

falcate and measured $20-55 \times 4.5-5.5 \mu$. Chlamydo-spores were intercalary and terminal. The isolate was identified as *Fusarium oxysporum* var. *redolens* (Wollenw.) Gordon at CMI, Kew (IMI 226585).

On the basis of morphological characters the isolate is considered intermediate between *Fusarium oxysporum* and *F. solani* but is differentiated from the former in having reddish-brown cultures with broader microconidia and thick walled macroconidia. Gerlach² studied 38 strains of *F. redolens* and concluded this species as a distinct one from *F. oxysporum*. Gerlach and Pag³ re-investigated this species and reverted to Wollenweber's original name, giving it the rank of species.

The pathogenicity was tried by burying tubers (bruised and unbruised) in the artificially infested soil with the test isolate and by directly inoculating the mycelium into the tubers through minor injuries. In fifteen days, bruised tubers infested soil and tubers directly inoculated with mycelium showed sinking of tissues around sites of inoculation which further progressed and developed wrinkles characteristic of dry rot. Results indicated that the pathogen could infect through injuries/bruising only. All the varieties/hybrid tested, viz., Kufri Jyoti, Kufri Chandramukhi, Kufri Sindhuri, Kufri Lavkar, Kufri Dewa, Kufri Alankar and SLB/Z 405a were susceptible.

Fusarium redolens is a well-known pathogen causing wilt, damping-off in seedlings and also cortical rot. It has been recorded in association with *F. oxysporum* f.sp. *pisi* causing wilt of broad bean and Pea⁴. Stem and root rot of carnation⁵ are also caused by this pathogen. So far there is no record of *F. redolens* on potato justifying this report a new one.

The author is thankful to the Director, CMI, Kew, for identification of the isolate. Sincere thanks to Dr. G. S. Shekhawat, Head, Division of Plant Pathology, for critically going through the manuscript. Research facilities received from Dr. B. B. Nagaich, Director, Central Potato Research Institute, Simla, are sincerely acknowledged.

November 11, 1980.

1. Anon, *Commonwealth Phytopathol. News.*, 1955, 1, 54.
2. Gerlach, W., *Phytopathol. Z.*, 1961, 42, 150.
3. — and Pag, H., *Ibid.*, 1961, 42, 349.
4. Hepple, S., *Nature (London)* 1960, 185, 333.
5. Kutova, I. and Petkova, M., *Abstr. in Review Plant Pathology*, 1977, 56, 915.

NAEMACYCLUS MINOR BUTIN, PHACIDIALES— A NEW RECORD FOR INDIA

M. P. SHARMA AND R. SHARMA

Botany Department, Panjab University
Chandigarh 160 014, India

DURING a survey of Inoperculate Discomycetes in the Central Himalayas, India, the senior author collected a fungus on fallen needles of *Pinus roxburghii* Sargent, belonging to the genus *Naemacyclus* Fuck. (Phacidiaceae) which constitute a new specific record for India. Only a single species of the genus *N. mulleri* Tilak and Kale, have so far been recognized by Bilgrami *et al.*¹ recorded by Tilak *et al.*² from Maharashtra State in India. The present fungus is quite close to *N. minor*, proposed by Butin³, included in Dennis⁴, "British Ascomycetes".

The collection has been deposited in PAN (Herbarium, Botany Department, Panjab University, Chandigarh, India) and CMI (Commonwealth Mycological Institute, Kew, Surrey, England).

Naemacyclus Fuck., in *Jahrb. Nass. Vereins f Naturkunde* 27-28, 49, 1873.

The taxonomic position of this genus is uncertain. Ainsworth⁵ and Bilgrami *et al.* (*l.c.*) included it in the order Ostropales. Following Dennis (*l.c.*) and Korf⁶, the species are treated in the order Phacidiales, which is more natural.

Type species *Naemacyclus niveus* (Pers. ex. Fr.) Sacc. in *Bot. Centralb.* 17, 251, 1884

Key to Indian *Naemacyclus* species

1. Ascocarps always on pine needles .. *N. minor*
2. Ascocarps on stems of *Anona squamosa* Linn. *N. mulleri**

Naemacyclus minor Butin, in *European J. Forest Pathology* 3, 160, 1973, Lit. Dennis 1978 (Fig. 1 A-D)

Ascocarps up to 0.7×0.4 mm, stone-coloured. Asci $81.2-114.8 \times 8.4-12.6 \mu$ m 8-spored, J-Ascospores $61-90 (-100) \times 2-3 \mu$ m hyaline Paraphyses filiform.

