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Pharmacognostical and histo chemical analysis of entire plant of *Kedrostis foeditissima* (Jacq) cogn. Cucurbitaceae

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A B S T R A C T

Man has relied on natural Products as a source of medicinal Agent for centuries. Today math the spectrum of Antibiotic resistance, emerging infectious diseases and causers, natural products continue to provide the structural leads for the chemo the rake tic industry. The histological methods has been vied for into species and the various histo chemical techniques like electron microscopy, fluorescence micros copy that has been utilized due tithe advance made in organic chemistry. Biophysics and cell physiology in order to find the active compounds present in the different part of the specimen which is under investigation. The complete morphological knowledge has inspired the need for his to chemical techniques which would give additional information on dynamic aspects of growth and nutrition of the species and its potential against dosage in the human beings. It has been observed that it will secure a significant place of natural produces because of its various antibiotic functions. The *Kedrostis foeditissima* plant were derived number of compound primary compounds are glyceroids, starch, proteins, and secondary metabolites are terphenoeds. Alkaloids, steroids, flonanoids, saponin, tanins mucilage, fats, lipids, etc. are present in different parts like seed, fruit, leaf, root tuber, into this retinal products histo chemical research has not been reported so far from any other part, hence the present investigation is the first report.

Introduction

Cucurbitaceae is one of the angiosperm taxonomy which includes many genera and species, which is demand to posses reputed compound of bring biological activities. Investigators have isolated flavonoid, alkaloids, terpinoids tannin, lipids, carbohydrate, starch, mucilage, fat saponin etc.... from various parts like leaf, tuber root, stem and fruit of *Kedrostis foeditissima* hence it was planned.

To present a detailed extensive and intensive studies and identify the bioactive compounds, potential of anti diabetics and anti-cancer activity to carry into the in vitro study.

Hence in the course of investigation, *Kedrostis freditissima* fruit and tuber have been chosen for the present study, the fruits and leaves used as anticancer, ulcer, wounds, tumors, and stones in bladders. It is also used in treatment of bronchitis, enlargement of spleen and it treatment of rheumatisms, leaf and fruit are useful in scabies, ringworm, pain diseases and syphilitic veers.

Since there is a growing interest in pharmacognocy of various herbs in traditional system of medicinal with advanced knowledge of molecular and scientific method of isolation a strive elucidation techniques was made to carry investigation

Materials and Methods for Anatomical Studies

Collection of specimens

The plant specimens for the proposed study were collected from Chittoor District. It was taken to select healthy plants and normal organs. The required samples of different organs were cut and removed from the plant and fixed in FAA (Farmalin-5ml+ Acetic acid-5ml + 70% Ethyl alcohol-90ml). After 24 hrs of fixing, the specimens were dehydrated with graded series of tertiary - Butyl alcohol as per the schedule given by Sass, 1940. Infiltration of the specimens was carried by gradual addition of paraffin wax (melting point 58-60 C) until TBA solution attained super saturation. The specimens were cast into paraffin blocks.

Sectioning

The paraffin embedded specimens were sectioned with the help of Rotary Microtome. The thickness of the sections was 10–12 µm. Dewaxing of the sections was by customary procedure (Johansen, 1940). The sections were stained with Toluidine blue as per the method published by O'Brien *et al.* (1964). Since Toluidine blue is a polychromatic stain. The staining results were remarkably good; and some cytochemical reactions were also obtained. The dye rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies etc. wherever necessary sections were also stained with safranin and Fast-green and IKI (for Starch)

For studying the stomatal morphology, venation pattern and trichome distribution, paradermal sections (sections taken parallel to the surface of leaf) as well as clearing of leaf with 5% sodium hydroxide or epidermal peeling by partial maceration employing Jeffrey's maceration fluid (Sass, 1940) were prepared. Glycerin mounted temporary preparations were made for macerated / cleared materials. Powdered materials of different parts were cleared with Noah and mounted in glycerin medium after staining. Different cell component were studied and measured.

Photomicrographs

Microscopic descriptions of tissues are supplemented with micrographs wherever necessary. Photographs of different magnifications were taken with Nikon lab photo 2 microscopic Unit. For normal observations bright field was used. For the study of crystals, starch grains and lignified cells, polarized light was employed. Since these structures have brief pingent property,

under polarized light they appear bright against dark background. Magnifications of the figures are indicated by the scale-bars. Descriptive terms of the anatomical features are as given in the standard Anatomy books (Esau, 1964).

Microscopic character show as, trichomes, starch grains, vacuoles alls, firms, excreting porting train, regions lotion, volatile oil chemical compounds.

