

Three New Species of *Drechslera* from India

A. P. MISRA

Rajendra Agricultural University, Dholi, Muzaffarpur (Bihar), India

and R. A. SINGH

ICAR Research Complex for Lakshadweep, Minicoy-6735559, India

Abstract. The present paper deals with the description of three new species of *Drechslera*, viz., *D. eragrostiellae* sp. nov. on *Eragrostiella bifaria* (VAHL) BOR., *D. cymmartinii* sp. nov. on *Cymbopogon martinii* (ROXT.) WATS. and *D. triticigrani* sp. nov. on *Triticum aestivum* L.

Description of species

1. *Drechslera eragrostiellae* MISRA & SINGH sp. n.

Fig. 1, 2

Conidiophora pallido-fuliginea vel atro-olivacea, singulares vel 2—5 fasciculata, emergentia, ramosa, geniculata, 40—56—174—72 × 4.68—7.80 μm (med. 117.62 × 6.55 μm), 2—11 (med. 7.20) septata; septa 15.60—34.32 μm inter se separata. Conidia numerosa, conidiophoris geniculatis et profuse ramosis portata, recta vel sigmoide curvata, ad utramque rotundatam extremitatem angustata, luteo-brunnea vel olivaceo-brunnea, 15.60—87.36 × 9.36—14.04 μm (med. 52.23 × 11.51 μm), 1—6 (med. 3.68) septata, cellula circa 11.16 μm longa, hilo inconspicuo instructa, germinatio uni- et bipolaris. Ad *Eragrostiellam* bifariam. India. Typus IMI 155931.

The fungus attacks the inflorescence, leaf blade and leaf sheath particularly the inflorescence which is covered with black, compact mass of fungal growth and gives a smutted appearance (scooty heads, fig. 1). There is no seed formation in heavily infected ear heads.

Conidiophores light fuliginous to dark olive, emerging singly or in fascicles of 2—5, occasionally more, branched, geniculate, 40.56—174.72 × 4.68—7.80 μm (av. 117.62 × 6.55 μm), 2—11 (av. 7.20) septate, septa 15.60—34.32 μm apart.

Conidia (fig. 2) borne on profusely ramifying geniculated conidiophores in large numbers, straight or sigmoidly curved, tapering towards both the rounded ends, yellowish brown or olive brown, 15.60—87.36 × 9.36—14.04 μm (av. 52.23 × 11.51 μm), 1—6 (av. 3.68) septate with average cell length 11.16 μm, hilum inconspicuous, germination both uni- and bipolar.

In culture on PDA, the fungus grows well attaining 95.66 mm colony diameter on the 8th day at 28° C., aerial mycelium abundant, dirty white in colour, colony circular, zonation and saltation absent.

On living leaves and inflorescence of *Eragrostiella bifaria* (VAHL) BOR., collected at the Indian Grassland and Fodder Research Institute,

Jhansi, U. P., India, 9 th October 1970, leg. R. A. SINGH. The holotype (IMI 155931) has been deposited in CMI, Kew, Surrey, England.

The fungus has been recorded for the first time on *E. bifaria* (VAHL) BOR. On comparison with all known species of *Helminthosporium* it resembles *H. ravenelli* (DRECHSLER, 1923) but differs from it in having narrower conidia. It is also close to *H. miyakei* (NISIKADO 1929), however, it can be distinguished from it in having straight or sigmoidly curved, smaller conidia with less septa. The specimen was also examined by Dr. ELLIS of CMI and he stated that "I agree this probably represents an undescribed species." It is, therefore, described here as a new species and designated as *D. eragrostiellae* after the name of the host *Eragrostiella bifaria*.

2. *Drechslera cymmartinii* MISRA & SINGH sp. n.

Fig. 3

Conidiophora aureo-brunnea atro-brunnea, singulares vel 2—5 fasciculata (plerumque 2—3), per stomata vel inter cellulas epidermales emergentia, geniculata, 37.44—118.56 × 4.68—6.24 μm (med. 76.44 × 5.46 μm), 3—9 (med. 6.30) septata, septa 15.60—34.32 μm inter se separata. Conidia typice recta, raro lateraliter leviter curvata, plus minusve symmetrica, ad basin tamen in pluribus conidiis angustata, pallido-fuliginea usque ad pallidobrunnea, 5—15 fasciculata, 15.60—49.92 × 6.24—10.92 μm (med. 35.63 × 8.49 μm), 2—9 (med. 5.46) septata, cellula circa 5.50 μm longa, hilo inconspicuo instructa, germinatio uni et bi-polaris. Ad *Cymbogonem martinii*. India. Typus IMI 155932.

