

Oidium (powdery mildew: Erysiphales) Parasitic on *Mangifera indica* L (Mango) in Nepal: A Taxonomic Approach

Mahesh Kumar Adhikari

Nepal Academy of Science and Technology, Khumaltar, Lalitpur

***CORRESPONDING AUTHOR:**

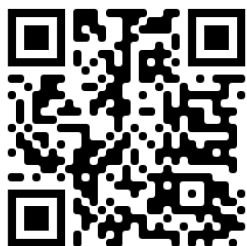
Mahesh Kumar Adhikari

Email: mahesh@mkadhikari.com.np

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ABSTRACT

Oidium species parasitic on mango leaves (*Mangifera indica* L.) was gathered from Bhanimandal, Lalitpur, Nepal. The previous studies done from Nepal has been revised based on study of recent collection, available literature and reports. It was concluded that the fungus was *Erysiphe quercicola* (S. Takam. & U. Braun.)

Keywords: Mango, *Oidium*, Nepal

1. INTRODUCTION

Mango (*Mangifera indica* L.) belongs to the family *Anacardiaceae*. It is the most common, delicious and important fruit in the world. In Nepal, it is mostly grown in tropical to subtropical region from east to west. The powdery mildew of mango, is a serious disease, affecting all cultivars in mango-growing areas of the world. The findings show that it is caused by the anamorph fungus *Oidium mangiferae* Berthet. It attacks inflorescences, leaves, and young fruits.

Khadka and Shah (1967) were first to report *Oidium mangiferae* Berthet, on *Mangifera indica*, from Shree Mahal, Kathmandu, Nepal. Later on Singh (1968) reported *Microsphaera alphitoides* Griff. & Maubl. on *Mangifera* and *Quercus* from Dhulikhel, Nepal (Adhikari 2017). No previous collections were made available for the study and the above reports do not include the detailed studies. There was confusion in proper taxonomic treatment and identification regarding the nomenclature of prevailing fungal species. Hence, this paper provides revision to the previous studies done from Nepal based on recent literature, reports and studies.

2. MATERIALS AND METHODS

Recently this *Oidium* species parasitic on mango leaves (*Mangifera indica* L.) was gathered from Dhungaadda, on the way to Thankot, Kathmandu and Bhanimandal, Lalitpur, Nepal. This seems that this disease is wide spread in Kathmandu valley. The season was between April and May of its fullbloom for its wide spread where new young leaves emerge on the trees. It was brought to the laboratory and studied under the microscope. Photographs were taken and identified through the concerned recent literature. The microscopic description given here is from the fresh material. The distribution of the fungus in the globe has also been provided below. The specimens gathered are housed in National Herbarium & Plant Lab (KATH), Godavary.

2.1 Taxonomic Treatment

The casual pathogen was found to be the asexual stage (anamorph) named as *Oidium mangiferae* Berthet. It was renamed as *Pseudoidium anacardii* (F. Noack) U. Braun & R.T.A. Cook (U. Braun & R. T. A. Cook 2012). Fig. 1 – 4.

The recent approaches involved in the study of this *Oidium* species following rDNA and ITS sequencing have concluded it to be *Erysiphe quercicola* S. Takam. & U. Braun 2007, 819 (2007) (U. Braun & R. T. A. Cook 2012: 497), the teleomorph stage of the fungus. The rest of the names *Microsphaera alphitoides*, *Erysiphe alphitoides*, *Oidium mangiferae* Berthet, *Bol. Agric. (São Paulo)* 15: 818, 1914; *Acrosporium mangiferae* (Berthet) Subram., *Hyphomycetes* (New Delhi): 834, 1971; *Oidium mangiferae* Berthet. have been turned into synonyms. *Pseudoidium anacardii* (Noack) U. Braun & R.T.A. Cook (2012) has been treated as anamorph and *Oidium anacardii* Noack, *Bol. Inst. Estado São Paulo* 9(2): 77, (1898), as basionym.

2.2 Description

The pathogen is wide spread in tropical and subtropical regions where Fagaceous and Anacardiceous plants prevail. Asia (Iran, Japan, Thailand, Nepal), Australia, Europe (France). Africa, and South America.

