In the present work it was observed in the same plant of *F. sepiaria* flowers in the axils of the leaves and also on thorns. Therefore, the exclusive absence of flowers and fruits on thorns in *F. ramontchi* distinguishes that taxon. But in the recent taxonomic works[5, 6] no valid status has been assigned to *F. ramontchi.*

F. sepiaria and *F. ramontchi* have the same somatic chromosome number (figure 1). However they differ in karyotype details[7].

Chromosome characteristics	*F. sepiaria*	*F. ramontchi*
Chromosomes with secondary constrictions	2 pairs	4 pairs
Chromosome with subterminal centromeres	Nil	1 pair
Chromosomes with satellites	Nil	1 pair
Chromosomes with median centromeres	9 pairs	7 pairs

Therefore in spite of identical chromosome numbers these two taxa differ conspicuously in their chromosome morphology. Naturally, *F. sepiaria* and *F. ramontchi* are not one and the same and so have to be treated as different taxa.

In fact, there are many instances where certain species of a particular genus differ not in chromosome number but in karyotype such as *Corchorus*[8], *Crotalaria*[9] and *Leucas*[10]. In such cases karyotype differences serve as markers of the individuality of the concerned taxa.

The chromotographic profiles of *F. sepiaria* and *F. ramontchi* show certain differences in the distribution pattern of free aminoacids and phenolic substances[11]. All the free aminoacids seen in *F. sepiaria* are seen in *F. ramontchi* also but the latter taxon has an addition of one more compound. As for the phenolic compounds, *F. ramontchi* has an addition of two compounds not seen in *F. sepiaria.*

In the light of the above findings it seems reasonable to retain the original specific status of *F. ramontchi.*

7 August 1985

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Figure 1. **A.** *F. sepiaria* Karyotype. **B.** *F. ramontchi.*

EFFECT OF ACCELERATED AGING ON DIFFERENT PROTEIN FRACTIONS OF OKRA SEEDS

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EARLIER studies on seed deterioration have concentrated only on total proteins and their reduction indicated a decline in seed vigour[1]. However, in examining the deterioration in protein metabolism, significant changes of some minor but important protein fractions might remain undetected if only the total proteins were examined. This study, therefore, deals with different protein fractions in relation to seed deterioration in okra seed, since such information is obscure in different types of seeds.

Ten grams of okra [(*Abelmoschus esculentus* L (Moench) cv] 'Punjab Padmini' seeds were acceleratedly aged at 100% relative humidity at 45 ± 1° C for 5 days[2]. Hundred seeds in triplicate were germinated

between rolled paper towels at 25 ± 1°C. The seeds were taken to be germinated when the radicle emerged. Speed of germination (N) was calculated as under:

$$N = \frac{n}{1} + \frac{n_2}{2} + \ldots + \frac{n_7}{7}$$

where $n_1 \ldots n_7$ is the number of seeds germinated on 1–7 days[3].

The milled seed (1 g) was mixed with 15 g of sterilized sand. Albumin + free amino acids, globulin, prolamin and glutelin were fractionated in 50 ml each of water, 0.5 N NaCl, 50% isopropanol and IN KOH in sequence[4]. The proteins[5] and free amino[6] acids were quantitized.

The seeds lost their vigour (speed of germination) much earlier (i.e. first day onwards) as compared to their germinability (after three days of aging). Albumins, globulins, prolamins and glutelins comprise 43.09, 33.2, 4.1 and 19.6% respectively of total protein content (26.5% in untreated seed) (table 1). Total protein declined markedly from the first day of the accelerated aging. Albumins recorded maximum reduction followed by prolamins, glutelins and globulins in that order. Further albumins and glutelins declined significantly after one day of aging while globulins and prolamins decreased markedly after 2 days. Protein loss may be due to proteolysis at high moisture content of seed and high temperature. Free amino acid accumulation confirmed the above; however, reduction/increase of proteins/amino acids are not absolutely correlated. The protein loss might also be due to the production of ammonia and its subsequent loss from the seed. Sizable ammonia loss occurred from the plant tissues during catabolism of different amino acids[7]. Soluble proteins (albumins and globulins) were affected more than the insoluble fractions (prolamins and glutelins); thus soluble/insoluble protein ratios declined. In okra different protein fractions showed higher positive correlations with the speed of germination than with germination (table 2). Only prolamins showed significantly high positive correlation with speed of germination. Earlier studies showed a positive correlation between seedling vigour and total seed protein in a range of plant species[8]. In wheat the seed vigour was positively correlated with the total