Reddish brown spots varying from 2—6 × 1—2 mm in size are irregularly distributed over the leaf lamina. The symptoms are also observed on glumes, where the fungus forms marginal stripes. In advanced stages several spots coalesce and result in complete drying of the leaves starting from the tip and progressing towards the base.

Conidiophores golden brown to dark brown, emerging solitary or in fascicles of 2—5 (mostly 2—3), through stomata or between epidermal cells, geniculate, 37.44—118.56 × 4.68—6.24 μm (av. 76.44 × 5.46 μm), 3—9 (av. 6.30) septate with septa 15.60—34.32 μm apart.

Conidia (fig. 3) typically straight, rarely slightly curved to one side, more or less symmetrical but much narrowed towards the basal portion in most of the conidia, light fuliginous to light brown, borne in clusters of 5—15 or occasionally more, 15.60—49.92 × 6.24—10.92 μm (av. 35.63 × 8.49 μm), 2—9 (av. 5.46) septate with average cell length 5.50 μm, hilum inconspicuous, germination both uni- and bipolar.

In culture on PDA, the fungus grows well attaining 87.33 mm diameter of the colony on the 8th day at 28° C, aerial mycelium moderate, olive gray (10Y3/1) in colour, colony circular with zonation and saltation.

On living leaves of *Cymbopogon martinii* (ROXB.) WATS. collected at the Soil Conservation Research Station, Rehmankhera, U. P.,

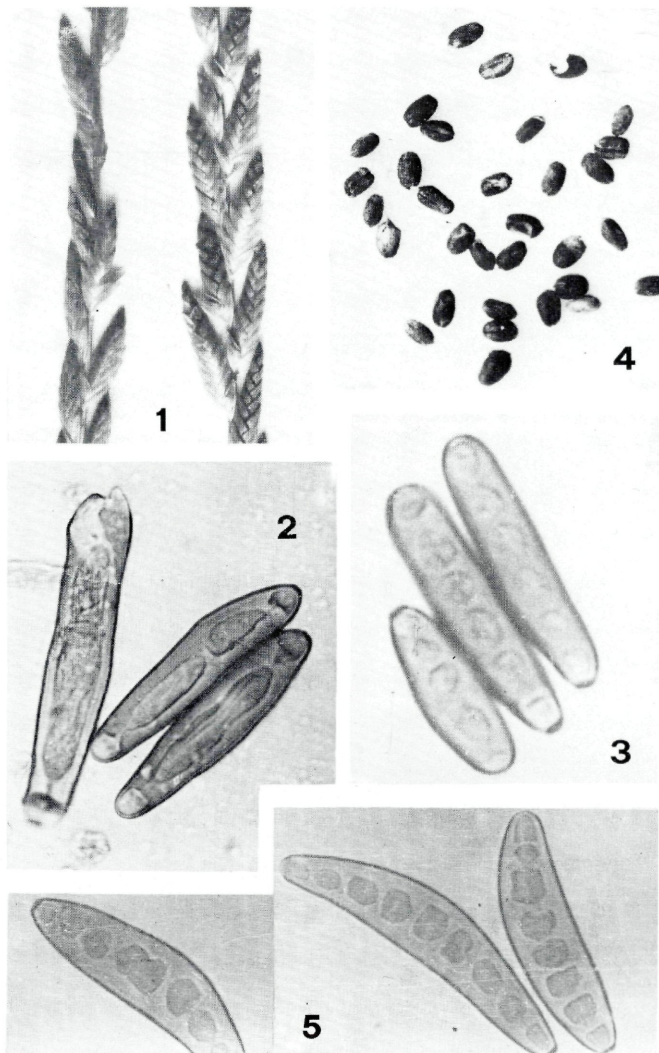


Fig. 1, 2. *Drechslera eragrostiellae* MISRA & SINGH (type). — 1. Symptoms on *Eragrostiella bifaria* caused by *D. eragrostiellae*. — 2. Conidia ($\times 700$)
 Fig. 3. *Drechslera cymmartinii* MISRA & SINGH (type). — 3. Conidia ($\times 700$)
 Fig. 4, 5. *Drechslera triticigrani* MISRA & SINGH (type). — 4. Diseased wheat kernels (*Triticum aestivum*) — 5. Conidia ($\times 900$).

