Few Asterina black mildew foliicolous fungal species from Pakhal and Eturnagaram wild life sanctuaries of Telangana state, India

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Few Asterina black mildew foliicolous fungal species from Pakhal and Eturnagaram wild life sanctuaries of Telangana state, India

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This paper reports eight Black Mildew fungal species belonging to division Ascomycetes, class Dothideomyctes, family Asterinaceae, genera *Asterina*, namely *Asterina adeniicola*, *Asterina canthii-dicocci, Asterina capparidis, Asterina crebra, Asterina flacourtiacearum, Asterina helicteris, Asterina jambolana* which are reported for the first time from Pakhal, Eturnagaram wildlife sanctuaries of Telangana state and *Asterina combreti* which is a new record from the south India.

Key words: Black mildew, *Asterina*, new records, Pakhal, Eturnagaram wildlife sanctuaries.

INTRODUCTION

Pakhal and Eturnagaram wildlife sanctuaries are located in Eastern Ghats of south India. Both these sanctuaries are spread over in erstwhile district of Warangal, Telangana state. These sanctuaries are covered with dry and moist deciduous forests with having rich in flora and fauna, Pakhal wildlife sanctuary is spread over an area of 860 sq. kms whereas Eturnagaram wild life sanctuary is spread over an area of 806 sq. kms. During the survey of foliicolous fungi of forests of Pakhal and Eturnagaram wild life sanctuaries of Warangal district of Telangana state, eight Black mildew infected leaves such as *Adina cordifolia, Canthiumdicoccum, Capparis zeylanica, Opiliaamentacea, Scolopia crenata, Helicteresisora, Syzygiumcumini* and *Terminalia arjuna* were noticed. The different species of *Asterina* (pathogens) were isolated from infected leaves and histopathological studies were made. A detailed compilation on Asterinales of India has been made by Hosagoudar (2006, 2010, 2012) and Hosagoudar *et al* (2006).

MATERIALS AND METHODS

The leaves were carefully collected from Pakhal and Eturnagaram wild life sanctuaries, each infected leaves were collected separately in polythene bags along with the host twigs (preferably reproductive parts) to facilitate the identity of corresponding host.

These infected plant parts were pressed neatly and dried in between blotting papers. After ensuring their dryness, they were kept in the butter paper folders. Later, these folders were placed in the thick paper envelop of convenient size with collection details. For microscopic study, in the laboratory, the standard method nail polish technique.The entire colony in its natural condition was studied. A drop of high quality well transparent nail polish were applied to the selected colonies and carefully thinned with the help of a fine brush without disturbing the colonies. Colonies with hyperparasites show woolly nature and were avoided. When the nail polish on the colonies dried fully, a thin, colourless film or flip formed with the colonies firmly embedded in it. A drop of DPX will be spread on a clear slide and the flip were spread properly on it. One or two more drops of DPX again added on the flip and a clean cover glass were placed over it and a gentle pressure on the cover glass brings out the excess DPX and it was removed after drying. These slides were labelled and placed in a dust free chamber for 12 days for drying. These permanent slides were then used for further studies. Microscopic studies were carried with Scopeimageanalyzer software and

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microphotographs were taken by inbuilt CMOS camera of 1.3 megapixels. After the study of each collection, some of the materials were deposited at Department of Botany Fungal Herbarium (DBFH) Osmania University, Hyderabad, Telangana; remaining materials were deposited at Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), Palode, Kerala, India.

RESULTS AND DISCUSSION

Taxonomic descriptions

Asterina adeniicola Hosagoudar (2006); Hosagoudar *et al*. (2011) (Fig.1)

Material examined:

On living leaves of *Adina cordifolia* (Willd. ex Roxb.) (Rubiaceae), (Fig.1) collected from Pakhal forest, Pakhal wildlife sanctuary, Warangal district, Telangana State, India. Coll. By Khajamoinuddin Mohammad, Dt. 05-09-2013, DBFH No-33.

Remarks:

Asterina adeniae Hansf. is known on *Adenia lobata* from Uganda. However, *Asterina adeniicola* differs from it in having dense and crustose colonies, 3% opposite and smaller appressoria, smaller thyriothecia and shorter ascospores. The released ascospores readily germinated and formed colonies and it was firstly reported from Kerala now it is first time reported from Telangana state.

2.*Asterina canthii-dicocci* Hosagoudar (2006) (Fig.2)

Material examined:

On living leaves of *Canthium dicoccum* (Gaertn.) Teijsm & Binn. (Rubiaceae), (Fig.2) collected from Narsapur forest, Kothagudamandal, Pakhal wild life sanctuary, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt. 26-12-2013, DBFH No-35.

