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**CACTACEAE**Subfamily **Cactoideae**Tribe **Cereeae**

- Arrojadoa aureispina* Buining & Brederoo,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 112*.  
*Arrojadoa penicillata* Britton & Rose,  $2n = 22$ ; Brazil, Bahia, *L.P. Felix 11592*.  
*Arrojadoa rhodantha* Britton & Rose,  $2n = 22$ ; Brazil, Bahia, *L.P. Felix 11895*.  
*Cereus jamacaru* DC.,  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 11977*.  
*Melocactus azureus* Buining & Brederoo,  $2n = 44$ ; Brazil, Bahia, *J.P. Castro 186*.  
*Melocactus bahiensis* Luetzelb.,  $2n = 44$ ; Brazil, Paraíba, *L.P. Felix 11780*.  
*Melocactus ernestii* Vaupel,  $2n = 44$ ; Brazil, Paraíba, *N.A. Porto 25*.  
*Melocactus lanssensianus* P.J. Braun,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 198*.  
*Melocactus levitestatus* Buining & Brederoo,  $2n = 22$ , CHN. Brazil, Bahia, *J.P. Castro 188*.  
*Melocactus oreas* Miq.,  $2n = 44$ ; Brazil, Bahia, *J.P. Castro 139*.  
*Melocactus zehntneri* (Britton & Rose) Luetzelb.,  $2n = 44$ ; Brazil, Alagoas, *L.P. Felix 12189*.  
*Micranthocereus flaviflorus* Buining & Brederoo,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 91*.  
*Pilosocereus chrysostele* (Vaupel) Byles & G.D. Rowley,  $2n = 22$ ; Brazil, Rio Grande do Norte, *L.P. Felix 11781*.

- Pilosocereus gounellei* (F.A.C. Weber ex K. Schum.) Byles & G.D. Rowley,  $2n = 22$ ; Brazil, Rio Grande do Norte, *L.P. Felix 11791*.  
*Pilosocereus pachycladus* F. Ritter subsp. *pachycladus*,  $2n = 44$ ; Brazil, Bahia, *J.P. Castro 90*.  
*Pilosocereus pachycladus* F. Ritter subsp. *pernambucoensis* (F. Ritter) Zappi,  $2n = 22$ ; Brazil, Pernambuco, *L.P. Felix 11894*.  $2n = 44$ ; Brazil, Alagoas, *L.P. Felix 12177*.  
*Pilosocereus pentaedrophorus* (Labour) Byles & G.D. Rowley,  $2n = 22$ ; Brazil, Bahia, *L.P. Felix 11843*.  
*Stephanocereus luetzelburgii* (Vaupel) N.P. Taylor & Eggli,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 140*.

Tribe **Hylocereeae**

- Epiphyllum phyllanthus* (L.) Haw.,  $2n = 22$ ; Brazil, Paraíba, *E.M. Almeida 186*.  
*Hylocereus setaceus* (Salm-Dyck ex DC.) Rauf Bauer,  $2n = 44$ ; Brazil, Paraíba, *L.P. Felix 14298*.

Tribe **Trichocereae**

- Discocactus zehntneri* Britton & Rose,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 175*.  
*Harrisia adscendens* (Gürke) Britton & Rose,  $2n = 22$ ; Brazil, Pernambuco, *J.P. Castro 13*.

Subfamily **Opuntioideae**

- Brasilopuntia brasiliensis* (Willd.) A. Berger,  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 11515*.  
*Nopalea cochenillifera* (L.) Salm-Dyck 'alagoense',  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 14281*.  
*Opuntia dillenii* Haw.,  $2n = 44$ ; Brazil, Paraíba, *L.P. Felix 14280*.  
*Opuntia ficus-indica* (L.) Mill. 'redonda',  $2n = 88$ ; Brazil, Paraíba, *L.P. Felix 14290*.  
*Tacinga funalis* Britton & Rose,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro*.  
*Tacinga inamoena* (K. Schum.) N.P. Taylor & Stuppy,  $2n = 44$ ; Brazil, Rio Grande do Norte, *L.P. Felix*.  
*Tacinga palmadora* (Britton & Rose) N.P. Taylor & Stuppy,  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 11902*.

Subfamily **Pereskioideae**

- Pereskia aculeata* Mill.,  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 12568*.  
*Pereskia bahiensis* Gürke,  $2n = 22$ ; Brazil, Bahia, *J.P. Castro 67*.  
*Pereskia grandiflora* Hort. ex Pfeiff.,  $2n = 22$ ; Brazil, Paraíba, *L.P. Felix 14290*.

All materials for the chromosome column should be submitted electronically to: Karol Marhold, [karol.marhold@savba.sk](mailto: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.

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All materials CHN, collected in Georgia, collectors: MCH = Manana Churadze, RG = Revaz Gagnidze.

**RANUNCULACEAE**

- Ranunculus abchasicus* Freyn,  $2n = 16$ ; MCH 49 (TB).  
*Ranunculus baidarae* Rupr.,  $2n = 32$ ; RG & MCH 220 (TB).  
*Ranunculus brutius* Ten.,  $2n = 16$ ; RG & MCH 113 (TB), RG & MCH 118 (TB).  
*Ranunculus buhsei* Boiss.,  $2n = 16$ ; MCH 48 (T), MCH 59 (TB), MCH 69 (TB), MCH 70 (TB), MCH 72 (TB).  
*Ranunculus cappadocicus* Willd.,  $2n = 16$ ; RG & MCH 122 (TB), MCH 37 (TB), MCH 40 (TB).  
*Ranunculus caucasicus* M. Bieb.,  $2n = 16$ ; RG & MCH 204 (TB), RG & MCH 207 (TB), RG & MCH 212 (TB), RG & MCH 221 (TB).  
*Ranunculus grandiflorus* L.,  $2n = 16$ ; MCH 99 (TB), RG & MCH 1120 (TBI).  $2n = 24$ ; RG & MCH 234 (TB), RG & MCH 238 (TB).  
*Ranunculus grossheimii* Kolak.,  $2n = 16$ ; RG, D. Chelidze & Sh. Shetekauri 925 (TBI), RG & al. 927 (TBI), RG & al. 928 (TBI), RG & D. Chelidze 858 (TBI).  
*Ranunculus helenae* Albov,  $2n = 16$ ; MCH 185 (TB), MCH 187 (TB).  
*Ranunculus lojkae* Sommier & Levier,  $2n = 16$ ; RG & MCH 227 (TB), RG & MCH 248 (TB), RG & MCH 251 (TB), RG, J. Mtskhvetadze, Sh. Shetekauri & G. Likokeli 985 (TBI).  
*Ranunculus obesus* Trautv.,  $2n = 28$ ; RG & MCH 274–284 (TB).  
*Ranunculus oreophilus* M. Bieb.,  $2n = 16$ ; RG & MCH 111 (TB), D. Chelidze & P. Chkheidze 736 (TBI), RG & D. Chelidze 638 (TBI), RG, D. Chelidze & Sh. Shetekauri 949 (TBI), RG & MCH 210 (TB).  $2n = 24$ ; RG & MCH 205 (TB), RG & MCH 211 (TB), RG & MCH 213 (TB), RG & MCH 219 (TB), RG, Sh. Shetekauri & D. Chelidze 982 (TBI).  $2n = 32$ ; RG & MCH 209 (TB), RG & MCH 249 (TB).  
*Ranunculus polyanthemos* L.,  $2n = 16$ ; MCH 41 (TB), MCH 62 (TB), RG & MCH 198 (TB).  
*Ranunculus raddeanus* Regel,  $2n = 16$ ; MCH 100 (TB), MCH 102 (TB), MCH 103 (TB), MCH 106 (TB), MCH 107 (TB), RG & MCH 114 (TB), RG & MCH 116 (TB), RG, D. Chelidze & Sh. Shetekauri 915 (TBI), MCH 65 (TB), MCH 29 (TB), MCH 35 (TB), RG, J. Mtskhvetadze, G. Likokeli & Sh. Shetekauri 995 (TBI), RG & J. Mtskhvetadze 998 (TBI).  
*Ranunculus repens* L.,  $2n = 16$ ; MCH 101 (TB), MCH 53 (TB), RG & MCH 206 (TB).  
*Ranunculus svaneticus* Rupr.,  $2n = 16$ ; MCH 81 (TB), MCH 88 (TB), MCH 89 (TB), RG & D. Chelidze 763 (TBI).

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**FABACEAE**

- Mimosa acutistipula* (Mart.) Benth. var. *acutistipula*,  $2n = 52$ ; Brazil, Rio Grande do Norte, A. Fernandes & al. s.n. (EAC 16547).  
*Mimosa bimucronata* (DC.) Kuntze,  $2n = 26$ ; Brazil, Ceará, E. Nunes & al. s.n. (EAC 17854).  
*Mimosa caesalpinifolia* Benth.,  $2n = 26$ ; Brazil, Ceará, M.A.O. Alves & al. s.n. (EAC 12649).  
*Mimosa hirsutissima* Mart.,  $2n = 52$ ; Brazil, Ceará, E. Nunes & al. s.n. (EAC 15462).  
*Mimosa invisá* Mart. ex Colla,  $2n = 26$ ; Brazil, Ceará, A.V. Custódio & al. s.n. (EAC 24350).  
*Mimosa lewisii* Barneby,  $2n = 28$ ; Brazil, Bahia, A. Fernandes & E. Nunes s.n. (EAC 24350).  
*Mimosa niomarlei* Afr. Fern.,  $2n = 26$ ; Brazil, Ceará, A. Fernandes & al. s.n. (EAC 17591).  
*Mimosa paraibana* Barneby (= *Mimosa platycarpa* Ducke),  $2n = 26$ ; Brazil, Paraíba, E. Nunes & al. s.n. (EAC 21403).  
*Mimosa pigra* L.,  $2n = 26$ ; Brazil, Ceará, E. Nunes & M.A.O. Alves s.n. (EAC 15465).  
*Mimosa quadrivalvis* var. *leptocarpa* (DC.) Barneby,  $2n = 52$ ; Brazil, Ceará, I.H. Vaz da Silva s.n. (EAC 48801).  
*Mimosa setosa* var. *paludosa* Benth.,  $2n = 26$ ; Brazil, Ceará, A. Fernandes & al. s.n. (EAC 16812).  
*Mimosa tenuiflora* (Willd.) Poir.,  $2n = 26$ ; Brazil, Paraíba, A. Fernandes & al. s.n. (EAC 21396).  
*Mimosa ursina* Mart.,  $2n = 26$ ; Brazil, Piauí, A. Fernandes & al. s.n. (EAC 18399).  
*Mimosa verrucosa* Benth.,  $2n = 26$ ; Brazil, Ceará, A. Fernandes & al. s.n. (EAC 16806).

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Materials gathered by L. Hardion (LH), R. Verlaque (RV), B. Zehzad (BZ), A. Fridlender (AF) and B. Vila (BV); counted by L. Hardion, R. Verlaque and B. Vila and analysed in FCM by A. Fridlender. *Petunia hybrida* (PxPC6, 2C = 2.85 pg) was used as internal standard to determine DNA content by FCM (Partec CyFlow 532 nm laser cytometer). Vouchers in MARS.

#### POACEAE

*Arundo donaciformis* (Loisel.) Hardion & al.

2n = 108, CHN; Italy, LH IL1/10-94, LH IL2/10-9, LH IL3/11-22, LH 10-05.

*Arundo donax* L.

2n = 108; CHN; Iran, BZ DoIG/13-2, BZ DoIK/13-01.

2n = 110, CHN; Peru, BV 13-35.

2n = 110, CHN; 2n ~ 18x, FCM, 2C DNA = 4.87 pg; Italy, AF 13-05.

2n ~ 18x, FCM, 2C DNA = 4.83–5.02 pg; France AF DoC, AF s.n. (MARS 05002).

*Arundo donax* var. *versicolor* (Mill.) Stokes

2n = ca. 108, CHN; France, LH DoV/11-150.

*Arundo formosana* Hack.

2n = 72, CHN; 2n ~ 12x ~ 72, FCM, 2C DNA = 3.57 pg; Taiwan, Lyonnet MFol/11-56.

*Arundo micrantha* Lam.

2n = 72, CHN; Croatia, LH 12-14; France, LH FD2/10-147, LH FD4/11-155; Greece, LH & BV GS1/11-47, LH & BV GS3/11-48, LH & BV GE2/11-51; Greece, Crete, BV GC2/11-55, BV GC3/11-56; Italy, LH IT1/11-19; Morocco, LH MM1/11-141, LH MM3/11-141; Spain, LH EE1/10-151, LH ES1/11-136, LH ES2/11-139, LH ES5/10-142.

2n = 72, CHN; 2n ~ 12x, FCM, 2C DNA = 3.23 pg; Italy, AF 13-06.

2n ~ 12x ~ 72, FCM, 2C DNA = 3.15 pg; Spain, AF MiAl.

*Arundo plinii* Turra s.str.

2n = 72, CHN; 2n ~ 12x, FCM, 2C DNA = 3.42–3.62 pg; Greece, LH & BV GP3/11-45; Italy, LH IS3/11-124.

2n = 74, CHN; 2n ~ 12x, FCM, 2C DNA = 3.46 pg; Italy, Sicily, LH IS6/11-131.

2n = 76, CHN; 2n ~ 12x, FCM, 2C DNA = 3.25–3.62 pg; Italy, LH & BV IC1/10-120, AF s.n. (MARS 03806); Italy, Sicily, AF 11-60, LH IS8/11-132.

2n = 108, CHN; 2n ~ 18x, FCM, 2C DNA = 4.60–4.82 pg; Greece, Crete, BV GC4/11-57; Italy, Sicily, LH IS4/11-127.

2n = 114, CHN; 2n ~ 18x, FCM, 2C DNA = 4.60–4.97 pg; Italy, LH & BV IC4/10-126; Malta, AF 11-182.

*Hakonechloa macra* Makino

2n = 48, CHN; Japan, LH Ha1/11-207.

*Molinia caerulea* subsp. *arundinacea* (Schränk) K. Richt.

2n = 36, CHN; France, LH 11-181.

*Phragmites australis* (Cav.) Trin. ex Steud.

2n = 48, CHN; France, RV 10-30.

2n ~ 8x ~ 48, FCM, 2C DNA = 2.04 pg; Spain, AF s.n. (MARS 03544).

2n = 72, CHN; Peru, BV 13-36.

2n = 96, CHN; China, Huiyi Wu 12-51; France, RV 13-55.

2n ~ 16x, FCM, 2C DNA = 4.00 pg; France, AF s.n. (MARS 05004).

*Phragmites frutescens* H. Scholz

2n = 48, CHN; Greece, LH & BV Pf1/11-46, BV Pf3/11-58; Lebanon, FM 11-302.

*Phragmites karka* (Retz.) Trin. ex Steud.

2n = 50, CHN; Cambodia, David 12-52.

*Phragmites mauritianus* Kunth

2n = 48, CHN; Madagascar, BV Pm1/11-26.

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#### ALLIACEAE

*Allium senescens* L., 2n = 32; Russia, Amurskaya Oblast', Shatkhina 66 (VLA).

#### ASCLEPIADACEAE

*Metaplexis japonica* Makino, 2n = 24; Russia, Amurskaya Oblast', Shatkhina 107 (VLA).

#### ASPARAGACEAE

*Asparagus oligoclonos* Maxim., 2n = 20; Russia, Amurskaya Oblast', Shatkhina & Starchenko 110 (VLA).

#### ASTERACEAE

*Artemisia altaiensis* Krasch., 2n = 36; Russia, Republic of Tyva, AK 04-130 (LE). 2n = 54; Russia, Republic of Tyva, Shmakov, Smirnov & al. 99-19 (ALTB), AK 04-39 (LE), AK 04-40 (LE), AK 04-41 (LE), AK 04-42 (LE), AK 04-43 (LE), AK 04-44 (LE), Popov 99-231 (LE).

*Artemisia anethifolia* Weber ex Stechm., 2n = 18; Russia, Republic of Tyva, Shmakov, Smirnov & al. 99-24 (ALTB).

*Artemisia annua* L., 2n = 18; Russia, Republic of Tyva, AK 04-24 (LE), Popov 99-232 (LE).

*Artemisia caespitosa* Ledeb., 2n = 18; Russia, Republic of Tyva, Shmakov, Smirnov & al. 99-25 (ALTB), Shmakov, Smirnov & al. 99-26 (ALTB), AK 04-27 (LE), AK 04-28 (LE), AK 04-29 (LE).

*Artemisia commutata* Besser, 2n = 18; Russia, Republic of Tyva, AK 04-72 (LE), Nikitin, Sytin & al. 02-37 (LE). 2n = 36; Russia, Republic of Tyva, AK 04-70 (LE), AK 04-71 (LE), AK 04-80 (LE), AK 04-81 (LE), AK 04-82 (LE), AK 04-83 (LE).

*Artemisia depauperata* Krasch., 2n = 36; Russia, Republic of Tyva, AK 04-73 (LE).

*Artemisia dolosa* Krasch., 2n = 18; Russia, Republic of Tyva, Shmakov, Smirnov & al. 99-27 (ALTB). 2n = 36; Russia, Republic of Tyva, AK 04-85 (LE), AK 04-86 (LE).

*Artemisia dracunculus* L., 2n = 36; Russia, Republic of Tyva, AK 04-90 (LE), AK 04-91 (LE), AK 04-95 (LE).

*Artemisia frigida* Willd., 2n = 18; Russia, Republic of Tyva, Molokanov & Shalimov 10-18 (ALTB), Shmakov, Smirnov & al. 99-21

(ALTB), *Shmakov, Smirnov & al.* 99-22 (ALTB), *AK 04-45* (LE), *AK 04-46* (LE), *AK 04-47* (LE), *AK 04-49* (LE), *AK 04-50* (LE), *AK 04-51* (LE), *AK 04-56* (LE), *AK 04-57* (LE), *AK 04-58* (LE), *AK 04-124* (LE), *Sambdu 04-52* (LE), *Popov 99-229* (LE).  $2n = 36$ ; Russia, Republic of Tyva, *AK 04-48* (LE), *AK 04-53* (LE), *AK 04-54* (LE), *AK 04-55* (LE), *AK 04-119* (LE), *AK 04-120* (LE), *AK 04-121* (LE), *AK 04-122* (LE), *AK 04-123* (LE), *AK 04-125* (LE), *AK 04-129* (LE). *Artemisia glauca* Pall. ex Willd.,  $2n = 18$ ; Russia, Republic of Tyva, *Molokanov & Shalimov 10-13* (ALTB).  $2n = 36$ ; Russia, Republic of Tyva, *AK 04-92* (LE), *AK 04-93* (LE), *AK 04-94* (LE), *AK 04-126* (LE), *AK 04-128* (LE).

*Artemisia gmelinii* Weber ex Stechm.,  $2n = 18$ ; Russia, Republic of Tyva, *Shmakov, Smirnov & al.* 99-16 (ALTB), *AK 04-67* (LE), *Popov 99-230* (LE).  $2n = 36$ ; Russia, Republic of Tyva, *AK 04-66* (LE), *AK 04-68* (LE), *AK 04-69* (LE).

*Artemisia jacutica* Drobow,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-30* (LE), *AK 04-31* (LE).

*Artemisia laciniata* Willd.,  $2n = 18$ ; Russia, Republic of Tyva, *Shmakov, Smirnov & al.* 99-14 (ALTB), *Shmakov, Smirnov & al.* 99-15 (ALTB).

*Artemisia lagocephala* (Fisch. ex Besser) DC.,  $2n = 18$ ; Russia, Primorskii Krai, *VK & Machs 2013-43* (LE), *VK & Machs 2013-44* (LE).

*Artemisia latifolia* Ledeb.,  $2n = 54$ ; Russia, Republic of Tyva, *AK 04-63* (LE), *AK 04-64* (LE), *AK 04-65* (LE), *AK 06-33* (LE).

*Artemisia littorica* Kitam.,  $2n = 36$ ; Russia, Primorskii Krai, *VK & Machs 2013-47* (LE), *VK & Machs 2013-49* (LE), *VK & Machs 2013-50* (LE).

*Artemisia macrocephala* Jacquem. ex Besser,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-32* (LE), *Molokanov & Shalimov 10-17* (ALTB), *Popov 99-233* (LE).

*Artemisia manshurica* (Kom.) Kom.,  $2n = 36$ ; Russia, Primorskii Krai, *VK & Machs 2013-46* (LE), *VK & Machs 2013-48* (LE).

*Artemisia obtusiloba* Ledeb.,  $2n = 36$ ; Russia, Republic of Tyva, *Popov 99-228* (LE).

*Artemisia palustris* L.,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-25* (LE), *AK 04-26* (LE).

*Artemisia pycnorhiza* Ledeb.,  $2n = 36$ ; Russia, Republic of Tyva, *AK 04-74* (LE).

*Artemisia rubripes* Nakai,  $2n = 16$ ; Russia, Primorskii Krai, *VK 2013-37* (LE), *VK & Machs 2013-38* (LE), *VK 2013-39* (LE); Russia, Khabarovskii Krai, *Burlyaeva 2012-86* (LE), *Burlyaeva 2012-87* (LE).

*Artemisia rutifolia* Steph. ex Spreng.,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-35* (LE), *AK 04-36* (LE), *AK 04-37* (LE).

*Artemisia sacrorum* Ledeb.,  $2n = 54$ ; Russia, Primorskii Krai, *VK & Machs 2013-26* (LE), *VK & Machs 2013-27* (LE).

*Artemisia schrenkiana* Ledeb.,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-20* (LE), *AK 04-21* (LE), *AK 04-22* (LE).

*Artemisia scoparia* Waldst. & Kit.,  $2n = 16$ ; Russia, Republic of Tyva, *AK 04-87* (LE), *AK 04-88* (LE).

*Artemisia selengensis* Turcz. ex Besser,  $2n = 36$ ; Russia, Primorskii Krai, *VK 2013-31* (LE), *VK & Machs 2013-32* (LE).

*Artemisia sieversiana* Ehrh. ex Willd.,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-38* (LE); Russia, Primorskii Krai, *VK & Machs 2013-45* (LE).

*Artemisia stolonifera* (Maxim.) Kom.,  $2n = 36$ ; Russia, Primorskii Krai, *VK & Machs 2013-28* (LE), *VK & Machs 2013-29* (LE), *VK & Machs 2013-30* (LE).

*Artemisia sylvatica* Maxim.,  $2n = 16$ ; Russia, Primorskii Krai, *VK 2013-33* (LE), *VK & Machs 2013-34* (LE), *VK 2013-35* (LE), *VK 2013-36* (LE).

*Artemisia tomentella* Trautv.,  $2n = 36$ ; Russia, Republic of Tyva, *AK 04-75* (LE), *AK 04-76* (LE), *AK 04-77* (LE), *AK 04-78* (LE), *AK 04-79* (LE), *AK 04-84* (LE).

*Artemisia umbrosa* Turcz. ex DC.,  $2n = 36$ ; Russia, Primorskii Krai,

*VK & Machs 2013-40* (LE), *VK & Machs 2013-41* (LE).  $2n = 54$ ; Russia, Primorskii Krai, *VK & Machs 2013-42* (LE).

*Artemisia vulgaris* L.,  $2n = 16$ ; Russia, Republic of Tyva, *AK 04-59* (LE), *AK 04-60* (LE), *Molokanov & Shalimov 10-19* (ALTB).

*Artemisia xerophytica* Krasch.,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-33* (LE), *AK 04-34* (LE).

*Neopallasia pectinata* (Pall.) Poljakov,  $2n = 18$ ; Russia, Republic of Tyva, *AK 04-61* (LE), *AK 04-62* (LE); Russia, Republic of Buryatia, *Safronova 04-110* (LE).

*Ptarmica alpina* DC.,  $2n = 36$ ; Russia, Primorskii Krai, *VK 2013-51* (LE), *VK & Machs 2013-52* (LE), *VK & Machs 2013-53* (LE).

*Pterocypsela indica* (L.) C. Shih,  $2n = 18$ ; Russia, Khabarovskii Krai, *Rudyka 12175* (VLA).

#### BALSAMINACEAE

*Impatiens parviflora* DC.,  $2n = 20$ ; Russia, Amurskaya Oblast', *Shatokhina, Starchenko & al.* 191 (VLA).

#### CAMPANULACEAE

*Platycodon grandiflorus* A. DC.,  $2n = 18$ ; Russia, Amurskaya Oblast', *Shatokhina 102* (VLA).

#### CHENOPODIACEAE

*Chenopodium hybridum* L.,  $2n = 18$ ; Russia, Amurskaya Oblast', *Kudrin 12082* (VLA).

#### CONVALLARIACEAE

*Polygonatum stenophyllum* Maxim.,  $2n = 30$ ; Russia, Amurskaya Oblast', *Shatokhina, Starchenko & al.* 192 (VLA).

#### CUSCUTACEAE

*Cuscuta japonica* Choisy,  $2n = 32$ ; Russia, Amurskaya Oblast', *Leussova 31* (VLA), *Shatokhina 39* (VLA).

#### IRIDACEAE

*Pardanthopsis dichotoma* (Pallas) L.W. Lenz,  $2n = 28$ ; Russia, Amurskaya Oblast', *Shatokhina & Starchenko 104* (VLA), *Shatokhina 113* (VLA).

#### POACEAE

*Achnatherum extremiorientale* (Hara) Keng,  $2n = 24$ ; Russia, Primorskii Krai, *Semeikin 12247* (VLA).

*Elymus franchetii* Kitag.,  $2n = 42$ ; Russia, Primorskii Krai, *Lapenko 11680* (VLA).

*Hierochloë glabra* Trin.,  $2n = 28$ ; Russia, Khabarovskii Krai, *Rudyka 12144* (VLA).

*Poa alpigena* Lindm.,  $2n = 70-72$ ; Russia, Kamchatka Peninsula, *Probatova & Rudyka 6300* (VLA).

*Stipa baicalensis* Roshev.,  $2n = 44$ ; Russia, Amurskaya Oblast', *Shatokhina 106* (VLA).

#### POLYGONACEAE

*Acetosa pratensis* Mill.,  $2n = 14, 15$ ; Russia, Primorskii Krai, *Lapenko 11022* (VLA).

#### RANUNCULACEAE

*Aconitum macrorhynchum* Turcz.,  $2n = 16$ ; Russia, Amurskaya Oblast', *Shatokhina 14* (VLA).

*Pulsatilla davurica* (Fisch. ex DC.) Spreng.,  $2n = 16$ ; Russia, Amurskaya Oblast', *Shatokhina & Darman 103* (VLA).

#### ROSACEAE

*Agrimonia pilosa* Ledeb.,  $2n = 56$ ; Russia, Amurskaya Oblast', *Timchenko 11164* (VLA).

*Filipendula angustiloba* Maxim.,  $2n = 14$ ; Russia, Amurskaya Oblast', *Shatokhina, Starchenko & al.* 194 (VLA).

**SCROPHULARIACEAE**

*Veronica incana* L.,  $2n = 34$ ; Russia, Amurskaya Oblast', *Shatokhina* 59 (VLA).

**SOLANACEAE**

*Datura stramonium* L.,  $2n = 24$ ; Russia, Primorskii Krai, *Lapenko* 11975 (VLA).

**THYMELAEACEAE**

*Diarthron linifolium* Turcz.,  $2n = 18$ ; Russia, Amurskaya Oblast', *Shatokhina* 114 (VLA).

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**AMARANTHACEAE**

*Corispermum hyssopifolium* L.,  $2n = 18$ ; Russia, Irkutskaya Oblast', *DK* 19829.

**BORAGINACEAE**

*Mertensia stylosa* DC.,  $2n = 48$ ; Russia, Irkutskaya Oblast', *SK* 19794.

**CAMPANULACEAE**

*Platycodon grandiflorus* (Jacq.) A. DC.,  $2n = 18$ ; Russia, Zabaykal'skii Krai, *Ye.A. Bondarevich* 28261.

**CAPRIFOLIACEAE**

*Lonicera edulis* Turcz. ex Freyn,  $2n = 18$ ; Russia, Zabaykal'skii Krai, *SK* 19935.

*Patrinia sibirica* (L.) Juss.,  $2n = 44$ ; Russia, Republic of Buryatiya, *SK & DK* 20012.

**CUPRESSACEAE**

*Tetraclinis articulata* (Vahl) Mast.,  $2n = 22$ ; Israel, Jerusalem District, *K.Z. Gamburg* 26977.

**EUPHORBIACEAE**

*Securinea suffruticosa* (Pall.) Rehder,  $2n = 26$ ; Russia, Zabaykal'skii Krai, *OC* 26824.

**FABACEAE**

*Astragalus mongholicus* Bunge,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *G.N. Zinov'yeva* 26821.

*Astragalus olchonensis* Gontsch.,  $2n = 48$ ; Russia, Irkutskaya Oblast', *DK* 28535.

*Astragalus uliginosus* L.,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *Ye.M. Shipulina* 26801, *G.N. Zinov'yeva* 26802, *OC* 26804.

*Caragana microphylla* Lam.,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *O.V. Sidneva* 26822, *G.N. Zinov'yeva* 26823.

*Glycyrrhiza grandiflora* Tausch,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *L.I. Sarayeva* 26797.

*Glycyrrhiza viscida* Grankina,  $2n = 16$ ; Russia, Novosibirskaya Oblast', *R.Ye. Krogulevich & T.A. Vagina* 21083.

*Lespedeza davurica* (Laxm.) Schindl.,  $2n = 42$ ; Russia, Zabaykal'skii Krai, *OC* 26795.

*Lespedeza juncea* (L. f.) Pers.,  $2n = 20$ ; Russia, Zabaykal'skii Krai, *O.N. Shevkun* 26796.

*Leucaena leucocephala* (Lam.) de Wit,  $2n = 104, 106$ ; Israel, Southern District, *K.Z. Gamburg* 26964.

*Medicago falcata* L.,  $2n = 32$ ; Russia, Irkutskaya Oblast', *AV & DK* 26783; Russia, Republic of Altay, *SK* 26591.

*Melilotus albus* Medik.,  $2n = 16$ ; Russia, Irkutskaya Oblast', *SK* 19196.  
*Onobrychis arenaria* DC.,  $2n = 14$ ; Russia, Republic of Altay, *SK* 26592.

*Oxytropis grandiflora* (Pall.) DC.,  $2n = 48$ ; Russia, Zabaykal'skii Krai, *Ye.M. Shipulina* 26825.

*Oxytropis myriophylla* (Pall.) DC.,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *Ye.M. Shipulina* 26818.

*Oxytropis oxyphylla* (Pall.) DC.,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *O.V. Sidneva* 26820.

*Oxytropis sylvatica* (Pall.) DC.,  $2n = 16$ ; Russia, Zabaykal'skii Krai, *S.M. Kalitkina* 26805.

*Sophora flavescens* Aiton,  $2n = 18$ ; Russia, Zabaykal'skii Krai, *O.N. Shevkun* 26799, *OC* 26800.

**LAMIACEAE**

*Stachys annua* L.,  $2n = 34$ ; Russia, Irkutskaya Oblast', *AV* 19432.

**POACEAE**

*Beckmannia syzigachne* (Steud.) Fernald,  $2n = 14$ ; Russia, Republic of Sakha (Yakutia), *DK* 28156.

*Deschampsia cespitosa* (L.) P. Beauv.,  $2n = 26$ ; Russia, Sverdlovskaya Oblast', *OD* 21111.

*Phleum pratense* L.,  $2n = 42$ ; Russia, Republic of Altay, *DK* 28226.

*Stipa baicalensis* Roshev.,  $2n = 44$ ; Russia, Zabaykal'skii Krai, *Ye.A. Bondarevich* 28221.

**POLYGONACEAE**

*Aconogonon ochreatum* (L.) Hara,  $2n = 20$ ; Russia, Republic of Buryatiya, *DK* 23197.

*Aconogonon sericeum* (Pall.) Hara,  $2n = 20$ ; Russia, Irkutskaya Oblast', *SK* 20684.

**ORCHIDACEAE**

*Coeloglossum viride* (L.) Hartm.,  $2n = 40$ ; Russia, Republic of Buryatiya, *AV* 27179.

*Cypripedium calceolus* L.,  $2n = 20$ ; Russia, Republic of Buryatiya, *AV* 23529.

*Gymnadenia conopsea* (L.) R. Br.,  $2n = 40$ ; Russia, Republic of Buryatiya, *AV* 23534.

**RANUNCULACEAE**

*Anemone crinita* Juz.,  $2n = 14$ ; Russia, Irkutskaya Oblast', *SK & DK* 20019.

*Ranunculus reptans* L.,  $2n = 32$ ; Russia, Zabaykal'skii Krai, *SK* 19544.

*Thalictrum baicalense* Turcz. ex Ledeb.,  $2n = 14$ ; Russia, Irkutskaya Oblast', *SK* 19795.

**VIOLACEAE**

*Viola brachyceras* Turcz.,  $2n = 20$ ; Russia, Zabaykal'skii Krai, *SK* 19546.

*Viola collina* Besser,  $2n = 20$ ; Russia, Zabaykal'skii Krai, *Ye.A. Bondarevich 22396*.  
*Viola irtutiana* Turcz.,  $2n = 24$ ; Russia, Republic of Buryatiya, *SK & DK 19465*.  
*Viola mauritii* Tepl.,  $2n = c. 16, 18$ ; Russia, Zabaykal'skii Krai, *SK 16362*.  
*Viola nemoralis* Kütz.,  $2n = 20$ ; Russia, Republic of Buryatiya, *SK 20654, SK & Yu.N. Pochinchik 20662, SK & Yu.N. Pochinchik 22090, AV & A.S. Anosova 22960*.  
*Viola rupestris* F.W. Schmidt,  $2n = 20$ ; Russia, Republic of Buryatiya, *SK & Yu.N. Pochinchik 20657*.  
*Viola trichosepala* (W. Becker) Juz.,  $2n = 24$ ; Russia, Republic of Buryatiya, *SK 19908*.

