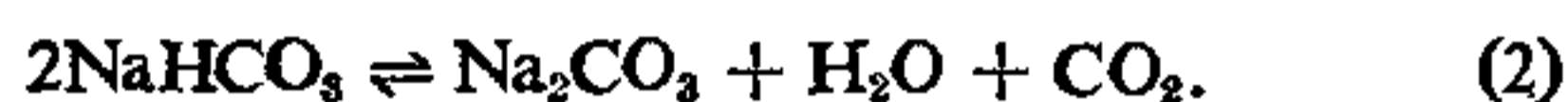
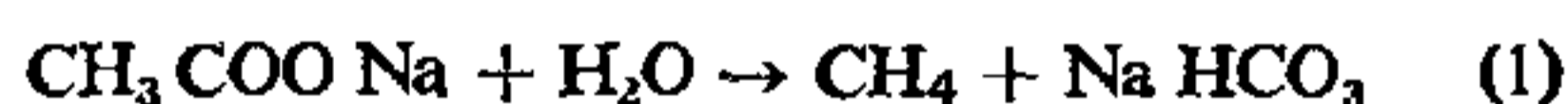


FIG. 2

(Fig. 2). The final pH of the slurry was found to be 6.95 (system A), 7.20 (system B), 7.45 (system C), 7.75 (system D) and 7.90 (system E). This systematic increase in the pH may be the result of proportionately higher amount of sodium carbonate and bicarbonate salt formation in the system as solution of sodium acetate was added to raise the level of acetate (equations 1 and 2). The biogas produced contained 84–87% methane<sup>10</sup>.



From the above studies it is clear that acetate level between 2500–3500 ppm is optimum for maximum production of gas. Studies are under progress in this laboratory to find ways to ensure a continuous production and maintenance of this level of acetate in biogas digestors so as to improve the efficiency of existing biogas plants in India.

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#### A NEW RECORD OF *CURVULARIA GUDAUSKASII* MORGAN-JONES AND KARR FROM INDIAN SOIL

IN continuation with our studies on soil mycoflora from Jabalpur, M.P. and its suburbs, a species of *Curvularia* was isolated from a soil sample of protected grassland. Comparative morphology of the present isolate with other species of *Curvularia* showed that it resembled closely to *Curvularia gudauskasii* Morgan-Jones and Karr<sup>1</sup> except for much broader, variously shaped conidia. These variations have been treated as an extension of the range of *C. gudauskasii* and the present isolate is disposed under this species.

A review of literature on Indian fungi shows that so far, *C. gudauskasii* has not been reported from India. The present note, therefore, constitutes the first report. A brief description of the fungus is presented below.

*Curvularia gudauskasii* Morgan-Jones and Karr (Fig. 1)

Colonies effused, greyish brown. Conidiophores simple or branched, erect, straight or flexuous, septate,



FIG. 1. Microphotograph of *Curvularia gudauskasii* showing conidia ( $\times 450$ ).



smooth, dark brown, 6.3–8.0  $\mu\text{m}$  thick at the base and 7.5–10.0  $\mu\text{m}$  at the apex, of variable length. Conidia acropleurogenous, clavate to obovate, smooth, almost always 3-septate, curved, frequently straight also, brown to dark brown, 22.3–38.2  $\times$  16.0–22.5  $\mu\text{m}$  (average 31.8  $\times$  19.5  $\mu\text{m}$ ), hilum prominently protuberant.

A sub-culture of the present isolate has been deposited at C.M.I., Kew, England under the accession number IMI 213301.

The authors are thankful to Dr. G. Morgan-Jones, Auburn University, Auburn, Alabama, U.S.A. and the Director, C.M.I., Kew, England, for confirming the identity of the fungus. Thanks are also due to the Principal, Govt. Science College, Jabalpur, for providing laboratory facilities.

