160–230 μ broad ; ostioles not very distinct : situated below upper epidermis as well as lower epidermis (Fig. 1 *b*). Hymenium basal ; asci clavate, bulged in the middle, 45–50 μ high and 8–16·5 μ broad ; ascospores arranged haphazardly in the ascus (Fig. 1 *b* and *c*). Ascospores elliptical, 7–8·5 μ in diam. (Fig. 1 *d*). Paraphyses basal as well as pendent from the roof of perithecia (pseudoparaphyses -apical paraphyses). Basal paraphyses projecting beyond the asci, apical reaching upto the base of asci, 1·1·5 μ broad (Fig. 1 *b*). Peridium loose, pseudoparenchymatous, dark and distinct except in the basal region (Fig. 1 *b*).

On living leaves of *Oryza sativa* L. water-logged variety (Gramineae), Bichhia fields, Gorakhpur, October 1973, Leg. Y. N. Srivastava.

Phyllachora gorakhpurensis, Srivastava et Bhargava, Spec. nova.—Perithecia perpendiculum compressa ; levis ovata, 100–130 μ alta et 160–230 μ lata ; ores non distincti ; situata et sub superam epidermen et super inferam epidermem. Hymenium inferum ; asci clavati, extensi in medio, 45–50 μ alti et 8–16 μ lati ; ascospores ordinati casu in asco (Fig. 1 *b* et *c*). Ascospores ellipticales, 7–8·5 μ in diameteriores (Fig. 1 *d*). Paraphyses et inferi et penduli a tectu peritheciae (pseudoparaphyses-paraphyses apicales). Inferiores paraphyses ultra ascum, apicales attingentes lasum asci, 1–1·5 μ lati (Fig. 1 *b*). Peridium mobile pseudoparenchymatous, niger et distinctus praeter in inferiore parte (Fig. 1 *b*).

