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Pharmacognostical Standardization Studies of Unani Medicinal Plant Galls Mazoo (*Quercus infectoria* Oliv-Fagaceae).

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Abstract

The gall of *Quercus infectoria* is well known for its medicinal properties. Pharmacognostical standardization of this gall was carried out on the basis of color, size and microscopy. Dried galls of *Quercus infectoria* are globular in shape, bluish grey in color, with uneven surface with pores (indicate infection) with hallow structures and inner surface is yellow, pale buff colored within tough and heavy, odour not specific, taste bitter and astringent. Histologically, the epidermis ruptures early and replaced by a metadlerm composed of one or two layers of suberized cells. Followed by cortex region, with sclerenchyma and parenchyma. Most of the cells are rich with tannin, starch and prisms or cluster crystals of calcium oxalate.The determined characters of the gall of *Quercus infectoria* provide a hope for solutions against various ailments.

1. Introduction

Galls are abnormal outgrowths of plant tissues made by gall-inducing organisms, which included various parasitic insects and mites. The morphology of galls related with the plant types, tissue types, gall-inducing agents, and environmental factors. It can be located at almost everywhere on a plant, including roots, leaf bases, branches or leaflets of host plants (Qin *et al.,* 2019; Rocha *et al.,* 2019). Vertebrate predators, squirrels and mice, birds such as woodpeckers and chickadees made plant galls. Plant *Solidago altissima* attached by galling flies *Eurosta solidagnis* or galling moths *Gnorimoschema gallaesolidaginis.* In flower, galls produced by dipteran *Myopites stylatus* on the *Dittrichia viscosa* (*Asteraceae*) aphid *Baizongia pistaciae* induces galls on the terminal buds of the pistachio *Pistacia palaestina* (*Anacardiaceae*) (Zoltan *et al.,* 2018). *Solidago altissima* attacked by the rosette gall-midge *Rhopalomyia solidaginis*. *Diplocarpon rosae* usually induce galls on *Rosa canina*. The most abundant parasitoid species *Orthopelma* mediator, *Torymus bedeguaris*, *Glyphomerus stigma* and *Pteromalus bedeguaris*, *Torymus rubi*, *Eupelmus urozonus*, *Eupelmus vesicularis*, *Eurytoma rosae* are gall inducers (Renee *et al.,* 2018).

Mazoo (*Quercus infectoria*), one of the popular medicinal plants usedin Unani system for the treatment of astringent, hemostyptic, antiseptic, anti-diaphoresis, chronic diarrhea, epistaxis, scurvy (Allama, 2010) and other traditional medicinal system for the treatment of various ailments. This plant is a small tree or shrub about two meters high and is mainly found in Asia, Greece, and Iran.Its galls are round shaped abnormal growth found arising on the young branches of the oak tree due to the attack by an insect, *Diplolepis gallaetinctoriae* or *Cynips*

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quercufolii for depositing its egg (Nur *et al.,* 2015; Supayanget *al.,* 2008). Gall has various medicinal potentials like antfungal (Nur *et al.,* 2015), antibacterial (Dayang*et al.,* 2012; Chusri and Voravuthikunchai, 2009; Archa*et al*., 2009), Wound Healing Properties (Umachigi*et al.,* 2008), antioxidant (Gurpreet *et al.,* 2008). This study was aimed to investigate the pharmacognostical properties of the Mazoo (*Q. infectoria*) by macroscopic and microscopic studies.

2. Methodology

2.1. Authentication of plant material

Q. infectoria galls were collected from Bangalore, Karnataka (Southern India) and authenticated at Regional Research Institute (Unani), Chennai by Dr. R. Murugeswaran Research officer (Botany) Scientist-IV & HoD, Survey and Cultivation of Medicinal Plants, Regional Research Institute of Unani Medicine, Royapuram, Chennai-600 013and voucher specimen of the plant was deposited for future reference. The collected sample was dried under shade and stored at ambienttemperature until use.

2.2 Pharmacognostic study

Compound microscope, glass slides, cover slips, watch glass and other common glassware were the basic apparatus and instruments used for the study. Microphotographs were taken using a microscope attached with camera. Dried galls were taken for microscopic studies, transverse sections were prepared and stained as per standard procedure and powder microscopy was performed.

3. Results & Discussion

3.1 **Macroscopic features:** The galls globular in shape and upto 3 cm in dia, greyish brown in color, with uneven surface with pores (indicate infection) with hallow structures and inner surface is yellow and pale buff colored within tough and heavy. The surface of the upper half hole of about one mm, it may occasionally be present in the middle with showing that the insect has emerged. When cut in two halves gall shows a central cavity and in those with holes. Average weight of 50 galls picked at random, should not be less than 2.5 g, odour not specific and taste is bitter

3.2 Microscopic: The epidermis ruptures early and is replaced by a metaderm composed of one or two layers of suberized cells. Followed by cortex region, the region outside the sclerenchyma is composed of numerous layers of parenchyma, the cells of the middle and inner layers are larger, somewhat radially elongated towards the sclerenchyma, the cellulosic walls have large oval simple pits and most of the cells contain several thin irregular transparent plates of tannin. Either other cells, often in radial rows, contain prisms or cluster crystals of calcium oxalate, small vascular strands occasionally present, the sclerenchyma consist of three to five layers of lignified sclereids 85 to 100 µ without intercellular spaces. Occasionally containing cluster crystals of calcium oxalate up to 27-35 µ in diameter. The inner parenchyma within the sclereids contains rounded starch grains about 25- 34 µ in diameter. A little fixed oil and brown globular or concretionary masses, which give a red color with phloroglucin and hydrochloric acid

and known as lignin bodies or tannin masses about 20 to 40 µ.

3.3 Powder: Mixture of course and fine, with creamish-white color. It is with no characteristic odour with bitter taste; group of parenchyma cells with depositions of crystals up to 27-35 µ in diameter, starch grains up to 25-34 µ in diameter and group of stone cells up to85 to 100 µ, tannin cells, long fibres and spiral vessels are present in powder microscopy.

4. Conclusion

Macroscopic and microscopic parameters of *Q. infectoria* galls proved the presence of primary and secondary metabolites like starch and tannins, calcium oxalate crystals and secondary metabolites like steroids, triterpenes, tannins, glycosides, saponins, alkaloids, phenolic compounds, flavonoids and carbohydrates are present in *Q. infectoria* galls (Savitri *et al.,* 2014).In conclusion, galls of *Q. infectoria* have high therapeutical potential. This finding provides an awareness into the practice of the galls of *Q. infectoria*as one of the important Unani medicinal plant used in the treatment of various ailments. Further, phytochemical and pharmacological studies needed to find out the types of compounds and efficacy of the drugs in the future drug development research.

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