Collection examined: M. P. Sharma 11510 (PAN, CMI), on fallen needles of *Pinus roxburghii*, Kausani, alt. 1,750 m, Almora (Kumaon Hills), Uttar Pradesh, September 5, 1973.

Distribution: Europe, Great Britain, Asia (India).

Remarks.—This species was recently proposed by Butin (*l.c.*) and reported to occur frequently on needles of *Pinus sylvestris* L. The Indian populations are recorded on *P. roxburghii*, not previously known for the species. The species is generally mistaken with other *Lophodermium* Chev., species occurring on pine

* So far known only from Apsinga, Poona, Maharashtra (type locality).

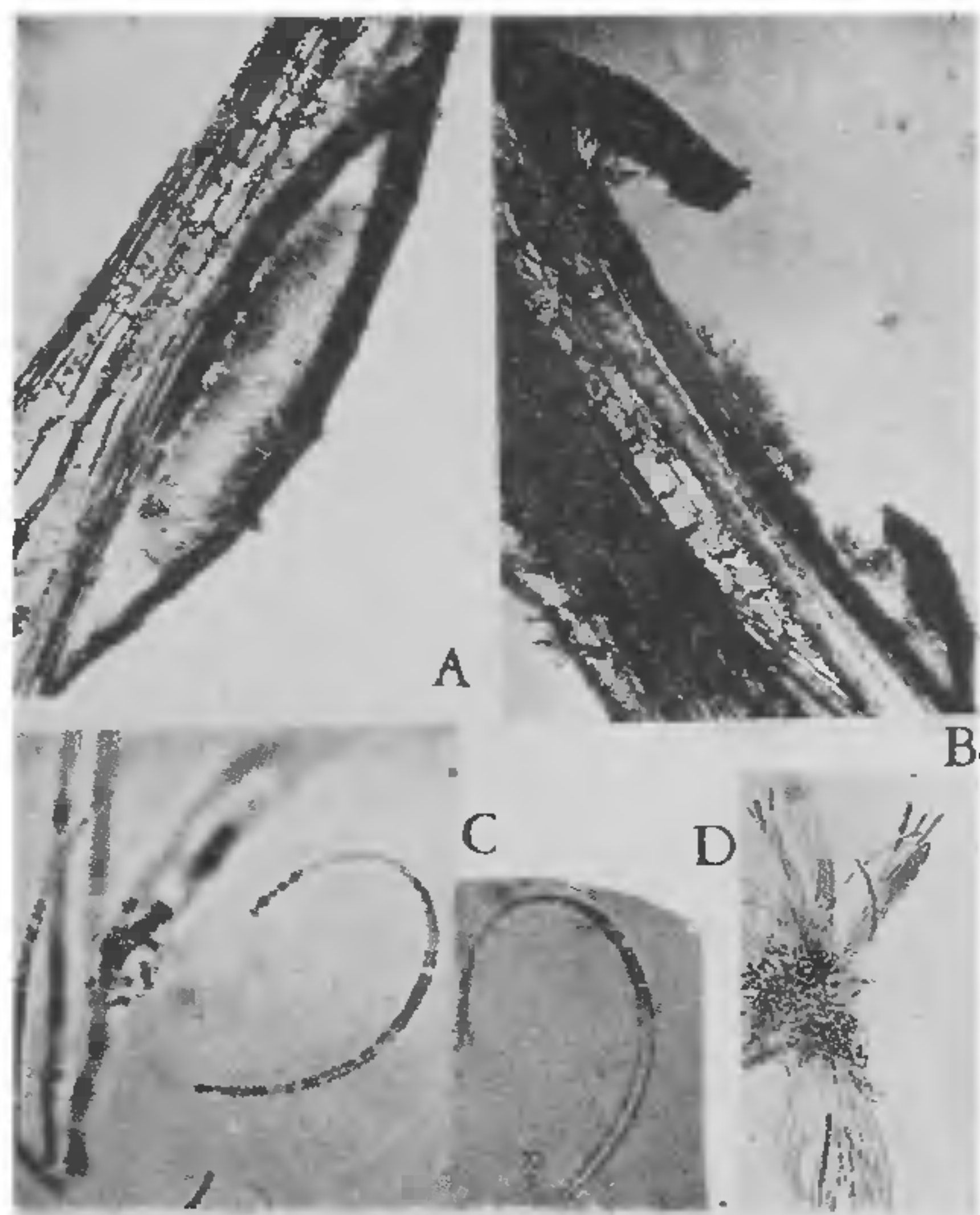


FIG. 1. *Naemacyclus minor* Butin, microphotographs. A. L.S. ascocarp showing hymenium and stromatized tissue, $\times 280$. B. L.S. of mature ascocarp passing through the centre showing flaps $\times 280$. C. Ascospores, $\times 1,120$. D. Ascus showing fascicle nature of the spores, paraphyses and young asci showing crozier development, $\times 560$.

