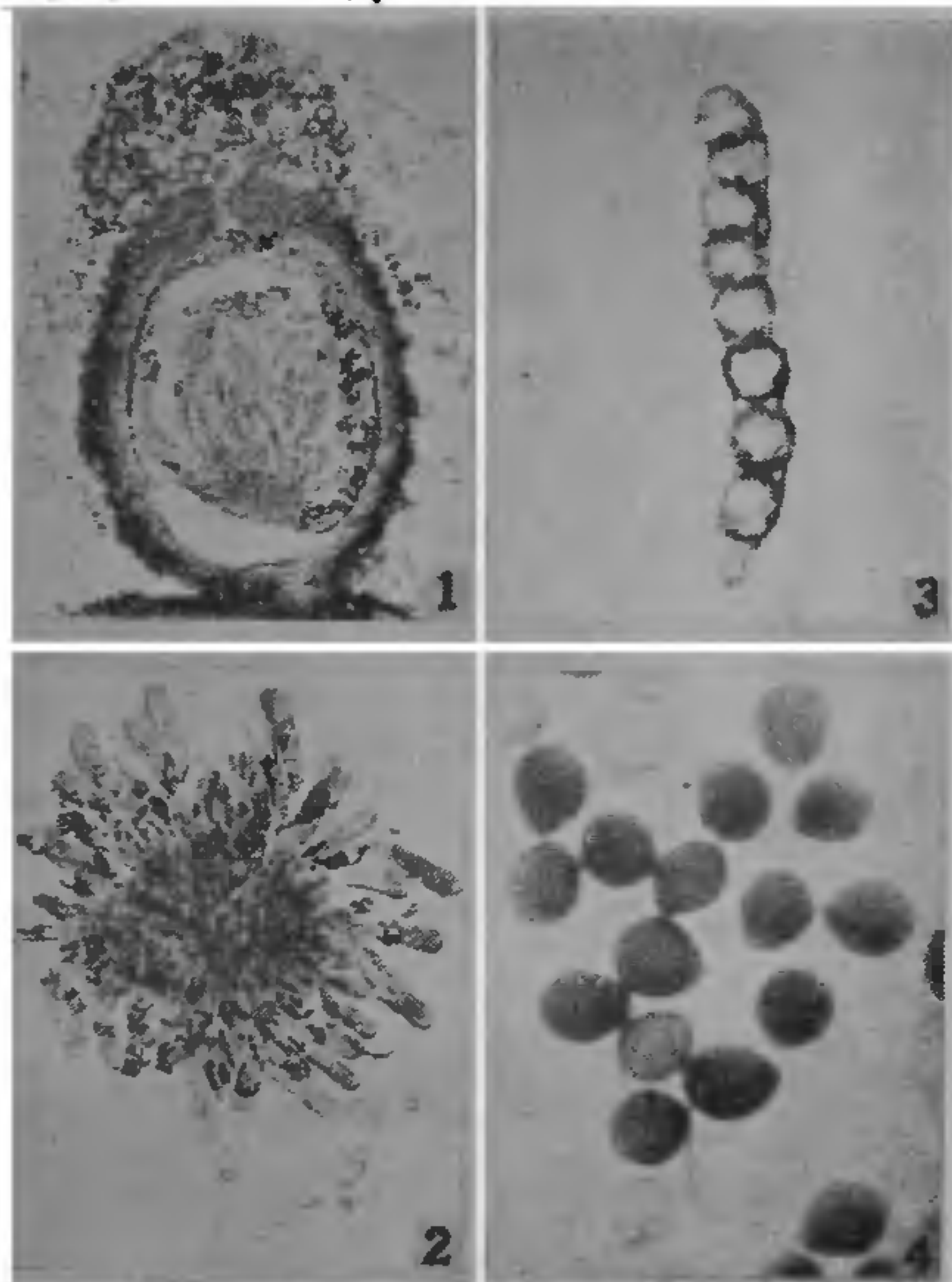


250.0-288.0 μ \times 216.0-250.0 μ . Asci octospori, fasciculati, Clavati, evanescentes, stipitati, aperi, generatim, 76.8-88.0 μ \times 10.0-14.4 μ . Ascosporae extrusae informa amygdolae et in uno termino apiculatae, irregulariter et binae dispositae in teneris ascis et postmodum uniseriatae adveniunt, griseo-brunneae, 16.0-16.8 μ \times 11.6-12.8 μ .



