

plants. Usually, the first tiller had greater number of such spikelets than those in the late tillers. Two such plants on cytological observation were found to be monosomic (41 chromosomes). It is obvious that all the monosomic plants did not possess supernumerary spikelets.

It is important to note that Red Bob monosomics for chromosome 7B have a tendency to bear supernumerary spikelets at one or two positions on the spike. Penetrance of this character appears to be incomplete. Further, supernumerary spikelets were not found in  $F_1$  monosomic for 7B.

These observations indicate that chromosome 7B is associated with the formation of normal spikelets. Monosomic condition for chromosome 7B itself is sufficient to produce abnormal spikes in Red Bobs. But this is not true with chromosome 7B of Sharbat i Sonora as evident in the monosomic  $F_1$  where the univalent is from Sharbat i Sonora. The appearance of this character again in  $F_2$  progeny of monosomic  $F_1$  indicates genes on other chromosomes too. The expression of the character under consideration, thus, required segregation of favourable alleles together with monosomic condition for chromosome 7B. Thus the Monosomic  $F_2$  analysis of Red Bobs  $\times$  Sharbat i Sonora for eleven chromosomes revealed the association of genes for normal spikelet with chromosome 7B.

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#### TWO INTERCHANGE TRISOMICS IN PEARLMILLET

In pearl millet, primary trisomics were grouped into morphologically distinct types by Gill, Virmani and Minocha<sup>1</sup> and Manga.<sup>2</sup> One type designated as Slender trisomic by both the authors was reported by the latter to have produced on selfing an unrelated primary trisomic. In the fourth generation progeny of this Slender trisomic two of the plants obtained on open pollination were morphologically different from control diploids. One was of the 'Slender' type and the other resembled to some extent the 'Bush' type trisomic described by Manga<sup>2</sup>. The Bush trisomic corresponds to the Dark green trisomic described by Gill *et al.*<sup>1</sup> The 'Bush' type plant differed from the typical Bush or Dark green trisomic in that it had narrow, stiff and erect leaves, with 8 tillers and a few lateral branches and was very late flowering.

Study of meiosis in pollen mother cells revealed that both plants were trisomics, with  $2n = 15$  chromosomes

and in both associations of five chromosomes were observed (Fig. 1). 500 PMC's in the 'Slender'



FIGS. 1-2. Two PMC's from an interchange trisomic. Fig. 1. Showing an association of five chromosomes. Fig. 2. Showing a ring of four chromosomes and an unpaired chromosome.

type plant and 100 PMC's in the 'Bush' type plant were examined at diakinesis and the data relating to the types of associations observed are presented in Table I.

It can be seen from the table that associations of 5 chromosomes were frequent. An association of five chromosomes in a trisomic is possible under two conditions: (1) when the extra chromosome is a tertiary one and (2) when an extra chromosome, which is a normal one, is present in a heterozygous interchange background. In the latter case when the extra chromosome remains as a univalent a ring of four

TABLE I

Chromosome associations at diakinesis in the 'Slender' and 'Bush' type plants

Chromosome association	Proportions of cells in each class in %	
	'Slender'	'Bush'
1 v + 5 ii	38.0	32.0
1 iv <sup>c</sup> + 5 ii + 1 i	12.6	10.0
1 iv <sup>r</sup> + 5 ii + 1 i	11.8	6.0
1 iii + 6 ii	29.6	39.0
1 iii + 5 ii + 2 i	2.0	2.0
6 ii + 3 i	0.4	2.0
7 ii + 1 i	5.6	9.0
No. of cells examined	500	100

c — chain of four. r — ring of four

configurations is expected<sup>3</sup>. As can be seen from the table rings of four chromosomes were found in both plants (Fig. 2). From this it is concluded that both the plants were interchange trisomics.

One of the methods of assessing preferential pairing is studying the frequency of trivalents and closed bivalents formed by the interchange complex<sup>4</sup>. In the present study it was observed that this condition was at a low frequency; 8% of the PMC's in the 'Slender' type plant and 14% of the PMC's in the 'Bush' type plant contained such a configuration. Hence it was concluded that preferential pairing was not of significance in the present interchange trisomics.

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#### A NEW SPECIES OF MELAMPSORA FROM ANDHRA PRADESH

RECENTLY Ramachar and Bhagyanarayana<sup>3</sup> described *Caecoma euphorbiae-genuclatae* a rust fungus parasitizing on *Euphorbia geniculata* Ortega from Hyderabad. In their paper the reason as to why *Melampsora euphorbiae-geniculatae* previously reported by Kern and Thurston<sup>1</sup> also on *Euphorbia geniculata* as *sed illegit* was pointed out. Since then the authors

made intense search for the other spore forms produced by this rust fungus and succeeded in finding out the telia which is described in this paper.

*Melampsora geniculatae* Ramachar and Bhagyanarayana sp. nov. (Fig. 1.)

