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All materials CHN; vouchers are deposited in NS; collector E.Yu. Zykova.

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ASTERACEAE

Anthemis tinctoria L., 2*n* = 18; Russia, Altay Republic, *Z35a*, *Z37.* 2*n* = 27; Russia, Altay Republic, *Z35b.*
Arctium lappa L., 2*n* = 36; Russia, Altay Republic, *Z38.*
Arctium minus (Hill) Bernh., 2*n* = 36; Russia, Altay Republic, *Z41*; Russia, Novosibirskaya Oblast, *Z43.*
Senecio vulgaris L., 2*n* = 40; Russia, Altay Republic, *Z56*, *Z90*; Russia, Altaiskii Krai, *Z55.*
Sonchus asper (L.) Hill, 2*n* = 18; Russia, Altay Republic, *Z65a*. 2*n* = 32; Russia, Altay Republic, *Z65b*, *Z64.*
Sonchus oleraceus L., 2*n* = 18; Russia, Altay Republic, *Z67.* 2*n* = 32; Russia, Altay Republic, *Z68*, *Z66*, *Z77.*
Tragopogon dubius Scop., 2*n* = 12; Russia, Novosibirskaya Oblasť, *Z134.*
Tragopogon orientalis L., 2*n* = 12; Russia, Novosibirskaya Oblasť, *Z70.*

BRASSICACEAE

Brassica juncea (L.) Czern., 2*n* = 36; Russia, Altay Republic, *Z15*, *Z16.*

EUPHORBIACEAE

Euphorbia humifusa Willd., 2*n* = 22; Russia, Altay Republic, *Z159.*

PLUMBAGINACEAE

Plumbagella micrantha (Ledeb.) Spach, 2*n* = 12; Russia, Altay Republic, *Z160.*

PORTULACACEAE

Portulaca oleracea L., 2*n* = 54; Russia, Altaiskii Krai, *Z152.*

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SOLANACEAE

Aureliana fasciculata (Vell.) Sendtn., 2*n* = 24; Brazil, Paraná, *GB & al. 1630* (CORD).
Jaltomata procumbens (Cav.) J.L.Gentry, 2*n* = 24; México, México state, *FC 1275* (CORD).
Jaltomata sinuosa (Miers) Mione, 2*n* = 24; Colombia, Cauca, *Orozco & al. 3859* (COL, CORD); Cundinamarca, *Beltrán 60* (COL).
Solanum abutiloides (Griseb.) Bitter & Lillo, 2*n* = 24; Argentina, Salta, *FC & al. 935* (CORD).
Solanum acanthodes Hook.f., 2*n* = 24; Brazil, Amazonas, *GB 2511* (CORD).
Solanum acaule Bitter, 2*n* = 48; Argentina, Catamarca, *GB & al. 4669* (CORD).
Solanum alternatopinnatum Steud., 2*n* = 24; Argentina, Misiones, *Keller & Paredes 10472* (SI).
Solanum amotapense Svenson, 2*n* = 24; Peru, Cajamarca, *TS & al. 4508* (BM).
Solanum boliviense Dunal, 2*n* = 24; Argentina, Jujuy, *GB & al. 1783* (CORD).

All materials for the chromosome column should be submitted electronically to: Karol Marhold, karol.marhold@savba.sk (Institute of Botany, Slovak Academy of Sciences, SK-845 23 Bratislava, Slovakia, and Department of Botany, Charles University, CZ 128-01 Prague, Czech Republic). The full version of this contribution is available in the online edition of TAXON appended to this article. The following citation format is recommended: Baltisberger, M. & Voelger, M. 2006. *Sternbergia sicula*. In: Marhold, K. (ed.), IAPT/IOPB chromosome data 1. *Taxon* 55: 444, E2.

Solanum brevicaule Bitter, 2*n* = 48; Argentina, La Rioja, *GB & al. 3874* (CORD).
Solanum campylacanthum Hochst. ex A.Rich., 2*n* = 48; South Africa, Limpopo, *JU 792* (CORD).
Solanum carolinense L., 2*n* = 24; Japan, Ibaraki, *FC 1021* (CORD).
Solanum chilense Dunal, 2*n* = 24; Peru, Tacna, *GB & al. 2986* (CORD).
Solanum chrysotrichum Schltdl., 2*n* = 24; Peru, Moquegua, *TS & al. 4079* (BM).
Solanum comptum C.V.Morton, 2*n* = 48; Argentina, Corrientes, *GB & al. 999* (CORD).
Solanum corymbosum Jacq., 2*n* = 24; Peru, Moquegua, *TS & al. 4075* (BM).
Solanum crinitum Lam., 2*n* = 24; Brazil, Amazonas, *GB 2512* (CORD).
Solanum fiebrigii Bitter, 2*n* = 24; Argentina, Jujuy, *FC 1227* (CORD).
Solanum furcatum Dunal, 2*n* = 72; Peru, Moquegua, *TS & al. 4083* (BM).
Solanum glaucophyllum Desf., 2*n* = 24; Argentina, Corrientes, *FC & al. 841* (CORD).
Solanum glutinosum Dunal, 2*n* = 24; Peru, La Libertad, *SK & al. 10594* (BM).
Solanum grandidentatum Phil., 2*n* = 48; Peru, Cusco, *SK 10413* (BM); Urubamba, *SK 10378* (BM).
Solanum hieronymi Kuntze, 2*n* = 24; Argentina, Formosa, *FC & al. 897* (CORD).
Solanum homalospermum Chiarini, 2*n* = ca. 48; Argentina, Córdoba, *FC 505* (CORD).
Solanum houstonii Martyn, 2*n* = 24; México, Puebla, *Bauk s.n.* (CORD).
Solanum iltisii K.E.Roe, 2*n* = 24; Peru, Apurímac, *SK & al. 10345* (BM).
Solanum infundibuliforme Phil., 2*n* = 24; Argentina, Jujuy, *GB & al. 1781* (CORD).
Solanum jabrense Agra & M.Nee, 2*n* = 24; Brazil, Paraíba, *Agra & al. 7077* (JPB).
Solanum juninense Bitter, 2*n* = 24; Peru, Ancash, *TS & al. 4754* (BM).
Solanum longifilamentum Särkinen & P.Gonzáles, 2*n* = 24; Peru, Puno, *TS & al. 4030* (BM, USM).
Solanum lycopersicoides Dunal, 2*n* = 24; Chile, Región I, *GB & al. 2993* (CORD).
Solanum microdontum Bitter, 2*n* = 24; Argentina, Tucumán, *JU & al. 753* (CORD).
Solanum multispinum N.E.Br., 2*n* = 24; Argentina, Formosa, *FC & al. 888* (CORD).
Solanum myriacanthum Dunal, 2*n* = 24; Botanical and Experimental Garden, Radboud Univ., Nijmegen, Accession # NLD020 (814750043), Origin: Mexico, Vera Cruz State, *J.G. Hawkes 2385* (BIRM).
Solanum okadae Hawkes & Hjert., 2*n* = 24; Bolivia, La Paz, *GB & al. 1863* (CORD).
Solanum pallidum Rusby, 2*n* = 24; Peru, Cusco, *TS & al. 4014* (BM).
Solanum polytrichostylum Bitter, 2*n* = 24; Peru, Cusco, *SK & al. 10384* (BM).
Solanum pseudoamericanum Särkinen, P.Gonzáles & S.Knapp, 2*n* = 24; Peru, Abancay, *SK & al. 10357* (BM, USM).
Solanum pubigerum Dunal, 2*n* = 24; Mexico, Guanajuato, *FC & al. 1272* (CORD).
Solanum radicans L.f., 2*n* = 24; Peru, Cusco, *TS 4008* (BM).
Solanum ramulosum Sendtn., 2*n* = 24; Argentina, Misiones, *JU & al. 569* (CORD).
Solanum reductum C.V.Morton, 2*n* = 24; Argentina, Catamarca, *GB & al. 4652* (CORD).
Solanum riparium Pers., 2*n* = 24; Argentina, Jujuy, *FC s.n.* (CORD).
Solanum robustum H.L.Wendl., 2*n* = 24; Argentina, Misiones, *JU & al. 559* (CORD).
Solanum saponaceum Dunal, 2*n* = 24; Peru, Apurímac, *SK & al. 10356* (BM).
Solanum thomasiifolium Sendtn., 2*n* = 24; Brazil, Bahia, *JU & al. 414* (UEC).
Solanum trichoneuron Lillo, 2*n* = 24; Argentina, Tucumán, *GB & al. 3512* (CORD).
Solanum valdiviense Dunal, 2*n* = 24; Argentina, Neuquén, *GB & al. 3772* (CORD).
Solanum weddellii Phil., 2*n* = 24; Peru, Puno, *TS & al. 4038* (BM).
Solanum wrightii Benth., 2*n* = 24; Colombia, Quindío, *Beltrán 77* (COL).

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ACERACEAE

Acer monspessulanum L., 2*n* = 26; France, *AE & IK 119.*

AMARANTHACEAE

Amaranthus hybridus L., 2*n* = 32; France, *AE & IK 228.*
Amaranthus retroflexus L., 2*n* = 32; France, *AE & IK 104.*

ASPARAGACEAE

Prospero autumnale (L.) Speta, 2*n* = 28+0–4B; France, *AE & IK 208.*

ASTERACEAE

Tragopogon pratensis L. subsp. *pratensis*, 2*n* = 12; France, *AE & IK 236.*

BRASSICACEAE

Isatis tinctoria L. subsp. *tinctoria*, 2*n* = 28; France, *AE & IK 235.*

CARYOPHYLLACEAE

Silene baccifera (L.) Roth, 2*n* = 24; France, *AE & IK 32.*

CUCURBITACEAE
Bryonia alba L., 2*n* = 20, 40; France, *AE & IK 108*, *AE & IK 109*.

FABACEAE
Spartium junceum L., 2*n* = 48; France, *AE & IK 16*.

IRIDACEAE
Iris foetidissima L., 2*n* = 40; France, *AE & IK 12*.

JUNCACEAE
Juncus bufonius L. s.l., 2*n* = ca. 100; France, *AE & IK 239*.

PHYTOLACCACEAE
Phytolacca americana L., 2*n* = 36; France, *AE & IK 251*.

PLANTAGINACEAE
Chaenorhinum minus (L.) Lange, 2*n* = 14; France, *AE & IK 9*.

POLYGONACEAE
Rumex patientia L., 2*n* = 60; France, *AE & IK 112*.

RANUNCULACEAE
Aquilegia aradanica Shaulo & Erst, 2*n* = 14; Russia, Krasnoyarskii Krai, *DS & AE 321*.
Aquilegia flabellata Siebold & Zucc., 2*n* = 14; Russia, Sakhalin Island, *VY 22*.
Aquilegia flavescens S.Watson, 2*n* = 14; U.S.A., Wyoming, *AE 428*.
Aquilegia jonesii Parry, 2*n* = 14; U.S.A., Wyoming, *LH 9*.
Aquilegia parviflora Ledeb., 2*n* = 14; Russia, Sakha (Yakutia) Republic, *SA 1*.
Aquilegia viridiflora Pall., 2*n* = 14; Russia, Tuva Republic, *AE & YuD 44*.
Ranunculus repens L., 2*n* = 16; France, *AE & IK 238*.

SCROPHULARIACEAE
Scrophularia nodosa L., 2*n* = 18; France, *AE & IK 242*.
Verbascum blattaria L., 2*n* = 30; France, *AE & IK 34*.

SOLANACEAE
Datura stramonium L.f. *stramonium*, 2*n* = 24; France, *AE & IK 183*, *AE & IK 240*.
Solanum nigrum L. s.str., 2*n* = 48; France, *AE & IK 46*.

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All materials CHN; collected in India; collectors: *HG* = Henna Goyal, *VS* = Vijay Singh; vouchers in PUN.

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ACANTHACEAE
Strobilanthes alatus Nees, *n* = 8; *VS 31379*.
Strobilanthes glutinosus Nees, *n* = 16; *VS 31382*.

APOCYNACEAE
Asclepias curassavica L., *n* = 11; *VS 31375*.

ASTERACEAE
Arctium lappa L., *n* = 17; *HG 25354*.
Aster albescens (DC.) Wall. ex Hand.-Mazz., *n* = 9; *HG 28225*.
Aster diplostephioides (DC.) Benth. ex C.B.Clarke, *n* = 9; *VS 31361*.
Brachyactis roylei (DC.) Wendelbo, *n* = 9; *HG 25338*.
Erigeron acer L., *n* = 9+0–4B; *VS 31327*.
Erigeron bellidioides (Buch.-Ham. ex D.Don) Benth. ex C.B.Clarke, *n* = 9; *VS 31352*.
Erigeron borealis (Vierh.) Simmons, *n* = 9; *HG 25356*.
Erigeron umbrosus (Kar. & Kir.) Boiss., *n* = 9; *HG 25337*.
Leontopodium alpinum Cass., *n* = 12; *HG 28201*.
Ligularia amplexicaulis DC., *n* =30; *HG 31362*.
Pulicaria foliolosa DC., *n* = 9; *HG 25344*.
Saussurea heteromalla (D.Don) Hand.-Mazz., *n* = 8; *HG 25272*.
Saussurea jacea (Klotzsch) C.B.Clarke, *n* = 17; *HG 28230*.
Solidago canadensis L., *n* = 18; *HG 33274*.
Tricholepis radicans (Roxb.) DC., *n* = 17; *VS 31359*.
Tricholepis roylei Hook.f., *n* = 16; *VS 31360*.

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All materials CHN, collected in India, Himachal Pradesh; collector: *H* = *Himshikha*; vouchers in PUN.

BALSAMINACEAE
Impatiens micranthemum Edgew., *n* = 9; *H 28464*.
Impatiens spirifer Hook.f. & Thomson, *n* = 7; *H 30165*.
Impatiens thomsonii Hook.f., *n* = 9; *H 30181*.

BIGNONIACEAE
Incarvillea arguta Royle, *n* = 11; *H 30133*.

BRASSICACEAE
Lepidium sativum L., *n* = 16; *H 30923*.

CAPRIFOLIACEAE
Lonicera hypoleuca Decne., *n* = 9; *H 30920*.

CUCURBITACEAE
Herpetospermum pedunculosum (Ser.) C.B.Clarke, *n* = 10; *H 30129*.

FABACEAE
Lespedeza juncea var. *variegata* (Comb.) Ali., *n* = 11; *H 30919*.
Trigonella pubescens Edgew. ex Baker, *n* = 8; *H 30918*.

GENTIANACEAE
Gentiana argentea Royle ex D.Don, *n* = 9; *H 25735.*

GERANIACEAE
Geranium lucidum L., *n* = 14; *H 30917.*

LAMIACEAE
Nepeta floccosa Benth., *n* = 18; *H 30929.*
Roylea cinerea (D.Don) Baill., *n* = 10; *H 30191.*

PAPAVERACEAE
Corydalis thyrsiflora Prain, *n* = 7; *H 25436.*

POLYGONACEAE
Fagopyrum dibotrys (D.Don) H.Hara, *n* = 8; *H 30927.*
Fallopia pterocarpa (Wall. ex Meisn.) Holub, *n* = 40; *H 30164.*
Rumex nepalensis Spreng, *n* = 40; *H 25445.*

PRIMULACEAE
Androsace lanuginosa Wall., *n* = 10; *H 30933.*

RANUNCULACEAE
Delphinium pyramidale Royle, *n* = 8; *H 30928.*

ROSACEAE
Potentilla desertorum Bunge, *n* = 14; *H 30926.*
Potentilla leuconota D.Don, *n* = 7; *H 30144.*

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All localities refer to New Zealand, South Island, Canterbury region. Chromosome numbers counted and DNA ploidy level ascertained by A. Krahulcová; CHN = chromosome number determined in mature plants; CHNs = chromosome number determined in germinating seeds; collectors: *AK* = A. Krahulcová, *FK* = F. Krahulec, *GH* = G. Houliston.

ASTERACEAE
Pilosella bauhini (Schult.) Arv.-Touv., 2*n* = 5*x* = 45, CHN. *AK, FK & GH s.n.* (PRA 12713, 12714, 12715, 12716, 12717, 12718, 12719); *AK & FK s.n.* (PRA 12735). 2*n* ~ 5*x* ~ 45, FCM. *AK & FK s.n.* (PRA 12733).
Pilosella caespitosa (Dumort.) P.D.Sell & C.West, 2*n* = 4*x* = 36, CHN. *AK, FK & GH s.n.* (PRA 12726); *AK & FK s.n.* (PRA 12727, 12728). 2*n* ~ 4*x* ~ 36, FCM. *AK, FK & GH s.n.* (PRA 12729, 12730, 12731).
Pilosella officinarum Vaill., 2*n* = 4*x* = 36, CHNs; 2*n* = 35, aneuploid CHNs; 2*n* = 37, aneuploid CHNs; 2*n* = 42, aneuploid CHNs. *GH s.n.* (PRA 12683, 12684, 12685, 12686, 12687, 12688, 12689, 12690, 12691, 12692, 12693, 12694, 12695, 12696, 12697). 2*n* = 5*x* = 45, CHN. *AK, FK & GH s.n.* (PRA 12703); *AK & FK s.n.* (PRA 12709). 2*n* ~ 5*x* ~ 45, FCM. *AK & FK s.n.* (PRA 12701, 12710). 2*n* = 7*x* = 63, CHN. *AK & FK s.n* (PRA 12698, 12699, 12700).
Pilosella piloselloides subsp. *praealta* (Gochnat) S.Bräut. & Greuter, 2*n* = 4*x* = 36, CHN. *AK, FK & GH s.n.* (PRA 12732); *AK & FK s.n.* (PRA 12722, 12723). 2*n* ~ 4*x* ~ 36, FCM. *AK, FK & GH s.n.* (PRA 12720, 12721, 12724, 12725).
Pilosella stoloniflora (Waldst. & Kit.) F.W.Schultz & Sch.Bip., 2*n* = 6*x* = 54, CHN. *AK, FK & GH s.n.* (PRA 12702, 12708). 2*n* = 57, aneuploid CHN. *AK, FK & GH s.n.* (PRA 12711, 12712). 2*n* ~ 6*x* ~ 54, FCM. *AK, FK & GH s.n.* (PRA 12704, 12705, 12706, 12707).

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All material CHN; vouchers in KAS unless otherwise stated. Regarding *Salsola*, for convenience we follow-up the traditional wide circumscription of the genus, except for the well-founded separation of *Caroxylon*.

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AMARANTHACEAE
Atriplex glauca Pall. ex Roem. & Schult., 2*n* = 18; Morocco, *H. Freitag 40.012a*.
Atriplex halimus var. *schweinfurthii* Boiss., 2*n* = 36; Morocco, *H. Freitag 40.003.*
Bassia scoparia (L.) A.J.Scott, 2*n* = 18; South Korea, *H. Freitag 35.110* (KAS, NS).
Caroxylon vermiculatum (L.) Akhani & Roalson, 2*n* = 54; Morocco, *H. Freitag 40.000*; Morocco, *H. Freitag 40.020.*
Hammada articulata (Moq.) O.Bolos & Vigo, 2*n* = 18; Morocco, *H. Freitag 40.018.*
Noaea mucronata (Forssk.) Asch. & Schweinf., 2*n* = 36; Cyprus, 15 Oct 2012, *E. Voznesenskaya s.n.* (LE).
Salsola deschaseauxiana Litard. & Maire, 2*n* = 54; Morocco, *H. Freitag 40.001.*
Salsola gymnomaschala Maire, 2*n* = 36; Morocco, *H. Freitag 40.039.*
Salsola komarovii Iljin, 2*n* = 36; South Korea, *H. Freitag 35.103* (KAS, NS).
Salsola oppositifolia Desf., 2*n* = 72; Morocco, *H. Freitag 40.002.*
Salsola stocksii Boiss., 2*n* = 18; Pakistan, *H. Freitag 18.231.*
Salsola verticillata Schousb., 2*n* = 36; Morocco, *H. Freitag 40.007.*
Suaeda calceoliformis (Hook.) Moq., 2*n* = 54; U.S.A., Utah, *H. Freitag US 24*, *H. Freitag US 26*; U.S.A., Nevada, *H. Freitag US 30a*, *H. Freitag US 38b*; U.S.A., California, *H. Freitag US 45*, *H. Freitag US 48a*.
Suaeda esteroa Ferren & S.A.Whitmore, 2*n* = 54; U.S.A., California, *H. Freitag US 44.*
Suaeda iranshahrii Akhani & H.Freitag, 2*n* = 18; Saudi Arabia, *B. Boer 18.*
Suaeda japonica Makino, 2*n* = 18; Japan, *S. Yahara S081212-1* (KAS, NS); South Korea, *H. Freitag 35.136* (KAS, NS).
Suaeda liaotungensis Kitag., 2*n* = 18; South Korea, *H. Freitag 35.106* (KAS, NS).
Suaeda linearis (Elliott) Moq., 2*n* = 54; U.S.A., New Jersey, *H. Freitag US 6*; U.S.A., Texas, *H. Freitag US 16*, *H. Freitag US 20*,

H. Freitag US 21, *H. Freitag US 23*. 2*n* = 90; U.S.A., Maine, York County, *H. Freitag US 8*.
Suaeda maritima subsp. *asiatica* Hara, 2*n* = 18; South Korea, *H. Freitag 35.100* (KAS, NS), *H. Freitag 35.139* (KAS, NS); Japan, *H. Ikeda*, *O. Yano T081019-1* (KAS, NS), *H. Ikeda & O. Yano O081019-2* (KAS, NS), *T. Kurosawa F081029-1*, *T. Kurosawa F081029-2* (KAS, NS).
Suaeda maritima (L.) Dumort. subsp. *maritima*, 2*n* = 36; U.S.A., New York, *H. Freitag US 4a*; U.S.A., Maine, *H. Freitag US 11*, *H. Freitag US 12*; U.S.A., New Jersey, *W. Ferren SH 3*, *W. Ferren SH 10*, *W. Ferren SH 11*.
Suaeda maritima subsp. *perennans* Maire, 2*n* = 36; Spain, Canary Islands, *H. Freitag 17.265*.
Suaeda monodiana Maire, 2*n* = 18; Morocco, *H. Freitag 40.029a*.
Suaeda occidentalis (S.Watson) S.Watson, 2*n* = 54; U.S.A., Nevada, *H. Freitag US 33* (KAS, NS); U.S.A., Nevada, *H. Freitag US 34*, *H. Freitag US 36*.
Suaeda patagonica Speg., 2*n* = 36; Chile, Antarctica Chilena Province, 25 Febr 2011, *E. Domingūez s.n*.
Suaeda rolandii Basset & Crompton, 2*n* = 90; U.S.A., New Jersey, *H. Freitag US 5*, *H. Freitag US 7*; *W. Ferren SH 1*, *W. Ferren SH 4*, *W. Ferren SH 9*.

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ARACEAE
Arisaema utile Hook.f. ex Engl., *n* = 26; *NM 30298*.

ASPARAGACEAE
Ophiopogon intermedius D.Don, *n* = 18+0–2B; *NM 26851*.
Polygonatum pubescens Pursh, *n* = 20; *NM 30362*.

COMMELINACEAE
Commelina benghalensis L., *n* = 11; *HK 25615*.
Cyanotis cristata (L.) D.Don, *n* = 12; *HK 24802*.

CYPERACEAE
Carex muricata L., *n* = 40; *NM 29384*.
Carex nubigena D.Don ex Tilloch & Taylor, *n* = 18; *NM 30273*. *n* = 20; *NM 30285*.
Carex remota L., *n* = 50; *NM 30216*.
Cyperus bulbosus Vahl, *n* = 36; *NM 29376*.
Eleocharis congesta D.Don, *n* = 10+0–1B; *NM 30353*.
Eleocharis palustris (L.) Roem. & Schult., *n* = 23+0–2B; *NM 26843*.
Fimbristylis polytrichoides (Retz.) R.Br., *n* = 45; *NM 30360*.
Schoenoplectus lacustris (L.) Palla, *n* = 38; *NM 30240*.
Schoenoplectus mucronatus (L.) Palla, *n* = 37; *NM 30242*.
Schoenoplectus smithii (A.Gray) Soják., *n* = 38+0–2B; *NM 30212*.
Schoenoplectus triqueter (L.) Palla, *n* = 21; *NM 30312*.
Scirpus mucronatus L., *n* = 40; *NM 30296*.

HYDROCHARITACEAE
Hydrocharis dubia (Blume) Backer, *n* = 12; *NM 30259*.

IRIDACEAE
Iris reticulata M.Bieb., *n* = 20; *NM 30307*.

LILIACEAE
Gagea reticulata (Pall.) Schult. & Schult.f., *n* = 36; *NM 30272*, *NM 30271*.

ORCHIDACEAE
Cephalanthera longifolia (L.) Fritsch, *n* = 26; *NM 30363*.

POACEAE
Agropyron repens (L.) P.Beauv., *n* = 7; *NM 26858*.
Agropyron semicostatum Nees ex Steud., *n* = 14; *NM 26893*.
Alopecurus nepalensis Trin. ex Steud., *n* = 21+0–1B; *NM 27181*.
Avena barbata Link, *n* = 14; *NM 30276*.
Bromus catharticus Vahl, *n* = 7; *NM 30288*.
Bromus hordeaceus L., *n* = 7+0–2B; *NM 30281*.
Bromus japonicus Thunb., *n* = 14+0–1B; *NM 30278*.
Calamagrostis emodensis Griseb., *n* = 7; *NM 30252*.
Cynodon dactylon (L.) Pers., *n* = 15; *NM 30260*.
Digitaria sanguinalis (L.) Scop., *n* = 18; *NM 30306*.
Festuca rubra L., *n* = 13; *NM 30339*.
Helictotrichon sempervirens (Vill.) Pilg., *n* = 14; *NM 29345*.
Hordeum glaucum Steud., *n* = 7+0–2B; *NM 30336*.
Koeleria argentea Griseb., *n* = 14; *NM 30308*.
Koeleria macrantha (Ledeb.) Schult., *n* = 7+0–3B; *NM 27182*.
Melica scaberrima Hook.f., *n* = 9; *HK 27018*.
Oryzopsis munroi Stapf ex Hook.f., *n* = 14; *NM 30226*.
Phacelurus speciosus C.E.Hubb., *n* = 20; *NM 30314*, *NM 26846*.
Phleum arenarium L., *n* = 13; *NM 30319*.
Poa bulbosa L., *n* = 7; *NM 29338*.
Poa sikkimensis (Stapf) Bor, *n* = 7+0–1B; *NM 26844*.
Poa sinaica Steud., *n* = 14; *NM 30354*.
Saccharum rufipilum Steud., *n* = 10; *HK 27061*.
Sporobolus marginatus Hochst. ex A.Rich., *n* = 10; *NM 30325*.
Vulpia myuros (L.) C.C.Gmel., *n* = 7; *NM 30303*.

TYPHACEAE
Typha latifolia L., *n* = 15; *NM 30289*.

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RUBIACEAE

Hexasepalum teres (Walter) J.H.Kirkbr., 2*n* = 28; Brazil, Bahia, *JAMC 249.*
Psyllocarpus asparagoides Mart. ex Mart. & Zucc., 2*n* = 28; Brazil, Minas Gerais, *JAMC 290.*
Psyllocarpus laricoides Mart. ex Mart. & Zucc., 2*n* = 28; Brazil, Minas Gerais, *JAMC 281.*
Staelia domingosii R.M.Salas & E.L.Cabral, 2*n* = 28; Brazil, Bahia, *JAMC 244.*

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FABACEAE

Mimosa adenophylla var. *mitis* Barneby, 2*n* = 52; *J.V. Santos & al. 310.*
Mimosa arenosa (Willd.) Poir. var. *arenosa*, 2*n* = 26; *R.S. Rodrigues & al. 63.*
Mimosa filipes Mart., 2*n* = 26; *J.V. Santos & al. 329.*
Mimosa lewisii Barneby, 2*n* = 26; *V.A. Oliveira & al. 187.*
Mimosa misera Benth., 2*n* = 26; *J.B. Lima & al.* 376; 2*n* = 26, 52 (polysomaty), *J.V. Santos & al. 332.*
Mimosa ophthalmocentra Mart. ex Benth., 2*n* = 26; *R.S. Rodrigues & al. 17.*
Mimosa pigra L., 2*n* = ca. 52; *R.S. Rodrigues & al. 76.*
Mimosa piscatorum Barneby, 2*n* = 26, 52 (polysomaty); *L.R. Silva & al. 95.*
Mimosa quadrivalvis var. *leptocarpa* (DC.) Barneby, 2*n* = 52; *R.S. Rodrigues & al. 69*, *R.S. Rodrigues & al. 109.*
Mimosa sensitiva L. var. *sensitiva*, 2*n* = 26; *L.R. Silva & al. 214.*
Mimosa tenuiflora (Willd.) Poir., 2*n* = 26; *R.S. Rodrigues & al. 77.*

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POACEAE

Aegilops tauschii Coss., 2*n* = 2*x* = 14; Tajikistan, *SL-1991.09.03: H10257.*
Elymus batalinii (Krasn.) Á.Löve s.l., 2*n* = 6*x* = 42; Tajikistan, *SL-1991.08.31: H10233.*
Elymus drobovii (Nevski) Tzvelev, 2*n* = 6*x* = 42; Tajikistan, *SL-1991.09.10: H10299.*
Elymus hispanicus (Boiss.) Talavera, 2*n* = 8*x* = 56; Spain, *C. Soler 475: H3959*, *C. Soler 485: H3960.*
Elymus repens (L.) Gould, 2*n* = 6*x* = 42; Tajikistan, *SL-1991.08.29: H10205.*
Elymus sibiricus L., 2*n* = 4*x* = 28; Tajikistan, *SL 1991.09.01: H10238.*
Elymus sikkimensis (Melderis) Melderis, 2*n* = 4*x* = 28; Bhutan, *R. von Bothmer & al. 1999.11.02-3: H10747.*
Elymus tianschanigenus Czerep., 2*n* = 4*x* = 28; Tajikistan, *SL-1991.09.05: H10275.*
Elymus transhyrcanus (Nevski) Tzvelev, 2*n* = 6*x* = 42; Tajikistan, *SL-1991.09.05: H10270.*
Eremopyrum bonaepartis (Spreng.) Nevski, 2*n* = 4*x* = 28; Tajikistan, *SL-1991.09.01: H10242.*
Hordeum brevisubulatum (Trin.) Link, 2*n* = 4*x* = 28; Tajikistan, *SL-1991.08.30: H10227*, *SL-1991.09.01: H10239.* 2*n* = 6*x* = 42; Tajikistan, *SL-1991.08.29: H10210.*
Hordeum bulbosum L., 2*n* = 4*x* = 28; Tajikistan, *SL-1991.08.29: H10206*, *SL-1991.09.04: H10264*, *SL-1991.09.10: H10298.*
Hordeum murinum subsp. *glaucum* (Steud.) Tzvelev, 2*n* = 2*x* = 14; Tajikistan, *SL-1991.09.03: H10256*, *SL-1991.09.03: H10260*, *SL-1991.09.07: H10289.*
Leymus alaicus (Korsh.) Tzvelev, 2*n* = 4*x* = 28; Tajikistan, *SL-1991.09.01: H10243*, *SL-1991.09.05: H10272.*

Pseudoroegneria ferganensis (Drobow) B.Salomon & Bothmer, **comb. nov.** ≡ *Agropyron ferganense* Drobow in Trudy Bot. Muz. Imp. Akad. Nauk. 16: 138. 1916 ≡ *Elytrigia ferganensis* (Drobow) Nevski in Trudy Sredne-Aziatsk. Gosud. Univ., Ser. 8b, Bot. 17: 61. 1934 – Orig. coll.: [Turkestan,] Prov. Fergana, distr. Skobelev, in decliviis lapodosis ad fl. Kara-kasyk, *Dobrov no. 317* (type probably at LE).
2*n* = 2*x* = 14; Tajikistan, *SL-1991.09.01: H10244*, *SL-1991.09.01: H10245*, *SL-1991.09.02: H10248*, *SL-1991.09.05: H10273*, *SL-1991.09.08: H10292.*

According to Bor (1960) *A. ferganense* Drobow is conspecific with *A. cognatum* Hack. from northern Pakistan and undoubtedly

they are closely related taxa. However, the two taxa show an obvious difference in that "ferganense" is densely caespitose whereas "cognatum" produces numerous thin rhizomes. This difference is not always evident on herbarium sheets but is striking in cultivation. We prefer to treat the three taxa as separate species, two diploids ("ferganense" and "cognatum") and one tetraploid ("geniculatum"). We are following the generic delineation of Dewey (1984), which means that "ferganense" should be transferred to *Pseudoroegneria*. Hence, we make the necessary new combination above.

