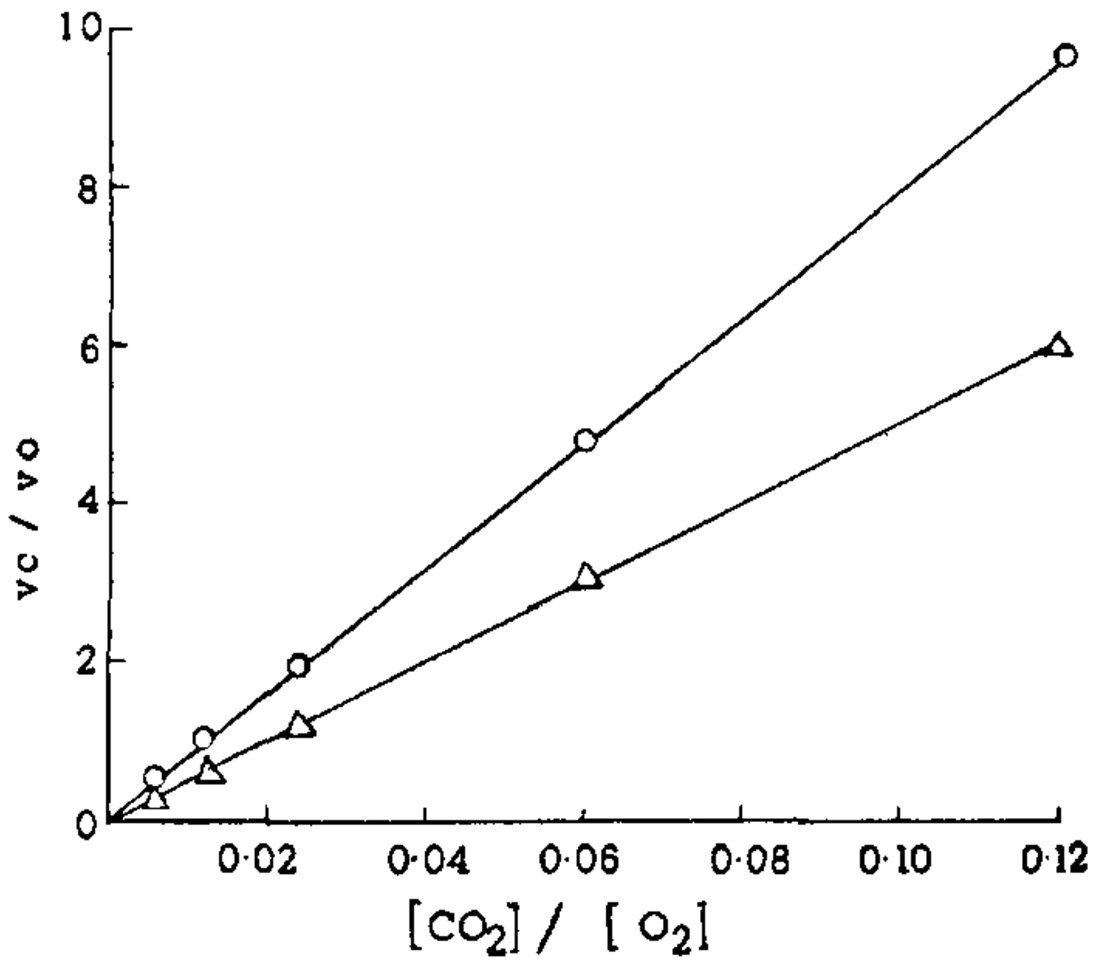

Figure 1. Effect of urea on the ratio of RuBP carboxylase to oxygenase (vc/vo) plotted against the ratio of $(CO_2)/(O_2)$ concentration present during assay. Control ○, with urea △.

The substrate specificity factor, Vc Ko/Vo Kc, determines the relative rates of two reactions at any given CO_2 and O_2 concentrations[1]. A high specificity value indicates a greater specificity for CO_2. Both the enzyme activities assayed simultaneously under several $(CO_2)/(O_2)$ values permit direct determination of the specificity factor. The specificity factor calculated from the slope of this plot was found to be 80. Similar value has been reported for other C_3 plants[5]. Urea treatment decreased the specificity factor to 50.