Macroscopic and microscopic analysis

The macroscopic characters such as colour, odour, taste, nature, texture, were studied for morphological investigation. For anatomical studies customary technique of microtomy was followed (Johansen, 1940) paraffin sections of 10µm thick were stained with safranin fast green. Photomicrography was taken with Nikon lab photo – microscopic unit quantitative microscopy was studied as per the procedure given by Wallis (2005) and Lala (1981). The powder analysis has been carried out according to the method of brain and turner brain.

Ergostic call contents

The cell contents with which are concerned in phavmcognosy are, those which can be identified in vegetable drug by microscopic examination or by chemical and physical test, these cell contents represent either food storage products or by products of meta boils and include carbohydrates, volatile oils, mucilage, tanins, flavonoids, lipids, fat, steroids, and terpenoids and saponin etc..

External parts of plant

The epidermis constitutes the outer most layer of cells of, the leaves, floral parts, fruits and seeds and of stems and roots before the undergo considerable secondary thickening, functionally and morphologically the epidermal cells are not uniform and among them apart from the ordinary cells, may types of hairs, stomata guard cells, and other specialized cells are found, To photographically, how ere and to a certain extent also on to genetically the epidemic constitutes a inform tissue.

Starch

starch occurs in granules of verging sizes in almost all organ of plants it is found most abundantly in note, season, fruits and seeds, etc, The small granules founded in chloroplasts by the condensation of sugar are after weds, belong dyed into sugar so that they may pass in solution. to storage organs where, under the in flue of leucoplasts.

Large grains of reserve store formed starches considerable pharmaceutical importance.

Starch

Starch is a carboxyl date composed of long chain molecules. It appears in the form of grains. Which commonly stain bluish black with a solution of iodine in potassium iodide starch grain is first formed in chloroplasts.

Protein

Storage protein occurs in the forms of aleuronic grains which are well oily seeds. (eg. castor seed).

Oils and fats

Oils and fats are widely distributed and occur in both vegetating and reproductive stored. They often occurred in seeds. Where they may replace the carboy dates as a reserve food material. As fats form an

essential component of biological membranes.

Mucilage's

Mucilage's are polysaccharides complexes formed from sugar and ironic arid chits. They are insoluble. On alcohol but dissolve or dwelling water. Specific tests for the substances are at present lacking but the forewing useful.

The official solution of ruthenium Red stains the mucilage of sienna and bunch leaves.

Linseed and mustard also stain lead acetate medium cube used to portent induce swelling or solution of the substrate being tested some forms of moorage are stained by the BP Alkaline solution of coralline that found in squall.

Volatile oils

Volatile oils occur as droplets in the cell they are sparingly soluble in water but dissolve in alcohol. They resemble fired oil. in their behavior sonic aid and tincture of alkanet, but they are not saponin field when treated with ammonia cal potash.

Tannins

Tannins are wildly distributed in plants and occur in solution in the all sap. often in distinct vacuoles. It section of gals are scat and mounted in clove oil, plates of tannin may be observed sections containing tanning acquire a blushes black or greenish color when mounted in a dilute solution of ferric chloride comply organic compounds congaing phenols, hydroxyl aid or glycosides.

Tannins: Ferric sulphate / Ferric chloride method (Jensen, 1962).

Fresh, tissue

Place the sections in a 10% formalin solution containing 2% fertic sulphate or ferric chloride,

Result: Blue or blur green precipitate indicates the presence of tannins.

Place of sections in a 0.5% to 1% solution of ferric sulphate or Ferric chloride in 0.1N HCl. Add a few drops of ciliolate sodium carbonate solution to the above to enhance the reaction.

Alkaloids and glycosides

These important secondary metabolites are rarely inside in plant cells without the application specific chemical tests.

Steroids: Complex hydrocarbons, chemically similar, occurring in plants and animals

Hair any epidermal Filamentous out growth consisting of one or more cells varied in shape superficial discharging secretion externally, e.g. glandular hair, embedded glandular tissue: in tissue.

Tissue of single or massed cells, paranchymatous and filled with granular protoplasm, adapted for secretion of aromatic substances in this plants.

Flavonoids/pigmentation:

The plant pigments are usually found in the plastids and in the vacuole. Another group of Pigments is the flavonoids (Anthocyonins and flavonoids or flavonols) which are generally presentation in Vacuoles (Goodwin and Mercer, 1972) these pigments are water soluble and give plants parts, especially many flowers and Fruits, various colors.

Color is depended on the pH. In aid solution the color varies from organ red to lilac. As the solution approaches PH 7.0 colorless pseudo bases are formed.

Flavones or flavonols absorb strongly in the ultraviolet region of the spectrum and can be seen by insects.