Table 1 *Per cent seed germination, speed of germination, different fractions of protein (mg/g dry weight), free amino acids (mg/g dry weight) and soluble/insoluble protein ratios as affected by accelerated aging*

Accelerated aging (days)	Germination (%)	Speed of germination	Albumin	Globulin	Prolamin	Glutelin	Total free amino acids	Total* proteins	Soluble/insoluble protein ratio
0	93.3	39.73	112.13	86.40	10.56	53.59	1.60	264.68	3.08
1	96.0	37.42	70.40	79.68	11.04	43.20	4.40	208.72	2.77
2	97.6	34.62	47.33	96.48	10.80	43.20	4.57	202.38	2.66
3	81.6	24.42	50.20	80.64	7.68	40.32	5.10	183.94	2.73
4	81.6	4.75	38.60	73.92	4.88	40.32	2.20	159.92	2.49
5	37.0	0.42	51.60	77.76	7.45	46.80	4.33	187.93	2.38
C.D. (0.05)	4.71	2.01	11.42	6.43	1.00	1.84	0.64	—	—

*Includes total free amino acids and different protein fractions.

Table 2 *Linear correlations (r) of different protein fractions with germination and speed of germination*

	Albumin	Globulin	Prolamin	Glutelin	Amino acid	Total protein
Germination	0.27	0.47	0.49	−0.09	−0.16	0.33
Speed of germination	0.65	0.66	0.87*	0.32	−0.05	0.73

*Significant at 5%.

protein of the whole seed and endosperm and individual fractions of both salt-soluble and insoluble proteins of endosperm[9].

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SEED YIELD OF ONION AS INFLUENCED BY DIFFERENT BULB-CUTS

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ONION is a biennial crop and the cost of bulbs (planting material for the seed crop) is exhorbitantly high during planting. Suitable techniques for minimizing the cost of bulbs therefore need to be evolved. The present note reports our study on the effect of different bulb-cuts on the yield of onion seed and to explore the possibility of vertical-cut treatments for reducing the planting material requirement.

The investigation was conducted during the rabi season of 1983–84. The soil of the area was sandy loam. Five treatments comprising 4 different types of bulb-cuts viz (i) vertically into two equal pieces (1/2 vertical cut) (ii) vertically into four equal pieces (1/4 vertical cut) (iii) transverse cut (removal of top half of the bulb) and (iv) (removal of three quarter top of the bulb) as well as one control (whole bulb) were replicated four times in a randomized block design.

In the case of vertical cuts the bulb was cut longitudinally and each piece was utilized for planting. As regards half and one fourth transverse cuts, the length of the individual bulb was measured and half and three quarters of the top portion were removed in respective treatments (figure 1). Average medium-sized bulbs were planted in plots of uniform size (4.5 × 3.0 m) in the first fortnight of November. All other requirements including fertilizers were given uniformly for all the treatments.

