarial, liver-protective and anti-fungal properties. The fruit pericarp of terminalia chebula exhibited antifungal, anti-mutagenic, and cardiac tonic effects in addition to cytoprotective action.

MATERIALS AND METHODS:

Collection of herbal material use in triphala churna Embellica Officinalis (Amla), Terminalia Bellerica (Bibhita) and Terminalia Chebula (Harita) are the components used in the Triphala Churna and were bought in the neighbourhood or market. Drugs need to be carefully washed and dried. The drugs are powdered and kept neatly apart. They are powdered after being sieved via an 80-mesh sieve. weighed individually, combined in a proper ratio (seen in Table 1) and then combined. Following that, it is saved in airtight flasks in a cool, dry location alongside the dabur triphal churna that was too bought for the purpose of references.

Chemicals and requirements: Water bath and rotary vaccuum evaporator, UV spectrophotometer, semi-automated biochemistry analyzer, digital cat cam camera, and automatic centrifuge. Acid gallic, piperin remaining chemicals, such as lead nitrate and methanol Silica gel G, hydroxyl amine hydrochloride, and ammonium ferrous sulphide. Preparation of aqueous also ethanolic extracts of triphala churna Using distilled water and 90% ethanol, a considered amount of powder (500gm) was approved through sieve no.40 and exposed near an aqueous in addition ethanolic extraction by maceration process, which was stored at room temperature for seven days while being stirred occasionally. The extract underwent filtering. An aqueous also ethanol extract were concerted in a water bath, and the extraction was dried out using a rotary vacuum evaporator under

reduced pressure. Afterward, the desiccator is used to keep the two dry extracts and use them for other purposes. Pharmacognostical evaluation of powderd crude drug.

Macroscopical evaluation: Macroscopic study was passed out by color, odour also taste for samples in the formula of churna.

▪ Determination of powder flow property

(A) Bulk and tap density: The bulk density (BD) or tapped density (TD) were both calculated. 10 gm of a powder mixture were added to a 25ml measuring cylinder. The first bulk otherwise volume was then recorded, and the cylinder was then allowed to rest less its own weight from a height of 2.5 cm on a hard surface for a second time. The volume of the tapping was observed to alter continuously. The following formulae were used to determine the bulk and tap densities. BD = Powder Blend Weight/Packing Volume Untapped TD stands for Wt. of Powder Blend/Tapped Vol. of Packing. (B) Compressibility index: It was used to calculate the powder blend' Compressibility index (carr's index). The carr's index calculation is as follows: carr's index (%) is equal to [(TD-BD) 100]/BD.

(C) **Housner's Ratio:** A formula is using for this ratio is as below: Housner's ratio = Tape density (TD)/ Bulk density(BD).

(D) **Angle of repose**: The funnel method was used to calculate the powder blend's angle of repose. Properly measured weight of the powder mixture in the funnel. The funnel' height was used to in such a way that its tip just touched the top the powder mixture. The funnel can easily handle the mix powder. The diameter of the powder cone was measured and the angle of repose was resolute using the equation exposed below. Tanq equals the powder cone & #39; height and radius.

Microscopical examination: The drug' powder properties were examined under a optical microscope. The discolored and colored slide was made, and a digital CCD camera was used to study and take pictures of the Characters.

Procedure: For a short period of time, powder was heated with the clarifying agent chloral hydrate. For the fabrication of an unstained slide, the powder was boiled before being pointed on the slide with lactophenol 50% glycerin and enclosed with a cover slip. While for the production of the stained slide, the powder was dyed with phloroglucinol and conc HCl, the mounts with 50% glycerin, and the cover slip was applied. Additionally, I 2 (iodine) solution designed for starch grains was used to make the stained slide. Under a microscope the slides were inspected.

Physico-chemical parameters for ash values :

1) **Total ash value** : A silicon crucible that had already been lit and weighed was filled with 3 gm of the powdered medication. The bottom of the crucible was covered in a thin coating of durg powder. By progressively raising the temp r to make the powder cloudy red hot untill it was carbon-free, the container was burned. After cooling, the crucible was weighed again for a consistent value. Calculations were made using the air-dried medication to determine the % of the Total Ash value.

2) **Acid insoluble ash:** The whole ash that was collected as instructed was heated in 25 ml of 2N Hcl for 5 minutes. Unsolvable ash Accumulated on ash-free filter paper, which was then thoroughly cleaned with hot water. A silica crucible with insoluble ash was filled, lit, and weighed. To obtain a consistent weight, repeat the experiment. Calculating the acid-insoluble ash percentage used the air-dried medication as a reference.

3) Determination for sulphated ash value: 3gm. Precisely considered air-dried powdered medication is placed in silicon container that has already been lit and considered. Then slowly flared until the substance was completely burned. The container was before cooled, the residue was soaked with 1ml of concentrated sulfuric

acid, heated it slowly until no longer emitting snowy vapours, and burned at 800°C 25°C until no longer emitting any black particles. It was allowed for the crucible to cool. Sulphuric acid was re-added in small amounts and heated. The ignition procedure was followed as previously, and cooling and weighting were done to obtain a consistent wt. (difference is not extra than 0.5gm. between two repeated readings). The medication was air dried, and the percentage of Sulphate ash valuemwas determined. Its ash values were considered or noted and recorded.

