

***SPHAEROTHECA FULIGINEA* (POWDERY MILDEW) PARASITIC ON *MACROTYLOMA UNIFLORUM* (GAHAT): A FUNGUS NEW TO NEPALESE MYCOFLORA**

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ABSTRACT

The powdery mildew (a fungus) *Sphaerotheca fuliginea* (Sch.: Fr.) Poll., parasitic on *Macrotyloma uniflorum* (Lam.) Verdc (Gahat) is recorded as new addition to Nepalese mycoflora. The description and distribution to the species is provided herewith.

Keywords: Erysiphales, *Sphaerotheca*, *Macrotyloma*, Nepal

INTRODUCTION

Till now only few authors have contributed their findings on powdery mildews from various places of Nepal (Adhikari, 2009). Notably they are Adhikari (2009, 2012), Adhikari *et al.* (1997, 2006), Bhatta (1966), Khadka & Shah (1967), Khadka *et al.* (1968), Joshi (1977), Lama (1976,1977), Manandhar & Shah, (1975), Manandhar & Shah (1975), Pandey & Adhikari (2005), Parajuli *et al.* (1999), Pawsey (1989), Singh (1968) and Singh & Nisha (1976). The check reference list of the previous reports can be seen in *Fungi of Nepal, Part 2: Mastigomycotina, Zygomycotina and Ascomycotina*. (Adhikari & Manandhar, 1997) and *Fungi of Nepal, Part 3: Deuteromycotina* (Adhikari & Manandhar, 2001).

Previously *Sphaerotheca pannosa* (Waller). Lev. on *Rosa indica* Linn. and *Rosa* sp., Putalisadak, Kathmandu (Singh,1968) and *Sphaerotheca* sp., on Rose, Kathmandu (Bhatt, 1966) have been reported from Nepal.

The present fungus is not gathered and described from Nepal. The photographs of the fungus (with host, conidiophores, conidiospores and cleistothecia) is provided below.

Description of the fungus

Sphaerotheca fuliginea (Sch.: Fr.) Poll. In *Atti. Ist. Bot. Uni. Pavia* ; Braun, *A monograph of the Erysiphales (powdery mildews)*. *Nova Hedwigia*. 89: 134, 1987.

Description - Colonies amphigenous, mostly on upper surface of leaf, effecting pods also, effused to irregular patches, thin, powdery, sometimes covering whole surface, white, cottony, infected portions turning grayish brown to black. Hyphae up to 15 x 6 µm broad, hyaline, thin walled, cylindrical, straight to curved, branched, septate, Haustoria not seen. Conidiophores up to 15 - 80 X 2 - 17.4 µm straight, cylindrical, rounded at tip, with 2 - 3 conidiogenous cells, upper cells up to 40 X 15- 18 µm, basal cells up to 50 x 17. 4 µm, thin walled, hyaline, foot cells, cylindrical, sometimes curved, hyaline, thin wall. Conidiospores 31. 9 – 50 X 8.7 – 20.3 µm, hyaline, thin walled, with 1 guttulate, ovoid, doliform to ellipsoid to cylindrical, barrel shaped

also, germinating tubes thin walled, up to 45 μm long, hyaline. Cleistothecia blackish brown, ovoid, scattered, 87 – 100 μm , cells upto 14.5 x 8.7 μm , globose to irregular, elongated. Appendages, septate, hyaline, up to 12, few to numerous, breaking readily, mycelloid, curved, up to 205 μm , long, not branched, simple, Ascus 70 – 75 μm , one, oval, hyaline, 6 spored. Ascospore 20 - 32 x 14 - 23 μm , oval to ellipsoid, smooth, brownish.

Specimen examined – Parasitic on *Macrotyloma uniflorum* (Lam.) Verdc. (Fabaceae), [Previously erroneously called *Dolichus biflorus* auct non Linn.; *Dolichus uniflora* Linn.], *Bhanimandal*, Lalitpur, no.2069.7.18, (2012,11.3), MK Adhikari.

Distribution – Australia, Europe, Asia, USSR and North America.

Comments

Macrotyloma uniflorum (Lam.) Verdc. is known as Gahat in Nepali and Horse Gram in English. The other names are Kulath, Kulthi (Hindi); Kollu (Tamil), Ulavalu (Telugu) and Galath.

