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OCCURRENCE OF CLEISTOTHECIAL STAGE OF *ERYSIPHE CICHORACEARUM* DC. ON *COCCINIA INDICA* W. & A.

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DURING the course of surveys for fungal diseases of cultivated plants at Chandigarh, severe infection of powdery mildew was noticed on *Coccinia indica*. This cucurbitaceous plant grows wild as a creeper in this area. The immature green fruits are used as a vegetable in South India. Whitish powdery growth

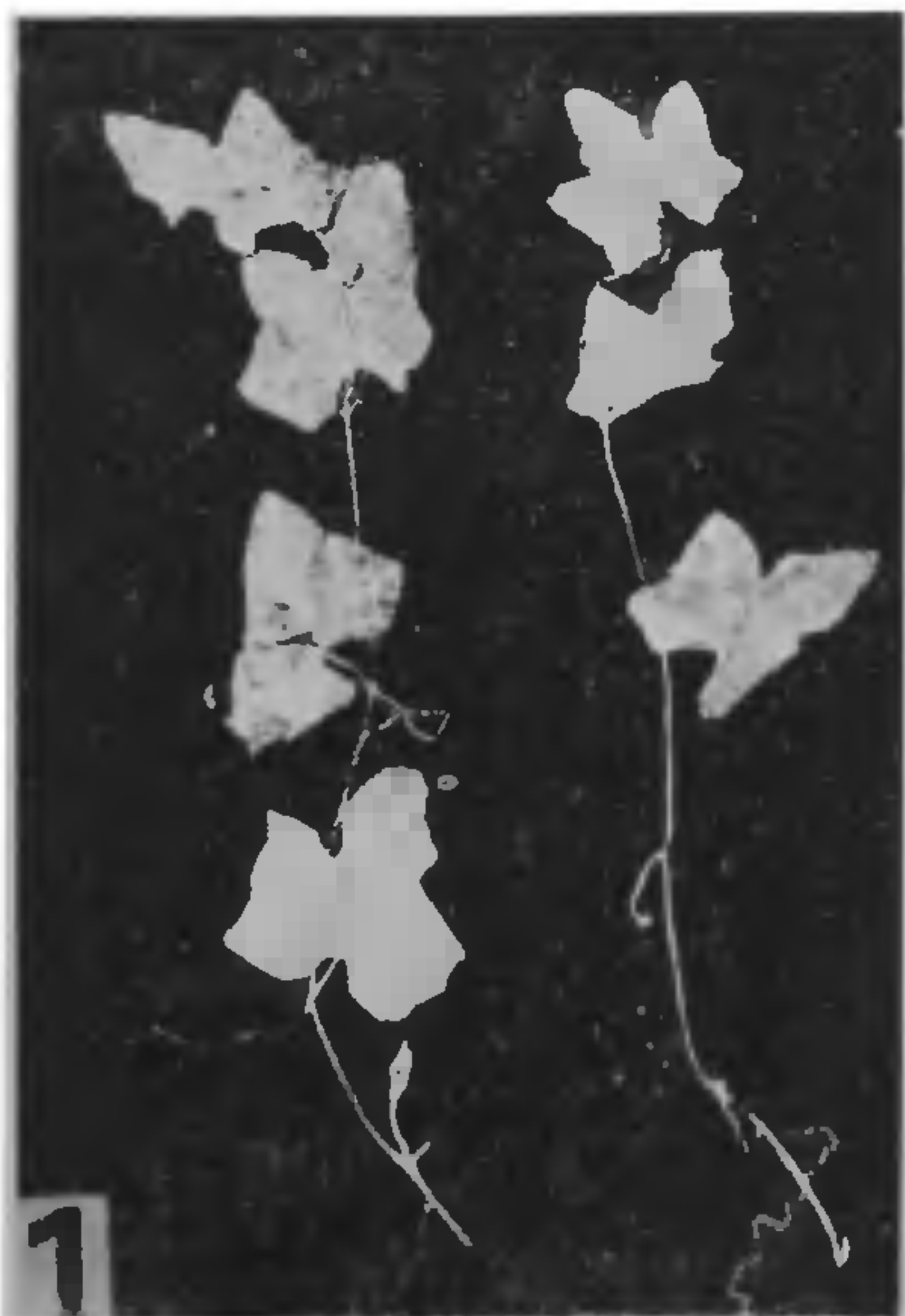


FIG. 1. Host plant showing infection on leaves, stem and fruit.



