J. Mycopathol. Res. ***52(1)*** *: 153-154, 2014;* (ISSN 0971-3719)

SHORT COMMUNICATION

First report of *Cephaliophora irregularis* associated with the deterioration of *Jatropha curcas* L. seeds

SWETA SRIVASTAVA[1], RAVINDRA KUMAR[2], GORAKH NATH GUPTA[3], VINIT PRATAP SINGH[4] AND ASHA SINHA[1]

[1]*Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 221 005, Uttar Pradesh.*

[2]*Indian Agricultural Research Institute, Regional Station, Karnal 132 001, Haryana.*

[3]*Department of Biochemistry, JSBB, Sam Higginbottom Institute of Agriculture Technology and Sciences, Allahabad 222 007, U.P..*

[4]*Department of Plant Pathology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut 250 110 (U.P.).*

Received : 23.09.2013 Accepted : 27.02.2014 Published : 28.04.2014

A new disease causing deterioration of *Jatropha curcus* L. caused by *Cephaliophora irregularis* was reported for the first time.

Key words: Biodiesel, *Cephaliophora irregularis*, deterioration, Physic nut.

The oil plant *Jatropha curcas* L. grows in tropical and subtropical climate across the developing world (Openshaw, 2000; Kumar *et al.* 2009) and contains 20-40% oil. It is a high oil yielding crop grown around the world for biodiesel production. *J. curcas* can grow well under adverse climatic conditions because of its low moisture demands, low nutrients requirements and tolerance to high temperatures (Kaushik *et al.* 2007; Michael, 2008). Due to diminishing petroleum reserves and the environmental consequences, biodiesel has become a potential alternative energy fuel (Zurina, 2009).

Numerous examples exist in agriculture literature for the international spread of plant diseases as a result of the seeds infected or contaminated with pathogens (Agarwal and Sinclair 1997). Some of the seed-borne fungi are very destructive as they reduce seeds germination and also cause pre and post germination mortality of plants (Bolkan *et al.*, 1975; Elarosi, 1993) in different host species.

*E-mail- shalu.bhu2008@gmail.com

Dharmaputra *et al.* (2009) have reported some irreversible degenerative changes in the quality of *Jatropha* seeds during storage, thus making the seed unfit for oil extraction, export purpose or sowing.

Cephaliophora irregularis Thaxter is a human pathogenic fungus which causes mycotic keratitis reported in a 55 years old female in India (Mathews and Kuriakose, 1995). In the present study it was found to cause deterioration of *Jatropha curcas* seeds during storage.

Seed samples of *Jatropha curcas* L. was collected from Varanasi district during October, 2008 to September, 2009 were used for the isolation and identification of seed-borne fungi. The fungus was isolated in the laboratory of Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. Agar plate method (Muskett, 1948) and Blotter method (De Tempe, 1953) recommended by International Seed Testing Association (Anonymous, 1966) were used for the isolation of this fungus. Plates

were incubated for 7 days at 25±2 C under 12 h alternating cycles of light and darkness and, fungi developed on each seed were examined under different magnifications of a stereomicroscope and identified. Both surface sterilized (0.1% mercuric chloride ($HgCl_2$) solution for1min.) and unsterilized seeds were taken for isolation of fungi.

This fungus was pure cultured on sterile Potato Dextrose Agar (PDA) and incubated for 7 days at 25±2 C. On the basis of morphological and cultural characteristics the fungus was identified as *Cephaliophora irregularis* Thaxter and the culture had been deposited to Indian Type Culture Collection (ITCC), New Delhi as ITCC No.6581.

Colonies growing rapidly on potato dextrose agar (PDA) medium, exhibited floccose, white to cream-coloured colony (Fig. 1a). Hyphae hyaline, 2.5-7.0 µm diameter. Conidiophores straight or flexuose, pale brown, up to 110 µm long. Conidia borne in heads on the inflated tips of conidiophores, arising synchronously next to each other, pyriform or obtriangular, smooth-walled, pedicellate, pale brown, 1-2-septate, 21-36 x 12-25 µm (Fig. 1b).