Sphaerthecha fuliginea (Schl. Fr.) Poll. has been reported from Australia and New Zealand (Anon, 1965) on *Macrotyloma uniflorum* (http://www.tropicalforages.info/key/Forages/Media/Html/Macrotyloma_uniflorum.htm). Braun's report (1987) of *Sphaerotheca fuliginea* has amphigenous mycelium, conidia in chains, ellipsoid – ovoid – doliform conidia, 24 – 35 x 15 – 19 μm , conidiophores straight, foot cells 45 – 95 x 9.5 – 12 μm but it differs being reported parasitic on *Veronica* species only. The foot cell of the present species has curved cylindrical hyphae with larger ovoid to barrel shaped conidiospores. *Erysiphe glycines* Tai has ovoid, ellipsoid – dolliform to barrel shaped conidiospores and produces many asci. It has been reported parasitic on (*Glycine*, *Phaseolus*) from Asia and N. America.

The powdery mildew (*Leveillula taurica* (Lév.) G. Arnaud,) on horse gram [*Macrotyloma uniflorum* (Lam.) Verdc] was reported from southern Karnataka, India (Naik, 2000). It differs from the present specimen in the shape and sizes of conidiophores and conidiospores.

Braun's key to powdery mildews parasitic on Fabaceae species is based entirely on cleistothecial structures and its appendages. In Fabaceae many powdery mildews of the genera viz.: *Brasiliomyces*, *Erysiphe* (*E. puerariae*, *E. thermopsidis*, *E. viciae-unijugae*, *E. pisi*, *E. caulicola*, *E. cercidis*, *E. glycine*, *E. deserticola*) *Phyllactinia*, *Pleochaeta*, *Uncinula*, *Oidiopsis*, *Leveillula taurica*, and *Microsphaera* (*M. acaciae*, *M. astragali*, *M. cladrastidis*, *M. palezewskii*, *M. subtrichotoma*, *M. ludens*, *M. diffusa*, *M. longissima*, *M. pseudoacaciae*, *M. robiniae*, *M. ravenelii*, *M. rayssiae*, *M. astragali*, *M. baeumleri*, *M. trifolii*, *M. hedysari*, *M. alhagi*, *M. guaranonii*, *M. swainsoniae*, *M. coluteae* and *M. chaurdii*) are reported. None of these species match with the present species.

It's the record of new host from Nepal.

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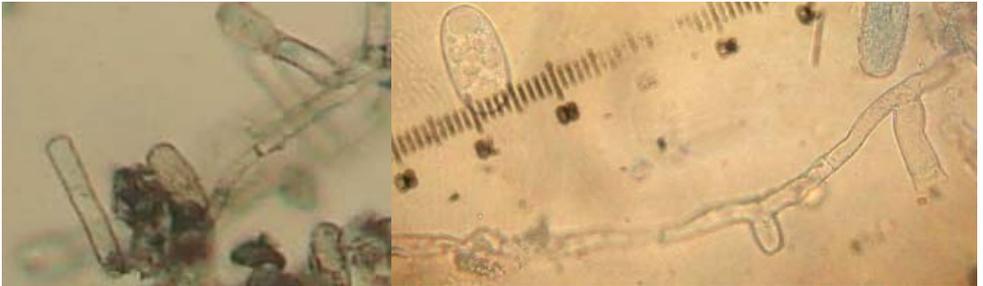
PHOTOGRAPH OF THE FUNGUS



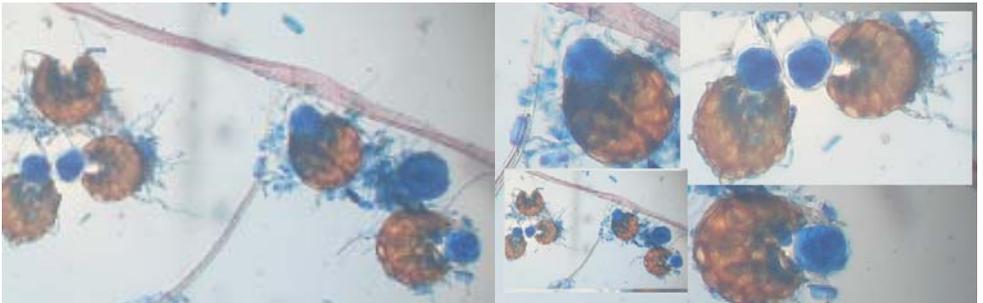
***Macrotyloma* infected with powdery mildew**



Conidiospores (10 x 40)



(Microscopic measurement 10 x 40) Hyphae, conidiophores and conidia



Cleistothecium (10 x 10)