

SHORT COMMUNICATION:

Cytogenetic studies of populations of *Arachis*, *Desmodium* and *Vigna* species (Leguminosae, Papilionoideae) from Rio Grande do Sul

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ABSTRACT

Cytogenetical studies were performed on 23 populations of *Arachis pintoii*, *Desmodium uncinatum*, *D. affine*, *D. incanum*, *D. triarticulatum*, *D. pachyrizum*, *Vigna adenantha*, *V. luteola* and *V. longifolia*. Populations were composed of diploid individuals with regular meiotic behavior and high pollen fertility (over 96%). This is the first population cytogenetic study of these native genera.

INTRODUCTION

Legume species are important components of the native pastures of Rio Grande do Sul, not only in number of species but also because some of them are promising as forage crops (Barreto and Kappel, 1964). Cytogenetic data are restricted to one or a few individuals in a few species, including four *Desmodium* (Schifino, 1983) and three *Vigna* species (Senff *et al.*, 1992). Population studies are rare.

MATERIAL AND METHODS

Inflorescences and seeds of populations of *Arachis pintoii*, *Desmodium incanum*, *D. uncinatum*, *D. triarticulatum*, *D. pachyrizum*, *D. cuneatum*, *Vigna*

adenantha, *V. luteola* and *V. longifolia* were collected from several places in Rio Grande do Sul (Table I) with the exception of one population of *D. incanum* from Santa Catarina and *A. pintoii* received from J.F. Valls of EMBRAPA/CENARGEN (Centro Nacional de Recursos Genéticos e Biotecnologia, Brasília, DF).

For somatic chromosome counts, seeds were germinated on moist filter paper in petri dishes. Seedlings were pretreated with a saturated solution of paradichlorobenzene for 5 h, fixed in 3:1 ethanol-acetic acid for 12-24 h and stored in 70% ethanol in a freezer. Slides were prepared after hydrolizing the root-tips in 5N HCl for 5 min and staining with Feulgen and Giemsa. At least five individuals per population and ten cells per individual were examined.

For meiotic analysis, inflorescences were directly fixed in 3:1 ethanol-acetic acid for 12-24 h and stored in 70% ethanol in a freezer. Slides were prepared by squashing the anthers in propionic carmine. Young inflorescences were used for chromosome number and meiotic pairing observations. Pollen fertility was

Table I - Mitotic and meiotic chromosome numbers, meiotic pairing, meiotic index and pollen fertility data for the *Arachis*, *Desmodium* and *Vigna* populations studied.

Species	Origin	2n	n	n II	m.i.	p.f.
<i>Arachis pintoi</i>	CENARGEN	20			100	99
<i>Desmodium incanum</i>	Cristal	22	11	11 II	99	96
	Nova Nordeste	22	11	11 II	99	96
	Porto Alegre	22	11	11 II	98	98
	Camaquã	22	11	11 II	97	96
	Pelotas		11	11 II	97	98
<i>D. uncinatum</i>	Imbituba (SC)		11	11 II	97	98
	Cristal		11	11 II	100	99
<i>D. triarticulatum</i>	Porto Alegre	22				
	Pedro Osório		11	11 II	99	98
<i>D. pachyrrizum</i>	Piratini	22	11	11 II	99	98
	Bagé		11		98	96
<i>D. cuneatum</i>	Bagé		11		99	98
<i>Vigna adenantha</i>	Porto Alegre	22	11	11 II	98	97
	Camaquã	22	11	11 II	99	97
	Pelotas	22	11	11 II	100	98
<i>V. luteola</i>	Porto Alegre	22	11	11 II	98	96
	Nova Nordeste	22	11	11 II	99	98
	Imbé	22				
	Torres	22				
<i>V. longifolia</i>	Nova Nordeste	22	11	11 II	98	98
	Ipiranga	22	11	11 II	98	97
	Mariluz	22	11	11 II	100	98

2n - somatic chromosomes number.

n II - number of bivalents at metaphase I.

p.f. - pollen fertility (%).

n - gametic chromosome number.

m.i. - meiotic index (%).

CENARGEN - Federal Agency in Brasilia.

SC - Santa Catarina, all the rest from Rio Grande do Sul.

estimated by the stainability of mature pollen grains. At least five individuals per population were examined. The greatest possible number of cells in different meiotic stages were analyzed. Special attention was given to chromosome associations at metaphase I. For meiotic index and pollen fertility determinations, 200 quartets and 200 mature pollen grains per individual were respectively examined.

RESULTS AND DISCUSSION

Data on somatic and meiotic chromosome numbers, meiotic pairing, meiotic index and pollen fertility are summarized in Table I. All individuals of all populations and species studied were diploid. Meiosis was regular with only bivalents formed at metaphase I,

meiotic indexes above 90% (an indication of meiotically stable plants, according to Love's (1949) definition) and pollen fertility over 96%.

Our results agree with published observations on the genera *Arachis* (Federov, 1969; Ressler and Gregory, 1979; Goldblatt, 1981), *Vigna* (Federov, 1969; Forni-Martins, 1989; Senff et al., 1992) and *Desmodium* (Federov, 1969; Coleman and de Menezes, 1980; Coleman, 1982; Schifino, 1983). The data presented here are the first on population cytogenetics of species of these three native legume genera.

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RESUMO

Estudos citogenéticos foram realizados em 21 populações de *Arachis pintoi*, *Desmodium uncinatum*, *D. affine*, *D. incanum*, *D. cuneatum*, *D. triarticulatum*, *D. pachyrrizum*, *Vigna adenantha*, *V. luteola* e *V. longifolia*. As populações estavam compostas por indivíduos diplóides, com comportamento meiótico regular e alta fertilidade de pólen (acima de 96%). Este é o primeiro estudo citogenético realizado em populações de espécies destes três gêneros nativos.

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