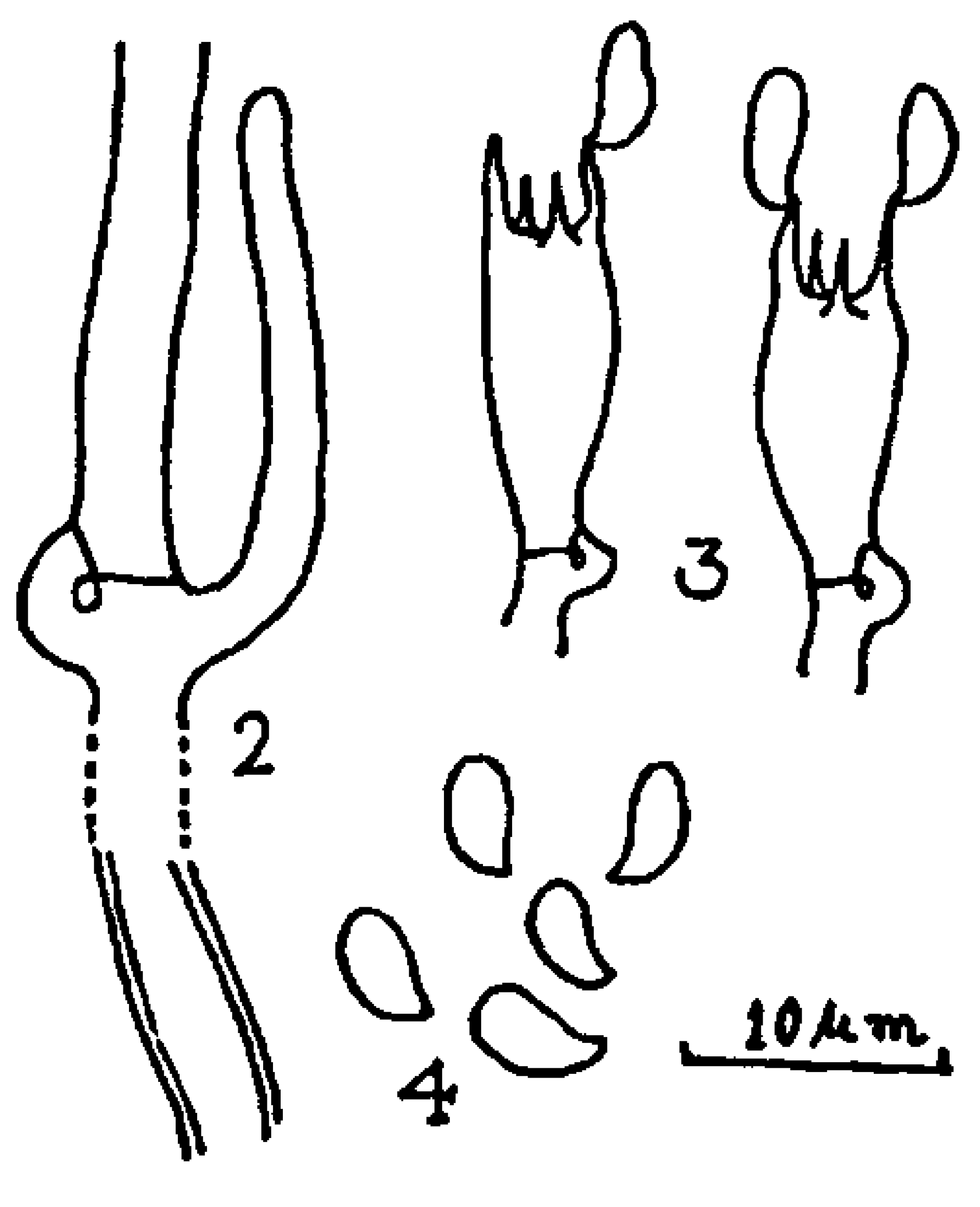

**Figures 2–4.** *Tyromyces subcaesius.* **2.** Generative hyphae; **3.** Basidia and **4.** Basidiospores.

incurved; context white, soft when fresh, hard on drying; pore surface white to ashy blue, pores angular and finely dentate, 4–5 per mm, pore tubes up to 5 mm long.

Anatomy (figures 2–4): Hyphal system monomitic. Generative hyphae hyaline, thin to slightly thick-walled, branched, with prominent clamp connections, 2.5–6 μm wide (figure 2); basidia hyaline, clavate, inamyloid, 10–12 × 3.5–4.5 μm (figure 3); basidiospores hyaline, thin-walled, allantoid, inamyloid, 4.5 × 1–1.3 μm (figure 4).