needles. However, it is recognized by its stone-coloured ascocarps, needle surface turning brown, opening by two flaps, absence of the blackened clypeus and filiform 1-2 septate ascospores which are rounded at the ends and are strongly curved in the middle.

We wish to thank Dr. David W. Minter, CMI, England, for confirming the identification. Thanks are due to Prof. K. S. Thind (PAN) for encouragement and to Prof. H. S. Sohi, Chairman, Botany Department, Panjab University, Chandigarh, for providing the laboratory facilities. We are especially thankful to Dr. A. K. Sarbhoy, Curator, HCIO, New Delhi, for allowing us to examine collections for comparison and useful discussions.

December 1, 1980.

1. Bilgrami, K. S., Jamaluddin and Rizwi, M. A., *The Fungi of India*, Today and Tomorrow's Publishers, New Delhi, 1979.
2. Tilak, S. T., Jadav, V. K. and Kale, V. S., *Sydowia*, 1970, 24, 97.
3. Butin, *European J. Forest Pathology*, 1973, 3, 160.
4. Dennis, R. W. G., "British ascomycetes," *J. Cramer, Lehre*, 1978, pp. 585.

5. Ainsworth, G. C., *Dictionary of the Fungi*, CMI Publication, Kew, Surrey, England, 1971.
6. Korf, R. P., *The Fungi*, Academic Press, New York and London, 1973, 4A, 249.

TWENTY-FOUR NEW HOSTS OF THE COWPEA CROSS-INOCULATION GROUP

VIJAYALAXMI SHINDE

Department of Microbiology,
Maharashtra Association for the Cultivation of Science
Research Institute, Pune 411 004, India

THE cowpea 'cross-inoculation group' is the most cosmopolitan group since it includes hosts ranging from cultivated annual pulse legumes to wild perennial creepers, shrubs and trees adapted to different climatic conditions.

In the present studies, rhizobial organisms were isolated from ten new wild nodulated legumes reported by Bhelke¹ and from fourteen more wild legumes previously known to be nodulated. After proving Koch's postulates, these 24 rhizobial organisms were separately inoculated to the seeds of chavli (*Vigna unguiculata*) and sown in sand in pot culture. The plants were fed with Bryan's modified Crone's nitrogen-free solution for a period of 45 days, i.e., till flowering stage. Afterwards, the roots of the plants were washed free of sand with water and it was observed that in all cases, tap roots were nodulated.

The 24 rhizobial organisms failed to nodulate authentic hosts of "Clover, Alfalfa, Bean, Pea and Soybean cross-inoculation groups. Moreover, rhizobial organisms of the above-mentioned groups, viz., *Rhizobium trifolii*, *R. meliloti*, *R. phaseoli*, *R. leguminosarum* and *R. japonicum* failed to nodulate the 24 wild legumes.

It is thus conclusively proved that the twenty-four wild nodulated legumes, viz., *Alysicarpus monilifer*, *A. belgaumensis*, *A. tetragonolobus*, *Clitoria biflora*, *Crotalaria filipes*, *C. nana*, *Cassia pumila*, *Dalbergia sympathetica*, *Desmodium laxiflorum*, *Geissaspis cristata*, *Goniogyna hirta*, *Indigofera glandulosa*, *I. stipularis*, *Psoralea corylifolia*, *Smithia blanda*, *S. capitata*, *S. conferta*, *S. hirsuta*, *S. purpurea*, *S. pycnantha*, *S. sensitiva*, *S. setulosa*, *Vigna khandelensis* and *V. radiata* var. *sub-lobata* belong to the cowpea cross-inoculation group.

Thanks are due to the Director, M.A.C.S. Research Institute, for the facilities and also to the C.S.I.R. for Junior Research Fellowship. Thanks are also due to Dr. Y. S. Kulkarni, Hon. Professor of Microbiology, M.A.C.S., for guidance.

November 21, 1980.

1. Bhelke, V., *Curr. Sci.*, 1972, p. 467.