Taeniatherum caput-medusae (L.) Nevski, 2*n* = 2*x* = 14; Tajikistan, *SL-1991.09.06: H10282*.
Thinopyrum intermedium (Host) Barkworth & D.R.Dewey, 2*n* = 6*x* = 42; Tajikistan, *SL-1991.08.28: H10202*.

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Dewey, D.R. 1984. The genomic system of classification as a guide to intergeneric hybridization in the perennial Triticeae. Pp. 209–279 in: Gustafson, J.P. (ed.), *Gene manipulation in plant improvement*. New York: Plenum Press.

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UMBELLIFERAE/APIACEAE

Angelica sachokiana (Karjagin) Pimenov & V.N.Tikhom., 2*n* = 22; *RM & TO 19*.
Astrodaucus orientalis (L.) Drude, *n* = 10; *TO & RM 7*; 2*n* = 20; *TO & RM 4*.
Bupleurum exaltatum M. Bieb., *n* = 7; *TO & RM 20*.
Bupleurum polyphyllum Ledeb., *n* = 8; *TO 75*, *TO 79*.
Daucus guttatus Sm., *n* = 10; 12 Aug 2015, *TO s.n.*; 2*n* = 20, 20+2B, *TO 1*.
Gasparrinia peucedanoides (M.Bieb.) Thell., *n* = 11; *TO 52*.
Heracleum asperum (Hoffm.) M.Bieb., 2*n* = 22; *TO 59a*, *TO & RM 7*.
Heracleum grandiflorum M.Bieb., 2*n* = 22; *TO & RM 40*.
Peucedanum ruthenicum M.Bieb., *n* = 11; *TO, 67*.
Pimpinella aromatica M.Bieb., 2*n* = 20; *TO & RM 21*.
Pimpinella saxifraga L., *n* = 10; *TO 50*, *TO 74*.
Seseli libanotis (L.) W.D.J.Koch, *n* = 11; *TO 45*.
Trinia hispida Hoffm., 2*n* = 18; 18 Aug 2015, *TO s.n*.

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LAMIACEAE

Caryopteris trichosphaera W.W.Sm., 2*n* = 26; China, Yunnan, *Dong HJ 996*.
Isodon angustifolius (Dunn) Kudô, 2*n* = 24; China, Yunnan, *Y.P. Chen & Q.R. Zhao EM135*.
Isodon eriocalyx (Dunn) Kudô, 2*n* = 24; China, Yunnan, *Y.P. Chen, F. Zhao & Z.F. Xu EM235*.
Isodon excisoides (Y.Z.Sun) H.Hara, 2*n* = 24; China, Hubei, *Y.P. Chen & Q.R. Zhao EM072*.
Isodon interruptus (C.Y.Wu & H.W.Li) H.Hara; 2*n* = 24; China, Yunnan, *Y.P. Chen EM295*.
Isodon lophanthoides (Buch.-Ham. ex D.Don) H.Hara; 2*n* = 24; China, Yunnan, *Y.P. Chen & al. EM160*; China, Yunnan, *Y.P. Chen & al. EM180*; China, Guangxi, *Y.P. Chen & L. Jiang EM279*.
Isodon loxothyrsus (Hand.-Mazz.) H.Hara, 2*n* = 24; China, Yunnan, *Y.P. Chen & L. Jiang EM259*.
Isodon macrocalyx (Dunn) Kudô, 2*n* = 24; China, Zhejiang, *Y.P. Chen & Q.R. Zhao EM040*.
Isodon macrophyllus (Migo) H.Hara, 2*n* = 24; China, Jiangsu, *Y.P. Chen & Q.R. Zhao EM034*.
Isodon phyllopodus (Diels) Kudô, 2*n* = 24; China, Yunnan, *Y.P. Chen & Q.R. Zhao EM134*.
Isodon phyllostachys (Diels) Kudô, 2*n* = 24; China, Yunnan, *Y.P. Chen& Q.R. Zhao EM146*.
Isodon rubescens (Hemsl.) H.Hara, 2*n* = 24; China, Hubei, *Y.P. Chen & Q.R. Zhao EM073*.
Isodon sculponeatus (Vaniot) Kudô, 2*n* = 24; China, Yunnan, *Y.P. Chen & F.H. Wang EM091*; China, Yunnan, *Y.P. Chen & Q.R. Zhao EM243*.
Isodon serra (Maxim.) Kudô, 2*n* = 24; China, Jiangsu, *Y.P. Chen & Q.R. Zhao EM037*.
Isodon wikstroemioides (Hand.-Mazz.) H.Hara, 2*n* = 24. China, Yunnan, *Y.P. Chen & L. Jiang EM252*.
Pseudocaryopteris bicolor (Roxb. ex Hardw.) P.D.Cantino, 2*n* = 40; China, Yunnan, *C.L. Xiang & E.D. Liu 549*.
Pseudocaryopteris paniculata (C.B.Clarke) P.D.Cantino, 2*n* = 18; China, Yunnan, *C.L. Xiang & E.D. Liu 557*.
Rubiteucris palmata (Benth. ex Hook.f.) Kudô, 2*n* = 30; China, Yunnan, *H.J. Dong s.n*.
Scutellaria barbata D.Don, 2*n* = 26; China, Guangdong, *G.X. Hu & F. Zhao 0072*.
Tripora divaricata (Maxim.) P.D.Cantino, 2*n* = 28; China, Sichuan, *C.L. Xiang 1235*.

IOPB COLUMN

Edited by Karol Marhold & Ilse Breitwieser

IAPT/IOPB chromosome data 25 [extended online version]

Edited by Karol Marhold & Jaromír Kučera

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* First chromosome count from the given regions.
** First chromosome count from Russia.
▼ New chromosome number (cytotype) for the taxon.

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ASTERACEAE

Anthemis tinctoria L.

*2*n* = 18, CHN. Russia, Altay Republic, Turochakskii Raion, Lebed' River, on road near the bridge, 52°17′N, 87°01′E, 10 Aug 2014, *E.Yu. Zykova Z35a* (NS) [Fig. 1A, B]; Russia, Altay Republic, Maiminskii Raion, track M-52 between Souzga and Rybalka villages, bank at a construction site, 51°53′N, 85°52′E, 18 Aug 2013, *E.Yu. Zykova Z37* (NS) [Fig. 2A].

▼*2*n* = 27, CHN. Russia, Altay Republic, Turochakskii Raion, Lebed' River,on road near the bridge, 52°17′N, 87°01′E, 10 Aug 2014, *E.Yu. Zykova Z35b* (NS) [Fig. 1C, D].

Arctium lappa L.

*2*n* = 36, CHN. Russia, Altay Republic, Choiskii Raion, vicinity of Levinka village, roadside, 51°59′N, 86°25′E, 10 Aug 2014, *E.Yu. Zykova Z38* (NS).

Arctium minus (Hill) Bernh.

*2*n* = 36, CHN. Russia, Altay Republic, Maiminskii Raion, Kyzyl-Ozek village, sandlot at the gas station, 51°53′N, 86°00′E, 9 Aug 2013, *E.Yu. Zykova Z41* (NS); Russia, Novosibirskaya Oblasť, Novosibirsk, Akademgorodok, Central Siberian Botanical Garden's territory, pathway near the greenhouses, 54°59′N, 83°00′E, 25 Jul 2012, *E.Yu. Zykova Z43* (NS).

Senecio vulgaris L.

*2*n* = 40, CHN. Russia, Altay Republic, Shebalinskii Raion, vicinity of Shebalino village, overgrown dumps, 50°18′N, 85°40′E, 17 Jul 2009, *E.Yu. Zykova Z56* (NS); Russia, Altay Republic, Shebalinskii Raion, Shebalino village, flowerbed at the gas station, 50°18′N, 85°40′E, 15 Aug 2014, *E.Yu. Zykova Z90* (NS); Russia, Altaiskij Kraj, Barnaul city, Nauchnyi Gorodok, at the edge of field, 53°22′N, 83°50′E, 12 Jun 2011, *E.Yu. Zykova Z55* (NS) [Fig. 2B].

Sonchus asper (L.) Hill

*2*n* = 18, CHN. Russia, Altay Republic, Chemal'skii Raion, Uznezya village, as weed on the streets, in yards, 51°32′N, 85°56′E, 18 Aug 2012, *E.Yu. Zykova Z65a* (NS) [Fig. 2C].

*2*n* = 32, CHN. Russia, Altay Republic, Chemal'skii Raion, Uznezya village, as weed on the streets, in yards, 51°32′N, 85°56′E, 18 Aug 2012, *E.Yu. Zykova Z65b* (NS); Russia, Altay Republic, Ust'-Koksinskii Raion, Ust'-Koksa village, an abandoned homestead, 50°16′N, 85°37′E, 11 Jul 2014, *E.Yu. Zykova Z64* (NS) [Fig. 2D].

Sonchus oleraceus L.

*2*n* = 18, CHN. Russia, Altay Republic, town of Gorno-Altaisk, on the street, roadside 51°56′N, 85°59′E, 18 Aug 2010, *E.Yu. Zykova Z67* (NS).

*2*n* = 32, CHN. Russia, Altay Republic, Ulaganskii Raion, Aktash village, on the streets, 50°19′N, 87°37′E, 10 Aug 2012, *E.Yu. Zykova Z68* (NS); Russia, Altay Republic, town of Gorno-Altaisk, as

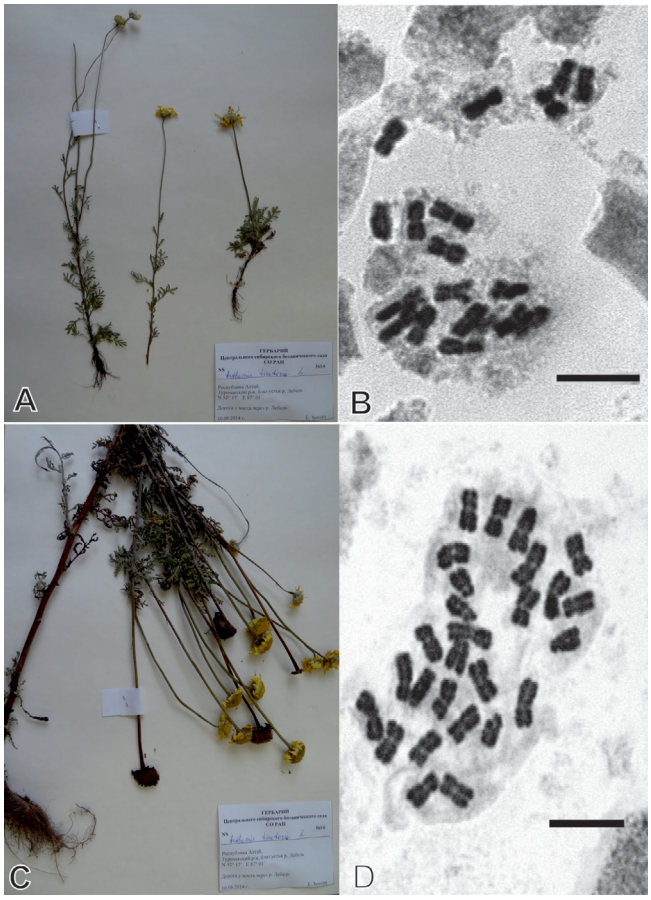

Fig. 1. Habitus and mitotic chromosomes of *Anthemis tinctoria*: **A & B,** *Z35a* (2*n* = 18); **C & D,** *Z35b* (2*n* = 27). — Scale bar = 10 µm (for B & D).

a weed in the garden, 51°57′N, 85°55′E, 6 Sep 2009, *E.Yu. Zykova Z66* (NS); Russia, Altay Republic, Maiminskii Raion, Kyzyl-Ozek village, roadside, 51°53′N, 86°00′E, 9 Aug 2013, *E.Yu. Zykova Z77* (NS).

Tragopogon dubius Scop.

*2*n* = 12, CHN. Russia, Novosibirskaya Oblast', town of Iskitim, sandlot at the railway crossing, 54°38′N, 83°18′E, 29 Aug 2015, *E.Yu. Zykova ZI34* (NS) [Fig. 2E].

Tragopogon orientalis L.

*2*n* = 12, CHN. Russia, Novosibirskaya Oblast', city of Novosibirsk, Akademgorodok, Central Siberian Botanical Garden's territory, pathway near the greenhouses, 54°59′N, 83°00′E, 26 Jul 2012, *E.Yu. Zykova Z70* (NS) [Fig. 2F].

BRASSICACEAE

Brassica juncea (L.) Czern.

**2*n* = 36, CHN. Russia, Altay Republic, Maiminskii Raion, Manzherok village, the bank of Katun river, on the dump of horticultural garbage, 51°49′N, 85°46′E, 3 Aug 2014, *E.Yu. Zykova ZI5* (NS); Russia, Altay Republic, town of Gorno-Altaisk, roadside, forming thickets, 51°58′N, 85°55′E, 22Aug 2014, *E.Yu. Zykova ZI6* (NS).

EUPHORBIACEAE

Euphorbia humifusa Willd.

*2*n* = 22, CHN. Russia, Altay Republic, Ongudaiskii Raion, Malyi Yaloman village, pebbly roadside, 50°29′N, 86°35′E, 24 Jul 2015, *E.Yu. Zykova ZI59* (NS).

PLUMBAGINACEAE

Plumbagella micrantha (Ledeb.) Spach

**2*n* = 12, CHN. Russia, Altay Republic, Ongudaiskii Raion, Malyi Yaloman village, pebbly roadside, 50°29′N, 86°35′E, 24 Jul 2015, *E.Yu. Zykova ZI60* (NS) [Fig. 2G].

PORTULACACEAE

Portulaca oleracea L.

*2*n* = 54, CHN. Russia, Altaiskiy Krai, Sovetskii Rajon, Shul'gin Log village, on the streets, roadside, 52°11′N, 85°50′E, 1 Aug 2015, *E.Yu. Zykova ZI52* (NS).

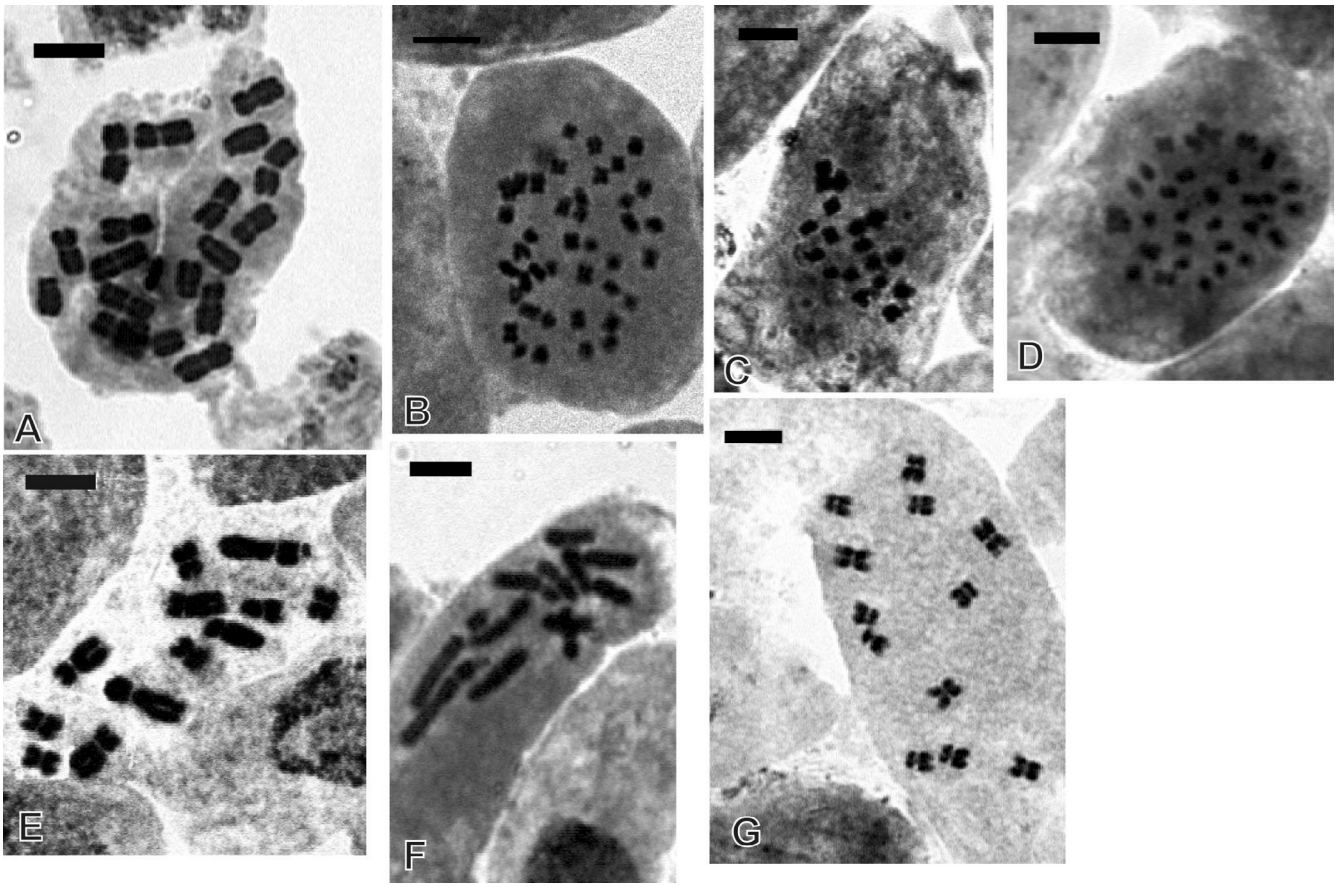

Fig. 2. Mitotic metaphases. **A,** *Anthemis tinctoria*, 2*n* = 18; **B,** *Senecio vulgaris*, 2*n* = 40; **C,** *Sonchus asper*, 2*n* = 18; **D,** *Sonchus asper*, 2*n* = 32; **E,** *Tragopogon dubius*, 2*n* = 12; **F,** *Tragopogon orientalis*, 2*n* = 12; **G,** *Plumbagella micrantha*, 2*n* = 12. — Scale bars = 5 µm.

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* First chromosome count for the species.

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SOLANACEAE

**Aureliana fasciculata* (Vell.) Sendtn.
2*n* = 24, CHN. Brazil, Paraná, Morretes, 25°19′57.1″ S, 48°54′02.8″ W, 24 Feb 2006, *Barboza & al. 1630* (CORD).

Jaltomata procumbens (Cav.) J.L.Gentry
2*n* = 24, CHN. México, México State, Teotihuacan pyramids, 19°41′11.5″ N, 98°50′54.8″ W, 26 Jun 2016, *Chiarini 1275* (CORD).

**Jaltomata sinuosa* (Miers) Mione
2*n* = 24, CHN. Colombia, Cauca, Parque Nac. Munchique, El Tambo, 17 Aug 2011, *C.I. Orozco & al. 3859* (COL, CORD); Colombia, Cundinamarca, Mun. Pacho, vereda Patasía, cerro Traga-Arepas, 11 Feb 2010, *Beltrán 60* (COL).

Solanum abutiloides (Griseb.) Bitter & Lillo
2*n* = 24, CHN. Argentina, Salta, La Caldera, El Ucumar, 24°30′24″ S, 65°19′39″ W, 19 Apr 2012, *Chiarini & al. 935* (CORD).

**Solanum acanthodes* Hook.f.
2*n* = 24, CHN. Brazil, Amazonas, Manaus, 22 Sep 2010, *Barboza 2511* (CORD).

Solanum acaule Bitter
2*n* = 48, CHN. Argentina, Catamarca, Ambato, El Manchado, 28°10′44.8″ S, 65°59′33″ W, 24 Feb 2016, *Barboza & al. 4669* (CORD).

**Solanum alternatopinnatum* Steud.
2*n* = 24, CHN. Argentina, Misiones, San Ignacio, Teyu Cuaré, 27°16′51″ S, 55°33′58″ W, 8 Dec 2011, *Keller & Paredes 10472* (SI).

Solanum amotapense Svenson
2*n* = 24, CHN. Peru, Cajamarca, Santa Cruz, Munana, 06°39′40″ S, 79°01′13″ W, 11 Apr 2013, *Särkinen & al. 4508* (BM).

Solanum boliviense Dunal
2*n* = 24, CHN. Argentina, Jujuy, Yavi, Abra del Lizoite, 22°13′39.2″ S, 65°16′05″ W, 23 Mar 2006, *Barboza & al. 1783* (CORD).

Solanum brevicaule Bitter
2*n* = 48, CHN. Argentina, La Rioja, Famatina, 28°44′26.3″ S, 67°50′21.6″ W, 28 Feb 2013, *Barboza & al. 3874* (CORD).

**Solanum campylacanthum* Hochst. ex A.Rich.
2*n* = 48, CHN. South Africa, Limpopo Mountains, 16 km S of Molemole, 12 Sep 2012, *Urdampilleta 792* (CORD).

Solanum carolinense L.
2*n* = 24, CHN. Japan, Ibaraki, Shishizuka forest, Satoyama site, 36°04′49″ N, 140°09′47″ E, 20 Aug 2013, *Chiarini 1021* (CORD).

**Solanum chilense* Dunal
2*n* = 24, CHN. Peru, Tacna, Berlín, 17°46′36″ S, 70°29′17″ W, 16 Feb 2011, *Barboza & al. 2986* (CORD).

Solanum chrysotrichum Schltdl.
2*n* = 24, CHN. Peru, Moquegua, Mariscal Nieto, Yacanco–Torata, 17°06′09″ S, 70°52′30″ W, 23 Mar 2012, *Särkinen & al. 4079* (BM).

**Solanum comptum* C.V.Morton
2*n* = 48, CHN. Argentina, Corrientes, Capital, 13 May 2004, *Barboza & al. 999* (CORD).

**Solanum corymbosum* Jacq.
2*n* = 24, CHN. Peru, Moquegua, Mariscal Nieto, Yacanco–Torata, 17°05′26″ S, 70°51′27″ W, 23 Mar 2012, *Särkinen & al. 4075* (BM).

Solanum crinitum Lam.
2*n* = 24, CHN. Brazil, Amazonas, Manaus, 22 Sep 2010, *Barboza 2512* (CORD).

Solanum fiebrigii Bitter
2*n* = 24, CHN. Argentina, Jujuy, Palpalá, Zapla, 24°14′23.35″ S, 65°04′56.16″ W, 18 Jan 2016, *Chiarini 1227* (CORD).

Solanum furcatum Dunal
2*n* = 72, CHN. Peru, Moquegua, Mariscal Nieto, Yacanco–Torata, 17°05′30″ S, 70°52′25″ W, 23 Mar 2012, *Särkinen & al. 4083* (BM).

Solanum glaucophyllum Desf.
2*n* = 24, CHN. Argentina, Corrientes, Goya, 29°10′01″ S, 59°18′36″ W, 29 Feb 2012, *Chiarini & al. 841* (CORD).

**Solanum glutinosum* Dunal
2*n* = 24, CHN. Peru, La Libertad, Santiago de Chuco, 08°08′38″ S, 78°11′08″ W, 10 May 2013, *Knapp & al. 10594* (BM).

Solanum grandidentatum Phil.
2*n* = 48, CHN. Peru, Cusco, Urubamba, Finca Pumawanka, 13°16′30″ S, 72°07′22″ W, 14 Mar 2012, *S. Knapp 10413* (BM); Peru, Cusco, Urubamba, across Río Urubamba, 13°45′31″ S, 72°15′24″ W, *S. Knapp 10378* (BM).

Solanum hieronymi Kuntze
2*n* = 24, CHN. Argentina, Formosa, Patiño, Pozo del Tigre, 24°51′14.5″ S, 60°22′16.8″ W, 6 Mar 2012, *Chiarini & al. 897* (CORD).

**Solanum homalospermum* Chiarini
2*n* = ca. 48, CHN. Argentina, Córdoba, Sobremonte, 29°46′34″ S, 63°59′59″ W, 29 Nov 2001, *Chiarini 505* (CORD).

Solanum houstonii Martyn
2*n* = 24, CHN. Mexico, Puebla, Tehuacán, Helia Bravo Hollis Botanic Garden, *Bauk s.n.* (CORD).

Solanum iltisii K.E.Roe
2*n* = 24, CHN. Peru, Apurímac, Abancay, 18–19.5 km above Curahuasi, 13°32′08″ S, 72°45′18″ W, 10 Mar 2012, *Knapp & al. 10345* (BM).

Solanum infundibuliforme Phil.
2*n* = 24, CHN. Argentina, Jujuy, Yavi, Abra del Lizoite, 22°13′39.2″ S, 65°16′05″ W, 23 Mar 2006, *Barboza & al. 1781* (CORD).

**Solanum jabrense* Agra & M.Nee
2*n* = 24, CHN. Brazil, Paraíba, Pico do Jabre, *Agra & al. 7077* (JPB).

**Solanum juninense* Bitter
2*n* = 24, CHN. Peru, Ancash, Luzuriaga, Road from Yanama to Vaqueria, 9°02′23″ S, 77°29′25″ W, 23 May 2013, *Särkinen & al. 4754* (BM).

**Solanum longifilamentum* Särkinen & P.Gonzáles
2*n* = 24, CHN. Peru, Puno, Uruhuasi, 13°41′23″ S, 70°27′26″ W, 19 Mar 2012, *Särkinen & al. 4030* (BM, USM).

Solanum lycopersicoides Dunal
2*n* = 24, CHN. Chile, Región I, Putre, 18°12′26.1″ S, 69°32′47.3″ W, 18 Feb 2011, *Barboza & al. 2993* (CORD).

Solanum microdontum Bitter
2*n* = 24, CHN. Argentina, Tucumán, Tafí del Valle, 31 Mar 2012, *Urdampilleta & al. 753* (CORD).

**Solanum multispinum* N.E.Br.
2*n* = 24, CHN. Argentina, Formosa, Laishi, 26°30′21.2″ S, 58°29′13.7″ W, 5 Mar 2012, *Chiarini & al. 888* (CORD).

Solanum myriacanthum Dunal
2*n* = 24, CHN. Seeds from Botanical and Experimental Garden, Radboud Univ,, Nijmegen, Accession # NLD020 (814750043), Origin Mexico, Vera Cruz State: above La Joya, *J.G. Hawkes 2385* (BIRM).

Solanum okadae Hawkes & Hjert.
2*n* = 24, CHN. Bolivia, La Paz, Inquisivi, Rosasani, 16°56′45″ S, 67°11′15″ W, 28 Apr 2006, *Barboza & al. 1863* (CORD).

Solanum pallidum Rusby
2*n* = 24, CHN. Peru, Cusco, Quispicanchis, Carretera Interoceanica, 13°33′16″ S, 70°53′35″ W, 18 Mar 2012, *Särkinen & al. 4014* (BM).

Solanum polytrichostylum Bitter
2*n* = 24, CHN. Peru, Cusco, Urubamba, Collpani, 15–16 km of Ollantaytambo, 13°11′08″ S, 72°17′18″ W, 13 Mar 2012, *Knapp & al. 10384* (BM).

**Solanum pseudoamericanum* Särkinen, P.Gonzáles & S.Knapp
2*n* = 24, CHN. Peru, Abancay, Curahuasi, road Abancay–Cusco, *Knapp & al. 10357* (BM, USM).

Solanum pubigerum Dunal
2*n* = 24, CHN. Mexico, Guanajuato, San Pedro de los Pozos, 21°13′15.42″ N, 100°29′39.42″ W, 19 Jun 2016, *Chiarini & al. 1272* (CORD).

Solanum radicans L.f.
2*n* = 24, CHN. Peru, Cusco, Quispicanchis, Urcos, 13°41′13″ S, 71°36′14″ W, 17 Mar 2012, *Särkinen 4008* (BM).

Solanum ramulosum Sendtn.
2*n* = 24, CHN. Argentina, Misiones, Candelaria, Loreto, 27°20′02″ S, 55°31′23″ W, 9 Oct 2011, *Urdampilleta & al. 569* (CORD).

Solanum reductum C.V.Morton
2*n* = 24, CHN. Argentina, Catamarca, Ambato, El Rodeo, 28°11′45.57″ S, 65°52′37.4″ W, 23 Feb 2016, *Barboza & al. 4652* (CORD).

Solanum riparium Pers.
2*n* = 24, CHN. Argentina, Jujuy, Palpalá, Zapla, 24°14′23.35″ S, 65°04′56.16″ W, 18 Jan 2016, *Chiarini s.n.* (CORD).

Solanum robustum H.L.Wendl.
2*n* = 24, CHN. Argentina, Misiones, San Ignacio, Teyú Cuaré, 9 Oct 2011, *Urdampilleta & al. 559* (CORD).

Solanum saponaceum Dunal
2*n* = 24, CHN. Peru, Apurímac, Abancay, 13°32′19″ S, 72°29′28″ W, 11 Mar 2012, *Knapp & al. 10356* (BM).

**Solanum thomasiifolium* Sendtn.
2*n* = 24, CHN. Brazil, Bahia, Rio das Contas, Cachoeira do Fraga, 21 Feb 2008, *Urdampilleta & al. 414* (UEC).

Solanum trichoneuron Lillo
2*n* = 24, CHN. Argentina, Tucumán, Lules, Villa Nougues, 26°51′34.9″ S, 65°21′27.8″ W, 14 Feb 2012, *Barboza & al. 3512* (CORD).

**Solanum valdiviense* Dunal
2*n* = 24, CHN. Argentina, Neuquén, Lácar, Lago Villarino, 40°26′45.9″ S, 71°32′37.6″ W, 28 Jan 2013, *Barboza & al. 3772* (CORD).

**Solanum weddellii* Phil.
2*n* = 24, CHN. Peru, Puno, Carabaya, San Gapán–Juliaca, 13°59′27″ S, 70°28′25″ W, 19 Mar 2012, *Särkinen & al. 4038* (BM).

Solanum wrightii Benth.
2*n* = 24, CHN. Colombia, Quindío, Vía Armenia–Circasia, 13 Feb 2010, *Beltrán 77* (COL).

The chromosome numbers of 50 and karyotype features of 42 species of Solanaceae (mostly *Solanum*) are presented. Mitotic

chromosomes were examined in root tips obtained from germinating seeds. Roots were pretreated in saturated p-dichlorobenzene in water for 2 h at room temperature, fixed in 3 : 1 ethanol : acetic acid, washed in distilled water, digested 45 min at 37°C with Pectinex SP ULTRA (Novozymes), and squashed in a drop of 45% acetic acid. Slides were stained with Giemsa (Guerra, 1983). At least ten metaphases of each species were photographed with phase contrast in a Zeiss Axiophot microscope. Photographs were used to take the following measurements for each chromosome pair: s (short arm), l (long arm), and c (average total chromosome length). The arm ratio (r = l / s) was then calculated and used to classify the chromosomes as recognized by Levan & al. (1964). In addition, total haploid chromosome length of the karyotype (TL) based on the mean chromosome lengths was calculated. Karyotype asymmetry was estimated using Romero Zarco's (1986) indices (A_1 = intrachromosomal asymmetry index, A_2 = interchromosomal asymmetry index). Figures 3–5 show the range of chromosomes morphologies found. Idiograms representing the haploid complement were based on the mean values for each species (Figs. 6, 7).