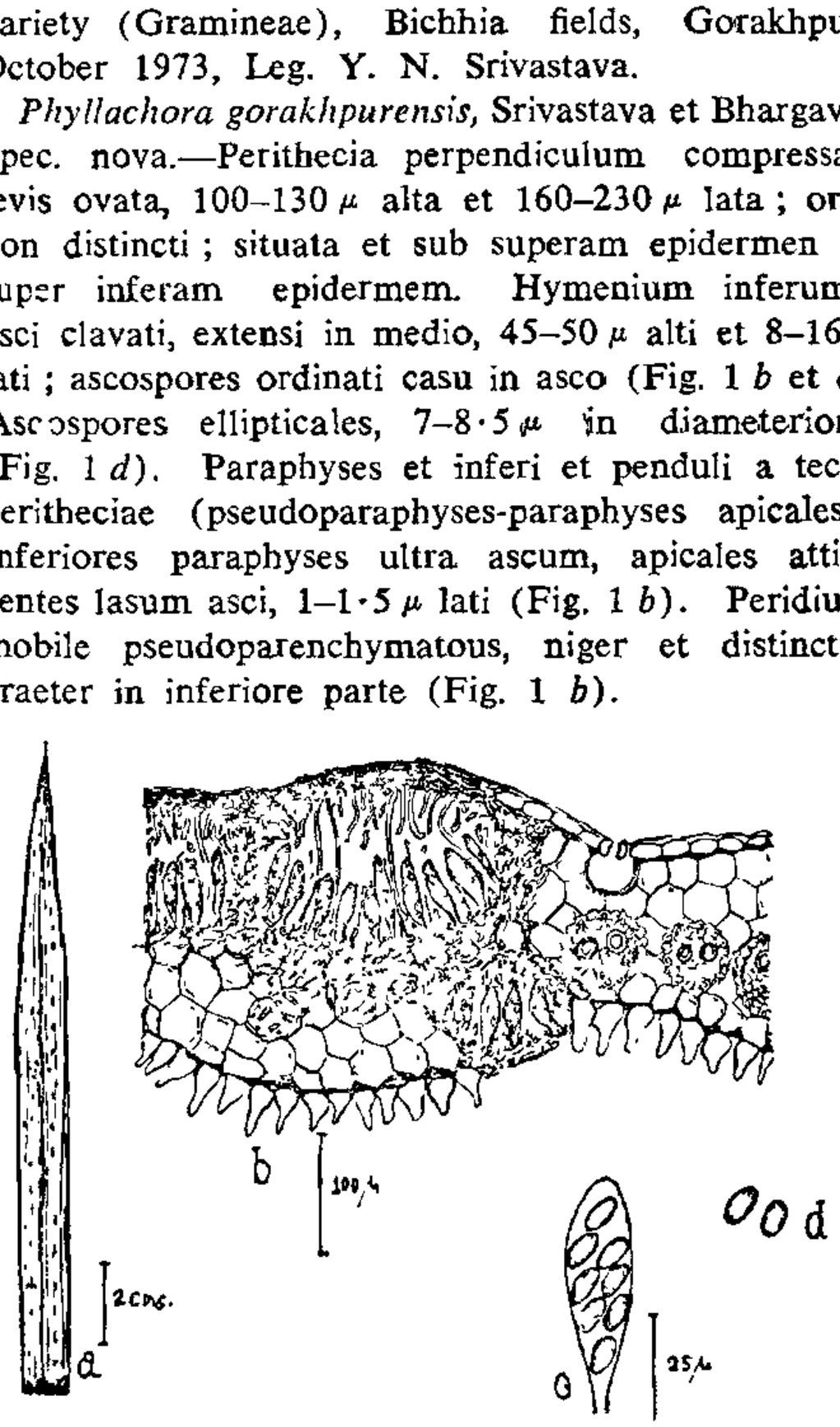

FIG. 1. *a,* Infected *Oryza sativa* leaf showing tar spots. *b,* V.T.S. of the host leaf through tar spots showing perithecia. *c,* Single ascus. *d,* Ascospores.

In viventibus foliis *Oryzae sativae* L. aquae collectae (Gramineae), in agris Bichhiae, Gorakhpur, mense Octoberi 1973, Leg. Y. N. Srivastava.

The type specimen has been deposited in the Herb. I.M.I., Kew, at No. 187024.

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STIGMATIC EXUDATES AND PLANT STERILITY: A CHROMATOGRAPHIC AND SPECTROPHOTOMETRIC STUDY

THE use of ultraviolet spectrophotometry in the analysis of stigmatic exudates has been reported by Martin[1,2] and others[3,4,5]. The authors also observed[3,6], in the UV profiles of the stigmatic exudates of a sterile mutant of *Impatiens sultani,* the absence of a peak characteristic of fertile plants. A summary of the data, obtained from a spectrophotometric and chromatographic analysis of a variety of mutants of *Impatiens,* presented here suggest a positive correlation between stigmatic exudates defective of some compounds absorbing UV light in the 250–300 nm region and plant sterility.

Association of specific UV peaks and fertility was tested in a dozen varieties of *Impatiens* available in our Botanical Gardens, but four colour mutants of *I. sultani* (known as 'Pink', 'Crimson', 'Orange' and 'Magenta') and one of *I. heddomei* (called 'White') showing various degrees of sterility were chosen for a detailed study. *In vitro* germination tests indicate that the approximate pollen viability of mutants vary from 2% in Pink to almost 100% in Magenta. Fruit setting is observed in Magenta, Crimson and Orange while Pink and White are sterile. *In vivo* observations revealed that viable pollen germinate on the stigmas of Magenta, Crimson and Orange but not on those of White and

Pink. For convenience, the former are referred to here as fertile and the latter as sterile.

UV absorption spectra of stigmatic exudates was studied by immersing 25 stigmas of each mutant into 4 ml of ethanol for 10 sec. Stigmatic surfaces do not show any sign of damage as a result of this treatment. The extracts showed constant and repeatable profiles when analyzed in a Beckman DU_2 Spectrophotometer. All mutants showed high absorbance and discernible peaks in the region below 250 nm but this had been reported for all genera and species examined by Martin[1] and others[4,5,6] and therefore has no relevance in comparisons. All fertile mutants, living either in natural habitats or in green houses, yielded similar results with respect to the principal peak around 260 nm with a red shift of less than 10 nm in alkaline extracts. By contrast, the sterile mutants—Pink and White—do not reveal any peak in the 250–300 nm region indicating the absence of compounds that absorb light in this range. Absence of these compounds from the stigmatic exudates is associated with their failure to support stigmatic pollen germination and consequent failure to set seeds.