The data presented in table 1 show no significant difference in different treatments for plant height and number of scapes per plant. The number of umbels per plant was influenced by $\frac{1}{2}$ transverse cut which was significantly better as compared to vertical-cut treatments, but it did not differ significantly from whole bulb and $\frac{1}{4}$ transverse-cut. There was no significant difference within two vertical-cut treatments, between $\frac{1}{2}$ vertical-cut and $\frac{1}{4}$ transverse-cut for this attribute. As regards the number of umbels per plot, not much difference was found between whole bulb and $\frac{1}{4}$

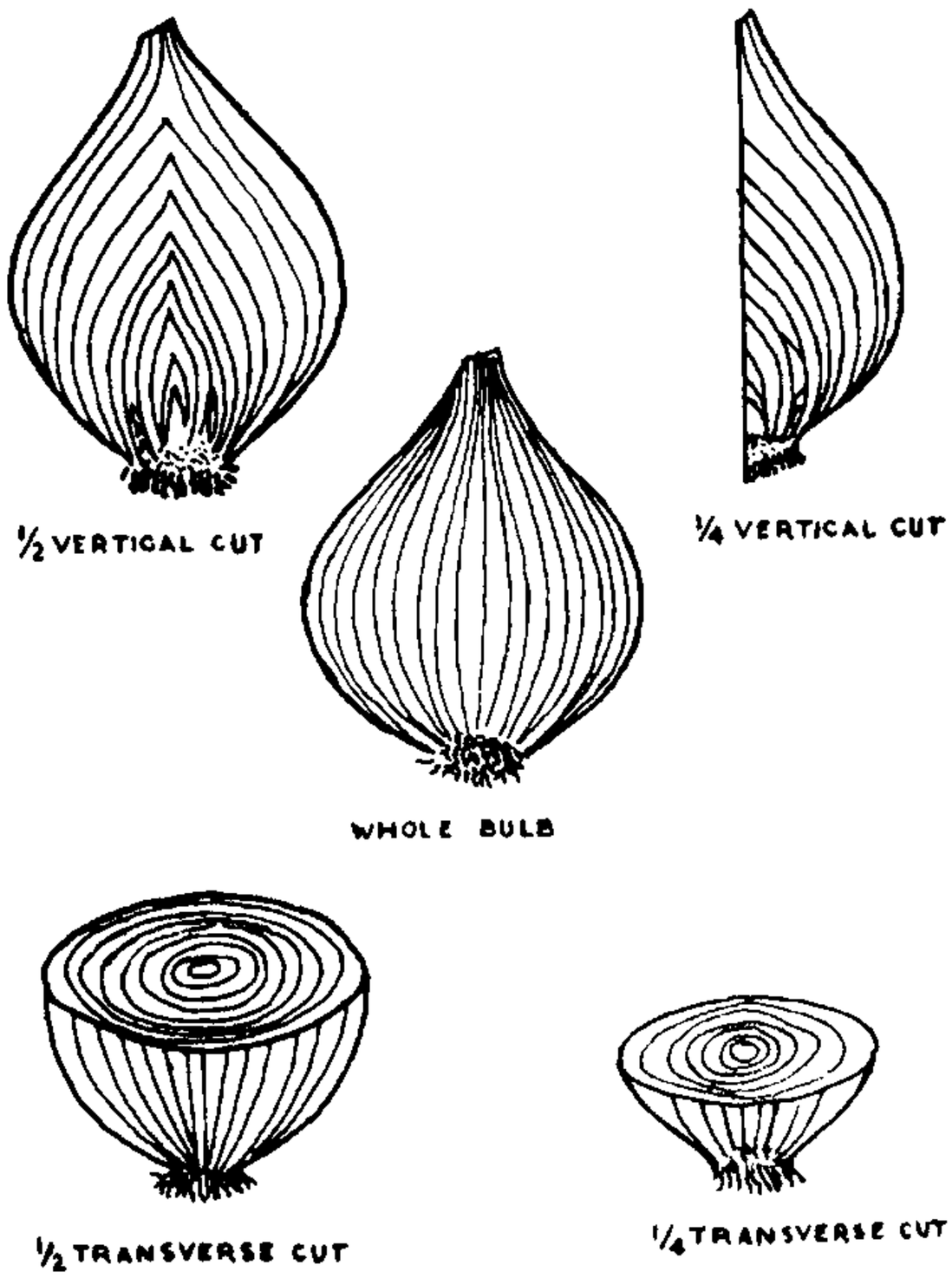

Figure 1. Different treatments of bulb-cut.