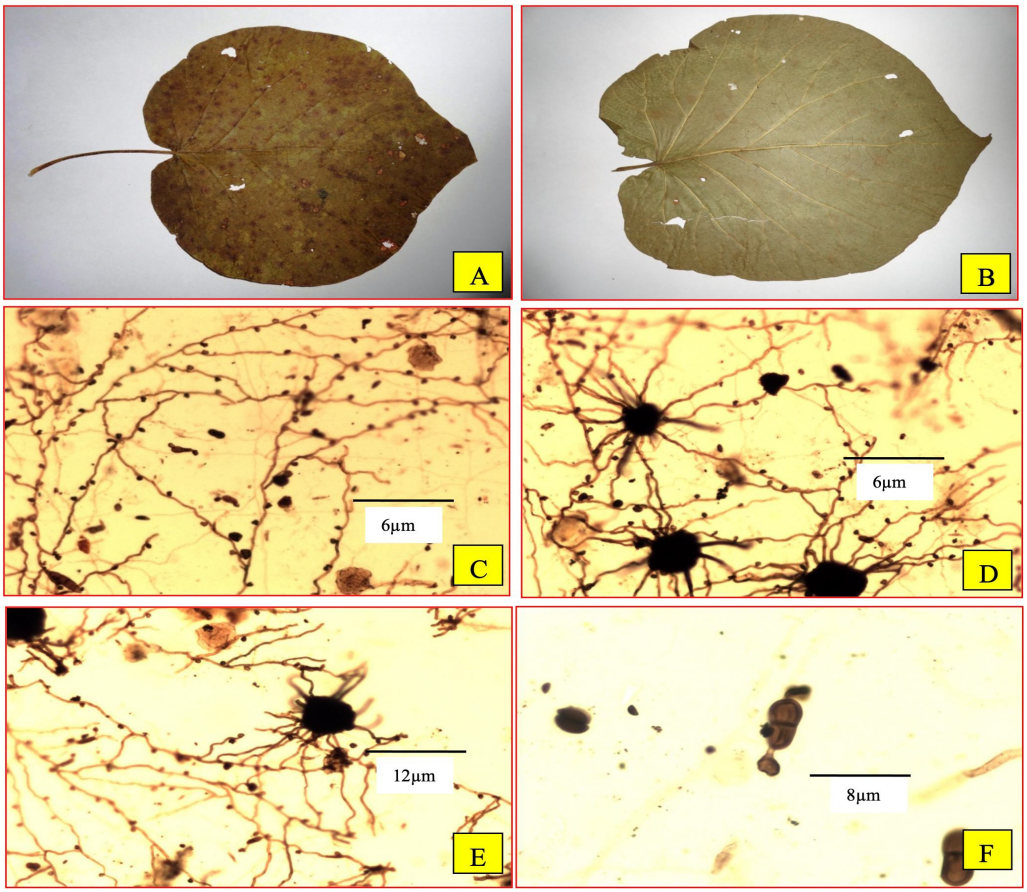

Fig.1 (A &B)- Leaves of *Adina cordifolia* infected with *Asterina adeniicola.* (C) Mycelium with Thyriothecia (D) Mycelium with appressoria (E) Thyriothecia with ascus (F) Germinating ascospores

