

Research Article

First Ever Report On Olive Leaf Nut Galls Caused By An Unidentified *Cecidomyiidaen* Spp In District Karak, Kpk, Pakistan

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ABSTRACT

Galls are outgrowths which are formed on the outer surface of different plants parts as a result of response to the infections of various parasites, from Bacteria, Fungi several other insects. They affect the plant growth by reducing the photosynthesizing area or by consuming the plant's stored food materials but at the same time they are of great interest to Biologist, Plant Pathologist. They are mostly a rich source of Tannins. Many plant species mostly oak plants have been reported for their different galls. But olive leaf galls have not yet been reported so far. This study is the first ever report on leaf galls of wild olive from Shamshukii, District Karak, KPK, Pakistan.

Keywords: wild olive, leaf galls, Shamshukii, first ever report.

1. INTRODUCTION

Galls are the pathological outgrowth on plant parts. Galls also called *Cecidia* are the hard outgrowths on the outer surface of Plants Parts /Plant tissues. They are caused by various infections, from fungi and bacteria, to insects and mites. Galls are reported from a number of species of Oak plant. *Blue galls* or *Allepo galls* are formed by an egg of small hymenopterous insect *Adleria gallaetinctoriae* Olivier on the twigs of *Querquce infectoria* Olivier (*Fagaceae*), *Morean galls* of *Q. cerris* Linn by *Cynips moreae* Graeffe. The *small crown galls* on some spp. of *Querquce* by *Cynips polycera*. *Chinense* and *Japnese galls* on *Melaphis chinensis* Bell, on the petiole of the leaf of *Rhus semialata* Murray, (*Anacardiaceae*). *Hungarian galls* are formed by *C. lignicola* on *Q. robur* Linn. *Bassurah galls* on *Q.infectoria* Olivier by *C. insana*. *English galls* on *Q. robur* Linn bmy *A. kollaria* Harting. (Wallis,2005). Krishan et al., 2011 explored new plant galls from eight different plants in the campus flora Guru Nanak College.

Mikdat et al. 2011 during investigation in 2007-2010 in Hatay Province, Turkey, reported two species of gall midges, *Dasineura oleae* (Angelini, 1831) and *Lasioptera oleicola* Skuhravá sp. new were reared from galls on leaves and shoots of *Olea europaea* L. Other plants species have been reported for galls. *Pistacia integrema* gall etc. peacan leaf galls are produced by various *Phylloxera* spp.

Literature search has shown that nut galls of wild olive (*olea ferruginea*) have not been reported so far. This is the first ever report of leaf galls of *Olea ferruginea* from Shamshukki District Karak, KPK Pakistan.

Karak is situated in the North East part of Province Khyber Pakhtunkhwa. It has semi-arid, subtropical Climate with minimum rainfall throughout the year, only frequent shower of rain in monsoons in July. Its Eastern North area is at a high elevation than its south western Part that is mostly dominated by loamy Sandy plains. This area is dominated by open forest of *acacia modesta- olea ferruginea*. The olive is the most valuable tree of the area as its wood is used for furniture making and ripened fruits are either eaten or oil is extracted and used for various purposes. During July 2008 the area was visited for its vegetation study then these galls were first noticed. According to the local peoples the olive production have been decreased as the nut galls on leaves have reduced the photosynthetic area. Nut galls are not eatable by domestic cattle, their unpalatable nature indicate their bitterness which might be due to high tannins contents. The study was aimed to report the olive galls for the first time in the world.

1.1 Olive Leaf Nut Galls

Infected Tree = *Olea ferruginea* leaf under surface (on the lower Surface)

Date of Collection = 10 April 2011

Area of collection = Shamshukki, Distt. Karak,KPK, Pakistan

Altitude and geographical location = the present study area of Shamshukki is a vast hilly area of about 14243 acre in District Karak. It is situated at a distance of 32 Km from the main city of District Karak, at an altitude of 3000-7500 feet from sea level .Its geographical location is North 33 ,0 7 minutes, 15.9 second and East 71, 24 minutes, 36.6 second(Shahida et al., 2012)

The area is famous for olea-Sanatha forest. Olive trees are distributed over the whole area and local people rely on these wild plants for their livelihood. During this study olive trees at elevation of 3000 feet were found free of any infection but trees with galls infection were appear at an elevation 3618 feet.

