DOI: http://dx.doi.org/10.22092/ijb.2013.2997

CHROMOSOME NUMBERS OF SOME PERSICARIA (POLYGONACEAE) SPECIES FROM IRAN

M. Keshavarzi & S. Mosaferi

Received 16.07.2012. Accepted for publication 08.11.2012.

Keshavarzi, M. & Mosaferi. S. 2013 06 30: Chromosome numbers of some *Persicaria* (*Polygonaceae*) species from Iran. *-Iran. J. Bot. 19 (1): 75-77.* Tehran.

Mitotic chromosome numbers of 5 taxa of the genus *Persicaria* (L.) Mill. is reported for Iran for the first time. Subspecies of *P. lapathifolia* showed 2n =22 chromosome number supporting the earlier report while the chromosome numbers of *P. minor* and *P. mitis* are 2n =40. Results are compared with previous records.

Maryam Keshavarzi (correspondence <Neshat112000@yahoo.com> *and Samaneh Mosaferi, Biology Dept., Faculty of Science, Alzahra University, Vanak, Tehran, Iran and Iran National Science Foundation (INSF).*

Key words. Persicaria, Polygonaceae, Chromosome number, Iran.

اعداد کروموزومی برای برخی از گونه‌های Persicaria (تیره علف هفت بند) از ایران

مریم کشاورزی، استادیار گروه زیست‌شناسی، دانشکده علوم پایه دانشگاه الزهرا.

سمانه مسافری، دانش‌آموخته کارشناسی ارشد گروه زیست شناسی، دانشکده علوم پایه دانشگاه الزهرا.

عدد کروموزومی میتوزی برای ۵ آرایه از جنس *Persicaria* (L.) Mill. برای نخستین بار برای ایران گزارش می‌شود. زیرگونه‌های *P. lapathifolia* عدد کروموزومی 2n=22 را نشان می‌دهند که از اعداد کروموزومی که پیشتر گزارش شده است حمایت می‌کند در حالیکه اعداد کروموزومی گونه‌های *p. minor* و *P. mitis* 2n=40 هستند. نتایج با گزارشات قبلی برای دنیا مقایسه شده است.

Introduction

The genus *Persicaria* (L.) Mill. comprises about 120 species distributed in moderate regions of North hemisphere. This genus has 6 annual species in Iran. High morphological variation especially in weedy species (Stanford 1925), allo- and autopolyploid hybridization (Timson 1964, Kim et al. 2008) and phenotypic plasticity (Sultan & Bazzaz 1993) are documented in *Persicaria* species. Due to the complex taxonomic history and delimitation problems in this genus, some biosystematic studies have been done (Ronse Decraene & Akeroyd 1988, Amiri & Sharifnia 2007, Mosaferi & Keshavarzi 2011, Mosaferi et al. 2011).

Previous cytological studies show that *Persicaria* has different basic chromosome numbers of x= 10, 11, 12 (Freeman & Reveal 2005). No chromosomal reports were available on *Persicaria* species of Iran so in order to understand whether there is any relation between diploid chromosome counts and morphological differences particularly in subspecies of *P. lapathifolia* (L.) Gray.

Materials and methods

We examined six taxa of annual *Persicaria* species from Iran, as: *P. mitis* (Schrank) Holub, *P. minor* (Huds.) Opiz, *P. lapathifolia* subsp. *lapathifolia* L., *P. lapathifolia* subsp. *nodosa* (Pers.) Á. Löve and *P. lapathifolia* subsp. *brittingeri* (Opiz) Soják. Voucher specimens are deposited at the herbarium of Alzahra University (AUH). This investigation was based on counting mitotic chromosomes. Mature seeds of plants collected from different habitats of Iran (table 1) were germinated in humidified Petri dishes at room temperature. Root tips with length of 0.5- 1.0 cm was exposed to a treatment of 0.002 M 8- hydroxyquinoline for 2-3 hours, fixed in 3:1 absolute ethanol: acetic acid, hydrolyzed in 1N HCl for 20 min. and stained in 1% aceto- orcein. Aceto- orcein squash method was applied to the root tips (Singh 2003).

Results and discussion

Persicaria mitis is a tetraploid species which is distributed in Himalayas, North West Europe, Africa, temperate Asia and North America. It grows along water channels and moist soils in 400- 2000 m. Our count of 2n=40 agrees with the previous report by Stoeva (1985) (Fig. 1).

P. minor is a species with wide range of

Table 1. Collection data for populations used in this study.

