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A NEW RECORD OF *ALTERNARIA* CAUSING LEAF SPOT OF SUNFLOWER

A SEVERE form of leaf spot due to *Alternaria* was observed during kharif 1973 on sunflower (*Helianthus annus* L.) crop grown around Srikalahasti in Chittoor district of Andhra Pradesh. The disease develops initially as small, chlorotic spots with brown centre on young leaves (Fig. 1 *a*). These spots turn dark brown and are somewhat circular with yellow halos measuring about 3–5 mm in diameter after 10 days (Fig. 1 *b*).

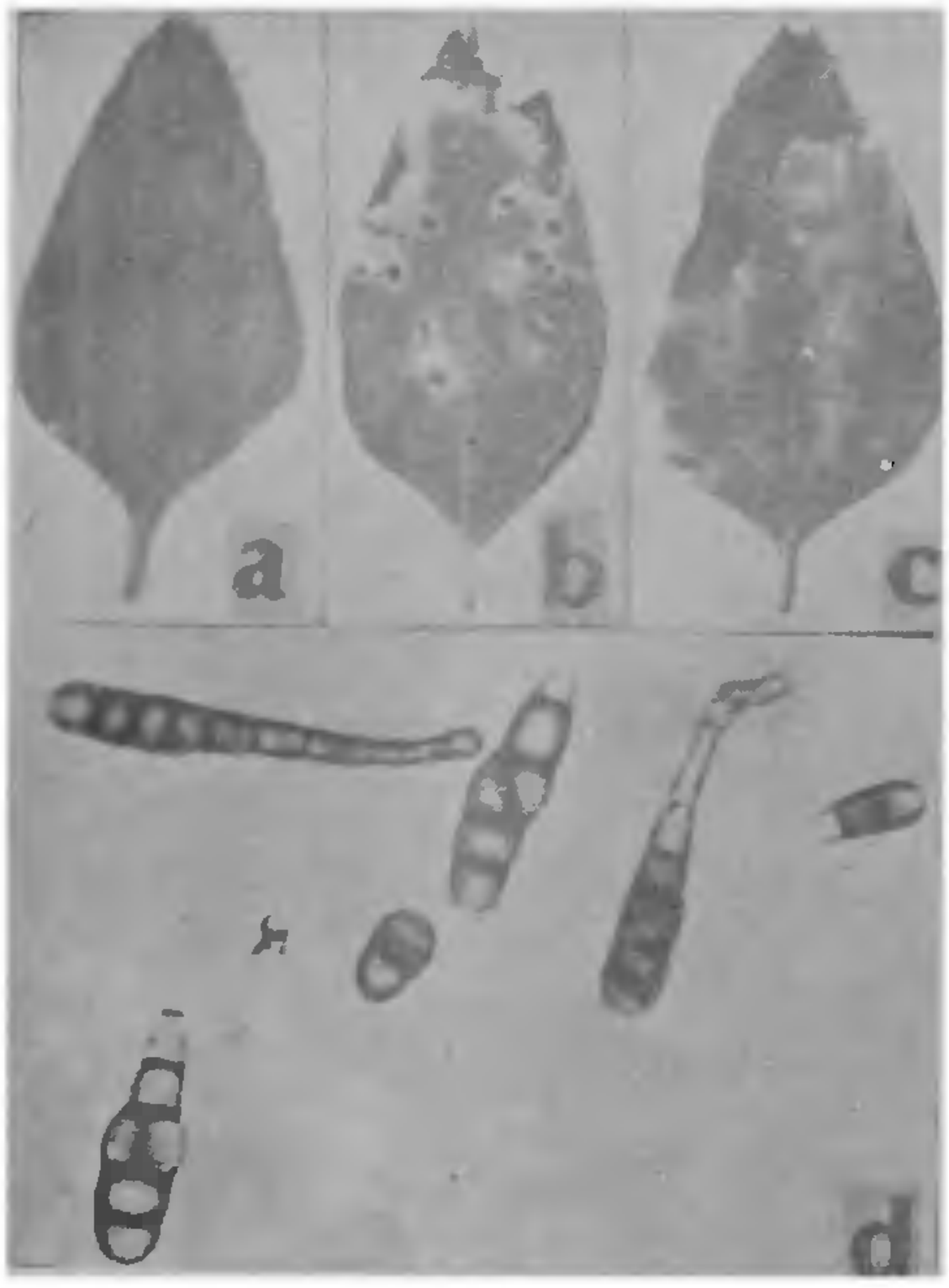

FIG. 1. *a*, *b* and *c*: Progression of symptoms on the leaves of sunflower due to *Alternaria helianthicola* (Rao and Raj). causing leaf spot; *d*: Conidia of *A. helianthicola* showing tapered apex, beak and longitudinal septa in some.

They later coalesce forming irregular dark patches ultimately leading to severe blighting, drying up of leaves and defoliation by 20 days (Fig. 1 *c*).

