

SHORT COMMUNICATION

CHROMOSOME NUMBER OF SEVEN SPECIES AND THREE VARIETIES OF THE GENUS *Stylosanthes* SW. (LEGUMINOSAE - PAPILIONOIDEAE)*

Alice Battistin¹ and Paulo Sodero Martins²

ABSTRACT

Chromosome counts were performed in seven species and three varieties of *Stylosanthes* Sw. Five out of seven species as well as the three varieties were diploids ($2n = 20$), while *S. capitata* and *S. scabra* were tetraploids ($2n = 40$). The chromosomes of *S. grandifolia* and *S. gracilis* are larger than those of the other five species and varieties studied.

INTRODUCTION

In the tribe Hydesareae of the genus *Stylosanthes* Sw. (leguminous forage), haploid chromosome numbers of $n = 7, 8, 9, 10, 11, 14, 18$ and 20 have been detected (Burkart, 1952), indicating a great heterogeneity in ploidy levels. This variation may be due to euploidy and aneuploidy.

Most of the species studied thus far have a basic chromosome number of $n = 10$. When Cameron (1967) studied 10 species of *Stylosanthes* Sw., he found diploids ($2n = 20$), tetraploids ($2n = 40$) and hexaploids ($2n = 60$). He then concluded that the genus *Stylosanthes* Sw. comprises a series of polyploids with a basic number $n = 10$.

*Part of a Masters Thesis presented by A.B. to the Department of Genetics, ESALQ/USP, Piracicaba, SP.

¹ Departamento de Biologia, Setor Genética. Centro de Ciências Naturais e Exatas, Universidade Federal de Santa Maria, 97119 Santa Maria, RS. Brasil. Send correspondence to A.B.

² Departamento de Genética, ESALQ/USP. Caixa Postal 83, 13400 Piracicaba, SP, Brasil.

For *S. guianensis* (Aubl.) Sw. (Atchinson, 1949; Kishore, 1951; Krapovickas and Fuchs de Krapovickas, 1957) and *S. humilis* H.B.K. (Richard and Gould, 1964) a chromosome number of $2n = 20$ has been determined. A study carried out at the International Center for Tropical Agriculture (Centro Internacional de Agricultura Tropical - CIAT - 1977) on *S. capitata* Vog. showed some ecotypes with $2n = 20$ and others with $2n = 40$ chromosomes.

The objective of the present study was to determine the somatic chromosome number of seven species and three varieties of *Stylosanthes* Sw.

MATERIAL AND METHODS

Seeds of seven species and three varieties of *Stylosanthes* Sw were collected in several geographical and ecological regions of the States of Minas Gerais, Rio de Janeiro and Goiás (Table I) and grown at Anhembi Experiment Station, ESALQ/USP, Genetics Department, Piracicaba, SP. Chromosome counts were performed on mother plant seeds. Seeds were germinated on Petri dishes with distilled water, in a greenhouse for 1-2 days at 25°C. Young roots were pretreated with 0.002% 8-hydroxyquinoline for 3 hours at room temperature (25-30°C), fixed in 3:1 alcohol-acetic acid for 24 hours and stored in 70% alcohol in the refrigerator until analysis.

For slide preparation the root-tips were hydrolyzed in 1N HCl at 60°C for 7-10 minutes and stained with Feulgen and propionic carmine. At least five cells per plant were examined.

RESULTS AND DISCUSSION

Table I summarizes the somatic metaphase chromosome numbers obtained for the seven species and three varieties of *Stylosanthes* Sw. Most of the species and varieties studied had $2n = 20$ chromosomes, except *S. capitata* and *S. scabra* which showed $2n = 40$ chromosomes.

This is the first report of the chromosome number of the three varieties of *S. guianensis*, *canescens*, *vulgaris* and *microcephala*, and of *S. macrocephala*, *S. scabra*, *S. grandifolia* and *S. gracilis*.