Taxonomic use of trachoma's

Externally few angiosperms are truly glabrous. Most "glabrous" angiosperms are so because of generation of trachoma's. This may in itself be of importance. For example in Herperomannia (Carl-qlist, 1957) trachoma's in various species are identical or primordial, but restive preservation of uniseriate trichomes provides a specific characteristic (Cowan, 1950).

Histochemistry

- ✓ It deals with the composition of the cells or tissues in terms of the chemical elements and their compounds present in the material.
- ✓ It has been mainly due to advances made in organic chemistry, electron microscopy, fluorescence microscopy, biophysics and cell physiology.
- ✓ The complete morphological knowledge has inspired the need for histo chemical techniques which would secure additional information on dynamic aspects of growth, nutrition, defense against disease in the living system.
- ✓ Histo chemical staining is mainly based on the chemical reactions of the living substances involves physiochemical reactions of dues on the tissues.
- ✓ Hence, histo chemical techniques would lead to better understanding of dye - specificities such as location.
- ✓ Histo chemical techniques enable the identification and localization of specific substance within tissue.
- ✓ The methods depend on chemical reactions - the substance to be identified and localized in a tissue section (Table 1).

Results and Discussion

Chemical constituents: oil, mucilage, proteins, glycoside, volatile oils, terpenoids, starch, protein, tannins, mucilage, alkaloids, steroids, bitter principles of terpenoids pungent principle etc is there.

Microphotographs of the extremely morphology of the organs of plant selected were take with NIKOM – 8400 cool P.X – digital camera photomicrographs under different magnifications were taken with Nikon lab photo – 2, microscopic units filled with Nikon cool pix digital camera, magnifications of the figure were indicated by the scale beds.

The specimens collected from various sources were diagnosed with the help of local flora (Ganble, mathew) the binomial of the specimen are as given in the flora of Tamil nadu, India (Nair and Benny 1982, Harmy *et al.,* 1987-1989).

Description of the cells and tissues are as per the terms used in standard anatomy book (Esav, 1965) Metcalfe and chalk, 1956). Term logy adopted for the description of wood and bark was adopted from IAWA multilingual glossary (1964) and Trucker Brodt (1990) and Junikka (1994).

Table.1 Plant compounds and their characteristics

	Compounds	Characteristics	Test reagents	Observation Under Microscope
1	Cellulose -	It is fibrous material of cell wall Lignin responsible for Structural rigidity of plant	1. Iodine Solution Iodine Sulphuriaid (60/vv) Zinc Chloride	Pale yellow Bright Blue
2	Mucilage Polymers of mono saccharide and may combined mitturonomic aid	Absorbs water and from sviscous mass. After defining it becomes hard and honey	Iodine Solution Sulphuric acid Zinc Chloride	Voilet
3	Storch Insoluble Polysacharride	Polyonal Compound	Iodine Solution sodium hydroxid solution	Blue
4	Protein Complex (nitrogenous compound)	Alearone grains consist of amorphors mass of protein developed by denser protein membrane	Eosin aquous solution. Alcoholic picric acid solution Iodine solution	Red colour Yello Yellow colour
5	Fat Gly ceryl esters of fatty acid	Resolved food abundance in seeds, In soluble inwater soluble in elter chroform and Benzene	Ether, benzene chloroform Osmic acid Pressed against a papper	Soluble Brown/black Parmanet greasy
6	Volatile oils	Occur as droplets in plant cells	Alcohol (90%)	Red colour
7	Alkaloids	Nitrogenous alkalaid substance haming marked physiological action	Iodine solution	Reddish Brown
8	Tanins	Non-Nitrogenous phenolic compounds of high molecular weight	Dilute ferric chloride solution	Bluish block green or colour
9	Terphenoids			Dark brown
10	Sapomins			Yellow
11	Steroids	Polyonal Compound		Red in color
12	Trichome	Covering unicellalar, dagger slopeed wateny with bulboos base.		