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#### AMARANTHACEAE

*Amaranthus albus* L.,  $2n = 32$ ; Russia, Kalmykia Republic, *ML 960*.  
*Amaranthus blitoides* S. Watson,  $2n = 32$ ; Russia, Kalmykia Republic, *ML 94*; Russia, Sakha (Yakutia) Republic, *ML & EN 800*.  
*Amaranthus retroflexus* L.,  $2n = 34$ ; Russia, Kalmykia Republic, *ML 949*.

#### ASTERACEAE

*Achillea asiatica* Serg.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 847*.  
*Cacalia hastata* L.,  $2n = 60$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 867*.  
*Cirsium setosum* (Willd.) Besser,  $2n = 34$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 795*.  
*Crepis jacutica* Lomon.,  $2n = 14$ ; Russia, Sakha (Yakutia) Republic, 6 Sep 2011, *EN s.n.* (SASY, NS); *ibid.*, 20 Jul 2011, *EN s.n.* (SASY, NS).  
*Crepis tectorum* L.,  $2n = 8$ ; Russia, Sakha (Yakutia) Republic, 12 Jul 2012, *EN s.n.*  
*Hieracium umbellatum* L.,  $2n = 27$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 809, ML & EN 873*.  
*Jacobeia nemorensis* (L.) Moench,  $2n = 40$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 861*.  
*Mulgedium sibiricum* Cass. ex Less.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 812*.  
*Saussurea amara* (L.) DC.,  $2n = 26$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 788*.  
*Serratula marginata* Tausch,  $2n = 60$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 822*.  
*Sonchus brachyotus* DC.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 791*.  
*Tephrosieris palustris* (L.) Rchb.,  $2n = 48$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 815*.

#### CHENOPODIACEAE

*Atriplex hortensis* L.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 911, ML & EN 916*.

*Atriplex laevis* C.A. Mey.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 819*.  
*Atriplex patens* (Litv.) Iljin,  $2n = 36$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 779, ML & EN 781, ML & EN 783, ML & EN 820, ML & EN 885*.  
*Atriplex patula* L.,  $2n = 36$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 917*.  
*Axyris amaranthoides* L.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 790a*.  
*Axyris sphaerosperma* Fisch. & C.A. Mey.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 825*.  
*Chenopodium album* L.,  $2n = 54$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 791, ML & EN 800, ML & EN 808, ML & EN 871, ML 890*.  
*Chenopodium chenopodioides* (L.) Aellen,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 781, ML & EN 782, ML & EN 830b, ML & EN 912*.  
*Chenopodium ficifolium* Sm.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, 23 Jul 2011, *EN s.n.*  
*Chenopodium glaucum* L.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, 1 Sep 2011, *EN s.n.*; *ibid.*, *ML & EN 791, ML & EN 912*.  
*Chenopodium rubrum* L.,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 782, ML & EN 813, ML & EN 912*.  $2n = 36$ , Russia, Sakha (Yakutia) Republic, *ML & EN 886*.  
*Corispermum sibiricum* Iljin,  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 808*.  
*Kali collina* (Pall.) Akhani & Roalson (= *Salsola collina* Pall.),  $2n = 18$ ; Russia, Sakha (Yakutia) Republic, *ML & EN 780*.  
*Suaeda corniculata* (C.A. Mey.) Bunge subsp. *corniculata*,  $2n = 54$ ; Russia, Sakha (Yakutia) Republic, *EN 80, ML & EN 790, ML & EN 820, ML & EN 830b, ML & EN 878, ML & EN 883, ML & EN 889, ML 890, ML & EN 914*.  
*Suaeda corniculata* subsp. *mongolica* Lomon. & Freitag,  $2n = 36$ ; Russia, Buryatia Republic, 11 Sep 2011, *B. Naidanov s.n.*  
*Suaeda kulundensis* Lomon. & Freitag,  $2n = 90$ ; Russia, Novosibirskaya Oblast, *N. Makunina 283*.

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#### FABACEAE

*Vigna pilosa* (J.G. Klein ex Willd.) Baker,  $2n = 22$ ; India, Kerala state, Vazhachal, *P.K. Jayan & K.C. Velayudhan HSI2963* (NHCP).  
*Vigna sahyadriana* Aitawade & al.,  $2n = 22$ ; India, Rajasthan state, *S.R. Yadav SUK-2* (SUK).

**MALVACEAE**

- Abelmoschus crinitus* Wall.,  $2n = 66$ ; India, Orissa state, S.R. Yadav SRYA-2 (SUK).  
*Abelmoschus enbeepeegearensis* K.J. John & al.,  $2n = 72$ ; India, Kerala state, Joseph John K HS20926, 173899 (NHCP).

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**ALLIACEAE**

- Allium maximowiczii* Regel,  $2n = 16$ ; Russia, Khabarovskii Krai, Shantarskie Islands, Bogatov 12148.  
*Allium sacculiferum* Maxim.,  $2n = 32$ ; Russia, Primorskii Krai, Barkalov 12229.  
*Allium senescens* L.,  $2n = 16$ ; Russia, Primorskii Krai, Chubar' 12243.  
*Allium spirale* Willd.,  $2n = 32$ ; Russia, Primorskii Krai, Chubar' 12194.

**APIACEAE**

- Sanicula chinensis* Bunge,  $2n = 16$ ; Russia, Primorskii Krai, Rudyka 12187.

**ASTERACEAE**

- Artemisia mongolica* Fisch. ex Besser,  $2n = 18$ ; Russia, Primorskii Krai, Prozorova 8170.  
*Artemisia palustris* L.,  $2n = 18$ ; Russia, Republic of Buryatia, Tzyrenova 12198.  
*Bidens frondosa* L.,  $2n = 48$ ; Russia, Khabarovskii Krai, Probatova & Seledets 10500.  
*Hieracium virosum* Pall.,  $2n = 36$ ; Russia, Primorskii Krai, Barkalov 9204.  
*Pterocypsela raddeana* (Maxim.) C. Shih,  $2n = 18$ ; Russia, Primorskii Krai, Rudyka 12267.  
*Senecio viscosus* L.,  $2n = 40$ ; Russia, Primorskii Krai, Barkalov 7524.

**BORAGINACEAE**

- Heliotropium europaeum* L.,  $2n = 32$ ; Russia, Krasnodarskii Krai, Probatova & Seledets 11586.

**BRASSICACEAE**

- Cochlearia oblongifolia* DC.,  $2n = 14$ ; Russia, Khabarovskii Krai, Shantarskie Islands, Bogatov 12143.  
*Dimorphostemon pectinatus* (DC.) Golubk.,  $2n = 14$ ; Russia, Republic of Buryatia, Tzyrenova 12310.

**CRASSULACEAE**

- Orostachys maximowiczii* V.V. Byalt,  $2n = 24$ ; Russia, Primorskii Krai, Chubar' 12299.

**EUPHORBIACEAE**

- Euphorbia discolor* Ledeb.,  $2n = 24$ ; Russia, Primorskii Krai, Barkalov 9287.

**FABACEAE**

- Caragana microphylla* Lam.,  $2n = 16$ ; Russia, Zabaikal'skii Krai, Tzyrenova 12304.  
*Caragana stenophylla* Pojark.,  $2n = 32$ ; Russia, Zabaikal'skii Krai, Tzyrenova 12305.  
*Oxytropis charkeviczii* Vyschin,  $2n = 16$ ; Russia, Khabarovskii Krai, Barkalov 12190.  
*Vicia japonica* A. Gray,  $2n = 12$ ; Russia, Sakhalin, Barkalov 12142.

**GENTIANACEAE**

- Gentiana algida* Pall.,  $2n = 24$ ; Russia, Khabarovskii Krai, Barkalov 12202.

**GERANIACEAE**

- Geranium sibiricum* L.,  $2n = 28$ ; Russia, Primorskii Krai, Nesterova 9320.  
*Geranium wilfordii* Maxim.,  $2n = 28$ ; Russia, Primorskii Krai, Rudyka 11898.

**JUNCACEAE**

- Juncus gracillimus* (Buchenau) V. Krecz. & Gontsch.,  $2n = 40$ ; Russia, Amurskaya Oblast', Timchenko 11074.  
*Luzula capitata* (Miq.) Nakai,  $2n = 12$ ; Russia, the Kuril Islands, Barkalov 11784.

**LAMIACEAE**

- Clinopodium chinense* (Benth.) Kuntze,  $2n = 20$ ; Russia, Primorskii Krai, Probatova & Seledets 7440, Probatova & Seledets 7965, Rudyka 11983.  
*Dracocephalum charkeviczii* Prob.,  $2n = 14$ ; Russia, Primorskii Krai, Probatova & Rudyka 6163, Probatova & Seledets 7894.  
*Elsholtzia serotina* Kom.,  $2n = 16$ ; Russia, Primorskii Krai, Chubar' 12237.  
*Prunella asiatica* Ohwi,  $2n = 28$ ; Russia, Primorskii Krai, Probatova, Seledets & al. 6438.  
*Scutellaria ussuriensis* (Regel) Kudô,  $2n = 24$ ; Russia, Primorskii Krai, Barkalov 9855.

**MELANTHIACEAE**

- Acelidanthus anticloides* Trautv. & C.A. Mey.,  $2n = 16$ ; Russia, Khabarovskii Krai, Barkalov 12203.

**MENISPERMACEAE**

- Menispermum dauricum* DC.,  $2n = 52$ ; Russia, Khabarovskii Krai, Rudyka 12150.

**ONAGRACEAE**

- Oenothera strigosa* (Rydb.) Mack. & Bush,  $2n = 14$ ; Russia, Primorskii Krai, Barkalov 9213.

**PAPAVERACEAE**

- Chelidonium asiaticum* (Hara) Krahulc.,  $2n = 10$ ; Russia, Primorskii Krai, Probatova, Seledets & al. 6437.  
*Papaver sokolovskajae* Prob.,  $2n = 56$ ; Russia, Primorskii Krai, Prozorova 8411, Probatova & Rudyka 8636.

**PARNASSIACEAE**

- Parnassia palustris* L.,  $2n = 18$ ; Russia, Sakhalin, Barkalov 11527.

**PLANTAGINACEAE**

*Plantago asiatica* L.,  $2n = 24$ ; Russia, Amurskaya Oblast', *Timchenko* 11066.

**POACEAE**

*Dactylis polygama* Horv.,  $2n = 14$ ; Russia, Krasnodarskii Krai, *Probatova & Seledets* 11617.

*Digitaria asiatica* (Ohwi) Tzvelev,  $2n = 18$ ; Russia, Primorskii Krai, *Chubar' 10503, Chubar' 12200*.

*Digitaria ischaemum* (Schreb.) Muhl.,  $2n = 36$ ; Russia, Primorskii Krai, *Probatova & Seledets* 12118.

*Elymus ciliaris* (Trin.) Tzvelev,  $2n = 28$ ; Russia, Primorskii Krai, *Chubar' 12244*.

*Festuca rubra* L.,  $2n = 42$ ; Russia, Primorskii Krai, *Chubar' 12246*.

*Festuca vorobievii* Prob.,  $2n = 14$ ; Russia, Primorskii Krai, *Probatova & Seledets* 6433.

*Koeleria cristata* Pers.,  $2n = 14$ ; Russia, Primorskii Krai, *Barkalov* 12221.

*Leymus chinensis* (Trin.) Tzvelev,  $2n = 28$ ; Russia, Zabaikal'skii Krai, *Tzyrenova* 12309.

*Ochlopoa supina* (Schrad.) H. Scholz & Valdés,  $2n = 14$ ; Russia, Irkutskaya Oblast', *Chepinoga, Rosbakh & al.* 10509.

*Poa sergievskajae* Prob.,  $2n = 56$ ; Russia, Primorskii Krai, *Gulariants* 12171.

*Poa sichotensis* Prob.,  $2n = 42$ ; Russia, Primorskii Krai, *Barkalov* 12222.

*Poa cf. verae* Prob.,  $2n = 28$ ; Russia, Primorskii Krai, *Chubar' 12185, Chubar' 12196*.

**POLEMONIACEAE**

*Polemonium laxiflorum* Kitam.,  $2n = 18$ ; Russia, Khabarovskii Krai, *Barkalov* 12286.

**RANUNCULACEAE**

*Ranunculus japonicus* Thunb.,  $2n = 14$ ; Russia, Primorskii Krai, *Barkalov* 9274.

*Ranunculus novus* H. Lév. & Vaniot,  $2n = 28$ ; Russia, the Kuril Islands, *Barkalov* 11781.

**ROSACEAE**

*Potentilla longifolia* Willd. ex Schldl.,  $2n = 14$ ; Russia, Irkutskaya Oblast', *Tzyrenova* 12201.

*Potentilla sericea* L.,  $2n = 28$ ; Russia, Republic of Buryatia, *Tzyrenova* 11892.

*Sorbaria grandiflora* Maxim.,  $2n = 36$ ; Russia, Khabarovskii Krai, *Barkalov* 12188.

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Verkhozina), 12-04-31151 (to D.A. Krivenko) from the Russian Fund for Basic Research (RFBR), and by Interdisciplinary integration project Nr. 17, from the Siberian Branch of the Russian Academy of Sciences.

**AMARANTHACEAE**

*Amaranthus retroflexus* L.,  $2n = 32$ ; Russia, Irkutskaya Oblast', *AV* 12176 (VLA, IRK).

**ASTERACEAE**

*Cirsium vulgare* (Savi) Ten.,  $2n = 34$ ; Russia, Republic of Altai, *SK* 12333 (VLA, IRK).

*Echinops ritro* L.,  $2n = 32$ ; Russia, Republic of Altai, *SK* 12331 (VLA, IRK).

*Hieracium filifolium* Üksip,  $2n = 18$ ; Russia, Irkutskaya Oblast', *SK* 12334 (VLA, IRK).

*Leibnitzia anandria* (L.) Turcz.,  $2n = 46$ ; Russia, Irkutskaya Oblast', Ust'-Ordynskii Buryatskii Okrug, *SK* 12313 (VLA, IRK).

*Petasites rubellus* (J.F. Gmel.) Toman,  $2n = 60$ ; Russia, Irkutskaya Oblast', *SK* 11986 (VLA, IRK).

*Saussurea stubendorffii* Herder,  $2n = ca.39$ ; Russia, Republic of Buryatia, *SK* 12130 (VLA, IRK).

*Taraxacum printzii* Dahlst. ex Printz,  $2n = 24$ ; Russia, Irkutskaya Oblast', *SK* 11990 (VLA, IRK).

**BORAGINACEAE**

*Myosotis caespitosa* Schultz,  $2n = 48$ ; Russia, Zabaikal'skii Krai, *SK* 12292 (VLA, IRK).

**BRASSICACEAE**

*Rorippa palustris* (L.) Besser,  $2n = 16$ ; Russia, Zabaikal'skii Krai, *SK* 12278 (VLA, IRK).

**CARYOPHYLLACEAE**

*Peschkovia saxatilis* (Turcz. ex Fisch. & C.A. Mey.) Tzvelev,  $2n = 48$ ; Russia, Zabaikal'skii Krai, *SK* 11985 (VLA, IRK).

**CHENOPODIACEAE**

*Axyris amaranthoides* L.,  $2n = 18$ ; Russia, Republic of Sakha-Yakutia, *AV & Krivenko* 12332 (VLA, IRK).

*Chenopodium glaucum* L.,  $2n = 18$ ; Russia, Irkutskaya Oblast', *SK* 11989 (VLA, IRK).

**FABACEAE**

*Astragalus membranaceus* (Fisch.) Bunge,  $2n = 16$ ; Russia, Republic of Buryatia, *AV & SK* 12316 (VLA, IRK).

*Astragalus suffruticosus* DC.,  $2n = 16$ ; Russia, Republic of Buryatia, *SK* 12317 (VLA, IRK).

*Oxytropis sylvatica* DC.,  $2n = 16$ ; Russia, Republic of Buryatia, *AV* 12318 (VLA, IRK).

**GENTIANACEAE**

*Lomatogonium carinthiacum* A. Braun,  $2n = 32$ ; Russia, Republic of Buryatia, *SK* 12192 (VLA, IRK).

**ONAGRACEAE**

*Epilobium montanum* L.,  $2n = 36$ ; Russia, Irkutskaya Oblast', *AV* 12166 (VLA, IRK).

**PAPAVERACEAE**

*Papaver rubro-aurantiacum* Lundstr.,  $2n = 14$ ; Russia, Zabaikal'skii Krai, *SK* 12141 (VLA, IRK).

**POACEAE**

*Agropyron michnoi* Roshev.,  $2n = 28$ ; Russia, Republic of Buryatia, *AG* 12283 (VLA, LE).

*Alopecurus aequalis* Sobol.,  $2n = 14$ ; Russia, Republic of Altai, *AG*



- 12228 (VLA, LE), *AG & Nossov 12241* (VLA, LE); Russia, Irkutskaya Oblast', *AG 12251* (VLA, LE).  
*Alopecurus pratensis* L.,  $2n = 28$ ; Russia, Altaiskii Krai, *AG 12235* (VLA, LE); Russia, Republic of Altai, *AG 12232* (VLA, LE), *AG 12253* (VLA, LE).  
*Arctopoa subfastigiata* (Trin.) Prob.,  $2n = 42$ ; Russia, Irkutskaya Oblast', *AG 12285* (VLA, LE).  
*Beckmannia syzigachne* (Steud.) Fernald,  $2n = 14$ ; Russia, Republic of Altai, *AG & Nossov 12263* (VLA, LE); Russia, Irkutskaya Oblast', *AG 12289* (VLA, LE).  
*Brachypodium sylvaticum* (L.) P. Beauv.,  $2n = 18$ ; Abkhazia, *AG & Ufimov 12269* (VLA, LE); Russia, Krasnodarskii Krai, *AG & Ufimov 12254* (VLA, LE); Russia, Republic of Daghestan, *AG & Ufimov 12258* (VLA, LE).  
*Echinochloa crus-galli* (L.) P. Beauv.,  $2n = 54$ ; Russia, Krasnodarskii Krai, *AG & Ufimov 12262* (VLA, LE).  
*Elymus sibiricus* L.,  $2n = 28$ ; Russia, Republic of Altai, *AG 12255*, *AG 12261*; Russia, Zabaikal'skii Krai, *SK 12277* (VLA, IRK).  
*Festuca altaica* Trin.,  $2n = 28$ ; Russia, Republic of Altai, *AG 12264* (VLA, LE).  
*Festuca musbelica* (Reverd.) Ikonn.,  $2n = 14$ ; Russia, Zabaikal'skii Krai, *AG & Gnutikova 12295* (VLA, LE).  
*Homalotrichon pubescens* (Huds.) Banfi, Galasso & Bracchi,  $2n = 14$ ; Russia, Republic of Altai, *AG 12284* (VLA, LE).  
*Hordeum brevisubulatum* Link,  $2n = 28$ ; Russia, Republic of Altai, *AG 12257* (VLA, LE).  
*Hordeum jubatum* L.,  $2n = 28$ ; Russia, Altaiskii Krai, *AG 12298* (VLA, LE).  
*Koeleria cristata* Pers.,  $2n = 28$ ; Russia, Irkutskaya Oblast', Ust'-Ordynskii Buryatskii Okrug, *AG 12288* (VLA, LE).  
*Leymus paboanus* (Claus) Pilg.,  $2n = 28$ ; Russia, Republic of Buryatia, *Krivenko 12294* (VLA, IRK).  
*Melica turczaninowiana* Ohwi,  $2n = 18$ ; Russia, Irkutskaya Oblast', *AG 12239* (VLA, LE).  
*Ochlopoa supina* (Schrad.) H. Scholz & Valdés,  $2n = 14$ ; Russia, Irkutskaya Oblast', *AG 12265* (VLA, LE).  
*Phleum phleoides* (L.) H. Karst.,  $2n = 14$ ; Russia, Republic of Altai, *AG 12260* (VLA, LE).  
*Phleum pratense* L.,  $2n = 42$ ; Russia, Republic of Altai, *AG 12287* (VLA, LE).  
*Secale cereale* L.,  $2n = 14$ ; Russia, Irkutskaya Oblast', *Dorofeev 12272* (VLA, IRK).  
*Setaria glareosa* V. Petrov,  $2n = 18$ ; Russia, Irkutskaya Oblast', *AG 12233* (VLA, LE).  
*Stipa capillata* L.,  $2n = 44$ ; Russia, Irkutskaya Oblast', *AG 12291* (VLA, LE).  
*Stipa krylovii* Roshev.,  $2n = 44$ ; Russia, Irkutskaya Oblast', *AG 12290* (VLA, LE).  
*Trisetum sibiricum* Rupr.,  $2n = 14$ ; Russia, Republic of Altai, *AG 12266* (VLA, LE).

**POLEMONIACEAE**

- Polemonium racemosum* Kitam.,  $2n = 18$ ; Russia, Zabaikal'skii Krai, *SK 12276* (VLA, IRK).

**POLYGONACEAE**

- Acetosa thyrsiflora* (Fingerh.) Á. Löve,  $2n = 14, 15$ ; Russia, Irkutskaya Oblast', *SK 11055* (VLA, IRK).  
*Aconogonon ochreatum* Nakai,  $2n = 20$ ; Russia, Irkutskaya Oblast', *SK 11056* (VLA, IRK).  
*Persicaria maculosa* Gray,  $2n = 40$ ; Russia, Irkutskaya Oblast', *SK & Pochinchik 12127* (VLA, IRK).

**PRIMULACEAE**

- Androsace septentrionalis* L.,  $2n = 20$ ; Russia, Zabaikal'skii Krai, Aginskii Buryatskii Natsional'nyi Okrug, *SK 12315* (VLA, IRK).

**SCROPHULARIACEAE**

- Chaenorhinum minus* (L.) Lange,  $2n = 14$ ; Russia, Primorskii Krai, *Gulariants & Lapenko 12327* (VLA).

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All materials CHN; vouchers in VLA.

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**ASTERACEAE**

- Anaphalis sinica* Hance,  $2n = 28$ ; Russia, Primorskii Krai, *Nechaev 12230*.  
*Centaurea pseudomaculosa* Dobroc.,  $2n = 18$ ; Russia, Primorskii Krai, *Nechaev 12042*.  
*Inula linariifolia* Turcz.,  $2n = 16$ ; Russia, Khabarovskii Krai, *Rudyka 12151*; Russia, Primorskii Krai, *Nechaev 11442*.  
*Turczaninowia fastigiata* (Fisch.) DC.,  $2n = 18$ ; Russia, Khabarovskii Krai, *Kriukova, Motorykina & al. 12220*.

**BORAGINACEAE**

- Myosotis caespitosa* Schultz,  $2n = 24$ ; Russia, Primorskii Krai, *Nechaev 12152*.

**CARYOPHYLLACEAE**

- Melandrium apricum* (Turcz.) Rohrb.,  $2n = 24$ ; Russia, Evreiskaya Avtonomnaya Oblast', *Motorykina 12281*.  
*Moehringia lateriflora* (L.) Fenzl,  $2n = 24$ ; Russia, Primorskii Krai, *Nechaev 12208*.  
*Silene repens* Patr. ex Pers.,  $2n = 24$ ; Russia, Primorskii Krai, *Nechaev 12181*.

**CHENOPODIACEAE**

- Chenopodium polyspermum* L.,  $2n = 18$ ; Russia, Khabarovskii Krai, *Antonova, Kriukova & al. 12212*.

**EUPHORBIACEAE**

- Phyllanthus ussuriensis* Rupr. & Maxim.,  $2n = 26$ ; Russia, Khabarovskii Krai, *Kriukova, Antonova & al. 12211*.

**FABACEAE**

- Astragalus uliginosus* L.,  $2n = 16$ ; Russia, Evreiskaya Avtonomnaya Oblast', *Motorykina 12279*.  
*Melilotoides schischkinii* (Vassilcz.) Soják,  $2n = 16$ ; Russia, Primorskii Krai, *Nechaev 12249*.  
*Vicia ramuliflora* (Maxim.) Ohwi,  $2n = 12$ ; Russia, Primorskii Krai, *Nechaev 10587*.

**IRIDACEAE**

- Iris ensata* Thunb.,  $2n = 24$ ; Russia, Khabarovskii Krai, *Motorykina 12282*.

**LAMIACEAE**

- Dracocephalum charkeviczii* Prob.,  $2n = 14$ ; Russia, Primorskii Krai, *Nechaev 12145*.

*Lycopus lucidus* Turcz. ex Benth.,  $2n = 22$ ; Russia, Primorskii Krai, Nechaev 10706.  
*Schizonepeta multifida* Briq.,  $2n = 12$ ; Russia, Primorskii Krai, Nechaev 12245.

**LINACEAE**

*Linum amurense* Alef.,  $2n = 18$ ; Russia, Primorskii Krai, Nechaev 11775.

**ONAGRACEAE**

*Oenothera strigosa* (Rydb.) Mack. & Bush,  $2n = 14$ ; Russia, Evreiskaya Avtonomnaya Oblast', Motorykina 12280.

**OXALIDACEAE**

*Oxalis acetosella* L.,  $2n = 22$ ; Russia, Primorskii Krai, Semeikin 12094.

**PAPAVERACEAE**

*Chelidonium asiaticum* (Hara) Krahulc.,  $2n = 10$ ; Russia, Khabarovskii Krai, Motorykina 12368.

**POACEAE**

*Alopecurus aequalis* Sobol.,  $2n = 14$ ; Russia, Primorskii Krai, Nechaev 12303.  
*Calamagrostis brachytricha* Steud.,  $2n = 56$ ; Russia, Primorskii Krai, Nechaev 12195.  
*Cleistogenes probatovae* Tzvelev,  $2n = 40$ ; Russia, Primorskii Krai, Nechaev 12300.  
*Digitaria asiatica* (Ohwi) Tzvelev,  $2n = 18$ ; Russia, Primorskii Krai, Nechaev 10507.  
*Elymus pendulinus* (Nevski) Tzvelev,  $2n = 28$ ; Russia, Primorskii Krai, Nechaev 12248.  
*Leymus coreanus* (Honda) K.B. Jensen & R.R.-C. Wang,  $2n = 28$ ; Russia, Primorskii Krai, Nechaev 12206.  
*Poa vorobievii* Prob.,  $2n = 28$ ; Russia, Primorskii Krai, Nechaev 11398, Nechaev 11607.

**PRIMULACEAE**

*Androsace septentrionalis* L.,  $2n = 20$ ; Russia, Khabarovskii Krai, Shlotgauer & Kriukova 12219.  
*Cortusa amurensis* Fed.,  $2n = 24$ ; Russia, Khabarovskii Krai, Kriukova 12216.  
*Cortusa sibirica* Andr. ex Besser,  $2n = 24$ ; Russia, Khabarovskii Krai, Kriukova 9068.

**ROSACEAE**

*Agrimonia coreana* Nakai,  $2n = 28$ ; Russia, Primorskii Krai, Nechaev 12149.  
*Geum urbanum* L.,  $2n = 42$ ; Russia, Primorskii Krai, Yakubov 12307.  
*Potentilla acervata* Soják,  $2n = 14$ ; Russia, Amurskaya Oblast', Timchenko 11098; Russia, Khabarovskii Krai, Motorykina & Kriukova 12363; Russia, Primorskii Krai, Lapenko 11534.  
*Potentilla anserina* L.,  $2n = 28$ ; Russia, Khabarovskii Krai, Motorykina 12367.  
*Potentilla argentea* L.,  $2n = 28$ ; Russia, Amurskaya Oblast', Tolmacheva 10449; Russia, Primorskii Krai, Nechaev 11016, Lapenko 11571.  
*Potentilla centigrana* Maxim.,  $2n = 14$ ; Russia, Khabarovskii Krai, Tolmacheva 9109, Motorykina & Korobitsina 12364, Motorykina & Kriukova 12365.  
*Potentilla chinensis* Ser.,  $2n = 14$ ; Russia, Amurskaya Oblast', Timchenko 11547; Russia, Khabarovskii Krai, Motorykina & Korobitsina 12329; Russia, Primorskii Krai, Nechaev 9283, Lapenko 11689, Chubar' 12273.  
*Potentilla cryptotaeniae* Maxim.,  $2n = 14$ ; Russia, Primorskii Krai, Probatova & Seledets 9590.

*Potentilla fragarioides* L.,  $2n = 14$ ; Russia, Khabarovskii Krai, Motorykina 12366; Russia, Primorskii Krai, Probatova & Seledets 9592, Nechaev 12209, Volynets 12274.  
*Potentilla fragiformis* Willd. ex Schldtl.,  $2n = 28$ ; Russia, Far East, Khabarovskii Krai, Shantarskye Islands, Bogatov 12147.  
*Potentilla multifida* L.,  $2n = 28$ ; Russia, Republic of Buryatia, Probatova & Seledets 9375; Russia, Amurskaya Oblast', Probatova & Seledets 9373, Timchenko 11097.  
*Potentilla norvegica* L.,  $2n = 56$ ; Russia, Amurskaya Oblast', Tolmacheva 10452; Russia, Primorskii Krai, Barkalov 9295.  
*Potentilla pacifica* Howell,  $2n = 28$ ; Russia, Khabarovskii Krai, Tolmacheva 9940; Russia, Primorskii Krai, Nechaev 11392.  
*Potentilla stolonifera* Lehm. ex Ledeb.,  $2n = 14$ ; Russia, Kamchatka, Yakubov 12306.  
*Potentilla supina* L.,  $2n = 28$ ; Russia, Khabarovskii Krai, Tolmacheva 10455; Russia, Amurskaya Oblast', Probatova & Seledets 9372, Tolmacheva 10453; Russia, Primorskii Krai, Shatalova 7708, Probatova & Seledets 9262, Lapenko 12179.  
*Potentilla tergemina* Soják,  $2n = 28$ ; Russia, Primorskii Krai, Barkalov 9276, Nesterova 9315.

**RUBIACEAE**

*Galium maximowiczii* (Kom.) Pobed.,  $2n = 22$ ; Russia, Primorskii Krai, Nechaev 12183.

**VIOLACEAE**

*Viola acuminata* Ledeb.,  $2n = 20$ ; Russia, Khabarovskii Krai, Motorykina 12297.

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**ASTERACEAE**

*Centaurea nigra* L. subsp. *nigra*,  $2n = 22$ ; 8 Sep 1984, MJL s.n. (LEB 26357).

**FABACEAE**

*Oxytropis foucaudii* Gillot,  $2n = 16$ ; 16 Jul 2002, EP s.n. (LEB 79999).  
*Oxytropis halleri* W.D.J. Koch subsp. *halleri*,  $2n = 32$ ; 27 Jul 2007, EP s.n. (LEB 92474).  
*Oxytropis neglecta* Ten.,  $2n = 16$ ; 3 Aug 2007, FE s.n. (LEB 92149).

**LAMIACEAE**

*Sideritis borgiae* J. Andrés subsp. *borgiae*,  $2n = 34$ ; 24 Aug 2004, FE s.n. (LEB 82987).

**RANUNCULACEAE**

*Anemone pavoniana* Boiss.,  $2n = 16$ ; 16 Jul 2002, EP s.n. (LEB 79495).  
*Pulsatilla vernalis* (L.) Mill.,  $2n = 16$ ; 16 Jul 2002, EP s.n. (LEB 80015).  
*Ranunculus seguieri* Vill.,  $2n = 16$ ; 18 Jun 2008, EP & FE s.n. (LEB 102249).

**ROSACEAE**

*Potentilla nivalis* Lapeyr. subsp. *nivalis*,  $2n = 14$ ; 16 Jul 2002, EP s.n. (LEB 80001).

**SCROPHULARIACEAE**

- Pedicularis comosa* L. subsp. *comosa*,  $2n = 16$ ; 16 Jul 2002, EP s.n. (LEB 80016).  
*Pedicularis pyrenaica* J. Gay subsp. *pyrenaica*,  $2n = 16$ ; 16 Jul 2002, EP s.n. (LEB 79488).

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All materials CHN, gathered in situ (SE France), fixed on flowers (F) or seedlings (S) produced from seeds collected by us or by the Conservatoire Botanique National Méditerranéen (CBNMED), and counted by R. Verlaque and B. Vila; vouchers in MARS.

This study was supported by the Parc National de Port-Cros and the CBNMED. Authors are grateful to colleagues who helped us with plant localisation and sampling. This work is dedicated to the eminent scientist Dr. Juliette Contandriopoulos (1922–2011).

**APIACEAE**

- Tordylium apulum* L.,  $2n = 20$ ; Verlaque F09-110.

**ASTERACEAE**

- Tractylis cancellata* L.,  $2n = 20$ ; CBNMED-Alziar S09-67.  
*Carduus litigiosus* Nocca & Balbis subsp. *litigiosus*,  $2n = 32$ ; Verlaque & Vila S09-70, Verlaque & Vila S09-74, Verlaque & Vila F09-149.  
*Carduus litigiosus* subsp. *horridissimus* (Briq. & Cavill.) Franco,  $2n = 32$ ; Verlaque F09-109.  
*Centaurea balbisiana* Soldano subsp. *balbisiana*,  $2n = 21, 22$ ; Verlaque & Vila S09-69.  $2n = 22$ ,  $n = 10, 11$ ; Verlaque & Vila F09-145.  
*Centaurea balbisiana* subsp. *aemilii* (Briq.) Kerguelen,  $2n = 22, 23, (24)$ ; Verlaque S09-66.  $2n = (22), 23, 24$ ; Verlaque & Vila F09-148.  
*Centaurea balbisiana* subsp. *verguinii* (Briq. & Cavill.) Kerguelen,  $2n = 22$ ; Verlaque & Vila F09-153.  
*Leucanthemum virgatum* (Desr.) Clos,  $2n = 18, n = 9$ ; Médail F96-5, Médail F96-56.  
*Phagnalon rupestre* subsp. *annoticum* (Burnat) Pignatti,  $2n = 18$ ; CBNMED-Noble S09-1.  
*Serratula lycopifolia* (Vill.) A. Kern.,  $2n = 60$ ; CBNMED-Michaud S10-11.

**BRASSICACEAE**

- Cardamine asarifolia* L.,  $2n = 48, n = 24$ ; Contandriopoulos F74-170.

- Hesperis inodora* L.,  $2n = 14$ ; CBNMED-Polidori S10-150.  $2n = 14, n = 7$ ; Aboucaya F95-149.