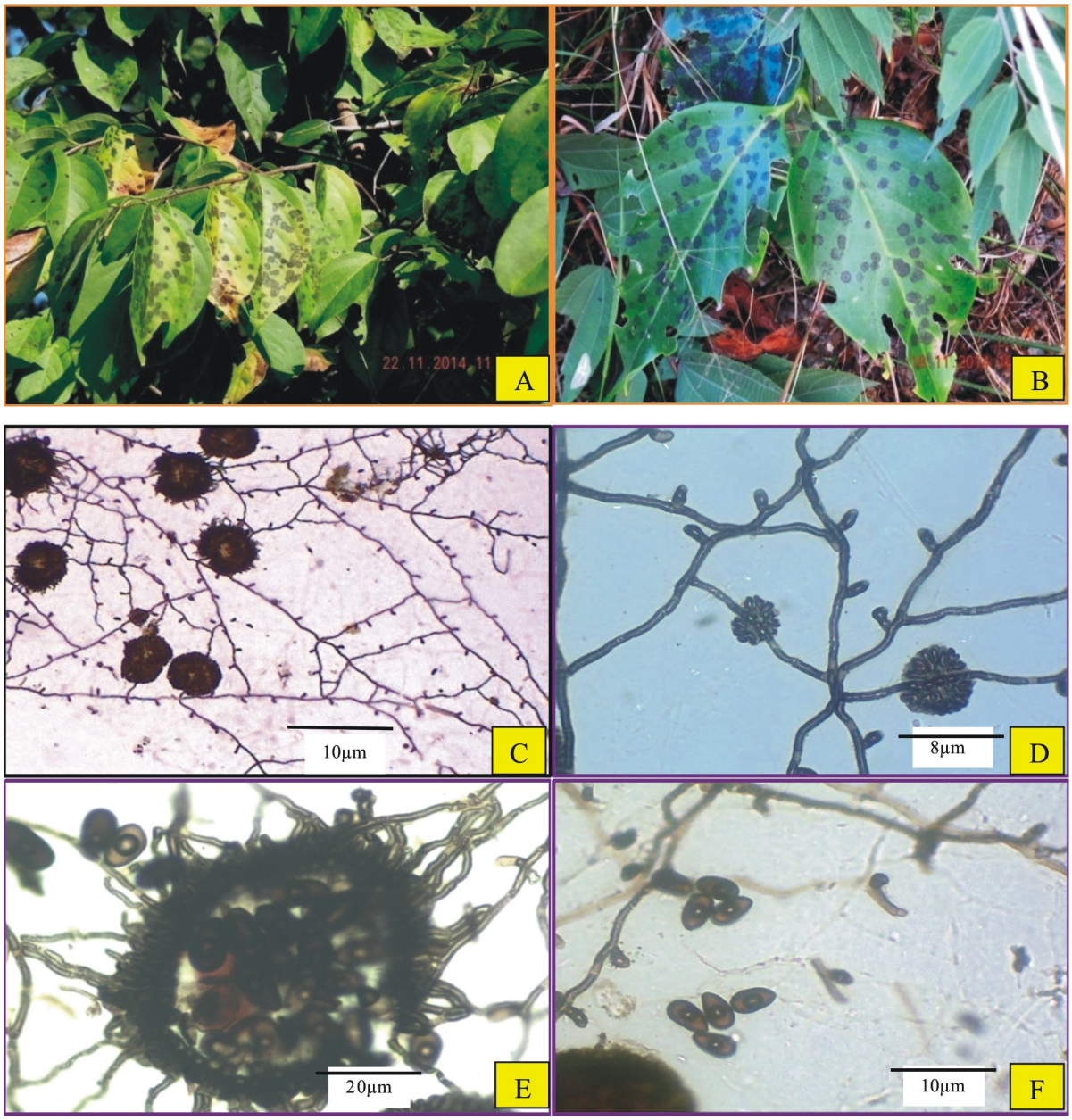

Fig.2 : A, B- Leaves of *Canthium dicoccum* infected with *Asterina canthii-dicocci*. (C, D) Mycelium with Thyriothecia (E) Thyriothecia with ascus (F) Thyriothecia releasing ascospores.

Remarks:
This fungus is known on this host genus from the Western Ghats region of Kerala and is new record here for the first time from the Telangana state.

3.*Asterina capparidis*
Sydow and Butler (1911) (Fig.3)

Material examined:

On living leaves of *Capparis zeylanica* L. (Capparidaceae), (Fig.3) collected from Komatlagudem forest, Kothaguda mandal, Pakhal wild life sanctuary, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt.26-11-2013, DBFH No-49.