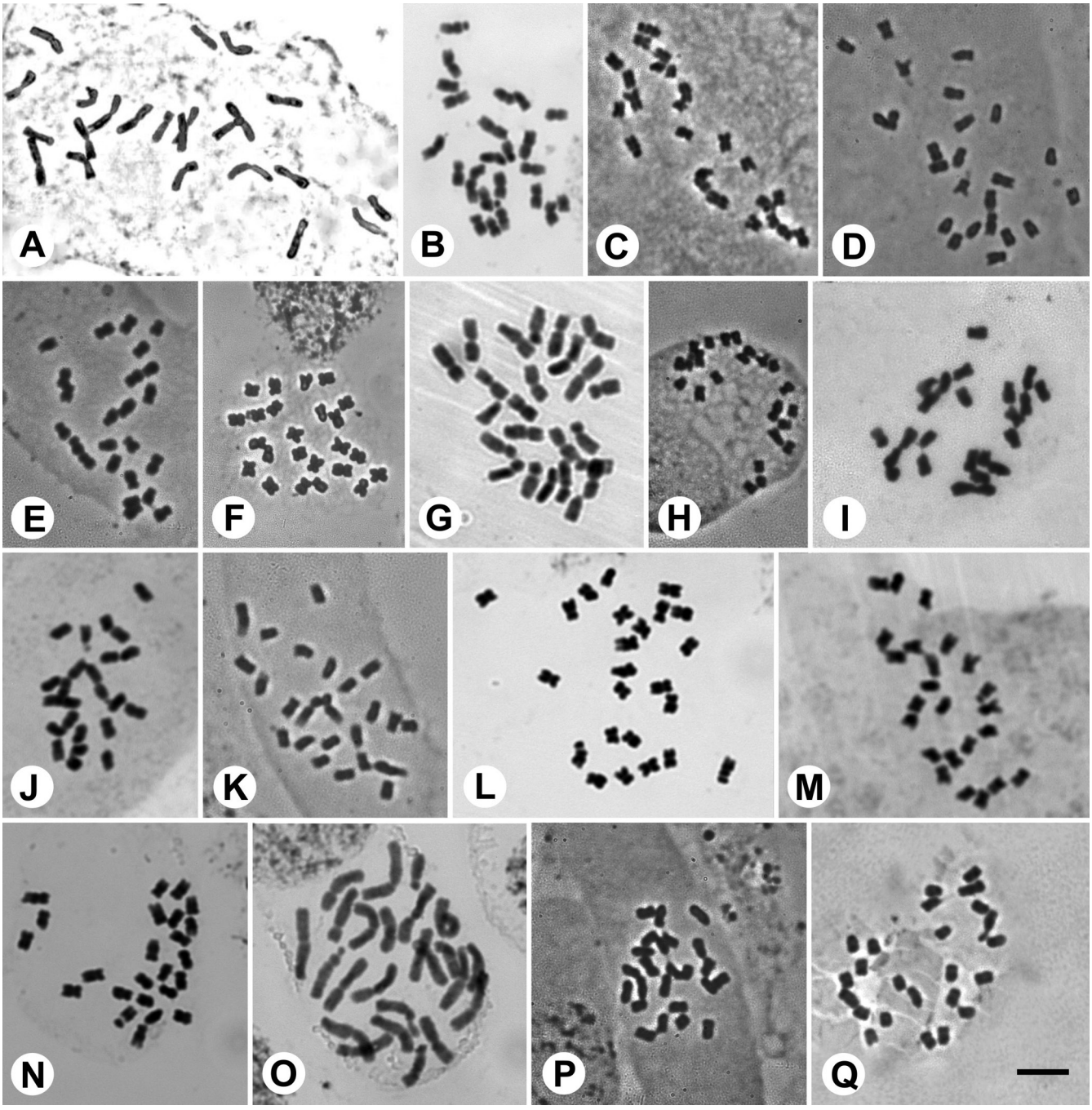

Fig. 3. Photomicrographs of mitotic metaphases of *Aureliana*, *Jaltomata* and *Solanum* species. **A,** *Aureliana fasciculata*; **B,** *Jaltomata procumbens*; **C,** *J. sinuosa*; **D,** *S. abutiloides*; **E,** *S. acanthodes*; **F,** *S. alternatopinnatum*; **G,** *S. amotapense*; **H,** *S. carolinense*; **I,** *S. crinitum*; **J,** *S. pubigerum*; **K,** *S. chilense*; **L,** *S. chrysotrichum*; **M,** *S. corymbosum*; **N,** *S. fiebrigii*; **O,** *S. glaucophyllum*; **P,** *S. glutinosum*; **Q,** *S. hieronymi*. — Scale bar = 5 mm.

Our chromosome counts are the first report for 18 species, while the remaining counts confirm previously published data. Chromosome features are summarized in Table 1; species of *Solanum* are arranged and discussed according to their clade membership sensu Bohs (2005) and Särkinen & al. (2013). All species were presumed diploid with $2n = 24$ (Figs. 3, 4, 5A–J), except for 8 species which exhibited polyploidy (Fig. 5K–N; Table 1). *Solanum*, *Aureliana* and *Jaltomata* are members of the "$x = 12$ clade" (sensu Olmstead & al., 2008; Särkinen & al., 2013), a group in which most species analyzed to date have a base chromosome number of 12, with a few exceptions (Chiarini & Bernardello, 2006). A review of the available literature suggests that polyploidy (both autoploidy and alloploidy) is the main modification on the generalized pattern of $x = 12$, a trend that our results support.

Our data on *Solanum* show that chromosome size is relatively small (c = from 1.42 to 3.11 mm) and species analyzed here fall within the range expected for the genus (Badr & al., 1997). The exception was the measurements taken in species of the Cyphomandra clade (c from 4.14 to 5.53 mm), a group characterized by its large chromosomes (Bohs, 1994). The karyotypes of species belonging to the Brevantherum and Wendlandii/Allophyllum clades are the first studied for these groups.

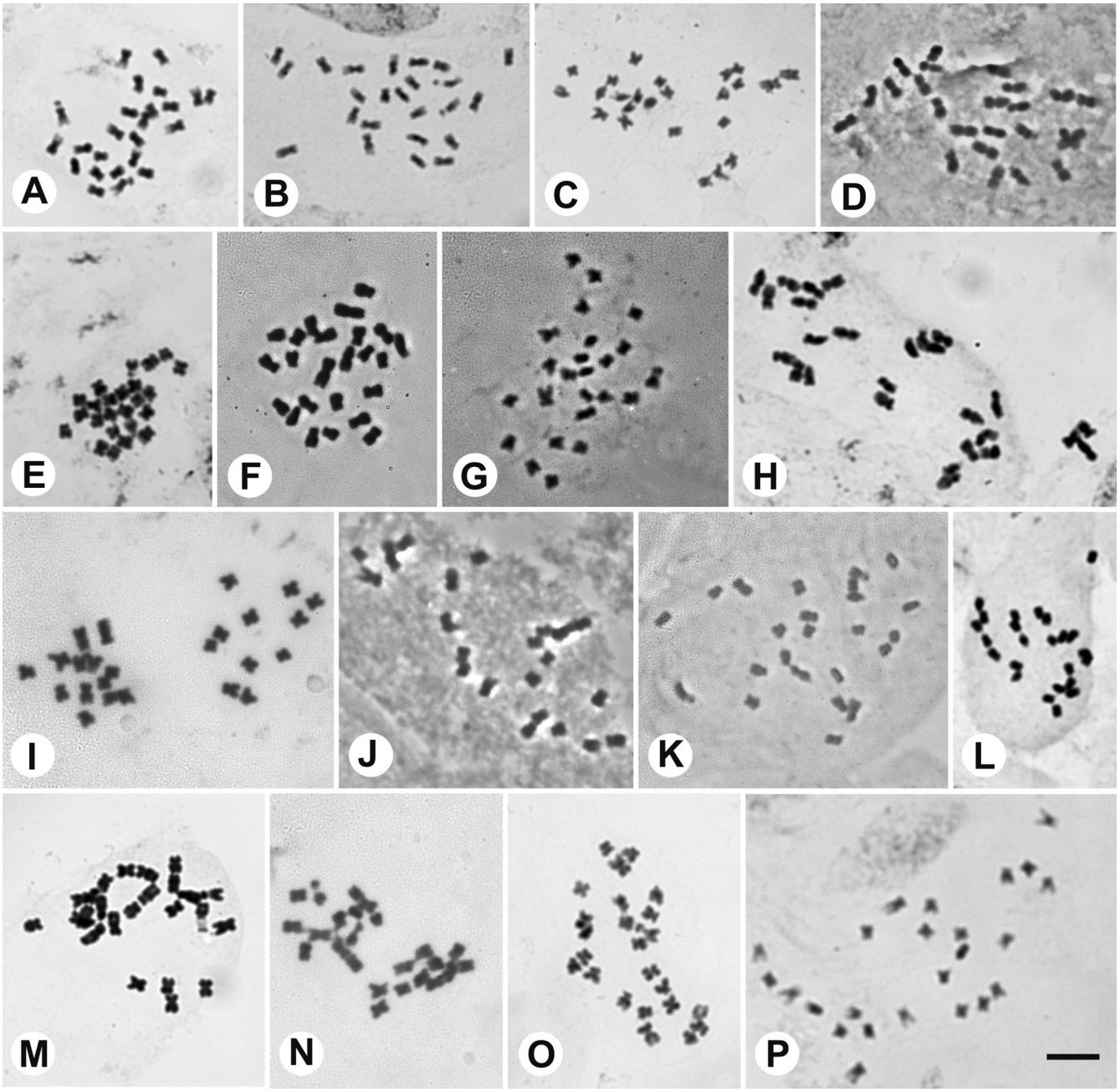

Fig. 4. Photomicrographs of mitotic metaphases of *Solanum* species. **A,** *Solanum houstonii*; **B,** *S. iltisii*; **C,** *S. infundibuliforme*; **D,** *S. jabrense*; **E,** *S. longifilamentum*; **F,** *S. lycopersicoides*; **G,** *S. boliviense*; **H,** *S. pseudoamericanum*; **I,** *S. multispinum*; **J,** *S. myriacanthum*; **K,** *S. okadae*; **L,** *S. juninense*; **M,** *S. pallidum*; **N,** *S. polytrichostylum*; **O,** *S. microdontum*; **P,** *S. radicans*. — Scale bar = 5 mm.

As a whole, karyotypes are typically symmetrical (Figs. 3–7). All species have m (metacentric) chromosomes (from 6 to 12 pairs in diploids, ten pairs being the most frequent number and exceptionally fewer in *S. infundibuliforme*; Table 1, Figs. 4C, 6). *Solanum valdiviense* (Figs. 5H, 6) and *S. houstonii* (Figs. 4A, 7) are remarkable in having 12 m pairs; the rest of species have also sm (submetacentric) chromosomes (1 to 6 pairs, two pairs being the most frequent number). St (subtelocentric) chromosomes are not common; a single pair is seen in *A. fasciculata* and in three species of *Solanum*. Telocentric chromosomes were not detected.

The r value varies from 1.22 in *S. valdiviense* (Table 1) to 1.77 in *S. glaucophyllum* (Figs. 3O, 6). *Solanum valdiviense* (Figs. 5H, 6) has the lowest A_1 value, while *S. longifilamentum* (Figs. 4E, 7) has the highest. *Solanum pubigerum* (Figs. 3J, 6) has the lowest value of A_2, and the highest value is found in *S. infundibuliforme* (Figs. 4C, 6). One chromosome pair with secondary constrictions (i.e., satellites) is present

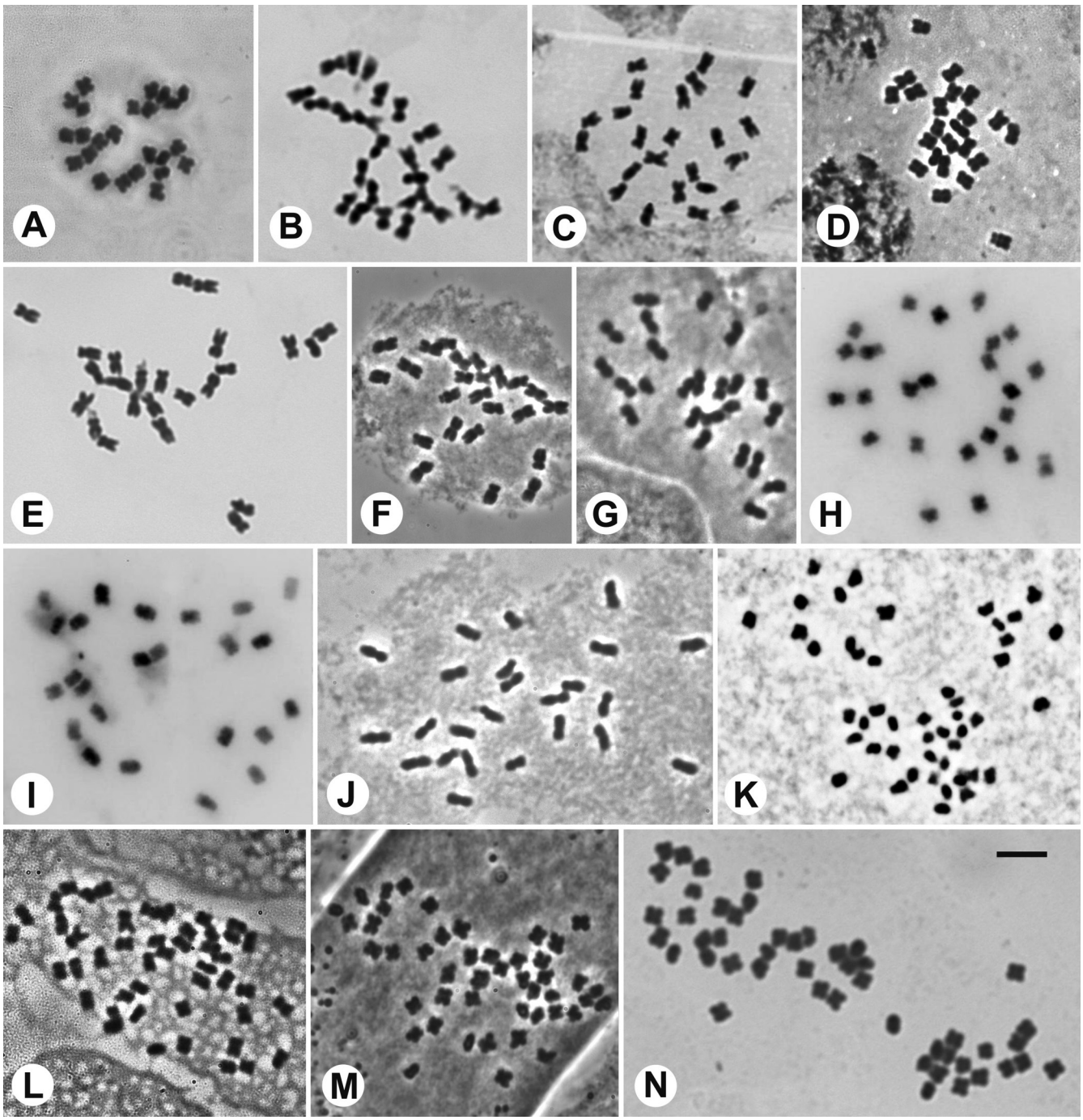

Fig. 5. Photomicrographs of mitotic metaphases of *Solanum* species. **A,** *Solanum ramulosum*; **B,** *S. reductum*; **C,** *S. riparium*; **D,** *S. robustum*; **E,** *S. saponaceum*; **F,** *S. thomasiifolium*; **G,** *S. trichoneuron*; **H,** *S. valdiviense*; **I,** *S. weddellii*; **J,** *S. wrightii*; **K,** *S. comptum*; **L,** *S. campylacanthum*; **M,** *S. homalospermum*; **N,** *S. grandidentatum*. — Scale bar = 5 mm.

in most species. One species (*S. reductum*) has a heteromorphic pair of chromosomes in which the satellites are of different sizes (Figs. 5B, 6). Satellites are frequently attached to the short arms, generally on metacentric chromosomes, but some species have satellites on long arms or on submetacentric/subtelocentric chromosomes as well (Figs. 3–5).

Aureliana is a genus with 12 species (Zamberlan & al., 2015), closely related to *Withania* and *Deprea*. The features of *A. fasciculata* reported here are similar to those of *A. sellowiana* (Barboza & al., 2010, the only karyotype available in the literature at present), with medium- to large-sized quite symmetrical chromosomes (Figs. 3A, 6; Table 1). This is in marked contrast to the chromosome morphology of their close relatives, *Withania* and *Deprea* (Deanna & al., 2014).

With ca. 80 species, *Jaltomata* is the sister clade to *Solanum* (Miller & al., 2011; Särkinen & al., 2013) and only seven chromosome

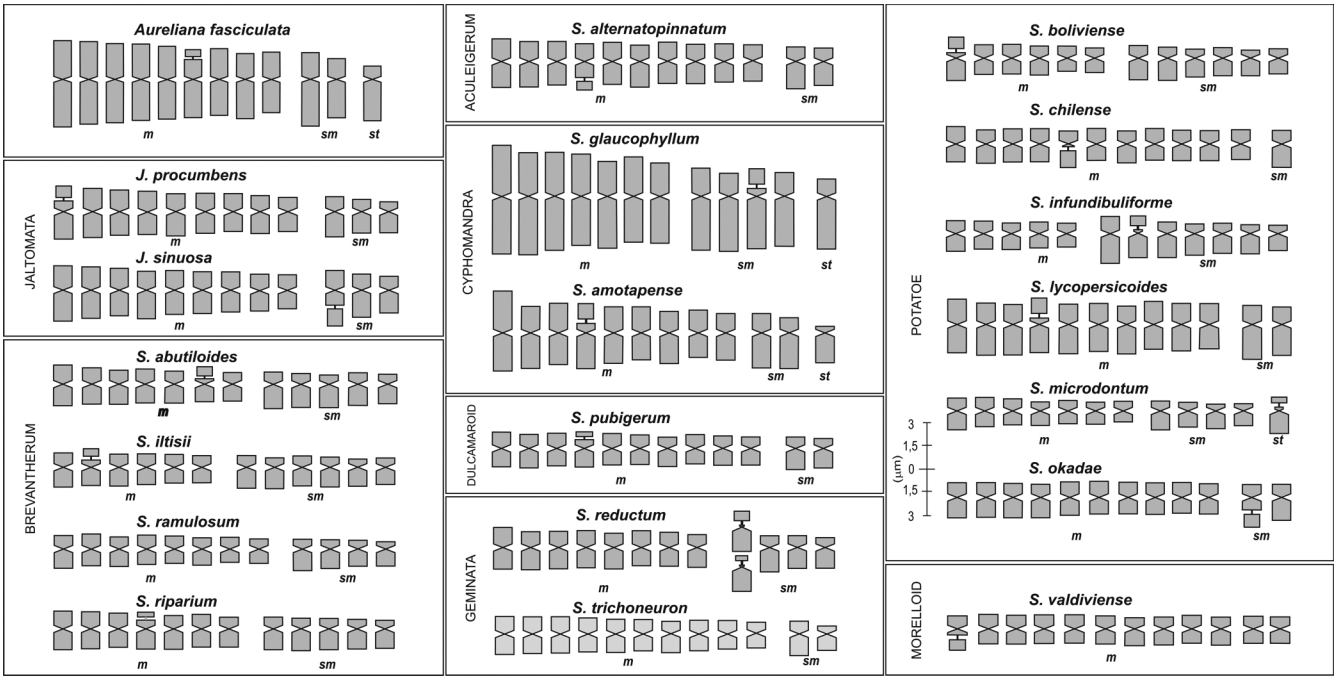

Fig. 6. Idiograms for *Aureliana*, *Jaltomata* and *Solanum* accessions, based on mean values, all at the same scale.

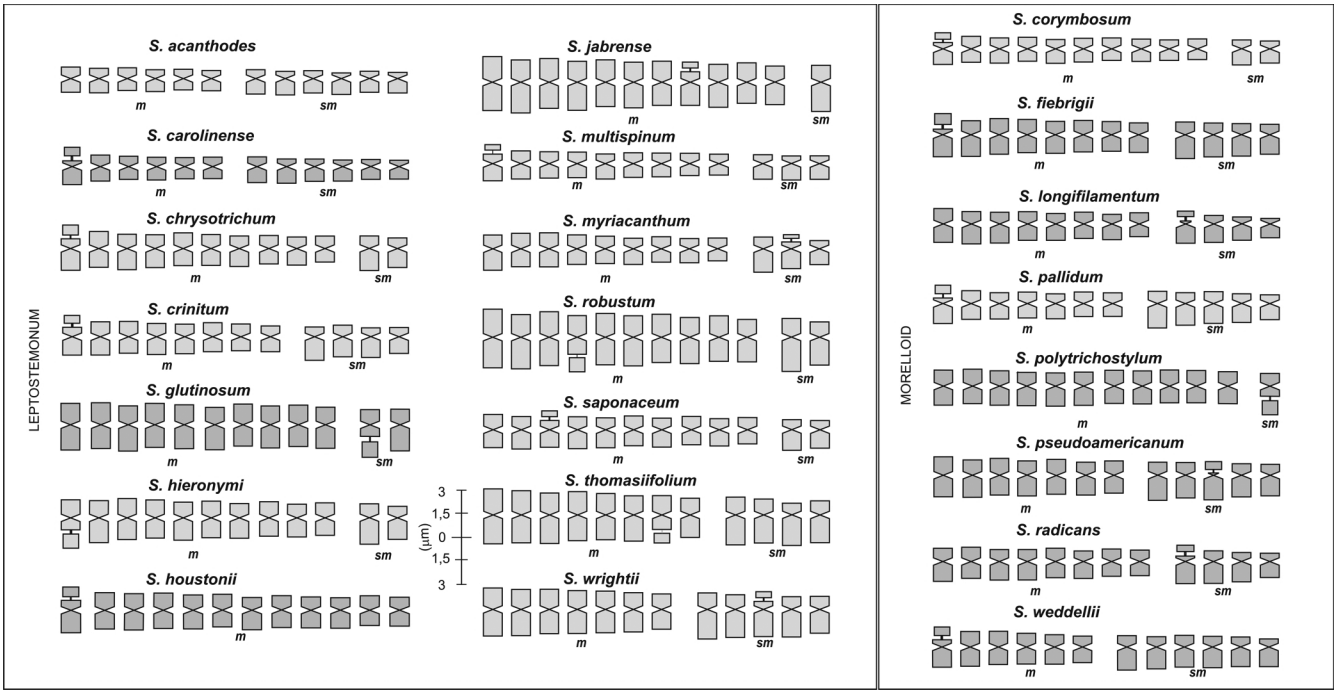

Fig. 7. Idiograms for *Solanum* accessions, based on mean values, all at the same scale.

Table 1. Chromosomal data of the Solanaceae species studied.

Species	2*n*	Karyotype formula	SAT	c	r	TL	A_1	A_2
Aureliana fasciculata (Vell.) Sendtn.	24	9m+2sm+1st	6	5.47±0.28	1.53±0.09	65.68±3.50	0.270±0.029	0.160±0.025
Jaltomata								
J. sinuosa (Miers) Mione	24	9m+3sm	10	2.11±0.21	1.38±0.03	25.37±2.46	0.251±0.017	0.177±0.023
J. procumbens (Cav.) J.L.Gentry	24	9m+3sm	1	2.57±0.29	1.39±0.08	30.83±3.43	0.230±0.023	0.175±0.021
Solanum								
Brevantherum								
S. abutiloides (Griseb.) Bitter & Lillo	24	7m+5sm	6	2.13±0.14	1.67±0.06	25.59±1.67	0.347±0.028	0.115±0.024
S. iltisii K.E.Roe	24	6m+6sm	2	1.97±0.23	1.67±0.08	23.67±2.80	0.353±0.023	0.102±0.021
S. ramulosum Sendtn.	24	8m+4sm	–	1.79±0.23	1.62±0.13	21.45±2.66	0.310±0.045	0.114±0.038
S. riparium Pers.	24	7sm+5sm	4	2.09±0.20	1.65±0.07	25.04±2.42	0.339±0.021	0.104±0.017
Cyphomandropsis								
S. amotapense Svenson	24	9m +2sm +1st	4	4.14±0.68	1.50±0.06	52.97±8.17	0.250±0.030	0.150±0.025
S. glaucophyllum Desf.	24	7m+4sm+1st	10	5.53±0.46	1.77±0.16	66.47±8.24	0.347±0.034	0.177±0.047
Dulcamaroid								
S. pubigerum Dunal	24	10m+2sm	4	1.97±0.21	1.41±0.08	23.62±2.50	0.250±0.035	0.087±0.010
Geminata								
S. reductum C.V.Morton	24	8m+4sm	9*	2.20±0.20	1.58±0.42	26.40±2.36	0.291±0.022	0.107±0.040
S. trichoneuron Lillo	24	10m+2sm	1	2.03±0.11	1.37±0.13	24.37±1.34	0.210±0.030	0.140±0.025
Leptostemonum								
S. acanthodes Hook.f.	24	10m+2sm	4	1.42±0.10	1.73±0.06	17.05±1.21	0.352±0.013	0.098±0.007
S. campylacanthum Hochst. ex A.Rich.	48	–	–	–	–	–	–	–
S. carolinense L.	24	8m+4sm	1	1.45±0.26	1.62±0.11	17.40±3.16	0.330±0.036	0.171±0.040
S. chrysotrichum Schltdl.	24	10m+2sm	1	2.01±0.19	1.35±0.03	24.09±2.27	0.228±0.018	0.143±0.022
S. comptum C.V.Morton	48	–	–	–	–	–	–	–
S. crinitum Lam.	24	8m+4sm	1	1.90±0.18	1.55±0.05	22.79±2.19	0.285±0.011	0.114±0.021
S. glutinosum Dunal	24	10m+2sm	1	2.16±0.22	1.31±0.06	25.91±2.69	0.180±0.030	0.120±0.025
S. hieronymi Kuntze	24	10m+2sm	1	2.34±0.77	1.44±0.10	28.07±9.19	0.248±0.045	0.138±0.041
S. homalospermum Chiarini	ca. 48	–	–	–	–	–	–	–
S. houstonii Martyn	24	12m	1	2.09±0.30	1.24±0.05	25.11±3.56	0.168±0.030	0.123±0.014
S. jabrense Agra & M.Nee	24	11m+1sm	8	2.89±0.38	1.28±0.06	34.70±4.55	0.196±0.030	0.111±0.025
S. multispinum N.E.Br.	24	9m+3sm	1	1.57±0.17	1.46±0.10	18.85±1.97	0.262±0.041	0.135±0.035
S. myriacanthum Dunal	24	9m+3sm	11	1.79±0.19	1.47±0.11	21.53±2.30	0.273±0.030	0.181±0.025
S. robustum H.L.Wendl.	24	10m+2sm	4	3.11±0.89	1.36±0.05	37.29±10.63	0.201±0.023	0.110±0.030
S. saponaceum Dunal	24	10m+2sm	3	1.87±0.30	1.45±0.06	22.50±3.58	0.266±0.024	0.113±0.011
S. thomasiifolium Sendtn.	24	8m+4sm	7	2.91±0.53	1.51±0.07	34.89±6.36	0.278±0.030	0.115±0.025
S. wrightii Benth.	24	7m+5sm	10	2.64±0.56	1.61±0.10	31.64±6.71	0.328±0.030	0.105±0.025
Morelloid								
S. corymbosum Jacq.	24	10m+2sm	1	1.48±0.17	1.35±0.03	17.79±2.08	0.215±0.012	0.109±0.022
S. fiebrigii Bitter	24	8m+4sm	1	2.07±0.22	1.55±0.07	24.90±2.63	0.315±0.031	0.105±0.020
S. furcatum Dunal	72	–	–	–	–	–	–	–
S. grandidentatum Phil.	48	–	–	–	–	–	–	–

SAT = ordering number of the satellited pair; c = average total chromosome length in mm; r = arm ratio; TL = total haploid chromosome length of the karyotype in mm; A_1 = intrachromosomal asymmetry index; A_2 = interchromosomal asymmetry index; * = heteromorphic pair.

Table 1. Continued.

Species	2*n*	Karyotype formula	SAT	c	r	TL	A_1	A_2
S. juninense Bitter	24	–	–	–	–	–	–	–
S. longifilamentum Särkinen & P.Gonzáles	24	8m+4sm	9	1.71±0.06	1.71±0.09	20.55±0.72	0.359±0.017	0.148±0.033
S. pallidum Rusby	24	7m+5sm	9	1.79±0.30	1.62±0.10	21.53±3.63	0.331±0.034	0.172±0.020
S. polytrichostylum Bitter	24	11m+1sm	12	1.67±0.28	1.29±0.08	20.06±3.41	0.160±0.028	0.130±0.024
S. pseudoamericanum Särkinen & al.	24	7m+5sm	10	2.21±0.17	1.61±0.06	26.49±2.08	0.304±0.040	0.103±0.013
S. radicans L.f.	24	8m+4sm	9	1.85±0.76	1.59±0.13	22.25±9.14	0.303±0.044	0.119±0.031
S. valdiviense Dunal	24	12m	1	1.42±0.16	1.22±0.03	17.05±1.91	0.140±0.030	0.150±0.025
S. weddellii Phil.	24	6m+6sm	1	1.98±0.21	1.71±0.16	23.72±2.41	0.333±0.027	0.094±0.010
Potatoe								
S. acaule Bitter	48	–	–	–	–	–	–	–
S. boliviense Dunal	24	6m+6sm	1	1.86±0.15	1.60±0.13	22.37±1.82	0.318±0.044	0.203±0.033
S. brevicaule Bitter	48	–	–	–	–	–	–	–
S. chilense Dunal	24	11m+1sm	1	1.63±0.25	1.26±0.06	19.53±3.05	0.150±0.030	0.170±0.025
S. infundibuliforme Phil.	24	5m+7sm	7	1.95±0.07	1.73±0.08	23.42±0.86	0.350±0.036	0.212±0.037
S. lycopersicoides Dunal	24	10m+2sm	1	2.54±0.37	1.43±0.14	30.43±4.40	0.230±0.030	0.190±0.025
S. microdontum Bitter	24	7m +4sm +1st	12	1.63±0.19	1.76±0.19	19.55±2.32	0.334±0.053	0.171±0.030
S. okadae Hawkes & Hjert.	24	10m+2sm	1	1.69±0.19	1.37±0.08	20.26±2.25	0.200±0.030	0.160±0.025
Wendlandii/Allophyllum								
S. alternatopinnatum Steud.	24	10m+2sm	1	2.64±0.01	1.37±0.05	31.72±1.18	0.230±0.030	0.090±0.016

counts and no karyotype reports were available before our study. The chromosome features of *Jaltomata* are similar to those of *Solanum* with chromosomes of relatively small to medium size and quite symmetrical karyotypes (Figs. 3B, C, 6; Table 1). More karyotypes, however, are necessary to definitely distinguish the two genera.

Our data are useful for distinguishing species and to characterize some clades within a large and complex group such as the "$x = 12$ clade", where information on chromosome morphology is scanty. The picture is far from complete, however, and more counts and karyotypes are needed in order to establish hypotheses of chromosome evolution across this economically important family.

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* First chromosome count for the species.
** New cytotype for the species.