**CAMPANULACEAE**

- Campanula fritschii* Witasek,  $2n = 34, n = 17$ ; Verlaque & Vila F09-154.  
*Campanula macrorhiza* DC.,  $2n = 68$ ; Verlaque F09-113.

**CARYOPHYLLACEAE**

- Holosteum umbellatum* subsp. *hirsutum* (Mutel) Breistr.,  $2n = 40$ ; CBNMED-Noble F11-116.  
*Moehringia sedoides* (Pers.) Loisel.,  $2n = 24$ ; Médail F96-51, Médail F96-54, Verlaque F09-112.

**CISTACEAE**

- Helianthemum lunulatum* DC.,  $2n = 22, n = 11$ ; Aboucaya F95-146.  
*Helianthemum nummularium* subsp. *berterianum* (Bertol.) Breistr.,  $2n = 20$ ; Verlaque F09-102.

**CRASSULACEAE**

- Sedum fragrans* t Hart,  $2n = 20, n = 10$ ; Médail F96-58.

**EUPHORBIACEAE**

- Euphorbia canutii* Parl.,  $2n = 14, n = 7$ ; Verlaque F09-100, Verlaque F09-101.

**FABACEAE**

- Hedysarum brigantiacum* Bourn., Chas & Kerguelen,  $2n = 14$ ; Verlaque F99-167.

**LAMIACEAE**

- Ballota frutescens* (L.) Woods,  $2n = 24, n = 12$ ; Verlaque F09-111.  
*Micromeria marginata* (Sm.) Chater,  $2n = 30$ ; Verlaque & Vila F09-151; CBNMED-Lavagne S09-64.  
*Teucrium lucidum* L.,  $2n = 34, n = 17$ ; Médail F96-52.

**LILIACEAE**

- Lilium pomponium* L.,  $2n = 24$ ; Médail F95-147, Médail F95-148, Verlaque & Vila F09-150.

**MALVACEAE**

- Lavatera punctata* All.,  $2n = 42$ ; CBNMED-Morvant S09-02.

**RANUNCULACEAE**

- Delphinium dubium* (Rouy & Foucaud) Pawł.,  $2n = 32, n = 16$ ; Verlaque F99-160, Verlaque F99-160.  
*Ranunculus canutii* Coss. ex Ardoino,  $2n = 32$ ; Verlaque F09-108.

**ROSACEAE**

- Potentilla delphinensis* Gren. & Godr.,  $2n = 56$ ; Caille F-S1, Caille F-S2.  
*Potentilla grandiflora* L.,  $2n = 28$ ; Caille F-M2, Caille F-M3.

## IOPB COLUMN

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## IAPT/IOPB chromosome data 15

Edited by Karol Marhold

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Methods for chromosome analysis are according to Guerra & Souza (2002).

- \* First chromosome count for the genus.
- \*\* First chromosome count for the species.
- \*\*\* New cytotype for the species.

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## CACTACEAE

Subfamily **Cactoideae**Tribe **Cereeae**

\* *Arrojadoa aureispina* Buining & Brederoo

$2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°31.39'S, 41°14.79'W, 29 Mar 2010, *J.P. Castro 112* (EAN) [Fig. 1C].

\*\* *Arrojadoa penicillata* Britton & Rose

$2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°34.45'S, 41°34.45'W, 13 May 2007, *L.P. Felix 11592* (EAN) [Fig. 2I].

\*\* *Arrojadoa rhodantha* Britton & Rose

$2n = 22$ , CHN. Brazil, Bahia, Jacobina, Fazenda Exu, 11°10.50'S, 40°31.06'W, 10 May 2007, *L.P. Felix 11895* (EAN) [Fig. 2J].

*Cereus jamacaru* DC.

$2n = 22$ , CHN. Brazil, Paraíba, Fagundes, 07°21.18'S, 35°46.30'W, 10 Apr 2007, *L.P. Felix 11977* (EAN) [Fig. 2K].

\*\* *Melocactus azureus* Buining & Brederoo

$2n = 44$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°21.70'S, 41°22.88'W, 29 Mar 2010, *J.P. Castro 186* (EAN) [Fig. 1D].

*Melocactus bahiensis* Luetzelb.

$2n = 44$ , CHN. Brazil, Paraíba, Picuí, 06°32.29'S, 36°26.44'W, 10 Apr 2007, *L.P. Felix 11780* (EAN) [Fig. 3A].

*Melocactus ernestii* Vaupel

$2n = 44$ , CHN. Brazil, Paraíba, Esperança, Lagoa de Pedra, 07°01.59'S, 35°51.26'W, 1 Jan 2007, *N.A. Porto 25* (EAN) [Fig. 3B].

\*\* *Melocactus lanssensianus* P.J. Braun

$2n = 22$ , CHN. Brazil, Bahia, Jaraguari, 09°59.15'S, 40°13.54'W, 5 Apr 2010, *J.P. Castro 198* (EAN) [Fig. 3C].

\*\* *Melocactus levitestatus* Buining & Brederoo

$2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°28.63'S, 41°22.21'W, 4 Apr 2010, *J.P. Castro 188* (EAN) [Fig. 1E].

*Melocactus oreas* Miq.

$2n = 44$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°33.67'S, 41°08.81'W, 5 Apr 2010, *J.P. Castro 139* (EAN) [Fig. 1F].

*Melocactus zehntneri* (Britton & Rose) Luetzelb.

$2n = 44$ , CHN. Brazil, Alagoas, Pariconha, Fazenda Araticum, 09°14.29'S, 28°01.44'W, 25 Mar 2008, *L.P. Felix 12189* (EAN) [Fig. 1G].

\* *Micranthocereus flaviflorus* Buining & Brederoo

$2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, Rod. BA 426, Km 13, 11°06.87'S, 40°51.86'W, 2 Apr 2010, *J.P. Castro 91* (EAN) [Fig. 1H].

\* *Pilosocereus chrysostele* (Vaupel) Byles & G.D. Rowley

$2n = 22$ , CHN. Brazil, Rio Grande do Norte, Carnaúba dos Dantas, 06°33'08.5"S, 36°29'33.8"W, 10 Apr 2007, *L.P. Felix 11781* (EAN) [Fig. 3D].

\*\* *Pilosocereus gounellei* (F.A.C. Weber ex K. Schum.) Byles & G.D. Rowley

$2n = 22$ , CHN. Brazil, Rio Grande do Norte, Caranúba dos Dantas, 06°23'35.6"S, 36°26'23.5"W, 10 Apr 2007, *L.P. Felix 11791* (EAN) [Fig. 3E].

\*\* *Pilosocereus pachycladus* F. Ritter subsp. *pachycladus*

$2n = 44$ , CHN. Brazil, Bahia, Senhor do Bonfim, 10°26.74'S, 40°13.26'W, 31 Mar 2010, *J.P. Castro 90* (EAN) [Fig. 4A].

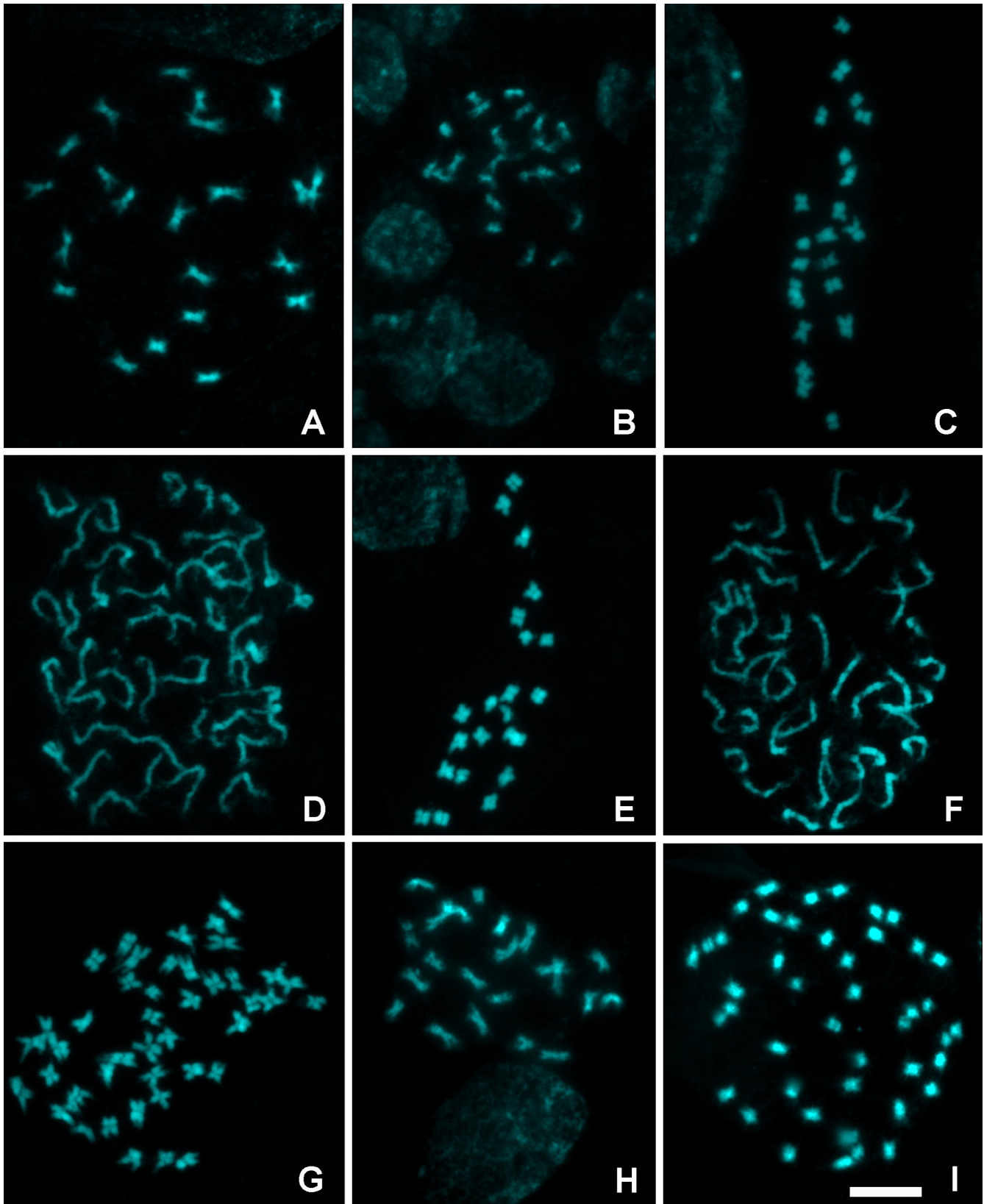
\*\* *Pilosocereus pachycladus* subsp. *pernambucoensis*

(F. Ritter) Zappi

$2n = 22$ , CHN. Brazil, Pernambuco, Gravatá, Serra das Russas, 08°12.04'S, 35°33.35'W, 30 Apr 2007, *L.P. Felix 11894* (EAN) [Fig. 3F].

$2n = 44$ , CHN. Brazil, Alagoas, Pariconha, Sítio Araticum 09°14.29'S, 28°01.44'W, 25 Mar 2008 *L.P. Felix 12177* (EAN) [Fig. 1I].

All materials for the chromosome column should be submitted electronically to: Karol Marhold, [karol.marhold@savba.sk](mailto: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.



**Fig. 1.** **A**, *Pereskia grandiflora*,  $2n = 22$ ; **B**, *Tacinga funalis*,  $2n = 22$ ; **C**, *Arrojadoa aureispina*,  $2n = 22$ ; **D**, *Melocactus azureus*,  $2n = 44$ ; **E**, *Melocactus levitestatus*,  $2n = 22$ ; **F**, *Melocactus oreas*,  $2n = 44$ ; **G**, *Melocactus zehntneri*,  $2n = 44$ ; **H**, *Micranthocereus flaviflorus*,  $2n = 22$ ; **I**, *Pilosocereus pachycladus* subsp. *pernambucoensis*,  $2n = 44$ . — Scale bar = 10  $\mu\text{m}$ .

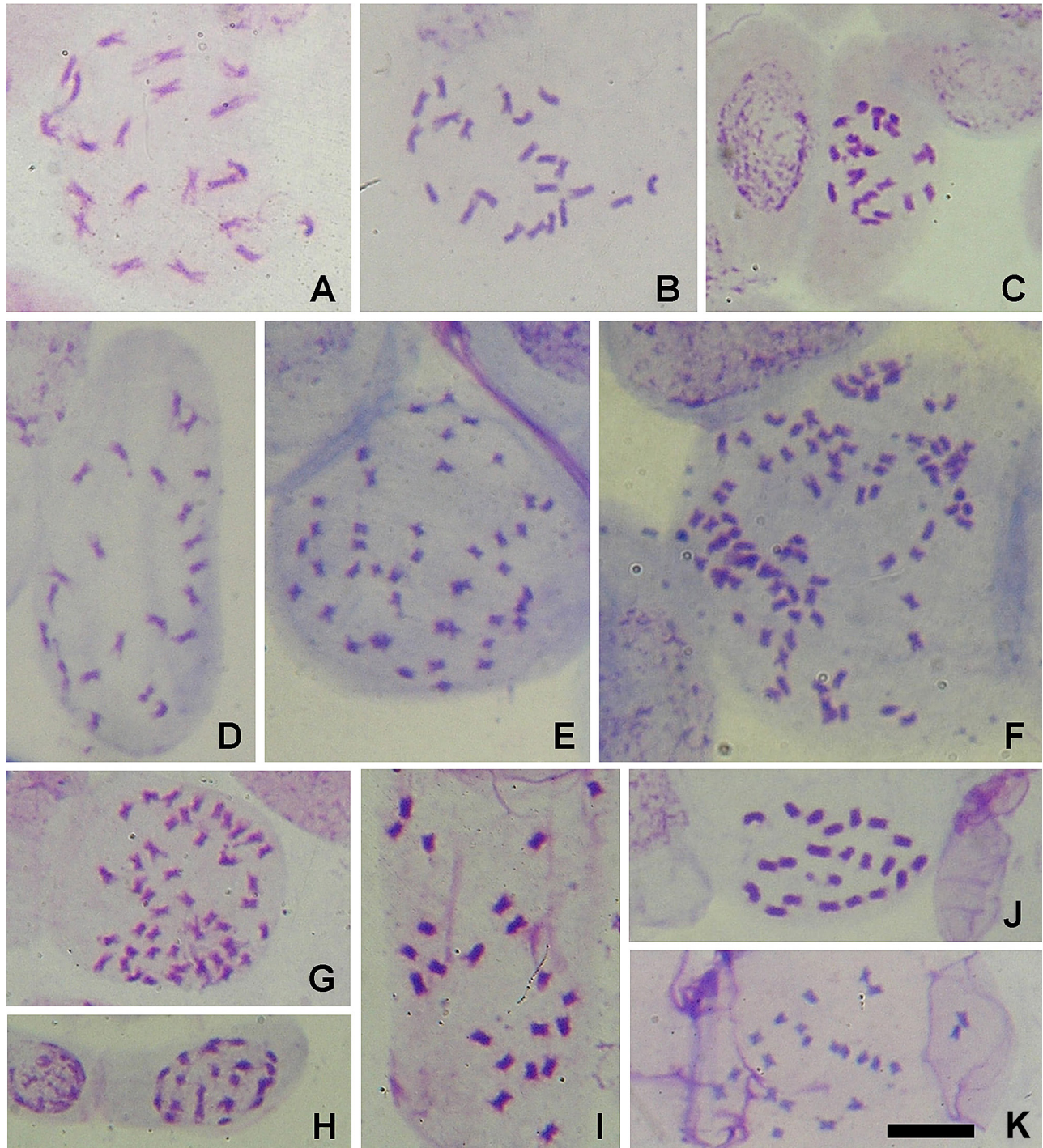
*Pilosocereus pentaedrophorus* (Labour) Byles & G.D. Rowley  
 $2n = 22$ , CHN. Brazil, Bahia, Jacobina, Paraíso, Faz. Exu,  
 11°17.51'S, 40°14'59.3"W, 11 May 2007, L.P. Felix 11843 (EAN)  
 [Fig. 4B].

\**Stephanocereus luetzelburgii* (Vaupel) N.P. Taylor & Eggli  
 $2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu 11°33'67.8"S,  
 41°08'80.9"W, 2 Apr 2010, J.P. Castro 140 (EAN) [Fig. 4C].

Tribe **Trichocreeae**

\*\**Discocactus zehntneri* Britton & Rose  
 $2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, 29°28.39'S,  
 41°20.61'W, 4 Apr 2010, J.P. Castro 175 (EAN) [Fig. 4D].

\*\**Harrisia adscendens* (Gürke) Britton & Rose  
 $2n = 22$ , CHN. Brazil, Pernambuco, Salgueiro, 08°22'65.5"S,  
 39°09.15'W, 29 Mar 2010, J.P. Castro 13 (EAN) [Fig. 4E].



**Fig. 2.** A, *Pereskia aculeata*,  $2n = 22$ ; B, *Pereskia bahiensis*,  $2n = 22$ ; C, *Brasilopuntia brasiliensis*,  $2n = 22$ ; D, *Nopalea cochenillifera*,  $2n = 22$ ; E, *Opuntia dillenii*,  $2n = 44$ ; F, *Opuntia ficus-indica*,  $2n = 88$ ; G, *Tacinga inamoena*,  $2n = 44$ ; H, *Tacinga palmadora*,  $2n = 22$ ; I, *Arrojadoa penicillata*,  $2n = 22$ ; J, *Arrojadoa rhodantha*,  $2n = 22$ ; K, *Cereus jamacaru*,  $2n = 22$ . — Scale bar = 10  $\mu$ m.

Tribe **Hylocereeae***Epiphyllum phyllanthus* (L.) Haw.

$2n = 22$ , CHN. Brazil, Paraíba, Serraria, Faz. Baixa Verde, 06°49.35'S, 35°38.23'W, 4 Apr 2012, *E.M. Almeida 186* (EAN) [Fig. 4F].

\*\* *Hylocereus setaceus* (Salm-Dyck ex DC.) Rauf Bauer

$2n = 44$ , CHN. Brazil, Paraíba, Serraria, Faz. Baixa Verde, 06°49.35'S, 35°38.23'W, 24 Jul 2013 *L.P. Felix 14298* (EAN) [Fig. 4G].

Subfamily **Opuntioideae***Brasilopuntia brasiliensis* (Willd.) A. Berger

$2n = 22$ , CHN. Brazil, Paraíba, Serraria, 06°49.35'S, 35°38.23'W, 24 Jan 2007, *L.P. Felix 11515* (EAN) [Fig. 2C].

*Nopalea cochenillifera* (L.) Salm-Dyck 'alagoense'

$2n = 22$ , CHN. Brazil, Paraíba, Areia, Centro de Ciências Agrária, 06°57.48'S, 35°41.30'W, 24 Jul 2013, *L.P. Felix 14281* (EAN) [Fig. 2D].

*Opuntia dillenii* Haw.

$2n = 44$ , CHN. Brazil, Areia, 06°57.48'S, 35°41.30'W, 24 Jul 2013, *L.P. Felix 14280* (EAN) [Fig. 2E].

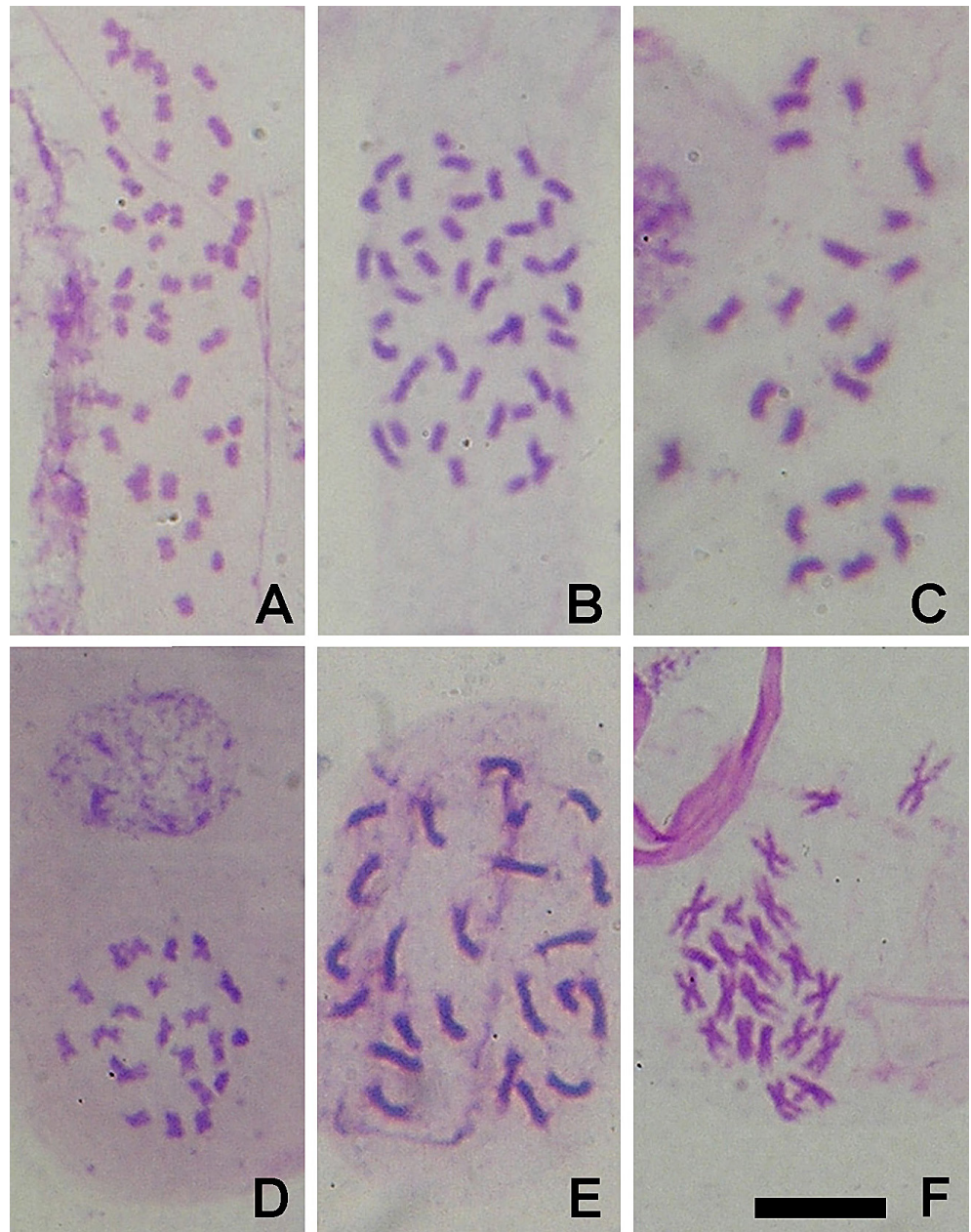
*Opuntia ficus-indica* (L.) Mill. 'redonda'

$2n = 88$ , CHN. Brazil, Paraíba, Areia, 06°56.02'S, 35°41.58'W, 24 Mar 2013, *L.P. Felix 14290* (EAN) [Fig. 2F].

*Tacinga funalis* Britton & Rose

$2n = 22$ , CHN. Brazil, Bahia, Morro do Chapéu, 11°25.00'S, 41°02.43'W, 3 Apr 2010, *J.P. Castro 153* (EAN) [Fig. 1B].

**Fig. 3. A**, *Melocactus bahiensis*,  $2n = 44$ ; **B**, *Melocactus ernestii*,  $2n = 44$ ; **C**, *Melocactus lanssen-sianus*,  $2n = 22$ ; **D**, *Pilosocereus chrysostele*,  $2n = 22$ ; **E**, *Pilosocereus gounellei*,  $2n = 22$ ; **F**, *Pilosocereus pachycladus* subsp. *pernambucoensis*,  $2n = 22$ . — Scale bar = 10  $\mu$ m.



\*\*\* *Tacinga inamoena* (K. Schum.) N.P. Taylor & Stuppy  
 $2n = 44$ , CHN. Brazil, Rio Grande do Norte, Carnaúba dos Dantas, 06°33.09' S, 36°29.34' W, 10 Apr 2007, *L.P. Felix 11797* (EAN) [Fig. 2G].

\*\* *Tacinga palmadora* (Britton & Rose) N.P. Taylor & Stuppy  
 $2n = 22$ , CHN Brazil, Paraíba, São João do Cariri, Fazenda Experimental, 07°23.27' S, 36°31.58' W, 24 May 2007, *L.P. Felix 11902* (EAN) [Fig. 2H].

Subfamily **Pereskioideae**

*Pereskia aculeata* Mill.

$2n = 22$ , CHN. Brazil, Paraíba, Serraria, Faz. Baixa Verde, 06°49.35' S, 35°38.23' W, 20 Oct 2008, *L.P. Felix 12568* (EAN) [Fig. 2A].

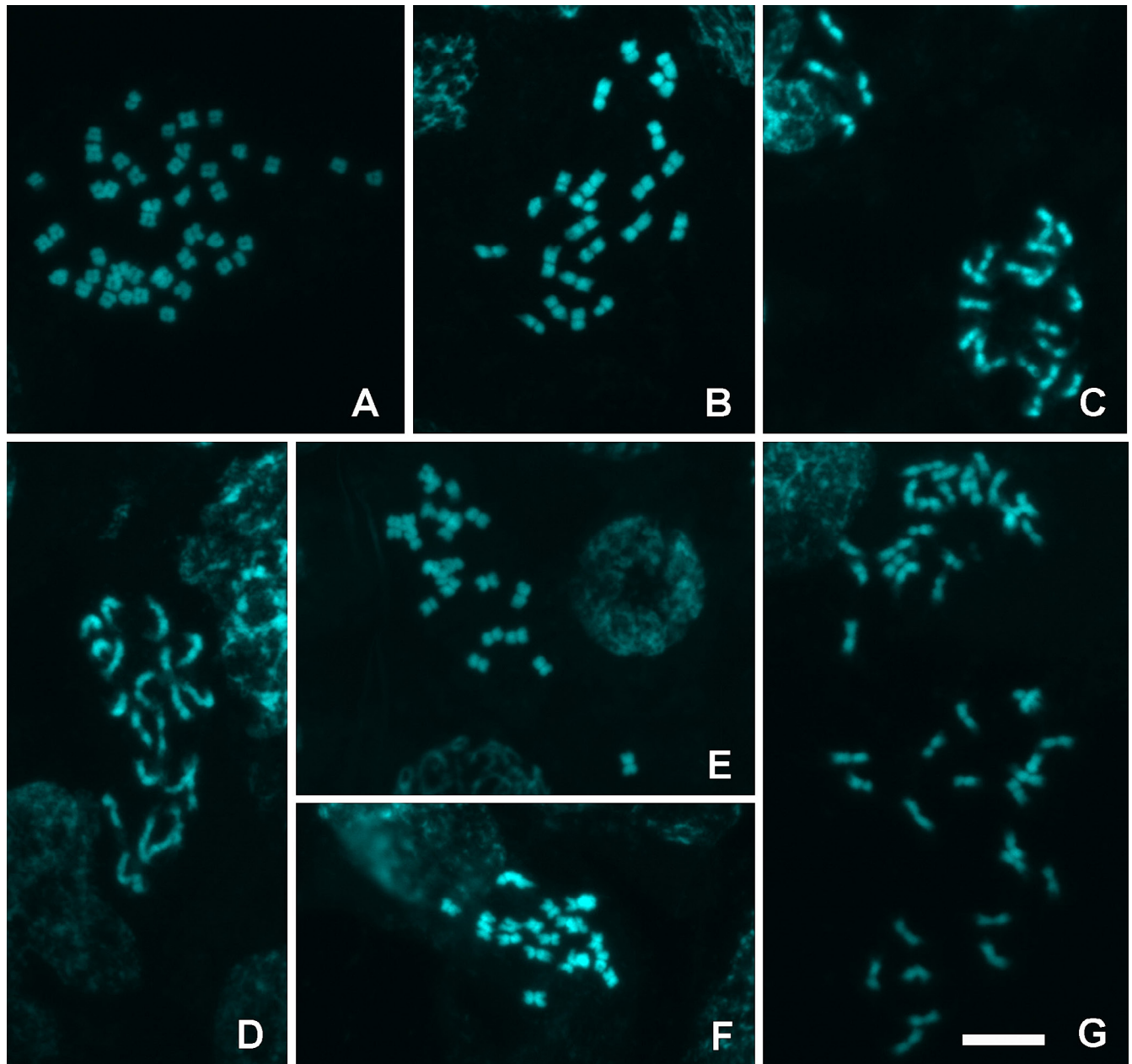
*Pereskia bahiensis* Gürke

$2n = 22$ , CHN. Brazil, Bahia, Senhor do Bonfim, Serra da Maravilha, 10°26.74' S, 40°13.26' W, 31 Mar 2010, *J.P. Castro 67* (EAN) [Fig. 2B].

*Pereskia grandiflora* Hort. ex Pfeiff.

$2n = 22$ , CHN. Brazil, Paraíba, Areia, Engenho Jussara, 06°57.48' S, 35°41.30' W, 24 Mar 2013, *L.P. Felix 14290* (EAN) [Fig. 1A].

The family Cactaceae occurs exclusively in the Neotropics, except *Rhipsalis baccifera* (Sol.) Stearn, which also occurs in the African continent, Madagascar, and Sri Lanka (Anderson, 2001). The family comprises 131 genera and 1866 species, with 39 genera and 274 species in Brazil, of which 26 genera and 105 species occur in



**Fig. 4.** **A**, *Pilosocereus pachycladus* subsp. *pachycladus*,  $2n = 44$ ; **B**, *Pilosocereus pentaedrophorus*,  $2n = 22$ ; **C**, *Stephanocereus luetzelburgii*,  $2n = 22$ ; **D**, *Discocactus zehntneri*,  $2n = 22$ ; **E**, *Harrisia adscendens*,  $2n = 22$ ; **F**, *Epiphyllum phyllanthus*  $2n = 22$ ; **G**, *Hylocereus setaceus*,  $2n = 44$ . — Scale bar = 10  $\mu$ m.



the Northeast region, considered an important center of endemism of the family (Stevens, 2001–; Zappi & al., 2013). Cactaceae is a group well studied in respect of chromosomes, although there is a remarkable scarcity of karyological data for taxa from Brazilian Northeast. The basic number is  $x = 11$ , and there are records of polyploidy in about 20% of species (Baker & al., 2009). Dysploidy was rarely reported and those records are considered to be due to erroneous counts (Pinkava & Mcleod, 1971; Ross, 1981). Most likely in Cactaceae, autopolyploidy and allopolyploidy are recurring phenomena related to reproductive isolation and diversification of the family as a whole (Wood & al., 2009).

All 32 taxa analyzed here showed chromosomes generally small, less than 1.0  $\mu\text{m}$  in *Cereus jamacaru* up to about 5.0  $\mu\text{m}$  in *Pilosocereus gounellei*. The chromosome numbers ranged from  $2n = 22$  in most species to  $2n = 88$  in *Opuntia ficus-indica*. In this work, the majority of species (22) were diploid, nine were tetraploid and only one was octoploid. Intraspecific polyploidy was observed in two populations of *Pilosocereus pachycladus* subsp. *pernambucoensis* and in only one population of *Pilosocereus pachycladus* subsp. *pachycladus*, suggesting important contribution of the polyploidy in the differentiation of these two subspecies, as well as the whole family, especially in the subfamily Cactoideae. On the other hand, dysploidy was not observed within or between different taxa. This suggests that structural rearrangements such as centric fusion or fission are probably eliminated in natural populations of Cactaceae.

#### Literature cited

- Anderson, E.F. 2001. *The Cactus family*. Portland: Timber Press.
- Baker, M.A., Rebman, J.P., Parfitt, B.D., Pinkava, D.J. & Zimmerman, A.D. 2009. Chromosome numbers in some cacti of western North America - VIII. *Haseltonia* 15: 117–134. <http://dx.doi.org/10.2985/026.015.0112>
- Guerra, M. & Souza, M.J. 2002. *Como observar cromossomos: Um guia de técnicas em citogenética vegetal, animal e humana*, 1st ed. Ribeirão Preto: FUNPEC.
- Pinkava, D.J. & Mcleod, M.G. 1971. Chromosome numbers in some cacti of western North America. *Brittonia* 23: 171–176. <http://dx.doi.org/10.2307/2805433>
- Ross, R. 1981. Chromosome counts, cytology, and reproduction in the Cactaceae. *Amer. J. Bot.* 68: 463–470. <http://dx.doi.org/10.2307/2443022>
- Stevens, P.F. 2001–. Angiosperm phylogeny website, version 12, July 2012 <http://www.mobot.org/MOBOT/research/APweb/> (accessed July 2013).
- Wood, T.E., Takebayashi, N., Barker, M.S., Mayrose, I., Greenspoon, P.B. & Rieseberg, L.H. 2009. The frequency of polyploid speciation in vascular plants. *Proc. Natl. Acad. Sci. U.S.A.* 106: 13875–13879. <http://dx.doi.org/10.1073/pnas.0811575106>
- Zappi, D., Taylor, N., Machado, M. & Santos, M.R. 2013. *Cactaceae*. In: Lista de espécies da flora do Brasil. Rio de Janeiro: Jardim Botânico do Rio de Janeiro. <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB70> (accessed July 2013).

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\* First chromosome count for the species.

#### RANUNCULACEAE

*Ranunculus abchasicus* Freyn

$2n = 16$ , CHN. Georgia, Zemo Svaneti, Shergen, Khelari ridge, Lelashkhi, 2950–3000 m, 8 Aug 1975, *M. Churadze* 49 (TB).

*Ranunculus baidarae* Rupr.

$2n = 32$ , CHN. Georgia, Shida Kartli, Ermani, 2350–2700 m, 12 Aug 1984, *R. Gagnidze* & *M. Churadze* 220 (TB).

*Ranunculus brutius* Ten.

$2n = 16$ , CHN. Georgia, Abkhazeti, Mamzyshkha ridge, Shkha-Bashkha mountain massif, 1850 m, 19 Jun 1980, *R. Gagnidze* & *M. Churadze* 113 (TB); *R. Gagnidze* & *M. Churadze* 118 (TB).

*Ranunculus buhsei* Boiss.