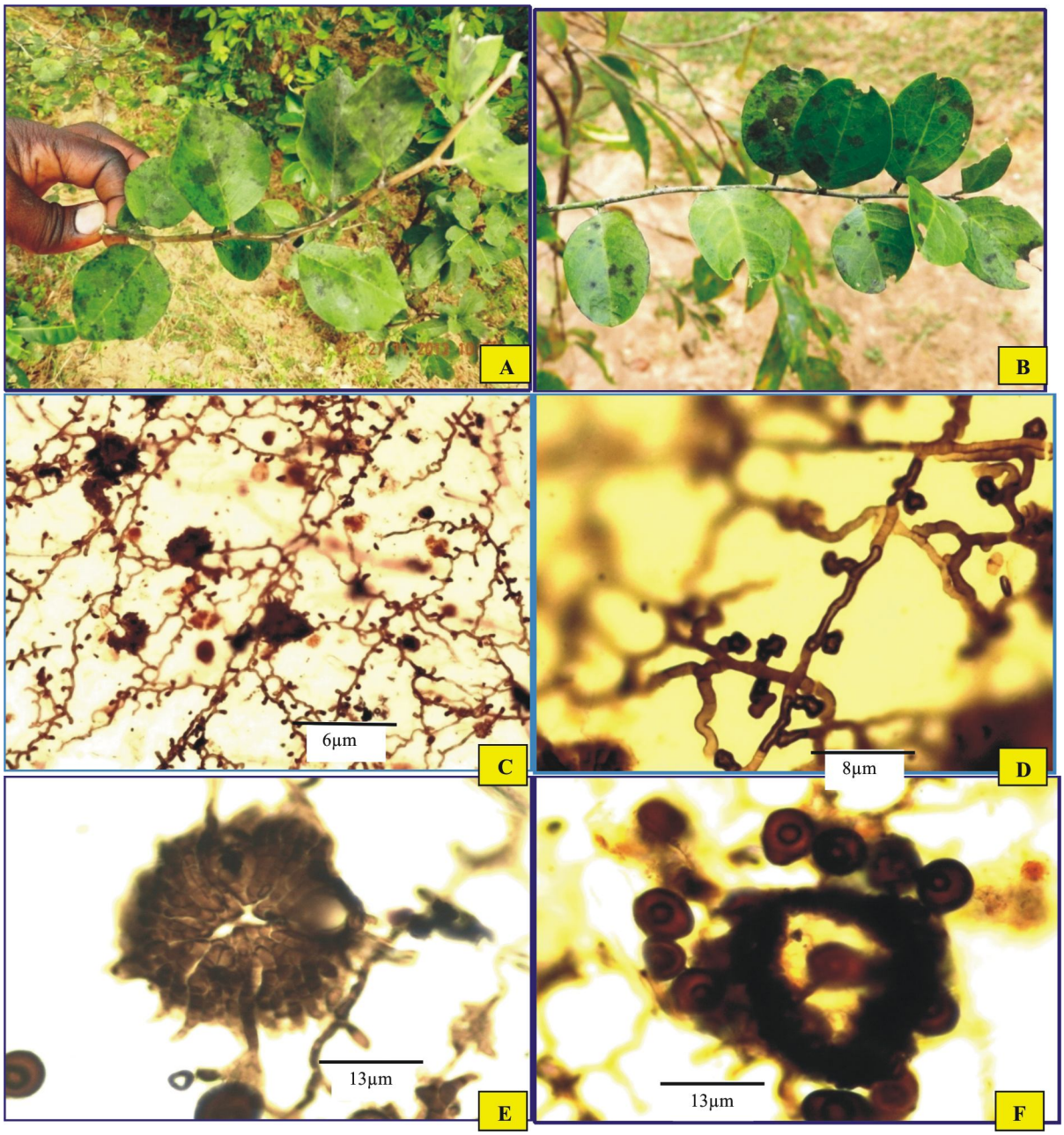

Fig. 3: (A&B)-Leaves of *Capparis zeylanica* infected with *Asterina capparidis*. (C&D) Mycelium with Thyriothecia, appressoria (E) Thyriothecia with ascus (F) Thyriothecia releasing ascospores

Remarks:

This species was collected by E. J. Butler in 1903 on *Capparis* sp. from Madras (Sydow *et al.* 1911). However, it is also reported from various states of India such as Karnataka and Uttar Pradesh. It is being reported here for the first time from the Telangana state.

4. *Asterina crebra*
Sydow (1913) (Fig.4)

Material examined:
On living leaves of *Opilia amentacea* Roxb. (Opiliaceae), (Fig.4) collected from Gunjedu forest, Kothagudamandal, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad Dt.15-Sep-2013, DBFH No-21.

