differences do exist, further studies to identify tolerant materials are needed.

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B-CHROMOSOME OCCURRENCE IN WEST AFRICAN POPULATIONS OF PEARL MILLET

J. V. PANTULU,
Department of Botany, Andhra University, Waltair 530 003, India.

THE presence of B-chromosomes in populations of *Pennisetum typhoides* (Burm.) S & H (*Pennisetum americanum*, Leeke) from Sudan[1] and from Nigeria[2,3] was reported earlier. B-chromosomes (Bs) present in Sudanese populations of pearl millet were largely heterochromatic and numerically unstable. The Bs reported by Powell and Burton[2], were euchromatic and nucleblous organizing ones, and were unstable. These Bs were of different sizes, *viz.*, small, medium and large, the large ones according to them were isochromosomes. Burton and Powell[3] reported heterochromatic Bs in other populations of Nigerian origin, which resembled in behaviour those described by Pantulu[1]. Subba Rao and Pantulu[4], obtained two derivative Bs, *viz.*, deficient and iso Bs from standard Bs (the original) Bs obtained in Sudanese material by Pantulu[1] were designated since then standard Bs).

The Bs reported so far are from pearl millet populations of West African origin only. Studies from cultivars from South Africa, Rhodesia, Kenya, Ethiopia and India did not reveal the presence of Bs in them. With a view to finding out if more cultivars of West African regions would carry Bs and if present, whether all of them will be of similar type, a preliminary survey of accessions from Cameroon, Upper Volta, Mali and Niger has been carried out. Bs were observed in one population from Cameroon, two populations from Upper Volta and one population from Mali.

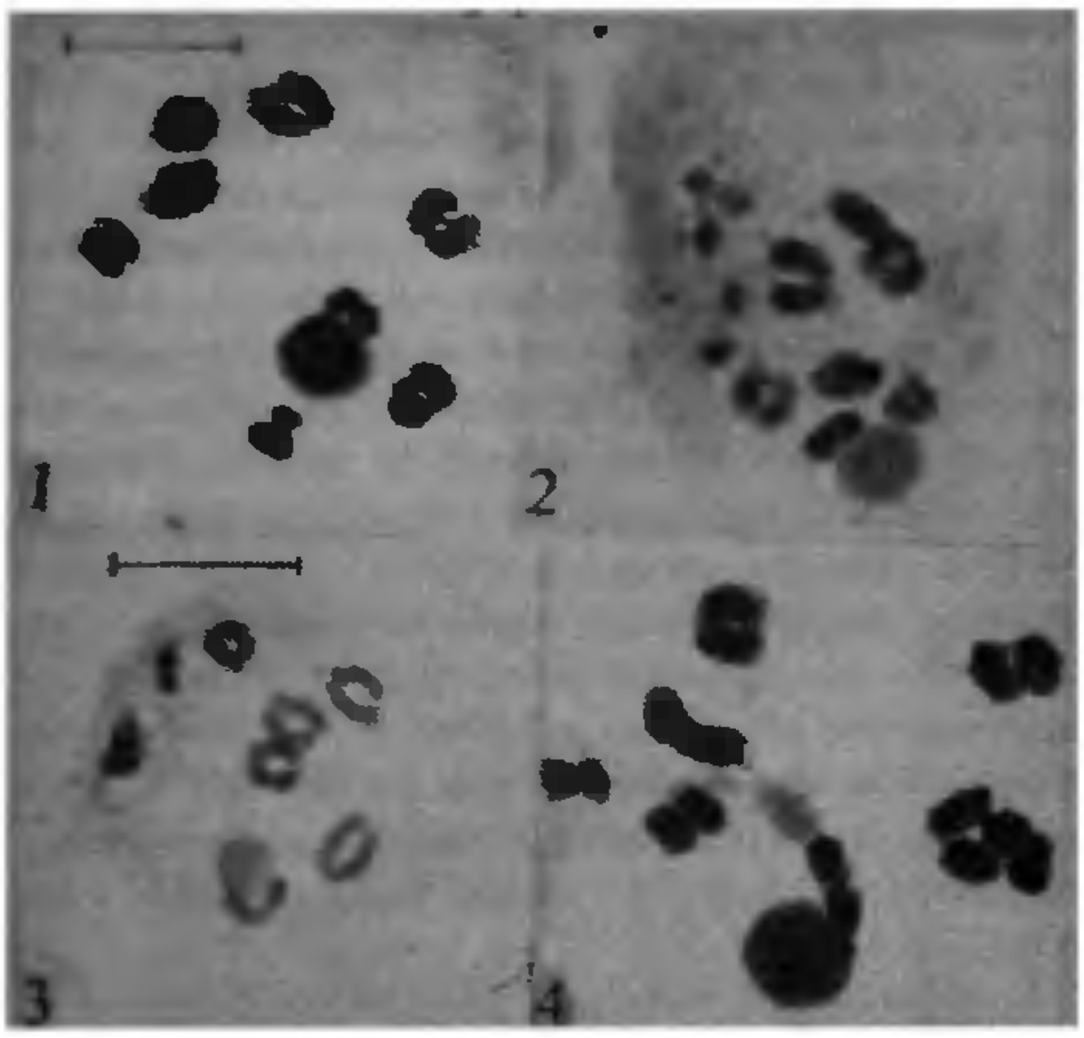
Cameroon Population: The Bs in this population resemble the standard Bs present in Sudanese material in their heterochromatic nature. These Bs show numerically less variation within plants (table 1) than of Sudanese Bs: though, between plants, the variation corresponds with that of Sudanese Bs. These Bs never pair with A-chromosomes, but pair among themselves to form multivalents, when present in higher numbers (figure.1).

