

**First Report of *Puccinia noccae* Arth. on *Lagascea mollis* Cav. from Eastern India**Malay Ghosh<sup>1</sup>, Arindam Mandal<sup>1\*</sup>, and Asit Baran De<sup>2</sup><sup>1</sup>*Department of Botany, Bejoy Narayan Mahavidyalaya, Itachuna, Hooghly - 712 147, West Bengal, India.*<sup>2</sup>*Department of Microbiology, University of Burdwan, Golapbag, Burdwan, Purba Bardhaman - 713 104, West Bengal, India.**\*Corresponding Author Email: arindammandal002@gmail.com*

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**ABSTRACT**

During the survey of plant pathogenic fungi, in the state of West Bengal, India some infected plants of *Lagascea mollis* Cav. were collected from Kalipahari, West Bengal, India. The pathogen was studied in detail and its identification was confirmed as *Puccinia noccae* Arth. based on symptoms, host, and microscopic observation. A survey of literature and also the present study confirmed that it is the first report of *Puccinia noccae* Arth. both from the state of West Bengal and the eastern part of this country.

**Keywords:** *Puccinia noccae*, *Lagascea mollis*, New report, Eastern India, West Bengal

**INTRODUCTION**

During the survey of plant pathogenic fungi from the state of West Bengal, India, some of the infected plants of *Lagascea mollis* Cav. were collected by the authors from Kalipahari (altitude 101 m), West Bengal, India in March 2021. After a thorough investigation, the pathogen was identified as *Puccinia noccae* Arth. A perusal of the literature (Butler and Bisby, 1960; Bilgrami *et al.*, 1991; Jamaluddin *et al.*, 2004; Bhanu, 2009; Patil *et al.*, 2011; Kannan, 2012; Gautam *et al.*, 2021) revealed that it is the first report of *Puccinia noccae* Arth. from West Bengal, India. The symptoms produced due to infection by this fungus and the diagnostic features of the pathogen have been presented herein based on the present collection made by the authors.

**MATERIALS AND METHODS**

The symptoms produced by the host plants were studied in detail. For studying the microscopic features of the pathogen, T.S. of the infected leaves were made, stained with cotton blue, mounted in lactophenol, and observed under a Labomed LX400 microscope. Photographs were taken using an Omax A35180U3 microscopic camera. The pathogen was determined based on the host of the pathogen, the symptoms produced due to infection of the pathogen, and the characteristic and features of the pathogen. For identification of the pathogen authentic descriptions provided by different authors (Arthur, 1905; Parmelee, 1967; Cummins, 1979; Bhanu, 2009) have been compared.

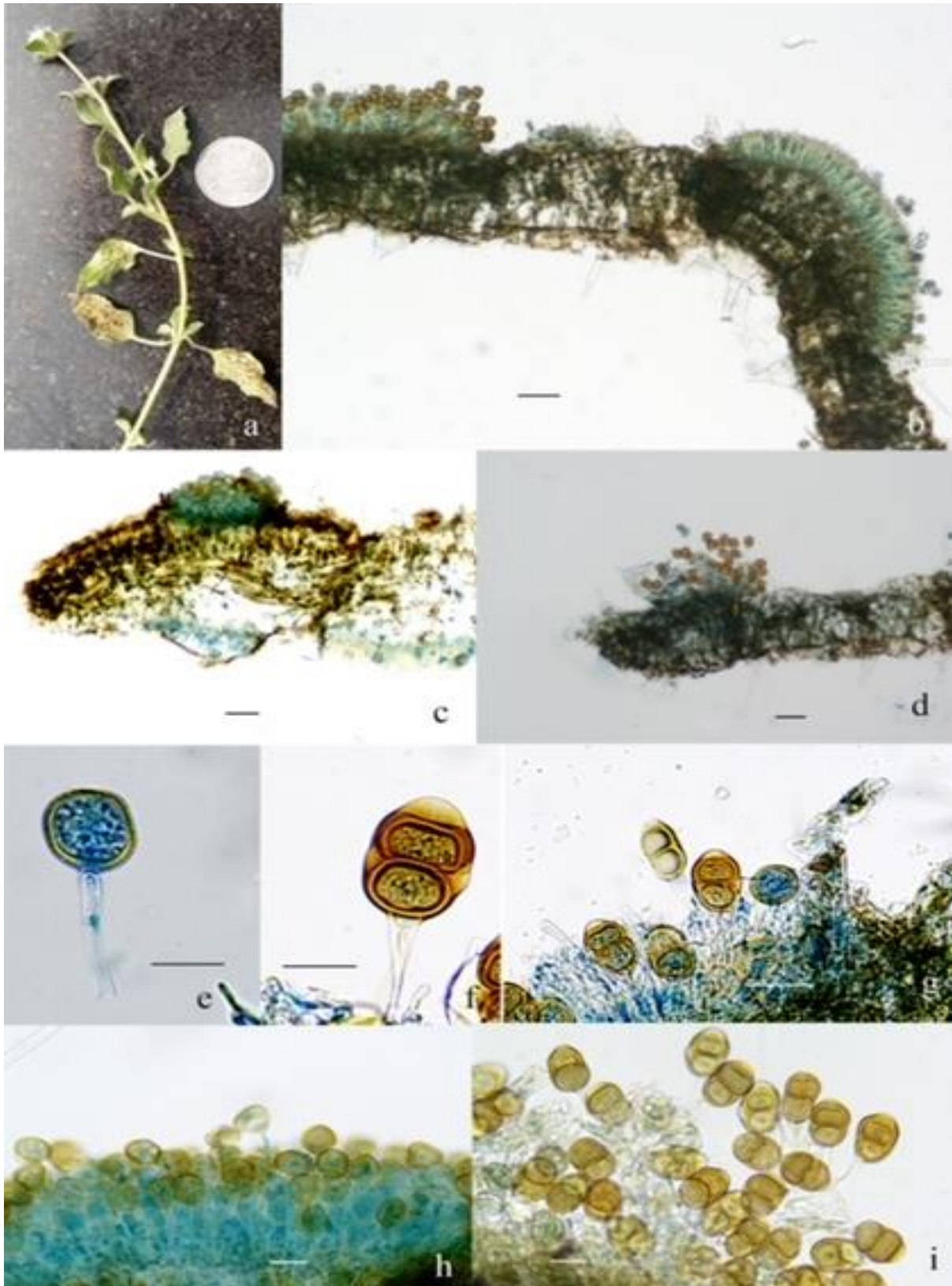
Voucher specimens have been deposited in the Central National Herbarium, BSI, Howrah, West Bengal, India.