It has been argued that RuBP carboxylase/oxygenase cannot completely discriminate between CO_2 and O_2, so that photorespiration is unavoidable[6,7]. However, Rubisco enzyme from diverse species showed substantial differences in CO_2/O_2 specificity and that carboxylase/oxygenase ratio increased during the natural evolution of photosynthesis[8]. Furthermore, Mn^{2+} [9], and temperature[1] have been shown to alter the ratio of two activities. The present study indicates that urea also alters the carboxylase/oxygenase ratio.

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INHERITANCE OF PERICARP COLOUR IN RICE, *ORYZA SATIVA* LINN.

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INHERITANCE of pericarp colour in rice has been studied earlier and genetical ratios 3r : 1w[1–6], 12p : 3r : 1w[1], 9p : 6b : 1w[7], 9p : 3b : 4w[8,9] and 15w : 1r[10,11] have been reported. A genic scheme for pericarp colouration has also been proposed[12]. The present study reports the inheritance of purple pericarp.

Inheritance of purple pericarp was studied in Jaya × 7019 and Jaya × 7010 up to F_3 generation. Jaya has white pericarp, 7019 and 7010 and the markers supplied by Dr Nelson E. Jodon of the USDA Louisiana, have purple pericarp.

F_1 showed purple pericarp (dominant) in both crosses and the F_2 population of 274 plants of Jaya × 7019 segregated into 176 purple : 98 white, giving a good fit to the ratio 162 : 94 with $\chi^2 = 0.11$; the F_2 population of Jaya × 7010 segregated into 438 purple : 148 white, giving a good fit to 3 : 1 with $\chi^2 = 0.02$ (table 1). The ratios were confirmed by the breeding behaviour of families in F_3 generation.

Out of 50 F_3 families of Jaya × 7019 studied, 1 bred true for purple, 11 segregated for 3 : 1, 11 for 9 : 7, 2 for 15 : 1, 1 for 27 : 37, 2 for 45 : 19, 2 for 54 : 10, 4 for 162 : 94 and 16 bred true for white pericarp, giving a good fit to the expected ratio with $\chi^2 = 11.48$ for 8 d.f., and out of 89 F_3 families of

Table 1 *Inheritance of purple pericarp*

Cross	Parents ♀	Parents ♂	F1	O/E	F_2 frequency +	F_2 frequency −	Total	χ^2	Ratio	P
Jaya × 7019	−	+	+	O	176	98	274			
				E	173.39	100.61	274	0.11	162 : 94	0.80–0.70
Jaya × 7010	−	+	+	O	438	148	586			
				E	439.50	146.50	586	0.02	3 : 1	0.90–0.80

+ purple pericarp; − white pericarp.

Table 2 *Breeding behaviour of F_3 families*

Cross	Expected ratio	O/E	Breeding behaviour of F_3 families: True dominant	F_3 families segregated into: 3 : 1	9 : 7	15 : 1	27 : 37	45 : 19	54 : 10	162 : 94	True recessive	Total	χ^2	P
Jaya × 7019	10 : 32 : 36 : 12 : 24 : 24 : 8 : 16 : 94	O	1	11	11	2	1	2	2	4	16	50		
		E	1.95	6.25	7.03	2.34	4.69	4.69	1.56	3.13	18.36	50	11.48	0.20–0.10
Jaya × 7010	1 : 2 : 1	O	30	43	—	—	—	—	—	—	16	89		
		E	22.25	44.50	—	—	—	—	—	—	22.25	89	4.63	0.10–0.05

Jaya × 7010, 30 bred true for purple, 43 segregated for 3 : 1 and 16 bred true for white pericarp with $\chi^2 = 4.63$ for 2 d.f., thereby confirming the F_2 observation (table 2).

The results show that purple pericarp is controlled by 1 and 4 dominant genes in the two crosses. The ratio 162 : 94 points to complementary genic interaction of four genes, of which one is basic and complementary to any two of the other three complementary genes to produce purple pericarp in rice. This appears to be a new report on purple pericarp in *indica* rice and is corroborative to the complementary genic scheme proposed earlier[9,12].