Species	Voucher number	Origin	Collector
P. lapathifolia subsp. nodosa	504	Hamadan province, Heydareh village	Mosaferi
P. lapathifolia subsp. lapathifolia	506	Kermanshah province, Kermanshah, Gharesoo river	Gholami
P. lapathifolia subsp. brittingeri	513	Mazandaran province, Noushahr	Amini
P. mitis	535	Mazandaran province, Abbas abad, Abbas abad forest	Mosaferi
P. minor	514	Isfahan province, Golpaygan, Saravar village	Mosaferi

morphological traits such as leaf shape, spot and width and flower color in different habitats (Mosaferi et al. 2011). This annual herb is widespread in Europe, Asia and North America. The mitotic chromosome number of 2n=40 is in congruent with Albers & Wisskirchen 1998. (Fig. 2).

P. lapathifolia subsp. *lapathifolia* occurs in Europe, Asia, Iran and Afghanistan. This diploid taxon occurs in damp soils and around cultivated lands in 0-1500 m. Our diploid count (2n=22) (Fig. 3) is in accordance with the previous report by Dempsey et al. (1994) and Probatova & Sokolovskaya (1989).

P. lapathifolia subsp. *nodosa* is diploid which differs from subsp. *lapathifolia* by having lax inflorescence and red dots on stem (Mosaferi et al. 2010). Its geographic distribution is from Western Himalayas to Western Europe in higher altitudes. Our counts of 2n=22 confirms the count reported by Vanchova & Zaborsky (1980) (Fig. 4).

P. lapathifolia subsp. *brittingeri* is diploid and has distribution in Western and central Europe and Western Asia. It is found in ditches and moist places in 0-1500m. The diploid chromosome number of 2n=22 is in accordance with the previous report by Albers & Wisskirchen 1998) (Fig. 5).

Acknowledgment

The authors wish to express their acknowledgments to Iran National Science Foundation (INSF) for financial support of this research.

References

Albers, F. & Wisskirchen, R. 1998: In. R. Wisskirchen & H. Haeupler, Standardliste der Farn- und Blütenpflanzen Deutschlands. -Bundesamt für Naturschutz & Verlag Eugen Ulmer, Stuttgart.

Amiri, N. & Sharifnia, F. 2007: Revision of taxonomy of Polygonum sections in Iran by palynological characters. -Rostaniha, 8: 85-93.

Craig C. Freeman, James L. Reveal. 2005: Polygonaceae. Flora of North America North of Mexico, Provisional Publication. Flora of North America Association. vol. 5. http://www.efloras.org (accessed 04.05.2011).

Dempsey, R. E., Gornall, R. J. & Bailey, J. P. 1994: Contributions to a cytological catalogue of the British and Irish flora, 4. -Watsonia 20: 63–66.

Kim, S., Sultan, S. E. & Donoghue, M. J. 2008: Allopolyploid speciation in Persicaria (Polygonaceae): Insights from a low copy nuclear region. -Proc. Natl. Acad. Sci. U.S.A., 105 (34): 12370-12375.

Mosaferi, S., Keshavarzi, M. & Amini, T. 2010: Persicaria lapathifolia subsp. nodosa (Polygonaceae) is recorded for the flora of Iran. -Iran. J. Bot., 16(2): 254-257.

Mosaferi, S. & Keshavarzi, M. 2011: Micro-morphological study of Polygonaceae tribes in Iran. -Phytol. Balcan. 17 (1): 89 –100.

Mosaferi, S., Keshavarzi, M. & Ghadam, P. 2011: Biosystematic study of annual species of Persicaria from Iran using SDS-PAGE. Phytol. Balcan. 17 (2): 185 – 190.

Probatova, N. S. & Sokolovskaya, A. P. 1989: Chromosome numbers in vascular plants from Primorye Territory, the Amur region, Sakhalin, Kamchatka and Kuril Islands. -Bot. Žurn. (Moscow & Leningrad). 74: 120- 123.

Ronse Decraene, L. P. & Akeroyd, J. R. 1988: Generic limits in Polygonum and related genera (Polygonaceae) on the basis of floral characters. -Bot. J. Linn. Soc., 98: 321-371.

Singh, R. J. 2003: Plant Cytogenetics. Second edition. CRC Press.