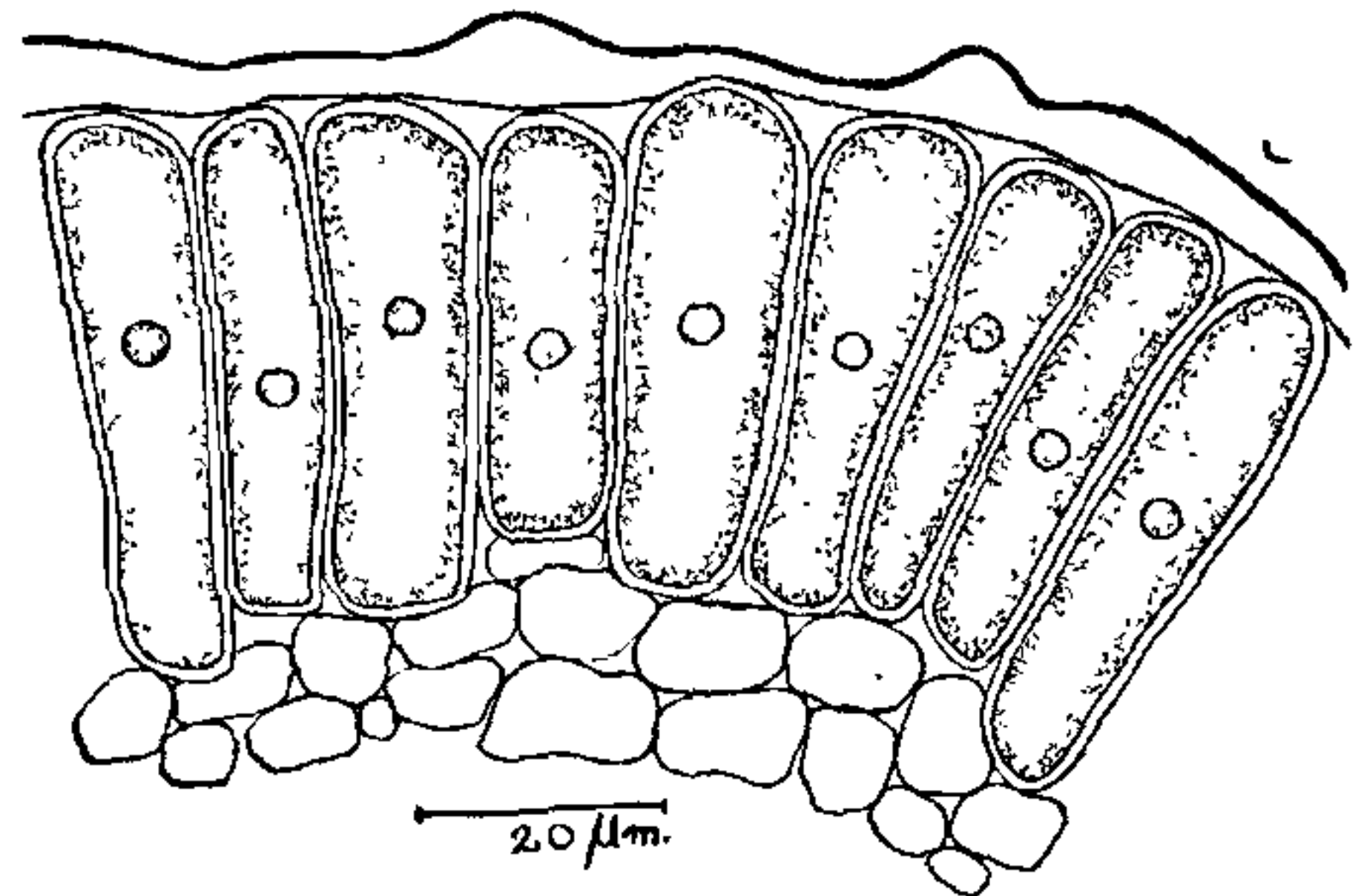


FIG. 1. *M. geniculatae*, vertical section of a *Telium*. *M. euphorbiae-geniculatae* Knern and Thurston, *Mycologia* 36: 507, 1944, nomen valid, sed illegit. *Caecoma euphorbiae-geniculatae* Ramachar and Bhagyanarayana, *Trans. Br. mycol. Soc.* 67 (1): 139-140, 1976.

Spermagonia ignotis. Aeciis amphigenis, pleurmque hypophyllis, cauliculis, in areas magnus plus minus uniformiter dispersis, aggregatis vel confluentibus in maculis 0.5-1.5 mm diam. flavescentibus, dein pulverulentis, paraphysibus, epidermide rupta conspicua; sporis ellipsoides vel globosis, 12-15 (-16.5) × 10-13.5 μm, membrana 1-2 μm crassa, hyalina vel flavida, minute verrucosa. Uredinis ignotis. Tellis minutes, hypophyllis, non visis, subepidermalibus; sporis 27-54.4 × 16 μm, cylindraccis, palide aureo-brunneis, membrana ad apicem. et ad latere 1 μm crass.

Spermagonia not known. Aecia caecomoid, amphigenous, usually hypophyllous yellowish, pulverulent, paraphysate; aeciospores 12-15 (-16.5) × 10-13.5 μm, ellipsoidal or globoid, wall 1-2 μm, thick, hyaline or yellowish, minutely verrucose. Uredinia not known. Telia subepidermal, hypophyllous, minute; teliospores 27-54.4 × 9-16 μm, cylindrical pale golden brown, uniformly 1 μm, thick.

Holotype: On *Euphorbia geniculata* Ortega, Botanical Garden, Osmania University, Hyderabad, June 1976, Ramachar and Bhagyanarayana. The type slide has been deposited at C.M.I.

*Melampsora geniculatae* appears to be a microcyclic and autoecious rust fungus. The distinct features of this species is the production of only two spore forms in its life cycle, viz., aeciospores and teliospores. Petersen<sup>2</sup> classifies this type of life cycle under catopsis type,