For chromatography, ethanolic extracts from 500 stigmas of each mutant were used. Of the different solvent systems employed in descending paper chromatography, *n*-butanol-acetic acid-water (4 : 1 : 5) mixture was found to be most suitable. R_f values of spots were taken as the average of six replicated extraction and chromatography series. The mutants showed variations in the number, the size and the distribution of spots. Various location reagents showed strong presence of anthocyanins in Crimson, while traces of free sugars were detected in Orange. However, the outstanding difference noted in the chromatograms of various mutants was the absence of spots 2 and 3 in sterile mutants (Table I).

TABLE I

UV absorption peaks and R_f values of stigmatic extracts of Impatiens *mutants**

	Orange (*Fertile*)			*Pink* (*Sterile*)		
	R_f values	Absorption peak (nm)		R_f values	Absorption peak (nm)	
		Without NaOH	With NaOH		Without NaOH	With NaOH
Crude extracts	..	261	270	..	..	..
Spot 1	0·29	279	280	0·29	279	279
Spot 2	0·49	246	No peak	..	..	..
		272	No peak	..	..	..
		300	290	..	..	..
Spot 3	0·60	278	282	..	..	..
Spot 4	0·86	277	285	0·86	277	284

* Data from a representative of fertile (Orange) and sterile (Pink) mutants only are given in this table. Other mutants belonging to both categories have similar values.

Spots 1–4 were cut out from the chromatograms, eluted in ethanol and spectrophotometrically analyzed. Eluates of all spots show specific peaks. Screening the alkaline extracts shows no shift or no peaks in some cases while others record positive or negative shifts. As summarized in Table I, spectral data suggest the absence of four species of compounds in the stigmatic exudates of sterile mutants. Responses of spots to various colour tests, cited by Harborne[7] and the small bathochromic shifts of the eluates imply that some of these compopunds are simple phenolics but further characterization was not possible.

The point of interest here is the total absence, or presence only in low concentrations, of compounds

of spots 2 and 3 in sterile mutants. This absence is associated with lack of pollen germination and seed setting. It has already been reported[6] that the sterility of Pink is not due to aberrations in megagametogenesis but due to failure of fertilization. For this paper, we followed the embryological events of other mutants and found that the sequences, in all of them are parallel until the time of pollination, after which the ovules of sterile mutants gradually aborted. In addition, the present study showed that intraovarian pollination failed to develop seeds both in fertile and sterile mutants. Perhaps this emphasizes the importance of stigmatic surfaces in pollen germination. In recent years, stigmatic surfaces[8], pollen emissions[9], and pollen wall degradation[10] have received attention from the angle of pollen-pistil interactions. Studies on female sterility and incompatibility do not usually take into consideration the role of defective stigmatic fluids; we suggest that this aspect is worthy of further investigation.

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A NEW SPECIES OF *PHYLLOSTICTA* CAUSING LEAF SPOT OF *NYCTANTHES ARBOR-TRISTIS*

This leaf spot disease was earlier described by the authors[1]. The pathogen, *Phyllosticta* sp., has been compared with other known species and it has been found to be a new taxa. It attacks the leaves of *Nyctanthes arbor-tristis* L. Its morphological characters have been recorded on Asthana and Hawkers medium 'A'. It has been named *Phyllosticta azadii* sp. n. after Shri Chandrashekher Azad.

Phyllosticta azadii sp. n.

Pycnidia were observed on older spots. Hyphae septate, buffy brown, branched, 2·84–4·26 μ in thickness; pycnidia olive-brown, ostiolate, mostly globose, 92·3–143·42 μ in diameter (Fig. 1 A and B); conidiophores short, hyaline; conidia hyaline, one-celled, oval to cylindrical, 2·84–7·10 × 1·42–2·84 μ in size (Fig. 1 C).

