

CHROMOSOME NUMBERS OF PROSOPIS SECT. PROSOPIS (MIMOSACEAE) FROM IRAN

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Chromosome numbers of three native species of *Prosopis* are presented. They include first counts from Iran for *Prosopis cineraria* and *Prosopis farcta*, both of which show diploidy by $2n=28$, and first record of *Prosopis koelziana* show diploidy and tetraploidy. Chromosomes were counted from thirty populations of *Prosopis* distributed in South Iran.

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Key words. *Prosopis*, chromosome numbers, Iran.

شمارش کروموزومی گونه‌های جنس کهور (*Prosopis*) در ایران

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اعداد کروموزومی ۳ گونه از جنس کهور (*Prosopis*) ارائه شده است. این گزارش شامل اعداد کروموزومی دو گونه *Prosopis cineraria* و *Prosopis farcta* برای اولین بار از ایران با سطح دیپلوئیدی $2n=28$ و اولین گزارش از عدد کروموزومی *Prosopis koelziana* با سطوح دیپلوئیدی و تتراپلوئیدی می‌باشد. کروموزومها از ۳۰ جمعیت از *Prosopis* گسترده در جنوب ایران شمارش شدند.

INTRODUCTION

Genus *Prosopis* L. belongs to *Mimosaceae*, a mainly tropical and subtropical family, consisting of 44 species which belong to five sections (Burkart 1976). *P. koelziana* Burkart has a wide distribution range from SE to SW Iran. Morphologically the species shows wide variation in shape and size of the fruit. It has also some intermediate features between *P. farcta* and *P. cineraria* (Burkart, 1976). As cytological data are of great importance for the understanding of relationship and evolution in angiosperms, an attempt is made to investigate the chromosome numbers of 30 populations of the genus distributed in South Iran. There is no former report on chromosome numbers of *P. cineraria* and *P. farcta* in Iran and the chromosome counts for *P. koelziana* is reported for the first time.

MATERIALS AND METHODS

Seed specimens were obtained from 30 populations (table 1). Voucher specimens of all investigated taxa are deposited at the herbaria of the Natural Resources Research center of Hormozgan, the Department of Biology, Faculty of the Science, Kerman University and TARI.

Seeds were treated in 97% sulfuric acid for 30 minutes then washed and soaked in tap water overnight at room temperature. Seeds were then germinated on moisten filter papers. Young growing root tips were pretreated in saturated alpha-Bromonaphtalene solution or 0.002 M 8-Hydroxyquinoline and then soaked in 75 mM KCl for 10 minutes (Bukhari, 1997b). Pretreated root tips were fixed in a freshly mixed 3:1 solution of 96% ethanol and glacial acetic acid. The fixed roots were preserved in 70% ethanol in a refrigerator until used. The counts were obtained from preparations, which were stained with Iron Hematoxylin and made by squash technique. Photographs were

taken using an AH2 Olympus photomicroscope. Initial magnification was x 250.

RESULTS

Chromosome counts for 30 populations of *Prosopis* sect. *Prosopis*, which mainly grow in S. Iran, are presented. Mitotic metaphase chromosomes were found very small in size and more or less uniform in shape.

Prosopis cineraria (L.) Druce

Syn. *P. spicigera* L.

Distribution. Arabia, Iran, Afghanistan and India.

All the populations had somatic chromosome numbers $2n=28$. These are the first counts of the species for the country.

Kumari & al. 1989 reported gametophytic number $n=26$, a doubtful count not previously reported within *Prosopis* species. Sandipa (1979) reported gametophytic number $n=14$ (see Goldblatt, 1984). The chromosome numbers of *P. cineraria* from Iran ($2n=28$) reported in this study are in accordance with counts of the species reported by Bukhari (1997a) from Pakistan and Senegal.

Prosopis farcta (Sol. ex Russell) Macbr.

Syn. *P. stephaniana* (M. Bieb.) Kunth ex Sprengel.

Distribution. Algeria, Tunisia, Egypt, Turkey, Cyprus, Syria, Palestine, Iraq, Iran, Afghanistan, Pakistan, Transcaucasia and Turkistan.

