Comparative Pharmacognostical evaluation of different parts of Chicorium intybus a potential antidiabetic herb with its suitability for novel drug delivery system.

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ABSTRACT

Background: Bioavailability enhancement is a key factor for making phytoconstituents more potent. Due to the complex nature large molecular size and poor membrane permeability and solubility limits the bioavailability of these compounds. Phytoconstituents and their suitability for development of a novel drug delivery system like herbosome, liposome etc. has gained popularity due their safety and other profiles.

Methods: Present study covered pharmacognostical evaluation of Chicorium intybus plant parts used in diabetes, gastric trouble, stimulant wound healing and hepatoprotection. Processed plant parts were subjected to various pharmacognostical studies like organoleptic, histology and power microscopic evaluation and various physical parameters such as ash values extractive values loss on drying moisture contents and fluorescence analysis were done and observations recorded.

Results: Study confirmed the suitability and selectivity of plant parts for extraction isolation and other screening. Leaves and root were containing maximum and minimum amount of extract respectively. Root contained maximum amount 5.32% total ash. Leaves were containing moisture 11.56% & 16.87% LOD.

Conclusion: Study confirmed selectivity of plant parts, leaves and roots were of special concern. Further phytochemical and pharmacological screening with Herbosome development of the phytoconstituents of Chicorium intybus is in progress.

Keywords: Bioavailability, Phytoconstituents, pharmacognostical.

Introduction

Life style disorders are proving a threat to life over worldwide. Stagnant lifestyle and working in sitting with long time is responsible for the obesity which is a primary responsible factor for initiation of type-2 diabetes. Working oriented stress and disturbed sleeping and irregular food habit worsen the diabetes more. Developing countries specially India which is also called as Diabetes capital of the world is facing a big challenge in this regard. India presently having approximately 20% of its population. Urban population with approximately 15% is prevailing the situation. Management of this a challenge to the health care services in India, India, from ancient time practicing to cure the life style disorders through use of herbs and herbal products. A variety of medicinal plants and their products are used by traditional and tribal people in India. Chicorium intybus a medium sized herb is used by various tribe across the country for its hypoglycaemic and other therapeutic potential.

Present study is focused to validate the claim of tribal people. Various parts of the herb is utilised by the different tribes of India, hence the study is aimed to establish the a tool for its quick utilization tool. Herbosomes or phytosomes are novel formulations of phytoconstituents with poor bioavailability making them more bioavailable with complexing with phospholipids. Herbosomes being amphiphilic in nature renders the phytoconstituents readily available to the cells and tissues exerting enhanced therapeutic response.

Materials and methods

Collection and Authentication- Plant specimen was collected from the local area of Hardiwar and authenticated by the expert taxonomist of the department of Botany and Microbiology Gurukula Kangri Vishwavidyalaya Hardiwar, a herbarium GKV/B & M/2018-1019 was deposited in the department. Plant material was dried in shade and crushed to the coarse powder and subjected to the various study.

Macroscopic evaluation- Color, odor, taste, shape size, fracture was noted.

Microscopic evaluation- Different parts viz root, stem and aerial parts were subjected to microscopic evaluation, for microscopy hand operated rotary microtome was used for cutting the thin sections of the material and mounted with stains and studied under 200x to 400x magnification with attached camera compound microscope, and images were taken.

Fluorescence analysis- Different powdered material was soaked in distilled water and chloroform for twenty-four 24hrs with occasional stirring for first 6 hours. Then filtered and analysed under UV light and observation were recorded.

Physical analysis- Various physical properties of the drug were studies by various instruments.

Moisture contents and Loss on drying- For this Citizen MB-200 digital balance and Hot air oven NSW S180 respectively were used and observation recorded.

Ash Values- Different ash values viz. total ash, acid insoluble ash, water soluble ash and sulphated ash were determined subjecting 5gm of the powdered drug in to the Muffle furnace (NSW-180MF) and incinerated to get ash and calculated the percentage of ash with reference to air dried drug.

Extractive Values- Different powders were placed in conical flask and 100ml solvents were added and closed with stopper and kept for twenty-four hours, occasionally shaking for first six hours. Filter and 25 ml of the filtrate were evaporated to dryness and percentage of the extract were calculated with reference to air dried drug.

Result & Conclusion- Above study confirm the suitability of various parts of the Chicorium intybus for ribosome preparation with a quick tool for the best suited part of it. Aerial part was having maximum extractives while root was having least. Root was containing max amount of ash while aerial part containing least. Other parameters like fluorescence pattern, moisture contents, loss on drying and microscopy is significant for the detection of adulteration and quality control.