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Mitotic chromosomes were examined in root tips of seedlings. Method is described in Smirnov (1968). Chromosome numbers in literature were checked using CCDB, version 1.45 (Rice & al., 2015).

ACERACEAE

Acer monspessulanum L.

2*n* = 26, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, garden, 43°32′N, 02°13′E, 4 Oct 2015, *A. Erst & I. Kuzmin 119* (NS).

AMARANTHACEAE

Amaranthus hybridus L.

2*n* = 32, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, waste places, 43°32′N, 02°13′E, 18 Oct 2015, *A. Erst & I. Kuzmin 228* (NS).

Amaranthus retroflexus L.

2*n* = 32, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, garden, 43°32′N, 02°13′E, 4 Oct 2015, *A. Erst & I. Kuzmin 104* (NS).

ASPARAGACEAE

Prospero autumnale (L.) Speta

2*n* = 28+0–4B, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, wet meadow, 43°32′N, 02°13′E, 18 Oct 2015, *A. Erst & I. Kuzmin 208* (NS) [Fig. 8A].

ASTERACEAE

Tragopogon pratensis L. subsp. *pratensis*

2*n* = 12, CHN. France, Region Midi-Pyrénées, Departament Tarn, 1 km S of Escoussens, field edge, 43°29′N, 02°12′E, 22 Jun 2014, *A. Erst & I. Kuzmin 236* (NS) [Fig. 8B].

BRASSICACEAE

Isatis tinctoria L. subsp. *tinctoria*

2*n* = 28, CHN. France, Region Midi-Pyrénées, Departament Aveyron, Millau Viaduct Information Centre, small landfill site, 44°04′51.7″N 03°01′14.2″E, 27 Jun 2014, *A. Erst & I. Kuzmin 235* (NS).

CARYOPHYLLACEAE

Silene baccifera (L.) Roth

2*n* = 24, CHN. France, Region Aquitaine, Departament Pyrénées-Atlantiques, vicinity of Guéthary, roadside ditch, 43°25′N, 01°36′E, 31 Oct 2013, *A. Erst & I. Kuzmin 32* (NS).

CUCURBITACEAE

Bryonia alba L.

**2*n* = 20, 40, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, garden, 43°32′N, 02°13′E, 31 Aug 2014, *A. Erst & I. Kuzmin 108* (NS), *A. Erst & I. Kuzmin 109* (NS).

FABACEAE

Spartium junceum L.

2*n* = 48, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km SO of Dourgne, La Capelette Saint Ferréol, roadside in the mountains, 43°28′41.5″N, 02°09′26.6″E, 2 Nov 2013, *A. Erst & I. Kuzmin 16* (NS) [Fig. 8C].

IRIDACEAE

Iris foetidissima L.

2*n* = 40, CHN. France, Region Midi-Pyrénées, Departament Tarn, 1 km S of Escoussens, roadside in the mountains, forest, 43°29′N, 02°12′E, 26 Sep 2015, *A. Erst & I. Kuzmin 12* (NS).

JUNCACEAE

Juncus bufonius L. s.l.

2*n* = ca. 100, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, wet meadow, 43°32′N, 02°13′E, 8 Jun 2014, *A. Erst & I. Kuzmin 239* (NS).

PHYTOLACCACEAE

Phytolacca americana L.

2*n* = 36, CHN. France, Region Midi-Pyrénées, Departament Haute-Garonne, Toulouse, near Cité de l'espace, waste places, 43°35′N, 01°29′E, 23 Oct 2015, *A. Erst & I. Kuzmin 251* (NS).

PLANTAGINACEAE

Chaenorhinum minus (L.) Lange

2*n* = 14, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km SO of Dourgne, La Capelette Saint Ferréol, roadside in the mountains, 43°28′41.5″N, 02°09′26.6″E, 2 Nov 2013, *A. Erst & I. Kuzmin 9* (NS).

POLYGONACEAE

Rumex patientia L.

2*n* = 60, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, wet meadow, 43°32′N, 02°13′E, 3 Oct 2015, *A. Erst & I. Kuzmin 112* (NS).

RANUNCULACEAE

Aquilegia aradanica Shaulo & Erst

*2*n* = 14, CHN. Russia, West Sayan, Aradansky Ridge, right bank of the Us River, gravelly scree, 52°22′N, 93°17′E, 3 Jul 2010, *D. Shaulo & A. Erst 321* (NS).

Aquilegia flabellata Siebold & Zucc.

2*n* = 14, CHN. Russia, Sakhalin Island, Yuzhno-Sakhalinsk, Chekhov Peak, cliffs, 47°00′19″N, 142°50′23″E, 13 Aug 2015, *V. Yakubov 22* (NS).

Aquilegia flavescens S.Watson

*2*n* = 14, CHN. U.S.A., Wyoming, Park County, Grinnell Creek Stream, shrubs, 44°29′N, 109°56′W, 15 Jul 2014, *A. Erst 428* (NS) [Fig. 8D].

Aquilegia jonesii Parry

2*n* = 14, CHN. U.S.A., Wyoming, Sheridan County, on limestone rubble, 3080 m, 28 Jul 2015, *L. Hill 9* (NS).

Aquilegia parviflora Ledeb.

2*n* = 14, CHN. Russia. Sakha (Yakutia) Republic, Aldan River, meadow, 58°45′N, 127°15′E, 13 Mar 2015, *S. Asboganov 1* (NS) [Fig. 8E].

Aquilegia viridiflora Pall.,

2*n* = 14, CHN. Russia, Tuva Republic, Ondum Ridge, Apedek Mountain, rocky ledges, 51°44′N, 94°45′E, 16 May 2010, *A. Erst & Yu. Danilov 44* (NS).

Ranunculus repens L.

2*n* = 16, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, wet meadow, 43°32′N, 02°13′E, 8 Jun 2014, *A. Erst & I. Kuzmin 238* (NS).

SCROPHULARIACEAE

***Scrophularia nodosa* L.

2*n* = 18, CHN. France, Region Midi-Pyrénées, Departament Haute-Garonne, Toulouse, Ramonville Saint Agne, bank of the Canal du Midi, 43°32′30.8″N, 01°29′28.5″E, 19 Jun 2014, *A. Erst & I. Kuzmin 242* (NS).

Verbascum blattaria L.

2*n* = 30, CHN. France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, wet meadow, 43°32′N, 02°13′E, 26 Sep 2015, *A. Erst & I. Kuzmin 34* (NS).

SOLANACEAE

Datura stramonium L.f. *stramonium*

2*n* = 24, CHN. France, Region Midi-Pyrénées, Departament Haute-Garonne, Toulouse, Balma, small landfill site, 43°35′N, 01°29′E, 16 Oct 2015, *A. Erst & I. Kuzmin 183* (NS) [Fig. 8F]; France, Region Midi-Pyrénées, Departament Tarn, 2 km W of Labruguière, roadside, 43°32′N, 02°13′E, 18 Oct 2015, *A. Erst & I. Kuzmin 240* (NS).

Solanum nigrum L. s.str.

2*n* = 48, CHN. France, Region Midi-Pyrénées, Departament Haute-Garonne, Toulouse, near Cité de l'espace, waste places, 43°35′N, 01°29′E, 19 Nov 2013, *A. Erst & I. Kuzmin 46* (NS).

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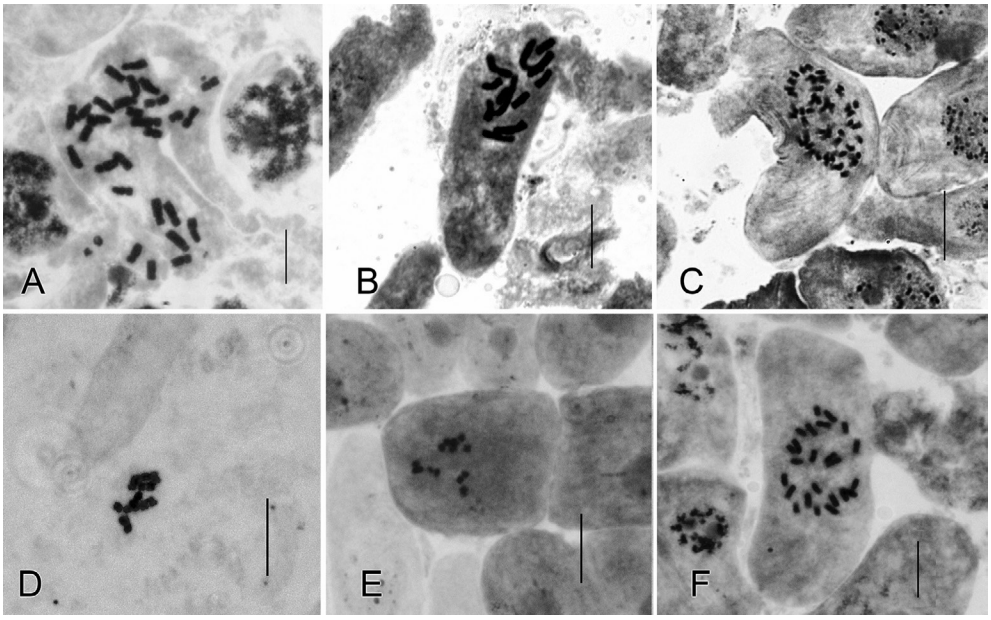

Fig. 8. Mitotic metaphase chromosomes: **A,** *Prospero autumnale* (L.) Speta, 2*n* = 28+0–4B; **B,** *Tragopogon pratensis* L. subsp. *pratensis*, 2*n* = 12; **C,** *Spartium junceum* L., 2*n* = 48; **D,** *Aquilegia flavescens* S.Watson, 2*n* = 14; **E,** *Aquilegia parviflora* Ledeb., 2*n* = 14; **F,** *Datura stramonium* L.f. *stramonium*, 2*n* = 24. — Scale bars = 10 µm.

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* First chromosome count for the species.
** New chromosome number (cytotype) for the species.
▼ First chromosome count from an Indian accession.
• First report of B-chromosome.

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ACANTHACEAE

**Strobilanthes alatus* Nees

n = 8, CHN. India, Himachal Pradesh, Sirmaur, Haripurdhar, 30°46′N, 77°31′E, 2400 m, along roadside, 12 Sep 2011, *Vijay Singh 31379* (PUN 59795) [Fig. 9R].

Earlier, the tetraploid level with 2*n* = 32 (Bhat & al., 1975; Vasudevan, 1976; Bir & Saggoo, 1981) was known for this species.

Strobilanthes glutinosus Nees

n = 16, CHN. India, Himachal Pradesh, Sirmaur, Haripurdhar, 30°46′N, 77°31′E, 2400 m, along roadside, 12 Sep 2011, *Vijay Singh 31382* (PUN *59798*) [Fig. 9S].

The present chromosome number agrees with 2*n* = 32 reported by Mehra & Vasudevan (1972).

APOCYNACEAE

Asclepias curassavica L.

n = 11, CHN. India, Himachal Pradesh, Sirmaur, Teesri, 30°51′N, 77°27′E, 3100 m, on rocky places, 15 Aug 2013, *Vijay Singh 31375* (PUN 59661) [Fig. 9A].

The present chromosome count is in accordance with the previous ones from India (Sreedevi & Namboodiri, 1977; Sarkar, 1988), as well as from outside of India (Pardi, 1933; Gadella & al., 1969; Niehaus & Wong, 1971).

ASTERACEAE

Arctium lappa L.

n = 17, CHN. India, Himachal Pradesh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassy slopes, 15 Jul 2011, *Henna Goyal 25354* (PUN 52794) [Fig. 9B].

The present chromosome number is in agreement with the previous report of 2*n* = 34 (Ge & al., 1989) from outside of India. Other cytotypes are reported, 2*n* = 36 (Mehra & al., 1965; Mehra & Remanandan, 1976; Bala & Gupta, 2011) from India and 2*n* =32 (Tischler, 1934) and 2*n* = 36 (Májovský & al., 1970; Pagni & Corsi, 1979) from outside of India.

**Aster albescens* (DC.) Wall. ex Hand.-Mazz.

n = 9, CHN. India, Himachal Pradesh, Shimla, Chadwik Fall, 31°07′N, 77°08′E, 1586 m, near water bodies, 15 Jul 2011, *Henna Goyal 28225* (PUN 57511) [Fig. 9C].

**Aster diplostephioides* (DC.) Benth. ex C.B.Clarke

n = 9, CHN. India, Himachal Pradesh, Sirmaur, Churdhar, 30°52′N, 77°29′E, 3650 m, on rocky slopes, 16 Aug 2014, *Vijay Singh 31361* (PUN 59791) [Fig. 9D].

**Brachyactis roylei* (DC.) Wendelbo

n = 9, CHN. India, Himachal Pradesh, Lahaul and Spiti, Keylong, 32°34′N, 77°01′E, 3340 m, on grassy slopes, 15 Jul 2011, *Henna Goyal 25338* (PUN 52778) [Fig. 9E].

•*Erigeron acer* L.

n = 9+0–4B, CHN. India, Himachal Pradesh, Sirmaur, Churdhar, 30°52′N, 77°29′E, 3650 m, on grassland, 25 Jun 2012, *Vijay Singh 31327* (PUN 59628) [Fig. 9F].

This chromosome number is in agreement with previous reports of 2*n* = 18, from India (Bala & Gupta, 2011) and outside of India (Podlech & Dieterle, 1969; Fernandes & Queiros, 1971). Besides, tetraploid cytotype (2*n*= 36) is also known from France (Siljak-Yakovlev, 1981).

**Erigeron bellidioides* (Buch.-Ham. ex D.Don) Benth. ex C.B.Clarke

n = 9, CHN. India, Himachal Pradesh, Sirmaur, Churdhar, 30°52′N, 77°29′E, 3650 m, on grassy slopes, 15 Aug 2014, *Vijay Singh 31352* (PUN 59650) [Fig. 9G].

▼*Erigeron borealis* (Vierh.) Simmons

n = 9, CHN. India, Himachal Pradesh, Lahaul and Spiti, Baralacha Pass, 32°45′N, 77°25′E, 4883 m, on grassy slopes, 15 Jul 2011, *Henna Goyal 25356* (PUN 52796) [Fig. 9H].

Our report is in agreement with that of 2*n* = 18 (Huber & Baltisberger, 1992; Lövkvist & Hultgård, 1999) from outside of India.

**Erigeron umbrosus* (Kar. & Kir.) Boiss.

n = 9, CHN. India, Himachal Pradesh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassland, 16 Jul 2011, *Vijay Singh 25337* (PUN 52777) [Fig. 9I].

▼*Leontopodium alpinum* Cass.

n = 12, CHN. India, Himachal Pradesh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassy slopes, 15 Jul 2011, *Henna Goyal 28201* (PUN 57494) [Fig. 9J].

The present chromosome count is different from the previously known diploid level with 2*n* =14 (Mehra & Remanandan, 1975) from India. Nevertheless, from outside of India, variation in chromosome numbers was reported, namely 2*n* = 26 (Murín & Paclová, 1979), 2*n* = 48 (Siljak, 1977), 2*n* = 50 (Kupfer, 1974) and 2*n* = 52 (Susnik & al., 1972).

**Ligularia amplexicaulis* DC.

n = 30, CHN. India, Himachal Pradesh, Sirmaur, Churdhar, 30°52′N, 77°29′E, 3650 m, on rocky slopes, 15 Aug 2015, *Vijay Singh 31362* (PUN 59792) [Fig. 9K].

**Pulicaria foliolosa* DC.

n = 9, CHN. India, Himachal Pradessh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassy slopes, 25 Aug 2011, *Henna Goyal 25344* (PUN 52784) [Fig. 9L].

***Saussurea heteromalla* (D.Don) Hand.-Mazz.

n = 8, CHN. India, Himachal Pradesh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassy slopes, 18 Jun 2011, *Henna Goyal 25272* (PUN 58532) [Fig. 9M].

Previously, the species is known to have two cytotype with 2*n* = 32 (Mehra & al., 1965; Bala & Gupta, 2011) and 2*n* =34 (Koul & al., 1976; Mehra & Remanandan, 1976).

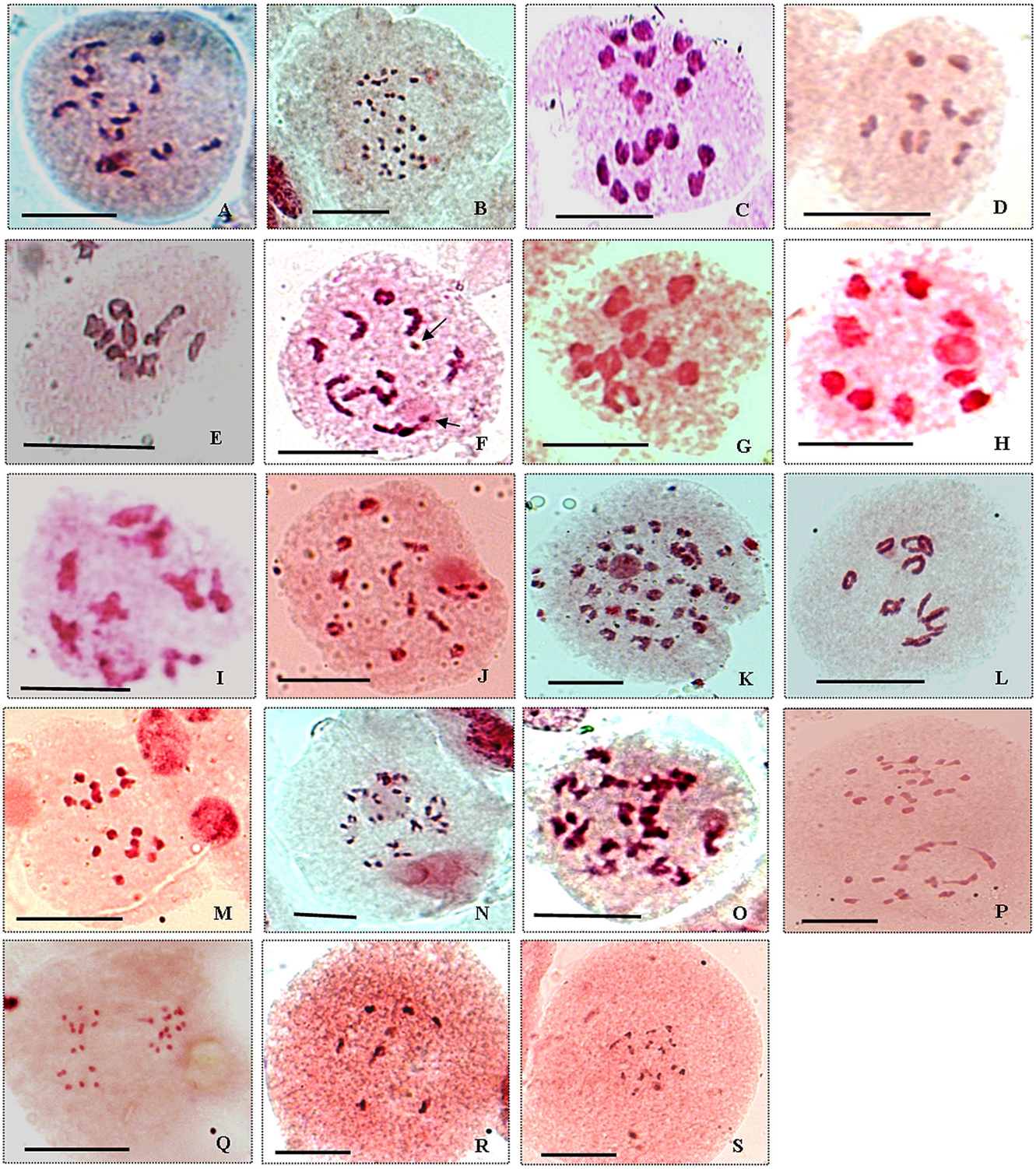

Fig. 9. A, *Asclepias curassavica*, PMC at diakinesis, *n* = 11 (PUN 59661); **B,** *Arctium lappa*, PMC at anaphase I, *n* = 17 (PUN 52794); **C,** *Aster albescens*, PMC at anaphase I, *n* = 9 (PUN 57511); **D,** *Aster diplostephioides*, PMC at metaphase I, *n* = 9 (PUN 59791); **E,** *Brachyactis roylei*, PMC at metaphase I, *n* = 9 (PUN 52778); **F,** *Erigeron acer*, PMC at diakinesis, *n* = 9+0–4B (PUN 59628); **G,** *Erigeron bellidioides*, PMC at metaphase I, *n* = 9 (PUN 59650); **H,** *Erigeron borealis*, PMC at diakinesis, *n* = 9 (PUN 52796); **I,** *Erigeron umbrosus*, PMC at metaphase I, *n* = 9 (PUN 52777); **J,** *Leontopodium alpinum*, PMC at diakinesis, *n* = 12 (PUN 57494); **K,** *Ligularia amplexicaulis*, PMC at diakinesis, *n* = 30 (PUN 59792); **L,** *Pulicaria foliolosa*, PMC at diakinesis, *n* = 9 (PUN 52784); **M,** *Saussurea heteromalla*, PMC at anaphase I, *n* = 8 (PUN 58532); **N,** *Saussurea jacea*, PMC at diakinesis, *n* = 17 (PUN 57516); **O,** *Solidago canadensis*, PMC at diakinesis, *n* = 18 (PUN 58528); **P,** *Tricholepis radicans*, PMC at anaphase I, *n* = 17 (PUN 59789); **Q,** *Tricholepis roylei*, PMC at anaphase I, *n* = 16 (PUN 59790); **R,** *Strobilanthes alatus*, PMC at metaphase I, *n* = 8 (PUN 59795); **S,** *Strobilanthes glutinosus*, PMC at metaphase I, *n* = 16 (PUN 59798). –– Scale bar = 10 µm.

***Saussurea jacea* (Klotzsch*)* C.B.Clarke

n = 17, CHN. India, Himachal Pradesh, Lahaul and Spiti, Koksar, 32°24′N, 77°14′E, 3140 m, on grassy slopes, 15 Jul 2011, *Henna Goyal 28230* (PUN 57516) [Fig. 9N].

Previously, diploid level with 2*n* = 32 was reported for this species (Jee & al., 1987).

▼*Solidago canadensis* L.

n = 18, CHN. India, Himachal Pradesh, Kullu, Manikaran Sahab, 32°01′N, 77°20′E, 1760 m, in grassy fields, 18 Jun 2011, *Henna Goyal 33274* (PUN 58528) [Fig. 9O].

The present chromosome count is different from previous Indian accessions, but the number is in accordance with Semple & al. (1992). Previously, the species was known at diploid level with 2*n* = 18 from India (Sarkar & al., 1980) and outside of India (Löve & Löve, 1982). Besides, the species is also known to have 2*n* = 54 (Sarkar & al., 1980) from India, and 2*n* = 40–48 (Skalinska, 1978), 2*n* = 54 (Semple & al., 1992) and 2*n* = 44, 84 (Xu & al., 1992) from outside of India. B-chromosome is also reported in the species with 2*n* = 18+0–2B (Kapoor, 1978) from India and 2*n* = 18+0–4B (Ward & Spellenberg, 1986) from outside of India.

Tricholepis radicans (Roxb.) DC.

n = 17, CHN. India, Himachal Pradesh, Sirmaur, Dadahu, 30°36′N, 77°26′E, 2400 m, along roadside, 12 Sep 2011, *Vijay Singh 31359* (PUN 59789) [Fig. 9P].

The present count agrees with the previous report of 2*n* = 32 (Gupta & Gill, 1979, 1989).

**Tricholepis roylei* Hook.f.,

n = 16, CHN. India, Himachal Pradesh, Sirmaur, Dadahu, 30°36′N, 77°26′E, 672 m, along roadside, 12 Sep 2011, *Vijay Singh 31360* (PUN 59790) [Fig. 9Q].

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* First chromosome count for the species.
** New chromosome report (cytotype) for the species.
▼ First chromosome count for an Indian accession.

BALSAMINACEAE

**Impatiens micranthemum* Edgew.

n = 9, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Sheela Village, 32°00′23″N, 77°22′44″E, 2650 m, grown in moist and shady areas in forests, *Himshikha 28464* (PUN 57309) [Fig. 10A].

**Impatiens spirifer* Hook.f. & Thomson

n = 7, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Satyam Tunnel, 32°00′05″N, 77°23′26″E, 2750 m, grown on moist and open slopes, *Himshikha 30165* (PUN 58643) [Fig. 10B].

***Impatiens thomsonii* Hook.f.

n = 9, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Malana Village, 32°03′45″N, 77°15′38″E, 2650 m, along streams, *Himshikha 30181* (PUN 58381) [Fig. 10C].

Previously, the Indian populations of this species were known to have intraspecific dysploid chromosome counts of 2*n* = 12 (Sharma & Ghosh, 1976), 2*n* = 14 (Khoshoo, 1955, 1956; Koul & Gohil, 1973), 2*n* = 16 (Sharma & Ghosh, 1976) and 2*n* = 20 (Khoshoo, 1955, 1956).

BIGNONIACEAE

▼*Incarvillea arguta* Royle

n = 11, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Tosh, 32°03′08″N, 77°26′58″E, 2400 m, rocky slopes, *Himshikha 30133* (PUN 58348) [Fig. 10D].

Earlier chromosome counts of 2*n* = 22 for this species have been made from China (Xiao & al., 2002; Chen, 2004).

BRASSICACEAE

***Lepidium sativum* L.

n = 16, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Pulga, 31°59′40″N, 77°26′22″E, 2100 m, rocky slopes, *Himshikha 30923* (PUN 58658) (Fig. 10E).

Previously, the species is known to have chromosome number of 2*n* = 12 (Aryavand, 1975; Al-Shehbaz & Al-Omar, 1982), 2*n* = 16 (Jaretzky, 1929; Reese, 1950, 1952; Lan & Cheo, 1989) and 2*n* = 24 (Vaarma, 1951; Reese, 1952; Sharma, 1970; Kadu, 1981; Murín, 1986; Pogan & al., 1980).

CAPRIFOLIACEAE

**Lonicera hypoleuca* Decne.

n = 9, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Malana Village, 32°03′45″N, 77°15′38″E, 2650 m, mountain slopes, *Himshikha 30920* (PUN 58655) [Fig. 10F].

CUCURBITACEAE

**Herpetospermum pedunculosum* (Ser.) C.B.Clarke

n = 10, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Sheela Village, 32°00′23″N, 77°22′44″E, 2650 m, climber growing along river banks and moist slopes, *Himshikha 30129* (PUN 58344) [Fig. 10G].

FABACEAE

***Lespedeza juncea* var. *variegata* (Comb.) Ali.

n = 11, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Jari, 31°59′44″N, 77°14′04″E, 1624 m, mountain slopes and in thickets, *Himshikha 30919* (PUN 58654) [Fig. 10M].

Previous reports for this species are 2*n* = 18 (Cooper, 1936; Pierce, 1939) and 2*n* = 20 (Pierce, 1939; Sokolovskaya & al., 1989; Kumar & Singhal, 2011). This report adds the new diploid chromosome number.

**Trigonella pubescens* Edgew. ex Baker

n = 8, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Malana Village, 32°03′45″N, 77°15′38″E, 2650 m, moist rocky slopes, *Himshikha 30918* (PUN 58653) [Fig. 10N].

GENTIANACEAE

▼*Gentiana argentea* Royle ex D.Don

n = 9, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Kasol, 32°00′38″N, 77°19′00″E, 2614 m, open slopes, *Himshikha 25735* (PUN 56087) [Fig. 10I].

Previously, the species showed a chromosome number of 2*n* = 20 (Mehra & Vasudevan, 1972; Bala & al., 2015) from other regions of Himalayas in India.

GERANIACEAE

***Geranium lucidum* L.

n = 14, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Kasol, 32°00′38″N, 77°19′00″E, 2614 m, found growing among rocks, *Himshikha 30917* (PUN 58680) [Fig. 10J].

Earlier chromosome reports of 2*n* = 20 (Warburg, 1938; Uhríková & Májovský, 1980), 2*n* = 40 (Strid & Franzén, 1981; Luque & Diaz Lifante, 1991; Hollingsworth & al., 1992; Dempsey & al., 1994; Albers & Pröbsting, 1998; Petrova & Stanimirova, 2003), 2*n* = 40, 42 (Galland, 1988) and 2*n* = 40, 60 (Aryavand, 1983) are from outside of India and varies with this report.

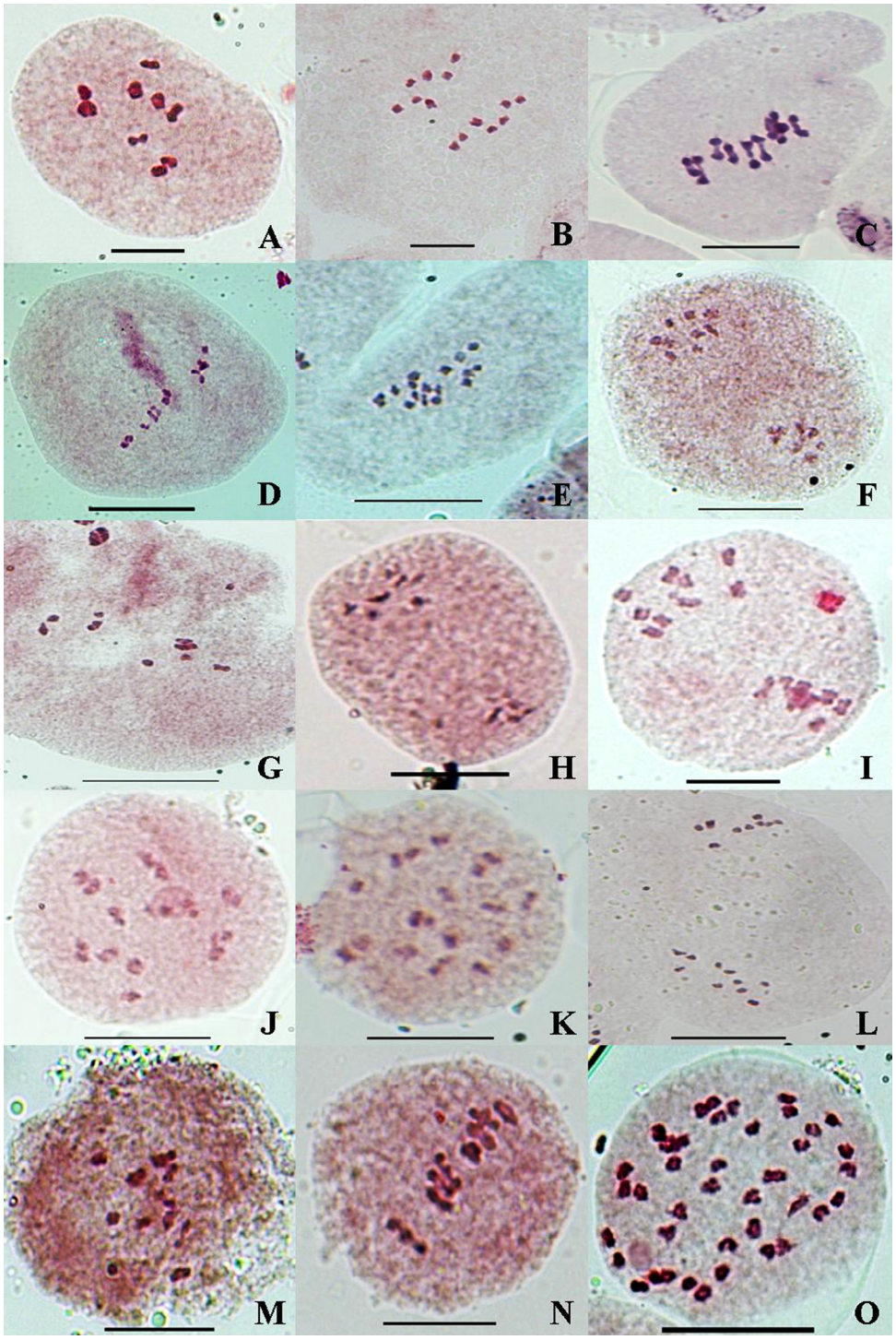

Fig. 10. A, *Impatiens micranthemum*, PMC showing 9 bivalents at metaphase I, *n* = 9 (PUN 57309); **B,** *Impatiens spirifer*, PMC showing equal distribution of 7 : 7 chromosomes at anaphase I, *n* = 7 (PUN 58643); **C,** *Impatiens thomsonii*, PMC showing 9 bivalents at metaphase I, *n* = 9 (PUN 58381); **D,** *Incarvillea arguta*, PMC showing 11 bivalents at metaphase I, *n* = 11 (PUN 58348); **E,** *Lepidium sativum*, PMC showing 16 bivalents at metaphase I, *n* = 16 (PUN 58658); **F,** *Lonicera hypoleuca*, PMC showing equal distribution of 9 : 9 chromosomes at anaphase I, *n* = 9 (PUN 58655); **G,** *Herpetospermum pedunculosum*, PMC showing 10 bivalents at metaphase I, *n* = 10 (PUN 58344); **H,** *Corydalis thyrsiflora*, PMC showing equal distribution of 7 : 7 chromosomes at anaphase I, *n* = 7 (PUN 57155); **I,** *Gentiana argentea*, PMC showing equal distribution of 9 : 9 chromosomes at metaphase II, *n* = 9 (PUN 56087); **J,** *Geranium lucidum*, PMC showing 14 bivalents at diakinesis, *n* = 14 (PUN 58680); **K,** *Nepeta floccosa*, PMC showing 18 bivalents at metaphase I, *n* = 18 (PUN 58664); **L,** *Roylea cinerea*, PMC showing equal distribution of 10 : 10 chromosomes at anaphase I, *n* = 10 (PUN 58394); **M,** *Lespedeza juncea*, PMC showing 11 bivalents at metaphase I, *n* = 11 (PUN 58654); **N,** *Trigonella pubescens*, PMC showing 8 bivalents at metaphase I, *n* = 8 (PUN 58653); **O,** *Fallopia pterocarpa*, PMC showing 40 bivalents at diakinesis, *n* = 40 (PUN 58367);

LAMIACEAE

***Nepeta floccosa* Benth.

n = 18, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Manikaran Sahib, 32°01′35″N, 77°20′58″E, 2090 m, clump forming herb found on stony slopes, *Himshikha 30929* (PUN 58664) [Fig. 10K].