FIG. 2. Numerous asci arising in a fascicle and coming out of the cleistothecium showing 2 ascospores per ascus.

of the conidial stage of the fungus was observed on all the aerial parts of the host including the young fruits during most part of the year except during rainy and winter seasons (Fig. 1). Cleistothecial stage was encountered during the months of November and December, 1980 when the weather was very chilly and the plants were withering. The cleistothecia were mostly noticed on the stem and less frequently on the leaf lamina as minute, reddish brown to dark, superficial, globose bodies, gregarious or scattered forming irregular patches in the floury mycelial growth. The cleistothecial wall consisted of irregular dark brown cells of various shapes and sizes. The outer cells possessed a few simple, septate and dark brown mycelial appendages. Cleistothecia were 172-192 μm in diameter containing numerous broadly elliptical to subglobose, hyaline to sub-hyaline asci arising in fascicles, 52-64 \times 24-32 μm . Ascospores mostly two per ascus, hyaline to sub-hyaline, one-celled, oval to oblong, minutely verrucose measuring 16-28 \times 12 μm (Fig. 2).

The above description confirms the identity of the fungus as *E. cichoracearum* DC.

Six species of powdery mildew fungi have been reported on various cucurbits from different regions of the world¹. In India, *E. cichoracearum* has been previously reported on *Momordica balsamina*, *Trichosanthes dioica*², *Lagenaria vulgaris*³ and *Coccinia cordifolia*⁴. This powdery mildew is reported to attack pumpkin in Malaysia and Singapore¹⁰; squash in England and Sweden^{3,9}; muskmelon in France¹¹; cucumber in Germany and Canada⁸; cucumber, squash and pumpkin in U.S.A.^{6,7} and muskmelon in Russia. These records indicate the wide host range of *E. cichoracearum* and its potential to infect different cucurbits which are extensively cultivated in this country. *C. indica* puts forth new growth from older

vines during March-April and shows conspicuous whitish disease spots and the infection spreads further.

Detailed studies on host range are in progress and would be reported in due course.

May 16, 1981.

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REVERSAL OF EFFECTS OF ALKYLATING AGENTS THROUGH THE USE OF PROSTAGLANDIN E_1 IN THE OVOTESTIS OF THE SNAIL *LYMNAEA ACUMINATA*

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ALKYLATING agents, because of their property of, inhibiting protein synthesis, have been used successfully, as chemosterilants for insect pests¹, and chemotherapy of cancer². The present authors³ proposed the use of cyclophosphamide as a chemosterilant for snail pests and vectors as it adversely affected embryonic development and reduced the number of eggs in the snail *Lymnaea acuminata* the intermediate host for the liver flukes *Fasciola gigantica* and *Fasciola hepatica*. Similar results have now been found with busulfan.

Cyclophosphamide (21 μ g) [2-oxo-2 (bis- β -chloroethylamino)-1-hydro-1,3,2-azoxaphosphorane] and

busulfan (15 μ g) [1,4-dimethanesulfonyloxybutane] (divided in three equal doses) were injected in the foot of *Lymnaea acuminata* every 24 hr on three consecutive days. Fourth day onwards, one group of treated animals were injected 5 μ g of prostaglandin E_1 (PGE_1)/animal/day for three days while another group (treated controls) was injected with saline only. DNA and RNA were estimated according to Schneider⁴, protein by Lowry *et al.*⁵ and total free amino acids according to the method of Spies⁶. Values have been expressed as μ g/mg of ovotestis (mean \pm SE) of six replicates. Student's t-test was used to determine significant differences ($P < 0.05$ indicated by * in the text).

Following 21 μ g cyclophosphamide or 15 μ g busulfan treatment, DNA levels were reduced from 69.42 ± 1.12 μ g/mg to 36.03 ± 1.36 μ g/mg (52%)* and 43.57 ± 2.35 μ g/mg (62%)* and RNA levels from 52.93 ± 0.81 μ g/mg to 27.16 ± 0.74 μ g/mg (52%)* and 30.60 ± 0.46 μ g/mg (59%)* respectively. Similarly protein concentrations came down from 84.66 ± 1.42 μ g/mg to 55.16 ± 1.30 μ g/mg (65%)* and 60.66 ± 1.42 μ g/mg (72%)* respectively, following cyclophosphamide and busulfan treatment. Free amino acid levels rose to 211%* and 212%* of controls following treatment with the same doses of the drugs.

Discontinuation of treatment with the alkylating agents for three days did not produce any significant recovery in any of the four constituents. However, when cyclophosphamide and busulfan-treated animals were administered PGE_1 for three days, there was remarkable recovery in the levels of DNA—87%* for cyclophosphamide and 84%* for busulfan; 99%* and 94%* respectively in case of RNA levels and 99%* in protein levels in animals treated with either drug. Relatively less, though significant, reduction in the free amino acid levels also took place.

The facts that, prostaglandin E and F like substances are present in molluscs⁷, and activation of prostaglandin endoperoxide synthetase results in increased spermatogenesis in snails⁸, indicate that prostaglandin may have a physiological role, in modulating fertility and synthesis of proteins in snails. The present experiments also give hopeful pointers towards the use of prostaglandins for countering the toxic effects of alkylating agents in cases where their use becomes essential for chemotherapy of neoplastic diseases.

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