TABLE I

Foam spora

Fungal species	Frequency
Alatospora acuminata Ingold	RA
Beltrania sp.	RA
Chaetospermum elasticae Koorders	RA
Clavariopsis bulbosa Anastasiou	RA
Diplocladiella scalaroides Arnaud	FA
Lunulospora curvula Ingold	MA
Robillarda sessilis Sacc.	RA
Tetraploa aristata Berk. and Br.	MA
Triscelophorus monosporus Ingold	MA
Ascomycete spores	RA

MA—More abundant; FA—Frequent appearance; RA—Rare appearance.

All the fungi observed have been listed in Table I in relation to their abundance. It is evident that *Diplocladiella scalaroides*, *Lunulospora curvula*, *Tetraploa aristata* and *Triscelophorus monosporus* were either abundant or more frequent than other fungal spores. The conidia of *L. curvula* and *T. monosporus* were observed in foam and scum samples of rapidly flowing unpolluted stream of Kambakkam hills[2]. Spores of *Clavariopsis bulbosa* and *Alatospora acuminata* were less frequent in appearance. Few spores of *Beltrania* sp., *Chaetospermum elasticae*, *Robillarda sessilis* and an unidentified ascomycete were also found in foam samples investigated. Among the fungi listed in Table I, *A. acuminata*, *C. bulbosa*, *D. scalaroides* and *L. curvula* are regarded as fungi of aquatic origin, while others have been classified as extra-aquatic.

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FUSARIUM REDOLENS WOLLENW.— A NEW PATHOGEN OF POTATO

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IN April 1978, freshly harvested tubers of Kufri Jyoti were found to be seriously affected with *Fusarium* sp. Studies were carried out on the identification of the species and its pathogenicity on different potato varieties/hybrid.

The infected tubers developed circular lesions (1·0 cm dia) on the surface (Fig. 1), rotting of the bruised surface and dry rot patches. Within a week these developed typical dry rot symptoms with characteristic circular wrinkles on the affected areas when incubated at 20° C. Sporodochial pustules were also formed when incubated at 50–70% RH. On cutting, the underneath flesh showed light to dark brown discolouration.

Small infected pieces from disease samples were surface sterilized and placed on PDA. From all infected pieces only one type of fungal colonies grew. Colonies had relatively flat aerial mycelium and produced a pale reddish-brown colour in the medium. The surface of the colonies turned powdery in appearance due to subsequent sporulation. Microconidia formed on phialides were oval to cylindrical and measured 7–14 × 3·2–4·0 μ. Macroconidia were 3–5 septate,

FIG. 1. Tuber infected with *F. redolens* showing dark circular lesion.

falcate and measured 20–55 × 4·5–5·5 μ. Chlamydospores 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. Gerlach[2] studied 38 strains of *F. redolens* and concluded this species as a distinct one from *F. oxysporum*. Gerlach and Pag[3] 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/bruisings only. All the varieties/hybrid tested, *viz.*, Kufri Jyoti, Kurfi Chandramukhi, Kufri Sindhuri, Kufri Lavkar, Kufri Dewa, Kufri Alankar and SLP/Z 405*a* were susceptible.

Furarium 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 Pea[4]. Stem and root rot of carnation[5] are also caused by this pathogen. So far there is no record of *F. redolens* on potato justifying this report a new one.

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NAEMACYCLUS MINOR BUTIN, PHACIDIALES—A NEW RECORD FOR INDIA

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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 Butin[3], included in Dennis[4], "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. Ainsworth[5] and Bilgrami *et al* (*l.c.*) included it in the order Ostropales. Following Dennis (*l.c.*) and Korf[6], 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 × 8·4–12·6 μm 8-spored, J-Ascospores 61–90 (–100) × 2–3 μm 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).