Earlier, the chromosome number of this species has been counted from Pakistan (Khatoon & Ali, 1993) and was at diploid level (2*n* = 18). This report is the new record for an Indian accession and also adds a new tetraploid cytotype (corresponding to 2*n* = 36).

***Roylea cinerea* (D.Don) Baill.

n = 10, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Sarsari, 31°57′05″N, 77°18′10″E, 1700 m, shrubberies and along roadsides, *Himshikha 30191* (PUN 58394) [Fig. 10L].

Previously, the species is known to have a chromosome number of 2*n* = 34 (Mehra & Gill, 1968; Gill, 1970; Saggoo, 1983; Saggoo & Bir, 1983).

PAPAVERACEAE

▼*Corydalis thyrsiflora* Prain

n = 7, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Sheela Village, 32°00′23″N, 77°22′44″E, 2650 m, among boulders, moist places and along streams, *Himshikha 25436* (PUN 57155) [Fig. 10H].

Previously, the species is known to have a chromosome number of *n* = 8 reported by Kumar & Singhal (2011, 2012) from Lahaul-Spiti and Rani & al. (2013) from Kangra District, Himachal Pradesin India.

POLYGONACEAE

***Fagopyrum dibotrys* (D.Don) H.Hara

n = 8, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Barshani, 32°00′03″N, 77°26′18″E, 2150 m, moist shady slopes and forests, *Himshikha 30927* (PUN 58662) [Fig. 11A].

Previously, the same diploid chromosome count of 2*n* = 16 has been reported from outside of India (Jaretzky, 1928; Doida, 1962). The Indian populations of the species are known to have triploid, 2*n* = 24 (Chatterjee & al., 1989) and tetraploid, 2*n* = 32 (Sharma & Chatterjee, 1960) cytotypes.

**Fallopia pterocarpa* (Wall. ex Meisn.) Holub

n = 40, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Jari, 31°59′44″N, 77°14′04″E, 1624 m, climber on rocks, *Himshikha 30164* (PUN 58367) [Fig. 10O].

This report with *n* = 40 (8*x*) is the first chromosome count for the genus *Fallopia* from India.

***Rumex nepalensis* Spreng.

n = 40, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Manikaran Sahib, 32°01′35″N, 77°20′58″E, 2090 m, dry slopes, *Himshikha 25445* (PUN 56057) [Fig. 11B].

Previously, this species is known to have chromosome numbers of 2*n* = 54 (Sugiura, 1936a, b) and 2*n* = 120 (Mehra & Dhawan, 1966; Löve, 1967; Degraeve, 1975; Himi & al., 1999; Farooq, 2013).

PRIMULACEAE

**Androsace lanuginosa* Wall.

n = 10, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Malana Village, 32°03′45″N, 77°15′38″E, 2650 m, along water banks, *Himshikha 30933* (PUN 58668) [Fig. 11C].

RANUNCULACEAE

**Delphinium pyramidale* Royle

n = 8, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Malana Village, 32°03′45″N, 77°15′38″E, 2650 m, open slopes and in forests, *Himshikha 30928* (PUN 58663) [Fig. 11D].

ROSACEAE

***Potentilla desertorum* Bunge

n = 14, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Rashol, 32°01′49″N, 77°17′26″E, 2700 m, moist slopes and in forests, *Himshikha 30926* (PUN 58661) [Fig. 11E].

Previously, Rani & al. (2013) recorded a diploid cytotype with 2*n* = 14 from India. The studied accession from Valley is at tetraploid level (corresponding to 2*n* = 28). The tetraploid cytotype has been reported earlier from outside of India (Měsíček & Soják, 1969; Guinochet & Lefranc, 1981).

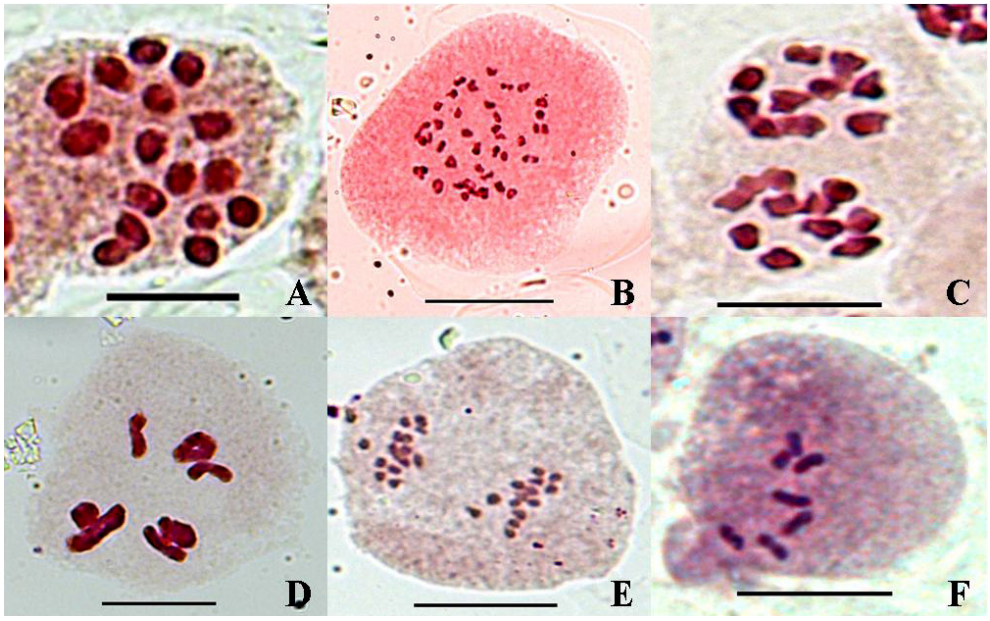

Fig. 11. A, *Fagopyrum dibotrys*, PMC showing equal distribution of 8 : 8 chromosomes at anaphase I, *n* = 8 (PUN 58662); **B,** *Rumex nepalensis*, PMC showing 40 bivalents at diakinesis, *n* = 40 (PUN 56057); **C,** *Androsace lanuginosa*, PMC showing equal distribution of 10 : 10 chromosomes at anaphase I, *n* = 10 (PUN 58668); **D,** *Delphinium pyramidale*, PMC showing 8 bivalents at metaphase I, *n* = 8 (PUN 58663); **E,** *Potentilla desertorum*, PMC showing equal distribution of 14 : 14 chromosomes at anaphase I, *n* = 14 (PUN 58661); **F,** *Potentilla leuconota*, PMC showing 7 bivalents at metaphase I, *n* = 7 (PUN 58357). — Scale bars = 10 µm.

* *Potentilla leuconota* D.Don

n = 7, CHN. India, Himachal Pradesh, Kullu, Parvati Valley, Braagha, 31°59′49″N, 77°22′32″E, 2600 m, forest meadows on mountain slopes and stream banks, *Himshikha 30l44* (PUN 58357) [Fig. 1l E].

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Chromosome numbers counted and DNA ploidy level ascertained by A. Krahulcová, plants determined by F. Krahulec. The nomenclature follows Bräutigam & Greuter (2007–2009) and Bräutigam (2017). All plants sampled as mature individuals in the field appeared parthenogenetic, because they set viable seed when cultivated under greenhouse conditions preventing access of pollinators. Species of the genus *Pilosella* Hill., classified formerly to genus *Hieracium* L. s.l., were introduced to New Zealand from Europe (e.g., Jenkins & Jong, 1997; Morgan-Richards & al., 2004).

FCM

DAPI (4',6-diamidino-2-phenylindole). The relative DNA genome sizes were estimated using fresh leaf tissue of plants sampled in the field and cultivated in greenhouse in the Experimental garden of the School of Biological Sciences, University of Canterbury, Christchurch, New Zealand. The leaf samples of *Bellis perennis* L., 2C DNA = 3.96 pg (Leong-Škorničková & al., 2007), were used as an internal reference standard, following the procedure well-tried for *Pilosella* plants (Trávníček & al., 2011). Considering the interspecific variation in the monoploid genome size in *Pilosella* (Morgan-Richards & al., 2004; Suda & al., 2007), the ratio of the G_0/G_1 peak positions was recorded for those reference *Pilosella* plants that had known chromosome number and represented each of respective species and cytotypes. Analysing the DNA ploidy levels of plants of unknown chromosome number, the ratio of their G_0/G_1 peak positions was always compared with that reference ratio for the respective taxon. For each measurement, the coefficients of variation (CV) of the standard and the simultaneously analysed sample were calculated. The CVs of the G_0/G_1 peak of all samples analysed did not exceed the 3% threshold. The data on DNA ploidy level were obtained using the Partec II cytometer and the Flomax software (Partec, Münster, Germany).

CHROMOSOME COUNTING

The root tip meristems stained by lacto-propionic orcein were used for mitotic chromosome counts (Krahulcová & Krahulec, 1999). If not otherwise stated, the chromosomes were counted in cultivated mature plants sourced from the field, and the herbarium specimens correspond to respective plants analysed. If the chromosomes were counted in root tips of germinating seeds that had originated from the field, their maternal plants were not available and the analysed progeny individuals were destroyed during the karyological procedure. Therefore, a half-sibs progeny were recovered from remaining seeds. These cultivated progeny plants that represented the progeny arrays of individual maternal plants, were used for herbarium specimens.

● First chromosome count for the species.
▼ First chromosome count/DNA ploidy level for a given country.

ASTERACEAE

Pilosella bauhini (Schult.) Arv.-Touv.

▼$2n = 5x = 45$, CHN. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12713, 12714, 12715, 12716, 12717, 12718, 12719); New Zealand, South Island, Canterbury region, Arthurs Pass, 790 m, 42°55′29″S, 171°33′26″E, 28 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12735).

▼$2n \sim 5x \sim 45$, FCM. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12733).

Pilosella caespitosa (Dumort.) P.D.Sell & C.West

$2n = 4x = 36$, CHN. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12726); New Zealand, South Island, Canterbury region, Arthurs Pass, 790 m, 42°55′29″S, 171°33′26″E, 28 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12727, 12728).

$2n \sim 4x \sim 36$, FCM. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12729, 12730, 12731).

Pilosella officinarum Vaill.

$2n = 4x = 36$, CHN in 63 germinating seeds; $2n = 35$, aneuploid CHN in three germinating seeds; $2n = 37$, aneuploid CHN in

two germinating seeds; 2*n* = 42, aneuploid CHN in one germinating seed. All seeds sourced from altogether four maternal plants. New Zealand, South Island, Canterbury region, area of the right shore of upper Rakaia river, ca. 430 m, 43°18′22″S, 171°21′07″E, 25 Jan 2000, *G. Houliston s.n.* (PRA 12683, 12684, 12685, 12686, 12687, 12688, 12689, 12690, 12691, 12692, 12693, 12694, 12695, 12696, 12697).

2*n* = 5*x* = 45, CHN. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12703); New Zealand, South Island, Canterbury region, Arthurs Pass, 790 m, 42°55′29″S, 171°33′26″E, 28 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12709).

2*n* ~ 5*x* ~ 45, FCM. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 31 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12701, 12710).

2*n* = 7*x* = 63, CHN. New Zealand, South Island, Canterbury region, Porters Pass, 940 m, 43°17′48″S, 171°44′31″E, 31 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12698, 12699, 12700).

Pilosella piloselloides subsp. *praealta* (Gochnat) S.Bräut. & Greuter

2*n* = 4*x* = 36, CHN. New Zealand, South Island, Canterbury region, Cave Stream beside the West Coast Road, 700 m, 43°11′41″S, 171°44′21″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12732); New Zealand, South Island, Canterbury region, Arthurs Pass, 790 m, 42°55′29″S, 171°33′26″E, 28 Mar 2004, *A. Krahulcová & F. Krahulec s.n.* (PRA 12722, 12723).

2*n* ~ 4*x* ~ 36, FCM. New Zealand, South Island, Canterbury region, Cave Stream beside the West Coast Road, 700 m, 43°11′41″S, 171°44′21″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12720, 12721, 12724, 12725).

Pilosella stoloniflora (Waldst. & Kit.) F.W.Schultz & Sch.Bip.

2*n* = 6*x* = 54, CHN. New Zealand, South Island, Canterbury region, Cass basin, Dracophyllum flat lower site ca 13 km S of Cass village, 790 m, 43°09′00″S, 171°44′03″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12702, 12708).

● 2*n* = 57, aneuploid CHN. New Zealand, South Island, Canterbury region, Cass basin, Dracophyllum flat lower site ca. 13 km S of Cass village, 790 m, 43°09′00″S, 171°44′03″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12711, 12712).

2*n* ~ 6*x* ~ 54, FCM. New Zealand, South Island, Canterbury region, Cass basin, Dracophyllum flat lower site ca. 13 km S of Cass village, 790 m, 43°09′00″S, 171°44′03″E, 4 Mar 2004, *A. Krahulcová, F. Krahulec & G. Houliston s.n.* (PRA 12704, 12705, 12706, 12707).

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The cytological investigations have been carried out in metaphase cells from root tips according to the procedure described by Lomonosova & al. (2008). Chromosome numbers in literature were checked using *IPCN* (Goldblatt & Johnson, 1979–) and *CCDB* (Rice & al., 2015). Nomenclature corresponds to recent Floras or checklists. Regarding *Salsola*, for convenience we follow-up the traditional wide circumscription of the genus, except for the well-founded separation of *Caroxylon*.

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* First chromosome number for the species or subspecies.
** First chromosome count from the U.S.A., Morocco or South Korea.
▼ First chromosome cytotype for the species.

AMARANTHACEAE

***Atriplex glauca* Pall. ex Roem. & Schult.

2*n* = 18, CHN. Morocco, 70 km NNW of Agadir, Tamri, dunes, 30°41′N, 09°50′W, 8 Nov 2013, *H. Freitag 40.012a* (KAS).

***Atriplex halimus* var. *schweinfurthii* Boiss.

2*n* = 36, CHN. Morocco, 54 km N of Agadir, 30°36′N, 09°46′W, 6 Nov 2013, *H. Freitag 40.003* (KAS).

***Bassia scoparia* (L.) A.J.Scott

2*n* = 18, CHN. South Korea, W coast Gyeonggi Province, Incheon, 37°29′N, 126°38′E, 3 Oct 2008, *H. Freitag 35.110* (KAS, NS).

***Caroxylon vermiculatum* (L.) Akhani & Roalson

2*n* = 54, CHN. Morocco, Agadir, N outskirts, 30°25′N, 09°35′W, 6 Nov 2013, *H. Freitag 40.000* (KAS); Morocco, 25 km N of Sidi Ifni, 29°22′N, 10°11′W, 9 Nov 2013, *H. Freitag 40.020* (KAS).

***Hammada articulata* (Moq.) O.Bolos & Vigo

2*n* = 18, CHN. Morocco, ca. 20 km N of Tiznit, 29°43′N, 09°43′W, 8 Nov 2013, *H. Freitag 40.018* (KAS).

***Noaea mucronata* (Forssk.) Asch. & Schweinf.

2*n* = 36, CHN. Cyprus, Paphos, Tombs of the Kings, 34°46′N, 32°27′E, 15 Oct 2012, *E. Voznesenskaya s.n.* (LE).

**Salsola deschaseauxiana* Litard. & Maire

2*n* = 54, CHN. Morocco, 22 km NNW of Agadir, near Tamrakht, 31°10′N, 07°17′W, 6 Nov 2013, *H. Freitag 40.001* (KAS).

**Salsola gymnomaschala* Maire

2*n* = 36, CHN. Morocco, Oued El-Quaar, ca. 68 km SSE El Ouatia, 31°38′N, 08°49′W, 11 Nov 2013, *H. Freitag 40.039* (KAS).

***Salsola komarovii* Iljin

2*n* = 36, CHN. South Korea, Jeju Island, S coast, beside Pyoseon beach, 33°14′N, 126°33′E, 1 Oct 2008, *H. Freitag 35.103* (KAS, NS).

***Salsola oppositifolia* Desf.

2*n* = 72, CHN. Morocco, 22 km NNW of Agadir, 30°25′N, 09°35′W, 6 Nov 2013, *H. Freitag 40.002* (KAS).

***Salsola stocksii* Boiss.

2*n* = 18, CHN. Pakistan, Baluchistan Prov., Haro Rge. SE Bela lowlands, 19 Sep 1986, *H. Freitag 18.231* (KAS)

**Salsola verticillata* Schousb.

2*n* = 36, CHN. Morocco, Essaouira, Isle de Mogador, 31°29′N, 09°47′W, 7 Nov 2013, *H. Freitag 40.007* (KAS).

Suaeda calceoliformis (Hook.) Moq.

2*n* = 54, CHN. U.S.A., Utah, Box Elder County, 4 km W of Brigham City at Highway 83 to Corinne, 41°31′N, 112°03′W, 30 Sep 2010, *H. Freitag US 24* (KAS); U.S.A., Utah, Box Elder County, ca. 12 km WNW of Corinne at Highway 83, 41°34′N, 112°13′W, 1285 m, 30 Sep 2010, *H. Freitag US 26* (KAS, NS); U.S.A., Nevada, White Pine County, near Ruby lake, ca. 20 km S of Wells, 1857 m, 40°05′N, 115°30′W, *H. Freitag US 30a* (KAS); U.S.A., Nevada, White Pine County, Newark lake, ca. 40 km NNE Eureka, 1773 m, 40°05′N, 115°30′W, 2 Oct 2010, *H. Freitag US 30b* (KAS, NS); U.S.A., Nevada, Washoe County, NW outskirts of Reno, SE edge of Silver Lake near Moya Blv, near airfield, 1511 m, 39°38′N, 119°54′W, 1511 m, 4 Oct 2010, *H. Freitag US 38b* (KAS); U.S.A., California, Los Angeles County, Long Beach Colorado Lagoon, E shore, 33°41′N, 118°02′W, 9 Oct 2010, *H. Freitag US 45* (KAS); U.S.A., California, San Bernardino County, San Bernardino Mts., Baldwin Lake, NE part of the dried off lake bottom, 2043 m, 34°17′N, 116°48′W, 14 Oct 2010, *H. Freitag US 48a* (KAS).

**Suaeda esteroa* Ferren & S.A.Whitmore

2*n* = 54, CHN. U.S.A., California, Orange County, Upper Newport Bay, Ecological Reserve behind Back Bay Science Center, close to Jamboree Rd, 33°37′N, 117°53′W, 9 Oct 2010, *H. Freitag US 44* (KAS).

Suaeda iranshahrii Akhani & H.Freitag

2*n* = 18, CNH. Saudi Arabia, Eastern prov., Abu Ali island near Jubayl, 27°00′N, 49°40′E, Sep 1992, *B. Boer 18* (KAS).

***Suaeda japonica* Makino

2*n* = 18, CHN. Japan, Kyusyu District, Saga Prefecture, Saga-gun, Higashiyoka-cho, 33°17′N, 130°10′E, 12 Dec 2008, *S. Yahara S081212-1* (KAS, NS); South Korea, W coast, Jeollanam Province, Muan area, Jido, salt farm just W of village, ditch, 34°59′N, 126°28′E, 9 Oct 2008, *H. Freitag 35.136* (KAS, NS).

**Suaeda liaotungensis* Kitag.

2*n* = 18, CHN. South Korea, W coast, Gyeonggi Province, Incheon, abandoned salt farm S of airport, 37°29′N, 126°38′E, 3 Oct 2008, *H. Freitag 35.106* (KAS, NS).

Suaeda linearis (Elliott) Moq.

2*n* = 54, CHN. U.S.A., New Jersey, Monmouth County, Sandy Hook, S part, W of Visitor Center, ca. 20 m SW of viewing platform at end of boardwalk, 40°25′N, 73°59′W, 20 Sep 2010, *H. Freitag US 6* (KAS); U.S.A., Texas, Nueces County, Mustang Island opposite Corpus Christi, lagoon side, 27°40′N, 97°10′W, 26 Sep 2010, *H. Freitag US 16* (KAS); U.S.A., Texas, Kleberg County, Riviera Beach, ca. 13 km E of Riviera, border of lagoon, 27°17′N, 97°39′W, 26 Sep 2010, *H. Freitag US 20* (KAS); Texas, Kenedy County, salty depression (fenced) just E of Highway 77, ca. 18 km S of (Riviera) River, 27°05′N, 97°47′W, 26 Sep 2010, *H. Freitag US 21* (KAS); U.S.A., Texas, Cameron County, northern side of Highway 100, ca. 14 km E of Los Fresnos, 26°03′N, 97°23′W, 27 Sep 2010, *H. Freitag US 23* (KAS).

▼2*n* = 90, CHN. U.S.A., Maine, York County, Wells, Miles Street, S bank of dam opposite the restaurant, between boulders, 43°18′N, 70°34′W, 21 Sep 2010, *H. Freitag US 8* (KAS).

Though being similar to *S. linearis*, the sample *H. Freitag US 8* is an allopolyploid of *S. linearis* × *S. maritima* and probably represents a new species as was proposed by Brandt & al. (2015). The only original data on chromosome number for *Suaeda linearis* (2*n* = 54) were published by Lorz (1937) without indication of any locality.

***Suaeda maritima* subsp. *asiatica* Hara

2*n* = 18, CHN. South Korea, Jeju Island, S coast, ca. 500 m W Jeju Folk Village, 33°14′N, 126°33′E, 1 Oct 2008, *H. Freitag 35.100* (KAS, NS); South Korea, Jeju Island, N coast, just E of Gimnyeong Beach, sandy inlets in lava flow, 33°33′N, 126°48′E, 17 Oct 2008, *H. Freitag 35.139* (KAS, NS); Japan, Tokushima Prefecture, Shikoku District, Tokushima-shi, Ronden-cho, Katuurahamabashi, 34°04′N, 134°33′E, 19 Oct 2008, *H. Ikeda & O. Yano T081019-1* (KAS, NS); Japan, Tyugoku District, Okayama Prefecture, Asaguchi-gun, Yorishima-cho, Yorishimakantakuchi, 34°51′N, 133°55′E, 19 Oct 2008, *H. Ikeda & O. Yano O081019-2* (KAS, NS); Japan, Fukushima Prefecture, Tohoku Distr., Sohma-shi, Oosu, 37°47′N, 140°55′E, 29 Oct 2008, *T. Kurosawa F081029-1* (KAS, NS), *T. Kurosawa F081029-2* (KAS, NS).

** *Suaeda maritima* (L.) Dumort. subsp. *maritima*

2*n* = 36, CHN. U.S.A., New York, Suffolk County, edge of saltmarshes on W side of Napeagu lagoon SW of Hither Hill and Montauk, 41°00′N, 72°03′W, 19 Sep 2010, *H. Freitag US 4a* (KAS); U.S.A., Maine, York County, Wells, Miles street, besides dam restaurant, 43°18′N, 70°34′W, 21 Sep 2010, *H. Freitag US 11* (KAS); U.S.A., Maine, York County, Wells, lagoon side of holiday village, 43°19′N, 70°33′W, 21 Sep 2010, *H. Freitag US 12* (KAS); U.S.A., New Jersey, Monmouth County, Sandy Hook, S part, W of Visitor Center, 40°25′N, 73°59′W, 14 Dec 2010, *W. Ferren SH 3* (KAS), *W. Ferren SH 10* (KAS), *W. Ferren SH 11* (KAS).

* *Suaeda maritima* subsp. *perennans* Maire

2*n* = 36, CHN. Spain, Canary Islands, Lanzarote NE coast, small bay 1 km SE of Orzola, 21°13′N, 13°27′W, 2 Dec 1995, *H. Freitag 17.265* (KAS).

* *Suaeda monodiana* Maire

2*n* = 18, CHN. Morocco, 16 km S Guelmim, beside road to Tan-Tan, 28°59′N, 10°04′W, 10 Nov 2013, *H. Freitag 40.029a* (KAS).

* *Suaeda occidentalis* (S.Watson) S.Watson

2*n* = 54, CHN. Nevada, Eureca County, ca. 4 km E of Beowawe, along piste crossing the Whorlwind Valley above Sinanca Ranch, 40°35′N, 116°31′W, 3 Oct 2010, *H. Freitag US 33* (KAS, NS); U.S.A., Nevada, Eureca County, ca. 6 km E of Beowawe, S side of piste leading to the Power Plant in Whorldwind Valley, ca. 1430 m, 40°34′N, 116°32′W, 3 Oct 2010, *H. Freitag US 34* (KAS); U.S.A., Nevada, Lander County, ca. 25 km SW of Battle Mountain, Buffalo Valley, SE side of large alkaline flat, 1413 m, 40°24′N, 117°18′W, 3 Oct 2010, *H. Freitag US 36* (KAS).

Suaeda patagonica Speg.

2*n* = 36, CHN. Chile, Antarctica Chilena Province, sector de Laguna Seca, camino a Puerto Natales, 51°44′S, 72°31′W, 25 Febr 2011, *E. Domingüez s.n.*

** *Suaeda rolandii* Basset & Crompton

2*n* = 90, CHN. U.S.A., New Jersey, Monmouth County, Sandy Hook, S part, W of Visitor Center, along trail just N of viewing platform at end of boardwalk, 40°25′N, 73°59′W, 20 Sep 2010, *H. Freitag US 5* (KAS); U.S.A., New Jersey, Monmouth County, Sandy Hook, S part, W of Visitor Center, along channel beside of trail leading N from viewing platform at end of boardwalk, 40°24′N, 73°59′W, 20 Sep 2010, *H. Freitag US 7* (KAS); U.S.A., New Jersey, Monmouth County, Sandy Hook, S part, W of Visitor Center, sandy edge of saltmarshes, 40°25′N, 73°59′W, 14 Dec 2010, *W. Ferren SH 1* (KAS), *W. Ferren SH 4* (KAS), *W. Ferren SH 9* (KAS).

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* First chromosome count for the species.
** New chromosome number (cytotype) for the species.
▼ First chromosome count for an Indian accession.

ARACEAE

** *Arisaema utile* Hook.f. ex Engl.

n = 26, CHN. India, Kashmir, Poonch, Dubjan, 33°46′01.16″N, 74°05′32.89″E, 2600 m, waste places and open dry slopes, 11 Jun 2012, *Nadeem Mubarik NM 30298* (PUN 58298) [Fig. 12A].

In the pollen mother cells of this species, 26 bivalents at diakinesis were found (Fig. 12A). This is the first record of a tetraploid cytotype (based on *x* = 13) for the species. Previous reports reveal diploid cytotype (2*n* = 28) based on *x* = 14 from the eastern part of India by Sharma & Sarkar (1968) and Kumar & Subramaniam (1986).

ASPARAGACEAE

** *Ophiopogon intermedius* D.Don

n = 18+0–2B, CHN. India, Kashmir, Anantnag, Betab valley, 34°03′14.90″N, 75°21′50.00″E, 2500 m, on barren lands, 3 Oct 2010, *Nadeem Mubarik NM 26851* (PUN 58058) [Fig. 12B, C].

This is the first record of the B chromosomes for this species. In the meiosis, *n* = 18 (Fig. 12B) was found, while at anaphase I in pollen mother cells two B chromosomes were visible (Fig. 12C). Earlier, this species was already known to have 2*n* = 36 from India and outside of India (Roy & al., 1988; Wang & al., 1990) and 2*n* = 112 only from outside of India (Dudgeon, 1923).

▼*Polygonatum pubescens* Pursh

n = 20, CHN. India, Kashmir, Pulwama, Shikargah Tral, 33°54′51.45″N, 75°07′58.58″E, 2000 m, in humus rich soils, 28 Apr 2013, *Nadeem Mubarik NM 30362* (PUN 59095) [Fig. 13D].

This record is in accordance with the earlier report of *n* = 20 by Therman (1956) from outside of India. Previously, the species is reported to have also 2*n* = 20 (Gervais, 1981) from outside of India. This diploid chromosome number has been counted at metaphase I in pollen mother cells (Fig. 13D).

COMMELINACEAE

Commelina benghalensis L.

n = 11, CHN. India, Himachal Pradesh, Kangra, Dehra, 31°52′54.32″N, 76°12′52.72″E, 430 m, waste places along roadsides, 16 Aug 2009, *Harpreet Kaur HK 2561*5 (PUN 53569) [Fig. 12D].

Cyanotis cristata (L.) D.Don

n = 12, CHN. India, Himachal Pradesh, Kangra, Dehra, 31°52′54.32″N, 76°12′52.72″E, 430 m, along roadsides, 16 Aug 2009, *Harpreet Kaur HK 24802* (PUN 53518) [Fig. 12E].

CYPERACEAE

***** *Carex muricata* L.

n = 40, CHN. India, Kashmir, Kulgam, Aharbal, 33°38′38.90″N, 74°46′39.34″E, 2500 m, along shady places, 12 May 2010, *Nadeem Mubarik NM 29384* (PUN 58003) [Fig. 12F].

The chromosome number *n* = 40 was revealed at metaphase I in pollen mother cells (Fig. 12F). Earlier reports revealed 2*n* = 50 to 2*n* = 58 mostly from outside India except for a single report of 2*n* = 56 in *C. muricata* subsp. *muricata* from India by Natarajan (1979).

* *Carex nubigena* D.Don ex Tilloch & Taylor

n = 18, CHN. India, Kashmir, Anantnag, Betab valley, 34°03′14.90″N, 75°21′50.00″E, 2500 m, on humus rich and shady slopes, 20 Aug 2011, *Nadeem Mubarik NM 30273* (PUN 58224) [Fig. 12G].