Fig.1

Fig.2

Fig.3

Fig.4

Fig.5

Fig.6

Fig.7

Fig.8

Fig.9

Fig.10

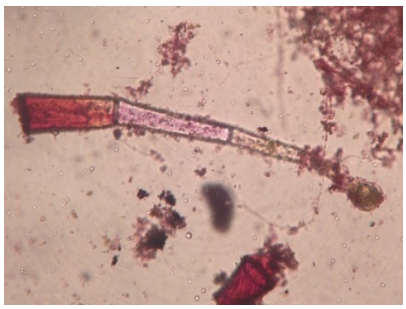

Fig.11 Trichome

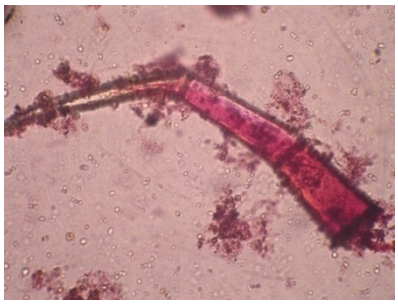

Fig.12

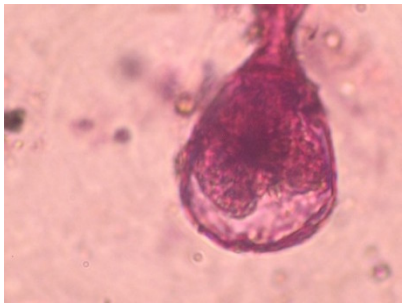

Fig.13 Gland

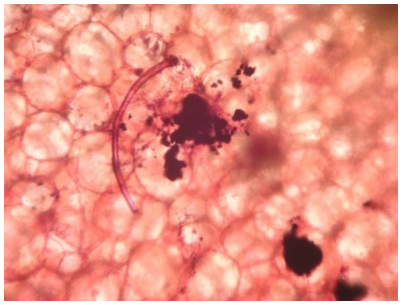

Fig.14 Saponin

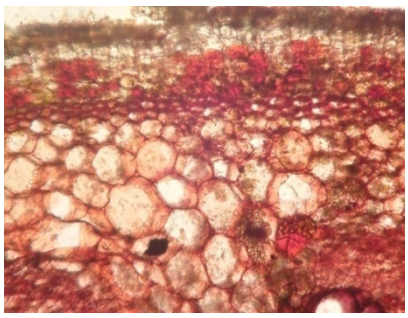

Fig.15 Flavonoid

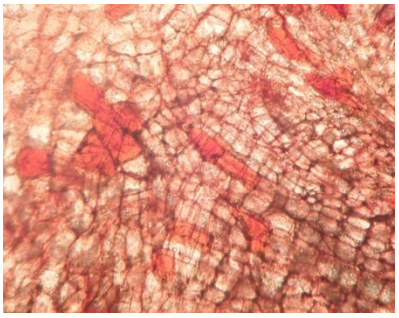

Fig.16 Terphenoid

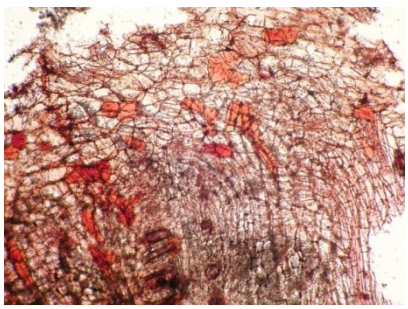

Fig.17 Alchaloid

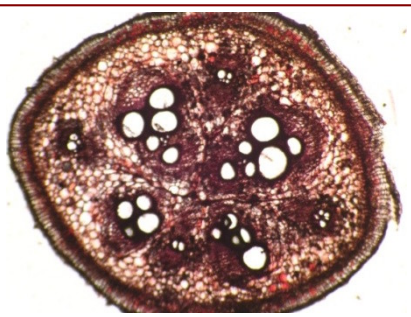

Fig.18 Steroid

Fig.19 Mucilage

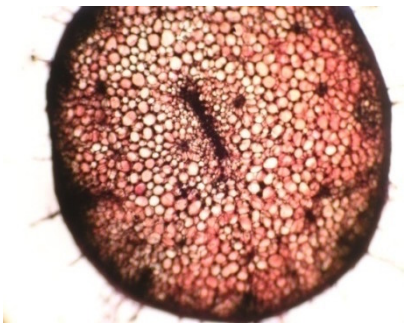

Fig.20 Tannin

The studies have been restricted to light microscopic observations, because such basic investigations are believed to after much interesting data for further and deeper insight into theca.

Conclusion

From the above observations, it is suggested that plant compound could be used as an easily accessible source of natural anti agents in pharmaceutical industry and also it may be extensively used for the treatment of some degenerative diseases such as cancer, inflammatory, liver disorder, diabetics, etc.... Therefore, it is suggested that further work should performed on the purification and identification of active components in plant compounds. This could ultimately lead to the inclusion of this compound in the formulation. The majority of the information on the identity, purity, and quality of the plant material can be obtained from its macroscopic, microscopy and physio – chemical parameters. As there is no record on pharmacognostical work on leaves and seed of *Kedrostis foeditissima*. The present work under taken to produced some pharmacognostical standards. The above studies provide information respect of their identification, chemical constituents and physicochemical characters which may be useful for pharmocognostical study under standardization of herbal drugs of folk medicinal practice of present era and enrichment of field of medicine. It will also determine therapeutic diagnostic tools for the scientists who are keen and sincere to evaluate the herbal medicine of indigenous resources.

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