The pathogen was purified by single spore isolation and the pathogenicity of the organism was proved with positive results in sunflower var. E.C. 68414, E.C. 68415 and Bulgarian. The organism failed to infect ten known hosts of *Alternaria*, viz., *Cyamopsis tetragonoloba* (L.) Taub., *Raphanus sativus* L., *Glycine max* (L.) Merrill, *Arachis hypogaea* L., *Solanum melongena* L., *Lycopersicon esculentum* Mill., *Chrysanthemum maximum* L., *Zinnia elegans* Jacq., *Cucumis sativus* L. and *Brassica juncea* Coss. and appeared to be host specific.

Mycelial colonies on potato dextrose agar were dark, profusely branched and frequently septate with abundant sporulation in 7–10 days. The conidiophores were cylindrical, often branched, septate and difficult to be ditinguished from the mycelium. Conidia were golden yellow or dark brown, ellipsoidal, each having tapered apex and distinct beak, 2–10 septate, slightly constricted at septation. The conidia inclusive of beak measured 66·5 (29·0–91·5) × 15·6 (7·25–21·75) μ, beak alone measuring 45·5 (29·0–72·5) μ in length. Longitudinal septae were present in some conidia (Fig. 1 *d*). Characters of conidia produced in culture were similar to those observed in nature.

From the perusal of literature, it is seen that *A. tenuis*[1], *A. zinniae*[2] and *A. helianthi*[3,4] infect sunflower and cause different leaf spots. However, the foliar symptoms, host range, sporulation as well as conidial measurements of the present isolate differ wholly or partly from the above species of *Alternaria* reported on sunflower. The isolate has since been examined and found quite distinct from *A. tenuis*, *A. zinniae* and *A. helianthi* and hence named as *Alternaria helianthicola* sp. (Rao and Raj.) now. as suggested by Dr. Ellis of Commonwealth Mycological Institute, Kew, Surrey, England. The type culture has been deposited at C.M.I., Kew, Surrey, England, as IMI–191573.

A Latin description of the new species is given below: "Mycelium (in cultura) fuscum, ramosissimum et saepe septatum, sporulatione copiosa; conidiophora cylindrica, saepe ramosa, septata, a mycelio difficile distinguibilia; conidia aurea vel atrobrunnea, ellipsoidea, unamquidque apice contracta et rostro distincto, 2–10 septatum, ad septam leviter constrictum; conidia (rostro incluso) 66·5 (29·0–91·5) × 15·6 (7·25–21·75) μ; rostrum tantum 45·5 (29·0–72·5) μ longum; septa longitudinalia conidiis nonnullis praesentia".

Our grateful thanks are due to Dr. Ellis and Mr. Anthony Johnston, Director, C.M.I., England, for examining the culture and suggesting the new name. Thanks are also due to Rev. Father K. M. Matthew, S.J., Director, The Rapinat Herbarium, St. Josephs'

College, Tiruchirapalli, Tamil Nadu, for Latin description of the new species.

Department of Plant Pathology, S.V. Agricultural College, Tirupati 517 502, Andhra Pradesh, India,
G. NARASIMHA RAO.
K. RAJAGOPALAN.

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AN IMPROVED TECHNIQUE FOR THE KARYOTYPE STUDY OF AN ECONOMICALLY IMPORTANT FAMILY UMBELLIFERAE

INDIA has got a large number of Umbelliferous species many of which are economically important as spices, vegetables and medicinal plants. Chromosome number of Umbellifers has been studied by many authors (*Wanscher, 1933; *Delay, 1947; *Garde and Garde, 1949, 1954; *Hakansson, 1953; *Sharma and Ghosh 1954; *Sharma and Bhattacharyya, 1959; *Bell and Constance, 1960, 1966; *Gadella and Kliphuis, 1967; *Cauwet, 1971). With one or two exceptions detailed studies of chromosome morphology of the members of this family which can elucidate structure and behaviour of karyotype and their interrelationships are yet to be made. Moore[3] pointed out that Umbelliferous cytotaxonomy is still at the 'alpha' level. This work involved the evolution of special pretreatment and fixation schedules for a proper study of chromosome morphology of members of Umbelliferae and their cytological implications.

