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CHROMOSOME NUMBERS IN PAPILIONACEAE FROM PAKISTAN

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Abstract

Thirty one meiotic counts are reported for 13 species of Papilionaceae from Pakistan. Counts for 2 species viz., *Rhynchosia capitata* (Heyne ex Roth) DC., and *Vigna trilobata* (L.) Verdc., are new to flora of Pakistan. *R. capitata* is an addition to the flora of Karachi.

Introduction

Papilionaceae is the third largest angiosperm family in the flora of Pakistan with about 382 species (Ali, 1978), but very little cytological work has been conducted on this family in Pakistan. Chromosome numbers for only 24 species (i.e. 6.2% of the total species) are available from the works of Baquar *et al.*, (1965, 1966), Baquar & Hussein (1967), Baquar & Askari (1970), Quraish & Faruqi (1970), Faruqi (1977) and Khatoon & Ali (1982). Therefore, extensive cytological work is to be done in this large and economicaly important family. In the present work, meiotic counts for 13 species are reported, more of them are based on more than one specimen.

Materials and Methods

Collections were made mainly from Karachi and some adjoining areas. Floral buds of suitable size were fixed at the spot in Carnoy's solution (3:1 Absolute alcohol - Acetic acid) and stored at 5°C in the refrigerator. Slides were prepared by squashing the anthers in (1%) Propionic-Carmine. The voucher specimens are deposited in the Karachi University Herbarium (KUH).

Results and Discussion

The results are summarised in Table I. The chromosome number is found to be constant in all the specimens of each species. No meiotic irregularity as evidenced through chromosomal associations at *Diakinesis, Metaphase I and Anaphase I* was detected in any species.

In the present work, chromosome numbers for 13 species (belonging to 7 genera) are reported. Of these, 11 species have previously been studied from flora of Pakistan, but the counts were based mostly on single specimen. In the present study except for *A. heterophyllus, T. cuneifolia* and *V. trilobata,* more than one specimen of every species

Table 1. Chromosome number in some Papilionaceae from Pakistan.

Species	Basic No. x	Voucher	Present count n	Previous counts with authority n	2n	
Alysicarpus heterophyllus (Baker) Jafri & Ali	8	K.U.Campus *Khatoon* 427	8	8	–	Khatoon & Ali, 1982
A. monilifer (L.) DC.	8	K.U. Campus, *Perveen* 118	8	8	–	Bir & Sidhu (1967) in Moore 1973
		K.U. Campus, *Perveen* 169	8	8	–	Khatoon & Ali, 1982
		K.U. Campus, *Perveen* 176	8			
Indigofera hochstetteri Baker	8	K.U. Campus, *Perveen* 88	8	8	–	Baquar & Husain, 1967
		Darsanochano, *Perveen* 93	8	8	–	Singh & Roy (1970) in Moore, 1973
		K.U. Campus, *Perveen* 170	8	8	– 32	Khatoon & Ali, 1982, Bhatt, 1974
I. oblongifolia Forssk.	8	K.U. Campus, *Perveen* 100	8	7	–	Baquar *et al.*, 1966
		K.U. Campus, *Perveen* 115	8	–	16	Bhatt, 1974; Singh & Roy (1970) in Moore, 1973
		K.U. Campus, *Perveen* 160	8	–	16	Faruqi, 1977
		K.U. Campus, *Perveen* 179	8	8	–	Khatoon & Ali, 1982
Melilotus alba Desr.	8	K.U. Campus *Perveen* 123	8	–	16	Bokharae, Atwood (1936) in Darlington & Wylie, 1966.
				–	16, 32	Raghuvanshe *et al.*, (1980) in Goldblatt, 1981.
		K.U. Campus *Perveen* 114	8	8	–	Baquar & Husain, 1967.
				–	16	Singh & Roy (1970) in Moore 1973.
		K.U. Campus, *Perveen* 125	8			
Melilotus indica (L.) All.	8	K.U. Campus, *Perveen* 113, 119	8	–	16	Ferrarella *et al.*, (1981) in Goldblatt, 1985.