Loss on drying: With a porcelain plate covered in tar, 2 g of powdered drug was consumed. dried at 100°C or 105°C in the oven, then chilled in a desiccator while being monitored. The loss was then recorded as a moisture value. 1) Determination of alcohol-soluble extractive: 5g of shade-dried coarse leaf concentrate was macerated with 100ml of 90% alcohol for 24 hrs, stirring constantly during the first 6 hrs, and then let to opinion for an additional 18 hours. Filtered carefully, taking measures to prevent alcohol loss. In a shallow dish with a flat, tarred bottom, evaporating the filtrate until it was 25 ml dry. 105°C dried, then weighed. With reference to the shade-dried medication, the percentage of alcohol-soluble extract was calculated Determination of water soluble extractive: Using chloroform water instead of alcohol, the identical technique was carried out as Instructed for identifying the extractive that is soluble in alcohol. Drugs' extractive values were computed and no properties The majority of the ash in Triphala Churna (lab and market samples) is water soluble, with a little amount of acid-insoluble ash indicating a permissible level of undesirable heavy metal contaminants.

RESULTS AND DISCCUSION:

Macroscopical assay of churna: Market Churna colour is dark brown, whereas laboratory Churna is reddish-brown with a strong aroma and flavour. Powder Flow Properties For testing their flow characteristics, laboratory as well as market samples of bulk density(BD), tape density (TD), Carr's index, angle of repose and Housner's ratio. The results of the lab and the market samples did not significantly differ. The amount of loss on drying for all components the pharmacopoeial limit. This suggests that the moisture content in these samples is within the permissible limit. Microscopical Examination The Amla, Baheda, Harde, and laboratory as well as commercial formulations of Triphala's microscopic characteristics. Physioco Chemical properties The majority of the ash in Triphala Churna (lab and market samples) is water soluble, with a little amount of acid-insoluble ash indicating a permissible level of undesirable heavy metal contaminants. The amount of loss on drying for all components the pharmacopoeial limit. This suggests that Results of LOD triphala churna. Limit test for heavy metals of triphala churna: The colour made by test solution does non differ significantly from the colour made from standard solution. Triphala churna (lab sample and market sample) hence conforms through heavy metal limit. Preliminary phytochemical studies All constituents include different phytochemicals, while Triphala Churna itself contains volatile oils, alkaloids, tannins, and flavonoids. Quantitative phytochemical estimation of Triphala Churna it's findings by looking at the data, it can be shown that this phytochemical and the Triphala Churna have high biological value. Qualitative phytochemical analysis of triphala churna. TLC of triphala fingerprinting of churna: TLC fingerprinting for Tannins and Alkaloids : A triphala churna (Lab sample and market sample) TLC fingerprinting for tannins gives spot corresponding to galiic acid to the Rf(0.57). After being sprayed with 5% FeCl3 Methanol Solution, it produces a dark blue coloured spot. Triphala Churna provides the

location that matches to the regular piperine with the same Rf for the alkaloids(0.83). It produces a yellow spot after being sprayed through Dragndroff's Reagent (Figure7). Triphala churna offers the similar location at the same Rf (0.93). Under UV light, it emits blue fluorescence (366 nm).

CONCLUSION

Utilizing pharmacognostical also physicochemical criteria, initial photochemical analysis, TLC fingerprinting and proximate analysis of active elements by UV spectrophotometer, Triphala Churna was standardised. Additionally assessed and contrasted with laboratory sample was the market sample. Lead limit testing was conducted on both lab-produced and commercially available churna. Triphala Churna contains a limited amount of heavy metals (lab and market sample). For ash levels,value of extraction, total value of tannins, phenolic content and iron content, market and laboratory Churna varied. These changes might result from a change in the raw materials' quality. Triphala extract ethanolic extracts showed potent anti-proliferative and antioxidant properties Physicochemical and pharmaceutical characteristics, as well as preliminary photochemical research, TLC fingerprinting of active ingredients by UV spectrophotometer, were used to standardise Triphala Churna. The market sample and laboratory sample were both assessed and contrasted. Lead limit testing was performed on both laboratory and commercially produced churna. In Triphala Churna (lab and market), heavy metals are in limited supply. A growing body of information shows unequivocally that dietary bioactive substances should target apoptosis as a key molecular target in the fight against cancer. As a result of the phytochemical study demonstrating the existence of strong phytochemicals similar like alkaloids, phenols, flavonoids and terpenoids, glycosides, saponins cand steroids, tannin, sugars and many mores . According to a number of writers, bioactive ingredients include phenolic, acids, flavonoids, steroids, and terpenoids.

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