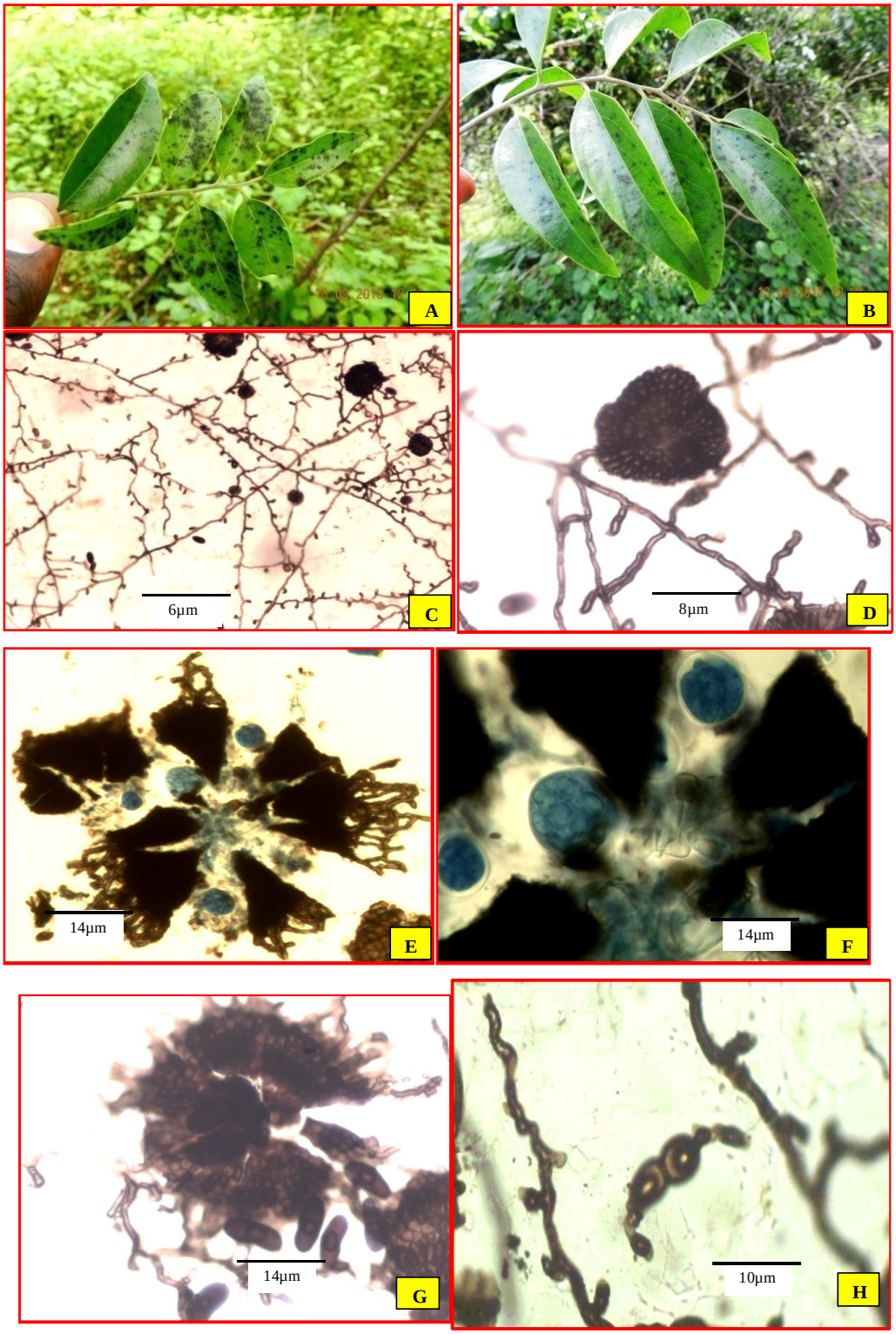

Fig.4 : (A & B) Leaves of *Opiliae amentacea* infected with*Asterina crebra*
(C&D) Mycelium with Thyriothecia (E&F) Thyriothecia with ascus (G) Thyriothecia releasing the ascospores (H) Germinating ascospore

Remarks:

This species was described by Sydow (1913) based on the collection of C.E.C. Fischer from Coimbatore, Tamil Nadu. Later its occurrence from Kerala was also recorded. The present report forms the third record of this species from India.

5.*Asterina flacourtiacearum*
Hosagoudar and Ravikumar (1996) (Fig.5)

Material examined:

On living leaves of *Scolopia crenata* (Wgiht & Arn.) D. Clox. (Flacourtiaceae), (Fig.5) collected from Gunjedu forest, Kothagudamandal, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt.19-10-2013, DBFH No-09.

