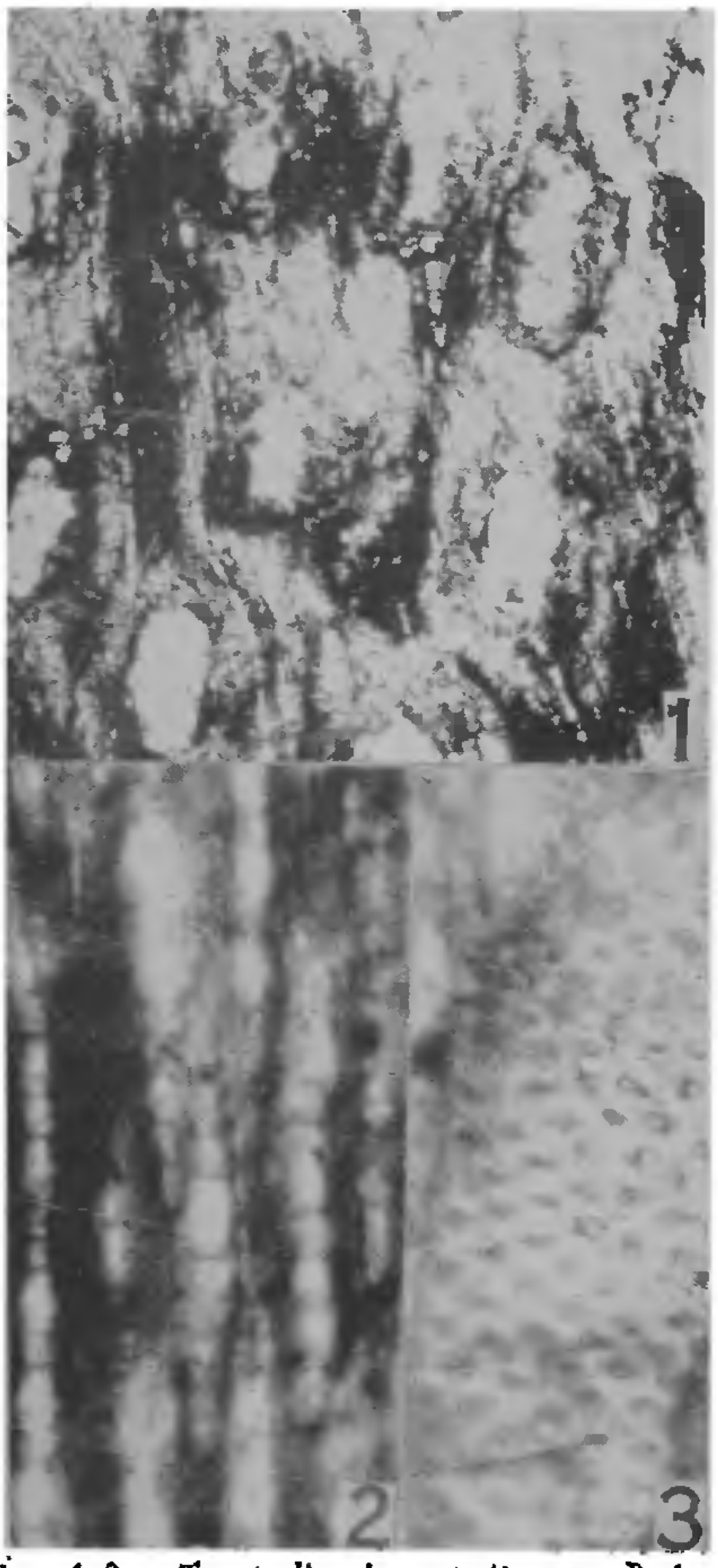
2–6 *per sq. mm*; vessel *members short to medium* sized, 160–560 μ in length; perforation simple with truncate ends; *intervessel* pits vestured (Fig. 3). *Parenchyma* vasicentric to usually aliform, sometimes confluent, *xylem rays* fine; uniseriate, closely spaced (Fig. 2); 2–25 cells high and 76–525 μ in length; homocellular; enlarged crystalliferous cells commonly present. *Fibres* non-*libriform*, often septate.



FIGS. 1–3. *Terminalioxylon tertiarum* Prakash. Fig. 1. Cross-section of the fossil wood showing the vessel and parenchyma, × 30. Fig. 2. Tangential longitudinal section showing xylem rays, × 100. Fig. 3. Vestured intervessel pits, × 500.

The fossil wood is identical to already known species *Terminalioxylon tertiarum* Prakash, described from Namsang River Bed, Nafa[1], Buri Dehing River bed, Assam[2] and Hailakandi, Assam[3].

