TABLE I

Amount of binding protein of two mutants and wild type in their fractions

Name of the mutants	Binding fraction	Total protein eluted	Amino acid binding in cpm/mg/ protein
ribo A_1, bi A_1 (Wild type)	7	1·5 mg	$5·7 \times 10^7$
ribo A_1, bi A_1, fpa K_{69}	8	1·5 mg	$2·9 \times 10^7$
ribo A_1, bi A_1, fpa D^{11}	9	1·5 mg	$5·2 \times 10^6$
fpa D_{11} + fpa K_{69}	9	1·5 mg	$4·6 \times 10^7$

four subunits. Last component is normal type. Some segments of genetic material exert their effects directly, rather than the extra chromosomal product which is free to mix and interact in the cytoplasm. It is assumed that the chain of fpa D_{11} and fpa K_{69} is complementary to many contact points between them. The interaction between the amino acid residue and the adjacent chain showed the stability of multichain enzyme in complex nature. The folding of polypeptide chain, however, suggests how subunits interact.

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SPODIOPOGON JAINII V. J. NAIR, A. N. SINGH *ET* N. C. NAIR: A NEW GRASS FROM MADHYA PRADESH, INDIA

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Spodiopogon jainii V. J. Nair, A. N. Singh *et* N. C. Nair *sp. nov.*

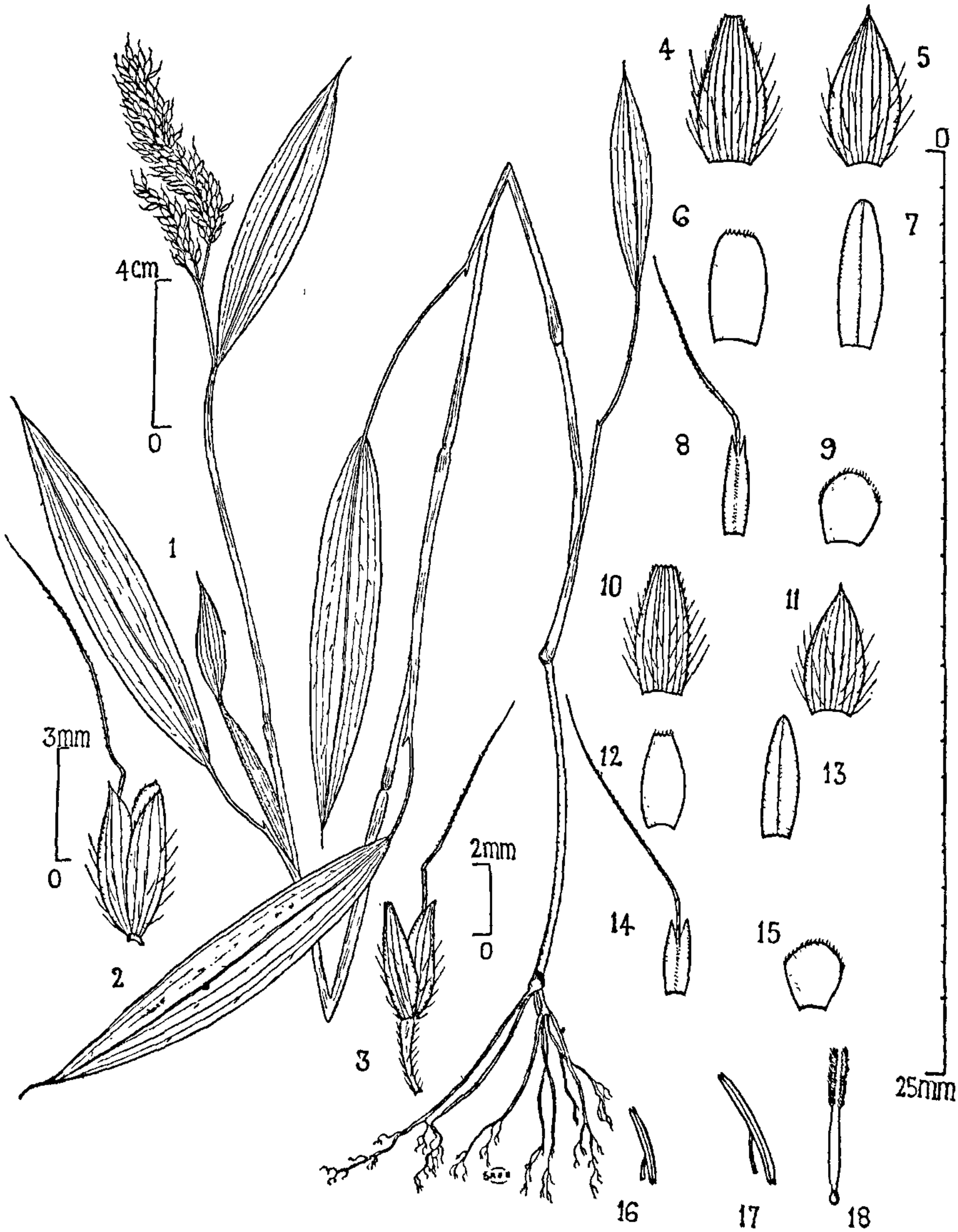
Affinis *Spodiopogon rhizophorus* (Steud.) Pilger a qua tamen differt in culmis gracilibus ; spiculis sparsim pilosis, pilis purpurascentibus ; glumis inferarum 5–7 nervis, apicibus truncatis, marginibus pilosis; glumis superis 7-nervis; paleis flosculorum inferorum apicibus rotundatis et aristis parvioribus.