Fresh nut galls are visible on the under surface of olive leaves.



Various Images of nut galls on leaf of wild olive



Old galls from which fly has been escaped through minute openings as they can be seen in the photograph.



1.1.2 Description of the Galls

It was observed during the study that infected leaf lamina was darker green and coiled in such a way that the galls although present on the lower surface, directed upward towards the sunlight. Galls outer surface was shiny grayish brown, with raised openings to the cavities insides of the galls for the escape of fly .When the surface was scratched with knife green color was present below the surface layer which indicates the gall self-photosynthesizing property. Galls were round in shape, varying in size from 2mm-6mm in diameter.

When the internal structure of gall was studied it was observed that a complex small flask shaped cavities surrounded by green photosynthetic area was present .In each cavity a small white colored larvae that then metamorphosis into orange larvae later. It turns into black color pupa from which a brown, small delicate cecidomyiidean fly emerges within a week.

Galls were heavy in weight when fresh but became lighter in weight and dark brown in color when flies were escaped.

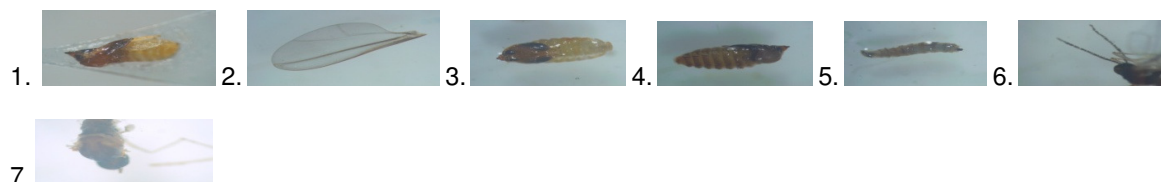
1.1.3 Fly Study

Fresh galls were kept in a glass jar and sprinkled with water to keep them moist. The jar' s mouth was tied with a piece of net cloth to prevent fly escape. With-in a week during May 2011 when temperature became warm (may be suitable for flies) then the flies started coming out from the galls through small openings in the galls. These flies were captured by making them unconscious by putting a chloroform wet cotton swab in the jar. They were then washed with alcohol to make them clean, mounted on needles and photographed though stereo microscope at the Entomology Department Agriculture University, KPK.

SEM photographs were taken in the CRL Laboratories Peshawar University. The following Characteristics of the fly were observed. It has the primitive characters of cecidomyiids

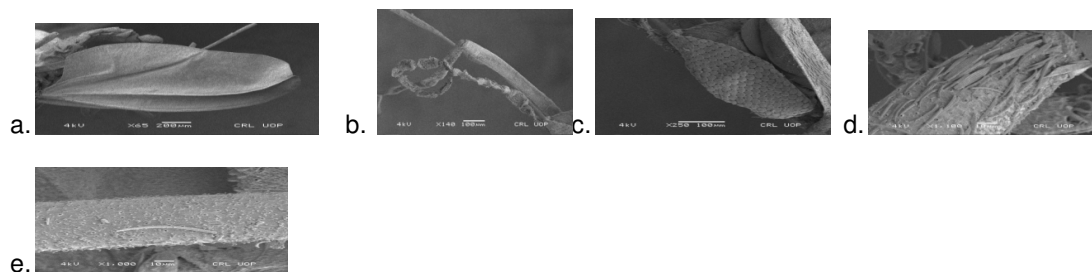
1. Flagellomeres in flagella- 12 in numbers
2. Heltares –two Heltares
3. Hairs on thorax-many stiff hairs
4. Larvea -White colour at the beginning and orange colour at latter stages
5. Pupa black brown in color

Fly photos



1. Adult fly emerging from pupa,
2. a wing of the fly,
- 3&4.pupa,
5. larvea,
6. Fly head with antennae,12 flgellomeres are also visible
7. Heltare of a fly

SEM Photographs of the Nut gall causing fly



- a. Wing,
- b. Flagellomeres,
- c. Compound eye,
- d. Bristles on legs
- e. pores in legs

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Insect Order Identification Home. Diptera--Flies, Mosquitoes, Midges, Gnats

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