India, 17th October 1969, leg. R. A. SINGH. The holotype (IMI 155932) has been deposited in CMI, Kew, Surrey, England.

The present species differs from *Helminthosporium* species described so far on *Cymbopogon* spp. and other hosts in the conidial morphology. It appears to be closely related with *H. brizae* (NISIKADO, 1929) and *H. hawaiiense* (BUGNICOURT, 1955) but differs from the former in having shorter and narrower conidia and the latter in having longer conidia with more septa. Thus it has been identified as a new species and designated as *D. cymmartinii* after the name of the host *Cymbopogon martinii*. The identity of the fungus as a new species has also been confirmed at the CMI, Kew, England.

3. *Drechslera triticigrani* MISRA & SINGH sp. n.

Fig. 4, 5

Conidiophora simplices, solitaria vel 2–4 fasciculata, emergentia, atro-brunnea vel olivacea, geniculata, 1–9 conidia instructa. Conidia suballantoidea, $96.72-255.84 \times 6.24-7.80 \mu\text{m}$ (med. $183.45 \times 6.86 \mu\text{m}$), 6–11 (med. 9.10) septata; septa $10.92-31.20 \mu\text{m}$ inter se separata. Conidia recta, persaepe lateraliter leviter curvata, ad utramque rotundatam extremitatem abrupte angustata, cylindracea, ad medium leviter latiores, primo pallidofulginea demum pallide atro-brunnea, $28.08-59.28 \times 9.36-12.48 \mu\text{m}$ (med. $45.95 \times 11.60 \mu\text{m}$, 3–8 (med. 5.74) septata, cellula circa $6.81 \mu\text{m}$ longa, ad septum non-contracta, hilum pariete peripherali inclusum, germinatio per proliferationem e cellula apicali basali. Ad granum Triticum aestivi. India. Typus CMI, S 4.

The fungus causes kernel rot of wheat (fig. 4). The grains get shrivelled and discoloured; when kept in moist chamber after surface sterilization a black crust forms on the surface of the grains with abundant conidiophores and conidia.

Conidiophores simple, emerging solitary or in fascicles of 2–4 (mostly 2–3), dark brown or olivaceous, geniculate, bearing 1–8 conidia, occasionally more, producing the first conidium at a distance of $24.96-34.32 \mu\text{m}$ from the base, $96.72-255.84 \times 6.24-7.80 \mu\text{m}$ (av. $183.45 \times 6.86 \mu\text{m}$), 6–11 (av. 9.10) septate, septa $10.92-31.20 \mu\text{m}$ apart.

Conidia (fig. 5) straight or more often slightly curved to one side, tapering slightly towards both the abruptly rounded ends, cylindrical, slightly broader near the middle, light fuliginous when young later turning into light to dark brown in colour at maturity, $28.08-59.28 \times 9.36-12.48 \mu\text{m}$ (av. $45.95 \times 11.60 \mu\text{m}$), 3–8 (av. 5.74) septate, with average cell length $6.81 \mu\text{m}$, non-constricted at the septum, hilum included within the contour of the peripheral wall, germination by the proliferation of one or two germ tubes growing out along the longitudinal axis of the spore, one from the apical cell and the other from the basal cell.

In culture on PDA, the fungus grows well, the colony attaining

a diameter of 93.83 mm on the 6th day at 28° C, aerial mycelium moderate, grayish olive green (2.5 GY 3/1) in colour, circular colony.

On *Triticum aestivum* L. isolated from grains of var. NP 852 collected at Piprakothi, Bihar, India, 10th June 1969, leg. A. P. MISRA. The holotype (no. S 4) has been deposited in U. S. P. L. 480 Lab., Department of Plant Pathology, Rajendra Agricultural University, Dholi, Bihar and also in CMI, Kew, Surrey, England.