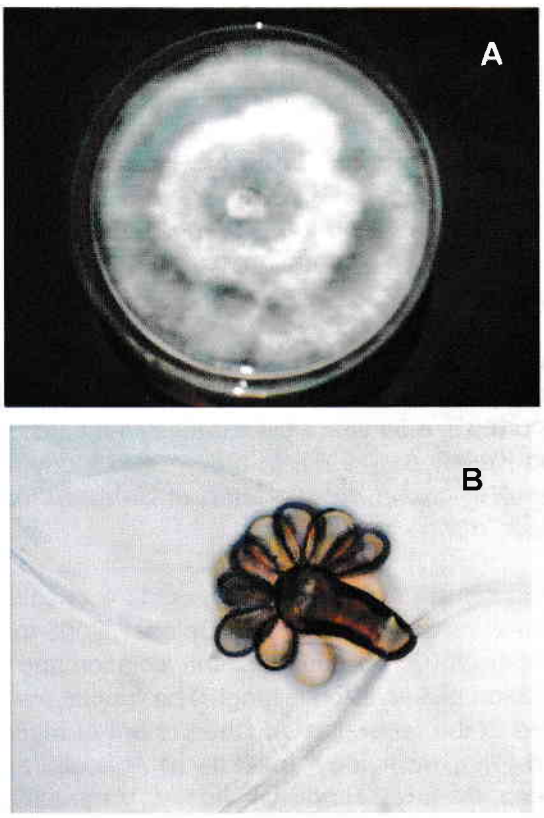

Fig. 1 : a = Colony of *Cephaliophora irregularis* Thaxter on PDA; b = Conidia of *Cephaliophora irregularis* Thaxter.

The pathogenicity of *C. irregularis* was established in the laboratory by inoculating apparently healthy and fresh seeds of *J. curcas*. Ten seeds and ten kernels were surface sterilized by 0.1% $HgCl_2$ solution and wounded with a glass rod, and 20 µl conidial suspensions of *C. irregularis* was applied to these wounds under a laminar flow hood. Similarly, control seeds and kernels were wounded and inoculated with 20 µl of sterile distilled water. All inoculated and non-inoculated seeds and kernels of *J. curcas* were incubated at 25±1°C for 7 to 10 days. Koch's postulates were confirmed when the same fungus was reisolated from all inoculated seeds and kernels that developed symptoms similar to deteriorated stored seeds of *J. curcas.*

This is the first report of *Cephaliophora irregularis* Thaxter causing deterioration of *Jatropha curcas* L. seeds.

ACKNOWLEDGEMENTS

Authors are thankful to Indian Council of Agricultural Research for the financial support. Thanks are also due to ITCC, IARI, New Delhi for Identification, maintenance and providing the accession number of this fungus.

REFERENCES

Agarwal, V.K. and Sinclair, J.B. 1997. *Principles of Seed Pathology* (2nd ed.) CRC Press, U.S.A.

Anonymous. 1966. International rules for seed testing, 1966. *Pro Int Seed Test Assoc* **31:** 1-152.

Bolkan, H.A., De Silva, A.R. and Cupertino, F.P. 1976. Fungi associated with soybean and been seeds and their control in central Brazil. *Pl Dis Reptr* **60:** 545-548.

De Tempe, J. 1953. The blotter method of seed health testing. *Proc Int Seed Test Assoc* **21:** 133-151.

Dharamputra, O.S., Worang, R.L., Syarief, R. and Miftahudin. 2009. The quality of physic nut (*Jatropha curcas*) seeds affected by water activity and duration of storage. *Microbiol* **3:** 139-145.

Elarosi, H. 1993. Diseases of vegetables. New Publishing House, Alexandria.

Kaushik, N., Kumar, S., Kaushik, N. and Roys, S. 2007. Genetic variabiality and divergence studies in seed traits and oil content of *Jatropha* (*Jatropha curcas* L.) accessions. *Biomass and Bioenergy* **31:** 497-502.

Kumar, R., Sinha, A., Singh, S.R. and Kamil, D. 2009. Incidence of a leaf spot disease in *Jatropha curcas* from Eastern Uttar Pradesh. *J Mycol Pl Pathol* **39:** 536-538.

Mathews, M.S. and Kuriakose, T. 1995. Keratitis due to *Cephaliophora irregularis* Thaxter. *J Med Vet Mycol* **33:** 359-360.

Michael, W. 2008. "Biodiesel produced from *Jatropha* seed oil", p. 480.

Muskett, A.E. 1948. Technique for the examination of seed for the presence of seedborne fungi. *Trans Br Mycol Soc* **30:** 74-83.

Openshaw, K. 2000. A review of *Jatropha curcas*: An oil plant of unfulfilled promise. *Biomass and Bioenergy* **19:** 1-15.

Zurina, Z.A. 2009. "Extraction of oil from *Jatropha* seed-optimization and kinetics". *Am J Appl Sci* **6:** 1390-1395.