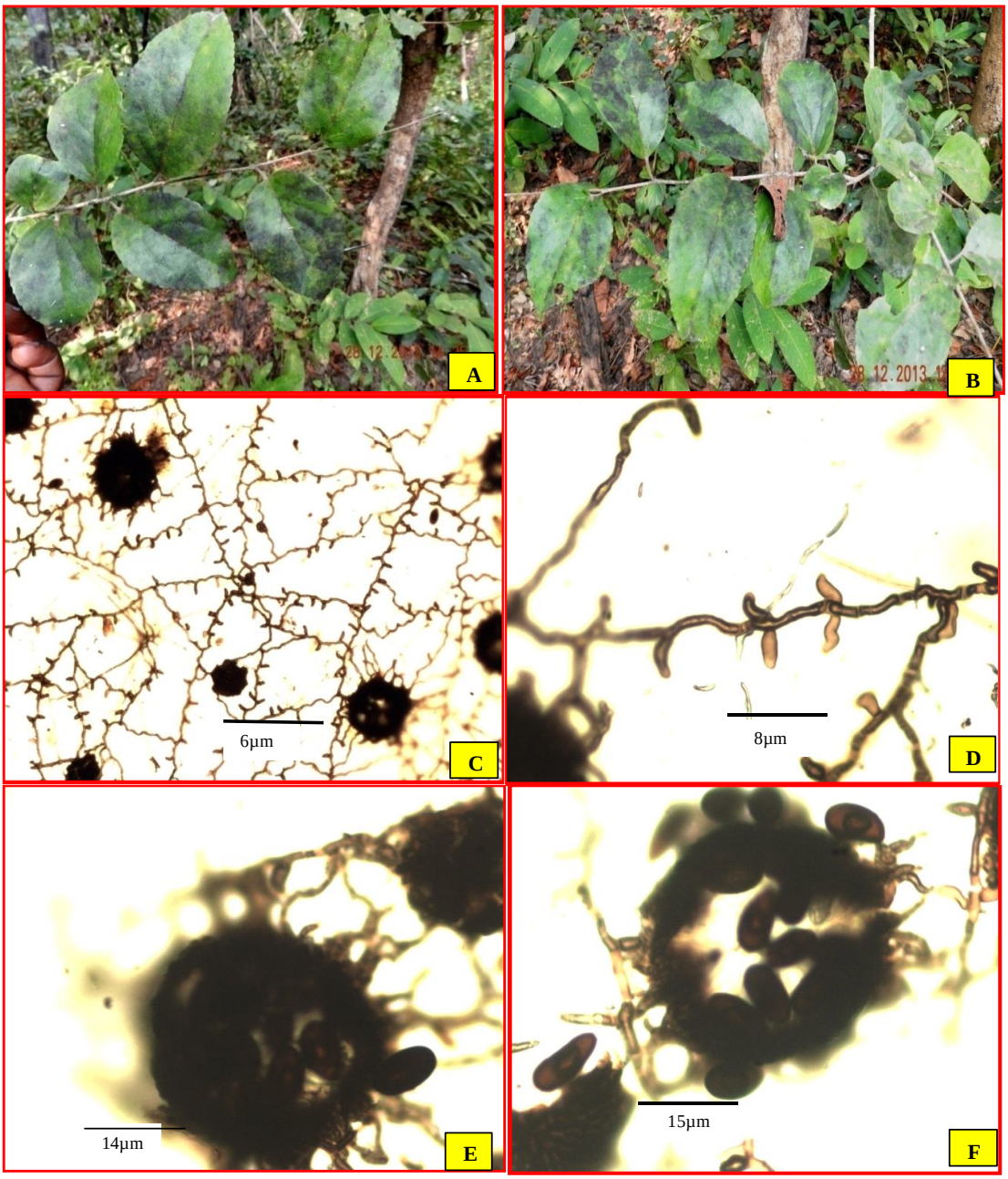

Fig. 5 : (A&B) Leaves of *Scolopia crenata* infected with*Asterina flacourtiacearum*. (C) Mycelium with Thyriothecia (D) Mycelium with appressoria (E) Thyriothecia with ascus (F) Thyriothecia releasing ascospores

Remarks:

This species has been earlier reported from Tamil Nadu and Karnataka. And it is new rerecordhere for the first time from Telangana state.

6. *Asterina helicteris*
Ouyang, Song & Hu (1996) (Fig.6)

On living leaves of *Helicteresisora* L. (Sterculiaceae), (Fig.6) collected fromThupakulagudem forest, Eturnagarammandal, Eturnagaram wild life sanctuary, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt. 19-10-2013, DBFH No-55.

