growth regulators[21-23] also question the argument explaining the accumulation caused by all these factors via a disturbance in tissue water status[1]. The vast difference in the proline levels between the plants exposed to methylparathion before seed germination and those after 5 days of germination (figure 2) indicates that the pesticide requires a suitable physiological condition to induce proline accumulation. This difference in the response was exhibited even in the continuing presence of the pesticide during the seedling growth until the harvest was made for proline estimations. Therefore, these results warrant a search for the common mechanism of the induction of proline accumulation in plants caused by various stress factors.

From the agronomic point of view, these results would further convey that methylparathion is relatively nontoxic to crop plants as a spray, while as residue in the soil it seems to exert a greater influence on the seed germination, seedling growth and metabolism.

One of the authors (GSS) thanks CSIR, New Delhi for financial assistance.

6 March 1987; Revised 25 May 1987

1. Aspinall, D. and Paleg, L. G., In: *The biochemistry and physiology of drought resistance in plants*, (eds) L. G. Paleg and D. Aspinall, Academic Press, New York, 1981, p. 206.
2. Stewart, G. R. and Lee, J. A., *Planta*, 1974, **120**, 279.
3. Chu, T. M., Aspinall, D. and Paleg, L. G., *Aust. J. Plant Physiol.*, 1976, **3**, 219.
4. Draper, S. R., *Phytochemistry*, 1972, **11**, 639.
5. Chu, T. M., Aspinall, D. and Paleg, L. G., *Aust. J. Plant Physiol.*, 1974, **1**, 87.
6. Chu, T. M., Jusaitis, M., Aspinall, D. and Paleg, L. G., *Physiol. Plant.*, 1978, **43**, 254.
7. Withers, L. A. and King, P. J., *Plant Physiol.*, 1979, **64**, 675.
8. Savitskaya, N. N., *Biol. Nauki.*, 1976, **19**, 49.
9. Ghildiyal, M. C., Pandey, M. and Sirohi, G. S., *Indian J. Plant Physiol.*, 1986, **29**, 368.
10. Wample, R. L. and Bewley, J. D., *Can. J. Bot.*, 1975, **53**, 2893.
11. Sinha, O. K., Bhansal, R. R. and Singh, K., *Curr. Sci.*, 1984, **53**, 493.
12. Mumford, R. A., Lipke, H. and Lanfer, D. A., *Environ. Sci. Technol.*, 1972, **6**, 427.
13. Godzik, S. and Linsleus, H. F., *Environ. Pollut.*, 1974, **7**, 25.
14. Soldatini, G. F., Ziegler, I. and Ziegler, H., *Planta*, 1978, **143**, 225.
15. Weimberger, R., Lerner, H. R. and Poljakoff-Mayber, A., *Physiol. Plant*, 1982, **55**, 5.
16. Carcellar, M. and Fraschina, A., *Bot. Gaz.*, 1986, **147**, 98.
17. Badawy, M. I. and El-Dib, M. A., *Bull. Environ. Contamin. Toxicol.*, 1984, **33**, 40.
18. Deshpande, A. A. and Swamy, G. S., *Inter. Conf. Pestic.*, 1985, abs., S-36.
19. Prat, D., Gangbe, F. and De Paepe, R., *Plant Sci. Lett.*, 1983, **31**, 19.
20. Bates, L. S., Waldren, R. P. and Teare, I. D., *Plant Soil*, 1973, **39**, 205.
21. Aspinall, D., Singh, T. N. and Paleg, L. G., *Aust. J. Biol. Sci.*, 1973, **26**, 379.
22. Singh, T. N., Aspinall, D. and Paleg, L. G., *Aust. J. Biol. Sci.*, 1973, **26**, 77.
23. Udayakumar, M., Rao, S. R., Prasad, T. G. and Sastry, K. S. K., *New Phytol.*, 1976, **77**, 593.

VIABILITY OF *CERCOSPORA CANESCENS* CONIDIA UNDER SIMULATED AIRBORNE CONDITIONS

P. BHASKARA RAO and K. V. MALLAIAH
Department of Botany, Nagarjuna University, Nagarjunanagar 522 510, India.

BLACK gram (*Vigna mungo* (L.) Hepper) is an economically important and highly priced pulse crop, cultivated throughout India, under a wide variety of edaphic and climatic conditions. Among the foliar fungal diseases of black gram leaf spot caused by *Cercospora canescens* Ell. & Mart. brings heavy destruction to the photosynthetic area. The conidia of this pathogen are aerially dispersed [1]. But for how long they retain viability under airborne conditions is not known. Since it is very difficult to bring the spores released into air back to a substratum after a period of time, the effect of aerial environment on conidial viability in *C. canescens* was studied in simulated airborne conditions.