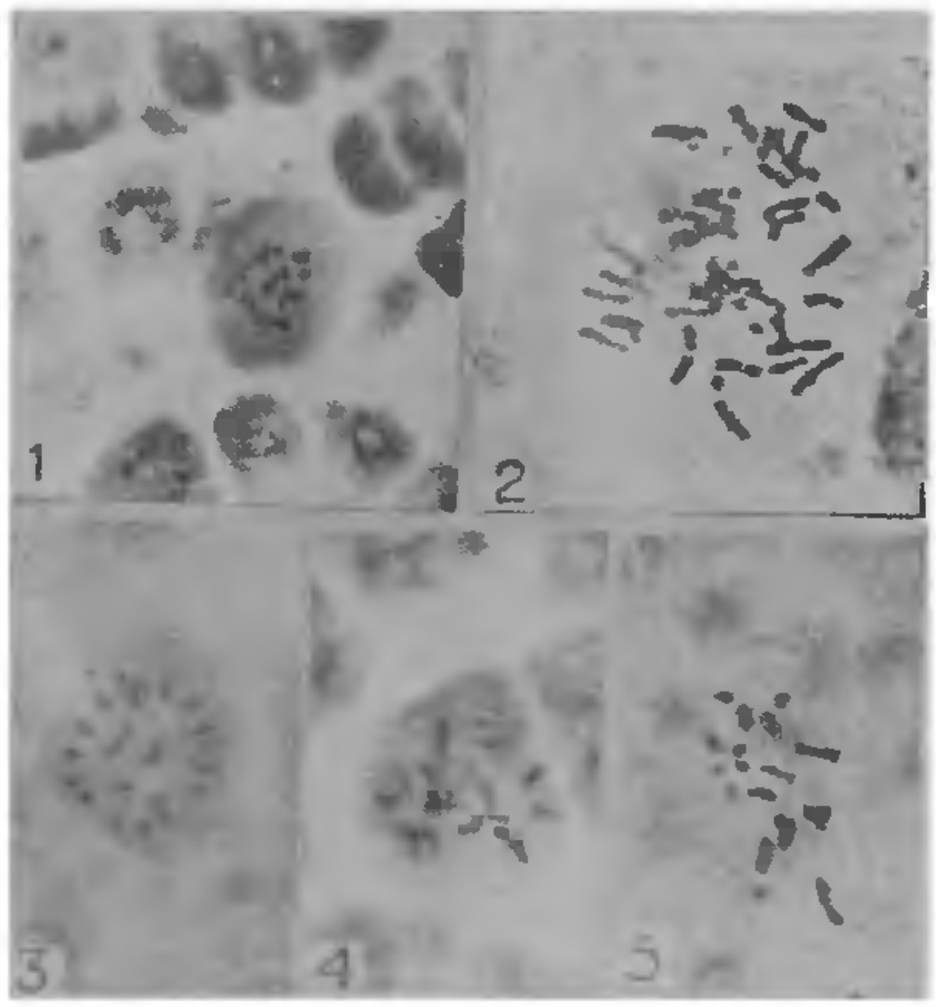
Different species and members of 18 genera were included in the study. Effect of chemical pretreatment, duration of pretreatment temperature as well as nature of fixative and period of fixation on cytological preparation were studied.

For cytological study seeds were raised in earthenware containing sand and soil mixture. When the roots attained 1 length, 1·5–2 mm apical lengths of roots were taken, washed in water and transferred to pretreatment chemicals of varying concentrations for different durations. Pretreated root tips were fixed in mixture of acetic alcohol (1 : 2) for 1–2 hours. After fixation, they were heated in a mixture of 2% aceto-orcein (N) HCl (9 : 1) solution for 5–6 seconds and kept in the mixture for 6–24 hours. Subsequently, the root tips were squashed in 45% acetic acid sealed and observed. The best schedules for different genera are given in Table I.

It is seen that L-bromonaphthalene proved most suitable for the majority of the species and varieties investigated. The response of chromosomes to chemical pretreatment varied from genus to genus as well as within the species and even within the varieties of the same species.

Pretreatment with a mixture of half saturated solution of aesculine and 0·002 M oxyquinoline (1 : 1) in cold (8° –14° C) proved effective in Hydrocotyloideae and Saniculoideae.

In the genera *Eryngium* and *Centella* however after fixation treatment with saturated solution of pectinase for 15 minutes at 60° C was necessary to get well-defined chromosome morphology.



FIGS. 1-5. Fig. 1. Somatic metaphase with $2n=22$ chromosomes in *Ammi majus*. Fig. 2. Somatic metaphase with $2n=38$ chromosomes in *Heracleum wallichii* D.C. Fig. 3. Somatic metaphse with $2n = 24$ chromosomes in *Coriaudrum sativum* var. $W.B_4$. Fig. 4. Somatic metaphase with $2n = 22$ chromosomes in *Coriandrum sativum*var. Madras. Fig. 5. Somatic metaphase with $2n = 16$ chromosomes in *Eryngium foetidum*.

Pretreatment with a saturated solution of L-bromonaphthhalene at 8–23° C for 75 minutes to 150 minutes proved satisfactory in members of the subfamily Apioideae.

For leaf tip chromosome preparations, an additional step after pretreatment, *viz.*, keeping in a mixture of Newcomers fluid and Carnoy's fluid (1 : 1) for 2–3 hours was very helpful in clearing the heavy cell content.

For feulgen staining of Umbelliferous materials standardization of time of hydrolysis (with N. HCl at 60° C) was found to be very important.

* References cited from recent compilation of Federov *et al.* [2].