The present results support previous counts for *S. humilis*, $2n = 20$ (Richard and Gould, 1964; Cameron, 1967), *S. viscosa* $2n = 20$ (Cameron, 1967) and *S. capitata* (Ciat, 1977).

Although the chromosomes of *Stylosanthes* Sw. are small, Cameron (1967) reported great differences in chromosome size and shape among the ten species studied. The present data show that *S. grandifolia* and *S. gracilis* have larger chromosomes than the other species and varieties studied, but it was not possible to differentiate each chromosome pair or the genomes.

Table I - List of species and varieties analyzed and somatic chromosome numbers.

Species and varieties	Place of origin	Number of plants examined	Number of cells studied	Chromosome number (2n)	Ploidy level
<i>S. capitata</i>	Itaguaí - RJ	9	45	40	4x
<i>S. macrocephala</i> Ferreira e Costa	Betim - MG	6	31	20	2x
<i>S. scabra</i> Vog.	Itaguaí - RJ	9	45	40	4x
<i>S. grandifolia</i> Ferreira e Costa	Montes Claros - MG	9	47	20	2x
<i>S. humilis</i> H.B.K.	Mozarlândia - GO	6	30	20	2x
<i>S. gracilis</i> H.B.K.	Montes Claros - MG	8	40	20	2x
<i>S. viscosa</i> Sw.	Uberaba - MG	8	44	20	2x
<i>S. guianensis</i> (Aubl.) Sw. var. <i>microcephala</i> Ferreira e Costa	Santo Antonio do Monte - MG	9	45	20	2x
<i>S. guianensis</i> (Aubl.) Sw. var. <i>canescens</i> Ferreira e Costa	Barbacena - MG	9	45	20	2x
<i>S. guianensis</i> (Aubl.) Sw. var. <i>vulgaris</i> Ferreira e Costa	Divinópolis - MG	9	45	20	2x

ACKNOWLEDGMENTS

The authors are indebted to the Department of Genetics of Piracicaba, SP, where this research was conducted. We are grateful to CNPq for financial support and to Dr. Akihiko Ando for material facilities. Special thanks are due to Dr. Maria Teresa Schifino for her suggestions and for reading the English version. Publication supported by FAPESP.

RESUMO

Foi feita a contagem do número cromossômico em 7 espécies e 3 variedades do gênero *Stylosanthes* Sw. Cinco das espécies e as 3 variedades revelaram-se diplóides com $2n = 20$, enquanto que *S. capitata* e *S. scabra* mostraram-se tetraplóides com $2n = 40$ cromossomos. Os cromossomos de *S. grandifolia* e *S. gracilis* possuem tamanhos maiores em relação às demais espécies e variedades estudadas.

REFERENCES

- Atchinson, E. (1949). Studies in the Leguminosae. IV. Chromosome numbers and geographical relationships of miscellaneous Leguminosae. *J. Elisha Mitchell Sci. Soc.* 65: 112.
- Burkart, A. (1952). *Las Leguminosas Argentinas Silvestres y Cultivadas*. ACME Agency Soc. de Resp. Ltda., Buenos Aires, pp. 193-285.
- Cameron, D.F. (1967). Chromosome numbers and morphology of some introduced *Stylosanthes* species. *Aust. J. Agric. Res.* 18: 375-379.
- CIAT - Centro Internacional de Agricultura Tropical. (1977). *Informe Anual. Fitomelhoramento*. A-14, A-16.
- Kishore, H. (1951). A note on the chromosome numbers of some plants. *Indian J. Genet. Plant Breed.* 11: 217.
- Krapovickas, A. and Fuchs de Krapovickas, A.M. (1957). Notas citológicas sobre leguminosas. II. *Investigaciones Agrícolas*, XI: 215-218.
- Richard, A.J. and Gould, K.F. (1964). Chromosome numbers in some introduced and indigenous legumes and grasses. *Div. Trop. Pastures Tech. Pop.* (CSIRO) 2: 1-18.

(Received May 20, 1987)