Specimen No. P_{10}, Department of Botany, University of Burdwan, Burdwan, West Bengal, India.

Locality : Silabati River bed, two miles north of Gerbeta Town, Midnapur District, West Bengal.

Age : *Miocene.*

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PRODUCTION OF CELL WALL DEGRADING ENZYMES BY TWO SEED-BORNE FUNGI

SEED-BORNE *fungi make the seeds unconsumable,* unviable and cause diseases at seedling and adult stages[1]. Though there have been a number of studies dealing with changes in food reserves[2–6] under the influence of fungi, only a few reports exist to elucidate the role of hydrolytic enzymes that facilitate the infection of the seed and hydrolysis of its complex reserve *food*[7,13]. Hence, enzymatic potentialities of two seed-borne fungi was assayed and their role in the deterioration of mung seeds is discussed.

Monosporic cultures of *Phoma exigua* Desm. and *Graphium penicillioides* Corda. isolated from decaying seeds of *Phaseolus aureus* Roxb. and *Cyamopsis tetragonaloba* Taub. *respectively maintained on PDA were* employed in the present study. The fungi were grown in 25 ml of Asthana and Hawker's medium 'A' (pH 5·5) suspended in 100 ml Ehrlenmeyer conical flasks and incubated at 27 ± 2° C. At the end of each incubation, cultures were harvested and the filtrate was used as an enzyme sample after centrifugation at × 1,800 g and dialysis. Different enzymes, *viz.*, cellulolytic[8], pectinolytic[9–10], α-amylase[11] and proteolytic[12] were assayed employing standard methods and the results obtained are presented in Table *I*.

It is evident from Table I that the present fungi were poor cellulolytic. This is contrary to the observations of Prasad[13] who reported substantial amounts of cellulases by the *Coriander* seed-borne fungi. Both the fungi were capable of elaborating pectinolytic enzymes which differed in the degree as well as time of its production. The fungi under study were incapable of secreting these enzymes by 4th day. Increasing trend of enzyme activity continued till the end of incubation. Pectin was degraded both hydrolytically and transeliminatively. Transeliminase activity was, however, witnessed only in the latter part of the incu-

TABLE I

Production of different hydrolytic enzymes in Asthana and Hawker's medium 'A' by two seed-borne fungi

Fungal organisms	Days of incubation	Cellulolytic	Pectinolytic					Amylolytic****	Proteolytic+
		C*	PL*	PAL*	PG*	PME**	PG***		
P. exigua	4	..	...	..	..	..	..	..	15·0
	8	6·66	11·33	7·33	..	0·086	64·5	0·0238	53·0
	12	14·81	20·00	10·66	44·13	0·170	77·5	0·0293	41·0
G. penicillioides	4	3·71	..	..	..	..	..	..	8·0
	8	4·44	1·33	6·00	..	0·086	22·5	0·0130	13·0
	12	13·33	4·15	20·00	21·33	0·132	28·5	0·0277	15·0

* Expressed in Relative Enzyme Activity (REA = $1000/tv_{60}$).
** Number of methoxyl groups split by 1 ml of enzyme.
*** Expressed as the amount of glucose liberated in μg/ml during 6 hours of incubation.
**** Units of α-amylase activity (hydrolysed starch in 30 minutes of incubation).
\+ Activity in units of tyrosine standards (0·5 μg/ml = 1 unit).

bation. In general *P. exigua* secreted more pectinolytic enzymes than *G. penicillioides*.

Amylolytic enzymes were also secreted by both the fungi. However, the enzyme production was significant from 8th day onwards and showed increasing trend till the end of incubation period tried. Proteolytic enzymes were also elaborated. *P. exigua* secreted maximum amount of enzyme on 8th day, while *G. penicillioides* on 12th day.

These studies show that the fungi under study are capable of elaborating all the hydrolytic enzymes which facilitate in colonization of seeds. Rich protein level in host is possibly responsible for good activity of proteolytic enzymes. The results also reflect that *P. exigua* will be more successful pathogen than *G. penicillioides* due to superior enzymic potentialities.

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CHROMOSOME NUMBERS IN TWO SPECIES OF *OPUNTIA*

Two species of *Opuntia*, *O. monacantha* Haw. and *O. dillenii* Haw., have been cytologically investigated with respect to their karyological differences. The taxa share several exomorphic characteristics except for the number of spines in each hump, which in *O. monacantha* is invariably one and long and in *O. dillenii* not less than 4 or 5.

The healthy root tips were pre-treated with 0·002M hydroxyquinoline for 2–3 hours at 10–15° C and,