Upper Volta-Population *1*: These Bs are largely heterochromatic, resembling the Bs present in Cameroon population. Within plant variation in B-number is less than even in Cameroon population (table 1). When Bs are present in higher numbers, they pair to give multivalent associations (figure.2).

TABLE 1

Frequency distribution of different B-classes in 4 populations, each one represented by a single plant

	Cameroon	Upper Volta-1	Upper Volta-2	Mali
Frequency distribution of different B-classes:				
0	0	—	1	1
1	3	—	7	45
2	288	—	42	233
3	29	—	0	15
4	—	—	6	17
5	—	145	14	38
6	—	4	2	1
7	—	—	1	—
Model B number	2	5	2	2
Mean number of Bs	2.08 ± 0.02	5.03 ± 0.01	2.79 ± 0.04	2.34 ± 0.07
Number of cells studied	320	149	73	350



Figuress 1–4 P. m. c. diakinesis showing 1 bivalent + univalent Bs in Cameroon population. **2.** A trivalent + two univalent Bs in Upper Volta population 1. **3.** A bivalent B in Upper Volta population 2. **4.** Two Bs in Mali population. Scale line indicates 10 μ. Figures 1, 2 and 4 are of same magnification.

Upper Volta-Population 2: The Bs present in the second population from Upper Volta are similar to the ones in population 1 in their heterochromatic nature. Within a plant, the numerical variation is greater than that in the population 1 (table 1). These Bs also pair among themselves to form multivalent associations (figure.3).

Mali population: The Bs in this population appear to be less heterochromatic than those of the above three populations. In their numerical instablility, they resemble more the population 2 of Upper Volta (table.1). When present in large numbers, they may pair to form associations of even five or six (figure.4).

Harlan[5] suggested that the centre of origin of this crop plant is a diffuse belt stretching from Western Sudan to Senegal. Correlation of present day morphology and distribution of *P. americanum* with what is known of the climatic and cultural history of the Sahara suggests, therefore, that pearl millet was domesticated along the southern regions of the central highlands of this desert, at the beginning of the present dry phase, probably between 3000 and 2000 B. C.[6]. It will be of interest to know if Bs were present in the progenitor of pearl millet, *Pennisetum americanum* sub sp. *monodii*.

The Bs of rye present in populations from Afghanistan, Russia, Australia, Sweden, England, the United States and Japan were of the same type, which fact, according to Darlington[7] indicates a common origin.

The Bs of pearl millet so far reported were of similar types, *i. e.*,they are largely heterochromatic with subterminal centromeres. Some derivative types of Bs were earlier reported[4,8]. Perhaps the Bs observed by powell and Burton[2] in some Nigerian populations were also derivative Bs, as they have reported the presence of Bs resembling the ones reported by pantulu[1] in some other populations of Nigerian origin.

From the presence of Bs only in the West African cultivars and their absence in populations from other areas—either in Africa or elsewhere—one might consider two alternative explanations:

(i) Bs were of ancient origin, co-extensive with the original domestication of this crop plant; Bs might have survived only in the cultivars of West African populations and might have been eliminated from populations of other ecological regions, to which the species had migrated to.

(ii) or, alternatively, it might be assumed that the Bs might have orignated after the orignal migration had taken place.

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