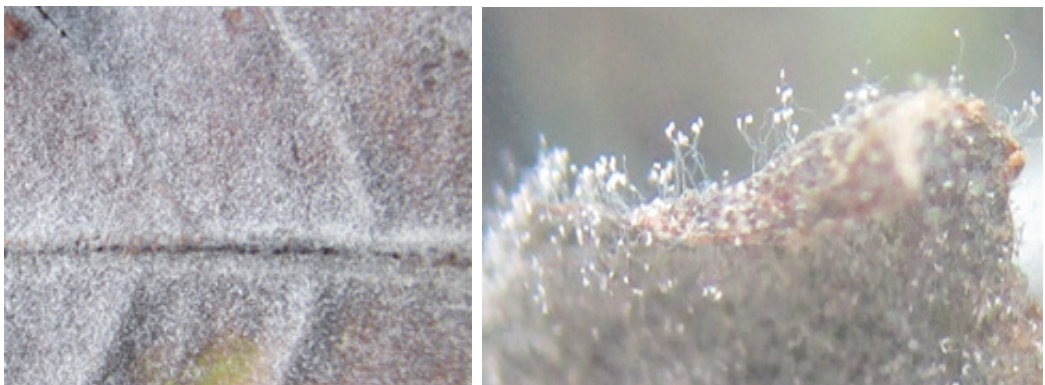
2.3 Comments

Félix-Gastélum et al (2013) reported for the first time the powdery mildew (*Pseudoidium anacardii*) of mango trees from Sinaloa, Mexico. Beenken (2017) reported *Erysiphe platani* and *E. alphitoides* on *Ailanthus altissima*, which revealed as host jumps independent of phylogeny on *Ailanthus altissima*. Marcais & Desprez-Loustau, (2014) and Nasir et al. (2014) study add that the accumulated evidence related to oak and mango powdery mildew are caused by the same species and emphasized on the need for reappraisal of literature, which up to now was considered the two diseases separately.

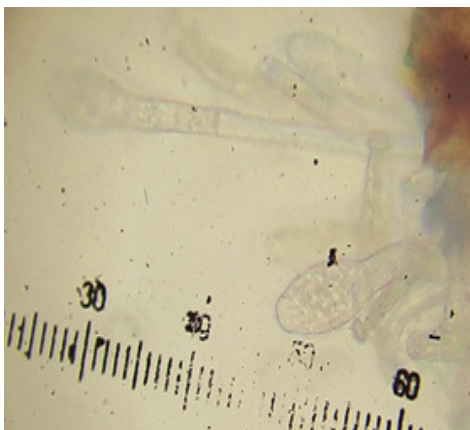
Desprez-Loustau et al (2017), in an study of European orchard, supported the conspecificity of oak and mango powdery mildew as *Erysiphe quercicola* and *Erysiphe alphitoides*. Both *E. quercicola* and *E. alphitoides* show the same characteristics while several other closely related *Erysiphe* spp. in the same clade have been strictly associated with oaks so far (Takamatsu et al. 2015; Denton et al. 2016), Hence the phylogenetic studies done suggest that *P. anacardii* is conspecific to *E. quercicola* (Limkaisang et al. 2006; Takamatsu et al. 2007 & 2015).



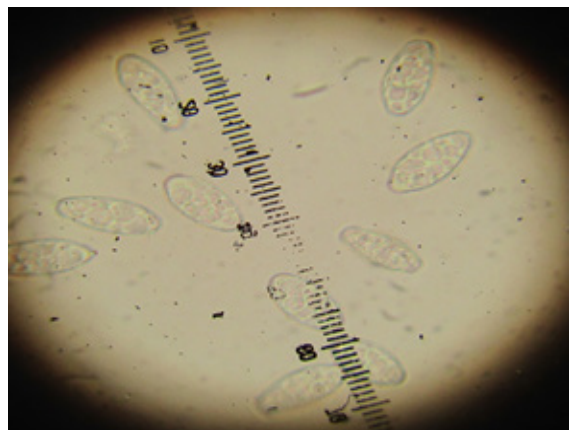
1



2



3



4

1. *Oidium* infected young leaves showing both surface (bar = 1.5cm). 2. Showing lower surface of leaf with mycelial matt and bearing conidia. 3 Hyphae with conidiophore and conidia (1= 3.5 μ m) 4. Conidia only

2.4 Control

Three methods are applied to control the infection of mango by powdery mildew. They are exclusion and eradication. The most common is the application of sulfur and copper fungicides (copper sulphate in Bordeaux mixture), which is applied prior to the flowering and after flowering. The other fungicides include Baycor, Calixin, and Bayleton. Several biological methods (such as plant extracts, antibiotics and antagonistic microorganisms) are applied now days to control mango anthracnose infection.

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