Habitat: Growing on logs of deciduous trees.

Specimen examined: VBMH 851461.

## EVALUATION OF COTTON GERMPLASM FOR RESISTANCE TO WHITEFLY *BEMISIA TABACI* (GENNADIUS)

A. P. JAYASWAL and R. PUNDARIKAKSHUDU
*Central Institute for Cotton Research, Post Bag No. 125, Nagpur 440 001, India.*

WHITEFLY, *Bemisia tabaci* (Gennadius) in cotton has emerged as a major pest during recent years in southern (Andhra Pradesh, Tamil Nadu and Karnataka) and central (Maharashtra and Gujarat) cotton-growing states of India. Prolonged dry spell coupled with high temperature and relative humidity during the crop period, excessive and 'ndiscriminate use of broad spectrum insecticides, high dose of nitrogenous fertilizers, close spacing, sowing of some susceptible varieties/hybrids, availability of alternate cultivated or wild host plants and monocropping appear to be mainly responsible for the recent outbreak of whitefly in cotton. High incidence of this pest was first reported in 1984–85 from Andhra Pradesh. The loss in yield of seed cotton was reported[1] to be 10–45%. The available insecticides are not much effective against this pest. Hence, 24 elite cotton germplasm lines were screened with a view to identifying resistant lines for utilizing them in the breeding programme.

The 24 lines of cotton germplasm were tested for their susceptibility to whitefly at this Institute during 1986. Maximum population of whitefly was observed during the second week of November. TXORHU 1–78, TXORSC-78 and T X Maroon 2–78 had very low population (0.5 to 1.1 adults/leaf) of whitefly. In these lines, the number of hairs was very low in lamina as well as in mid-rib. Germplasm lines, 101–102 B, CTI 425–45, CPI 25/1, JR 80, Reba B 50, BJA 592 and Laxmi had high population of whitefly and the number of hairs on leaf lamina and mid-rib was very high (table 1).

**Table 1** *Incidence of whitefly on some germplasm of cotton*

| Germplasm | Population of adult whitefly/leaf 13.11.86 | 29.11.86 | No. of hairs on lamina hairs/cm² | midrib hairs/cm² |
|---|---|---|---|---|
| TXORHU 1-78 | 0.5 | 0.1 | 14 | 31 |
| TXORSC -78 | 0.7 | 0.2 | 5 | 6 |
| TX Maroon 2-78 | 1.1 | 0.2 | 12 | 11 |
| 24-8 (Nect.) | 1.7 | 0.5 | 7 | 19 |
| STA-7 (Okra) | 1.7 | 0.3 | 65 | 53 |
| 20-3 | 2.8 | 0.5 | 79 | 66 |
| TX Bonham | 3.7 | 0.7 | 12 | 80 |
| Tashkent 1 | 3.3 | 0.1 | 46 | 14 |
| Aub—NE 213 | 3.5 | 0.3 | 74 | 34 |
| Stone-Ville 825 | 4.3 | 0.4 | 219 | 101 |
| Tamcot SP 21 | 5.5 | 1.4 | 54 | 37 |
| Tamcot SP 23 | 4.3 | 0.6 | 136 | 100 |
| Tamcot SP 37 H | 8.2 | 0.2 | 71 | 42 |
| Tamcot SP 37 | 3.9 | 0.2 | 118 | 69 |
| Tamcot SP 215 | 4.9 | 0.4 | 47 | 16 |
| Tamcot-Camde | 2.2 | 0.5 | 148 | 115 |
| Dunn 118 | 4.6 | 1.0 | 162 | 115 |
| 101-102 B | 15.3 | 2.4 | 869 | 311 |
| CTI 425-45 | 12.7 | 3.4 | 824 | 306 |
| CPI 25/1 | 18.9 | 4.8 | 533 | 297 |
| JR 80 | 13.7 | 17.9 | 856 | 211 |
| Reba B 50 | 26.8 | 3.0 | 308 | 212 |
| BJA 592 | 32.2 | 5.2 | 466 | 308 |
| Laxmi | 22.1 | 4.4 | 448 | 195 |