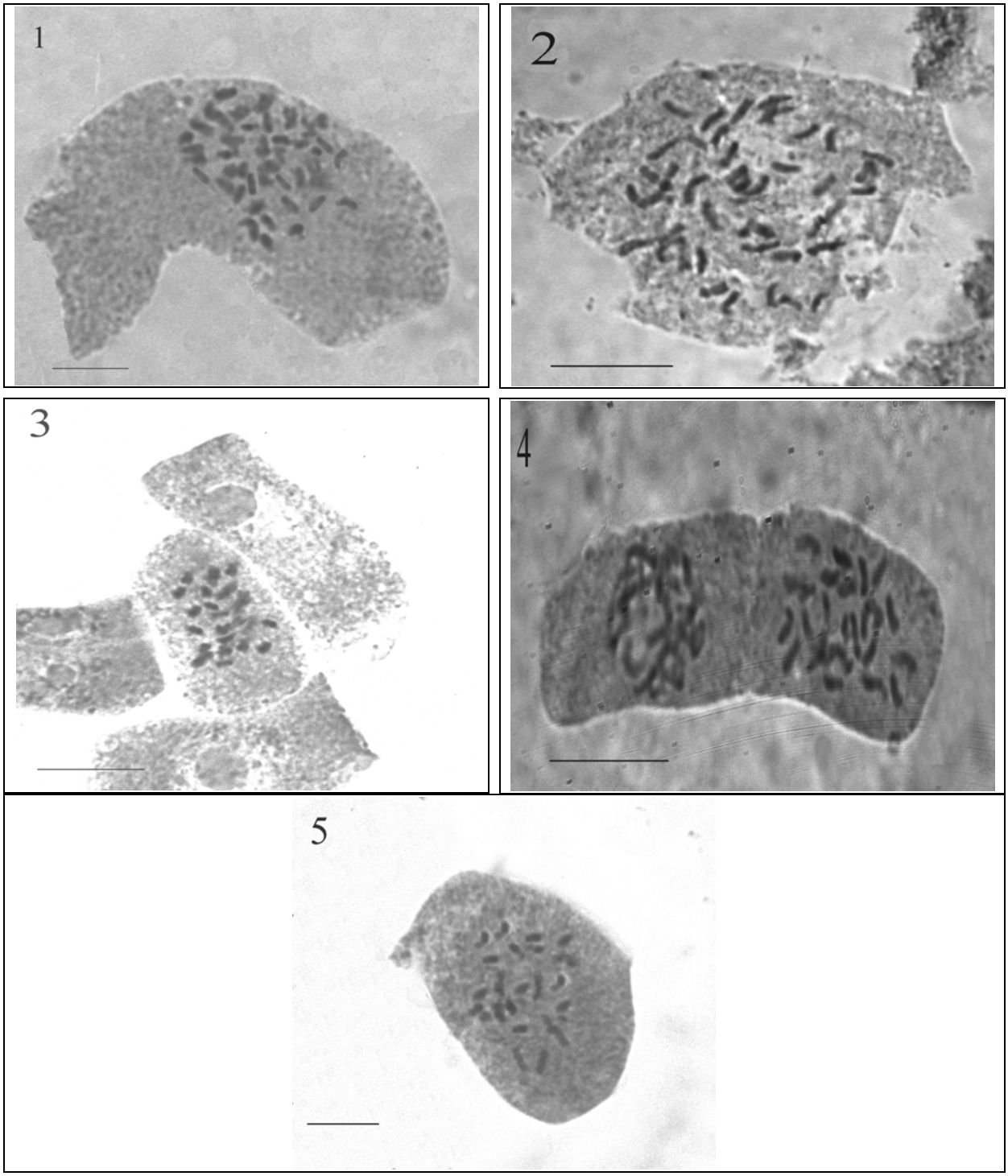
Stanford, E. E. 1925: Possibilities of hybridism as a cause of variation in Polygonum. -Rhodora. 27: 81–89.

Stoeva, M. P. 1985: Chromosome number of Bulgarian angiosperms. -Fitologia. 30: 78- 79.

Sultan S. E, & Bazzaz, F. A. 1993: Phenotypic plasticity in Polygonum persicaria. II. Norms of reaction to soil moisture and the maintenance of genetic diversity. -Evolution 47: 1032–1049.

Timson, J. 1964: Study of hybridization in Polygonum section Persicaria. -J. Linn. Soc. 59: 155- 161.

Vanchova, M. & Zaborsky, J. 1980: Chromosome number reports LXIX. -Taxon. 29: 724.



Figs. 1-5: Somatic cells of *Persicaria* species 1. *P. mitis*; 2. *P. minor*; 3. *P. lapathifolia* subsp. *lapathifolia*; 4. *P. lapathifolia* subsp. *nodosa*; 5. *P. lapathifolia* subsp. *brittingeri* (Bar=10µm).