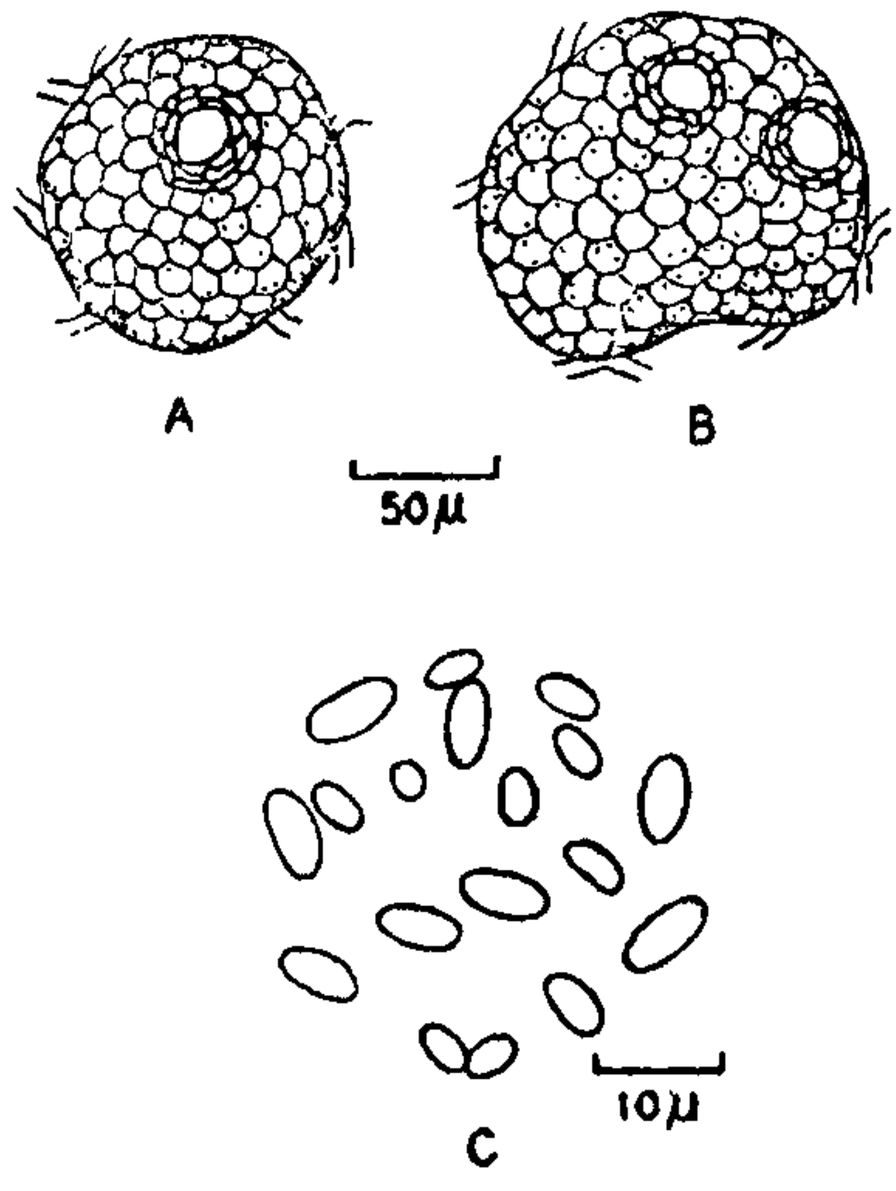

FIG. 1. *Phyllosticta azadii*—A, a single pycnidium; B, two pycnidia fused and C, conidia.

The type species was collected from Chandrashekher Azad Park, Allahabad, India. It infected the leaves of *Nyctanthes arbor-tristis* L. The type culture has been deposited in CMI, Kew, England, No. IMI. 137489.

Inoculations of this species were successful on the leaves of other garden and wild plants growing in the vicinity. Most of them, *Alocasia* sp., *Bougainvillea spectabilis, Jasminum arborescens* and *Jasminum sambac* as well as *Achlypha indica* and *Boerhaavia diffusa* were susceptible to this infection.

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