		K.U. Campus, *Perveen* 132	8			
Rhynchosia capitata (Heyne ex Roth) DC.		K.U. Campus, *Perveen* 173	11	11	22	Bir & Sidhu in Moore, 1973
		K.U. Campus, *Khatoon* 359	11			
R. minima (L.) DC.		K.U. Campus, *Perveen* 116	11	11	–	Baquar *et al.*, 1966
				–	22	Quraish & Faruqi, 1970
		K.U. Campus, *Perveen* 149	11	11	–	Sands (1975) in Goldblatt, 1981.
		K.U. Campus, *Perveen* 164	11	–	22	Thuan (1975) in Goldblatt, 1981.
R. pulverulanta Stocks (Syn. *R. memnonia* auct. non (Delile) DC.)	11	Darsanochano, *Perveen* 101	11	–	22	Quraish & Faruqi, 1970
		K.U. Campus, *Perveen* 140	11			
		K.U., Campus, *Perveen* 167	11			
Taverniera cuneifolia (Roth) Arn.	8	Paradise Point Karachi, *Khatoon* 313	8	8 –	– 16	Baquar & Warsi, 1968 Faruqi, 1977
Tephrosia subtriflora Baker	11	K.U. Campus, *Perveen* 137	11	11	–	Baquar & Warsi, 1968
		K.U. Campus, *Perveen* 161	11			
		K.U. Campus, *Perveen* 166	11			
T. uniflora Pers. subsp. *petrosa* (Blatter & Hallb) Gillett & Ali	11	K.U. Campus, *Perveen* 177	11	11	–	Baquar & Husain, 1967
		K.U. Campus, *Perveen* 178	11	11	–	Khatoon & Ali, 1982
		K.U. Campus, *Perveen* 180	11			
Vigna trilobata (L.) Verdc.		K.U. Campus, *Perveen* 172	11	–	22	Joseph & Bouwkamp in Goldblatt, 1981.