So far three species of *Helminthosporium* viz., *H. sativum* (BRENTZEL 1944, CHRISTENSEN 1953, DASTUR 1932 and 1942, DHARAM VIR et al. 1968, DICKSON 1956, DOBRETSOV 1972, GREANEY & WALLACE 1943, MISRA & SINHA 1963—64, MITRA 1930, SATHE 1972, SPRAGUE 1950 and SUBRAMANIAN 1971); *H. bifforme* (SAKSENA & THAMMAYYA 1961) and *H. proliferatum* DESHPANDE & DESHPANDE (1967) have been reported from wheat grains. The present species isolated from affected wheat grains differs from these and other *Helminthosporium* species recorded on wheat in respect of size, shape, colour of conidia and conidiophores characters. The fungus was also compared with other known species of *Helminthosporium*; it resembles somewhat *H. sacchari* in shape but differs in having shorter and narrower conidia. It is, therefore, proposed as new species.

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Literature Cited

- BRENTZEL, W. E. (1944). The black point disease of wheat. — North Dakota Agri. Experiment Station, Bulletin. 330: 1—14.
- BUGNICOURT, F. (1955). Two new species of *Helminthosporium* isolated from rice seeds. — Rev. Gen. Bot. 62: 734, 238—243. *)
- CHRISTENSEN, J. J. (1953). Root rots of wheat, oats, rye, barley. — Year Book of Agri. No. 2441: 321—328.
- DASTUR, J. F. (1932). Foot rot and black point diseases of wheat in the Central Provinces. — Agri. and Livestock in India. 275—282.
- (1942). Notes on some fungi isolated from black point affected wheat kernels in the Central Provinces. — Indian J. Agri. Sci. 12: 731—742.
- DESHPANDE, K. S. & DESHPANDE, K. B. (1967). Contribution to the taxonomy of genus *Helminthosporium* I. — Sydowia, Annales Mycologici Ser. II, 20: 1—6.

*) Original not seen.

- DHARAM VIR, K. L., ADLAKHA, L. M. JOSHI & PATHAK, K. D. (1968). Preliminary note on the occurrence of black point disease of wheat in India. — Indian Phytopath. 21 (2): 234—235.
- DICKSON, J. G. (1956). Diseases of Field Crops. — 2nd Edition, Tata McGraw-Hill Publishing Co. Ltd., Bombay—New Delhi.
- DOBRETSOV, A. N. (1972). Resistance of varieties to diseases and pests. Ustoichivost Sortov K. boleznyam i Vreditelyam. — Selchtsiya i Semenovodstvo, No. 5, 27—28. *)
- DRECHSLER, C. (1923). Some graminicolous species of *Helminthosporium* I. — J. Agric. Res. 24 (8): 641—740.
- GREANEY, F. J. & WALLACE, H. A. H. (1943). Varietal susceptibility to kernel smudge in wheat. — Scientific Agric. 24 (3): 126—234.
- MISRA, A. P. & SINHA, B. K. (1963—64). Factors affecting the development of seedling blight of wheat *Helminthosporium sorokinianum* Sacc. & SOROKIN (*H. sativum* P. K. & B.). — Bihar Academy Agril. Sci. 12 & 13 (2): 29—40.
- MITRA, M. (1930). A comparative study of species and strains of *Helminthosporium* on certain Indian cultivated crops. — Trans. Brit. Mycol. Soc. 15: 254—293.
- NISIKADO, Y. (1929). Studies on the *Helminthosporium* diseases of Gramineae in Japan. — Ber. Ohara Inst. Landw. Forsch. 4: 111—126.
- SAKSENA, S. B. & THAMMAYYA, A. (1961). A study of fungi from stored wheat grains from Sagar. — Nat. Acad. Sci. India, Annual number, pp. 120—121.
- SATHE, A. V. (1972). Black point of wheat grain. — FAO Plant Prot. Bulletin. 20 (1): 9—11.
- SPRAGUE, R. (1950). Diseases of cereals and grasses in North America. — pp. 352—399.
- SUBRAMANIAN, C. V. (1971). Hyphomycetes. — ICAR Pub., pp. 737—778.

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