The chromosome number of *n* = 18 has been counted at anaphase I in pollen mother cells (Fig. 12G).

**n* = 20, CHN. India, Kashmir, Anantnag, Sinthen top, 33°34′47.84″N, 75°30′39.34″E, 3800 m, on shady slopes, 10 Jul 2012, *Nadeem Mubarik NM 30285* (PUN 58236) [Fig. 12H].

The chromosome number *n* = 20 was counted in the pollen mother cells of this species at anaphase I (Fig. 12H).

***** *Carex remota* L.

n = 50, CHN. India, Kashmir, Bandipora, Dawar, 34°37′59.39″N, 74°49′54.14″E, 3300 m, shady places, 5 Jul 2011, *Nadeem Mubarik NM 3021*6 (PUN 58133) [Fig. 12I].

The present chromosome number has been counted at metaphase I of meiosis in pollen mother cells (Fig. 12I). Earlier, the species is also known to have 2*n* = 46 (Hoshino & al., 2000), 2*n* = 60 (Luceno, 1992) and 2*n* = 62 (Lövkvist & Hultgård, 1999) from outside of India.

***** *Cyperus bulbosus* Vahl

n = 36, CHN. India, Kashmir, Anantnag, Sangam, 33°49′39.02″N, 75°04′19.44″E, 1700 m, open grassy and shady places, 29 Aug 2010, *Nadeem Mubarik NM 29376* (PUN 57995) [Fig. 12J].

The present meiotic study revealed the pollen mother cells with chromosome number of *n* = 36 at metaphase I (Fig. 1J) which is a new octoploid cytotype for this species. Earlier reports include 2*n* = 80 (Bir & al., 1994), 2*n* = 84 (Bir & al., 1988), 2*n* = 92 (Cheema & Bir, 1995), 2*n* = 100 (Bir & al., 1992) and 2*n* = 118 (Bir & al., 1990) from Punjab plains.

▼Eleocharis congesta* D.Don

n = 10+0–1B, CHN. India, Kashmir, Anantnag, Panjtarni, 34°11′23.71″N, 75°29′55.87″E, 3500 m, near water channels, 1 Jul 2013, *Nadeem Mubarik NM 30353* (PUN 59086) [Fig. 12K].

The present chromosome count agrees with earlier reports by Yano & al. (2004) from Japan. Additionally, the B chromosome is reported for the first time for this species. The chromosome number *n* = 10 along with one B chromosome has been clearly seen at metaphase I in pollen mother cells (Fig. 12K).

▼Eleocharis palustris* (L.) Roem. & Schult.

n = 23+0–2B, CHN. India, Kashmir, Kulgam, Aharbal, 33°38′38.90″N, 74°46′39.34″E, 2500 m, shady or grassy slopes, 12 May 2010, *Nadeem Mubarik NM 26843* (PUN 58053) [Fig. 12L, M].

Chromosome number *n* = 23 was counted in pollen mother cells at metaphase I (Fig. 12L, M), which is a new report from India but in conformity with the previous report by Saunte (1958) from outside of India. Along with normal bivalent formation, presence of B chromosomes (Fig. 12L, M) represents the first record for this species. Earlier, this species is also known to have other cytotypes ranging from 2*n* = 10 to 2*n* = 76 (Mehra & Sachdeva, 1975; Hoshino & al., 2000; Tischler, 1935; Strandhede, 1961; Rath, 1983).

***** *Fimbristylis polytrichoides* (Retz.) R.Br.

n = 45, CHN. India, Kashmir, Anantnag, Sinthen top, 33°34′47.84″N, 75°30′39.34″E, 3600 m, moist and shady places, 25 Jul 2013, *Nadeem Mubarik NM 30360* (PUN 59093) [Fig. 12N].

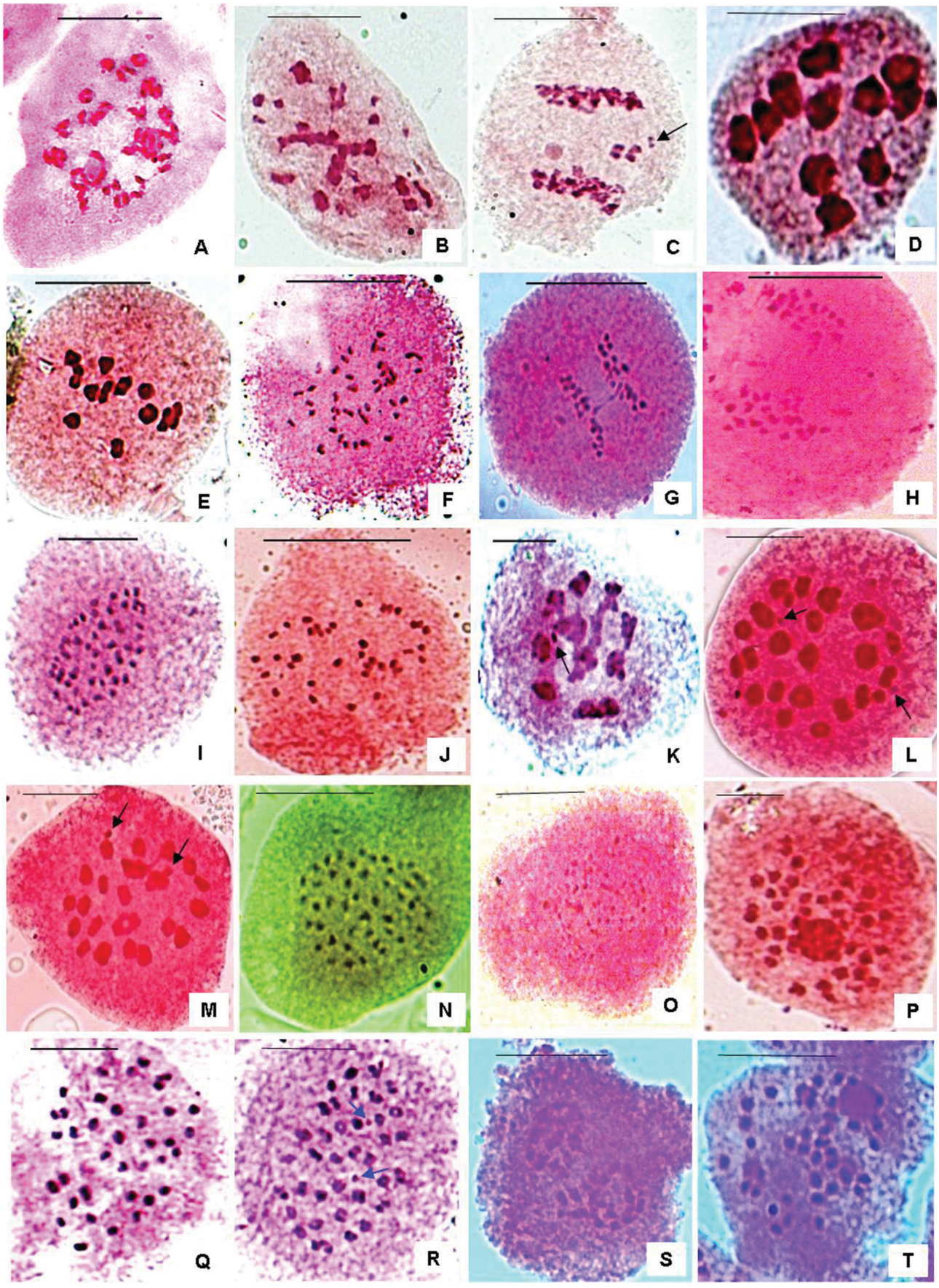
Chromosome number *n* = 45 was counted in pollen mother cells at metaphase I (Fig. 12N). This species is already known to have 2*n* = 10 from south India (Nijalingappa & Tejavathi, 1984) and Punjab plains of north India (Bir & al., 1992; Cheema & Bir, 1997) and 2*n* = 20 from Punjab plains (Cheema & Bir, 1997).

***** *Schoenoplectus lacustris* (L.) Palla

n = 38, CHN. India, Kashmir, Baramulla, Mirgund, 34°08′07.01″N, 74°39′46.25″E, 1600 m, along roadsides, 30 May 2012, *Nadeem Mubarik NM 30240* (PUN 58253) [Fig. 12O].

Study of PMCs in this species clearly revealed 38 bivalents at metaphase I (Fig. 12O). A previous report for this species was from Slovakia, namely 2*n* = 42 (Váchová, 1976).

Fig. 12. A, *Arisaema utile*, meiotic diakinesis, *n* = 26 (PUN 58298); **B,** *Ophiopogon intermedius*, meiotic metaphase I, *n* = 18 (PUN 58058); **C,** *Ophiopogon intermedius*, meiotic anaphase I, *n* = 18+0–2B (PUN 58058) (arrow shows B chromosome); **D,** *Commelina benghalensis*, meiotic metaphase I, *n* = 11 (PUN 53569); **E,** *Cyanotis cristata*, meiotic metaphase I, *n* = 12 (PUN 53518); **F,** *Carex muricata*, meiotic metaphase I, *n* = 40 (PUN 58003); **G,** *Carex nubigena*, meiotic anaphase I, *n* = 18 (PUN 58224); **H,** *Carex nubigena*, meiotic anaphase I, *n* = 20 (PUN 58236); **I,** *Carex remota*, meiotic metaphase I, *n* = 50 (PUN 58133); **J,** *Cyperus bulbosus*, meiotic metaphase I, *n* = 36 (PUN 57995); **K,** *Eleocharis congesta*, meiotic metaphase I, *n* = 10+0–1B (PUN 59086) (arrow shows B chromosome); **L,** *Eleocharis palustris*, meiotic metaphase I, *n* = 23+0–2B (PUN 58053) (arrows show B chromosomes); **M,** *Eleocharis palustris*, meiotic metaphase I, *n* = 23+0–2B (PUN 58053) (arrows show B chromosomes); **N,** *Fimbristylis polytrichoides*, meiotic metaphase I, *n* = 45 (PUN 59093); **O,** *Schoenoplectus lacustris*, meiotic metaphase I, *n* = 38 (PUN 58253); **P,** *Schoenoplectus mucronatus*, meiotic diakinesis, *n* = 37 (PUN 58125); **Q,** *Schoenoplectus smithii*, meiotic metaphase I, *n* = 38 (PUN 58126); **R,** *Schoenoplectus smithii*, meiotic metaphase I, *n* = 38+0–2B (PUN 58126) (arrows show B chromosomes); **S,** *Schoenoplectus triqueter*, meiotic anaphase I, *n* = 21 (PUN 58263); **T,** *Scirpus mucronatus*, meiotic diakinesis, *n* = 40 (PUN 58247). — Scale bars = 10 µm.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** *Schoenoplectus mucronatus* (L.) Palla

n = 37, CHN. India, Kashmir, Kulgam, Pombay, 33°38′45.76″N, 74°56′26.18″E, 1700 m, near water streams, 8 Sep 2010, *Nadeem Mubarik NM 30242* (PUN 58125) [Fig. 12P].

The chromosome number of *n* = 37 has been counted at diakinesis in pollen mother cells of this species (Fig. 12P). Previously, this species is known to have other cytotypes with 2*n* = 42 (Roalson, 2008) and 2*n* = 44 (Bir & al., 1988; Jankun, 1989; Pogan & al., 1990).

* *Schoenoplectus smithii* (A.Gray) Soják.

n = 38+0–2B, CHN. India, Kashmir, Kulgam, Pombay, 33°38′45.76″N, 74°56′26.18, 1700 m, wastelands, 13 Aug 2009, *Nadeem Mubarik NM 30212* (PUN 58126) [Fig. 12Q, R].

▼*Schoenoplectus triqueter* (L.) Palla

n = 21, CHN. India, Kashmir, Anantnag, Betab Valley, 34°03′14.90″N, 75°21′50.00″E, 2300 m, moist shady places, 11 Aug 2012, *Nadeem Mubarik NM 30312* (PUN 58263) [Fig. 12S].

Chromosome number *n* = 21 was counted in pollen mother cells at anaphase I (Fig. 12S), which is in agreement with the single previous report of 2*n* = 42 by Yano & Hoshino (2005) from Japan.

** *Scirpus mucronatus* L.

n = 40, CHN. India, Kashmir, Kulgam, Pombay, 33°38′45.76″N, 74°56′26.18″E, 1700 m, in rice fields, 21 Jul 2012, *Nadeem Mubarik NM 30296* (PUN 58247) [Fig. 12T].

Chromosome number *n* = 40 was counted in pollen mother cells at diakinesis (Fig. 12T). Earlier, the species is reported to have 2*n* = 40 (Briggs & al., 2002) from Australia, 2*n* = 42 (Mehra & Sachdeva, 1975) from the Himalayas and 2*n* = 44 (Tanaka, 1937) from outside of India.

HYDROCHARITACEAE

** *Hydrocharis dubia* (Blume) Backer

n = 12, CHN. India, Kashmir, Srinagar, Nehru park, 34°05′26.65″N, 74°50′44.28″E, 1650 m, Dal Lake and other water bodies, 29 May 2012, *Nadeem Mubarik NM 30259* (PUN 58210) [Fig. 13A].

In the PMCs of this species, 12 bivalents at metaphase I were found (Fig. 13A). This species is previously known to have 2*n* = 16 from the Kashmir Himalayas by Pandita & Mehra (1984), from Japan by Uchiyama (1989), and 2*n* = 22 from eastern part of India by Sharma & Chatterjee (1967).

IRIDACEAE

** *Iris reticulata* M.Bieb.

n = 20, CHN. India, Kashmir, Poonch, Peer gali, 33°38′06.28″N, 74°31′04.53″E, 3500 m, roadsides, 11 Jun 2012, *Nadeem Mubarik NM 30307* (PUN 58258) [Fig. 13B].

Chromosome number *n* = 20 was counted in pollen mother cells at diakinesis (Fig. 13B). Previously, other cytotypes were reported for this species as 2*n* = 16, 18, 20 and 26 from outside of India (Johnson & Brandham, 1997).

LILIACEAE

** *Gagea reticulata* Schult. & Schult.f.

n = 36, CHN. India, Kashmir, Kulgam, Khanpora, 33°43′30.96″N, 75°00′04.45″E, 1700 m, dry places, 21 Mar 2012, *Nadeem Mubarik NM 30272* (PUN 59091) [Fig. 13C]; India, Kashmir, Srinagar, Shankarcharya, 34°05′N, 74°50′E, 2500 m, dry and moist places, 13 Mar 2012, *Nadeem Mubarik NM 30271* (PUN 58222) .

Chromosome number *n* = 36 was counted in pollen mother cells at diakinesis (Fig. 13C). Earlier studies reported for this species also the number 2*n* = 24, from India (Koul & Wakhlu, 1985; Kaur, 2013) and outside of India (Magulaev, 1992).

ORCHIDACEAE

** *Cephalanthera longifolia* (L.) Fritsch

n = 26, CHN. India, Kashmir, Pulwama, Shikargah Tral, 33°54′51.45″N, 75°07′58.58″E, 2000 m, dry and humus rich soils, 28 Apr 2013, *Nadeem Mubarik NM 30363* (PUN 59096) [Fig. 13E].

Meiotic studies of this species revealed *n* = 26 in the pollen mother cells at diakinesis (Fig. 13E). Previously, this species is already known to have 2*n* = 32 and 2*n* = 33 from outside of India (Scrugli, 1978; Schwarzacher, 2000) and 2*n* = 34 from India by Vij & Sood (1986).

POACEAE

** *Agropyron repens* (L.) P.Beauv.

n = 7, CHN. India, Kashmir, Bandipora, Gurez, 34°38′12.12″N, 74°46′25.42″E, 2500 m, high meadows, 31 Aug 2010, *Nadeem Mubarik NM 26858* (PUN 58065) [Fig. 13F].

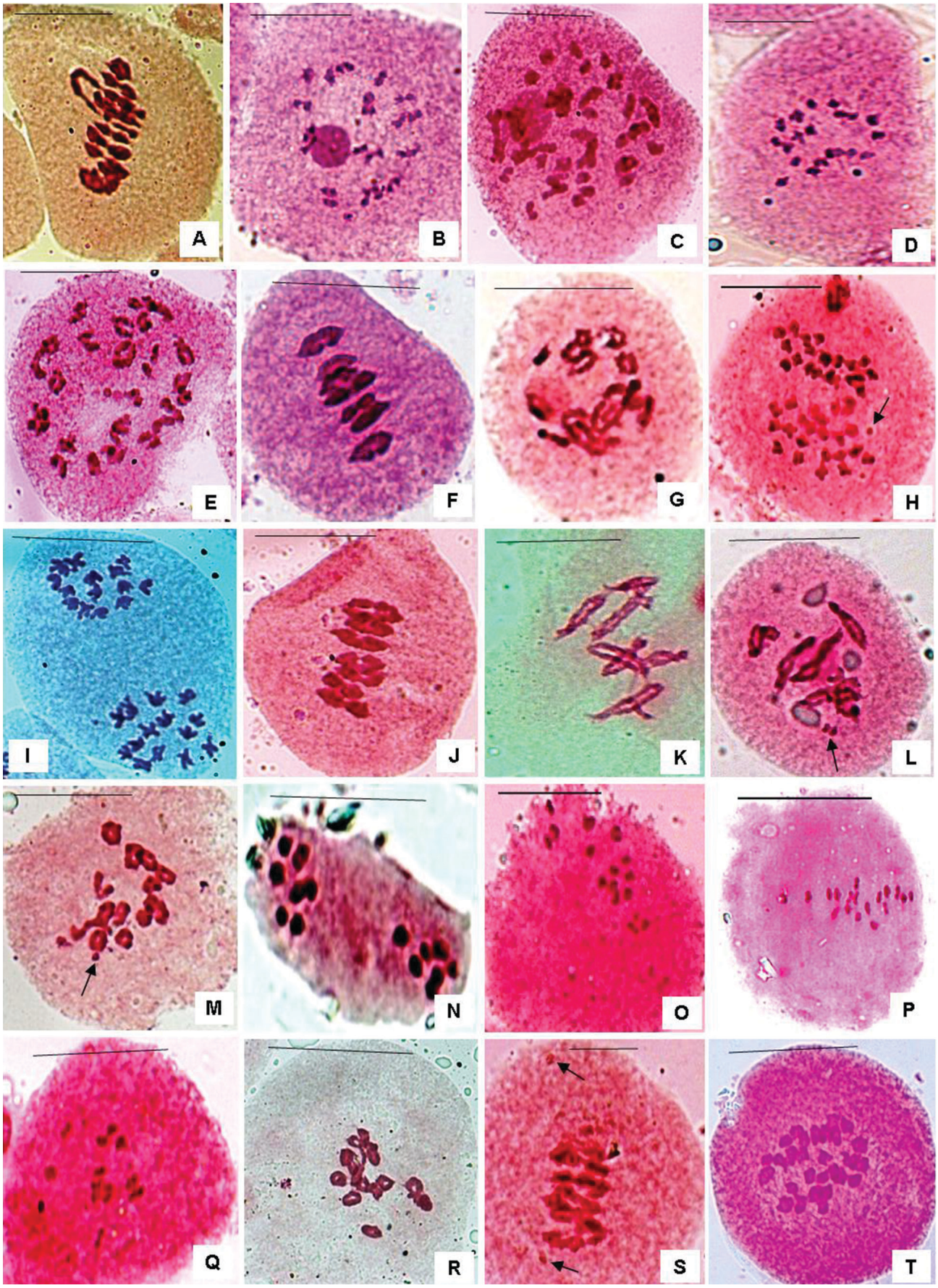
Earlier, this species is reported to have 2*n* = 28 and 2*n* = 56 from outside of India and, hexaploid cytotype with 2*n* = 42 both from India and outside India (Schulz-Schaeffer & Jurasits, 1962; Pogan & al., 1980). The present chromosome number *n* = 7 has been counted at metaphase I in pollen mother cells (Fig. 13F).

▼*Agropyron semicostatum* Nees ex Steud.

n = 14, CHN. India, Kashmir, Baramulla, Baba reshi, 34°04′42.25″N, 74°23′32.88″E, 2700 m, near moist grasslands, 19 Aug 2010, *Nadeem Mubarik NM 26893* (PUN 58099) [Fig. 13G].

The chromosome number of *n* = 14 has been counted at diakinesis in pollen mother cells (Fig. 13G). This tetraploid cytotype is in agreement with the previous reports from outside of India (Bowden, 1965; Sakamoto & Muramatsu, 1966).

Fig. 13. A, *Hydrocharis dubia*, meiotic metaphase I, *n* = 12 (PUN 58210); **B,** *Iris reticulata*, meiotic diakinesis, *n* = 20 (PUN 58258); **C,** *Gagea reticulata*, meiotic diakinesis, *n* = 36 (PUN 59091); **D,** *Polygonatum pubescens*, meiotic metaphase I, *n* = 20 (PUN 59095); **E,** *Cephalanthera longifolia*, meiotic diakinesis, *n* = 26 (PUN 59096); **F,** *Agropyron repens*, meiotic metaphase I, *n* = 7 (PUN 58065); **G,** *Agropyron semicostatum*, meiotic diakinesis, *n* = 14 (PUN 58099); **H,** *Alopecurus nepalensis*, meiotic anaphase I, *n* = 21+0–1B (PUN 55457) (arrow shows B chromosome); **I,** *Avena barbata*, meiotic metaphase II, *n* = 14 (PUN 58227); **J,** *Bromus catharticus*, meiotic metaphase I, *n* = 7 (PUN 58239); **K,** *Bromus hordeaceus*, meiotic diakinesis, *n* = 7 (PUN 58232); **L,** *Bromus hordeaceus*, meiotic diakinesis, *n* = 7+0–2B (PUN 58232) (arrow shows B chromosomes); **M,** *Bromus japonicus*, meiotic metaphase I, *n* = 14+0–1B (PUN 58229) (arrow shows B chromosome); **N,** *Calamagrostis emodensis*, meiotic anaphase I, *n* = 7 (PUN 58203); **O,** *Cynodon dactylon*, meiotic metaphase I, *n* = 15 (PUN 58211); **P,** *Digitaria sanguinalis*, meiotic metaphase I, *n* = 18 (PUN 58257); **Q,** *Festuca rubra*, meiotic metaphase I, *n* = 13 (PUN 59073); **R,** *Helictotrichon sempervirens*, meiotic metaphase I, *n* = 14 (PUN 57964); **S,** *Hordeum glaucum*, meiotic metaphase I, *n* = 7+0–2B (PUN 59070) (arrows show B chromosomes); **T,** *Koeleria argentea*, meiotic anaphase I, *n* = 14 (PUN 58261). — Scale bars = 10 µm.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***Alopecurus nepalensis* Trin. ex Steud.

n = 21+0–1B, CHN. India, Kashmir, Anantnag, Bijbehara, 33°47′12.83″N, 75°05′58.47″E, 1700 m, along sides of water channels, 25 Apr 2011, *Nadeem Mubarik NM 27181* (PUN 55457) [Fig. 13H].

The presence of the B chromosome in this hexaploid cytotype represents the first report of B chromosome for the species. Earlier studies reported other chromosome numbers, as 2*n* = 28 (Kaur & al., 2011b) and 2*n* = 42 (Kaur & al., 2011a) from district Kangra of Himachal Pradesh. The hexaploid chromosome number *n* = 21 with B chromosome has been counted at anaphase I in pollen mother cells (Fig. 13H).

▼*Avena barbata* Link

n = 14, CHN. India, Kashmir, Srinagar, Zabarwan, 34°05′04.75″N, 74°49′59.52″E, 2300 m, dry soils, 29 Jul 2009, *Nadeem Mubarik NM 30276* (PUN 58227) [Fig. 13I].

This count agrees with earlier reports from outside of India (Spies & al., 1996; Diaz Lifante & al., 1992). Earlier, the species is also known to have 2*n* = 14 by Kozuharov & Petrova (1991) from outside of India. The tetraploid chromosome number has been counted at metaphase II in pollen mother cells (Fig. 13I).

***Bromus catharticus* Vahl

n = 7, CHN. India, Kashmir, Kulgam, Khanpora, 33°43′30.96″N, 75°00′04.45″E, 1700 m, shady places, 8 May 2012, *Nadeem Mubarik NM 30288* (PUN 58239) [Fig. 13J].

Study of PMCs clearly showed 14 bivalents at metaphase I (Fig. 13J). For this species, it was previously reported 2*n* = 28 and 2*n* = 42 from India as well as from outside of India (Kishore, 1951; Spies & al., 1999; Kaur & al., 2011b), and 2*n* = 30 from outside of India (Lopez Pacheco & al., 2002).

**▼*Bromus hordeaceus* L.

n = 7+0–2B, CHN. India, Kashmir, Srinagar, Zewan, 34°02′28.10″N, 74°54′44.09″E, 2100 m, shady and moist places, 21 May 2012, *Nadeem Mubarik NM 30281* (PUN 58232) [Fig. 13K, L].

The current report is in agreement with the previous one, namely 2*n* = 14 by Devesa & al. (1990) from outside of India. The report on B-chromosomes is presented here for the first time for this species. Previously, this species is also known to have 2*n* = 42 from outside India (Lövkvist & Hultgård, 1999). The PMCs clearly revealed *n* = 7 at diakinesis (Fig. 13K) with the presence of two B-chromosomes (Fig. 13L).

**▼*Bromus japonicus* Thunb.

n = 14+0–1B, CHN. India, Kashmir, Srinagar, Shankaracharya, 34°04′44.12″N, 74°50′37.41″E, 2500 m, roadsides, 29 May 2012, *Nadeem Mubarik NM 30278* (PUN 58229) [Fig. 13M].

The chromosome count showed *n* = 14+0–1B in the pollen mother cells at metaphase I (Fig. 13M). Earlier, diploid cytotype (2*n* = 14) has been reported both, from India and outside of India (Kozuharov & al., 1981; Koul & Gohil, 1987), whereas tetraploid cytotype (2*n* = 28) is known from Bulgaria (Kozuharov & Petrova, 1991). Additionally, along with the normal bivalent formation, the presence of B-chromosome is reported here for the first time for this species.

**Calamagrostis emodensis* Griseb.

n = 7, CHN. India, Kashmir, Kulgam, Aharbal, 33°38′38.90″N, 74°46′39.34″E, 2500 m, open dry slopes, 18 Aug 2011, *Nadeem Mubarik NM 30252* (PUN 58203) [Fig. 13N].

The chromosomal count of *n* = 7 was done in PMCs at anaphase I (Fig. 13N).

▼*Cynodon dactylon* (L.) Pers.

n = 15, CHN. India, Kashmir, Srinagar, Zewan bala, 34°02′28.10″N, 74°54′44.09″E, 1900 m, open grasslands, 1 Jun 2012, *Nadeem Mubarik NM 30260* (PUN 58211) [Fig. 13O].

The chromosome number *n* = 15 was counted at metaphase I in pollen mother cells (Fig. 13O), which is in agreement with the previous report of Hunter (1934) from outside India. Earlier, higher variation (2*n* = 18, 27, 36, 40 and 54) was reported for this species (Mehra & al., 1968; Gupta & Srivastava, 1970; Mehra & Sharma, 1975; Rao & Mwasumbi, 1981; Koul & Gohil, 1987).

▼*Digitaria sanguinalis* (L.) Scop.

n = 18, CHN. India, Kashmir, Kulgam, Humpathri, 33°38′41.97″N, 75°01′04.91″E, 2600 m, along river banks, 6 Aug 2012, *Nadeem Mubarik NM 30306* (PUN 58257) [Fig. 13P].

The chromosome number of *n* = 18 has been counted at metaphase I in pollen mother cells of this species (Fig. 13P). The present report is in agreement with earlier ones of 2*n* = 36 by Yan & al. (2000) and Probatova & al. (2014) from Russia. Previous reports for this species also include chromosome numbers 2*n* = 54 from Libya (Faruqi & al., 1987), China (Xu & al., 1993), and 2*n* = 72 from India (Koul & Gohil, 1991).

***Festuca rubra* L.

n = 13, CHN. India, Kashmir, Anantnag, Sinthen top, 33°34′47.84″N, 75°30′39.34″E, 3500 m, moist and shady places, 1 Sep 2012, *Nadeem Mubarik NM 30339* (PUN 59073) [Fig. 13Q].

The chromosomal number of *n* = 13 was counted in the pollen mother cells at metaphase I (Fig. 13Q). Earlier, the species is known to have a higher number of variable chromosome numbers ranging from 2*n* = 14 to 2*n* = 70 (Mehra & Sunder, 1969; Tateoka, 1980; Mehra, 1982; Salvesen, 1986; Lövkvist & Hultgård, 1999).

▼*Helictotrichon sempervirens* (Vill.) Pilg.

n = 14, CHN. India, Kashmir, Bandipora, Tragbal, 34°22′10.60″N, 74°33′28.96″E, 2800 m, moist shady places, 1 Sep 2010, *Nadeem Mubarik NM 29345* (PUN 57964) [Fig. 13R].

The present chromosomal count agrees with earlier reports by Sorokin (1993) from outside of India. Earlier, this species is also known to have 2*n* = 42 from outside of India (Roser, 1997). The haploid chromosome number has been counted here at metaphase I in pollen mother cells (Fig. 13R).

**▼*Hordeum glaucum* Steud.

n = 7+0–2B, CHN. India, Kashmir, Srinagar, Zewan, 34°02′28.10″N, 74°54′44.09″E, 1900 m, along river banks, 9 Apr 2012, *Nadeem Mubarik NM 30336* (PUN 59070) [Fig. 13S].

n = 7+2B was counted in the pollen mother cells of this species at metaphase I (Fig. 13S). This diploid cytotype corresponds with the previous reports of 2*n* = 14 by Bowden (1965) from outside of India. The presence of B chromosomes was confirmed here for the first time.

**Koeleria argentea* Griseb.

n = 14, CHN. India, Kashmir, Anantnag, Sinthen top, 33°34′47.84″N, 75°30′39.34″E, 3700 m, on high meadows, 10 Jul 2012, *Nadeem Mubarik NM 30308* (PUN 58261) [Fig. 13T].

n = 14 was counted in pollen mother cells of this species at anaphase I (Fig. 13T).