KU = Karachi University Campus

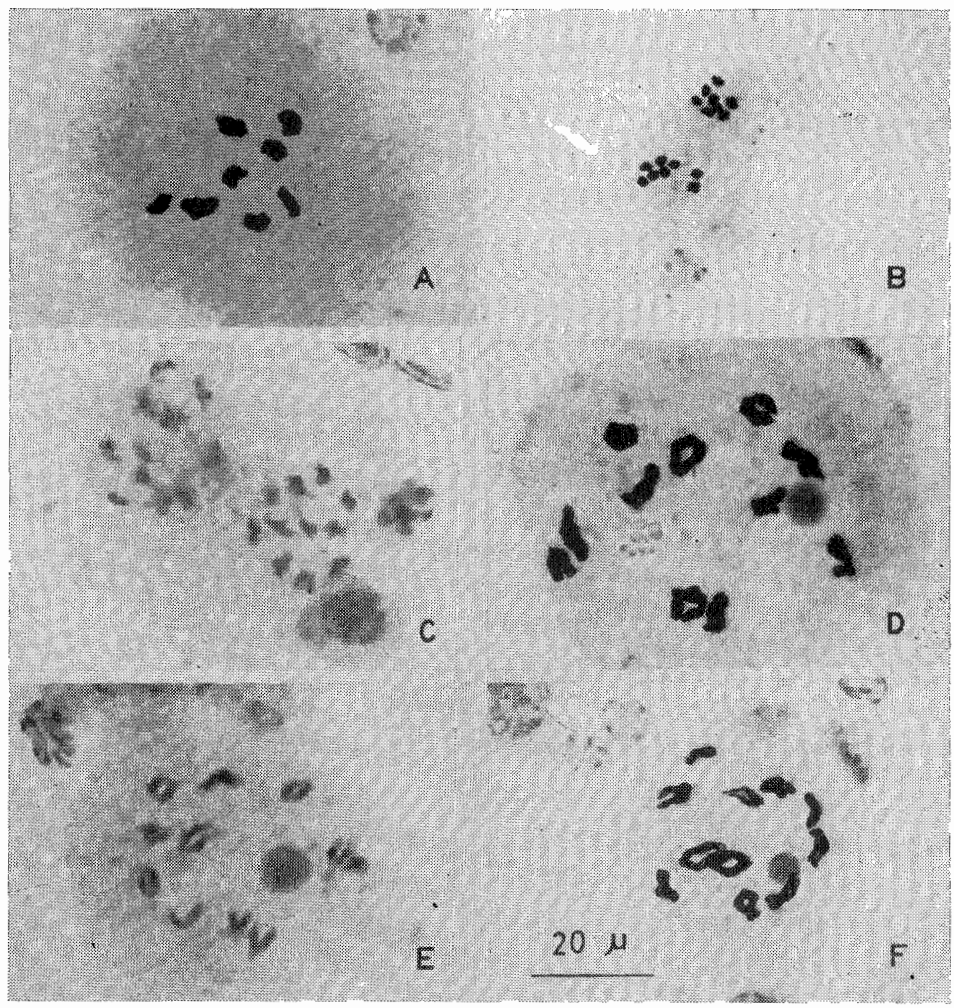

Fig. 1. Meiosis in pollen mother cells: A. *Alysicarpus heterophyllus* (metaphase-I) n = 8 (Kh. 427), B. *Indigofera oblongifolia* (Anaphase-I) n = 8 (Perveen 179), C. *Rhynchosia pulverulenta* (late prophase-II) n = 11 (Perveen 167), D. *Tephrosia subtriflora* (diakinesis) n = 11 *(Perveen 137)*, E. *Tephrosia uniflora* subsp. *petrosa* (diakinesis) n = 11 *(Perveen 180)*, F. *Vigna trilobata* (diakinesis) n = 11 (Perveen 172).

was analysed to reveal either the constancy or variability of the chromosome number in these species. Counts for 2 species i.e., *Rhynchosia capitata* and *Vigna trilobata* are new to flora of Pakistan. *R. capitata* is also an addition to the flora of Karachi, as this species has not been previously recorded from this area. All the specimens of *I. Indigofera oblongifolia* analysed by us have n=8 (Table 1), suggestive that it is the correct chromosome number for this species and not n=7 as reported previously by Baquar *et al.*, (1966).

No variation in the chromosome number is recorded in any species, neither did we find any polyploidy among them. All species possessed a constant chromosome number i.e., cytotypes were not met in any. Though tetraploids are recorded in *I. hochstetteri* and *Melilotus alba* from areas other than Pakistan (Table 1) only diploids were recorded in the present study.

References

Ali, S.I. 1978. The flora of Pakistan: some general and analytical remarks. *Notes Roy. Bot. Gard. Ednb.*, 36: 427-439.

Baquar, S.R. and S.H.A. Askari. 1970. Chromosome studies in some flowering plants of West Pakistan-II, *Genet.* Iber., 22: 41-51.

Baquar, S.R. and A. Hussain. 1967. Chromosome studies in some flowering plants of West Pakistan-I. *Phyton* (Argentina), 24: 49-55.

Baquar, S.R. and B.A. Warsi. 1968. In IOPB chromosome number reports XV. *Taxon*, 17: 91-104.

Baquar, S.R., S. Akhter and A. Hussain. 1965. Meiotic chromosome numbers in some vascular plants of Indus delta-I. *Botaniska Notiser*, 118: 289-298.

Baquar, S.R., A. Hussain and S. Akhter. 1966. Meiotic chromosome numbers in some vascular plants of Indus delta-II. *Botaniska Notiser*, 119: 24-32.

Bhatt, R.P. 1974. Studies on the flora in north Gujrat: III Cytology. *Nucleus* (Calcutta), 17: 33-39.

Darlington, C.D. and A.P. Wylie. *Chromosome Atlas of Flowering Plants*. George Allen and Unwin Ltd, London.

Faruqi, S.A. 1977. Chromosome numbers of some plants from Pakistan. *Libyan Jour. Sci*, 7A: 71-72.

Goldblatt, P. (Ed.) 1981. Index to Plant Chromosome Numbers for 1975-1978. *Missouri Botanical Garden.*

Goldblatt, P. (Ed.) 1985. Index to Plant Chromosome Numbers for 1982-1983. *Missouri Botanical Garden.*

Khatoon, S. and S.I. Ali. 1982. Chromosome numbers of some plants of Pakistan. *Pak. Jour. Bot.*,14: 117-129.

Moore, R.J. (Ed.) 1973. Index to plant chromosome numbers for 1967-1971. *Regnum Vegetabile*, 90: 1-539.

Quraish, H.B. and S.A. Faruqi. 1970. Genetic system in *Rhynchosia minima* and *R. memnonia* (Leguminosae). *Pak. Jour. Bot.*, 2: 65-82.

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