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TORREYITES SITHOLEYI, A NEW RECORD FROM THE GANGAPUR FORMATION OF ANDHRA PRADESH

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THE paper records *Torreyites sitholeyi* in the Lower Cretaceous (Neocomian-Aptian) Gangapur Formation of the Pranhita—Godavari basin, Andhra Pradesh. The fossil specimen has been collected from the Gangapur sediments near Rallapet (19°19′; 79°25′), about 1 km from the Rebna on the Rebna—Kagaznagar Road in Adilabad District. *Torreyites* was collected from the fine-grained cream to whitish clay in a quarry at Rallapet.

Genus: *Torreyites* Seward 1919
Torreyites sitholeyi Ganju 1947 (figures 1 and 2)

Description: Vegetative shoot 7.5 cm long. Leaves spirally arranged, linear, lanceolate, 2–2.3 cm long, 1–1.5 mm broad, base decurrent and constricted, apex acute, margin entire, midrib distinct.

Comments: Only two species of *Torreyites* i.e. *T. constricta*[1] and *T. sitholeyi*[2] are known to date from India. The former is from the Sriperumbudur beds of Palar basin, while the latter is from the Rajmahal hills, Bihar.

The present species *T. sitholeyi* differs from *T. constricta* in having the leaves with pointed apex.

Torreyites shows apparent similarities with the leafy twigs of *Torreya* of Taxaceae. The fossil specimen is deposited in the Palaeobotany-Palynology Laboratory of P. G. College of Science, Saifabad, Hyderabad.

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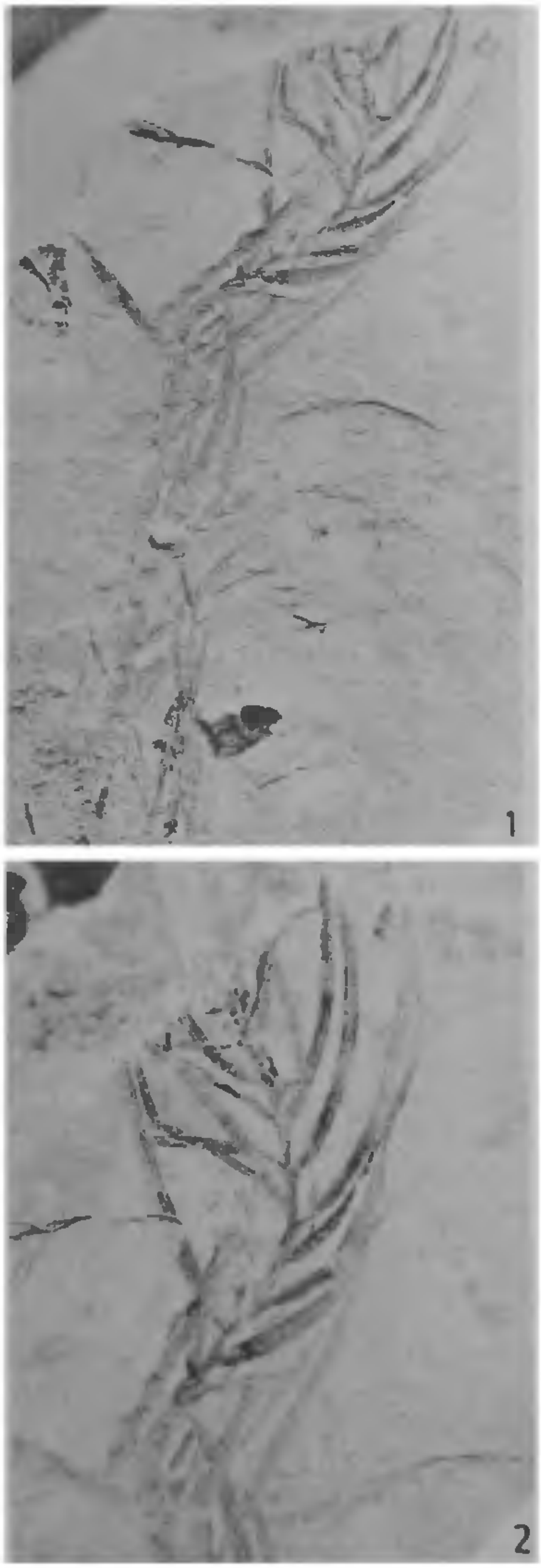

Figures 1 and 2. *Torreyites sitholeyi* (**1.** × same size; **2.** × 1½).

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