$2n = 16$ , CHN. Georgia, Zemo Svaneti, Shergen, Khelari ridge, Lelashkhi, 2950 m, 8 Aug 1975, *M. Churadze* 48 (TB); Georgia, Zemo Svaneti, Khashpali, 1950 m, 14 Aug 1975, *M. Churadze* 59 (TB); Georgia, Zemo Svaneti, Lashkrashi, 16 Aug 1975, *M. Churadze* 69 (TB), *M. Churadze* 70 (TB), *M. Churadze* 72 (TB).

*Ranunculus cappadocicus* Willd.

$2n = 16$ , CHN. Georgia, Abkhazeti, Mamzyshkha ridge, Shkha-Bashkha mountain massif, 1850 m, 20 Jun 1980, *R. Gagnidze* & *M. Churadze* 122 (TB); Georgia, Samegrelo, Askhi mountain massif, Kochuri-Kva, Naturkulari, 14 Aug 1975, *M. Churadze* 37 (TB), *M. Churadze* 40 (TB).

*Ranunculus caucasicus* M. Bieb.

$2n = 16$ , CHN. Georgia, Shida Kartli, Fidari mountain massif, 2600 m, 5 Aug 1984, *R. Gagnidze* & *M. Churadze* 204 (TB); Georgia, Shida Kartli, river Britata gorge, 2600 m, 8 Aug 1984, *R. Gagnidze* & *M. Churadze* 207 (TB); Georgia, Shida Kartli, river Khodzistskali gorge, 2600 m, 10 Aug 1984, *R. Gagnidze* & *M. Churadze* 212 (TB); Georgia, Shida Kartli, Ermani mountain massif, 2450 m, 12 Aug 1984, *R. Gagnidze* & *M. Churadze* 221 (TB).

*Ranunculus grandiflorus* L.

$2n = 16$ , CHN. Georgia, Kartli, Tbilisi vicinity, Kiketi, 20 May 1976, *M. Churadze* 99 (TB); Georgia, Shida Kartli, Ermani mountain massif, 2400 m, 14 Aug 1984, *R. Gagnidze* & *M. Churadze* 1120 (TBI)

$2n = 24$ , CHN. Georgia, Shida Kartli, Ermani mountain massif, 2400 m, 19 Aug 1984, *R. Gagnidze* & *M. Churadze* 234 (TB), *R. Gagnidze* & *M. Churadze* 238 (TB).

\**Ranunculus grossheimii* Kolak.

$2n = 16$ , CHN. Georgia, Abkhazeti, river Yupshara gorge, 21 Jun 1980, *R. Gagnidze*, *D. Chelidze* & *Sh. Shetekauri* 925 (TBI), *R. Gagnidze* & al. 927 (TBI), *R. Gagnidze* & al. 928 (TBI); Georgia, Samegrelo, Khudoni, Mt. Tsulishi, 1000 m, Aug 1977, *R. Gagnidze* & *D. Chelidze* 858 (TBI).

\**Ranunculus helenae* Albov

$2n = 16$ , CHN. Georgia, Abkhazeti, Gagra ridge, Berchil limestone plateau, on slopes, 2200 m, 2 Sep 1983, *M. Churadze* 185 (TB), *M. Churadze* 187 (TB).

*Ranunculus lojkae* Sommier & Levier

$2n = 16$ , CHN. Georgia, Shida Kartli, Ermani mountain massif, 2700 m, 12 Aug 1984, *R. Gagnidze* & *M. Churadze* 227 (TB); Georgia, Shida Kartli, Lake Keli vicinity, 3100 m, 22 Aug 1984, *R. Gagnidze* & *M. Churadze* 248 (TB), *R. Gagnidze* & *M. Churadze* 251 (TB); Georgia, Shida Kartli, Keli Pass, 3100 m, 21 Aug 1982, *R. Gagnidze*, *J. Mtskhvetadze*, *Sh. Shetekauri* & *G. Likokeli* 985 (TBI).

\**Ranunculus obesus* Trautv.

$2n = 28$ , CHN. Georgia, Guria, Adjara-Imereti ridge, Lake Chinchao, between Bakhmaro and Gomismta, 2300–2400 m, 27 Jul 1985, *R. Gagnidze* & *M. Churadze* 274–284 (TB).

*Ranunculus oreophilus* M. Bieb.

$2n = 16$ , CHN. Georgia, Abkhazeti, Mamzyshkha ridge, Shkha-Bashkha mountain massif, 1850 m, 18 Jun 1980, *R. Gagnidze & M. Churadze 111* (TB); Georgia, Svaneti, Tub-Mashari, 3150 m, Aug 1975, *D. Chelidze & P. Chkheidze 736* (TBI); Georgia, Racha, Nakerala ridge, 1200 m, Aug 1975, *R. Gagnidze & D. Chelidze 638* (TBI); Georgia, Racha, Mamisoni Pass, 2900–3100 m, Aug 1982, *R. Gagnidze, D. Chelidze & Sh. Shetekauri 949* (TBI); Georgia, Shida Kartli, river Britata gorge, 2800 m, 8 Aug 1984, *R. Gagnidze & M. Churadze 210* (TB).

$2n = 24$ ; Georgia, Shida Kartli, Fidari mountain massif, 2600 m, 5 Aug 1984, *R. Gagnidze & M. Churadze 205* (TB); Georgia, Shida Kartli, river Khodzistskali gorge, 2800 m, 10 Aug 1984, *R. Gagnidze & M. Churadze 211* (TB), *R. Gagnidze & M. Churadze 213* (TB); Georgia, Shida Kartli, Ermani mountain massif, 2350 m, 12 Aug 1984, *R. Gagnidze & M. Churadze 219* (TB); Georgia, Shida Kartli, Ermani mountain massif, 2300 m, 12 Aug 1982, *R. Gagnidze, Sh. Shetekauri & D. Chelidze 982* (TBI).

$2n = 32$ ; Georgia, Shida Kartli, river Britata gorge, 2800 m, 8 Aug 1984, *R. Gagnidze & M. Churadze 209* (TB); Georgia, Shida Kartli, Lake Keli vicinity, 3100 m, 22 Aug 1984, *R. Gagnidze & M. Churadze 249* (TB).

*Ranunculus polyanthemus* L.

$2n = 16$ , CHN. Georgia, Zemo Svaneti, Phari, 24 Aug 1974, *M. Churadze 41* (TB); Georgia, Zemo Svaneti, Khashpali, 1950 m, 14 Aug 1975, *M. Churadze 62* (TB); Georgia, Zemo Svaneti, Mestia vicinity, 1450 m, 14 Aug 1975, *R. Gagnidze & M. Churadze 198* (TB).

*Ranunculus raddeanus* Regel

$2n = 16$ , CHN. Georgia, Abkhazeti, Avadkhara, 27 Jul 1976, *M. Churadze 100* (TB), *M. Churadze 102* (TB), *M. Churadze 103* (TB), *M. Churadze 106* (TB), *M. Churadze 107* (TB); Georgia, Abkhazeti, Mamzyshkha ridge, Shkha-Bashkha mountain massif, 1850 m, 18 Jun 1980, *R. Gagnidze & M. Churadze 114* (TB), *R. Gagnidze & M. Churadze 116* (TB); Georgia, Abkhazeti, Bam-beyashta, 1900–2000 m, Jun 1980, *R. Gagnidze, D. Chelidze & Sh. Shetekauri 915* (TBI); Georgia, Zemo Svaneti, Atsvili, 1900 m, 14 Aug 1975, *M. Churadze 65* (TB); Georgia, Samegrelo, Gegechkori, Kvibia, Naturkulari, 10 Aug 1974, *M. Churadze 29* (TB); Georgia, Samegrelo, Askhi mountain massif, Karmaidani, 13 Aug 1974, *M. Churadze 35* (TB); Georgia, Shida Kartli, Lake Keli vicinity, 2900 m, 22 Aug 1982, *R. Gagnidze, J. Mtskhvetadze, G. Likokeli & Sh. Shetekauri 995* (TBI); Georgia, Shida Kartli, Keli Pass, 3100 m, 23 Aug 1982, *R. Gagnidze & J. Mtskhvetadze 998* (TBI).

*Ranunculus repens* L.

$2n = 16$ , CHN. Georgia, Abkhazeti, Avadkhara, 27 Jul 1976, *M. Churadze 101* (TB); Georgia, Zemo Svaneti, between Kala and Ushguli, 1900 m, 13 Aug 1975, *M. Churadze 53* (TB); Georgia, Shida Kartli, river Britata gorge, 2000 m, 8 Aug 1984, *R. Gagnidze & M. Churadze 206* (TB).

*Ranunculus svaneticus* Rupr.

$2n = 16$ , CHN. Georgia, Zemo Svaneti, Mt. Dadiashi, 2500–2800 m, 22 Aug 1975, *M. Churadze 81* (TB), *M. Churadze 88* (TB), *M. Churadze 89* (TB); Georgia, Zemo Svaneti, Mt. Dadiashi, 2500–2800 m, 22 Aug 1975, *R. Gagnidze & D. Chelidze 763* (TBI).

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Methods for chromosome counts follow Guerra (1983).

- \* First chromosome count for the species.
- § Species with intra-specific cytotype variation. The chromosome numbers here obtained are different from those reported by other authors (Shibata, 1962; Seijo, 1999; Dahmer & al., 2011).
- # IUCN Red List (<http://www.iucnredlist.org>).
- + Endemic to Caatinga biome (Queiroz, 2009).

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**FABACEAE**

*Mimosa acutistipula* (Mart.) Benth. var. *acutistipula*  
+ $2n = 52$ , CHN. Brazil, Rio Grande do Norte, 2 Jun 1990, *A. Fernandes & al. s.n.* (EAC 16547) [Fig. 5A].

*Mimosa bimucronata* (DC.) Kuntze  
# $2n = 26$ , CHN. Brazil, Ceará, Guarimiranga, Pacoti, 20 Aug 1991, *E. Nunes & al. s.n.* (EAC 17854) [Fig. 5B].

*Mimosa caesalpinifolia* Benth.  
+ $2n = 26$ , CHN. Brazil, Ceará, Fortaleza, Campus do Pici, 24 May 1984, *M.A.O. Alves & al. s.n.* (EAC 12649).

*Mimosa hirsutissima* Mart.  
§ $2n = 52$ , CHN. Brazil, Ceará, Caucaia, Pacheco Beach, 27 Jul 1988, *E. Nunes & al. s.n.* (EAC 15462) [Fig. 5C].

*Mimosa invisá* Mart. ex Colla  
 $2n = 26$ , CHN. Brazil, Ceará, Tianguá, 7 Jun 1991, *A.V. Custódio & al.* (EAC 17593) [Fig. 5D].

*Mimosa lewisii* Barneby  
+ $2n = 28$ , CHN. Brazil, Bahia, road between Cícero Dantas and Jeremoaba municipalities, 7 Sep 1996, *A. Fernandes & E. Nunes s.n.* (EAC 24350) [Fig. 5E].

*Mimosa niomarlei* Afr. Fern.  
+ $2n = 26$ , CHN. Brazil, Ceará, Sobral, Fazenda Andorinha – Taperoaba, 9 Jun 1990, *A. Fernandes & al. s.n.* (EAC 17591) [Fig. 5F].

*Mimosa paraibana* Barneby (= *Mimosa platycarpa* Ducke)  
+ $2n = 26$ , CHN. Brazil, Paraíba, Remígio, 29 Sep 1994, *E. Nunes & al. s.n.* (EAC 21403).

*Mimosa pigra* L.

§ $2n = 26$ , CHN. Brazil, Ceará, Caucaia, Pacheco Beach, 27 Jul 1988, E. Nunes & M.A.O. Alves s.n. (EAC15465) [Fig. 5G].

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

\* $2n = 52$ , CHN. Brazil, Ceará, Crateús, Serra das Almas, 15 Apr 2010, I.H. Vaz da Silva s.n. (EAC 48801) [Fig. 5H].

*Mimosa setosa* var. *paludosa* Benth.

§ $2n = 26$ , CHN. Brazil, Ceará, Ubajajara, Parque Nacional de Ubajara, 29 Nov 1990, A. Fernandes, E. Nunes & A.V. Custódio s.n. (EAC 16812) [Fig. 5J].

*Mimosa tenuiflora* (Willd.) Poir.

$2n = 26$ , CHN. Brazil, Paraíba, BR 230, between Pombal and Patos municipalities, 28 Sep 1994, A. Fernandes & al. s.n. (EAC 21396) [Fig. 5I].

*Mimosa ursina* Mart.

$2n = 26$ , CHN. Brazil, Piauí, Floriano, 8 Apr 1992, A. Fernandes & al. s.n. (EAC 18399).

*Mimosa verrucosa* Benth.

+ $\#2n = 26$ , CHN. Brazil, Ceará, between Tianguá and Viçosa do Ceará, 30 Nov 1990, A. Fernandes & al. s.n. (EAC 16806).

Traditionally, the family Fabaceae is subdivided into three subfamilies: Caesalpinioideae, Papilinoideae and Mimosoideae (Wojciechowski & al., 2004). Mimosoideae have 40 genera, and 2500

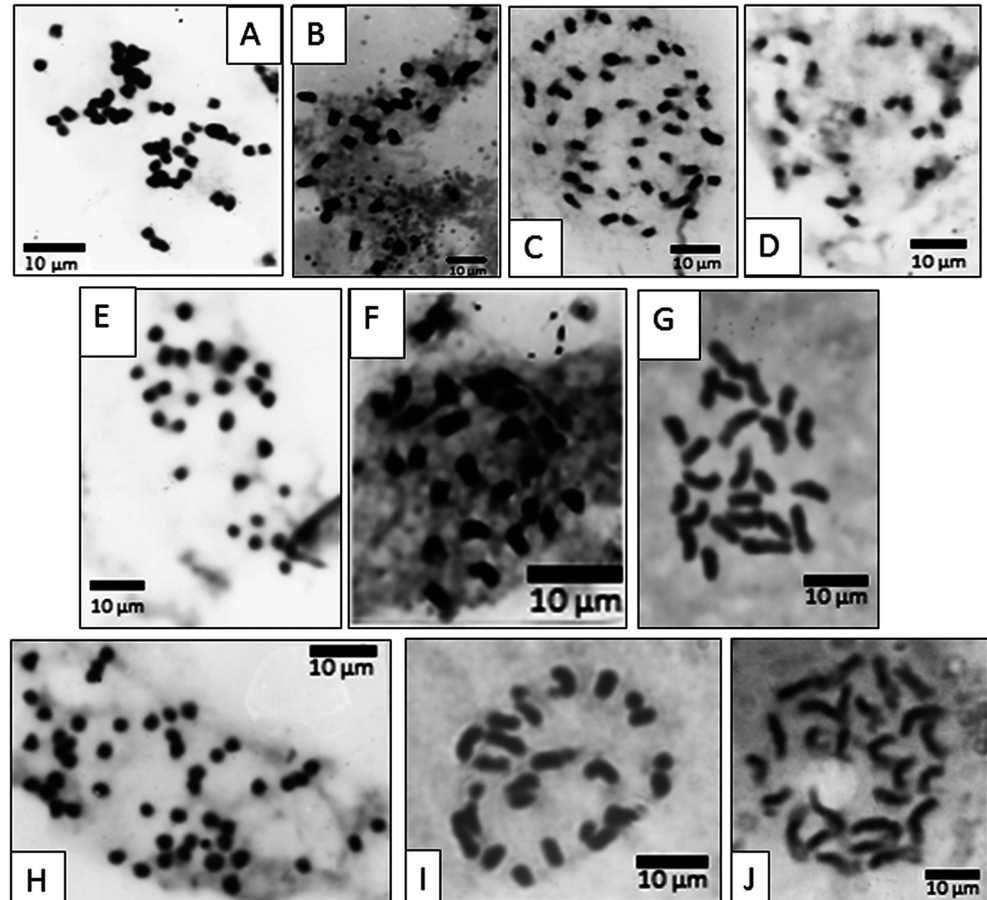
species distributed in the tropical, subtropical and sub-temperate regions (Queiroz, 2009). The genera are currently placed into four tribes: Acacieae, Ingeae, Mymozyantheae and Mimoseae (including the previously recognised tribe Parkieae and the genus *Pentaclethra* Benth.) (Lucknow & al. 2000, 2003; Herendeen & al., 2003).

The Mimoseae has 40 genera and about ca. 880 species (Lucknow, 2005), most of them from *Mimosa* with ca. 510 species in the Neotropical region (Lewis & al., 2005), of them 236 species found in Brazil (Dutra & Morim, 2013).

To date, several papers from systematics and evolution associated with analyses of chromosomes have been published (for details see Dahmer & al., 2011). Currently, chromosome studies of 44% of species belonging to *Mimosa* are recorded (Dahmer & al., 2011). Within this context, we present here the somatic chromosome numbers of fourteen species of *Mimosa*, all of them from northeastern Brazil, mainly the domain of the Caatinga biome.

Our results showed eleven (78.6%) diploid species: for ten of them  $2n = 26$ , and  $2n = 28$  for *M. lewisii*; and three (21.4%) tetraploid species with  $2n = 52$ . The chromosomes are small, reaching less than  $5 \mu\text{m}$  (Fig. 5). The records for *M. lewisii*, *M. niomarley*, *M. paraibana* and *M. quadrivalvis* var. *leptocarpa* represent first reports for these taxa. Our records for *M. acutistipula*, *M. bimucronata*, *M. caesalpiniiifolia*, *M. tenuiflora*, *M. ursina* and *M. verrucosa* corroborate the literature records (Alves & Custódio, 1989; Seijo, 1999; Dahmer & al., 2011). *Mimosa hirsutissima*, *M. pigra* and *M. setosa* var. *paludosa* were sampled by other authors and the chromosome numbers they reported diverge from those obtained here, showing intra-specific variation in chromosome numbers.

**Fig. 5.** A, *M. acutistipula*,  $2n = 52$ ; B, *M. bimucronata*,  $2n = 26$ ; C, *M. hirsutissima*,  $2n = 52$ ; D, *M. invisita*,  $2n = 26$ ; E, *M. lewisii*,  $2n = 28$ ; F, *M. niomarley*,  $2n = 26$ ; G, *M. pigra*,  $2n = 26$ ; H, *M. quadrivalvis* var. *leptocarpa*,  $2n = 52$ ; I, *M. tenuiflora*,  $2n = 26$ ; J, *M. setosa* var. *paludosa*,  $2n = 26$ .



## Literature cited

- Alves, M.A.O. & Custódio, A.V. 1989. Citogenética de leguminosas coletadas no estado do Ceará. *Revista Brasil. Genét.* 12: 81–92.
- Dahmer, N., Simon, M.F., Schifino-Wittmann, M.T., Hughes, C.E., Miotto, S.T.S. & Giuliani, J.C. 2011. Chromosome numbers in the genus *Mimosa* L.: Cytotaxonomic and evolutionary implications. *Pl. Syst. Evol.* 291: 211–220. <http://dx.doi.org/10.1007/s00606-010-0382-2>
- Dutra, V.F. & Morim, M.P. 2013. *Mimosa*. In: Lista de espécies da flora do Brasil. Rio de Janeiro: Jardim Botânico do Rio de Janeiro. <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB23084> (accessed July 2013).
- Guerra, M. 1983. O uso de Giemsa na citogenética vegetal - comparação entre a coloração simples e o bandeamento. *Ci. Hoje* 35: 190–193.
- Herendeen, P.S., Bruneau, A. & Lewis, G.P. 2003. Phylogenetic relationships in caesalpinoid legumes: A preliminary analysis based on morphological and molecular data. Pp. 37–62 in: Klitgaard, B.B. & Bruneau, A. (eds.), *Advances in legume systematics*, vol. 10, *Higher level systematics*. Kew: Royal Botanic Gardens.
- Lucknow, M. 2005. Mimosaceae. Pp. 163–183 in: Lewis, G., Schrire, B., Mackinder, B. & Lock, M. (eds.), *Legumes of the World*. Kew: Royal Botanic Gardens.
- Lucknow, M., White, P.J. & Bruneau, A. 2000. Relationships among the basal genera of mimosoid legumes. Pp. 165–180 in: Herendeen, P.S. & Bruneau, A. (eds.), *Advances in legume systematics*, vol. 9. Kew: Royal Botanic Gardens.
- Lucknow, M., Millert J.T., Murphy, D.J. & Livshultz, T. 2003. A phylogenetic analysis of the Mimosoideae (Leguminosae) based on chloroplast DNA sequence data. Pp. 197–220 in: Klitgaard, B.B. & Bruneau, A. (eds.), *Advance in legume systematics*, vol. 10, *Higher level systematics*. Kew: Royal Botanic Gardens.
- Queiroz, L.P. 2009. *Leguminosae da Caatinga*. Feira de Santana: Editora Universitária UEFS.
- Seijo, G. 1999. Chromosome studies in Argentinian species of *Mimosa* (Leguminosae). *Cytologia* 64: 241–246. <http://dx.doi.org/10.1508/cytologia.64.241>
- Shibata, K. 1962. Estudios citológicos de plantas colombianas silvestres y cultivadas. *J. Agric. Sci. (Tokyo)* 8: 49–62.
- Wojciechowski, M.F., Lavin, M. & Sanderson, M.J. 2004. A phylogeny of legumes (Leguminosae) based on analysis of the plastid *matK* gene resolves many well-supported subclades within the family. *Amer. J. Bot.* 91: 1846–1862. <http://dx.doi.org/10.3732/ajb.91.11.1846>

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Materials gathered by A. Fridlender (AF), L. Hardion (LH), R. Verlaque (RV), B. Vila (BV) and B. Zehzad (BZ); counted by L. Hardion, R. Verlaque and B. Vila and analysed in FCM by A. Fridlender. *Petunia hybrida* (PxPC6, 2C = 2.85 pg) was used as internal standard to determine DNA content by FCM (Partec CyFlow 532 nm laser cytometer).

- \* First chromosome count for the species.  
\*\* New chromosome number (cytotype) for the taxon.

## POACEAE

*Arundo donaciformis* (Loisel.) Hardion & al.

\*2n = 108, CHN; Italy, Liguria, Cervo, between Via Julia Augusta and the railway, toward Andorra, 43°55'38" N, 08°07'37" E,

33 m, 16 Oct 2010, *LH IL1/10-94* (MARS 00067) [Fig. 6A]; Italy, Liguria, Andorra, in the cliff between Via Julia Augusta and the sea, 43°57'49" N, 08°10'00" E, 68 m, 16 Oct 2010, *LH IL2/10-90* (MARS 00068); Italy, Liguria, near Finale Ligure, 44°10'39" N, 08°22'12" E, 68 m, 5 June 2011, *LH IL3/11-22* (MARS 00069); France, Puget-sur-Argens, urban wasteland, 43°26'38" N, 06°42'28" E, 20 Feb 2013, *LH 10-05* (MARS 00064).

*Arundo donax* L.

2n = 108, CHN; Iran, Golestan, Tamak, Nov 2012, *BZ DoIG/13-02* (MARS 03836); Iran, Gilan, Kiashahr, Nov 2012, *BZ DoIK/13-01* (MARS 03839).

2n = 110, CHN; Peru, Lima, Ventanilla callao, 26 Apr 2012, *BV 13-35* (MARS 03664);

2n = 110, CHN; 2n ~ 18x, FCM, 2C DNA = 4.87 pg; Italy, Sardinia, San-Pietro Island, Carloforte, 18 Feb 2012, *AF 13-05* (MARS 05001).

2n ~ 18x ~ 108, FCM, 2C DNA = 4.83 pg; France, Bouches-du-Rhône, Marseille, Cap Croisette, 5 Apr 2012, *AF DoC* (MARS 03837); FCM, 2C DNA = 5.02 pg; France, Bouches-du-Rhône, Marseille, Luminy, 5 Apr 2012, *AF s.n.* (MARS 05002).

*Arundo donax* var. *versicolor* (Mill.) Stokes

\*2n = ca. 108, CHN; 2n ~ 18x, FCM, 2C DNA = 4.91 pg; France, PACA, La Seyne-sur-Mer, in a public green, 43°05'19" N, 05°53'14" E, 20 m, 11 Nov 2011, *LH DoV/11-150* (MARS 03807).

*Arundo formosana* Hack.

\*2n = 72, CHN; 2n ~ 12x, FCM, 2C DNA = 3.57 pg; Taiwan, *Lyonnet Fol/11-56* (MARS 00045). [Fig. 6B]

*Arundo micrantha* Lam.

2n = 72, CHN; Croatia, Split, in a waste ground, 43°31'42" N, 16°30'07" E, 41 m, 6 Jul 2012, *LH 12-14* (MARS 00136); France, Alpes-Maritimes, Golfe-Juan, between Via Julia Augusta and railway, 43°33'48" N, 07°04'08" E, 5 m, 5 Dec 2010, *LH FD2/10-147* (MARS 00075) [Fig. 6C]; France, Languedoc-Roussillon, Ste-Lucie Island, in a cliff between railway and nature reserve, 43°03'25" N, 03°01'51" E, 10 m, 8 Aug 2011, *LH FD4/11-155* (MARS 00076); Greece, Messolonghi, between road and olive field, in sympatry with *A. plinii* s.str., 38°22'42" N, 21°28'37" E, 19 m, 10 Apr 2011, *LH & BV GS1/11-47* (MARS 00081); Greece, Itea, in a waste ground, 38°26'14" N, 22°25'25" E, 6 m, 10 Apr 2011, *LH & BV GS3/11-48* (MARS 00082); Greece, Euboea Island, Vasiliko, on the Lilas riverside, 38°25'29" N, 23°39'31" E, 11 m, 11 Apr 2011, *LH & BV GE2/11-51* (MARS 00080); Greece, Crete, Mires, at the edge of orange fields, 35°04'05" N, 24°47'06" E, 24 m, 15 Apr 2011, *BV GC2/11-55* (MARS 00078); Greece, Crete, Mirtos, on the river bank, 35°00'21" N, 25°35'16" E, 10 m, 17 Apr 2011, *BV GC3/11-56* (MARS 00079); Italy, Trieste, seafront, 45°45'02" N, 13°39'16" E, 1 m, 28 Feb 2011, *LH IT1/11-19* (MARS 00083); Morocco, Tanger, between habitations, 35°44'44" N 05°53'07" W, 57 m, 3 Jul 2011, *LH MMI/11-141* (MARS 00086); Morocco, Rabat, roadside, 34°01'43" N, 06°47'42" W, 4 Jul 2011, *LH MM3/11-141* (MARS 00087); Spain, Amposta, at the edge of an olive field, 40°41'21" N, 00°34'31" E, 14 m, 19 Dec 2010, *LH EE1/10-151* (MARS 00090); Spain, Jaen, under a road-bridge on the Guadalquivir riverside, 38°01'32" N, 03°54'54" W, 212 m, 25 Nov 2010, *LH ES1/11-136* (MARS 00092); Spain, Córdoba, roadside, 37°56'42" N, 04°29'50" W, 135 m, 25 Nov 2010, *LH ES2/11-139* (MARS 00093); Spain, Bonares, at the edge of farming, 37°20'39" N, 06°40'37" W, 56 m, 26 Nov 2010, *LH ES5/10-142* (MARS 00096).

2n = 72, CHN; 2n ~ 12x, FCM, 2C DNA = 3.23 pg; Italy, Sardinia, Las Plassas, 18 Feb 2013, *AF 13-06* (MARS 05000).

2n ~ 12x ~ 72, FCM, 2C DNA = 3.15 pg; Spain, near Algeciras, edge of agricultural fields, *AF MiAl* (MARS 03840).

*Arundo plinii* Turra s.str.

$2n = 72$ , CHN;  $2n \sim 12x$ , FCM, 2C DNA = 3.62 pg; Italy, Calabria, between Dinami and San Calogero, on ancient agricultural fields, 38°33'38"N, 16°04'54"E, 98 m, 3 Jun 2011, LH IS3/11-124 (MARS 00128).

$2n = 72$ , CHN;  $2n \sim 12x$ , FCM, 2C DNA = 3.42 pg; Greece, Peloponnesus, Patras, in the hills surrounding the town, on an abandoned parcel between farming, 38°14'26"N, 21°46'02"E, 178 m, 10 Apr 2011, LH & BV GP3/11-45 (MARS 00105).

\*\* $2n = 74$ , CHN;  $2n \sim 12x$ , FCM, 2C DNA = 3.46 pg; Italy, Sicily, Agrigente, roadside at the entering of the town, 37°19'13"N, 13°35'10"E, 223 m, 4 Jun 2011, LH IS6/11-131 (MARS 00131).

$2n = 76$ , CHN;  $2n \sim 12x$ , FCM, 2C DNA = 3.25 pg; Italy, Campania, Napoli, near the Averno lake, roadside, 40°50'09"N, 14°03'52"E, 77 m, 3 Nov 2010, LH & BV ICI10-120 (MARS 00109).

$2n = 76$ , CHN;  $2n \sim 12x \sim 108$ , FCM, 2C DNA = 3.29 pg; Italy, Campania, near Salerno, 6 Oct 2012, AF s.n. (MARS 03806).

$2n = 76$ , CHN;  $2n \sim 12x$ , FCM, 2C DNA = 3.62 pg; Italy, Sicily, Castellamare del Golfo, in an abandoned field, 38°01'11"N, 12°53'55"E, 57 m, 4 Jun 2011, LH IS8/11-132 (MARS 00133).

$2n = 76$ , CHN;  $2n \sim 12x \sim 76$ , FCM, 2C DNA = 3.44 pg; Italy, Sicily, S. Madonie Mountains, between Petralia and Castellana, wide pasture, 830 m, 19 Oct 2011, AF 11-160 (MARS 05011).

$2n = 108$ , CHN;  $2n \sim 18x$ , FCM, 2C DNA = 4.82 pg; Italy, Sicily, roadside between Siracusa and Augusta, 37°18'31"N, 15°06'26"E, 71 m, 3 Jun 2011, LH IS4/11-127 (MARS 00129).

$2n = 108$ , CHN;  $2n \sim 18x \sim 108$ , FCM, 2C DNA = 4.60 pg; Greece, Crete, Sirili, 35°29'56"N, 23°48'54"E, 49 m, 13 Apr 2011, BV GC4/11-57 (MARS 00100).

\*\* $2n = 114$ , CHN;  $2n \sim 18x$ , FCM, 2C DNA = 4.63 pg; Italy, Puglia, Rodi Gargano, coastline, on the side of the railway, 41°55'58"N, 15°55'16"E, 8 m, 4 Nov 2011, LH & BV IC4/10-126 (MARS 00112).

\*\* $2n = 114$ , CHN;  $2n \sim 18x \sim 108$  FCM, 2C DNA = 4.97 pg; Malta, Wadi between Ta'Brija and Ta'Zuta, 130 m, 21 Nov 2011, AF 11-182 (MARS 05003).

For the five species currently placed in the genus *Arundo* L., chromosome data available exhibit only two ploidy levels:  $12x$  and  $18x$ . The most common cytotype is  $2n = 12x = 72$ , shared by all *Arundo* species, except the Ligurian endemic *A. donaciformis* (S France and NW Italy) characterized by the euployploid level  $2n = 18x = 108$ . At the opposite, the circum-Mediterranean *A. micrantha* always shows the same low level  $12x$ . The cosmopolitan *A. donax* exhibits a clear geographic structuring:  $2n = 12x = ca. 72$  in Asia (Thailand: Larsen, 1963; India: Christopher & Abraham, 1971; Mehra & Kalia, 1975; Uzbekistan: Bochantseva, 1972), and  $2n = 18x = ca. 108$  for introduced plants in Mediterranean Basin (Gorenflot & al., 1972a; Hardion &

al., 2011, 2012) and America. The most common ploidy level for the Italo-Balkan endemic *A. plinii* s.str. remains  $12x$ , but news counts indicate  $18x$  in some marginal populations from Crete, Italy and Sicily. In addition, our data also highlight strong aneuploidy phenomena concerning the two ploidy levels:  $2n = ca. 72-74-76$  and  $2n = 108-114$ . However, measures in flow cytometry (FCM) differentiate only the two ploidy levels, but fail to detect aneuploidy.

*Hakonechloa macra* Makino

\*\* $2n = 48$ , CHN; Japan, accurate origin unknown, horticultural plant cultivated in the greenhouse of Aix-Marseille University, LH Hal/11-207 (MARS 03811).

*Molinia caerulea* subsp. *arundinacea* (Schrank) K. Richt.

$2n = 36$ , CHN; France, PACA, La Méridolle, between Vitrolles and Aix-en-Provence, watercourse, 43°29'12"N, 05°19'07"E, 127 m, 9 Oct 2011, LH 11-181 (MARS 03808).

Long time considered as a Poaceae dustbin group (Prat, 1960), Arundinoideae Dum. currently remain the smaller (15 genera and ca. 44 species) and less resolved subfamily (GPWG, 2001). Formerly gathering 72 genera (Renvoize, 1981), this grass subfamily was drastically reduced with the distinction of Danthonioideae Barker & H.P. Linder subfamily (GPWG, 2001). Our new counts must be added to the data already known in this group for *Arundo* and *Phragmites* (see below), as well as *Molinia* Schrank ( $2n = 36, 54, 72, 90, 108$ ; Dančák & al., 2012), *Hakonechloa* Makino ( $2n = 48$  here and 50; Ono & Tateoka, 1953), *Dregeochloa* Conert ( $2n = 42$ ; Du Plessis & Spies, 1988), *Monachather* Steud. ( $2n = 72$ ; Brock & Brown, 1961, as *Danthonia bipartita* Muell.), *Styppeiochloa* Winter ( $2n = 24, 48$ ; Roodt & al., 2002) and *Elytrophorus* Dum. ( $2n = 24, 26$ ; Mehra & Kalia, 1975; Veyret, 1958). The literature suggests  $x = 6, 9, 12$  as chromosomal base numbers for Arundinoideae (Conert, 1961; GPWG, 2001). The  $2n = 18$  cytotypes reported for *Molinia caerulea* (Mattick-Ehrensberger, 1950; Milkovits & Borhidi, 1986) were recently rejected by a Dančák & al. (2012). As an euploid number,  $2n = 24$  discards  $x = 9$  whereas  $2n = 42$  and  $54$  support  $x = 6$ .