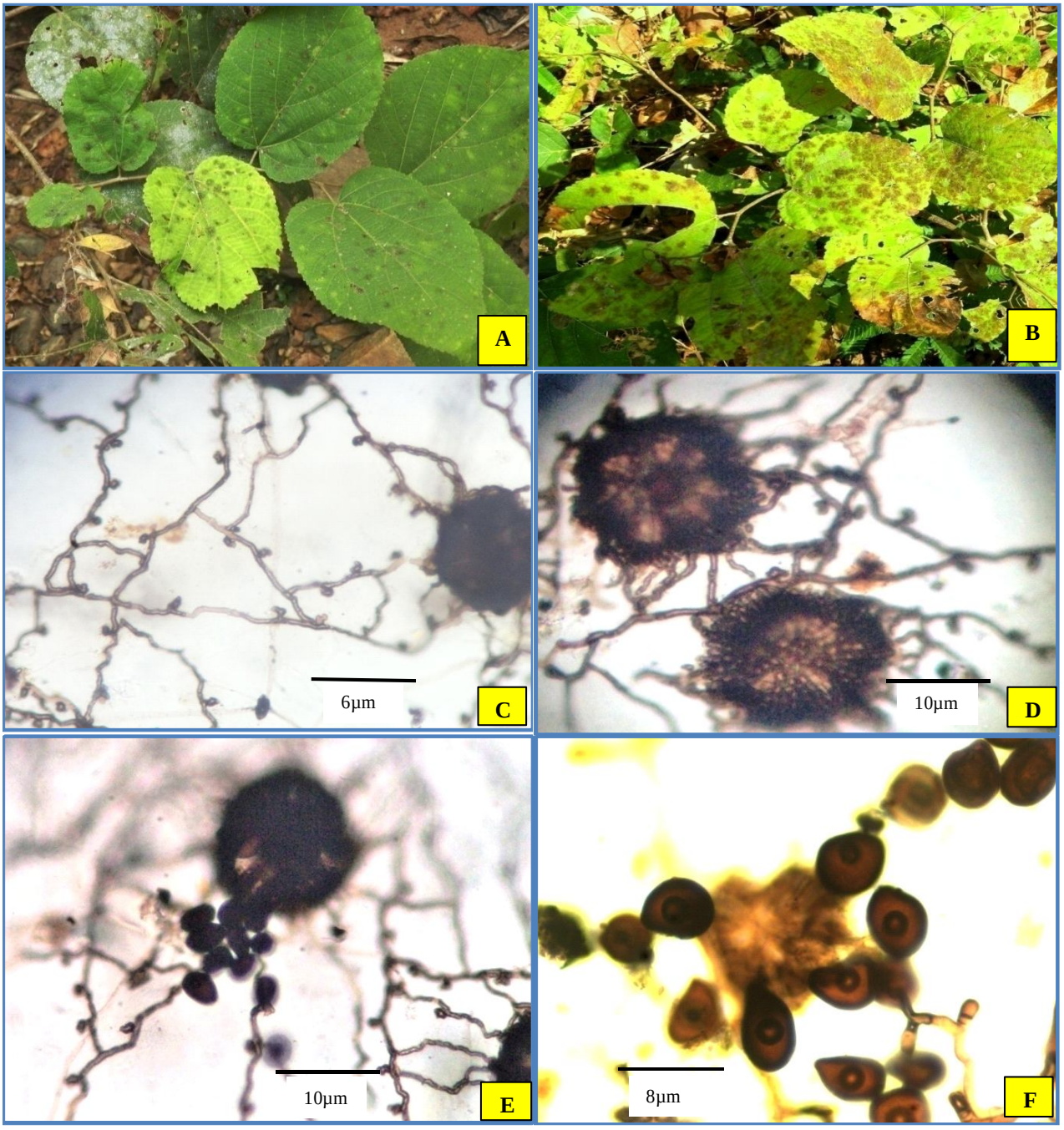

Fig.6 (A& B) Leaves of *Helicteres isora* infected with *Asterina helicteris*. (C&D) Mycelium with Thyriothecia (E) Thyriothecia with ascus (F) Thyriothecia releasing ascospores

Remarks:

This species was known from Tamil Nadu and Kerala. And it is reported here for the first time from Telangana state.

7. *Asterina jambolana*
Kar & Maity (1970) (Fig.7)

Material examined:

On living leaves of *Syzygium cumini* (L.) Skeels. (Myrtaceae), (Fig.7) collected from Pandem forest, Kothagudamandal, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt. 19-10-2012, DBFH No-48.

