Telo Aneuploids in Pearl Millet

J.V. Pantulu and G.J. Narasimha Rao

Department of Botany, Andhra University, Waltair (India)

Summary. Nomenclature and chromosome constitution for twenty different aneuploids with telocentrics in *Pennisetum typhoides* are presented.

Key words: *Pennisetum typhoides* (Burm.) S. & H. — Aneuploids — Telocentrics

In *Pennisetum typhoides* (Burm.) S. & H. a number of aneuploids with telocentric chromosomes were obtained. Some of these aneuploids are of the type described by Kimber and Sears (1968), but a number of new types are also described. In this paper an attempt has been made to present the nomenclature and descriptions of all these aneuploids obtained by us in pearl millet. This will provide a uniform nomenclature for the use of workers on pearl millet.

Symbols for full chromosomes, telocentrics and isochromosomes suggested by Kimber and Sears (1968) may be followed. Pairing status, i.e. the ability of the chromosomes to pair, and chromosome designations also may be represented as suggested by Kimber and Sears (1968).

Initially we obtained plants with telocentric chromosomes in the progeny of an autotriploid and a primary trisomic 'Bush' (trisomic for chromosome 2) of pearl millet. The former plants had the chromosome constitution $2n = 13 + 2$ telocentrics. The two telocentrics were the products of centromere misdivision of chromosome 1. In the aneuploid plants obtained from the latter source the telos were of chromosome 7 (the nucleolus organizing chromosome). By selfing these plants with telocentrics and crossing them in different combinations a number of aneuploids have been obtained which are listed below:

For the sake of convenience these aneuploids may be classified into two series:
1) Substitution diploids or Compensated diploids.
2) Aneuploids.
(a) Single arm addition
(b) Two arm additions
(c) Telo plus full chromosome
(d) Monosomic for an arm

1) Substitution Diploids

Substitution diploids are aneuploids with telocentrics substituting one, two or more chromosomes in the complement (Sybenga 1975; Tsuchiya and An Hang 1979).

Descriptive term	Somatic number	Chromosome constitution
1. Double telotrisomic	$2n = 15$	$6^{II} + (t^{1S} + t^{1L})1^{III}$
2. Double telotrisomic	$2n = 15$	$6^{II} + (t^{7S} + t^{7L})1^{III}$
3. Double ditelosomic	$2n = 16$	$6^{II} + (t^{1S})^{II} + (t^{1L})^{II}$
4. Double doubletelotrisomic	$2n = 16$	$5^{II} + (t^{1S} + t^{1L})1^{III} + (t^{7S} + t^{7L})1^{III}$
5. Double ditelosomic plus double telotrisomic	$2n = 17$	$5^{II} + (t^{1S})^{II} + (t^{1L})^{II} + (t^{7S} + t^{7L})1^{III}$
6. Double telotrisomic for chromosome 1 plus translocation involving chromosome 1	$2n = 15$	$5^{II} + (t^{1S} + t^{1L})3^{V}$
7. Double telotrisomic for chromosome 1 plus translocation involving other than chromosome 1	$2n = 15$	$4^{II} + (t^{1S} + t^{1L})1^{III} + (4)^{IV}$

2) Aneuploids

(a) Single arm additions

These aneuploids are telotrisomic with one arm being represented three times.

8.	Monotelotrisomic	2n = 15	$6^{II} + (t^{1S})2^{III}$
9.	Monotelotrisomic	2n = 15	$6^{II} + (t^{7S})2^{III}$
10.	Dimonotelotetrasomic	2n = 16	$6^{II} + \{(t^{1S})^{II} + t^{1L}\}1^{IV}$
11.	Monotelotrisomic plus double telotrisomic	2n = 16	$5^{II} + (t^{1S})2^{III} + (t^{7S} + t^{7L})1^{III}$
12.	Double telotrisomic plus monotelotrisomic	2n = 16	$5^{II} + (t^{1S} + t^{1L})1^{III} + (t^{7S})2^{III}$
13.	Dimonotelotetrasomic plus double telotrisomic	2n = 17	$5^{II} + \{(t^{1S})^{II} + (t^{1L})\}1^{IV} + (t^{7S} + t^{7L})1^{III}$

(b) Two arm additions

These aneuploids are either trisomic for two different arms or tetrasomic for one arm.

14.	Ditelotetrasomic	2n = 16	$6^{II} + \{(t^{1S})^{II}\}2^{IV}$
15.	Double ditelopentasomic	2n = 17	$6^{II} + \{(t^{1S})^{II} + (t^{1L})^{II}\}1^{V}$
16.	Double monotelotrisomic	2n = 16	$5^{II} + (t^{1S})2^{III} + (t^{7S})2^{III}$

(c) Telo plus full chromosome additions

Aneuploids with telos and having in addition full chromosome(s)

17.	Double telotrisomic plus trisomic	2n = 16	$5^{II} + (t^{1S} + t^{1L})1^{III} + 1^{III}$
18.	Double telotrisomic plus tertiary trisomic	2n = 16	$5^{II} + (t^{1S} + t^{1L})4^{VI}$
19.	Dimonotelotetrasomic plus trisomic	2n = 17	$5^{II} + \{(t^{1S})^{II} + (t^{1L})\}1^{IV} + 1^{III}$

(d) Monosomic for one arm of a chromosome

20.	Monotelodisomic	2n = 14	$6^{II} + (t)1^{II}$

Acknowledgement

Literature

Kimber, G.; Sears, E.R. (1968): Nomenclature for the description of aneuploids in Triticinae. In: Proc. 3rd Intern. Wheat Genet. Symp. Aust. Acad. Sci. Canberra, pp. 468-473 New York: Plenum Press; Canberra: Botterworths

Sybenga, J. (1975): Meiotic Configurations. Berlin, Heidelberg, New York: Springer

Tsuchiya, T.; An Hang (1979): Cytology and breeding behaviour of novel compensating diploid plants in barley. Barley Genet. News Lett. 9, 105-106

Mr. G.J. Narasimha Rao
A.R.S. Geneticist
Central Rice Research Institute
Cuttack (Orissa), (India)

Dr. J.V. Pantulu
Department of Botany
Andhra University
Waltair-530003 (India)