FIGS. 1-4. *Achaetomium unispiculatum* spec. nov. Fig. 1. Section of the mature ascotarp showing extrusion of ascospores, \times 125. Fig. 2. Ascus tascicle from squash mount, \times 140. Fig. 3. Ascus, \times 510. Fig. 4. Ascospores, \times 560.

Haec seiunctae fuerunt mense Junii, 1970, ab horti humo, in Indore, India, collecto. Dry cultura holotypus positus in herbario mycologico, sectione botanica, Universitatis lucknowensis, Lucknow, India.

Colonies on oatmeal agar moderately fast-growing, attaining a diameter of 7.0 cm in 4 days at 28° C, mycelium slightly pinkish with white margins, reverse brownish-black in the fruiting areas, reverse agar closely approaching 'Garnet-Brown (00918)'. Ascocarps usually in groups, rarely dispersed, measuring 250.0-288.0 μ \times 216.0-250.0 μ . Asci clavate, shortly stipitate, aporate, deliquescent at early stage, unincrusted and fascicled, 8-spored commonly 76.8-88.0 μ \times 10.0-14.4 μ . Ascospores arranged irregularly biserially in younger asci, later on becoming uniseriate, greyish-brown, 16.0-16.8 μ \times 11.6-12.8 μ , almond-shaped, apiculate at one end with a single pore.

Isolated in June 1970, from garden soil (pH 7.0) collected from Indore, India. Type in the form of dried culture deposited in the Department of Botany, Lucknow University, Lucknow.

The authors are grateful to Mother Cyril for the Latin diagnosis and to the U.S. PL 480 authorities for the financial assistance.

Dept. of Botany, Lucknow University, Lucknow, April 16, 1971.
J. N. RAI.
H. J. CHOWDHURY.

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HETEROTIC RESPONSE FOR PERCENT GRAIN PROTEIN AND PELSHANKY VALUE IN BREAD WHEAT

THE discovery of cytoplasmic-genic male sterility^{4,9} and its fertility restoring mechanism⁶ in bread wheat (*Triticum aestivum* L. em. Thell.) stimulated the interest of plant breeders towards the commercial exploitation of hybrid vigour in this crop. The manifestation of heterosis for grain yield in wheat has been reported by several workers.^{1,3,7,8} However, limited attention has so far been paid towards the study of heterotic response for the quality characters. The success of hybrid wheat would also depend upon the quality of its grain, as it is an important source of human nutrition. In the present investigation, the extent of heterosis for per cent grain protein and pelshanky value has been observed in 8 \times 8 diallel crosses.

The experimental material for this investigation comprised of eight wheat cultivars (S 210, S 386, Kalyan Sona, Safed Lerma, S 410, C 273, Chhoti Lerma and Sonora 64) and all possible 28 one-way crosses involving these cultivars. The experiment was sown in a randomized block design with three replications. The per cent grain protein was determined according to McKenzie and Wallace⁵ and the methods of Cutler and Worzella² were utilized for determining pelshanky value in minutes on plot basis for the first two replications.