Holotypus : Balaghat District, Supkhar, Lodhopara Forest, ± 800 m, 25th Sept. 1973, *V. J. Nair* 18431 (CAL). Isotypi in K, BSA et MH.

Spodiopogon jainii V. J. Nair, A. N. Singh *et* N. C. Nair *sp. nov.*

Annual herb growing in the crevices of rocks. Culms 50–60 cm long, slender; nodes glabrous. Leaf blades 5–13 × 1·5–3 cm, flat, elliptic-lanceolate, acuminate, sparsely villous on both sides. Petioles 1–6 cm long. Sheaths 6–10 cm long, glabrous. Ligules membranous, acute. Panicles 8–10 cm long, densely flowered with 2–3 nate spikelets. Rhachis jointed. Spikelets 1 sessile and 1–2 pedicelled together, sparsely hairy ; hairs 2–3 mm long, turning purplish. Sessile spikelets 3·5–4 mm long, 2 flowered ; lower glume 3·5–4 × 1·5–1·8 mm, broadly ovate, truncate at apex, 5-7 nerved ; sparsely hairy, ciliate on the margins; upper glume 3·8–4 × 1·8–2 mm, broadly ovate, acute, mucronate at apex, 7-nerved, sparsely hairy ; lower floret male; lemma *ca.* 3 × 1·8 mm, ovate-oblong, truncate and ciliate at apex, hyaline; palea *ca.* 4 × 1·25 mm, oblong, rounded at apex, faintly 1-nerved, hyaline; stamens 3, anthers *ca.* 2·5 × 0·3 mm, linear, filaments short. Upper floret bisexual: lemma *ca.* 2·5 × 0·8 mm, notched at the apex, awns 8–10 mm long, twisted; palea *ca.* 2 × 1·8 mm, obovate, ciliate at apex, hyaline; stamens 3, anthers *ca.* 3 × 0·4 mm, linear, filaments short; ovary *ca.* 0·2 mm long, ovate, styles *ca.* 2·3 mm long, slender; stigmas *ca.* 1·5 mm long, plumose. Pedicelled spikelets 3–3·5 mm long, 2-flowered; pedicels 2–3 mm long, ciliate on the margins; lower glume *ca.* 3 × 1·5 mm, ovate, truncate at apex, 5–7 nerved, sparsely hairy, ciliate on the margins; upper glume *ca.* 3·5 × 1·75 mm, ovate, acute, mucronate at apex, 7-nerved, sparsely hairy; lower floret male; lemma *ca.* 2·5 × 1 mm, ovate-oblong, truncate and ciliate at apex, hyaline; palea *ca.* 3 × 1 mm, oblong, acute, rounded at apex, faintly one-nerved, hyaline; stamens 3, anthers *ca.* 2 × 0·3 mm, linear, filaments short; upper floret bisexual; lemmas *ca.* 2 × 0·6 mm, notched at apex, awns 6–10 mm long; palea *ca.* 1·75 × 1·5 mm, obovate, ciliate at apex, hyaline; anthers *ca.* 3 × 0·3 mm, filaments short; ovary *ca.* 0·2 mm long, ovate ; styles *ca.* 2 mm long, slender; stigmas *ca.* 1·3 mm long, plumose. Grains not seen.

Holotype : Balaghat District, Supkhar, Lodhopara Forest ± 800 m, 25th Sept. 1973, *V. J. Nair* 18431 (CAL). Isotypes in K, BSA and MH.