In this investigation five populations of this species were examined, all of which indicate somatic chromosome number $2n=28$. Cherubini (1981) reported $2n=28$ and 56 (see Goldblatt 1985).

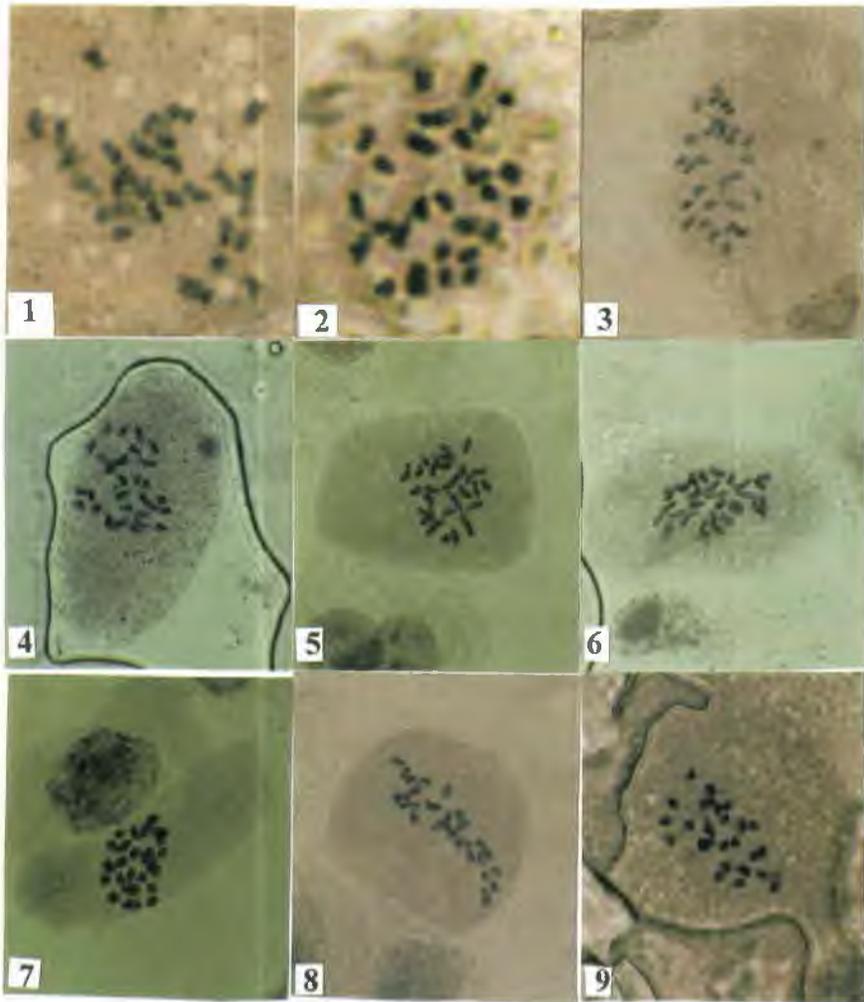
Prosopis koelziana Burkart

Distribution. Iran, Arabia.

This species show variation in shape, habitat and somewhat in pod morphology. As

Table 1. Localities and chromosome numbers of examined populations of *Prosopis* species.