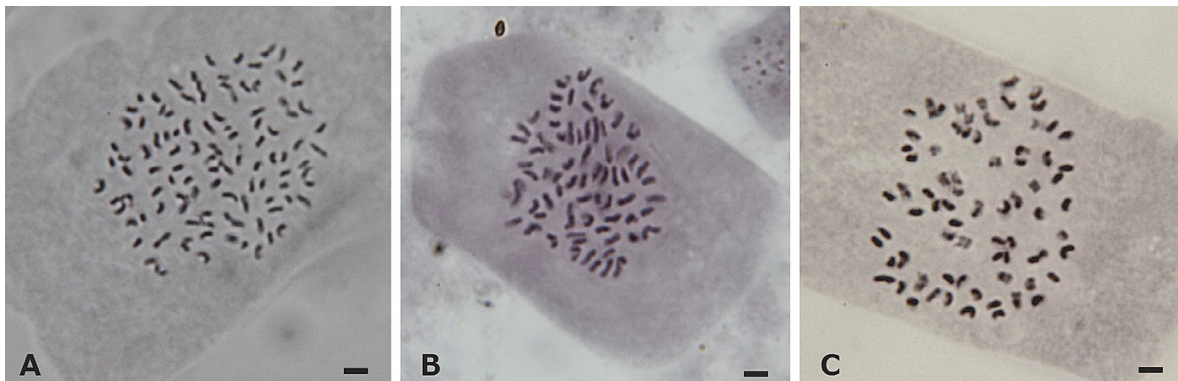
*Phragmites australis* (Cav.) Trin. ex Steud.

$2n = 48$ , CHN; France, Bouches-du-Rhône, Chateaufneuf-les-Martigues, along the trail of Patafloux, Apr 2012, RV 10-30 (MARS 03838).

$2n \sim 8x \sim 48$ , FCM, 2C DNA = 2.04 pg; Spain, Balears, Isla de Mallorca, Albuferra, wetland, 19 Apr 2012, AF s.n. (MARS 03544).

$2n = 72$ , CHN; Peru, Ica desert, between the road and a cultivated field, 24 Apr 2012, BV 13-36 (MARS 03663).

$2n = 96$ , CHN; China, road side near Nankin, Nov 2012, Huiyi Wu 12-51 (MARS 03671); France, Bouches-du-Rhône, reed back beach near Sausset-les-Pins, Nov 2012, RV 13-55 (MARS 03670).



**Fig. 6.** Mitotic metaphases of **A**, *Arundo donaciformis* (Cervo, Italy),  $2n = 108$ ; **B**, *A. formsana* (Taiwan),  $2n = 72$ ; **C**, *A. micrantha* (Golfe Juan, France),  $2n = 72$ . — Scale bars = 2  $\mu$ m.

$2n \sim 16x$ , FCM, 2C DNA = 4.00 pg; France, Bouches-du-Rhône, Camargue, wetland, 17 Apr 2012, *AF s.n.* (MARS 05004).

*Phragmites frutescens* H. Scholz

\* $2n = 48$ , CHN; Greece, Peloponnese, roadside toward Kavasilas, 37°52'34"N, 21°16'02"E, 13 m, 9 Apr 2011, *LH & BV Pf1/11-46* (MARS 03810); Greece, Crete, Georgiopolis, 35°21'16.5"N, 24°16'47.3"E, 1 m, back beach, in the sand, 14 Apr 2011, *BV Pf3/11-58* (MARS 03668); Lebanon, Tyr, 14 Jul 2011, *FM 11-302* (MARS 03809).

*Phragmites karka* (Retz.) Trin. ex Steud.

$2n = 50$ , CHN; Cambodia, near Phnom Penh, along the river, Aug 2012, *David 12-52* (MARS 03841).

*Phragmites mauritianus* Kunth

$2n = 48$ , CHN; Madagascar, Itasy region, Amparaky, sandy bank of the river, 18°56'08"S, 46°39'03"E, 980 m, 28 Feb 2011, *BV Pml/11-26* (MARS 03669).

In *Phragmites* Adans., all endemic taxa possess the same ploidy level  $2n = 8x = 48$  (E Mediterranean *P. frutescens*, S African *P. mauritianus*, Asian *P. karka* and *P. japonica*). On the opposite, the cosmopolitan *P. australis* shows a strong chromosomal variability, with six ploidy levels and many aneuploids around the number 48 ( $2n = ca. 36, 48, 72, 96, 120, 132$ ; Gorenflot & al., 1972b; Clevering & Lissner, 1999).

**Literature cited**

- Bochantseva, Z.P.** 1972. O chislakh chromosom. *Introd. Akklim. Rast. (Tashkent)* 3: 44–53.
- Brock, R.D. & Brown, J.A.M.** 1961. Cytotaxonomy of Australian *Danthonia*. *Austral. J. Bot.* 87: 289–295.
- Christopher, J. & Abraham, A.** 1971. Studies on the cytology and phylogeny of South Indian grasses: I. Subfamilies Bambusoideae, Oryzoideae, Arundinoideae and Festucoideae. *Cytologia* 36: 579–594. <http://dx.doi.org/10.1508/cytologia.36.579>
- Clevering, O.A. & Lissner, J.** 1999. Taxonomy, chromosome numbers, clonal diversity and population dynamics of *Phragmites australis*. *Aquatic Bot.* 64: 185–208. [http://dx.doi.org/10.1016/S0304-3770\(99\)00059-5](http://dx.doi.org/10.1016/S0304-3770(99)00059-5)
- Conert, H.J.** 1961. *Die Systematik und Anatomie der Arundineae*. Weinheim: Verlag von J. Cramer.
- Dančák, M., Duchoslav, M. & Trávníček, B.** 2012. Taxonomy and cytogeography of the *Molinia caerulea* complex in central Europe. *Preslia* 84: 351–374.
- Du Plessis, H. & Spies, J.J.** 1988. Chromosome studies on African plants. 8. *Bothalia* 18: 119–122.
- Gorenflot, R., Cartier, D. & Raicu, P.** 1972a. Caryologie de la Canne de Provence. *Compt. Rend. Hebd. Séances Acad. Sci., Ser. D* 274: 391–393.
- Gorenflot, R., Raicu, P., Cartier, D., Ciobanu, I., Stoian, V. & Staicu, S.** 1972b. Le complexe polyploïde du *Phragmites communis* Trin. *Compt. Rend. Hebd. Séances Acad. Sci., Ser. D* 274: 1501–1504.
- GPWG (Grass Phylogeny Working Group)** 2001. Phylogeny and subfamilial classification of the grasses (Poaceae). *Ann. Missouri Bot. Gard.* 88: 373–457. <http://dx.doi.org/10.2307/3298585>
- Hardion, L., Verlaque, R., Fridlender, A. & Vila, B.** 2011. [Reports]. In: Marhold K. (ed.), IAPT/IOPB Chromosome data 11. *Taxon* 60: 1221.
- Hardion, L., Verlaque, R., Baumel, A., Juin, M. & Vila, B.** 2012. Revised systematics of Mediterranean *Arundo* (Poaceae) based on AFLP fingerprints and morphology. *Taxon* 61: 1217–1226
- Larsen, K.** 1963. Studies in the flora of Thailand. 14. Cytological studies in vascular plants of Thailand. *Dansk Bot. Ark.* 20: 211–275.
- Mattick-Ehrensberger, R.** 1950. [Report]. Pp. 44–45 in: Tischler, G. (ed.), *Die Chromosomenzahlen der Gefäßpflanzen Mitteleuropas*. Gravenhage: W. Junk. <http://dx.doi.org/10.1007/978-94-011-5958-6>
- Mehra, P.N. & Kalia, V.** 1975. [Report]. Pp. 501–516 in: Löve, A. (ed.), IOPB chromosome number reports XLIX. *Taxon* 24: 511.

**Milkovits, I. & Borhidi, A.** 1986. Studies of *Molinia caerulea* complexes in Hungary. *Acta Univ. Upsal., Symb. Bot. Upsal.* 27: 139–145.

**Ono, H. & Tateoka, T.** 1953. Karyotaxonomy in Poaceae. I. Chromosomes and taxonomic relations in some Japanese grasses. *Bot. Mag. (Tokyo)* 66: 18–27.

**Prat, H.** 1960. Vers une classification naturelle des Graminées. *Bull. Soc. Bot. France* 107: 32–79.

**Renvoize, S.A.** 1981. The sub-family Arundinoideae and its position in relation to a general classification of the Gramineae. *Kew Bull.* 36: 85–102. <http://dx.doi.org/10.2307/4119008>

**Roodt, R., Spies, J.J., Malan, A.F., Holder, F. & Van Wyk, S.M.C.** 2002. Poaceae. Chromosome studies on African plants. 17. The subfamilies Arundinoideae and Danthonioideae. *Bothalia* 32: 233–240.

**Veyret, Y.** 1958. Observations caryologiques chez quelques Graminées tropicales. *J. Agric. Trop. Bot. Appl.* 5: 308–310.

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\* First chromosome count for the species.

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

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**ALLIACEAE**

*Allium senescens* L.

$2n = 32$ , CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, near Novinka village, N slope of a hill, 2 Sep 2005, *Shatokhina 66* (VLA).

**ASCLEPIADACEAE**

*Metaplexis japonica* Makino

$2n = 24$ , CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, the quay of the Amur River, 24 Aug 2006, *Shatokhina 107* (VLA).

**ASPARAGACEAE**

*Asparagus oligoclonos* Maxim.

$2n = 20$ , CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, 4 km above Mikhailovka village, steep S slope in the valley of the Amur River, 20 Sep 2006, *Shatokhina & Starchenko 110* (VLA).

**ASTERACEAE**

*Artemisia altaiensis* Krasch.

\* $2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, unstable sands, 15 Sep 2003, *Korobkov 04-130* (LE).

\* $2n = 54$ , CHN. Russia, East Siberia, Republic of Tyva, Turanskii Raion, Uyukskii Range, 3 km NW of Kara-Khaak village, right river-side of the Bii-Khem River, 21 Sep 1997, *Shmakov, Smirnov & al. 99-19* (ALTB); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii

Raion, the depression of salt lakes Shara-Nur and Dus-Khol', 10 km E of Agar-Dag-Taiga Range, slope with steppe vegetation to the lake, 17 Sep 2003, *Korobkov 04-39* (LE); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, low hill on the right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, *Artemisia* steppe with various herbs, 11 Sep 2003, *Korobkov 04-40* (LE); Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, *Artemisia* and grasses community, 13 Sep 2003, *Korobkov 04-41* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, sandy barkhan with sparse *Caragana*, 3 Sep 2003, *Korobkov 04-42* (LE), *Korobkov 04-43* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, the granite mountains Kezhege, 5 km N of Tsagan-Tolgoi customs station, rubbly-melkozem plots, 16 Sep 2003, *Korobkov 04-44* (LE); Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m, 11 Sep 1997, *Popov 99-231* (LE).

*Artemisia anethifolia* Weber ex Stechm.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Ulug-Khemskii Raion, massif Khayrkan, 19 Sep 1997, *Shmakov, Smirnov & al. 99-24* (ALTB).

*Artemisia annua* L.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, old fallow land, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-24* (LE); Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m, 11 Sep 1997, *Popov 99-232* (LE).

*Artemisia caespitosa* Ledeb.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Dzun-Khemchikskii Raion, the valley of Chergany River in its lower course, 18 Sep 1997, *Shmakov, Smirnov & al. 99-25* (ALTB); Russia, East Siberia, Republic of Tyva, Turanskii Raion, Uyukskii Range, 3 km NW of Kara-Khaak village, right riverside of the Bii-Khem River, 21 Sep 1997, *Shmakov, Smirnov & al. 99-26* (ALTB); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, nanophanerophyte *Artemisia* desert with various herbs, 11 Sep 2003, *Korobkov 04-27* (LE), *Korobkov 04-28* (LE), *Korobkov 04-29* (LE).

*Artemisia commutata* Besser

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Tes-Khemskii Raion, 20 km N of Balgazyn settlement, on the road to Kyzyl city, *Pinus* forest edge, sandy dumps, grass community with various herbs, 18 Sep 2003, *Korobkov 04-72* (LE); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, the road Turan-Khut, 60 km N of Turan town, steppe meadow on the slope, 11 Aug 2002, *Nikitin, Sytin & al. 02-37* (LE).

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Tes-Khemskii Raion, 20 km N of Balgazyn settlement, on the road to Kyzyl city, *Pinus* forest edge, sandy dumps of the fire-prevention furrows, grass community with various herbs, 18 Sep 2003, *Korobkov 04-70* (LE), *Korobkov 04-71* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-80* (LE), *Korobkov 04-82* (LE); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, Vostochnyi Tannu-Ola Ridge, the Shuarmak Pass, S stony slope, meadow community, 13 Sep 2003, *Korobkov 04-81* (LE); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, nanophanerophyte *Artemisia* desert with various herbs, 11 Sep 2003, *Korobkov 04-83* (LE).

*Artemisia depauperata* Krasch.

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, the granite mountain Yamallyg, 15 km NW of the Tere-Khol' Lake, the bottom of a slope, melkozem spots among granite blocks, 15 Sep 2003, *Korobkov 04-73* (LE).

*Artemisia dolosa* Krasch.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, the pass between valleys of Alash and Khondelen Rivers, 18 Sep 1997, *Shmakov, Smirnov & al. 99-27* (ALTB).

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, nanophanerophyte *Artemisia* desert with various herbs, 11 Sep 2003, *Korobkov 04-85* (LE), *Korobkov 04-86* (LE).

*Artemisia dracuncululus* L.

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, in *Caragana* shrubs, 15 Sep 2003, *Korobkov 04-90* (LE), *Korobkov 04-95* (LE); Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the top of a hill, old fallow land, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-91* (LE).

*Artemisia frigida* Willd.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, the pass between valleys of Alagoz and Khondelen Rivers, E spurs of Talangara Mt., 18 Sep 1997, *Shmakov, Smirnov & al. 99-21* (ALTB), *Shmakov, Smirnov & al. 99-22* (ALTB); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, the mountain Yamallyg, 15 km NW of the Tere-Khol' Lake, 14 Sep 2003, *Korobkov 04-45* (LE), *Korobkov 04-58* (LE); Russia, East Siberia, Republic of Tyva, Tes-Khemskii Raion, near Balgazyn settlement, slope of a hill, *Artemisia* steppe with grasses and various herbs, 18 Sep 2003, *Korobkov 04-46* (LE); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, *Artemisia* steppe with various herbs, 11 Sep 2003, *Korobkov 04-47* (LE), *Korobkov 04-124* (LE); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, the depression of salt lakes Shara-Nur and Dus-Khol', 10 km E of Agar-Dag-Taiga Range, stony slope to the lake, 17 Sep 2003, *Korobkov 04-49* (LE); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, Vostochnyi Tannu-Ola Ridge, the Shuarmak Pass, S stony slope, meadow community with shrubs, 13 Sep 2003, *Korobkov 04-50* (LE), *Korobkov 04-57* (LE); Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the top of a hill, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-51* (LE); Russia, East Siberia, Republic of Tyva, Oviurskii Raion, near Bora-Shai, stony slope, 8 Sep 2003, *Sambdu 04-52* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, the granite mountains Kedzhege, 5 km N of Tsagan-Tolgoi customs station, rubbly plots, 16 Sep 2003, *Korobkov 04-56* (LE); Russia, East Siberia, Republic of Tyva, Ulug-Khemskii Raion, left riverside of the Tolaidy River, near Mt. Mongun-Taiga, 1954 m, high-mountain tundra, 29 Aug 2008, *Molokanov & Shalimov 10-18* (ALTB); Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m, 11 Sep 1997, *Popov 99-229* (LE).

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, the right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, *Artemisia* steppe with various herbs, 11 Sep 2003, *Korobkov 04-48* (LE), *Korobkov 04-125* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, near Erzin settlement, the top of a hill, old fallow land, *Artemisia* community with various herbs, 16 Sep 2003, *Korobkov 04-53* (LE), *Korobkov 04-123* (LE), *Korobkov 04-129* (LE); Russia, East Siberia, Republic

of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, sandy barchans with sparse *Caragana*, 13 Sep 2003, *Korobkov 04-54* (LE), Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 20 km NW of Erzin settlement, the bottom of limestone mountains, rocks and rubbly placer, 18 Sep 2003, *Korobkov 04-55* (LE), *Korobkov 04-120* (LE), *Korobkov 04-121* (LE); Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the top of a hill, old fallow land, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-119* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, the granite mountains Kedzhege, 5 km N of Tsagan-Tolgoi customs station, granite rocks and rubbly spots, 16 Sep 2003, *Korobkov 04-122* (LE).

*Artemisia glauca* Pall. ex Willd.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Ulug-Khemskii Raion, middle course of the Mogen-Buren River, water-meadow, at the road, 30 Aug 2008, *Molokanov & Shalimov 10-13* (ALTB).

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, old fallow land, *Artemisia* community with grasses, 12 Sep 2003, *Korobkov 04-92* (LE), *Korobkov 04-94* (LE); Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, the right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, low hill, *Artemisia* steppe with various herbs, 11 Sep 2003, *Korobkov 04-126* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, near Erzin settlement, the slope of a hill, old fallow land, *Artemisia* community, 17 Sep 2003, *Korobkov 04-128* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-93* (LE).

*Artemisia gmelinii* Weber ex Stechm.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Turanskii Raion, Uyukskii Range, 3 km NW of Kara-Khaak village, right riverside of the Bii-Khem River, 21 Sep 1997, *Shmakov, Smirnov & al. 99-16* (ALTB); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, Vostochnyi Tannu-Ola Ridge, the Shuurmak Pass, S stony slope, shrubs and meadow community, 13 Sep 2003, *Korobkov 04-67* (LE); Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m alt., 11 Aug 1997, *Popov 99-230* (LE).

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, the granite mountain Yamallyg, 15 km NW of the Tere-Khol' Lake, rocks and rubbly placer, 14 Sep 2003, *Korobkov 04-66* (LE); Russia, East Siberia, Republic of Tyva, Tes-Khemskii Raion, in vicinities of Balgazyn settlement, slope of a hill, rubbly plots at the edge of a ditch, 18 Sep 2003, *Korobkov 04-68* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-69* (LE).

*Artemisia jacutica* Drobow

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-30* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, 20 km NW of Erzin settlement, the bottom of limestone slopes, gravel at the roadside, 18 Sep 2003, *Korobkov 04-31* (LE).

*Artemisia laciniata* Willd.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Turanskii Raion, Uyukskii Range, 3 km NW of Kara-Khaak village, right riverside of the Bii-Khem River, 21 Aug 1997, *Shmakov, Smirnov*

*& al. 99-14* (ALTB); Russia, East Siberia, Republic of Tyva, Dzun-Khemchikskii Raion, the valley of Chergany River in its lower course, 18 Sep 1997, *Shmakov, Smirnov & al. 99-15* (ALTB).

*Artemisia lagocephala* (Fisch. ex Besser) DC.

$2n = 18$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, near Sergeevka village, Alekseevskii Range, on the way to Ol'khovaya Mt., 1600 m, 7 Sep 2012, *Kotseruba & Machs 2013-43* (LE), *Kotseruba & Machs 2013-44* (LE).

*Artemisia latifolia* Ledeb.

$2n = 54$ , CHN. Russia, East Siberia, Republic of Tyva, Tes-Khemskii Raion, 20 km of Balgazyn settlement, on the route to Kyzyl city, W edge of the Sygalyg-Taiga Range, sparse *Pinus* forest, sandy dumps of the fire-prevention furrows, grass community with various herbs, 18 Sep 2003, *Korobkov 04-65* (LE); Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, Vostochnyi Tannu-Ola Ridge, the Shuurmak Pass, S stony slope, shrubs and meadow community, 13 Sep 2003, *Korobkov 04-63* (LE), *Korobkov 04-64* (LE), *Korobkov 06-33* (LE).

*Artemisia littorcola* Kitam.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 19 Oct 2012, *Kotseruba & Machs 2013-47* (LE), *Kotseruba & Machs 2013-49* (LE), *Kotseruba & Machs 2013-50* (LE).

*Artemisia macrocephala* Jacquem. ex Besser

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 5 km downstream of Tsagan-Tolgoi customs station, on gravel, 16 Sep 2003, *Korobkov 04-32* (LE); Russia, East Siberia, Republic of Tyva, Ulug-Khemskii Raion, middle course of the Mogen-Buren River, 1954 m, water-meadow, at the road, 30 Aug 2008, *Molokanov & Shalimov 10-17* (ALTB); Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m, 11 Sep 1997, *Popov 99-233* (LE).

*Artemisia manshurica* (Kom.) Kom.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Anissimovka village, on the way to Mt. Tumannaya, 837 m, 16 Oct 2012, *Kotseruba & Machs 2013-46* (LE); Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 25 Sep 2012, *Kotseruba & Machs 2013-48* (LE).

*Artemisia obtusiloba* Ledeb.

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Mongun-Taiginskii Raion, hills along Ustiu-Sooru River (the affluent of the Ustiu-Ishkin River), 1500 m, 11 Sep 1997, *Popov 99-228* (LE).

*Artemisia palustris* L.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, the granite mountain Yamallyg, 15 km W of the Tere-Khol' Lake, flat slope, on melkozem spots, 14 Sep 2003, *Korobkov 04-25* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-26* (LE).

*Artemisia pycnorhiza* Ledeb.

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 20 km NW of Erzin settlement, the bottom of limestone mountains, rocks and rubbly placers, 18 Sep 2003, *Korobkov 04-74* (LE).

*Artemisia rubripes* Nakai

$2n = 16$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, near "Kedrovaya Pad'" nature reserve, on the way to sea shore,



11 Oct 2012, *Kotseruba 2013-37* (LE); Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Anissimovka village, on the way to Tumannaya Mt., 1000 m, 16 Oct 2012, *Kotseruba & Machs 2013-38* (LE); Russia, Far East, Primorskii Krai, Partizanskii Raion, near Sergeevka village, Alekseevskii Range, on the way to Ol'khovaya Mt., 6 Sep 2012, *Kotseruba 2013-39* (LE); Russia, Far East, Khabarovskii Krai, Nikolaevskii Raion, the Sea of Okhotsk coast, the Cape Lazarev, near Lazarev settlement, at the edge of mixed forest, 18 Sep 2011, *Burlyayeva 2012-86* (LE), *Burlyayeva 2012-87* (LE).

*Artemisia rutifolia* Steph. ex Spreng.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, the granite mountains Kezhege, 5 km N of Tsagan-Tolgoi customs station, on the rocks, 16 Sep 2003, *Korobkov 04-35* (LE), *Korobkov 04-36* (LE), *Korobkov 04-37* (LE).

*Artemisia sacrorum* Ledeb.

$2n = 54$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, at the road, 19 Oct 2012, *Kotseruba & Machs 2013-26* (LE), *Kotseruba & Machs 2013-27* (LE).

*Artemisia schrenkiana* Ledeb.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Chedi-Khol'skii Raion, the depression of salt lakes Shara-Nur and Dus-Khol', 10 km E of the Agar-Dag-Taiga Range, saline land along the lakeside, 17 Sep 2003, *Korobkov 04-20* (LE), *Korobkov 04-21* (LE), *Korobkov 04-22* (LE).

*Artemisia scoparia* Waldst. & Kit.

$2n = 16$ , CHN. Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, old fallow land, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-87* (LE), *Korobkov 04-88* (LE).

*Artemisia selengensis* Turcz. ex Besser

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, near "Kedrovaya Pad'" nature reserve, on the way to sea shore, 11 Oct 2012, *Kotseruba 2013-31* (LE); Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 25 Sep 2012, *Kotseruba & Machs 2013-32* (LE).

*Artemisia sieversiana* Ehrh. ex Willd.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-38* (LE); Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Anissimovka village, on the way to Mt. Tumannaya, 837 m, roadside, 16 Oct 2012, *Kotseruba & Machs 2013-45* (LE).

*Artemisia stolonifera* (Maxim.) Kom.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Vladivostok city, Vavilova Str., on the way to water supply point, 9 Oct 2012, *Kotseruba & Machs 2013-28* (LE), *Kotseruba & Machs 2013-29* (LE); Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 20 Oct 2012, *Kotseruba & Machs 2013-30* (LE).

*Artemisia sylvatica* Maxim.

$2n = 16$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, near Sergeevka village, Alekseevskii Range, on the way to Ol'khovaya Mt., 1600 m, 6 Sep 2012, *Kotseruba 2013-33* (LE), *Kotseruba 2013-36* (LE); Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Anissimovka village, Mt. Tumannaya, 837 m, 16 Oct 2012, *Kotseruba & Machs 2013-34* (LE); Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 25 Sep 2012, *Kotseruba 2013-35* (LE).

*Artemisia tomentella* Trautv.

$2n = 36$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, sandy barks with sparse *Caragana* shrubs, 13 Sep 2003, *Korobkov 04-75* (LE), *Korobkov 04-76* (LE), *Korobkov 04-77* (LE), *Korobkov 04-78* (LE), *Korobkov 04-79* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, the granite mountains Kezhege, 5 km N of Tsagan-Tolgoi customs station, granite rocks, rubbly-melkozem plots, 16 Sep 2003, *Korobkov 04-84* (LE).

*Artemisia umbrosa* Turcz. ex DC.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 20 Oct 2012, *Kotseruba & Machs 2013-40* (LE); Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Anissimovka village, on the way to Mt. Tumannaya, 837 m, 16 Oct 2012, *Kotseruba & Machs 2013-41* (LE).

$2n = 54$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, Sergeevka village, Alekseevskii Range, on the way to Mt. Ol'khovaya, 1600 m, 6 Sep 2012, *Kotseruba & Machs 2013-42* (LE).

*Artemisia vulgaris* L.

$2n = 16$ , CHN. Russia, East Siberia, Republic of Tyva, outskirts of Kyzyl city, the upper part of hill slope, old fallow land, *Artemisia* and grasses community, 12 Sep 2003, *Korobkov 04-59* (LE); Russia, East Siberia, Republic of Tyva, Erzinskii Raion, right riverside of the Tes-Khem River, 30 km NW of Erzin settlement, valley terrace, grass steppe with various herbs, 13 Sep 2003, *Korobkov 04-60* (LE); Russia, East Siberia, Republic of Tyva, Ulug-Khemskii Raion, 1954 m, water-meadow, at the road, 28 Aug 2008, *Molokanov & Shalimov 10-19* (ALTB).

*Artemisia xerophytica* Krasch.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Erzinskii Raion, E lakeside of the Tere-Khol' Lake, sandy barrage Tsuger-Eliss, sandy barks with sparse *Caragana* shrubs, 13 Sep 2003, *Korobkov 04-33* (LE), *Korobkov 04-34* (LE).

*Neopallasia pectinata* (Pall.) Poljakov

$2n = 18$ , CHN. Russia, East Siberia, Republic of Tyva, Barun-Khemchikskii Raion, low hill on the right riverside of the Bol'shoi Enissei River, opposite the mouth of the Tais River, stony *Artemisia* steppe with various herbs, 11 Sep 2003, *Korobkov 04-61* (LE), *Korobkov 04-62* (LE); Russia, East Siberia, Republic of Buryatia, Selenginskii Raion, 80 km SW of Ulan-Ude city, the lakeside of Solënoe Lake, near the railway station, on the slope to the lake, 27 Aug 2004, *Safronova 04-110* (LE).

*Pterocypsela alpina* DC.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, Sergeevka village, Alekseevskii Range, on the way to Mt. Ol'khovaya, 1600 m, 7 Sep 2012, *Kotseruba 2013-51* (LE); Russia, Far East, Primorskii Krai, Peter the Great Bay, Popova Island, 20 Oct 2012, *Kotseruba & Machs 2013-52* (LE), *Kotseruba & Machs 2013-53* (LE).

*Pterocypsela indica* (L.) C. Shih

$2n = 18$ , CHN. Russia, Far East, Khabarovskii Krai, left riverside of the Amur River, opposite Khabarovsk city, country place, disturbed meadow, 3 Aug 2012, *Rudyka 12175* (VLA).

**BALSAMINACEAE**

*Impatiens parviflora* DC.

$2n = 20$ , CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, park Pervomaiskii, broad-leaved forest, at the path, 14 Jun 2012, *Shatokhina, Starchenko & al. 191* (VLA).

**CAMPANULACEAE***Platycodon grandiflorus* A. DC.

2n = 18, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, locality Mukhinka, *Pinus* forest, 3 Sep 2006, *Shatokhina 102* (VLA).

**CHENOPODIACEAE***Chenopodium hybridum* L.

2n = 18, CHN. Russia, Far East, Amurskaya Oblast', Arkharskii Raion, Khinganskii nature reserve, Antonovskoe forestry, disturbed meadow, 2 Aug 2011, *Kudrin 12082* (VLA).

**CONVALLARIACEAE***Polygonatum stenophyllum* Maxim.

2n = 30, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, park Pervomaiskii, broad-leaved forest, 14 Jun 2012, *Shatokhina, Starchenko & al. 192* (VLA).

**CUSCUTACEAE***Cuscuta japonica* Choisy

2n = 32, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, the area of the 5th building construction, on *Artemisia*, 2003, *Leussova 31* (VLA); Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, the quay of the Amur River, near the rehabilitation center, on the *Ulmus* underbrush, 24 Oct 2004, *Shatokhina 39* (VLA).

**IRIDACEAE***Pardanthopsis dichotoma* (Pallas) L.W. Lenz

2n = 28, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, 4 km above Mikhailovka village, steep S slope in the valley of the Amur River, 20 Sep 2006, *Shatokhina & Starchenko 104* (VLA); Russia, Far East, Amurskaya Oblast', Tambovskii Raion, Muravëvskii nature park, steppe-like grassland, 19 Sep 2006, *Shatokhina 113* (VLA).

**POACEAE***Achnatherum extremiorientale* (Hara) Keng

2n = 24, CHN. Russia, Far East, Primorskii Krai, Muravëv-Amurskii Peninsula, near Akademgorodok, post-forest community on the slope, 21 Oct 2012, *Semeikin 12247* (VLA).

*Elymus franchetii* Kitag.

2n = 42, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, 4 km S of Slavyanka town, Cape Chirok, coastal rocks, 6 Aug 2010, *Lapenko 11680* (VLA).

*Hierochloë glabra* Trin.

2n = 28, CHN. Russia, Far East, Khabarovskii Krai, left riverside of the Amur River, opposite Khabarovsk city, country place, meadow, 3 Aug 2012, *Rudyka 12144* (VLA).

*Poa alpigena* Lindm.

2n = 70–72, CHN. Russia, Far East, Kamchatka Peninsula, Elizovskii Raion, the Kronotskii nature reserve, caldera of Uzon Volcano, mountain tundra, grass plots, 1 Aug 1982, *Probatova & Rudyka 6300* (VLA).

*Stipa baicalensis* Roshev.

2n = 44, CHN. Russia, Far East, Amurskaya Oblast', Shimanovskii Raion, 15 km W of Chagoyan settlement, the valley of Zeya River, S slope of a hill, 28 Sep 2006, *Shatokhina 106* (VLA).

**POLYGONACEAE***Acetosa pratensis* Mill.

2n = 14, 15, CHN. Russia, Far East, Primorskii Krai, Mikhail-

ovskii Raion, 2.5 km W of Novoshakhtinskii town, fallow land, 15 Jun 2008, *Lapenko 11022* (VLA).

**RANUNCULACEAE***Aconitum macrorhynchum* Turcz.

2n = 16, CHN. Russia, Far East, Amurskaya Oblast', Ivanovskii Raion, the valley of Man'chzhurka River, meadow with *Calamagrostis* and various herbs, 20 Aug 2004, *Shatokhina 14* (VLA).

*Pulsatilla davurica* (Fisch. ex DC.) Spreng.

2n = 16, CHN. Russia, Far East, Amurskaya Oblast', Tambovskii Raion, near Nikolaevka village, roadside, 7 Jun 2006, *Shatokhina & Darman 103* (VLA).

**ROSACEAE***Agrimonia pilosa* Ledeb.

2n = 56, CHN. Russia, Far East, Amurskaya Oblast', 3–4 km of Blagoveshchensk city, on the way to Verkhne-Blagoveshchenskoe village, 25 Jul 2008, *Timchenko 11164* (VLA).

*Filipendula angustiloba* Maxim.

\*\*2n = 14, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchensk city, park Pervomaiskii, broad-leaved forest, 14 Jun 2012, *Shatokhina, Starchenko & al. 194* (VLA).

**SCROPHULARIACEAE***Veronica incana* L.

2n = 34, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, locality Mukhinka, the flood-plain of Zeya River, meadow with *Carex* and various herbs, 12 Jul 2005, *Shatokhina 59* (VLA).

**SOLANACEAE***Datura stramonium* L.

2n = 24, CHN. Russia, Far East, Primorskii Krai, Mikhailovskii Raion, W outskirts of Novoshakhtinskii town, as a weed in a vegetable garden, 5 Oct 2011, *Lapenko 11975* (VLA).

**THYMELAEACEAE***Diarthron linifolium* Turcz.

2n = 18, CHN. Russia, Far East, Amurskaya Oblast', Blagoveshchenskii Raion, left riverside of the Amur River, between Mikhailovskie Stolby and Sergeevskii Utës, stony slope, 21 Sep 2006, *Shatokhina 114* (VLA).

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\* First chromosome count for the species.

\*\* New chromosome number (cytotyp) for the species.

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#### AMARANTHACEAE

*Corispermum hyssopifolium* L.

$2n = 18$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, Olkhon Island on the Baikal Lake, vicinity of Kharantsy village, 53°13'25"N, 107°25'44"E, on the sands, with *Oxytropis lanata* and *Chamaerhodos grandiflorum*, 3 Sep 2010, D.A. Krivenko 19829 (IRK).

#### BORAGINACEAE

*Mertensia stylosa* DC.

$2n = 48$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Slyudyanskii Raion, vicinity of Slyudyanka city, valley of Sludyanka River, right bank, 594 m, 51°37'35"N, 103°40'15"E, afforested steep valley sides, with rocky outcrops, 29 Jul 2011, S.G. Kazanovsky 19794 (IRK).

#### CAMPANULACEAE

*Platycodon grandiflorus* (Jacq.) A. DC.