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#### OCCURRENCE OF A NEW STRAIN OF SORGHUM DOWNY MILDEW *PERONOSCLEROSPORA SORGHI* AND ITS OOSPORES ON MAIZE IN RAJASTHAN

DURING surveys in August–September, 1979 a new strain of sorghum downy mildew [*Peronosclerospora sorghi* (Weston and Uppal) C.G. Shaw] of maize was recorded in several fields of Udaipur division in Rajasthan State. Different genotypes of maize crop were found infected by the disease. The disease exhibited symptoms clearly different from those of sorghum downy mildew known in the State since 1968. The affected plants showed long, narrow to broad, regular, white to yellowish streaks and stripes along the length of the leaves of plants of one month age and beyond. The first 3–4 leaves were found free from infection whereas those developing subsequently showed streaks and stripes in increasing acropetal order covering fully the top leaves. A white downy growth developed on both the surfaces of the striped leaves under favourable weather conditions. The stripes in due course of time turned brown and necrotic. The diseased plants remained abortive and rarely bore poor ears with none or few grains.

#### The Pathogen

The fungus formed abundant conidiophores bearing conidia generally on the lower surface but in favourable weather conditions on the upper surface of leaves also. The conidiophores were hyaline, erect, determinate, macronemous, with a prominent bulbous

base, frequently with one or rarely two septa and developed three branches mostly. The basal cells of conidiophores were knobbed or bulbous at the bottom measuring 38.5–250.2 (105.1)  $\mu\text{m}$  in length and 3.85–11.55 (7.9  $\mu\text{m}$ ) in width. The main axis from the first septum to the beginning of branch system was 103.9–219.4 (161.1)  $\mu\text{m}$  long with the average diameter being 9.1  $\mu\text{m}$  near the base and 28.3  $\mu\text{m}$  near the origin of branches. The main axis was usually more than or equal but rarely less than the length of the basal cell. It ramified in primary, secondary and tertiary branches terminating in tapering horny sterigmata averaging 11.3  $\mu\text{m}$  in length. Conidia borne on sterigmata on tips of branchlets when in place on conidiophores having three primary branches, lie in a hemispherical plane—a feature characteristic of this downy mildew. Conidia were globose to oval, hyaline, thin-walled, 13.5–28.9  $\times$  13.5–21.2  $\mu\text{m}$  with an average of 18.1  $\times$  16.0  $\mu\text{m}$ . The conidium always germinated by a germ tube. The oospores were recorded in the brown necrotic stripes abundantly. Oogonia were dark brown in colour and irregular in shape varying from 42.4–61.6  $\times$  38.5–50.0  $\mu\text{m}$  (49.6  $\times$  44.5)  $\mu\text{m}$  in size. The oospores were spherical enclosed in the thick irregular oogonial wall, golden yellow and were 26.9 to 38.5  $\mu\text{m}$  in diameter (average 33.95–34.65  $\mu\text{m}$ ). The presence of oil globules centrally located or eccentrically placed in the body of oospores was noticed.

#### Discussion and Conclusion

The fungal morphology described here particularly of arrangement of conidia on a hemispherical dome and irregularly polygonally angled oogonial wall resembles that of *Peronosclerospora sorghi*<sup>3,4</sup>. Payak *et al.*<sup>2,3</sup> described the presence of three races of *Peronosclerospora sorghi* on the basis of symptomatology and host range, viz., sorghum, sorghum-maize and maize races. The present pathogen does not fit in any of the three races. The sorghum race occurs only on grain sorghum and grain sorghum  $\times$  Sudan grass hybrids. The sorghum-maize race attacking different species of sorghum, maize, teosinte and others produces proliferation of vegetative and floral parts; result in leaf shredding and shortening of upper internodes of diseased plants. The absence of any of such symptoms in the present pathogen excludes its possibility of being sorghum-maize race. Moreover, nowhere the disease has been recorded on any of the sorghum genotypes grown near maize fields having the disease. The pathogen also differs from maize race. Maize race has been reported to occur in India (Rajasthan) as well as Thailand and Africa. A comparison of the disease symptoms and morphology of maize race prevailing in Rajasthan State with that of the present pathogen showed that the two are distinctly different. Moreover, occurrence of oospores