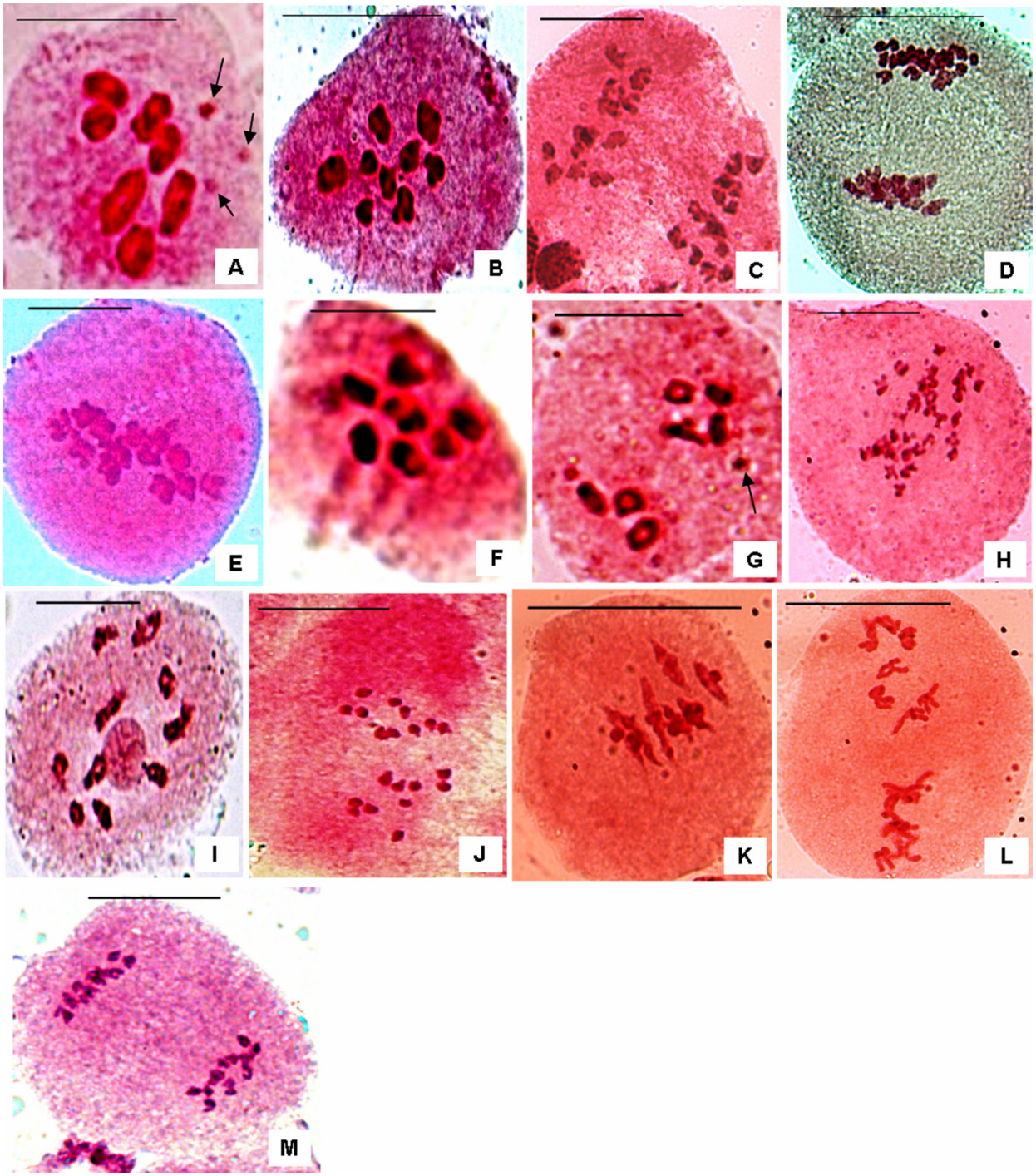

Fig. 14. A, *Koeleria macrantha*, meiotic metaphase I, $n = 7+0–3B$ (PUN 55458) (arrows show B chromosomes); **B,** *Melica scaberrima*, meiotic metaphase I, $n = 9$ (PUN 55264); **C,** *Oryzopsis munroi*, meiotic anaphase I, $n = 14$ (PUN 58139); **D,** *Phacelurus speciosus*, meiotic anaphase I, $n = 20$ (PUN 58069); **E,** *Phleum arenarium*, meiotic metaphase I, $n = 13$ (PUN 58270); **F,** *Poa bulbosa*, meiotic metaphase I, $n = 7$ (PUN 57957); **G,** *Poa sikkimensis*, meiotic metaphase I, $n = 7+0–1B$ (PUN 57956) (arrow shows B chromosome); **H,** *Poa sinaica*, meiotic anaphase I, $n = 14$ (PUN 59087); **I,** *Saccharum rufipilum*, meiotic diakinesis, $n = 10$ (PUN 54761); **J,** *Sporobolus marginatus*, meiotic anaphase I, $n = 10$ (PUN 59059); **K,** *Vulpia myuros*, meiotic metaphase I, $n = 7$ (PUN 58253); **L,** *Vulpia myuros*, meiotic metaphase II, $n = 7$ (PUN 58253); **M,** *Typha latifolia*, meiotic anaphase I, $n = 15$ (PUN 58240). — Scale bars = 10 µm.

***Koeleria macrantha* (Ledeb.) Schult.

n = 7+0–3B, CHN. India, Kashmir, Kulgam, Aharbal, 33°38′38.90″N, 74°46′39.34″E, 2400 m, mountain rocks, 25 Apr 2011, *Nadeem Mubarik, NM 27182* (PUN 55458) [Fig. 14A].

The current record agrees with the previous one for this species from India (Kaur & al., 2011a). Other reports for this species include 2*n* = 28 (Holub & al., 1972; Arnow, 1994) from outside of India and 2*n* = 28+0–6B from Europe (Larsen, 1982). The presence of B chromosomes in the diploid cytotype is reported here for the first time. The chromosome number *n* = 7 along with B chromosomes has been clearly seen at metaphase I in pollen mother cells (Fig. 14A).

Melica scaberrima Hook.f.

n = 9, CHN. India, Himachal Pradesh, Kangra, Chhota Bhangal, 32°02′27.63″N, 76°50′24.70″E, 2000 m, rocky slopes, 1 Sep 2010, *Harpreet Kaur HK 27018* (PUN 55264) [Fig. 14B].

***Oryzopsis munroi* Stapf ex Hook.f.

n = 14, CHN. India, Kashmir, Anantnag, Pishutop, 34°06′53.53″N, 75°24′33.44″E, 3300 m, open grasslands, 16 Mar 2010, *Nadeem Mubarik NM 30226* (PUN 58139) [Fig. 14C].

Meiotic studies of this species revealed *n* = 14 in the pollen mother cells at anaphase I (Fig. 14C). Other reports for this species represent 2*n* = 22 (Mehra & Sunder, 1969) and 2*n* = 24 (Sharma & Sharma, 1979) from north India.

***Phacelurus speciosus* C.E.Hubb.

n = 20, CHN. India, Kashmir, Kulgam, Aharbal, 33°38′38.90″N, 74°46′39.34″E, 2600 m, moist shady places, 12 Aug 2012, *Nadeem Mubarik NM 30314* (PUN 58069) [Fig. 14D]; CHN. India, Kashmir, Anantnag, Aru, 34°05′31.78″N, 75°15′47.59″E, 2800 m, shady places, 1 Jul 2011, *Nadeem Mubarik NM 26846* (PUN 58054).

This tetraploid chromosome number has been counted at anaphase I in pollen mother cells (Fig. 14D). Previous records for this species include 2*n* = 20 from north India (Sharma & Sharma, 1979) and Pakistan (Ahsan & al., 1994), 2*n* = 22 (Mehra & Sunder, 1969), 2*n* = 60 (Mehra & al., 1968), 2*n* = 70 (Kaur & al., 2014) and 2*n* = 80 (Mehra, 1965) from north India.

**▼*Phleum arenarium* L.

n = 13, CHN. India, Kashmir, Srinagar, Zewan bala, 34°02′28.10″N, 74°54′44.09″E, 2300 m, disturbed sites and pastures, 1 Jun 2012, *Nadeem Mubarik NM 30319* (PUN 58270) [Fig. 14E].

Previously 2*n* = 14 was reported from outside of India (Probatova & al., 1991; Hollingsworth & al., 1992). During meiotic studies, 13 bivalents were counted in pollen mother cells at metaphase I (Fig. 14E).

▼*Poa bulbosa* L.

n = 7, CHN. India, Kashmir, Kulgam, Zainapora, 33°46′34.75″N, 75°00′19.71″E, 1700 m, open grasslands, 31 Mar 2010, *Nadeem Mubarik NM 29338* (PUN 57957) [Fig. 14F].

This record is in accordance with earlier reports of 2*n* = 14 by Hubbard (1954) and Skalińska & al. (1957) from outside of India. Previously, considerable variability in the chromosome numbers was reported for this species (2*n* = 14 to 2*n* = 56) (Hubbard, 1954; Nygren, 1957; Strid & Franzen, 1981; Stoeva, 1982; Duckert-Henriod & Favarger, 1987; Lövkvist & Hultgård, 1999). The chromosome number *n* = 7 has been clearly counted at metaphase I in pollen mother cells (Fig. 14F).

***Poa sikkimensis* (Stapf) Bor

n = 7+0–1B, CHN. India, Kashmir, Kulgam, Khanpora, 33°43′30.96″N, 75°00′04.45″E, 1720 m, moist and shady places, 7 Mar 2010, *Nadeem Mubarik NM 26844* (PUN 57956) [Fig. 14G].

At metaphase I 7 bivalents, along with 1B chromosome were revealed (Fig. 14G). This is the first diploid report for this species as earlier reports gave 2*n* = 28 (Mehra & Sharma, 1975) and 2*n* = 42 (Parkash, 1979; Mehra, 1982) from India.

**▼*Poa sinaica* Steud.

n = 14, CHN. India, Kashmir, Anantnag, Panjtarni, 34°11′23.71″N, 75°29′55.87″E, 3500 m, open grasslands, 1 Jul 2013, *Nadeem Mubarik NM 30354* (PUN 59087) [Fig. 14H].

The present chromosome number has been counted at anaphase I in pollen mother cells (Fig. 14H). Previously, a single diploid count was recorded by Moinuddin & al. (1994) from Pakistan.

Saccharum rufipilum Steud.

n = 10, CHN. India, Himachal Pradesh, Kangra, Chhota Bhangal, 32°02′27.63″N, 76°50′24.70″E, 2000 m, near water channels, 24 Jun 2010, *Harpreet Kaur HK 27061* (PUN 54761) [Fig. 14I].

▼*Sporobolus marginatus* Hochst. ex A.Rich.

n = 10, CHN. India, Kashmir, Bandipora, Jalandora Gurez, 34°38′12.12″N, 74°46′25.42″E, 3000 m, in rock crevices, 10 Jul 2014, *Nadeem Mubarik, NM 30325* (PUN 59059) [Fig. 14J].

The present chromosome number count agrees with previous single report by Baquar & Saeed (1969) from Pakistan. Previously, this species is also known to have 2*n* = 18 from north India (Bir & al., 1987), as well as from Pakistan (Baquar & Saeed, 1969) and 2*n* = 36 from north India (Mehra & al., 1968). The chromosome number of *n* = 10 has been counted at anaphase I in pollen mother cells (Fig. 14J).

▼*Vulpia myuros* (L.) C.C.Gmel.

n = 7, CHN. India, Kashmir, Srinagar, Zewan, 34°02′28.10″N, 74°54′44.09″E, 2000 m, along rocky slopes, 8 Aug 2012, *Nadeem Mubarik NM 30303* (PUN 58253) [Fig. 14K, L].

n = 7 was counted at metaphase I and metaphase II in pollen mother cells (Fig. 14K, L), which agrees with the previous reports of 2*n* = 14 from outside of India (Májovský & al., 1974; Spies & al., 1999). Earlier, Kaur & al. (2014) recorded a hexaploid cytotype in addition to one B-chromosome (2*n* = 42+0–1B) from District Kangra of Himachal Pradesh in India.

TYPHACEAE

▼*Typha latifolia* L.

n = 15, CHN. India, Kashmir, Srinagar, Botanical garden, 33°54′56.26″N, 75°02′45.92″E, 2000 m, stagnant water bodies, 29 May 2012, *Nadeem Mubarik NM 30289* (PUN 58240) [Fig. 14M].

The current report is in agreement with the previous ones from outside of India (Gervais & al., 1999; Chepinoga & al., 2012).

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Methods for chromosome counts follow Guerra & Souza (2002).

§ First chromosome count for the genus.
* First chromosome count for the species.
\+ Endemic to Brazilian Cerrado (incl. the *campos rupestres*).
++ Endemic to Brazilian Caatinga.

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RUBIACEAE

Hexasepalum teres (Walter) J.H.Kirkbr.

§*2*n* = 28, CHN. Brazil, Bahia, Mucugê, Cemitério Santa Isabel, 13°00′26″S, 41°23′07″W, 26 Oct 2014, *J.A.M. Carmo & al. 249* (UEC) [Fig. 15A, B].

Psyllocarpus asparagoides Mart. ex Mart. & Zucc.

§*+2*n* = 28, CHN. Brazil, Minas Gerais, Diamantina, Parque Nacional das Sempre Vivas, 17°04′58″S, 43°45′34″W, 13 Jan 2015, *J.A.M. Carmo & A.V.Scatigna 290* (UEC) [Fig. 15C, D].

Psyllocarpus laricoides Mart. ex Mart. & Zucc.

§*+2*n* = 28, CHN. Brazil, Minas Gerais, São Gonçalo do Rio Preto, Parque Estadual do Rio Preto, 18°04′52″S, 43°21′10″W, 11 Jan 2015, *J.A.M. Carmo & A.V.Scatigna 281* (UEC) [Fig. 15E, F].

Staelia domingosii R.M.Salas & E.L.Cabral

§*++2*n* = 28, CHN. Brazil, Bahia, Andaraí, BA 142, areal impactado, 12°49′14″S, 41°19′19″W, 25 Oct 2014, *J.A.M. Carmo & al. 244* (UEC) [Fig. 15G, H].

Rubiaceae comprises more than 13,000 species classified in ca. 620 genera worldwide (Govaerts & al., 2006). Nevertheless, species diversity and biomass are concentrated in the tropics and subtropics (Davis & al., 2009), with almost one half of the species (and about one third of the genera) occurring in the Neotropics, especially in the Amazon Basin, Andean cloud forests, Cerrado (including the campos rupestres), Caatinga, restingas, and the Atlantic forest of Brazil (Delprete & Jardim, 2012). The tribe Spermacoceae Bercht. & J.Presl, represented by ca. 61 genera and 1235 species (Salas & al., 2015), presents the most complex and debated generic delimitation in the Rubiaceae (Groeninckx & al., 2009; Delprete & Jardim, 2012; Salas & al., 2015). Its circumscription was expanded based on molecular data to include not only the Spermacoceae s.str., i.e., the tribe as traditionally delimited (Robbrecht, 1988), but also the tribes Hedyotideae Cham. & Schltdl. ex DC., Manettieae Bremek., Knoxieae Hook.f. and Triainolepideae Bremek. (Bremer & Manen, 2000). The Spermacoceae s.str., or Spermacoce clade (Kårehed & al., 2008; Salas & al., 2015) as we call it in the present work, is almost entirely restricted to the New World, pointing to a South American origin of the clade, as suggested by Dessein (2003), pending further biogeographic studies in order to test this hypothesis. Such clade comprises often-herbaceous plants, characterized by the presence of raphides, fimbriate stipules, uniovulate ovary locules and pluri-aperturate pollen grains (Salas & al., 2015).

The basic chromosome number described for the tribe is $x = 14$ (Kiehn, 2010), although $x = 7$, $x = 8$, $x = 9$ and $x = 11$ have also been reported. The presence of taxa presenting basic numbers higher than $x = 7$ in the Spermacoce clade suggests that $x = 14$ is a result of a disploidy event (Kiehn, 2010). We present the first counts for all species and

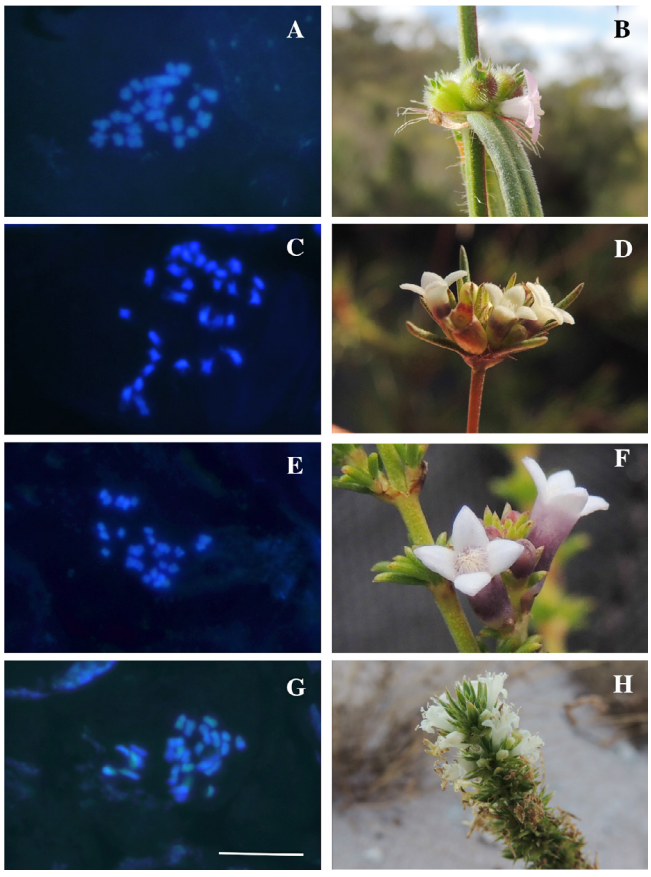

Fig. 15. Mitotic chromosomes ($2n = 28$, DAPI staining) and flowers of Spermacoce clade, Spermacoceae tribe, Rubiaceae. **A & B,** *Hexasepalum teres*; **C & D,** *Psyllocarpus asparagoides*; **E & F,** *Psyllocarpus laricoides*; **G & H**, *Staelia domingosii*. — Scale bar = 10 µm (for A, C, E & G).

genera treated here, all of them belonging to the Spermacoce clade. *Hexasepalum*, *Psyllocarpus* and *Staelia* possess $2n = 28$, a number also found in other genera of the clade, e.g., *Spermacoce* L. and *Richardia* L.

Hexasepalum teres (= *Diodella teres* (Walter) Small) is a widely distributed species, native in the Americas and introduced in the Netherlands, Cape Verde, Gambia, Guinea-Bissau, Senegal, southeast China, Japan, Korea, Madagascar and Australia, growing preferably on sandy soils or well-drained sandy-rocky soil, also being reported as an invasive species in cultivated fields (Cabaña Fader & al., 2016). *Psyllocarpus* is an endemic genus from Brazil. *Psyllocarpus asparagoides* and *P. laricoides* are known from higher elevations of the Espinhaço mountain range, in Minas Gerais and Bahia (Kirkbride, 1979). *Staelia domingosii* is restricted to the Caatinga in the Chapada Diamantina, Bahia, growing on sandy soils along river margins.

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* First chromosome count for the species.
§ New chromosome number for the species.
\+ Endemic to Caatinga vegetation (BFG, 2015).

Chromosome counts were done following the method by Guerra & Souza (2002).

FABACEAE

Mimosa adenophylla var. *mitis* Barneby

*+$2n$ = 52, CHN. Brazil, Bahia, Jeremoabo, Estação Ecológica Raso da Catarina, 09°43′40″S, 38°40′23″W, 8 May 2014, *J.V. Santos & al. 310* (HUNEB) [Fig. 16A].

Mimosa arenosa (Willd.) Poir. var. *arenosa*

$2n$ = 26, CHN. Brazil, Bahia, Jeremoabo, APA Serra Branca, 09°54′59″S, 38°41′49″W, 11 Nov 2013, *R.S. Rodrigues & al. 63* (HUNEB) [Fig. 16B].

Mimosa filipes Mart.

*$2n$ = 26, CHN. Brazil, Bahia, Canudos, Estação Biológica de Canudos, 09°56′26″S, 39°01′49″W, 12 May 2014, *J.V. Santos & al. 329* (HUNEB) [Fig. 16C].

Mimosa lewisii Barneby

§$2n$ = 26, CHN. Brazil, Bahia, Jeremoabo, APA Serra Branca, 09°58′32″S, 38°23′51″W, 12 Dec 2012, *V.A. Oliveira & al. 187* (HUNEB) [Fig. 16D].

Mimosa misera Benth.

$2n$ = 26, CHN. Brazil, Bahia, Canudos, Estação Biológica de Canudos, 09°56′26″S, 39°01′49″W, 13 May 2014, *J.B. Lima & al. 376* (HUNEB) [Fig. 16E].

§$2n$ = 26, 52 (polysomaty), CHN. Brazil, Canudos, Bahia, Estação Biológica de Canudos, 09°56′42″S, 39°00′56″W, 14 May 2014, *J.V. Santos & al. 332* (HUNEB) [Fig. 16F].

Mimosa ophthalmocentra Mart. ex Benth.

+$2n$ = 26, CHN. Brazil, Bahia, Rodelas, near the village Icó, 19 Jul 2013, *R.S. Rodrigues & al. 17* (HUNEB) [Fig. 16G].

Mimosa pigra L.

$2n$ = ca. 52, CHN. Brazil, Bahia, Paulo Afonso, Park Belvedere, 09°23′34″S, 38°12′31″W, 20 Feb 2014, *R.S. Rodrigues & al. 76* (HUNEB) [Fig. 16H].

Mimosa piscatorum Barneby

*2*n* = 26, 52 (polysomaty), CHN. Brasil, Bahia, Jeremoabo, APA Serra Branca, 09°58′50″ S, 38°23′47″ W, 13 Dec 2012, *L.R. Silva & al. 95* (HUNEB) [Fig. 16I, J].

Mimosa quadrivalvis var. *leptocarpa* (DC.) Barneby

2*n* = 52, CHN. Brasil, Bahia, Jeremoabo, Senhor do Bonfim village, 10°03′39″ S, 38°22′15″ W, 15 Jan 2014, *R.S. Rodrigues & al. 69* (HUNEB) [Fig. 16K]; Brasil, Bahia, Paulo Afonso, Near the village São José, 09°37′43″ S, 38°20′30″ W, 7 May 2014, *R.S. Rodrigues & al. 109* (HUNEB).

Mimosa sensitiva L. var. *sensitiva*

2*n* = 26, CHN. Brasil, Bahia, Jeremoabo, APA Serra Branca, 09°58′35″ S, 38°25′39″ W, 22 Oct 2013, *L.R. Silva & al. 214* (HUNEB) [Fig. 16L].

Mimosa tenuiflora (Willd.) Poir.

2*n* = 26, CHN. Brasil, Bahia, Paulo Afonso, Exército Park, 09°23′47″ S, 38°13′31″ W, 21 Feb 2014, *R.S. Rodrigues & al. 77* (HUNEB) [Fig. 16M].

The genus *Mimosa* comprises approximately 540 species distributed mainly in the Neotropics, with Brazil being one of the principal centers of diversity and endemism, with 358 species, of which 265 are endemic (Simon & al., 2011; BFG, 2015). Among the legumes in the exclusively Brazilian Caatinga biome, *Mimosa* is the genus with the greatest diversity (Queiroz, 2009), with 53 species, of which 14 are endemic (BFG, 2015).

Only approximately 28% of the species of the genus have chromosome counts. We present here the first chromosome number records for *M. adenophylla* var. *mitis*, *M. filipes* and *M. piscatorum*. Of the 11 species analyzed, two: *Mimosa adenophylla* var. *mitis* (2*n* = 52) and *M. ophthalmocentra* (2*n* = 26) are endemic to the Caatinga

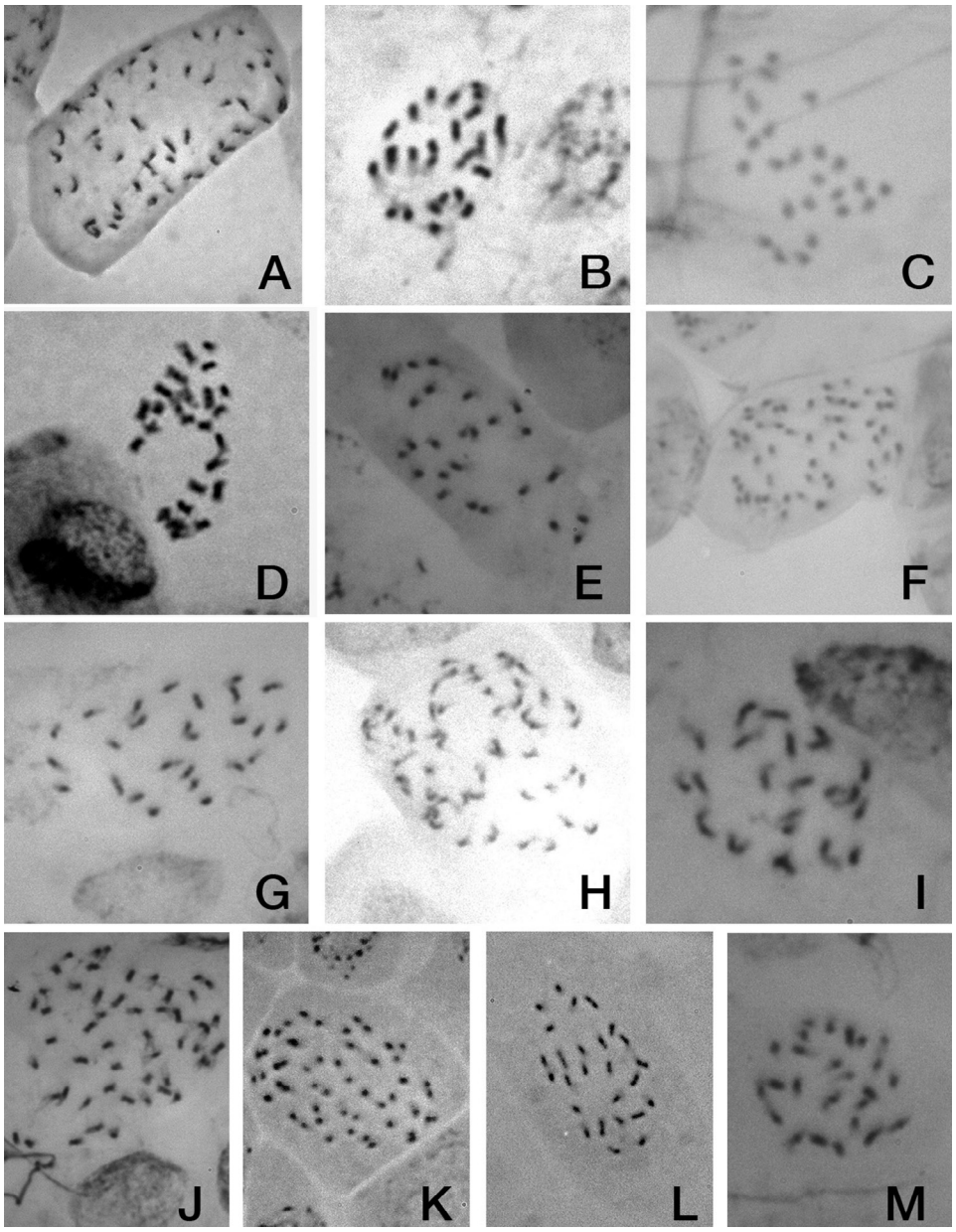

Fig. 16. Chromosome complements in *Mimosa* species. **A,** *M. adenophylla* var. *mitis*, 2*n* = 52; **B,** *M. arenosa* var. *arenosa*, 2*n* = 26; **C,** *M. filipes*, 2*n* = 26; **D,** *M. lewisii*, 2*n* = 26; **E & F,** *M. misera*, 2*n* = 26 and 52 respectively; **G,** *M. ophthalmocentra*, 2*n* = 26; **H,** *M. pigra*, 2*n* = ca. 52; **I & J,** *M. piscatorum*, 2*n* = 26 and 52 respectively; **K,** *M. quadrivalvis* var. *leptocarpa*, 2*n* = 52; **L,** *M. sensitiva* var. *sensitiva*, 2*n* = 26; **M,** *M. tenuiflora*, 2*n* = 26.

vegetation. These chromosome complements were likewise observed in the other species considered in this study, totaling eight species with $2n = 26$ and three with $2n = 52$, suggesting polyploidy events in the evolution of the group. *Mimosa misera* and *M. piscatorum* demonstrated variations in ploidy levels within the same individual, indicating polysomatic events, a phenomenon common among the legumes.

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* First chromosome count for the species.

** New chromosome number (cytotype) for the species.

All materials CHN; vouchers in LD.

POACEAE

Aegilops tauschii Coss.

$2n = 2x = 14$, CHN. Tajikistan, Zeravshan Mts., road to Mogijan, at the gold mine, 1500 m, *B. Salomon & B.-R. Lu 1991.09.03: H10257* (LD).

This finding confirms many previous reports, e.g., Badaeva & al. (2002).

Elymus batalinii (Krasn.) Á.Löve s.l.

$2n = 6x = 42$, CHN. Tajikistan, Gissar Mts., ca. 20 km E of Takfon village, at "underground Jagnob", 2100 m, on rocky screes, *B. Salomon & B.-R. Lu 1991.08.31: H10233* (LD).

This species has previously been reported to be an hexaploid by Jensen (1990) based on accessions from Kazakstan (USDA gene bank accession number PI-314623) and Kyrgyzstan (USDA gene bank accession number PI-531562) and Salomon & Lu (1994) who used an accession from Xinjiang, China (*H7801*, herb. C). *Elymus batalinii* s.l. forms part of a Central Asiatic complex of ca. 10–30 closely related species. This species complex is here treated as belonging to *Elymus* sect. *Hyalolepis* (Nevski) Á.Löve, but is nowadays often separated from *Elymus* and then treated as the genus *Kengyilia* C.Yen & J.L.Yang. Our result conforms with previous investigations and all studied species in the complex have shown to be hexaploids (Chen & Zhu, 2006).

Elymus drobovii (Nevski) Tzvelev

$2n = 6x = 42$, CHN. Tajikistan, Gissar Mts., Choga-obigarm, 1900 m, along road in forest, *B. Salomon & B.-R. Lu 1991.09.10: H10299* (LD).

This species has previously been reported to be an hexaploid by Dewey (1980a, b), who used four accessions from Uzbekistan (USDA gene bank accession numbers PI-314194, PI-314196, PI-314201, PI-314203). Our material seems to deviate morphologically slightly from the Uzbeki materials. However, in the absence of a taxonomic revision of *E. drobovii* we tentatively consider our material to form part of one, although morphologically variable taxon.

***Elymus hispanicus* (Boiss.) Talavera

$2n = 8x = 56$, CHN. Spain, Jaén, Cazorla, 1280 m, *C. Soler 475: H3959* (LD); Spain, Granada, Baza, 1820 m, *C. Soler 485: H3960* (LD).

These results are in contrast to previous reports. This species from southern Spain was first reported to be a tetraploid, $2n = 28$, by Soler & al. (1997), but later it was reported to be a hexaploid, $2n = 42$, by García & al. (2002). However, the plants grown from both accessions in our study are undoubtedly octoploid. Obviously more materials need to be studied in order to solve this discrepancy. Furthermore, it would be particularly interesting to include materials from North Africa too, since several infraspecific taxa have been described from that area and they have, to our knowledge, never been cytologically examined.

Elymus repens (L.) Gould

$2n = 6x = 42$, CHN. Tajikistan, Gissar Mts., E of Ziddi, Hazora, 2500 m, meadows, *B. Salomon & B.-R. Lu 1991.08.29: H10205* (LD).

This finding confirms numerous previous reports, e.g., Salomon & Lu (1994) and Assadi (1995).

Elymus sibiricus L.

$2n = 4x = 28$, CHN. Tajikistan, Gissar Mts., Iskander-kul, SW side of the lake, 2400 m, meadow with scattered trees, *B. Salomon & B.-R. Lu 1991.09.01: H10238* (LD).

This finding confirms previous reports on materials from other areas, e.g., Japan (Tateoka, 1954), China (Lu & Bothmer, 1993), Russia and Kazakhstan (Dewey, 1974), and Alaska (Hodgson, 1956).

**Elymus sikkimensis* (Melderis) Melderis

$2n = 4x = 28$, CHN. Bhutan, Timphu, just N of Timphu, 2370 m, moist alpine meadow, *R. von Bothmer & al. 1999.11.02-3: H10747* (LD).

This seems to be the first chromosome count for *E. sikkimensis*. This species is morphologically similar to *E. dolichatheus* (Keng ex Keng & S.L.Chen) S.L.Chen from China, which is a tetraploid, too (Lu & Bothmer, 1991), and the independent status of *E. sikkimensis* should be verified experimentally.

Elymus tianschanigenus Czerep.

$2n = 4x = 28$, CHN. Tajikistan, Zeravshan Mts., Marguzor, at the 7th lake, E slopes of the valley, 2400–2800 m, *B. Salomon & B.-R. Lu 1991.09.05: H10275* (LD).