No.	Species	Locality	Chromosome numbers
1	<i>P. cineraria</i>	Hormozgan: Bandar Lengeh, Maragh village, 150 m, Zaeifi 5867.	28
2	<i>P. cineraria</i>	Hormozgan: between Bandar Lengeh and Gavbandi, Buchir village, 200, Zaeifi 5868.	28
3	<i>P. cineraria</i>	Hormozgan: Gavbandi, 50 m, Zaeifi 5869.	28
4	<i>P. farcta</i>	Yazd: yazd, 1200 m, Zaeifi 5870.	28
5	<i>P. farcta</i>	Khuzestan: 165 km from Ahvaz to Bushehr, 150 m, Zaeifi & Dinarvand 5871.	28
6	<i>P. farcta</i>	Khuzestan: 60 km from Shoush to Ahvaz, 40 m, Zaeifi & Dinarvand 5872.	28
7	<i>P. farcta</i>	Khuzestan: 45 km from Shoushtar to Ahvaz, 50 m, Zaeifi & Dinarvand 5873.	28
8	<i>P. farcta</i>	Khuzestan: Ramhormoz, 130 m, Zaeifi & Dinarvand 5874.	28
9	<i>P. koelziana</i>	Baluchistan: Iranshahr, Bampour, 490 m, Zaeifi 5875.	28
10	<i>P. koelziana</i>	Baluchistan: Iranshahr, Bampour, Touran, 500 m, Zaeifi 5876.	28
11	<i>P. koelziana</i>	Baluchistan: Iranshahr, 500 m, Zaeifi 5877.	28
12	<i>P. koelziana</i>	Baluchistan: between Rigan and Bazman, 600 m, Zaeifi 5878.	28
13	<i>P. koelziana</i>	Kerman: Shahdad, 320 m, Zaeifi 5879.	56
14	<i>P. koelziana</i>	Kerman: 32 km from Bam to Zahedan, 800 m, Zaeifi 5880.	28
15	<i>P. koelziana</i>	Kerman: 27 km from Bam to Zahedan (Vakil abad), 830 m, Zaeifi 5881.	28
16	<i>P. koelziana</i>	Kerman: Bam, 800 m, Zaeifi 5882.	28
17	<i>P. koelziana</i>	Hormozgan: Hajiabad, Madanuyeh, 800 m, Zaeifi 5883.	56
18	<i>P. koelziana</i>	Hormozgan: Hajiabad, Tezerj, 800 m, Zaeifi 5884.	28
19	<i>P. koelziana</i>	Hormozgan: Hajiabad, Gahkom, 600 m, Zaeifi 5885.	28
20	<i>P. koelziana</i>	Hormozgan: Bandar e Khamir, 20 m, Zaeifi 5886.	28
21	<i>P. koelziana</i>	Hormozgan: Bandar e Lengeh, 5 km E. of Buchir, 150 m, Zaeifi 5887.	28
22	<i>P. koelziana</i>	Hormozgan: Bandar e Lengeh, Buchir, 150 m, Zaeifi 5888.	28
23	<i>P. koelziana</i>	Hormozgan: Gavbandi, Behdeh, 200 m, Zaeifi 5889.	28
24	<i>P. koelziana</i>	Hormozgan: Gavbandi, 50 m, Zaeifi 5890.	28
25	<i>P. koelziana</i>	Bushehr: Dashti, Razmabad, 100 m, Zaeifi 5891.	56
26	<i>P. koelziana</i>	Bushehr: Borazjan, 100 m, Zaeifi 5892.	28
27	<i>P. koelziana</i>	Khuzestan: Ramhormoz, 130 m, Zaeifi & Dinarvand 5893.	28
28	<i>P. koelziana</i>	Khuzestan: Shoush, 100 m, Zaeifi & Dinarvand 5894.	28
29	<i>P. koelziana</i>	Khuzestan: Shoush, 100 m, Zaeifi & Dinarvand 5895.	28
30	<i>P. koelziana</i>	Khuzestan: 25 km from Andimeshk to Shoush, 100 m, Zaeifi & Dinarvand 5896.	28



Figs. 1-9. Mitotic chromosomes of *Prosopis* species; -1-2: *P. cineraria* no. 2 ($\times 500$). -3-4: *P. farcta* no. 6 and 8 respectively ($\times 250$). -5-9: *P. koelziana* no. 9, 10, 12, 14 and 15 respectively ($\times 250$). All diploids.