$2n = 18$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Ishaga village, 51°28'14"N, 119°58'12"E, mountain steppe with patches of black birch (*Betula davurica*) forest, 2 Sep 2011, Ye.A. Bondarevich 28261 (IRK).

#### CAPRIFOLIACEAE

*Lonicera edulis* Turcz. ex Freyn

$2n = 18$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Mogo-chinskii Raion, 59th km of trails Mogochoa–Tupik, right tributary of the Malaya Mogochoa River, 54°07'34"N, 120°09'37"E, birch-larch-grass-forb forest, 13 Jul 2011, S.G. Kazanovsky 19935 (IRK).

*Patrinia sibirica* (L.) Juss.

$2n = 44$ , CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, vicinity of Zun-Murino village, near the base of Institute of Plant Physiology & Biochemistry Siberian Branch of the Russian Academy of Sciences, 766 m, 51°43'21"N, 102°53'38"E, pine-rhododendron-forb-lichen forest, 31 Jul 2011, S.G. Kazanovsky & D.A. Krivenko 20012 (IRK).

#### CUPRESSACEAE

*Tetraclinis articulata* (Vahl) Mast.

$2n = 22$ , CHN. Israel, Jerusalem District, community settlement Tzur Hadassah, 17 km WSW of the city of Jerusalem, 732 m, 31°43'08"N, 035°05'42"E, forest, 10 Feb 2013, K.Z. Gamburg 26977 (IRK).

#### EUPHORBIACEAE

*Securinega suffruticosa* (Pall.) Rehder

$2n = 26$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, 10 km of the village Olochi on the road to the village of Argunsk, 51°24'43"N, 119°57'05"E, steppe slope to the left of the road, 14 Aug 2012, O.D. Chernova 26824 (IRK).

#### FABACEAE

*Astragalus mongholicus* Bunge

$2n = 16$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Gazimuro-Zavodskii Raion, vicinity of Trubachovo village, 51°23'39"N, 118°11'52"E, larch-birch forest, 24 Jul 2000, G.N. Zinov'yeva 26821 (IRK).

\*\**Astragalus olchonensis* Gontsch.

$2n = 48$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, Olkhon Island on the Baikal Lake, Peschanka village, 463 m, 53°17'11"N, 107°35'02"E, eolic sands, 17 Aug 2012, D.A. Krivenko 28535 (IRK).

*Astragalus uliginosus* L.

$2n = 16$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Shilkinskii Raion, vicinity of Razmakhnino village, 51°46'02"N, 115°29'09"E, waterlogged meadow, 25 Aug 1994, Ye.M. Shipulina 26801 (IRK); Russia, East Siberia, Zabaikal'skii Krai, Akshinskii Raion, vicinity of Novokurgatai village, steppe, 26 Aug 2000, G.N. Zinov'yeva 26802 (IRK); Russia, East Siberia, Zabaikal'skii Krai, Gazimuro-Zavodskii Raion, Budyumkan River, road fork Budyumkan–Kaktolga, 52°30'57"N, 119°41'47"E, road roadside, 2 Jul 2009, O.D. Chernova 26804 (IRK).

*Caragana microphylla* Lam.

$2n = 16$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Borzinskii Raion, vicinity of Borzya city, 50°21'36"N, 116°27'05"E, steppe, 22 Jul 2000, G.N. Zinov'yeva 26823 (IRK); Russia, East Siberia, Zabaikal'skii Krai, Ononskii Raion, Zun-Torey Lake shore, 50°08'43"N, 115°53'38"E, foothills of the mountains, 21 Jul 2001, O.V. Sidneva 26822 (IRK).

\**Glycyrrhiza grandiflora* Tausch

$2n = 16$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Ononskii Raion, Zun-Torey Lake, reserve Daurinskii, 50°08'18"N, 115°55'34"E, feather grass stony steppe, 25 Aug 2000, L.I. Sarayeva 26797 (IRK).

\**Glycyrrhiza viscida* Grankina

$2n = 16$ , CHN. Russia, West Siberia, Novosibirskaya Oblast', Karasukkii Raion, vicinity of Karasuk city, 53°41'57"N, 078°06'24"E, saliniferous steppe, 22 Aug 1983, R.Ye. Krogulevich & T.A. Vagina 21083 (IRK).

*Lespedeza davurica* (Laxm.) Schindl.

$2n = 42$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Gornyi-Zerentui village, steppe slope left of the road at the entrance to the settlement, 638 m, 51°12'46"N, 119°31'10"E, petrophytic steppe, 15 Aug 2012, O.D. Chernova 26795 (IRK).

*Lespedeza juncea* (L. f.) Pers.

$2n = 20$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Chitinskii Raion, Kashtachnaya mountain valley, slope, steppe, 1 Sep 2000, O.N. Shevkun 26796 (IRK).

*Leucaena leucocephala* (Lam.) de Wit

$2n = 104, 106$ , CHN. Israel, Southern District, vicinity of the Ein Gedi, Dead Sea, 0 m, 31°27'30"N, 035°23'58"E, seashore, 18 Feb 2013, K.Z. Gamburg 26964 (IRK).

*Medicago falcata* L.

$2n = 32$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Irkutsk city, Angara River, left bank, fork in the road of the Academic bridge, 436 m, 52°15'13"N, 104°16'21"E, along the asphalt footpath, 19 Jul 2012, A.V. Verkhovina & D.A. Krivenko 26783 (IRK); Russia, West Siberia, Republic of Altay, Ongudaiskii Raion, vicinity of Tuekta village, 50°51'00"N, 085°50'50"E, steppe rocky slope with shrubs and rocky outcrops, 30 Aug 2012, S.G. Kazanovsky 26591 (IRK).

*Melilotus albus* Medik.

$2n = 16$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Irkutsk city, Akademgorodok, near the Institute of Power Engineering Systems Siberian Branch of the Russian Academy of Sciences, waste ground, 52°14'24"N, 104°16'20"E, 15 Sep 2011, S.G. Kazanovsky 19196 (IRK).

*Onobrychis arenaria* DC.

$2n = 14$ , CHN. Russia, West Siberia, Republic of Altay, Ongudaiskii Raion, vicinity of Tuekta village, 50°51'00"N, 085°50'50"E,

steppe rocky slope with shrubs and rocky outcrops, 30 Aug 2012, *S.G. Kazanovsky 26592* (IRK).

\*\**Oxytropis grandiflora* (Pall.) DC.

2n = 48, CHN. Russia, East Siberia, Zabaikal'skii Krai, Ononskii Raion, Mt. Tsugol'skii, sandy knoll, 23 Aug 1993, *Ye.M. Shipulina 26825* (IRK).

*Oxytropis myriophylla* (Pall.) DC.

2n = 16, CHN. Russia, East Siberia, Zabaikal'skii Krai, vicinity of Chita city, Mt. Chita, 51°57'36"N, 113°32'21"E, 15 Aug 1992, *Ye.M. Shipulina 26818* (IRK).

*Oxytropis oxyphylla* (Pall.) DC.

2n = 16, CHN. Russia, East Siberia, Zabaikal'skii Krai, Ononskii Raion, Mt. Gydrygun, Zun-Torey Lake shore, 50°08'43"N, 115°53'38"E, steppe meadow, 21 Jul 2001, *O.V. Sidneva 26820* (IRK).

*Oxytropis sylvatica* (Pall.) DC.

2n = 16, CHN. Russia, East Siberia, Zabaikal'skii Krai, Khilokskii Raion, vicinity of Mozgon village, 51°45'35"N, 111°59'03"E, 18 Jul 2001, *S.M. Kalitkina 26805* (IRK).

*Sophora flavescens* Aiton

2n = 18, CHN. Russia, East Siberia, Zabaikal'skii Krai, Aginskii Buryatskii District, Aginskii Raion, 17th km of the trails Aginskoye–Nizhnii Tsasuchei, 23 Aug 2000, *O.N. Shevkun 26799* (IRK); Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Olochi village, slope on the left side of the road in the Argunsk village, 51°20'47"N, 119°52'34"E, steppe slope, 14 Aug 2012, *O.D. Chernova 26800* (IRK).

#### LAMIACEAE

*Stachys annua* L.

2n = 34, CHN. Russia, East Siberia, Irkutskaya Oblast', Ust'-Ordynskii Buryatskii District, Osinskii Raion, vicinity of Obusa village, 448 m, 53°43'28"N, 103°49'40"E, road roadside, 26 Jun 2010, *A.V. Verkhovina 19432* (IRK).

#### POACEAE

*Beckmannia syzigachne* (Steud.) Fernald

2n = 14, CHN. Russia, East Siberia, Republic of Sakha (Yakutia), Mirminskii Raion, vicinity of Tas-Yuryakh village, base "Yakutskgeofizika", 61°46'56"N, 113°05'30"E, ruderal community, 6 Sep 2012, *D.A. Krivenko 28156* (IRK).

*Deschampsia cespitosa* (L.) P. Beauv.

2n = 26, CHN. Russia, Central Ural, Sverdlovskaya Oblast', Ekaterinburg city, territory of Institute of Plant & Animal Ecology. Ural Branch of the Russian Academy of Sciences, old building, 56°49'20"N, 060°19'38"E, ruderal community along the asphalt walkway, 7 Sep 2011, *O.S. Dymshakova 21111* (IRK).

*Phleum pratense* L.

2n = 42, CHN. Russia, West Siberia, Republic of Altay, Turochakskii Raion, right bank of the Biya River, vicinity of Novotroitskoe village, 526 m, 51°54'18"N, 087°08'47"E, glade among the thickets of willow shrubs, 24 Jun 2012, *D.A. Krivenko 28226* (IRK).

*Stipa baicalensis* Roshev.

2n = 44, CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Ishaga village, 51°28'14"N, 119°58'12"E, mountain steppe with patches of black birch (*Betula davurica*) forest, 3 Sep 2011, *Ye.A. Bondarevich 28221* (IRK).

#### POLYGONACEAE

*Aconogonon ochreatum* (L.) Hara

2n = 20, CHN. Russia, East Siberia, Republic of Buryatiya, Pribaikal'skii Raion, Baikal Lake, vicinity of Gremyachinsk village, 411 m, 52°47'46"N, 107°58'44"E, sandy shore of the lake, 22 Jul 2011, *D.A. Krivenko 23197* (IRK).

\**Aconogonon sericeum* (Pall.) Hara

2n = 20, CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, Olkhon Island on the Baikal Lake, vicinity of Peschanka village, 466 m, 53°17'02"N, 107°04'31"E, shore lake, on the sands, 28 Jun 2011, *S.G. Kazanovsky 20684* (IRK).

#### ORCHIDACEAE

*Coeloglossum viride* (L.) Hartm.

2n = 40, CHN. Russia, East Siberia, Republic of Buryatiya, Okinskii Raion, East Sayan, Kitoiskii Mountains, Kitoi River, upper course, left bank, 1880 m, 52°01'14"N, 101°07'30"E, swampy river bank, 31 Jul 2011, *A.V. Verkhovina 27179* (IRK).

*Cypripedium calceolus* L.

2n = 20, CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, northwest vicinity of Moigoty village, right bank of the Irkut River, 1012 m, 51°38'59"N, 101°23'20"E, birch-pine herb forest, 31 Jul 2011, *A.V. Verkhovina 23529* (IRK).

*Gymnadenia conopsea* (L.) R. Br.

2n = 40, CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, northwest vicinity of Moigoty village, right bank of the Irkut River, 1008 m, 51°39'01"N, 101°23'21"E, pine-herb forest, 31 Jul 2011, *A.V. Verkhovina 23534* (IRK).

#### RANUNCULACEAE

*Anemone crinita* Juz.

2n = 14, CHN. Russia, East Siberia, Irkutskaya Oblast', Slyudyanskii Raion, vicinity of Slyudyanka city, valley of the Sludyanka River, right bank, 594 m, 51°37'35"N, 103°40'15"E, afforested steep valley sides, with rocky outcrops, 29 Jul 2011, *S.G. Kazanovsky & D.A. Krivenko 20019* (IRK).

*Ranunculus reptans* L.

2n = 32, CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Znamenka village, bayou Nercha River, 505 m, 52°11'52"N, 116°14'21"E, in the water and on the sand-clay soil near the water, 14 Jul 2011, *S.G. Kazanovsky 19544* (IRK).

*Thalictrum baicalense* Turcz. ex Ledeb.

2n = 14, CHN. Russia, East Siberia, Irkutskaya Oblast', Slyudyanskii Raion, vicinity of Slyudyanka city, valley of the Sludyanka River, right bank, 594 m, 51°37'35"N, 103°40'15"E, spruce-pine-birch-forb forest with fir, 29 Jul 2011, *S.G. Kazanovsky 19795* (IRK).

#### VIOLACEAE

*Viola brachyceras* Turcz.

2n = 20, CHN. Russia, East Siberia, Zabaikal'skii Krai, Tungiro-Olokminskii Raion, 68th km of trails Mogocha–Tupik (1 km south of the geologists village), 795 m, 54°12'17"N, 120°08'04"E, larch-ledum-cranberry-mossy forest, 12 Jul 2011, *S.G. Kazanovsky 19546* (IRK).

*Viola collina* Besser

2n = 20, CHN. Russia, East Siberia, Zabaikal'skii Krai, Nerchinsko-Zavodskii Raion, vicinity of Ishaga village, 51°28'14"N, 119°58'12"E, black birch forest (*Betula davurica*) without underbrush and herbage, 3 Sep 2011, *Ye.A. Bondarevich 22396* (IRK).

*Viola irtutiana* Turcz.

$2n = 24$ , CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, vicinity of Zun-Murino village, base of Institute of Plant Physiology & Biochemistry Siberian Branch of the Russian Academy of Sciences, Khyr-Gorkhon River, 740 m, 51°43'14" N, 102°53'36" E, slight slope to the river, grass-forb meadow, 31 Jul 2011, S.G. Kazanovsky & D.A. Krivenko 19465 (IRK).

\*\* *Viola mauritii* Tepl.

$2n = \text{ca. } 16, 18$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Aginskii Buryatskii District, Dul'durginskii Raion, National Park "Alkhanai", Alkhanai Creek, 1364 m, 50°55'52" N, 113°12'32" E, larch small reed-green moss, with stone loose, on stony placers, 22 Jul 2010, S.G. Kazanovsky 16362 (IRK).

*Viola nemoralis* Kütz.

$2n = 20$ , CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, vicinity of Arshan village, near datsan, 894 m, 51°54'44" N, 102°24'41" E, grass-forb meadow, 26 Aug 2009, S.G. Kazanovsky & Yu.N. Pochinchik 20662 (IRK); Russia, East Siberia, Republic of Buryatiya, Kabanskii Raion, Khamar-Daban Mountains, Bol'shoi Mamai River in the middle reaches, 51°24'40" N, 104°49'21" E, edge of the pine-fir forest, at forest road, 26 Aug 2010, S.G. Kazanovsky & Yu.N. Pochinchik 22090 (IRK); Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, Margasan River, right bank, 771 m, 51°40'56" N, 102°53'25" E, bank of the river, covered with shrubs, 11 Jun 2011, S.G. Kazanovsky 20654 (IRK); Russia, East Siberia, Republic of Buryatiya, Pribaykal'skii Raion, 6.6 km south-west of the Turka village, 455 m, 52°54'11" N, 108°09'47" E, wayside of the road, at the edge of the sand dunes, 23 Jul 2011, A.V. Verkhozina & A.S. Anosova 22960 (IRK).

*Viola rupestris* F.W. Schmidt

$2n = 20$ , CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, vicinity of Arshan village, near datsan, 894 m, 51°54'44" N, 102°24'41" E, grass-forb meadow, 26 Aug 2009, S.G. Kazanovsky & Yu.N. Pochinchik 20657 (IRK).

*Viola trichosepala* (W. Becker) Juz.

$2n = 24$ , CHN. Russia, East Siberia, Republic of Buryatiya, Tunkinskii Raion, Margasan River, right bank, 5 km to the south of Margasan uninhabited house, 790 m, 51°40'56" N, 102°53'40" E, rocky slope south-eastern exposure, 11 Jun 2011, S.G. Kazanovsky 19908 (IRK).

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All cytological investigations have been carried out on root tips of seedlings, pretreated in 0.2% colchicine, fixed in ethanol-acetic acid (3:1) and stained in 1% acetic hematoxylin (Smirnov, 1968). Chromosome numbers in literature were checked using IPCN (Goldblatt & Johnson, 1979+).

\* First chromosome count for the species.

▼ First chromosome count for Siberian accession.

\*\* First chromosome count from the Republic.

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**AMARANTHACEAE***Amaranthus albus* L.

\*\*  $2n = 32$ , CHN. Russia, Kalmykia Republic, Elista, roadside, Lomonosova 960 (NS).

*Amaranthus blitoides* S. Watson

\*\* ▼  $2n = 32$ , CHN. Russia, Kalmykia Republic, Sarpinskii region, coast of the Arshan-Zelmen reservoir, roadside, 47°35' N, 44°35' E, Lomonosova 941 (NS); Russia, Sakha (Yakutia) Republic, Namskii ulus, vicinities of Maimaga village, potato field, 63°02' N, 129°31' E, Lomonosova & Nikolin 800 (NS).

*Amaranthus retroflexus* L.

\*\*  $2n = 34$ , CHN. Russia, Kalmykia Republic, Priyutnoe village, waste places, 46°05' N, 43°27' E, Lomonosova 949 (NS).

**ASTERACEAE***Achillea asiatica* Serg.

$2n = 18$ , CHN. Russia, Sakha (Yakutia) Republic, Khangalasskii ulus, 127 km of the Pokrovskii tract, cut-through in the larch forest, 61°21' N, 128°27' E, Lomonosova & Nikolin 847 (NS).

The same chromosome number was indicated by Yurtsev & Zhukova (1982) from northeastern Yakutia.

*Cacalia hastata* L.

\*\*  $2n = 60$ , CHN. Russia, Sakha (Yakutia) Republic, Khangalasskii ulus, between Bulgunnyakhtakh and Ulakhaan-An villages, Lena river valley, spruce forest, 61°17' N, 128°24' E, Lomonosova & Nikolin 867 (NS).

*Cirsium setosum* (Willd.) Besser

\*\*  $2n = 34$ , CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, between Moduttsy and Khatyryk villages, fallow land, 62°57' N, 129°33' E, Lomonosova & Nikolin 795 (NS).

*Crepis jacutica* Lomon.

\*\*  $2n = 14$ , CHN. Russia, Sakha (Yakutia) Republic, Tomponskii ulus, 3 km E from Nezhdaninskoe, 6 Sep 2011, Nikolin s.n. (SASY, NS); *ibid.*, Tomponskii ulus, watershed of the rivers Kuranakh and Dyby, 61 km of the road to Nezhdaninskoe, 20 Jul 2011, Nikolin s.n. (SASY, NS).

*Crepis tectorum* L.

\*\*  $2n = 8$ , CHN. Russia, Sakha (Yakutia) Republic, Tomponskii ulus, Razvilka village, 12 Jul 2012, Nikolin s.n. (NS).

*Hieracium umbellatum* L.

\*\*  $2n = 27$ , CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, Namskii tract, the Kemkeme river bank, birch forest 62°40' N, 129°02' E, Lomonosova & Nikolin 809 (NS); *ibid.*, Megino-Khangalasskii ulus, Kolymskii tract, vicinities of Bestyakh village, road ditch, 61°58' N, 129°56' E, Lomonosova & Nikolin 873 (NS).

*Jacobeia nemorensis* (L.) Moench

\*\*  $2n = 40$ , CHN. Sakha (Yakutia) Republic, Khangalasskii ulus, vicinities of Bulgunnyakhtakh village, Lena river valley, on the canyon slope, 61°18' N, 128°34' E, Lomonosova & Nikolin 861 (NS).

*Mulgedium sibiricum* Cass. ex Less.

$2n = 18$ , CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, Orgolookh natural boundary (between the Kemkeme river and Tastakh village), roadside, 62°35' N, 128°53' E, Lomonosova & Nikolin 812 (NS).

This chromosome number corresponds with the indication of Yurtsev & Zhukova (1982) from northeastern Yakutia.

*Saussurea amara* (L.) DC.

\*\*2n = 26, CHN. Russia, Sakha (Yakutia) Republic, Namskii tract, vicinities of Edeitsy village, grass salt meadow, 62°25'N, 129°44'E, *Lomonosova & Nikolin 788* (NS).

*Serratula marginata* Tausch

\*\*2n = 60, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk vicinities, 1 km N of Vladimirovka village, south steppe slope, 61°54'N, 129°31'E, *Lomonosova & Nikolin 822* (NS).

*Sonchus brachyotus* DC.

\*\*▼2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, vicinities of Betyuntsy village, oats field, 62°48'N, 129°37'E, *Lomonosova & Nikolin 791* (NS).

*Tephrosieris palustris* (L.) Rchb.

\*\*▼2n = 48, CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, 3.5 km of Namtsy, lakeshore, 62°43'N, 129°18'E, *Lomonosova & Nikolin 815* (NS).

**CHENOPODIACEAE***Atriplex hortensis* L.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk vicinities, Kagalassy village, on the compost heap, 62°21'N, 129°58'E, *Lomonosova & Nikolin 911* (NS); *ibid.*, Yakutsk, embankment along Saisary lake shore, *Lomonosova & Nikolin 916* (NS).

*Atriplex laevis* C.A. Mey.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk, Tuimaada valley, solonchak near the gas station, *Lomonosova & Nikolin 819* (NS).

*Atriplex patens* (Litv.) Iljin

\*\*2n = 36, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk, roadside, *Lomonosova & Nikolin 779* (NS); *ibid.*, Yakutsk vicinities, Namskii tract near Zhatai village, solonchak, *Lomonosova & Nikolin 781* (NS); *ibid.*, salt meadow with *Puccinellia*, *Lomonosova & Nikolin 783* (NS); *ibid.*, 12 km S from Yakutsk, Pokrovskii tract, salty spots along the road, 61°56'N, 129°36'E, *Lomonosova & Nikolin 820* (NS); *ibid.*, Megino-Kangalasskii ulus, 27 km of Amginskii tract, solonchak, 61°46'N, 130°13'E, *Lomonosova & Nikolin 885* (NS).

*Atriplex patula* L.

\*\*2n = 36, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk, embankment along Saisary lake shore, *Lomonosova & Nikolin 917* (NS).

*Axyris amaranthoides* L.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, vicinities of Khamagatta village, fallow land, 62°40'N, 129°41'E, *Lomonosova & Nikolin 790a* (NS).

*Axyris sphaerosperma* Fisch. & C.A. Mey.

\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk vicinities, near Vladimirovka village, on sand, 61°53'N, 129°31'E, *Lomonosova & Nikolin 825* (NS).

*Chenopodium album* L.

\*\*2n = 54, CHN. Russia, Sakha (Yakutia) Republic, Namskii ulus, Betyuntsy village, oats field, 62°48'N, 129°37'E, *Lomonosova & Nikolin 791* (NS); *ibid.*, vicinities of Maimaga village, potato field, 63°02'N, 129°31'E, *Lomonosova & Nikolin 800* (NS); *ibid.*, Namskii tract, the Kemkeme riverside, on sand, 62°40'N, 129°02'E, *Lomonosova & Nikolin 808* (NS); Megino-Kangalasskii ulus, Kolymskii tract, Nizhnii Bestyakh village, sandy dunes, 61°57'N, 129°54'E, *Lomonosova & Nikolin 871* (NS); *ibid.*, Yakutsk, solonchak along Chepalova street, *Lomonosova 890* (NS).

*Chenopodium chenopodioides* (L.) Aellen

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Namskii tract, vicinities of Zhatai village, salt meadow with *Agrostis stolonifera*, 62°09'N, 129°46'E, *Lomonosova & Nikolin 781* (NS), *Lomonosova & Nikolin 782* (NS); *ibid.*, Khamgalasskii ulus, 37 km Pokrovskii tract, Kuldaty river valley, solonchak, 61°44'N, 129°32'E, *Lomonosova & Nikolin 830b* (NS); *ibid.*, Yakutsk vicinities, NW outskirts of Kagalassy village, spoil banks, 62°21'N, 129°57'E, *Lomonosova & Nikolin 912* (NS).

*Chenopodium ficifolium* Sm.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Tomponskii ulus, Kolymskii tract, the left river bank of Aldan, at a ferry site, 23 Jul 2011, *Nikolin s.n.* (NS).

*Chenopodium glaucum* L.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk, roadside, 1 Sep 2011, *Nikolin s.n.* (NS); *ibid.*, Namskii ulus, Betyuntsy village, oats field, 62°48'N, 129°37'E, *Lomonosova & Nikolin 791* (NS); *ibid.*, Yakutsk vicinities, NW outskirts of Kagalassy village, spoil banks, 62°21'N, 129°57'E, *Lomonosova & Nikolin 912* (NS).

*Chenopodium rubrum* L.

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Namskii tract, vicinities of Zhatai village, salt meadow with *Agrostis stolonifera* 62°09'N, 129°46'E, *Lomonosova & Nikolin 782* (NS), *ibid.*, Namskii ulus, vicinities of Tastakh village, degraded meadow, 62°35'N, 128°51'E, *Lomonosova & Nikolin 813* (NS); *ibid.*, Yakutsk vicinities, NW outskirts of Kagalassy village, spoil banks, 62°21'N, 129°57'E, *Lomonosova & Nikolin 912* (NS).

\*\*2n = 36, CHN. Russia, Sakha (Yakutia) Republic, Megino-Kangalasskii ulus, 27 km of Amginskii tract, salt meadow, 61°46'N, 130°13'E, *Lomonosova & Nikolin 886* (NS).

*Corispermum sibiricum* Iljin

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Namskii tract, sandy riverside of the Kemkeme, near the bridge to Tastakh village, 62°40'N, 129°02'E, *Lomonosova & Nikolin 808* (NS).

*Kali collina* (Pall.) Akhani & Roalson (≡ *Salsola collina* Pall.)

\*\*2n = 18, CHN. Russia, Sakha (Yakutia) Republic, Yakutsk, built up sand, *Lomonosova & Nikolin 780* (NS).

*Suaeda corniculata* (C.A. Mey.) Bunge subsp. *corniculata*

\*\*2n = 54, CHN. Russia, Sakha (Yakutia) Republic, Amginskii ulus, vicinities of Amga village, 60°53'N, 131°56'E, *Nikolin 80* (NS); *ibid.*, Namskii ulus, vicinities of Khamagatta village, solonchak with *Salicornia*, 62°40'N, 129°41'E, *Lomonosova & Nikolin 790* (NS); *ibid.*, 12 km S of Yakutsk, Pokrovskii tract, solonchak near the road, 61°56'N, 129°36'E, *Lomonosova & Nikolin 820* (NS); *ibid.*, Khamgalasskii ulus, 37 km of Pokrovskii tract, Kuldaty river valley, solonchak near the road, 61°44'N, 129°32'E, *Lomonosova & Nikolin 830b* (NS); *ibid.*, Megino-Kangalasskii ulus, 73 km of the Kolymskii tract, vicinities of Tumul village, farm road on solonchak, 62°10'N, 130°38'E; *Lomonosova & Nikolin 878* (NS); *ibid.*, Megino-Kangalasskii ulus, 27 km of the Amginskii tract, solonchak spots on the alas 61°46'N, 130°13'E, *Lomonosova & Nikolin 883* (NS), *Lomonosova & Nikolin 889* (NS); *ibid.*, 13 km N of Yakutsk, Namskii tract, vicinities of Markha scientific station, solonchak, *Lomonosova & Nikolin 914* (NS); *ibid.*, Yakutsk, solonchak along Chepalova street, *Lomonosova 890* (NS).

*Suaeda corniculata* subsp. *mongolica* Lomon. & Freitag

2n = 36, CHN. Russia, Buryatia Republic, Barguzinskii region, 12 km NW Bayangol village, community with *Achnatherum splendens*, 11 Sep 2011, *B. Naidanov s.n.* (NS).

*Suaeda kulundensis* Lomon. & Freitag

$2n = 90$ , CHN. Russia, Novosibirskaya Oblast, vicinities of Chis-toozerne village, northern coast of the lake Solenoe, Kurambelskaya steppe, 16 Sep 2004, *N. Makunina 283* (NS).

All *Suaeda* taxa studied belong to the *S.* sect. *Brezia* (Moq.) Volk. The survey of known karyological data for this taxon has been done by Lomonosova (2011).

#### Literature cited

- Goldblatt, P. & Johnson, D.E. (eds.)** 1979–. *Index to plant chromosome numbers (IPCN)*. St. Louis: Missouri Botanical Garden. <http://www.tropicos.org/Project/IPCN> (accessed Feb 2013).
- Lomonosova, M.N.** 2011. Khromosomnye chisla, taksonomiya i rasprostraneniye podroda *Brezia* (*Suaeda*, Chenopodiaceae) [Chromosome numbers, taxonomy and distribution of the subgenus *Brezia* (*Suaeda*, Chenopodiaceae)]. *Turczaninowia* 14(3): 45–52. [in Russian]
- Smirnov, Yu.A.** 1968. Uskorennyy metod issledovaniya somaticheskikh khromosom plodovoykh [Accelerated method for studying somatic chromosomes in fruit trees]. *Tsitologia* 10: 1132–1134. [in Russian]
- Yurtsev, B.A. & Zhukova, P.G.** 1982. Khromosomnye chisla nekotorykh rastenii Severo-Vostochnoi Yakutii (Bassein srednego techeniya reki Indigirki) [Chromosome numbers of some plants of the northeastern Yakutia (The drainage Indigirka river in the its middle reaches)]. *Bot. Zhurn.* 67: 778–787. [in Russian]

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Methods for chromosome counts follow Anju & al. (2012) and Merita & al. (2012).

- \* First chromosome count for the species.
- + Endemic to low-elevation Western Ghats of India including Kerala, Tamil Nadu and Karnataka states.

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#### FABACEAE

\* *Vigna pilosa* (J.G. Klein ex Willd.) Baker

$2n = 22$ , CHN. India, Kerala state, Thrissur district, Vazhachal, 10°19.744'N, 076°35.312'E, 6 Oct 1998, *P.K. Jayan & K.C. Velayudhan HSI2963* (NHCP) [Fig. 7E, F].

\* *Vigna sahyadriana* Aitawade & al.

$2n = 22$ , CHN. India, Rajasthan state, Sirohi district, Mount Abu,

24°37.476'N, 072°45.521'E, 5 Oct 2009, *S.R. Yadav SUK-2* (SUK) [Fig. 7G, H].

#### MALVACEAE

\* *Abelmoschus crinitus* Wall.

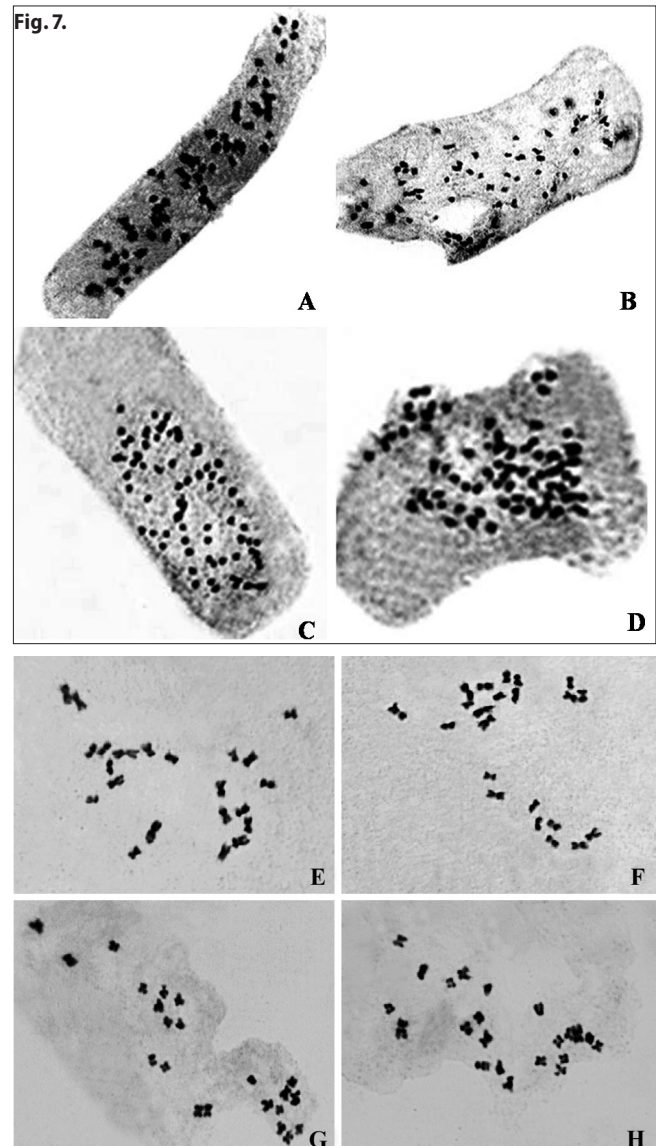
$2n = 66$ , CHN. India, Orissa state, Phulbani district, Phulbani forest, Godimunda, 20°34'9.9"N, 84°18'32.58"E, 13 Oct 2011, *S.R. Yadav SRYA-2* (SUK) [Fig. 7A, B].

\* *Abelmoschus enbeepeegearensis* K.J. John & al.

$2n = 72$ , CHN. India, Kerala state, Palakkad district, Mangalam dam site, 10°00'31.02"N, 76°00'32.1"E, 19 Nov 2009, *Joseph John K. HS20926* (NHCP), 173899 (MH) [Fig. 7C, D].

#### Literature cited

- Anju, S., Madhavan, L., Yadav, S.R., Bhat, K.V. & Rao, S.R.** 2012. Chromosome diversity analysis in various species of *Vigna* Savi from India. *Nucleus* 55: 107–114. <http://dx.doi.org/10.1007/s13237-012-0063-3>
- Merita, K., Kattukunnel, J.J., Yadav, S.R., Bhat, K.V. & Rao, S.R.** 2012. Chromosome counts in wild and cultivated species of *Abelmoschus* Medikus. from the Indian sub-continent. *J. Hort. Sci.* 87: 593–599.