Parental and F₁ array means and mean increase/decrease over the mid-parent for each array for per cent grain protein and pelshanky

TABLE I
Parental and F_1 array means and heterotic response for per cent grain protein and pelshanky value

Array	Per cent grain protein			Pelshanky value (Min.)		
	Parents	F_1	Mean increase/decrease over mp*(%)	Parents	F_1	Mean increase/decrease over mp*(%)
S 210 ..	16.4	15.6	- 2.9	206.5	168.1	-5478.9
S 386 ..	15.0	16.5	147.1	204.5	170.3	-3035.4
Kalyan Sona	13.4	14.5	13.6	125.0	159.5	7.0
Safed Lerma	13.8	15.0	43.7	131.5	145.1	-1706.7
S 410 ..	15.9	15.2	-27.7	255.0	184.6	-3056.9
C 273 ..	15.7	15.9	49.1	206.0	174.9	-1921.1
Chhoti Lerma	15.3	15.3	- 1.6	125.0	123.6	-3585.9
Sonora 64	15.7	15.4	2.0	228.5	185.1	-2578.7
S.E. ..	0.2	0.3	0.3	7.1	7.3	8.7

* mp,—mid-parent

value are set out in Table I. This investigation revealed that most of the array of crosses exhibited considerable heterosis for per cent grain protein, the range of the heterotic response over the mid-parent being from -27.7% to 147.1%. However, for pelshanky value, such range was from -5478.9% to 7.0%. The crosses involving cultivar S 386 exhibited maximum heterosis for grain protein, whereas cultivars S 210, S 386 and C 273 seem to be good for producing wheat hybrids with medium pelshanky value, which is an ideal characteristic for chapati making. These studies, therefore, showed promise of developing high quality wheat hybrids in case of commercial exploitation of hybrid vigour in this self-pollinating species.

Dept. of Plant Breeding, K. S. BAINS.
Punjab Agric. University, K. S. GILL.
Ludhiana, April 6, 1971. K. L. SEHGAL.

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PHENOLIC CONSTITUENTS IN WHEAT GRAINS

In view of the reported involvement of phenols in whole-meal dough darkening,^{1,2} browning of chapatties^{3,4} and alteration of various enzymatic processes,^{5,6} grains of some of the tall and dwarf wheats were analysed for their free and glycosidic phenolic constituents.

Grains of tall wheat varieties, viz., C 273, C 306, C 591, NP 830 and NP 880 and dwarf wheats, viz., Lerma rojo, Sonalika, Sonora 64, Sharbati Sonora and Kalyansona were ground in Labconco Mill. Whole-meal was extracted in boiling 80% ethanol for 1 hr. Free and acid hydrolysable phenols were determined by the methods of Swain *et al.*⁷ and Ibrahim and Tower⁸ using Folin-Ciocalteau reagent and expressed as mg/100 gm wheat-meal. Milling fractions were obtained using Seaborg and Barmore's method.⁹ Chapatties were prepared as described elsewhere.⁴

Total phenolics varied from 83.10 in the variety C 306 to 166.20 in Sonalika. Analysis of free phenolics revealed that the amount varied from 53.20 to 93.20. Acid hydrolysable phenolics, which reflect the glycosidic forms,⁸ were consistently lower than the free phenolics. Varieties C 306 and Sharbati Sonora had low amount of glycosidic phenols (Table I).

TABLE I
Phenolic constituents in grains of different wheat varieties
(mg/100 gm whole-meal)

Variety	Free phenols	Acid-hydrolysable phenols	Total phenols
Lerma rojo	90.00	60.00	150.00
Sonalika	80.00	86.20	166.20
Sonora 64	86.50	63.50	150.00
Sharbati Sonora	93.20	31.80	125.00
Kalyansona	73.20	52.80	125.00
C 273	80.00	45.00	125.00
C 306	63.20	19.90	83.10
C 591	93.20	48.00	142.10
NP 830	53.20	46.80	100.00
NP 880	60.00	40.00	100.00

Analysis of total phenolics in the milling fractions of variety Sonalika showed that in bran the values varied from 200 to 240 in middlings (shorts), from 230 to 260, and in flour from 130 to 150.

Examination of the wheat grains of varieties Kalyansona and Sonalika grown at two fertility levels, viz., N_0 and N_{200} (kg/hect) showed that there was an increase in the total phenolics with fertility in both the varieties. The increase was reflected in both the frac-