FIGS. 1–18. *Spodiopogon Jainii* V. J. Nair, A. N. Singh and N. C. Nair *sp nov*. Fig. 1. Plant, Fig. 2. Sessile spikelet, Fig. 3. Pedicelled spikelet, Fig. 4. Lower glume of Sessile Spikelet, Fig. 5. Upper glume, Fig. 6. Lemma of the lower floret. Fig. 7. Its palea. Fig. 8. Lemma of the upper floret. Fig. 9. Its palea, Fig. 10. Lower glume of pedicelled spikelet, Fig. 11. Upper glume. Fig. 12. Lemma of the lower floret. Fig. 13. Its palea. Fig. 14. Lemma of the upper floret. Fig. 15. Its palea. Fig. 16. Stamen of lower floret (♂). Fig. 17. Stamen of upper floret (♂). Fig. 18. Gynoecium

This species is closely allied to *Spodiopogon rhizophorus* (Steud.) Pilger with which it differs as shown below :

Spodiopogon rhizophorus (Steud.) Pilger	*Spodiopogon jainii* sp.nov.
1. Culms stout	Culms slender
2. Spikelets densely hairy	Spikelets sparsely hairy
3. Sessile spikelets 6–7 mm long	Sessile spikelets 3·5–4 mm long
4. Pedicelled spikelets 4·5–5 mm long	Pedicelled spikelets 3–3·5 mm long
5. Lower glume 7–9 nerved; distinctly 2-mucronate at apex; margins hyaline, not ciliate	Lower glume 5–7 nerved, apex truncate, margins ciliate
6. Upper glumes 9–13 nerved	Upper glume strictly 7-nerved
7. Hairs on glumes 3-5 mm long, white	Hairs on glumes at the most 2 mm long, purplish
8. Paleas of lower florets acute at apex	Paleas rounded at apex
9. Lemmas of upper florets deeply bifid, lobes long acuminate	Lemmas of the upper florets notched at apex, lobes acute or shortly acuminate
10. Awns 15–20 mm long	Awns 6–10 mm long

The species is named after Dr. S. K. Jain, Director, Botanical Survey of India, in recognition of his outstanding contributions to the study of Indian grasses.

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GAMMA RADIATION INDUCED CHANGES IN THE PEROXIDASE ACTIVITY OF CHICKPEA SEEDLINGS

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PEROXIDASE activity was measured in the seedlings raised from gamma-irradiated dry seeds of white seeded chickpea variety L 144. The seeds were germinated and grown in Petri dishes[1]. Peroxidase activity was determined in cotyledons and embryo-axis separately up to 6 days of growth. The tissue (0·5 g) was homogenized in 6 ml of 0·05 M sodium acetate buffer pH 4·5 and centrifuged at 10,000 rpm for 15 minutes at 0° C. The enzyme activity was measured in the supernatant by measuring the change in O.D. at 470 nm due to oxidation of O-Dianisidine in a medium containing H_2O_2. One unit of enzyme was the amount of enzyme which caused a change of 0·1 in O.D. The experiment was repeated twice with duplicate samples.

The enzyme activity increased with time in cotyledons as well as embryo-axis. Increase in the enzyme activity was also noted as a result of gamma-irradiation in 5 and 10 kR treatments, the increase being more at 5 KR (Table I). Higher doses resulted in decreased activity. The stimulation persisted upto 4th day of germination after which it declined. A similar study on 'desi' chickpeas (data not given) also showed increased enzyme activity due to irradiation in the cotyledons in 5 kR treatment. Higher doses were detrimental.

TABLE I

Percentage change in the peroxidase activity of chickpea seedlings

Radiation dose (kR)	Age of the seedling (days)			
	1	2	4	6
Cotyledons				
5	+16·1	+ 7·9	+10·4	− 2·2
10	+ 6·5	+ 5·3	+ 4·2	+ 1·1
20	− 6·5	− 5·9	− 4·2	− 6·5
30	− 6·5	−10·5	−10·4	−20·4
40	−12·9	−21·1	−20·8	−32·3
Embryo-axis				
15	+13·0	+ 6·9	+12·5	+ 7·4
10	+ 9·4	+ 4·0	+ 3·1	− 7·4
20	−13·0	−13·3	−12·5	−12·5
30	−25·4	−17·2	−18·8	−22·2
40	−21·7	−21·6	−31·3	−33·3
Activity (units) in control				
Cotyledons	372	912	1152	2232
Embryo-axis	276	696	768	648

Gamma-radiations cause damage to the tissue by producing H_2O_2 and organic peroxy radicals[3], and peroxidases are the internal mechanism for removal of these radicals. The increase in the enzyme activity at the lower doses could be a direct response of the