Table 2 *Chemical analysis of leaves of some cotton germplasm*

| Germplasm | Total sugars (%) | Reducing sugars as glucose (%) | Non-reducing sugars as sucrose (%) | Sucrose as percentage of total sugars | (N) (%) | P(%) | (K)(%) | Moisture (%) | Cell-sap (pH) | Cell-sap (conc) m. mhos/cm |
|---|---|---|---|---|---|---|---|---|---|---|
| Tamcot SP23 | 3 1 | 2.5 | 0.5 | 17.6 | 2.7 | 0.2 | 1.3 | 74.0 | 5.5 | 28 4 |
| TX ORSC-78 | 2.8 | 2.4 | 0.5 | 17.0 | 2.6 | 0.2 | 1.2 | 69.5 | 5.5 | 24.0 |
| TX ORHU 1-78 | 2.9 | 2.3 | 0 6 | 19.7 | 2.7 | 0.2 | 1.7 | 70.5 | 5.4 | 26.3 |
| Tamcot SP-215 | 2.9 | 2.5 | 0.4 | 13.7 | 2.5 | 0.2 | 2.0 | 71.0 | 5.5 | 26.6 |
| Reba B-50 | 3.3 | 2.7 | 1.0 | 30.0 | 2.5 | 0.2 | 1.3 | 71.0 | 5.6 | 23.7 |
| Laxmi | 3.4 | 2 6 | 0.8 | 24.0 | 2.4 | 0.2 | 1.8 | 75.0 | 6 0 | 28.0 |

Smooth leaf types, like Deltapine 61, Deltapine 62 and AET 5 have been reported resistant to whitefly[2] as compared to pubescent cotton varieties. Hairy varieties of cotton have been observed susceptible to thrips and whiteflies[3].

Chemical analysis of leaves of some germplasm lines (where population of whitefly was very low and high) was carried out. Preliminary studies indicated positive relationship between susceptibility to whitefly and sugar content particularly of non-reducing sugars as sucrose. Susceptible lines contained more of non-reducing sugars as sucrose compared to other fairly resistant lines. Sucrose constituted about 24 and 30% of the total sugars in whitefly susceptible lines, (viz. Laxmi and Reba B 50 respectively) while in other fairly resistant lines, it varied from 14 to 20% of the total sugars (table 2). Preference of whitefly for higher sucrose concentration has been reported[4]. No definite trends were observed in leaf N, P and K contents and cell sap pH between susceptible and fairly resistant lines.

Studies indicate that moderately hairy cotton germplasm lines with higher level of non-reducing sugars (as sucrose) are susceptible, while lines having less hairs coupled with relatively low sucrose content appear to be fairly resistant to whitefly.

Thanks are due to Dr Sheo Raj and Dr N. D. Mannikar for assistance and to the Division of Crop Improvement for supplying seeds of germplasm materials.

11 November 1987

1. Reddy, A. S., Rosaiah, B., Bhaskara Rao, T., Rama Rao, B. and Venugopal Rao, N., *Proceedings of seminar 'Problems of whitefly on cotton'* Pune, March, 1986.
2. Butler, G. D. and Wilson, F. D., *J. Econ. Entomol.*, 1984, **77**, 1137.
3. Baloch, A. A., Soomro, B. A. and Mallah, G. H., Cotton Research Institute, Sakrand, Pakistan, Ann. Rep., 1982.
4. Berlinger, M. J., Magal, J. and Benzioni, A., *Phytoparasitica*, 1983, **11**, 51.

## GROWTH AND SPORULATION OF MILLET LEAF BLAST FUNGUS *PYRICULARIA PENNISETI*: ROLE OF POLYAMINES

S. C. GAUR, N. S. SHEKHAWAT and H. C. ARYA

*Department of Botany, University of Jodhpur, Jodhpur 342 001, India.*

LEAF blast of millet (*Pennisetum americanum*) caused by *Pyricularia penniseti* Prasad and Goyal adversely affects the yield of the crop as it attacks green leaves and damages photosynthetic tissues. We are working on the biology of the fungus and the factors which influence its growth and sporulation. Polyamines are essential for the growth of the plant as well as for the fungal cells[1,2]. The physiology and biochemistry of polyamines and their metabolism in normal plants and plants under stress have been reviewed[3-5]. Rajam and Galston[6] have studied the effect of inhibitors of polyamine biosynthesis on the growth and morphology of various phytopathogenic fungi and have observed that polyamines are essential for fungal growth and development. They reported on the fungicidal and plant protective efficacy of DL-difluoromethylornithine (DFMO), a specific inhibitor of ornithine decarboxylase, the enzyme that provides fungi with the necessary polyamines[2]. Birecka *et al*[7], reported that DFMO inhibited mycelial growth and sporulation of *Helminthosporium maydis* and the inhibition could be reversed with putrescine. We report here on the