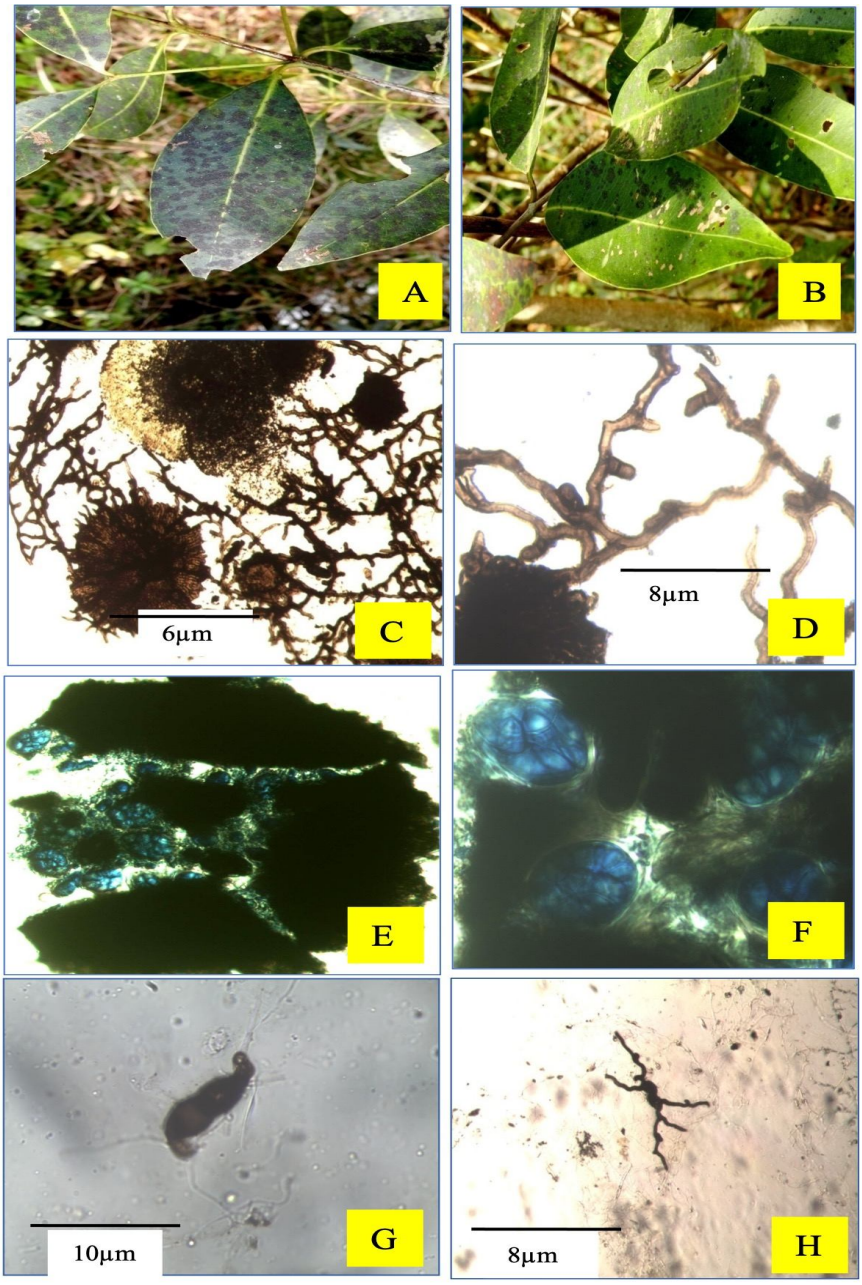

Fig.7. (A&B) Leaves of *Syzygium cumini* infected with *Asterina jambolana*. (C&D) Mycelium with Thyriothecia (E) Thyriothecia with ascus (F) Thyriothecia releasing ascospores (G&H) Germinating ascospores

Remarks:

This species was known from various states in India such as Karnataka, Kerala, Tamil Nadu and West Bengal.It is reported here for the first time from Telangana state.

8.*Asterina combreti* Sydow (1910) (Fig.8)

Material examined:

On living leaves of *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn, (Combretaceae), (Fig.8) collected fromThupakulagudem forest, Eturnagarammandal, Eturnagaram wild life sanctuary, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt. 28-DEC-2013, DBFH No-19.

On living leaves of *Combretum ovalifolium*Roxb. (Combretaceae), Gunjedu forest, Kothagudam-andal, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, dt.11-Sep-2013, DBFH-29, this species is dfferent from other Asterina species viz., *Asterina combreti* (Sydow). In having presence of colonies on both surfaces and appressoria are unicellular. In India this pathogen has been reported from West Bengal only. For the first time this is being reported from south India.

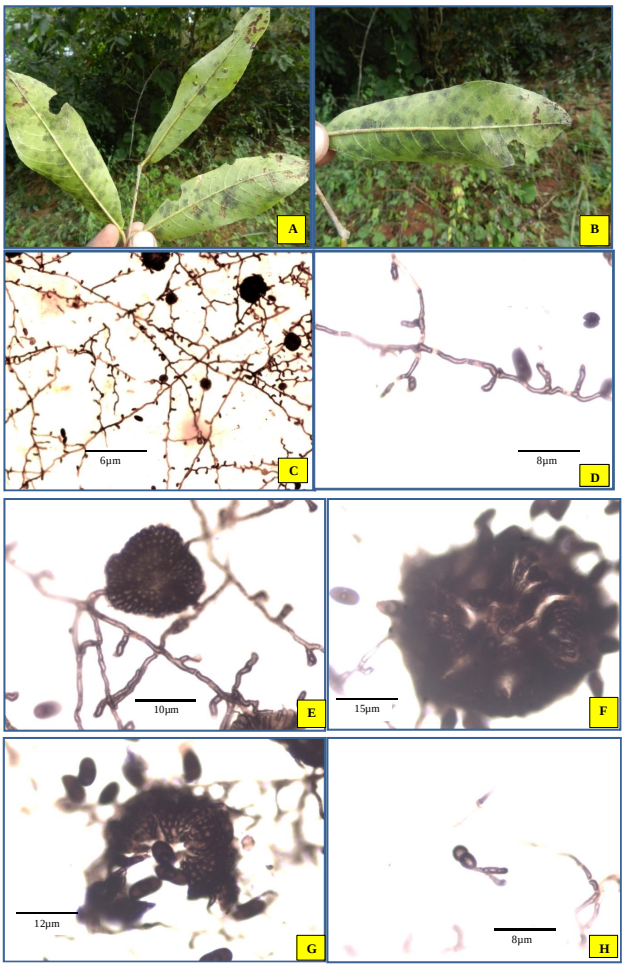

Fig.8. (A&B)Leaves of *Terminalia arjuna* infected with *Asterina combreti.*
(C) Mycelium with Thyriothecia (D) Mycelium with Appressoria (E)Thyriothecia.
(F&G)Thyriothecia releasing ascospores(H) Germinating ascospore

On living leaves of *Terminalia alata* (Roxb. ex DC.) (Combretaceae), Eturnagaram wildlife sanctuary forest, Warangal district, Telangana state, India. Coll. By Khajamoinuddin Mohammad, Dt.27-12-2013, DBFH No-15.

Remarks

This species was reported earlier from West Bengal and in Kerala on *Combretum ovalifolium*and *Calycopteris floribunda, Terminalia arjuna, Terminalia alata*.

In India *Asterinacombreti*has been reported on living leaves of *Combretum ovalifolium*. This pathogen has been reported from West Bengal only. For the first time this is being reported from south India.

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