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- \* First chromosome count for the species.  
\*\* New chromosome number (cytotype) for the species.

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#### ALLIACEAE

*Allium maximowiczii* Regel

2n = 16, CHN. Russia, Far East, Khabarovskii Krai, the Shantar-skie Islands, Feklistova Island, seashore near the rock Arka, 18 Aug 2010, *Bogatov 12148* (VLA).

*Allium sacculiferum* Maxim.

2n = 32, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Gamova Peninsula, Cape Gamova, disturbed habitat in *Arundinella* meadow with various herbs, 29 Sep 2012, *Barkalov 12229* (VLA).

*Allium senescens* L.

2n = 16, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, the Krabbe Peninsula, rubbly slope, rocky outcrops, sparse oak forest (*Quercus dentata*, *Q. mongolica*), 12 Sep 2012, *Chubar' 12243* (VLA).

*Allium spirale* Willd.

2n = 32, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Peter the Great Bay, Far East marine biosphere reserve, Vera Island, on the rocks, 11 Sep 2012, *Chubar' 12194* (VLA).

#### APIACEAE

*Sanicula chinensis* Bunge

2n = 16, CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Russkii Island, forest on the slope, 13 Sep 2012, *Rudyka 12187* (VLA).

#### ASTERACEAE

*Artemisia mongolica* Fisch. ex Besser

2n = 18, CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Klykova Island, 30 Jun 2000, *Prozorova 8170* (VLA).

*Artemisia palustris* L.

2n = 18, CHN. Russia, East Siberia, Republic of Buryatia, near Khorinsk settlement, stony steppe, 14 Jul 2012, *Tzyrenova 12198* (VLA).

*Bidens frondosa* L.

2n = 48, CHN. Russia, Far East, Khabarovskii Krai, the railway station Vyazemskaya, on the railroad embankment, 4 Sep 2004, *Probatova & Seledets 10500* (VLA).

*Hieracium virosum* Pall.

2n = 36, CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, nature reserve "Khankaiskii", part "Sosnovyi", Przheval'skogo Peninsula, among shrubs, 19 May 2004, *Barkalov 9204* (VLA).

*Pterocypsela raddeana* (Maxim.) C. Shih

2n = 18, CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Russkii Island, forest on the slope, 13 Sep 2012, *Rudyka 12267* (VLA).

*Senecio viscosus* L.

2n = 40, CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", the lakeside of Khanka Lake, Oct 1997, *Barkalov 7524* (VLA).

#### BORAGINACEAE

*Heliotropium europaeum* L.

2n = 32, CHN. Russia, North Caucasus, Krasnodarskii Krai, Novorossiiskii Raion, Gelendzhik town, seaside park, as a weed on the flower-bed, 3 Sep 2009, *Probatova & Seledets 11586* (VLA).

#### BRASSICACEAE

*Cochlearia oblongifolia* DC.

2n = 14, CHN. Russia, Far East, Khabarovskii Krai, Shantarskie Islands, Bol'shoi Shantar Island, Yakshina Bay, the Bol'shoi Anaur River, 14 Aug 2010, *Bogatov 12143* (VLA).

*Dimorphostemon pectinatus* (DC.) Golubk.

\*2n = 14, CHN. Russia, East Siberia, Republic of Buryatia, near Khorinsk settlement, stony steppe, 14 Jul 2012, *Tzyrenova 12310* (VLA).

#### CRASSULACEAE

*Orostachys maximowiczii* V.V. Byalt (*O. iwarenge* auct.)

2n = 24, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, the Krabbe Peninsula, rubbly slope, rocky outcrops, sparse oak forest (*Quercus dentata*, *Q. mongolica*), 12 Sep 2012, *Chubar' 12299* (VLA).

#### EUPHORBIACEAE

*Euphorbia discolor* Ledeb.

2n = 24, CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", part "Sosnovyi", Khanka Lake, Arsen'eva spit, on sands, 20 Jun 2004, *Barkalov 9287* (VLA).

#### FABACEAE

*Caragana microphylla* Lam.

2n = 16, CHN. Russia, East Siberia, Zabaikal'skii Krai, "Daurskii" nature biosphere reserve, Zun-Torei Lake, stony slope of a hill, feather-grass steppe, 10 Jul 2011, *Tzyrenova 12304* (VLA).

*Caragana stenophylla* Pojark.

2n = 32, CHN. Russia, East Siberia, Zabaikal'skii Krai, "Daurskii" nature biosphere reserve, Zun-Torei Lake, near Mt. Tely (Oboo), stony hillocks, steppe, 20 Jul 2011, *Tzyrenova 12305* (VLA).

*Oxytropis charkeviczii* Vyschin

2n = 16, CHN. Russia, Far East, Khabarovskii Krai, Nanaiskii Raion, Sikhote-Alin' Range, N part, Mt. Tardoki-Yani, the upper course of Sukhaya Pad' spring (the An'ui River basin), 1920 m, alpine belt, the dwarf shrub-lichen stony tundra, 29 Aug 2012, *Barkalov 12190* (VLA).

*Vicia japonica* A. Gray

2n = 12, CHN. Russia, Far East, Sakhalin, Aleksandrovsk-Sakhalinskii Raion, near Due settlement, a ravine on coastal slope, in various herbs community, 6 Sep 2009, *Barkalov 12142* (VLA).



**GENTIANACEAE***Gentiana algida* Pall.

$2n = 24$ , CHN. Russia, Far East, Khabarovskii Krai, Nanaiskii Raion, Sikhote-Alin' Range, N part, Mt. Tardoki-Yani, the upper course of Sukhaya Pad' spring (the An'ui River basin), 1900 m, alpine belt, meadow, 29 Aug 2012, *Barkalov 12202* (VLA).

**GERANIACEAE***Geranium sibiricum* L.

$2n = 28$ , CHN. Russia, Far East, Primorskii Krai, Terneiskii Raion, Ternei settlement, Terneiskaya Str., slide-rocks covered with grasses between road and rivulet, 27 Jun 2004, *Nesterova 9320* (VLA)

*Geranium wilfordii* Maxim.

$2n = 28$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Russkii Island, Shigino, lower part of the slope, 22 Aug 2011, *Rudyka 11898* (VLA).

**JUNCACEAE***Juncus gracillimus* (Buchenau) V.I. Krecz. & Gontsch.

\* $2n = 40$ , CHN. Russia, Far East, Amurskaya Oblast', 3–4 km of Blagoveshchensk city, on the way to Verkhne-Blagoveshchenskoe village, 25 Jul 2008, *Timchenko 11074* (VLA).

*Luzula capitata* (Miq.) Nakai

$2n = 12$ , CHN. Russia, Far East, the Kuril Islands, Shikotan Island, Bezimyannaya Bay, at the Cape Nepokornyi, stony coastal slope, meadow, 24 Jul 2010, *Barkalov 11784* (VLA).

**LAMIACEAE***Clinopodium chinense* (Benth.) Kuntze

$2n = 20$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Elena Island, oak forest, 19 Sep 1997, *Probatova & Seledets 7440* (VLA); Russia, Far East, Primorskii Krai, Peter the Great Bay, Russkii Island, the watershed of the Voevoda and Boyarin Bays, forest edge, 24 Sep 1999, *Probatova & Seledets 7965* (VLA); Russia, Far East, Primorskii Krai, Peter the Great Bay, Russkii Island, Shiguino, forest community at the bottom of seaside slope, 22 Aug 2011, *Rudyka 11983* (VLA).

*Dracocephalum charkeviczii* Prob.

$2n = 14$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Putyatina Island, near the lagoon lake Brasenievoe (Koreiskoe), on the slope of a hill, 3 Sep 1982, *Probatova & Rudyka 6163* (VLA); Russia, Far East, Primorskii Krai, Peter the Great Bay, Reineke Island, N coast, on the slope of seashore terrace, 26 Aug 1999, *Probatova & Seledets 7894* (VLA).

*Elsholtzia serotina* Kom.

$2n = 16$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, the Krabbe Peninsula, rubbly slope, rocky outcrops, sparse oak forest (*Quercus dentata*, *Q. mongolica*), 12 Sep 2012, *Chubar' 12237* (VLA).

*Prunella asiatica* Nakai

$2n = 28$ , CHN. Russia, Far East, Primorskii Krai, Dal'negorskii Raion, near Krasnorechensk, forest edge, on roadside, 19 Jul 1984, *Probatova, Seledets & al. 6438* (VLA).

*Scutellaria ussuriensis* (Regel) Kudô

\*\* $2n = 24$ , CHN. Russia, Far East, Primorskii Krai, Ussuriiskii Raion, the Borissovskoe (Shufanskoe) Plateau, the Malaya Borissovka River near its flowing into the Borissovka River, deciduous forest on the slope of a hill, 10 Jul 2005, *Barkalov 9855* (VLA).

**MELANTHIACEAE***Acelidanthus anticoleoides* Trautv. & C.A. Mey.

$2n = 16$ , CHN. Russia, Far East, Khabarovskii Krai, Nanaiskii Raion, Sikhote-Alin' Range, N part, Mt. Tardoki-Yani, the upper course of Sukhaya Pad' spring (the An'ui River basin), forest belt, *Picea* forest on the slope, 28 Aug 2012, *Barkalov 12203* (VLA).

**MENISPERMACEAE***Menispermum dauricum* DC.

$2n = 52$ , CHN. Russia, Far East, Khabarovskii Krai, left riverside of the Amur River, opposite Khabarovsk city, country place, meadow, 3 Aug 2012, *Rudyka 12150* (VLA).

**ONAGRACEAE***Oenothera strigosa* (Rydb.) Mack. & Bush

$2n = 14$ , CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", part "Sosnovyi", Przheval'skogo Peninsula, Khanka Lake, sandy spit, moist depression, 19 May 2004, *Barkalov 9213* (VLA).

**PAPAVERACEAE***Chelidonium asiaticum* (Hara) Krahulc.

$2n = 10$ , CHN. Russia, Far East, Primorskii Krai, Dal'negorskii Raion, near Krasnorechensk, forest edge, on roadside, 19 Jul 1984, *Probatova, Seledets & al. 6437* (VLA).

*Papaver sokolovskajae* Prob.

$2n = 56$ , CHN. Russia, Far East, Primorskii Krai, Peter the Great Bay, Klykova Isl., seacoast, 30 Jun 2000, *Prosorova 8411* (VLA); Russia, Far East, Primorskii Krai, Peter the Great Bay, Reineke Island, S coast, seaside pebbles, 2 Oct 2001, *Probatova & Rudyka 8636* (VLA).

Earlier for the specimen 8636 the chromosome number  $2n = 42$  was erroneously published by Probatova & al. (in Bot. Zhurn. 91(3): 491–509. 2006).

**PARNASSIACEAE***Parnassia palustris* L.

$2n = 18$ , CHN. Russia, Far East, Sakhalin, Aleksandrovsk-Sakhalinskii Raion, near Due settlement, the Cape Khodzhi, at the rocks on coastal slope, 6 Sep 2009, *Barkalov 11527* (VLA).

**PLANTAGINACEAE***Plantago asiatica* L.

$2n = 24$ , CHN. Russia, Far East, Amurskaya Oblast', 3–4 km of Blagoveshchensk city, on the way to Verkhne-Blagoveshchenskoe village, 25 Jul 2008, *Timchenko 11066* (VLA).

**POACEAE***Dactylis polygama* Horv.

$2n = 14$ , CHN. Russia, North Caucasus, Krasnodarskii Krai, Abinskii Raion, near Erivanskaya stanitsa, forest edge, 5 Sep 2009, *Probatova & Seledets 11617* (VLA).

*Digitaria asiatica* (Ohwi) Tzvelev

$2n = 18$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Peter the Great Bay, the Far East marine biosphere reserve, Durnovo Island, 2002, *Chubar' 10503* (VLA); Russia, Far East, Primorskii Krai, Khassanskii Raion, Pempzovaya Bay, seaside terrace, 11 Sep 2012, *Chubar' 12200* (VLA).

*Digitaria ischaemum* (Schreb.) Muhl.

$2n = 36$ , CHN. Russia, Far East, Primorskii Krai, Vladivostok city, Stoletya Prospect, as a weed on the flower-bed, 1 Sep 2010, *Probatova & Seledets 12118* (VLA).

*Elymus ciliaris* (Trin.) Tzvelev

2n = 28, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Pemzovaya Bay, seaside terrace, 11 Sep 2012, *Chubar' 12244* (VLA).

*Festuca rubra* L.

2n = 42, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Peter the Great Bay, the Far East marine biosphere reserve, Vera Island, rocks and pebbles, 11 Sep 2012, *Chubar' 12246* (VLA).

*Festuca vorobievii* Prob.

2n = 14, CHN. Russia, Far East, Primorskii Krai, Dal'negorskii Raion, outskirts of Rudnaya Pristan' town, seashore sands, 18 Jul 1984, *Probatova & Seledets 6433* (VLA).

*Koeleria cristata* Pers.

2n = 14, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Cape Gamova, the upper part of a flat slope, the grass meadow with various herbs, 29 Sep 2012, *Barkalov 12221* (VLA).

*Leymus chinensis* (Trin.) Tzvelev

2n = 28, CHN. Russia, East Siberia, Zabaikal'skii Krai, Zun-Torei Lake, steppe, 10 Jul 2011, *Tzyrenova 12309* (VLA).

*Ochlopoa supina* (Schrad.) H. Scholz & Valdés (≡ *Poa supina* Schrad.)

2n = 14, CHN. Russia, East Siberia, Irkutskaya Oblast', Ziminskii Raion, near Zulumai village, *Pinus* forest, on the path, 14 Jul 2005, *Chepinoga, Rosbakh & al. 10509* (VLA).

*Poa sergievskajae* Prob.

2n = 56, CHN. Russia, Far East, Primorskii Krai, Dal'negorskii Raion, Sikhote-Alin' Range, the upper course of the Rudnaya (Tetiukhe) River, the pass to Elovyi (Iman) Spring, small meadow with green mosses and *Stellaria longifolia*, 12 Aug 2012, *Gulariants 12171* (VLA).

*Poa sichotensis* Prob.

2n = 42, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, Cape Gamova, the upper part of a flat slope, the grass meadow with various herbs, 29 Sep 2012, *Barkalov 12222* (VLA).

*Poa cf. verae* Prob.

2n = 28, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, the Cape Nazimova, on the rocks, 10 Sep 2012, *Chubar' 12185* (VLA); Russia, Far East, Primorskii Krai, Khassanskii Raion, Pemzovaya Bay, seaside terrace, 11 Sep 2012, *Chubar' 12196* (VLA).

#### POLEMONIACEAE

*Polemonium laxiflorum* Kitam.

2n = 18, CHN. Russia, Far East, Khabarovskii Krai, Nanaiskii Raion, Sikhote-Alin' Range, N part, Mt. Tardoki-Yani, the upper course of Sukhaya Pad' spring (the An'ui River basin), forest belt, among boulders on the stream bank, 28 Aug 2012, *Barkalov 12286* (VLA).

#### RANUNCULACEAE

*Ranunculus japonicus* Thunb.

2n = 14, CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", part "Sosnovyi", Khanka Lake, Przheval'skogo spit, at the edge of deciduous forest, 19 Jun 2004, *Barkalov 9274* (VLA).

*Ranunculus novus* H. Lévl. & Vaniot

2n = 28, CHN. Russia, Far East, the Kuril Islands, Shikotan

Island, 3 km SW of Krabozavodskoe settlement, moist meadow, at the rivulet, 3 Aug 2010, *Barkalov 11781* (VLA).

#### ROSACEAE

*Potentilla longifolia* Willd. ex Schldt.

2n = 14, CHN. Russia, East Siberia, Irkutskaya Oblast', near Listvyanka settlement, the lakeside of Baikal Lake, *Pinus* and *Larix* forest on the slope, 18 Jul 2012, *Tzyrenova 12201* (VLA).

*Potentilla sericea* L.

2n = 28, CHN. Russia, East Siberia, Republic of Buryatia, Barguzinskii Raion, near Maksimikha village, the lakeside of Baikal Lake, Barguzinskii Bay, 24 Jul 2009, *Tzyrenova 11892* (VLA).

*Sorbaria grandiflora* Maxim.

2n = 36, CHN. Russia, Far East, Khabarovskii Krai, Nanaiskii Raion, Sikhote-Alin' Range, N part, Mt. Tardoki-Yani, the upper course of Sukhaya Pad' spring (the An'ui River basin), 1900 m, alpine belt, slide-rocks, 29 Aug 2012, *Barkalov 12188* (VLA).

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\* First chromosome count for the species.

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

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#### AMARANTHACEAE

*Amaranthus retroflexus* L.

2n = 32, CHN. Russia, East Siberia, Irkutskaya Oblast', Ussol'e-Sibirskoe town, Kuibysheva Str., waste ground behind the communal services building "Sibiryachka", 15 Aug 2008, *Verkhovina 12176* (VLA, IRK).

#### ASTERACEAE

*Cirsium vulgare* (Savi) Ten.

2n = 34, CHN. Russia, Republic of Altai, Chermal'skii Raion, Chermal settlement, near gas station, roadside, 30 Aug 2012, *Kazanovsky 12333* (VLA, IRK).

*Echinops ritro* L.

2n = 32, CHN. Russia, Republic of Altai, Ongudaiskii Raion, near Ongudai village, 958 m, at the bottom of S stony slope, steppe community, 30 Aug 2012, *Kazanovsky 12331* (VLA, IRK).

*Hieracium filifolium* Üksip

2n = 18, CHN. Russia, East Siberia, Irkutskaya Oblast', Ust'-Kutskii Raion, 15 km NW of Yarakta oilmians' settlement, roadside, on moist loamy soil, 9 Aug 2012, *Kazanovsky 12334* (VLA, IRK).

*Leibnitzia anandria* (L.) Turcz.

$2n = 46$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ust'-Ordynskii Buryatskii Okrug, Ossinskii Raion, near Prokhorovka village, 507 m, steppe, in *Fragaria*, sedges, grasses and various herbs community, 25 Jun 2010, *Kazanovsky 12313* (VLA, IRK).

*Petasites rubellus* (J.F. Gmel.) Toman (= *Nardosmia saxatilis* Turcz.)

$2n = 60$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Sliudnyanskii Raion, in vicinity of Utulik settlement, near tourist centre, 526 m, riverside, *Abies-Betula-Populus* forest with ferns and various herbs, 14 Jun 2011, *Kazanovsky 11986* (VLA, IRK).

*Saussurea stubendorffii* Herder

\*\* $2n = ca. 39$ , CHN. Russia, East Siberia, Republic of Buryatia, Okinskii Raion, near Samarta settlement, East Sayan Mts., Kitoiskii Range, the upper course of the Kitoi River, 1890 m, steep sabulous riverside, 29 Aug 2010, *Kazanovsky 12130* (VLA, IRK).

*Taraxacum printzii* Dahlst. ex Printz

$2n = 24$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, the Baikal Lake, Ol'khon Island, near Peschanaya village, 466 m, at the bottom of dune sands, 29 Jun 2011, *Kazanovsky 11990* (VLA, IRK).

#### BORAGINACEAE

*Myosotis caespitosa* Schultz

$2n = 48$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Mogo-chinskii Raion, Mogocha settlement, the Amazar River, 610 m, sedge and grass meadow, 6 Jul 2011, *Kazanovsky 12292* (VLA, IRK).

#### BRASSICACEAE

*Rorippa palustris* (L.) Besser

$2n = 16$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Tungiro-Ol'ekminskii Raion, 69-th km of the route Mogocha–Tupik, Geologov settlement, the Bukhta River, 736 m, riverside, at the bridge, 12 Jul 2011, *Kazanovsky 12278* (VLA, IRK).

#### CARYOPHYLLACEAE

*Peschkovia saxatilis* (Turcz. ex Fisch. & C.A. Mey.) Tzvelev  
(= *Gastrolychnis saxatilis* (Turcz. ex Fisch. & C.A. Mey.)  
Peschkova)

$2n = 48$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Mogo-chinskii Raion, near Mogocha settlement, the Amazar River, 610 m, sedge and grass meadow, 6 Jul 2011, *Kazanovsky 11985* (VLA, IRK).

#### CHENOPODIACEAE

*Axyris amaranthoides* L.

$2n = 18$ , CHN. Russia, East Siberia, Republic of Sakha-Yakutia, right riverside of the Ulakhan-Botuobuya River, 4.6 km NE of the mouth of the Mata-Ulegir River (right tributary of the Ulakhan-Botuobuya River), 319 m, forest edge, ruderal community, 2 Sep 2012, *Verkhovina & Krivenko 12332* (VLA, IRK).

*Chenopodium glaucum* L.

$2n = 18$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Irkutsk city, Akademgorodok, Lermontova Str., at the building 281, as a weed on the lawn, 16 Sep 2011, *Kazanovsky 11989* (VLA, IRK).

#### FABACEAE

*Astragalus membranaceus* (Fisch.) Bunge

$2n = 16$ , CHN. Russia, East Siberia, Republic of Buryatia, Pribaikal'skii Raion, near Klochnevo village, 489 m, *Larix* and *Pinus* forest with *Spiraea*, grasses and various herbs, 9 Jul 2009, *Verkhovina & Kazanovsky 12316* (VLA, IRK).

*Astragalus suffruticosus* DC. (= *A. fruticosus* Pall.)

$2n = 16$ , CHN. Russia, East Siberia, Republic of Buryatia, Pribaikal'skii Raion, near Klochnevo village, 524 m, S slope, *Pinus* forest with grasses, sedges and various herbs, 10 Jul 2009, *Kazanovsky 12317* (VLA, IRK).

*Oxytropis sylvatica* DC.

$2n = 16$ , CHN. Russia, East Siberia, Republic of Buryatia, Selinginskii Raion, between Gussinoozersk and Yagodnyi settlements, the Boldogor River, 697 m, sparse *Pinus* forest with steppe elements, forest roadside, 12 Jul 2009, *Verkhovina 12318* (VLA, IRK).

#### GENTIANACEAE

*Lomatogonium carinthiacum* A. Braun

$2n = 32$ , CHN. Russia, East Siberia, Republic of Buryatia, Okinskii Raion, in vicinity of Samarta settlement, East Sayan Mts., Kitoiskii Ridge, the upper course of the Kitoi River, 1899 m, water-logged sedge and grass meadow, 29 Aug 2010, *Kazanovsky 12192* (VLA, IRK).

#### ONAGRACEAE

*Epilobium montanum* L.

$2n = 36$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Sliudnyanskii Raion, SE outskirts of Solzan settlement, near the bridge on Bol'shaya Ossinovka River, left riverside, 475 m, *Pinus* forest with various herbs, roadside, 28 Jul 2011, *Verkhovina 12166* (VLA, IRK).

#### PAPAVERACEAE

*Papaver rubro-aurantiacum* Lundstr.

\* $2n = 14$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Chitinskii Raion, outskirts of Urulga settlement, left riverside of the Urulga River, 835 m, riverside, on the naked ground, 14 Jul 2011, *Kazanovsky 12141* (VLA, IRK).

#### POACEAE

*Agropyron michnoi* Roshev.

$2n = 28$ , CHN. Russia, East Siberia, Republic of Buryatia, Mukhorshibirskii Raion, near Mukhorshibir' settlement, on sands, 3 Jul 2010, *Gnutikov 12283* (VLA, LE).

*Alopecurus aequalis* Sobol.

$2n = 14$ , CHN. Russia, Republic of Altai, Kosh-Agachskii Raion, plateau Ukok, lakeside of the Ukok Lake, 2420 m, 28 Aug 2011, *Gnutikov & Nossov 12241* (VLA, LE); Russia, Republic of Altai, Akkol' Pass, 2012, *Gnutikov 12228* (VLA, LE); Russia, East Siberia, Irkutskaya Oblast', Ussol'skii Raion, near Tal'any settlement, small bog, in water, 10 Jun 2011, *Gnutikov 12251* (VLA, LE).

*Alopecurus pratensis* L.

$2n = 28$ , CHN. Russia, West Siberia, Altaiskii Krai, Biiskii Raion, the highway Biisk–Barnaul, on roadside, 2 Sep 2011, *Gnutikov 12235* (VLA, LE); Russia, Republic of Altai, Ongudaiskii Raion, the 742nd km of Chuyskii route, Belyi Bom settlement, 916 m, left riverside of the Chuya River, on the riverbank, 14 Aug 2011, *Gnutikov 12232* (VLA, LE); Russia, Republic of Altai, Ongudaiskii Raion, the slope of a hill, 1425 m, sparse *Larix* forest, 13 Aug 2011, *Gnutikov 12253* (VLA, LE).

*Arctopoa subfastigiata* (Trin.) Prob.

$2n = 42$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, the valley of the Talaya River, waterlogged lakeside, 7 Jul 2011, *Gnutikov 12285* (VLA, LE).

*Beckmannia syzigachne* (Steud.) Fernald

$2n = 14$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ussol'skii Raion, right riverside of the Toissuk River, moist site, 9 Jul 2011, *Gnutikov 12289* (VLA, LE); Russia, Republic of Altai,

Kosh-Agachskii Raion, plateau Ukok, lakeside of a small lake, 2255 m, 28 Aug 2011, *Gnutikov & Nossov 12263* (VLA, LE).

*Brachypodium sylvaticum* (L.) P. Beauv.

$2n = 18$ , CHN. Abkhazia, Sukhumsii Raion, 6 km N of Sukhum city, left riverside of the Gumisty River, on the rocks covered with forest, near the water, 10 Oct 2011, *Gnutikov & Ufimov 12269* (VLA, LE); Russia, Republic of Dagestan, near Derbent city, Naryn-Kala, oak forest, 151 m, 27 Sep 2011, *Gnutikov & Ufimov 12258* (VLA, LE); Russia, North Caucasus, Krasnodarskii Krai, Severskii Raion, near stanitsa Ubinskaya, the flood-plain of the Ubin River, 7 Aug 2010, *Gnutikov & Ufimov 12254* (VLA, LE).

*Echinochloa crus-galli* (L.) P. Beauv.

$2n = 54$ , CHN. Russia, North Caucasus, Krasnodarskii Krai, Tuapsinskii Raion, near Agoi settlement, along the road, 20 Jul 2010, *Gnutikov & Ufimov 12262* (VLA, LE).

*Elymus sibiricus* L.

$2n = 28$ , CHN. Russia, Republic of Altai, Ongudaiskii Raion, the 742nd km of Chuyskii route, Belyi Bom settlement, 916 m, left riverside of the Chuya River, on the riverbank, 14 Aug 2011, *Gnutikov 12255* (VLA, LE); Russia, Republic of Altai, Ongudaiskii Raion, left riverside of the Kuyakhtonar River, 1715 m, along the bank, 15 Aug 2011, *Gnutikov 12261* (VLA, LE); Russia, East Siberia, Zabaikal'skii Krai, Tungiro-Olëkminskii Raion, 69th km of the route Mogoča–Tupik, Geologov settlement, Bukhta River, 736 m, riverside, near the bridge, 12 Jul 2011, *Kazanovsky 12277* (VLA, IRK).

*Festuca altaica* Trin.

$2n = 28$ , CHN. Russia, Republic of Altai, Kosh-Agachskii Raion, close to Malye Boguty Lake, towards Mt. Bogut, slide-rocks, 2400 m, 16 Aug 2011, *Gnutikov 12264* (VLA, LE).

*Festuca musbelica* (Reverd.) Ikonn. (= *F. valesiaca* subsp. *hypsophila* (St.-Yves) Tzvelev, non *F. hypsophila* Phil.)

$2n = 14$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Uletovskii Raion, near Cheremkhovo settlement, stony steppe, 5 Jul 2010, *Gnutikov & Gnutikova 12295* (VLA, LE).

*Homalotrichon pubescens* (Huds.) Banfi & al. (≡ *Helictotrichon pubescens* (Huds.) Pilg.)

$2n = 14$ , CHN. Russia, Republic of Altai, Kosh-Agachskii Raion, riverside of the Bar-Burgazy River, steppe on the slope, 2000 m, 16 Aug 2011, *Gnutikov 12284* (VLA, LE).

*Hordeum brevisubulatum* Link

$2n = 28$ , CHN. Russia, Republic of Altai, Kosh-Agachskii Raion, right riverside of the Dzhazator River, steppe on the slope, 1782 m, 30 Aug 2011, *Gnutikov 12257* (VLA, LE).

*Hordeum jubatum* L.

$2n = 28$ , CHN. Russia, West Siberia, Altaiskii Krai, Biiskii Raion, the highway Biisk–Barnaul, along roadside, 2 Sep 2011, *Gnutikov 12298* (VLA, LE).

*Koeleria cristata* Pers.

$2n = 28$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ust'-Ordynskii Buryatskii Okrug, Alarskii Raion, Aliaty settlement, lake-side of the Aliaty Lake, 4 Jul 2011, *Gnutikov 12288* (VLA, LE).

*Leymus paboanus* (Claus) Pilg.

$2n = 28$ , CHN. Russia, East Siberia, Republic of Buryatia, Pribaikal'skii Raion, left riverside of the Selenga River, ferry berth near Tataurovo village, ruderal community, 22 Jul 2011, *Krivenko 12294* (VLA, IRK).

*Melica turczaninowiana* Ohwi

$2n = 18$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, near Bugul'deika village, rocks in the forest, along a road, 7 Jul 2011, *Gnutikov 12239* (VLA, LE).

*Ochlopoa supina* (Schröd.) H. Scholz & Valdés (≡ *Poa supina* Schröd.)

$2n = 14$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Irkutsk city, Cheremushki, the valley of the Irkut River, meadow, 8 Jul 2011, *Gnutikov 12265* (VLA, LE).

*Phleum phleoides* (L.) H. Karst.

$2n = 14$ , CHN. Russia, Republic of Altai, Shebalinskii Raion, Mt. Sarlyk, NE slope, 2 Sep 2010, *Gnutikov 12260* (VLA, LE).

*Phleum pratense* L.

$2n = 42$ , CHN. Russia, Republic of Altai, Ongudaiskii Raion, left riverside of the Kuyakhtonar River, 1715 m, along the riverbank, 15 Aug 2011, *Gnutikov 12287* (VLA, LE).

*Secale cereale* L.

$2n = 14$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Zalarinskii Raion, in vicinity of Tungui village, near experimental station of the Siberian Institute of Plant Physiology & Biochemistry, Siberian Branch of RAS, a many years' fallow land, the plant naturalized during 5 years, 30 Sep 2011, *Dorofeev 12272* (VLA, IRK).

*Setaria glareosa* Petrov

\* $2n = 18$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Shelekhovskii Raion, Bol'shoi Lug settlement, on the railway embankment, 8 Jul 2011, *Gnutikov 12233* (VLA, LE).

*Stipa capillata* L.

$2n = 44$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, the Baikal Lake, Ol'khon Island, near Kharantsy settlement, feather-grass steppe, 1 Jul 2010, *Gnutikov 12291* (VLA, LE).

*Stipa krylovii* Roshev.

$2n = 44$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, the Baikal Lake, Ol'khon Island, feather-grass steppe, 1 Jul 2010, *Gnutikov 12290* (VLA, LE).

*Trisetum sibiricum* Rupr.

$2n = 14$ , CHN. Russia, Republic of Altai, Ulaganskii Raion, the Chuyskii route, 5 km S of Aktash settlement, S slope of Mt. Rzhanaya, 1500 m, 2 Sep 2011, *Gnutikov 12266* (VLA, LE).

#### POLEMONIACEAE

*Polemonium racemosum* Kitam.

$2n = 18$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Tungiro-Olëkminskii Raion, 69th km of the route Mogoča–Tupik, Geologov settlement, Bukhta River, 736 m, *Larix* forest with shrubs, 12 Jul 2011, *Kazanovsky 12276* (VLA, IRK).

#### POLYGONACEAE

*Acetosa thyrsiflora* (Fingerh.) Á. Löve

$2n = 14, 15$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, lakeside of Lake Baikal, Cape Zunduk, *Larix* forest with steppe elements, 3 Aug 2003, *Kazanovsky 11055* (VLA, IRK).

*Aconogonon ochreatum* Nakai

$2n = 20$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Ol'khonskii Raion, the Baikal Lake, Zunduk Cape, pebbly shore, 3 Aug 2003, *Kazanovsky 11056* (VLA, IRK).

*Persicaria maculosa* Gray

$2n = 40$ , CHN. Russia, East Siberia, Irkutskaya Oblast', Sliud'yanskii Raion, lower course of Solzan River, left riverside, on pebbles, 29 Aug 2009, *Kazanovsky & Pochinchik 12127* (VLA, IRK).

**PRIMULACEAE***Androsace septentrionalis* L.

$2n = 20$ , CHN. Russia, East Siberia, Zabaikal'skii Krai, Aginskii Buryatskii National'nyi Okrug, Dul'durginskii Raion, nature park "Alkhanai", near Ara-Ilya village, right riverside of the Ilya River, 895 m, a slope with steppe vegetation, 20 Jul 2010, *Kazanovsky 12315* (VLA, IRK).

**SCROPHULARIACEAE***Chaenorhinum minus* (L.) Lange

$2n = 14$ , CHN. Russia, Far East, Primorskii Krai, Dal'negorskii Raion, Dal'negorsk town, as a weed at a pile of building materials near garage, 4 Aug 2011, *Gulariants & Lapenko 12327* (VLA).

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\* First chromosome count for the species.

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

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**ASTERACEAE***Anaphalis sinica* Hance

\* $2n = 28$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, 5 km N of Khassan railway station, 8 Sep 2012, *Nechaev 12230* (VLA).

*Centaurea pseudomaculosa* Dobrocz.

$2n = 18$ , CHN. Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Bol'shoi Kamen' town, roadside, 25 Jul 2010, *Nechaev 12042* (VLA).

*Inula linariifolia* Turcz.

$2n = 16$ , CHN. Russia, Far East, Khabarovskii Krai, left riverside of the Amur River, opposite Khabarovsk city, country place, meadow, 3 Aug 2012, *Rudyka 12151* (VLA); Russia, Far East, Primorskii Krai, Oktyabr'skii Raion, between Fadeevka and Novogeorgievka villages, steppe meadow, 27 Jul 2009, *Nechaev 11442* (VLA).

*Turczaninowia fastigiata* (Fisch.) DC.