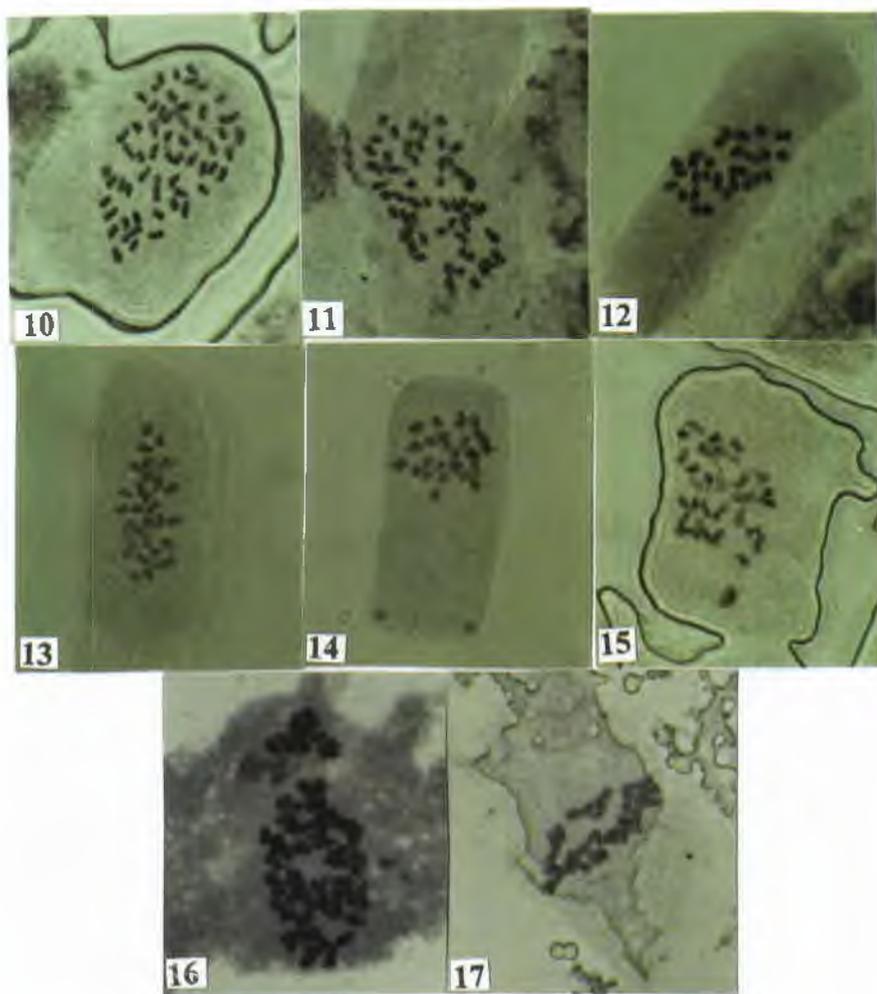


Fig. 10-17. -10-11: *P. koelziana* no. 17, (tetraploid). -12-13: no. 20 (diploid). -14-15: no. 22 (diploid). -16: no. 25 (tetraploid) -17: no. 28 (diploid). All x 250.

it is almost a newly recognized and least known species, 22 populations were examined. Three populations showed $2n=4x=56$ (tetraploid) and others were all diploid. This is the first report of chromosome count of this species.

Morphologically, the tetraploids had more or less long pods and yielded a large number of pods. Among diploids some had long dark brown pods with dark seeds (table 1, numbers 9-12 from Baluchistan) and some had inflated and very small yellowish pods, but produced a few number of pods (table 1, numbers 26-29).

REFERENCES

- Bukhari, Yahaya, M. 1997a: Cytoevolution of taxa in *Acacia* and *Prosopis* (Mimosaceae). - *Aus. Jour. Bot.* 45: 879-891.
- Bukhari, Yahaya, M. 1997b: A simple method of chromosome preparation for *Acacia* and *Prosopis*. - *Hereditas.* 126 (2): 195-197.
- Goldblatt, P. 1984: Index to plant chromosome numbers (1979-1981). - Missouri Botanical Garden. USA.
- Goldblatt, P. 1985: Index to plant chromosome numbers (1982-1983). Missouri Botanical Garden. -USA.
- Goldblatt, P. 1991: Index to plant chromosome numbers (1988-1989). Missouri Botanical Garden. -USA.
- Burkart, A. 1976: A monograph of the genus *Prosopis*. - *Journal of the Arnold Arboretum.* 67: 219-249, 450-525.
- Zaeifi, M. 1995: *Prosopis* in Fl. of Iran. no 18- Tehran.