Such a condition was created using fine threads drawn from the silkworm cocoon. The threads were wound round to two arms of a special metal fork and the threads were coated with dry conidia from freshly sporulating leaf spot. Twenty-four such units were prepared and exposed to natural conditions near the field. Two units were brought back to the laboratory at each hourly intervals, placed on slides

Table 1 *Viability of conidia of C. canescens in simulated airborne conditions (studied at 1 hr intervals)*

Exposure time (hr)	Per cent spores germinated	Germ tube length (μm) Average per conidium	Basal cell	Intercalary cells	Apical cell
0 (Control)	96.0	151.69	255.64	117.18	141.42
1	76.0	182.82	246.86	167.72	140.56
2	39.0	140.08	155.68	137.20	108.08
3	19.7	96.78	104.58	106.82	74.34
4	3.5	47.14	50.68	51.38	38.50
5	1.3	35.91	38.64	0	28.00
6	0	0	0	0	0

and the threads cut with a sharp blade. Two or three drops of distilled water were placed on the spores present on the threads and the slides were incubated for 24 hr in humid petri chambers at room temperature (25 ± 2°C) to observe spore germination. At the start of the experiment the percentage of germination was recorded for spores freshly collected from leaf spots.

In a preliminary experiment the conidia were tested for germination at 2 hr intervals. It was observed that they lost viability within 6 hr and hence, their germination was again studied at hourly intervals. The conidia completely lost germinability after 5 hr of exposure to atmospheric conditions. After 1 hr exposure, 76% conidia showed germination. The germination dropped to 39% and 19.7% after 2 and 3 hr, respectively and then steeply decreased to 1.3% after 5 hr. The same trend was also observed in germ tube growth (table 1). The average germ tube growth recorded at 1, 2, 3, 4 and 5 hr was 182.82 μm, 140.08 μm, 96.78 μm, 47.14 μm and 35.91 μm respectively. The number of germ tubes per conidium decreased from 8 to 2 when the exposure period to atmospheric conditions increased from 1 to 5 hr. These studies were conducted on rain- and mist-free days in January 1985. On this day the atmospheric temperatures were 28°C maximum and 20°C minimum and the relative humidity was around 88%.

The conidia of *C. canescens* lost viability very rapidly within 6 hr in simulated airborne conditions. The conidia are thin-walled, filiform and hyaline and this may be the reason for rapid loss of viability when exposed to the aerial environment. There are no previous studies on this aspect on *Cercospora* species. Urediniospores of rust fungi, which are relatively thick-walled, were reported to lose viability within 4–5 days under normal aerial environment as reported earlier[2–4].

Thanks are due to CSIR, New Delhi for financial assistance.

20 March 1987

1. Bhaskara Rao, P. and Mallaiah, K. V., *Proc. Natl. Conf. Env. Biol.*, 1981, p. 237.
2. Maddison, A. C. and Manners, J. G., *Trans. Br. Mycol. Soc.*, 1972, **59**, 429.
3. Rapilly, F., *Annu. Rev. Phytopathol.*, 1979, **17**, 59.
4. Mallaiah, K. V., Progress report No. 14, ICRISAT, Patancheru, India, 1984, p. 80.

A NEW SPECIES OF *ASTERINA*

L. N. NAIR and V. P. KAUL
Department of Botany, University of Poona, Pune 411 007, India.

ASTERINA GOPALKRISHNANII sp. nov. (figures 1–5)

Coloniae amphigenae, dispersae vel aggregatae densae vel subdensae. Mycelium superficiale, reticulatum, hyphis subrectis, cellulis 20–25 μm longis, 5–7 μm latis. Hyphopodia sessilia, alterna, hemisphaerica, ex una cellula constantia, 5–7 μm lata. Thyriothecia carbonacea ostiolata 226–240 μm diametro dehiscentia modo stellato. Asci ovati, sine paraphysibus 50–65 μm × 25–50 μm. Ascospore ex duabus cellulis constantes, 12–16 × 30–45 μm, parietibus crassis spinosae brunneae, media cellula vittata duabus fuscis vittis.

Habitat: In foliis *Syzygium cumini* (Myrtaceae).

Colonies amphigenous, scattered or aggregated dense to subdense. Mycelium superficial, reticulate, hyphae substraight, cells 20–25 μm long, 5–7 μm broad, Hyphopodia sessile, alternate, hemispherical, one-celled, 5–7 μm broad. Thyrothecia carbonaceous, ostiolate, 226–240 μm in diameter, stellately dehiscent. Asci ovate, aparaphysate, 50–65 μm × 25–50 μm. Ascospores two-celled, 12–16 × 30–45 μm, thick-walled, spiny, brown with two dark brown bands in the middle of each cell.

Habit.: On leaves of *Syzygium cumini* (Myrtaceae)
Loc. Mahabaleshwar, Maharashtra, India, February 1979
Leg. L.N.N. and V.P.K.