**Specimens examined:** India, West Bengal: Paschim Bardhaman, Kalipahari (CAL, 2011).

**RESULTS**

Symptoms appeared on lamina first as greenish-yellow to pale color translucent uredinio pustule, mostly on the abaxial surface and rarely on the adaxial surface which turned into reddish-brown or cinnamon-brown at maturity releasing a powdery mass of spores. Uredosori (**Figure 1a**) circular to oval, 0.5-1.5 mm in diameter, scattered, pulverulent, some pustules which were closed to one another fused to form pustules of irregular shape. Pustules in some leaves covered the entire lamina leading to early senescence, severe defoliation, and eventual death of infected plants. Stems and flowers were not affected. Some affected mature leaves showed circular to slightly elongated, scattered, blackish, small, wart-like somewhat pulverulent teleutosorus (**Figure 1a**) in both adaxial and abaxial surfaces, some pustules fused to form pustules of irregular shape.

T.S. of infected leaves through uredosori showed reddish-brown, globose, obovoid, or cuneate uredospores (**Figures. 1b, 1c and 1h**) on the lower surface of the leaf (**Figure 1b**) or on both the surface (**Figures 1c**), 19.7-23 X 18.7-19.7  $\mu\text{m}$ , spore wall up to 2.2  $\mu\text{m}$  thick, echinulate, pores 2-3, subequatorial. Pedicel hyaline to yellowish, firm, 33-37  $\mu\text{m}$  long.



**Figure 1:** a, Infected plant of *Lagascea mollis* Cav. showing pustules on the leaves bearing uredospori, and teleutospori; b, T.S. of an infected leaf showing both uredospori and teleutospori in different sori; c, T.S. of the leaf showing uredospori on both its abaxial and adaxial surfaces; d, T.S. of leaf showing teleutosorus; e, Single uredospore with its pedicel; f, Single teleutospore with its pedicel; g, Mixed sorus bearing both uredospore and teleutospore; h, Some uredospori; i, some teleutospori. Scale bar = 20  $\mu$ m.

Teleutospores (**Figures 1d, 1f, 1g & 1i**) broadly oblong to elliptical, 33.3-40.2 X 20.0-23.6 µm, 2-celled, not constricted or slightly constricted at septum, wall smooth, dark chestnut - brown, conspicuously laminated, wall up to 4.6 (2.0-4.6) µm thick at side, up to 7.6 (4.6-7.6) µm broad and concolorous or yellowish umbo at apex, pore apical and septal. Pedicel hyaline, firm, 43-59 µm long, often broken.

#### DISCUSSION

*Lagascea mollis* Cav., the only species of the genus *Lagascea* Cav. occurring in India is parasitized so far in altogether three states of India by three species of *Puccinia* Pers. (Bhanu, 2009; Patil *et al.*, 2011; Kannan, 2012; Gautam *et al.*, 2021.). *Lagascea mollis* Cav. is parasitized by *Puccinia jabalpurensis* Bhanu in Madhya Pradesh and Telangana (Bhanu 2009; Gautam *et al.* 2021), by *Puccinia praeterimissa* Pram. in Maharashtra (Patil *et al.*, 2011) and by *Puccinia noccae* Arth. in Madhya Pradesh. So, the present study revealed that *Puccinia noccae* collected from Kalipahari constitutes its first report from the state of West Bengal as well as from the whole eastern region of India.

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#### CONFLICT OF INTEREST

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