This report agrees with the statement by Chen & Zhu (2006).

Elymus transhyrcanus (Nevski) Tzvelev

$2n = 6x = 42$, CHN. Tajikistan, Zeravshan Mts., Marguzor, at the 7th lake, E slopes of the valley, 2400–2800 m, *B. Salomon & B.-R. Lu 1991.09.05: H10270* (LD).

Our report agrees with the previous reports by Dewey (1972) and Assadi (1995).

Eremopyrum bonaepartis (Spreng.) Nevski

2*n* = 4*x* = 28, CHN. Tajikistan, Gissar Mts., SW of Iskander-kul, Kanchoch village, E side of the valley, 2400 m, *B. Salomon & B.-R. Lu 1991.09.01: H10242* (LD).

This report confirms previous ones by, e.g., Sarkar (1958) and Frederiksen (1993).

Hordeum brevisubulatum (Trin.) Link

2*n* = 4*x* = 28, CHN. Tajikistan, Gissar Mts., Jagnob river, 2 km E of Anzob village, 2150 m, *B. Salomon & B.-R. Lu 1991.08.30: H10227* (LD); Tajikistan, Gissar Mts., Iskander-kul, SW side of the lake, 2400 m, *B. Salomon & B.-R. Lu 1991.09.01: H10239* (LD).

2*n* = 6*x* = 42, CHN. Tajikistan, Gissar Mts., Kuhteppa, 2750 m, *B. Salomon & B.-R. Lu 1991.08.29: H10210* (LD).

These findings agree with Bothmer & al. (1995) who reported that both tetraploid and hexaploid cytotypes are found in Tajikistan.

Hordeum bulbosum L.

2*n* = 4*x* = 28, CHN. Tajikistan, Gissar Mts., E of Ziddi, Hazora, 2500 m, meadows, *B. Salomon & B.-R. Lu 1991.08.29: H10206* (LD); Tajikistan, Zeravshan Mts., the road to Farob village, 2000 m, *B. Salomon & B.-R. Lu 1991.09.04: H10264* (LD); Tajikistan, Gissar Mts., Choga-obigarm, 1900 m, *B. Salomon & B.-R. Lu 1991.09.10: H10298* (LD).

These reports support Bothmer & al. (1995) that only the tetraploid cytotype of *Hordeum bulbosum* occurs in Tajikistan.

Hordeum murinum subsp. *glaucum* (Steud.) Tzvelev

2*n* = 2*x* = 14, CHN. Tajikistan, Zeravshan Mts., between Dardar and Veschkan, 1500 m, *B. Salomon & B.-R. Lu 1991.09.03: H10256* (LD); Tajikistan, Zeravshan Mts., the road to Mogijan, at the gold mine, 1500 m, *B. Salomon & B.-R. Lu 1991.09.03: H10260* (LD); Tajikistan, Turkestan Mts., S side, along road M 34, 1900 m, *B. Salomon & B.-R. Lu 1991.09.07: H10289* (LD).

This report confirms many previous ones, e.g., Bothmer & al. (1995).

Leymus alaicus (Korsh.) Tzvelev

2*n* = 4*x* = 28, CHN. Tajikistan, Gissar Mts., SW of Iskander-kul, Kanchoch village, E side of the valley, 2400 m, *B. Salomon & B.-R. Lu 1991.09.01: H10243* (LD); Tajikistan, Zeravshan Mts., Marguzor, at the 7th lake, E slopes of the valley, 2400–2800 m, *B. Salomon & B.-R. Lu 1991.09.05: H10272* (LD).

This report agrees with a previous one by Löve (1984).

Pseudoroegneria ferganensis (Drobow) B.Salomon & Bothmer

2*n* = 2*x* = 14, CHN. Tajikistan, Gissar Mts., SW of Iskander-kul, Kanchoch village, E side of the valley, 2400 m, *B. Salomon & B.-R. Lu 1991.09.01: H10244* (LD); Tajikistan, Gissar Mts., SW of Iskander-kul, Kanchoch village, W side of the valley, 2400 m, *B. Salomon & B.-R. Lu 1991.09.01: H10245* (LD); Tajikistan, Gissar Mts., SW of Iskander-kul, Mura valley, 2600–2900 m, *B. Salomon & B.-R. Lu 1991.09.02: H10248* (LD); Tajikistan, Zeravshan Mts., Marguzor, at the 7th lake, E slopes of the valley, 2400–2800 m, *B. Salomon & B.-R. Lu 1991.09.05: H10273* (LD); Tajikistan, Gissar Mts., Ustur-gardan pass, 2700–3100 m, *B. Salomon & B.-R. Lu 1991.09.08: H10292* (LD).

Assadi (1994) has previously published another accession (*H10230*, herb. LD), collected during the same expedition, as being diploid. He published this information under the name *Elytrigia geniculata* subsp. *ferganensis* (Drobow) Tzvelev. According to Bor (1960) *A. ferganense* Drobow is conspecific with *A. cognatum* Hack. from northern Pakistan and undoubtedly they are closely related taxa. However, the two taxa show an obvious difference in that "ferganense" is densely caespitose whereas "cognatum" produces numerous thin rhizomes. This difference is not always evident on herbarium sheets but is striking in cultivation. We prefer to treat the three taxa as separate species, two diploids ("ferganense" and "cognatum") and one tetraploid ("geniculatum"). We are following the generic delineation of Dewey (1984), which means that "ferganense" should be transferred to *Pseudoroegneria*. Hence, we make the necessary new combination in this paper.

Taeniatherum caput-medusae (L.) Nevski

2*n* = 2*x* = 14, CHN. Tajikistan, Zeravshan Mts., Mogijan river, below the gold mine, 8 km of Zhing, 1300 m, *B. Salomon & B.-R. Lu 1991.09.06: H10282* (LD).

This report confirms previous ones, e.g., Frederiksen (1986).

Thinopyrum intermedium (Host) Barkworth & D.R. Dewey

2*n* = 6*x* = 42, CHN. Tajikistan, Gissar Mts., N of Dushanbe, Ziddi, Kishlak village, 2400 m, *B. Salomon & B.-R. Lu 1991.08.28: H10202* (LD).

This finding agrees with previous reports, e.g., Assadi (1995).

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UMBELLIFERAE/APIACEAE

Angelica sachokiana (Karjagin) Pimenov & V.N.Tikhom.

$2n = 22$, CNH. Russia, Dagestan Rep., Akhty Distr., left bank of Samur river, the mouth of Yalakdere river, near settlement Khrug, 41°29′N, 47°36′E, 12 Aug 2015, *R.A.Murtazaliev & T.A.Ostroumova 19* (MW) [Fig. 17A].

Endemic species of East Caucasus (Russia, Azerbaijan). This is the second determination of chromosome number for the species, confirming the first one ($2n = 22$) for the plants, collected in Azerbaijan (Vasil'eva & Pimenov, 1991). Material from Russia is investigated here for the first time.

Astrodaucus orientalis (L.) Drude

$n = 10$, CNH. Russia, Dagestan Rep., Rutul Distr., settlement Kala, Shinaz-Chai river near its mouth, 41°35′N, 47°21′E, 12 Aug 2015, *T.A.Ostroumova & R.A.Murtazaliev 7* (MW) [Fig. 18A].

$2n = 20$, CNH. Russia, Dagestan Rep., Rutul Distr., left bank of Samur river between settlements Luchek and Kina, 41°37′N, 47°17′E, 11 Aug 2015, *T.A.Ostroumova & R.A.Murtazaliev, 4* (MW) [Fig. 17B].

Chromosome number $n = 10$ ($2n = 20$) is typical for genus *Astrodaucus* (Pimenov & al., 2002; Shner & al., 2004b). *Astrodaucus orientalis* from Russia is investigated for the first time.

Bupleurum exaltatum M.Bieb.

$n = 7$, CNH. Russia, Dagestan Rep., Dokuzpara Distr., right bank of Samur river between settlements Miskindzha and Usukhchai, 13 Aug 2015, 41°25′N, 47°53′E, *T.A.Ostroumova & R.A.Murtazaliev 20* (MW) [Fig. 18C].

This polymorphic widely spread from South Europe to Pakistan species which has aneuploid series of cytotypes with $n = 6, 7, 8$ (Daushkevich & al., 1993; Pimenov & al., 2002). Up to date the only cytotype found on the European and Caucasian part of its areal was $n = 8$.

Bupleurum polyphyllum Ledeb.

$n = 8$, CNH. Russia, Dagestan Rep., Gunib Distr., Keger plateau, 42°23′N, 47°00′E, 1500 m, 18 Aug 2015, *T.A.Ostroumova 75*, *79* (MW) [Fig. 18E].

This chromosome number ($n = 8$) was reported for the plants from different regions of Caucasus and from Turkey, the species has also aneuploid ($n = 7$) and tetraploid ($n = 16$) cytotypes, both were found once in the North Caucasus (Daushkevich & al., 1993; Pimenov & al., 2002).

Daucus guttatus Sm.

$n = 10$, CNH. Russia, Dagestan Rep., Magaramkent Distr., left bank of Samur river, near settlement Chakh-Chakh, 41°30′N, 48°05′E, 12 Aug 2015, *T.A.Ostroumova s.n.* (MW) [Fig. 18B].

$2n = 20, 20+2B$, CNH. Russia, Dagestan Rep., Kayakent Distr., right bank of Kolichai river near Izberbash town, 42°35′N, 47°49′E, 11 Aug 2015, *T.A.Ostroumova & R.A.Murtazaliev 1* (MW) [Fig. 17C].

Alien species, was recorded for Russia for the first time. This annual species of *Daucus* is widespread in the eastern Mediterranean basin and belongs to the *Daucus guttatus* complex, which contains five similar annual species (Martínez-Flores & al, 2016). *Daucus guttatus* perhaps has two cytotypes. Chromosome number of $2n = 22$ ($n = 11$) was determined for the plants from Greece (Engstrand, 1970; Constance & al., 1976; Strid & Franzen, 1981), $2n = 20$ ($n = 10$) for the plants from Bulgaria, Cyprus and Turkey (Ceschmedjiev, 1983; Vogt & Aparicio, 1999; Shner & al., 2004a). Our chromosome data confirms the second cytotype, we also found in some cells B-chromosomes.

Gasparrinia peucedanoides (M.Bieb.) Thell.

n = 11, CNH. Dagestan Rep., Gunib Distr., Gunib plateau above settlement Gunib, 42°25′N, 46°56′E, 1800 m, 15 Aug 2015, *T.A.Ostroumova 52* (MW) [Fig. 18F].

Our chromosome data confirms the three previous ones, made for plants from Hungary, Slovakia and Kabardino-Balkaria (Pimenov & al., 2002).

Heracleum asperum (Hoffm.) M.Bieb.

2*n* = 22, CNH. Russia, Dagestan Rep., Gunib Distr., Gunib plateau above settlement Gunib, 42°25′N, 46°55′E, 1800 m, 16 Aug 2015, *T.A.Ostroumova 59a* (MW); Russia, Dagestan Rep., Rutul Distr., right bank of Samur river upstream from settlement Mishlesh, 41°40′N, 47°05′E, 12 Aug 2015, *T.A.Ostroumova & R.A.Murtazaliev 7* (MW) [Fig. 17E].

Our chromosome data confirms six previous determinations, made for plants from North Caucasus and Georgia (Pimenov & al., 2002; Shner & al., 2008; Gagnidze & al., 2015).

Heracleum grandiflorum M.Bieb.,

2*n* = 22, CNH. Russia, Dagestan Rep., Laki Distr., Vachi pass, 1600 m, 42°05′N, 47°11′E, 14 Aug 2015, *T.A.Ostroumova & R.A.Murtazaliev 40* (MW) [Fig. 17D].

This is the second chromosome number report for this endemic Caucasian species spread in Dagestan and Azerbaijan, the previous one (2*n* = 22) was also published for the plants from Dagestan (Vasil'eva & al., 1981).

**Peucedanum ruthenicum* M.Bieb.

n = 11, CNH. Russia, Dagestan Rep., Gunib Distr., Gunib plateau above settlement Gunib, 42°24′N, 46°54′E, 2000 m, 17 Aug 2015, *T.A.Ostroumova 67* (MW) [Fig. 18D].

Hexaploid chromosome number 2*n* = 66 for this species was determined from Bulgaria (Kuzmanov & al., 1977; Kuzmanov & al., 1987) and from the south regions of European Russia (Vasil'eva & al., 1981; Alexeeva & al., 1994), tetraploid one *n* = 22 was reported for the cultivated plants (Kord'um, 1967). The diploid cytotype of *P. ruthenicum* was discovered for the first time. The similar intraspecific polyploidy variation (*n* = 11, 22, 33) occurs for related species *P. longifolium* Waldst. & Kit. (Pimenov & al., 2002).

Pimpinella aromatica M.Bieb.

2*n* = 20, CNH. Russia, Dagestan Rep., Dokuzpara Distr., right bank of Samur river between settlements Miskindzha and Usukhchai, 13 Aug 2015, 41°25′N, 47°53′E, *T.A.Ostroumova & R.A.Murtazaliev 21* (MW) [Fig. 17F].

Our chromosome data confirms the previous one, made for the plants of unknown origin (Tamamschjan, 1933).

Pimpinella saxifraga L.

n = 10, CNH. Dagestan Rep., Gunib Distr., Gunib plateau above settlement Gunib, 42°25′N, 46°56′E, 1800 m, 15 Aug 2015, *T.A.Ostroumova, 50* (MW); Russia, Dagestan Rep., Gunib Distr., Keger plateau, 42°23′N, 47°00′E, 1500 m, 18 Aug 2015, *T.A.Ostroumova 74* (MW) [Fig. 18H].

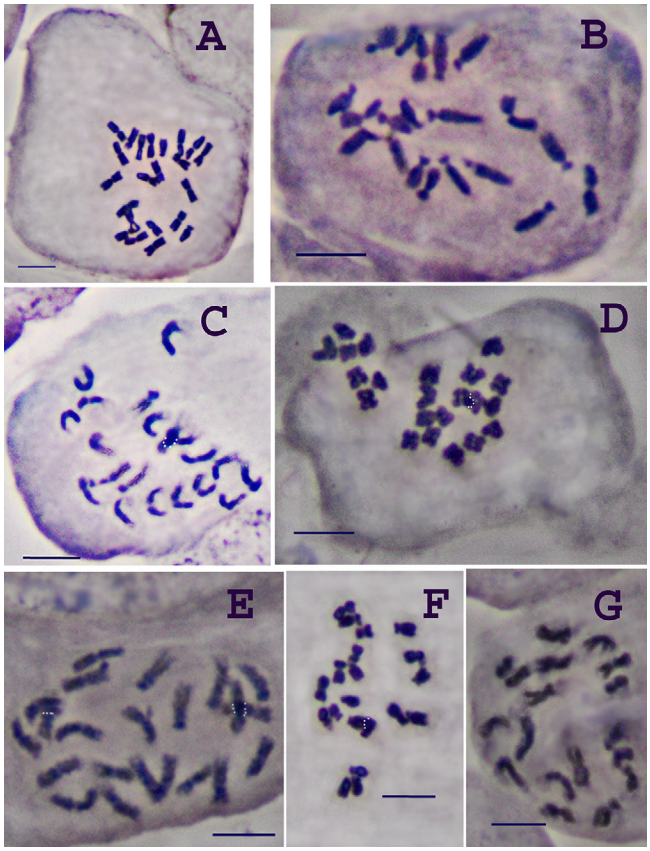

Fig. 17. Mitotic chromosomes. **A,** *Angelica sachokiana*, 2*n* = 22; **B,** *Astrodaucus orientalis*, 2*n* = 20; **C,** *Daucus guttatus*, 2*n* = 20; **D,** *Heracleum grandiflorum*, 2*n* = 22; **E,** *Heracleum asperum*, 2*n* = 22; **F,** *Pimpinella aromatica*, 2*n* = 20; **G,** *Trinia hispida*, 2*n* = 18. — Scale bars = 5 µm.

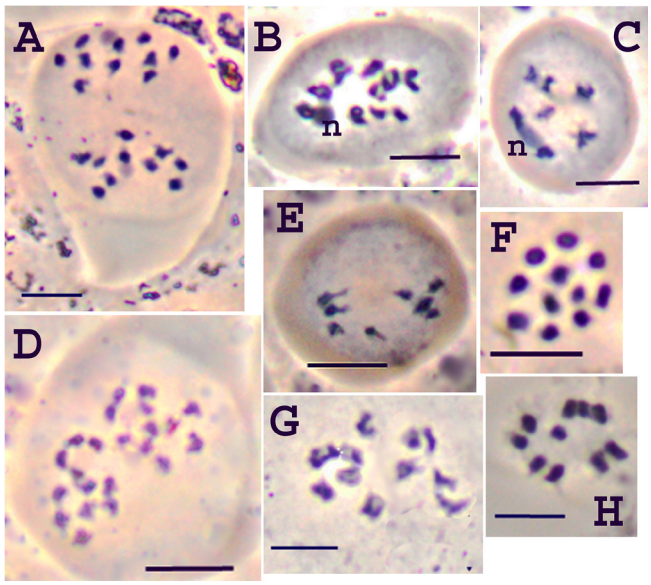

Fig. 18. Meiotic chromosomes. **A,** *Astrodaucus orientalis*, *n* = 10; **B,** *Daucus guttatus*, *n* = 10; **C,** *Bupleurum exaltatum*, *n* = 7; **D,** *Peucedanum ruthenicum*, *n* = 11; **E,** *Bupleurum polyphyllum*, *n* = 8; **F,** *Gasparrinia peucedanoides*, *n* = 11; **G,** *Seseli libanotis*, *n* = 11; **H,** *Pimpinella saxifraga*, *n* = 10. — Scale bars = 10 µm; n, nucleolus.

For *Pimpinella saxifraga* were published more than 50 chromosome numbers reports (Pimenov & al., 2002). Two ploidy levels (diploid, tetraploid) and aneuploidy on both of them were discovered (2*n* = 18, 20, 36, 49). Plants from Caucasus region were investigated for the first time.

Seseli libanotis (L.) W.D.J.Koch

n = 11, CNH. Dagestan Rep., Gunib Distr., Gunib plateau above settlement Gunib, 42°25′N, 46°55′E, 1800 m, 15 Aug 2015, *T.A.Ostroumova 45* (MW) [Fig. 18G].

Seseli libanotis has widely spread diploid (2*n* = 22) and rare tetraploid (2*n* = 44; four reports from more than 30 ones) cytotypes (Pimenov & al., 2002). Plants from Caucasus region were investigated for the first time.

Trinia hispida Hoffm.

2*n* = 18, CNH. Russia, Dagestan Rep., Gunib Distr., Keger plateau, 42°23′N, 47°00′E, 1500 m, 18 Aug 2015, *T.A.Ostroumova s.n*. (MW) [Fig. 17G].

Our chromosome data confirms three previous reports (Pimenov & al., 2002).

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* First chromosome count for the species.

** New chromosome number for the species.

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LAMIACEAE

Caryopteris trichosphaera W.W.Sm.

*2*n* = 26, CHN. China, Yunnan Province, Dêqên County, in the valley of the Mekong River, 3100 m, 27 Oct 2013, *Dong HJ 996* (KUN) [Fig. 19A].

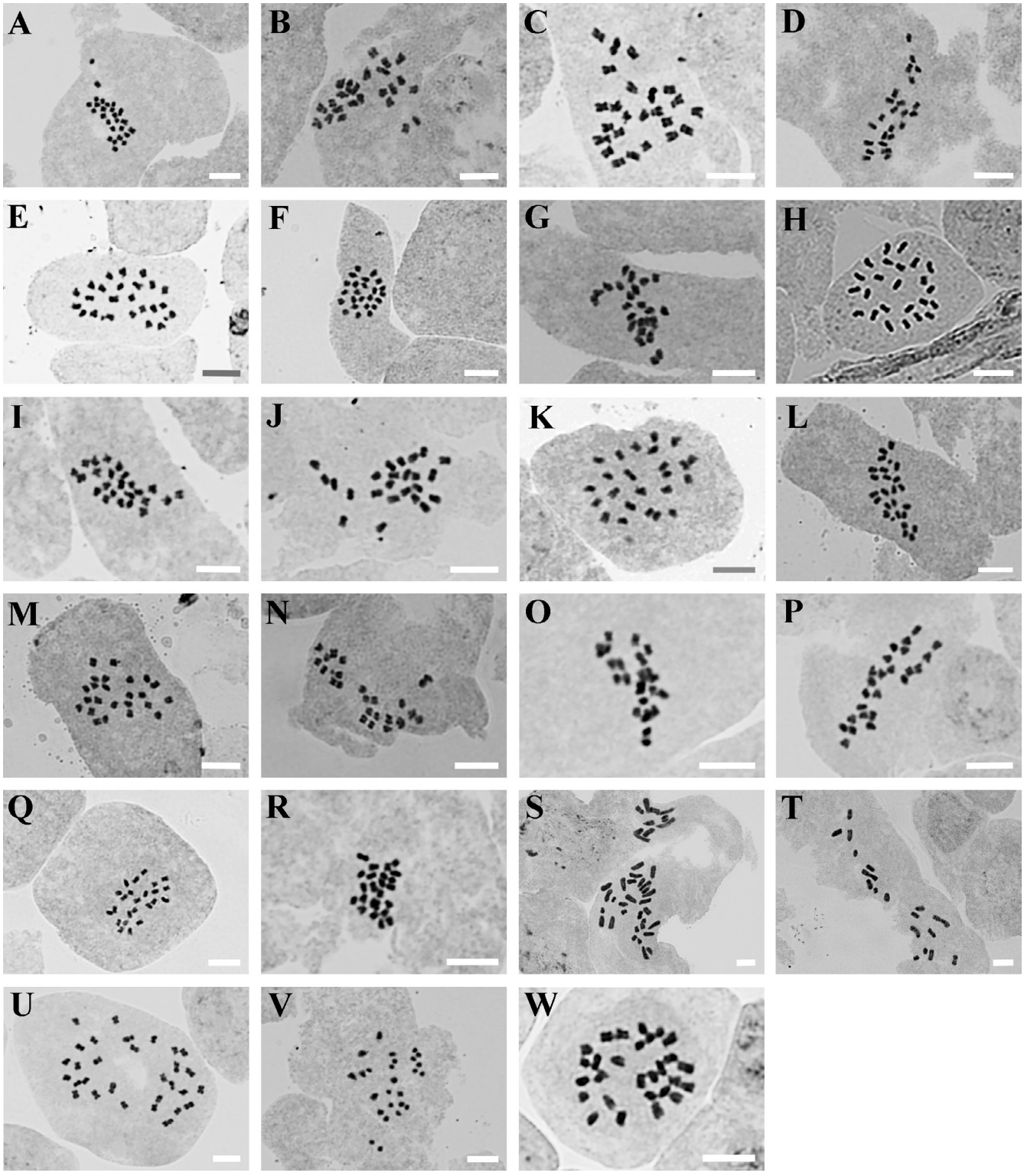

Fig. 19. Photographs of mitotic metaphase chromosomes of 23 taxa of Lamiaceae from China. **A,** *Caryopteris trichosphaera*, 2*n* = 26; **B,** *Isodon angustifolius,* 2*n* = 24; **C,** *I. eriocalyx*, 2*n* = 24; **D,** *I. excisoides*, 2*n* = 24; **E,** *I. interruptus*, 2*n* = 24; **F,** *I. lophanthoides*, 2*n* = 24 (*Y.P. Chen & al. EM160*); **G,** *I lophanthoides*, 2*n* = 24 (*Y.P. Chen & al. EM180*); **H,** *I. lophanthoides*, 2*n* = 24 (*Y.P. Chen & L. Jiang EM279*); **I,** *I. loxothyrsus*, 2*n* = 24; **J,** *I. macrocalyx*, 2*n* = 24; **K,** *I. macrophyllus*, 2*n* = 24; **L,** *I. phyllopodus*, 2*n* = 24; **M,** *I. phyllostachys*, 2*n* = 24; **N,** *I. rubescens*, 2*n* = 24; **O,** *I. sculponeatus*, 2*n* = 24 (*Y.P. Chen & F.H. Wang EM091*); **P,** *I. sculponeatus*, 2*n* = 24 (*Y.P. Chen & Q.R. Zhao EM243*); **Q,** *I. serra*, 2*n* = 24; **R,** *I. wikstroemioides*, 2*n* = 24; **S,** *Pseudocaryopteris bicolor*, 2*n* = 40; **T,** *P. paniculata*, 2*n* = 18; **U,** *Rubiteucris palmata*, 2*n* = 30; **V,** *Scutellaria barbata*, 2*n* = 26; **W,** *Tripora divaricata*, 2*n* = 28. — Scale bars = 5µm.

Isodon angustifolius (Dunn) Kudô

*2*n* = 24, CHN. China, Yunnan Province, Yongsheng County, Yangping Reservoir, 2595 m, 26°42′37.20″N, 100°47′58.88″E, 30 Oct 2014, *Y.P. Chen & Q.R. Zhao EM135* (KUN) [Fig. 19B].

Isodon eriocalyx (Dunn) Kudô

*2*n* = 24, CHN. China, Yunnan Province, Kunming City, Mt. Chongchongshan, roadside, 1900 m, 3 Oct 2015, *Y.P. Chen, F. Zhao & Z.F. Xu EM235* (KUN) [Fig. 19C].

Isodon excisoides (Y.Z.Sun) H.Hara

*2*n* = 24, CHN. China, Hubei Province, Shennongjia Forestry District, Muyu Town, roadside, 1673 m, 31°34′55.51″N, 110°21′55.97″E, 9 Sep 2014, *Y.P. Chen & Q.R. Zhao EM072* (KUN) [Fig. 19D].

Isodon interruptus (C.Y.Wu & H.W.Li) H.Hara

*2*n* = 24, CHN. China, Yunnan Province, Kunming City, Xishan Park, Maomaoqing Village, among the shrub, 24°55′52.58″N, 102°37′16.02″E, 2200 m, 29 Nov 2015, *Y.P. Chen EM295* (KUN) [Fig. 19E].

Isodon lophanthoides (Buch.-Ham. ex D.Don) H.Hara

2*n* = 24, CHN. China, Yunnan Province, Longling County, Longshan Town, Yiwanshui Village, among the grass, 1660 m, 24°35′17.9″N, 98°39′29.2″E, 8 Nov 2014, *Y.P. Chen & al. EM160* (KUN) [Fig. 19F]; China, Yunnan Province, Nanjian County, Lingbaoshan National Forest Park, roadside, 2300 m, 14 Nov 2014, *Y.P. Chen & al. EM180* (KUN) [Fig. 19G]; China, Guangxi Province, Xing'an County, Huajiang Town, Gaozhai Village, Mt. Maoershan, roadside, 390 m, 5 Nov 2015, *Y.P. Chen & L. Jiang EM279* (KUN) [Fig. 19H].

Isodon loxothyrsus (Hand.-Mazz.) H.Hara

*2*n* = 24, CHN. China, Yunnan Province, Dêqên County, Yanmen Town, Cizhong Village, roadside, 1977 m, 28°01′40.6″N, 98°54′20.2″E, 22 Oct 2015, *Y.P. Chen & L. Jiang EM259* (KUN) [Fig. 19I].

Isodon macrocalyx (Dunn) Kudô

*2*n* = 24, CHN. China, Zhejiang Province, Lin'an City, W Tianmu Mountains, Taizi'an, 800 m, 29 Aug 2014, *Y.P. Chen & Q.R. Zhao EM040* (KUN) [Fig. 19J].

Isodon macrophyllus (Migo) H.Hara

*2*n* = 24, CHN. China, Jiangsu Province, Nanjing City, Xingdian Town, Mt. Laoshan, roadside, 82 m, 32°02′40.86″N, 118°24′56.19″E, 27 Aug 2014, *Y.P. Chen & Q.R. Zhao EM034* (KUN) [Fig. 19K].

Isodon phyllopodus (Diels) Kudô

*2*n* = 24, CHN. China, Yunnan Province, Yongsheng County, Yangping Reservoir, under the pine forest, 2595 m, 26°42′37.20″N, 100°47′58.87″E, 30 Oct 2014, *Y.P. Chen & Q.R. Zhao EM134* (KUN) [Fig. 19L].

Isodon phyllostachys (Diels) Kudô

*2*n* = 24, CHN. China, Yunnan Province, Yongsheng County, Zili Village, roadside, 1860 m, 31 Oct 2014, *Y.P. Chen& Q.R. Zhao EM146* (KUN) [Fig. 19M].

Isodon rubescens (Hemsl.) H.Hara

2*n* = 24, CHN. China, Hubei Province, Shennongjia Forestry District, Muyu Town, roadside, 1538 m, 31°35′24.86″N, 110°22′39.84″E, 10 Sep 2014, *Y.P. Chen & Q.R. Zhao EM073* (KUN) [Fig. 19N].

Isodon sculponeatus (Vaniot) Kudô

*2*n* = 24, CHN. China, Yunnan Province, Kunming City, Mt. Changchongshan, roadside, 2150 m, 6 Oct 2014 *Y.P. Chen & F.H. Wang EM091* (KUN) [Fig. 19O]; China, Yunnan Province, Qiaojia County, on the way from Yaoshan Town to Dacun Village, roadside, 2300 m, 14 Oct 2015, *Y.P. Chen & Q.R. Zhao EM243* (KUN) [Fig. 19P].

Isodon serra (Maxim.) Kudô

2*n* = 24, CHN. China, Jiangsu Province, Nanjing City, Xingdian Town, Houxu Village, roadside, 53 m, 27 Aug 2014, *Y.P. Chen & Q.R. Zhao EM037* (KUN) [Fig. 19Q].

Isodon wikstroemioides (Hand.-Mazz.) H.Hara

*2*n* = 24, CHN. China, Yunnan Province, Shangri-La County, Nixi Town, on the slope, 3079 m, 28°01′16.7″N, 98°32′04.3″E, 22 Oct 2015, *Y.P. Chen & L. Jiang EM252* (KUN) [Fig. 19R].

Pseudocaryopteris bicolor (Roxb. ex Hardw.) P.D.Cantino

**2*n* = 40, CHN. China, Yunnan Province, Luqüan County, Xiaohekou Town, on the slope of valley, 1196 m, 25°59′26.38″N, 102°42′41.97″E, 20 Apr 2013, *C.L. Xiang & E.D. Liu 549* (KUN) [Fig. 19S].

Pseudocaryopteris paniculata (C.B.Clarke) P.D.Cantino

2*n* = 18, CHN. China, Yunnan Province, Xichou County, vicinities of Fadou Village, on the forest edge, 1397 m, 23°22′42.24″N, 104°49′11.67″E, 30 Apr 2013, *C.L. Xiang & E.D. Liu 557* (KUN) [Fig. 19T].

Rubiteucris palmata (Benth. ex Hook.f.) Kudô

*2*n* = 30, CHN. China, Yunnan Province, Yulong County, Shitou Town, under forest, 3043 m, 26°42′11.31″N, 99°45′34.40″E, 17 Sep 2015, *H.J. Dong s.n.* (KUN) [Fig. 19U].

Scutellaria barbata D.Don

2*n* = 26, CHN. China, Guangdong Province, Ruyuan County, Tixia Village, near the farm, alt. 240 m, 24°52′28.99″N, 113°08′26.91″E, 16 Apr 2014, *G.X. Hu & F. Zhao 0072* (KUN) [Fig. 19V].

Tripora divaricata (Maxim.) P.D.Cantino

**2*n* = 28, CHN. China, Sichuan Province, Muli County, vicinities of Wujiao Town, in the valley, 2890 m, 27°57′19.1″N, 100°45′11.8″E, 2 Sep 2015, *C.L. Xiang 1235* (KUN) [Fig. 19W].