$2n = 18$ , CHN. Russia, Far East, Khabarovskii Krai, Bikinskii Raion, the valley of the Ussuri River in its lower course, near Lonchakovo settlement, Mt. Il'inskaya, the edge of the oak forest with shrubs and various herbs, 29 Aug 2011, *Kriukova, Motorykina & al. 12220* (VLA).

**BORAGINACEAE***Myosotis caespitosa* Schultz

\*\* $2n = 24$ , CHN. Russia, Far East, Primorskii Krai, near Artëm

town, lakeside of the Orlovskoe Lake, in reeds, 24 Jun 2012, *Nechaev 12152* (VLA).

**CARYOPHYLLACEAE***Melandrium apricum* (Turcz.) Rohrb.

\*\* $2n = 24$ , CHN. Russia, Far East, Evreiskaya Avtonomnaya Oblast', near Pokrovskii bridge, roadside, 20 Jul 2012, *Motorykina 12281* (VLA).

*Moehringia lateriflora* (L.) Fenzl

$2n = 24$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, Mt. Brat, limestone rocks on the top, 20 May 2012, *Nechaev 12208* (VLA).

*Silene repens* Patrin ex Pers.

$2n = 24$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, the lower course of the Partizanskaya River, Mt. Brat, limestone rocks on the top, 20 May 2012, *Nechaev 12181* (VLA).

**CHENOPODIACEAE***Chenopodium polyspermum* L.

$2n = 18$ , CHN. Russia, Far East, Khabarovskii Krai, Vaninskii Raion, the valley of the Buty River, on rocks, 27 Aug 2010, *Antonova, Kriukova & al. 12212* (VLA).

**EUPHORBIACEAE***Phyllanthus ussuriensis* Rupr. & Maxim.

$2n = 26$ , CHN. Russia, Far East, Khabarovskii Krai, Bikinskii Raion, the valley of the Ussuri River in its lower course, Pokrovka village, riverside, on gravel-bank, 8 Aug 2012, *Kriukova, Antonova & al. 12211* (VLA).

**FABACEAE***Astragalus uliginosus* L.

$2n = 16$ , CHN. Russia, Far East, Evreiskaya Avtonomnaya Oblast', near Pokrovskii bridge, roadside, 20 Jul 2012, *Motorykina 12279* (VLA).

*Melilotoides schischkinii* (Vassilcz.) Soják

$2n = 16$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, the lower course of the Partizanskaya River, Mt. Brat, on the stony top, 20 May 2012, *Nechaev 12249* (VLA).

*Vicia ramuliflora* (Maxim.) Ohwi

$2n = 12$ , CHN. Russia, Far East, Primorskii Krai, the Muravëv-Amurskii Peninsula, in vicinity of the railway station Okeanskaya, in forest, 21 Apr 2007, *Nechaev 10587* (VLA).

**IRIDACEAE***Iris ensata* Thunb.

$2n = 24$ , CHN. Russia, Far East, Khabarovskii Krai, Bikinskii Raion, near Lonchakovo settlement, at the bottom of Mt. Il'inskaya, moist meadow, 29 Aug 2011, *Motorykina 12282* (VLA).

**LAMIACEAE***Dracocephalum charkeviczii* Prob.

$2n = 14$ , CHN. Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, near Tavrichanka settlement, 1 km of seashore, meadow, 15 Jul 2012, *Nechaev 12145* (VLA).

*Lycopus lucidus* Turcz. ex Benth.

$2n = 22$ , CHN. Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Bol'shoi Kamen' town, meadow at seashore, 1 Jul 2007, *Nechaev 10706* (VLA).

*Schizonepeta multifida* Briq.

$2n = 12$ , CHN. Russia, Far East, Primorskii Krai, Partizanskii

Raion, the top of Mt. Brat, limestone rocks, 30 Sep 2012, *Nechaev 12245* (VLA).

#### LINACEAE

*Linum amurense* Alef.

2n = 18, CHN. Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Bol'shoi Kamen' town, seashore, on sands, 25 Jul 2010, *Nechaev 11775* (VLA).

#### ONAGRACEAE

*Oenothera strigosa* (Rydb.) Mack. & Bush

2n = 14, CHN. Russia, Far East, Evreiskaya Avtonomnaya Oblast', near Pokrovskii bridge, roadside, 20 Jul 2012, *Motorykina 12280* (VLA).

#### OXALIDACEAE

*Oxalis acetosella* L.

2n = 22, CHN. Russia, Far East, Primorskii Krai, Muravëv-Amurskii Peninsula, near Okeanskaya, nature reserve of the Botanical Garden-Institute FEB RAS, mixed forest, 20 May 2012, *Semeikin 12094* (VLA).

#### PAPAVERACEAE

*Chelidonium asiaticum* (Hara) Krahulc.

2n = 10; Russia, Far East, Khabarovskii Krai, Khabarovsk city, Pan'kova Str., near the building of the Institute of Water & Ecological Problems, Far East Branch of the Russian Academy of Sciences, roadside, 24 May 2013, *Motorykina 12368* (VLA).

#### POACEAE

*Alopecurus aequalis* Sobol.

2n = 14, CHN. Russia, Far East, Primorskii Krai, near Artëm town, lakeside of the Orlovskoe Lake, in reeds, 24 Jun 2012, *Nechaev 12303* (VLA).

*Calamagrostis brachytricha* Steud.

2n = 56, CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, the lower course of the Partizanskaya River, Mt. Brat, on the stony top, 20 May 2012, *Nechaev 12195* (VLA).

*Cleistogenes probatovae* Tzvelev

2n = 40, CHN. Russia, Far East, Primorskii Krai, Shkotovskii Raion, near Petrovka village, at the bottom of rocks, abundant, 1 Sep 2012, *Nechaev 12300* (VLA).

*Digitaria asiatica* (Ohwi) Tzvelev

2n = 18, CHN. Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, near Razdol'noe settlement, the valley of Razdol'naya River, on the riverbank, 7 Oct 2006, *Nechaev 10507* (VLA).

*Elymus pendulinus* (Nevski) Tzvelev

2n = 28, CHN. Russia, Far East, Primorskii Krai, Oktyabr'skii Raion, Novogeorgievka village, sandy bank of the Razdol'naya (Suifun) River, 7 Jul 2012, *Nechaev 12248* (VLA).

*Leymus coreanus* (Honda) K.B. Jensen & R.R.-C. Wang

(≡ *Hystrix coreana* (Honda) Ohwi)

2n = 28, CHN. Russia, Far East, Primorskii Krai, Partizanskii Raion, the lower course of the Partizanskaya River, Mt. Brat, on the stony top, 20 May 2012, *Nechaev 12206* (VLA).

*Poa vorobievii* Prob.

2n = 28, CHN. Russia, Far East, Khassanskii Raion, Krabbe Peninsula, seashore, sandy beach, 18 Jun 2009, *Nechaev 11398* (VLA); Russia, Primorskii Krai, Shkotovskii Raion, in vicinity of Shkotovo settlement, seashore, on coastal rocks, 4 Jul 2010, *Nechaev 11607* (VLA).

#### PRIMULACEAE

*Androsace septentrionalis* L.

2n = 20, CHN. Russia, Far East, Khabarovskii Krai, Sovgavanskii Raion, nature reserve "Botchinskii", the valley of Botchi River in its middle course, near the mouth of Mul'pa River, gravel bank at "Belaya Glina" cordon, 23 Jul 2011, *Shlotgauer & Kriukova 12219* (VLA).

*Cortusa amurensis* Fed.

\*2n = 24, CHN. Russia, Far East, Khabarovskii Krai, Sovgavanskii Raion, Tatarskii Strait, the mouth of Botchi River, Cape Krestovozdvizhenskii, split on rock, on moist substratum, 28 Jul 2011, *Kriukova 12216* (VLA).

*Cortusa sibirica* Andr. ex Besser

2n = 24, CHN. Russia, Far East, Khabarovskii Krai, Lazo Raion, the Khor River basin, right riverside of the Sagdy-Selanka River, the valley of its lower course (right tributary of Kafe River), at the cave "Proshal'naya", limestone outcrops, 24 Jul 2003, *Kriukova 9068* (VLA).

#### ROSACEAE

*Agrimonia coreana* Nakai

2n = 28, CHN. Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, in vicinity of the railway station Razdol'naya, the valley of the Razdol'naya (Suifun) River, oak forest on the slope, 12 Aug 2012, *Nechaev 12149* (VLA).

*Geum urbanum* L.

2n = 42, CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, in vicinity of Ovchinnikovo village, moist valley forest at the Mongugai (Barabashevka) River, 18 Aug 2012, *Yakubov 12307* (VLA).

*Potentilla acervata* Soják

2n = 14, CHN. Russia, Far East, Amurskaya Oblast', in vicinity of Blagoveshchensk city, 3–4 km to Verkhne-Blagoveshchenskoe village, 25 Jul 2008, *Timchenko 11098* (VLA); Russia, Far East, Khabarovskii Krai, Lazo Raion, Pereyaslavka settlement, right riverside of the Kiya River, meadow at the bridge, 29 Aug 2011, *Motorykina & Kriukova 12363* (VLA); Russia, Far East, Primorskii Krai, Khankaiskii Raion, near Astrakhanka settlement, the lakeside of Khanka Lake, forest edge, 25 Sep 2009, *Lapenko 11534* (VLA).

*Potentilla anserina* L.

2n = 28, CHN. Russia, Far East, Khabarovskii Krai, outskirts of Khabarovsk city, near sovkhos, roadside, at the building, 13 Jun 2012, *Motorykina 12367* (VLA).

*Potentilla argentea* L.

2n = 28, CHN. Russia, Far East, Amurskaya Oblast', Arkharskii Raion, the railway station Arkhara, on railway embankment, 28 Jul 2005, *Tolmacheva 10449* (VLA); Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, near the railway platform Sovkhoz'naya, roadside, on gravel, 28 Jun 2008, *Nechaev 11016* (VLA); Russia, Far East, Primorskii Krai, Dal'nerechenskii Raion, 2 km E of Vagutan settlement, on the slope of railway embankment, 16 Jul 2009, *Lapenko 11571* (VLA).

*Potentilla centigrana* Maxim.

2n = 14, CHN. Russia, Far East, Khabarovskii Krai, Lazo Raion, 30 km above Solontsovyi settlement, floodplain of the Ko River in its middle course (tributary of Katen River, the Khor River basin), post-forest moist plots, roadside, 23 Jul 2003, *Tolmacheva 9109* (VLA); Russia, Far East, Khabarovskii Krai, Bikinskii Raion, the scientific station "Shivki", forest road, on roadside, 10 Aug 2011, *Motorykina & Korobitsina 12364* (VLA); Russia, Far East, Khabarovskii Krai,

Bikinskii Raion, the valley of Barkhatnaya River, *Pinus koraiensis* broad-leaved forest, the forest road, 20 Aug 2011, *Motorykina & Kriukova 12365* (VLA).

*Potentilla chinensis* Ser.

$2n = 14$ , CHN. Russia, Far East, Amurskaya Oblast', 40 km N of Blagoveschensk city, nature park "Urochishche Mukhinka", tourist centre "Mukhinskaya", lakeside, 30 Sep 2007, *Timchenko 11547* (VLA); Russia, Far East, Khabarovskii Krai, Bikinskii Raion, in vicinity of the railway station Boitsovo, experimental station "Shivki", roadside, 23 Oct 2012, *Motorykina & Korobitsina 12329* (VLA); Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, near Tavrichanka settlement, the shore of the Amurskii Bay, 19 Jun 2004, *Nechaev 9283* (VLA); Russia, Far East, Primorskii Krai, Khassanskii Raion, 4 km S of Slayanka settlement, Cape Chirok, on the rocks, 6 Aug 2010, *Lapenko 11689* (VLA); Russia, Far East, Primorskii Krai, Khassanskii Raion, the Krabbe Peninsula, rubbly slope, rocky outcrops, sparse oak forest (*Quercus dentata*, *Q. mongolica*), 12 Sep 2012, *Chubar 12273* (VLA).

*Potentilla cryptotaeniae* Maxim.

$2n = 14$ , CHN. Russia, Far East, Primorskii Krai, the Muravëv-Amurskii Peninsula, Ussuriyskii Gulf, near Muravyinaya (Tavaiza) Bay, the area of nature monument "Chernopikhtarnik", the valley of Muravyinyi Spring, 21 Oct 2004, *Probatova & Seledets 9590* (VLA).

*Potentilla fragarioides* L.

$2n = 14$ , CHN. Russia, Far East, Khabarovskii Krai, outskirts of Khabarovsk city, the oak forest with *Lespedeza bicolor* behind the 1st Territorial hospital, 7 Jul 2011, *Motorykina 12366* (VLA); Russia, Far East, Primorskii Krai, the Muravëv-Amurskii Peninsula, Ussuriyskii Gulf, near Muravyinaya (Tavaiza) Bay, the area of nature monument "Chernopikhtarnik", the valley of Muravyinyi Spring, 21 Oct 2004, *Probatova & Seledets 9592* (VLA); Russia, Far East, Primorskii Krai, Nadezhdinskii Raion, near Tavrichanka settlement, 1 km of seashore, meadow, 15 Jul 2012, *Nechaev 12209* (VLA); Russia, Far East, Primorskii Krai, Peter the Great Gulf, Russkii Island, Cape Pospelova, deforested E slope, 4 Nov 2012, *Volynets 12274* (VLA).

*Potentilla fragiformis* Willd. ex Schldtl.

\*\* $2n = 28$ , CHN. Russia, Far East, Khabarovskii Krai, Shantar-skye Islands, Malyi Shantar Island, the bay S of Cape Gorbatiy, 12 Aug 2010, *Bogatov 12147* (VLA).

*Potentilla multifida* L.

$2n = 28$ , CHN. Russia, East Siberia, Republic of Buryatia, Ulan-Ude city, near the Buryatskii Scientific Centre, Siberian Branch of the Russian Academy of Sciences, as a weed, 13 Sep 2004, *Probatova & Seledets 9375* (VLA); Russia, Far East, Amurskaya Oblast', the railway station Erofei Pavlovich, on the embankment, 5 Sep 2004, *Probatova & Seledets 9373* (VLA); Russia, Far East, Amurskaya Oblast', in vicinity of Blagoveshchensk city, 3–4 km to Verkhne-Blagoveshchenskoe village, 25 Jul 2008, *Timchenko 11097* (VLA).

*Potentilla norvegica* L.

$2n = 56$ , CHN. Russia, Far East, Amurskaya Oblast', Arkharinskii Raion, on the railway embankment, 28 Jul 2005, *Tolmacheva 10452* (VLA); Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", part "Sosnovyi", Khanka Lake, Przheval'skogo spit, moist meadow at the road, 19 Jun 2004, *Barkalov 9295* (VLA).

*Potentilla pacifica* Howell

$2n = 28$ , CHN. Russia, Far East, Khabarovskii Krai, Ul'chskii Raion, near De-Kastri settlement, Chikhachëva Gulf, Severnaya Bay, along the seashore, 15 Aug 2005, *Tolmacheva 9940* (VLA); Russia,

Far East, Primorskii Krai, Shkotovskii Raion, outskirts of Shkotovo town, waterlogged coastal plain, 500 m of seashore, 27 Jun 2009, *Nechaev 11392* (VLA).

*Potentilla stolonifera* Lehm. ex Ledeb.

$2n = 14$ , CHN. Russia, Far East, Kamchatka, in vicinity of Petropavlovsk-Kamchatskii city, near Khalaktyrka village, coastal sands, meadow, 7 Jul 2012, *Yakubov 12306* (VLA).

*Potentilla supina* L.

$2n = 28$ , CHN. Russia, Far East, Khabarovskii Krai, outskirts of Khabarovsk city, near the bus station "13th km", 22 Jul 2005, *Tolmacheva 10455* (VLA); Russia, Far East, Amurskaya Oblast', the railway station Erofei Pavlovich, on the embankment, 5 Sep 2004, *Probatova & Seledets 9372* (VLA); Russia, Far East, Amurskaya Oblast', Arkharinskii Raion, on the railway embankment, 28 Jul 2005, *Tolmacheva 10453* (VLA); Russia, Far East, Primorskii Krai, Ussuriyskii Raion, near Gorodechnoe village, at the railway bridge, the bank of the former river-bed, 1998, *Shatalova 7708* (VLA); Russia, Far East, Primorskii Krai, Spasskii Raion, the railway station Spassk, on the railway embankment, 4 Sep 2004, *Probatova & Seledets 9262* (VLA); Russia, Far East, Primorskii Krai, Lessozavodskii Raion, outskirts of Lessozavodsk town, roadside, 18 Jun 2012, *Lapenko 12179* (VLA).

*Potentilla tergemina* Soják

$2n = 28$ , CHN. Russia, Far East, Primorskii Krai, Khankaiskii Raion, the nature reserve "Khankaiskii", part "Sosnovyi", spit Przheval'skogo, among shrubs, at the roadside, 19 Jun 2004, *Barkalov 9276* (VLA); Russia, Far East, Primorskii Krai, Terneiskii Raion, Ternei settlement, Terneiskaya Str., slide-rocks covered with grasses between road and rivulet, 27 Jun 2004, *Nesterova 9315* (VLA).

**RUBIACEAE**

*Galium maximowiczii* (Kom.) Pobed.

$2n = 22$ , CHN. Russia, Far East, Primorskii Krai, Khassanskii Raion, in vicinity of Khassan settlement, sparse oak forest (*Quercus dentata*, *Lespedeza cyrtobotrya*) at the edge of a bog, 8 Sep 2012, *Nechaev 12183* (VLA).

**VIOLACEAE**

*Viola acuminata* Ledeb.

$2n = 20$ , CHN. Russia, Far East, Khabarovskii Krai, Bikinskii Raion, in vicinity of the railway station Boytsovo, experimental station "Shivki", roadside, 26 Aug 2011, *Motorykina 12297* (VLA)

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\* First chromosome count for an Iberian accession.

**ASTERACEAE**

*Centaurea nigra* L. subsp. *nigra*

$2n = 22$ , CHN. Spain, León, Aviados, 30TUN04, pasture, 8 Sep 1984, *M<sup>a</sup> J. López Pacheco s.n.* (LEB 26357).

**FABACEAE**

*Oxytropis foucaudii* Gillot

$2n = 16$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3364, 2000 m, orotemperate basophilous geliturbate graminoid

and dwarf-chamaephyte grassland-like community (Festucion burnatii), 16 Jul 2002, *E. Puente s.n.* (LEB 79999).

The present chromosome count of this Pyrenean-Cantabrian endemic species agrees with the previous report by Küpfer (1974) from a Pyrenean accession. This is the first count from a Cantabrian Mountains accession.

*Oxytropis halleri* W.D.J. Koch subsp. *halleri*

$2n = 32$ , CHN. Spain, León, Torre de Babia, La Riera, Peña Redonda, 29TQH3264, orotemperate basophilous geliturbate graminoid and dwarf-chamaephyte grassland-like community (Festucion burnatii), 27 Jul 2007, *E. Puente s.n.* (LEB 92474).

*Oxytropis neglecta* Ten.

$2n = 16$ , CHN. Spain, León, Maraña, Mampodres, between Collado Valverde and Peña Polinosa, 30TUN2082266397, 1893 m, basophilous and chionophilous grassland community (Armerion cantabricae), 3 Aug 2007, *F. del Egido s.n.* (LEB 92149).

Laínz (1999) points out that there are no chromosome counts from Iberian accessions. However, Küpfer (1974) reported  $2n = 16$  (sub *O. pyrenaica* Godr. & Gren.) from Andorra and Santander.

#### LAMIACEAE

*Sideritis borgiae* J. Andrés subsp. *borgiae*

$2n = 34$ , CHN. Spain, León, Piedrafita, Valle Aguazones, 30TTN8497768233, 1853 m, shrubby community dominated by brooms, 24 Aug 2004, *F. del Egido s.n.* (LEB 82987).

The present chromosome count of this narrowly distributed Iberian endemic taxon agrees with previous reports by Nieto Feliner (1985) and López Pacheco & al. (2011). This is the first count from a Cantabrian Mountains accession.

#### RANUNCULACEAE

*Anemone pavoniana* Boiss.

$2n = 16$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3364, 2100 m, chasmophyte community on limestone rock crevice, 16 Jul 2002, *E. Puente s.n.* (LEB 79495).

*Pulsatilla vernalis* (L.) Mill.

\* $2n = 16$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3365, 2100 m, basophilous and chionophilous grassland community (Armerion cantabricae), 16 Jul 2002, *E. Puente s.n.* (LEB 80015).

*Ranunculus seguieri* Vill.

$2n = 16$ , CHN. Spain, León, San Emiliano, Peña Ubiña, 30TTN5839967430, 1901 m, calcium carbonate rich loose scree community (Linario filicaulis–Crepidetum pygmaeae) dominated by *R. seguieri*, 18 Jun 2008, *E. Puente & F. del Egido s.n.* (LEB 102249).

#### SCROPHULARIACEAE

*Pedicularis comosa* L. subsp. *comosa*

\* $2n = 16$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3365, 2100 m, basophilous and chionophilous grassland community (Armerion cantabricae), 16 Jul 2002, *E. Puente s.n.* (LEB 80016).

*Pedicularis pyrenaica* J. Gay subsp. *pyrenaica*

$2n = 16$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3365, 2100 m, basophilous and chionophilous grassland community (Armerion cantabricae), 16 Jul 2002, *E. Puente s.n.* (LEB 79488).

The reported chromosome count of this Pyrenean-Cantabrian endemic subspecies agrees with those previously reported by Küpfer & Favarger (1967) from Pyrenees and by Küpfer (1974) from other province in the Cantabrian Mountains (Santander).

#### ROSACEAE

*Potentilla nivalis* Lapeyr. subsp. *nivalis*

$2n = 14$ , CHN. Spain, León, Torre de Babia, Picos Albos, 29TQH3364, 2100 m, chasmophyte community on limestone rock crevice, 16 Jul 2002, *E. Puente s.n.* (LEB 80001).

#### Literature cited

- Küpfer, P. 1974. Recherches sur les liens de parenté entre la flore orophile des Alpes et celle des Pyrénées. *Boissiera* 23: 3–322.
- Küpfer, P. & Favarger, C. 1967. Premières prospections caryologiques dans la flore orophile des Pyrénées et de la Sierra Nevada. *Compt. Rend. Acad. Sci. Paris, Ser. 3, Sci. Vie* 264: 2463–2465.
- Laínz, M. 1999. *Oxytropis*. Pp. 338–347 in: Talavera, S., Aedo, C., Castroviejo, S., Romero Zarco, C., Sáez, L., Salgueiro, F.J., & Velayos, M. (eds.), *Flora Iberica*, vol. 7(1). Madrid: Real Jardín Botánico-C.S.I.C.
- López Pacheco, M.J., Puente, E., del Egido, F. & Fernández Cañedo, M. 2011. Números cromosómicos para la flora española. 831–842. *Lagascalia* 31: 243–248.
- Nieto Feliner, G. 1985. Estudio crítico de la flora orófila del suroeste de León: Montes Aquilianos, Sierra del Teleno y Sierra de la Cabrera. *Ruizia* 2: 3–239.

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\* First chromosome count for the taxon.

\*\* New chromosome number (cytotype) for the taxon.

▼ First chromosome count from French populations.

All materials gathered in situ (SE France), fixed on flowers (*F*) or seedlings (*S*) produced from seeds collected by us or by the Conservatoire Botanique National Méditerranéen (CBNMED), and counted by R. Verlaque and B. Vila. This study was supported by the Parc National de Port-Cros and the CBNMED. Authors are grateful to colleagues who helped us with plant localisation and sampling.

This work is dedicated to Dr. Juliette Contandriopoulos (1922–2011). She was an eminent scientist at our institute, working mainly on insular endemism (e.g., Contandriopoulos, 1962, 1990; Cardona & Contandriopoulos, 1979) and on Campanulaceae, as well as on Mediterranean and Middle Eastern flora. She left many important karyological publications, the most famous of which is a classification, using chromosomal and morphological features of endemic taxa compared to closely related species (Favarger & Contandriopoulos, 1961).

Southeastern France is a noteworthy pole of plant biodiversity due to complex historical and environmental factors (Verlaque & al., 1997). Within this area, the maritime Alps occupy a particularly important place, as one of the ten Mediterranean hotspots (Médail & Quézel, 1997). Often considered as a refuge, this biogeographical unit shelters 60% of the French flora, about 120 endemic and numerous patrimonial taxa (Salanon & al., 2010; Noble & Diadema, 2011). To confirm the “clear congruence between regional hotspots and refugia” (Médail & Diadema, 2009), karyological investigations of many



poorly known taxa are needed. Future syntheses of previous and new data should allow better assessment and localisation of conservative and active endemisms.

#### APIACEAE

##### ▼ *Tordylium apulum* L.

$2n = 20$ , CHN. France, Alpes-Maritimes, near Drap, below the Col de la Colle, wet slope roadside, 120 m, 11 May 2009, *Verlaque F09-110* (MARS 00029) [Fig. 8A].

In Provence, this circum-Mediterranean species is rare and at its northern limit. This first chromosome count from France agrees with previous reports from Greece (Runemark, 1968) and Italy (Capineri & al., 1978).

#### ASTERACEAE

##### ▼ *Atractylis cancellata* L.

$2n = 20$ , CHN. France, Alpes-Maritimes, Saint-Jean-Cap-Ferrat, Chemin des Douaniers, rocky place, 9 m, 1 Aug 1998, *CBNMED-Alziar S09-67* (MARS) [Fig. 8B].

In Provence, this circum-Mediterranean species is very rare, protected, and at its northern limit. This first chromosome count from France confirms the previous reports from Italy (Bartolo & al., 1977) and North Africa (Humphries & al., 1978; Vogt & Oberprieler, 1993).

##### *Carduus litigiosus* Nocca & Balbis subsp. *litigiosus*

$2n = 32$ , CHN. France, Alpes-Maritimes, Revest-les-Roches, Mont Vial, rocky place, 1450 m, 17 Jun 2009, *Verlaque & Vila S09-70*, *Verlaque & Vila S09-74* (MARS); France, Alpes-Maritimes, Revest-les-Roches, top of Mont Vial, rocky place beside a path, 1500 m, 17 Jun 2009, *Verlaque & Vila F09-149* (MARS 00031) [Fig. 8C].

In this endemic subspecies of SE France and N Italy, we confirm our previous report from the Gorges du Verdon (Verlaque & al., 1987).

##### \* *Carduus litigiosus* subsp. *horridissimus* (Briq. & Cavill.)

Franco

$2n = 32$ , CHN. France, Alpes-Maritimes, Plateau Tercier, near La Trinité, dry rocky place, 500 m, 11 May 2009, *Verlaque F09-109* (MARS 00032) [Fig. 8D].

This count is the first for this Ligurian endemic taxon. Its chromosomes are smaller than those of the former and without big satellites.

##### \* *Centaurea balbisiana* Soldano subsp. *balbisiana*

$2n = 21, 22$ , CHN. France, Alpes-Maritimes, Vallée de la Vésubie, Levens, cliff, 450 m, 17 Jun 2009, *Verlaque & Vila S09-69* (MARS 00016).

$2n = 22, n = 10, 11$ , CHN. France, Alpes-Maritimes, Vallée de la Vésubie, Levens, cliff, 450 m, 17 Jun 2009, *Verlaque & Vila F09-145* (MARS 00013) [Fig. 8E].

##### \* *Centaurea balbisiana* subsp. *aemilii* (Briq.) Kerguélen

$2n = 22, 23, (24)$ , CHN. France, Alpes-Maritimes, Toudon, Mont Vial, rocky place, 1500 m, 17 Jun 2009, *Verlaque S09-66* (MARS 00010).

$2n = (22), 23, 24$ , CHN. France, Alpes-Maritimes, Toudon, top of Mont Vial, rocky place, 1510 m, 17 Jun 2009, *Verlaque & Vila F09-148* (MARS 00011, MARS 00012) [Fig. 8F].

##### \* *Centaurea balbisiana* subsp. *verguinii* (Briq. & Cavill.)

Kerguélen

$2n = 22$ , CHN. France, Alpes-Maritimes, Thiéry, Forêt Domaniale de La Madone, rocky place, in clearing in pine forest, 1280 m, 17 Jun 2009, *Verlaque & Vila F09-153* (MARS 00009) [Fig. 8G].

Endemic to the Maritimes Alps, *C. balbisiana* has differentiated into four subspecies clearly distinct by their morphology, area,

ecology and karyology. Our counts are the first for three of these legally protected taxa. The orophyte *C. balbisiana* subsp. *verguinii* (550–1900 m, sandstone rocky places) differs from the others in having greenish not tomentose leaves, and regular meiotic and somatic divisions, as well as a genetic isolation (J. Lopez, pers. comm.). In contrast to this former taxon, the *C. balbisiana* subsp. *balbisiana* (200–600 m, rupicolous) with appendages not covering bracts, and *C. balbisiana* subsp. *aemilii* (850–1550 m, calcareous rocky places) with appendages covering bracts, show strong somatic, meiotic and pollen anomalies. The karyological instability of these two white tomentose subspecies attests to their ongoing karyological evolution.

##### *Leucanthemum virgatum* (Desr.) Clos

$2n = 18, n = 9$ , CHN. France, Alpes-Maritimes, Fontan, Caïros, by the roadside, 290 m, 1 Jul 1994, *Médail F96-53* (MARS); France, Alpes-Maritimes, Breil-sur-Roya, Caïros, rocky place, 350 m, 1 Jul 1994, *Médail F96-56* (MARS).

For this endemic species of the Alpes-Maritimes and Liguria, our counts agree with the only previous report (Favarger, 1975 as *L. discoideum* (All.) Coste).

##### ▼ *Phagnalon rupestre* subsp. *annoticum* (Burnat) Pignatti

$2n = 18$ , CHN. France, Alpes-Maritimes, Clans, calcareous rocky slope, 700 m, 23 Aug 2008, *CBNMED-Noble S09-1* (MARS) [Fig. 8H].

Rare in France, this legally protected subspecies is endemic to the Maritime and Ligurian Alps. This first count from France confirms the only previous report from Italy (Corrias, 1980), and agrees with the diploid number found by many authors in other taxa of this Mediterranean polymorphic complex.

##### ▼ *Serratula lycopifolia* (Vill.) A. Kern.

$2n = 60$ , CHN. France, Alpes-Maritimes, Andon, Vallée de Lane, near Thorenc Lake, wet meadow, 1130 m, 21 Aug 2004, *CBNMED-Michaud S10-11* (MARS) [Fig. 8I].

This Eurasian species reaches its western limit in the Alpes-Maritimes where it is very rare and legally protected. The first from France, our count confirms those from Hungary (Baksay, 1957) and Poland (Pogan & al., 1988), and differs from Russian reports ( $2n = 30$ : Chouksanova & al., 1968).

#### BRASSICACEAE

##### *Cardamine asarifolia* L.

$2n = 48, n = 24$ , CHN. France, Alpes-de-Haute-Provence, Col de Larche, wet meadow, 1820 m, 5 July 1974, *Contandriopoulos F74-170* (MARS) [Fig. 8J].

Protected in France, this orophyte occurs in S & C Alps and N Apennines. This hexaploid number counted in France confirms those of Lihová & al. (2006) obtained in Italy, while two old reports give diploid numbers:  $2n = 14$  and  $16$  (Lawrence, 1931; Manton, 1932, respectively) on botanical garden materials.

##### \* *Hesperis inodora* L.

$2n = 14$ , CHN. France, Alpes-Maritimes, Tende, Vallée du Réfrei, shaded place, 1300 m, 13 Aug 2009, *CBNMED-Polidori S10-150* (MARS).

$2n = 14, n = 7$ , CHN. France, Alpes-Maritimes, Tende, Vallée du Réfrei, 1400 m, 11 Jul 1995, *Aboucaya F95-149* (MARS) [Fig. 8K].

They are the first counts for this rare and legally protected endemic species of the Alpes-Maritimes. It belongs to the Eurasian *H. matronalis* s.l., often cultivated for its colored or white flowers: “a group of closely related taxa of which the status is in many cases doubtful” (Ball in Tutin & al., 1993). Among wild populations of this mainly tetraploid complex ( $2n = 24, 26, 28$ : Jalas & Suominen, 1994), *H. inodora* is the westernmost diploid and the only one with white flowers. Thus, these data argue for its status of relict species.

**CAMPANULACEAE**

\*\**Campanula fritschii* Witasek

$2n = 34$ ,  $n = 17$ , CHN. France, Alpes-Maritimes, Thiéry, Forêt Domaniale de La Madone, marly slopes in open pine forest, 1280 m, 17 Jun 2009, *Verlaque & Vila F09-154* (MARS).

Our count is the first with  $2n = 34$  for this endemic species scattered over the Alpes-Maritimes, while  $2n = 68$  has been found in plants from Beuil in the Vallée du Var (Podlech, 1962).

*Campanula macrorrhiza* DC.

$2n = 68$ , CHN. France, Alpes-Maritimes, Vallée du Paillon, Peille, cliff, 650 m, 11 May 2009, *Verlaque F09-113* (MARS 00033) [Fig. 8L].

Our count confirms that this rupicolous endemic taxon has two polyploid levels in its SW Alps range, as for the preceding species. It possesses  $2n = 34$  in the mountains of Vaucluse (Guinochet, 1942; Podlech, 1962) and  $2n = 68$  in the Var (Geslot, 1980) and Alpes-Maritimes. This latter cytotype has typical 4-porate pollen grains, vs 3-porate grains in taxa with  $2n = 34$  (Geslot & Médus, 1971). This SE France endemic *Campanula* needs further investigation.

**CARYOPHYLLACEAE**

\**Holosteum umbellatum* subsp. *hirsutum* (Mutel) Breistr.

$2n = 40$ , CHN. France, Alpes-Maritimes, Plateau de Caussols, Embut de Caussols, dry meadow, 1050 m, 19 Apr 2011, *CBNMED-Noble F11-116* (MARS 00034) [Fig. 9A].

Our count is the first for this rare and protected orophyte endemic to SW French Alps. Many authors have only found a diploid number in this small genus, except for tetraploid *H. umbellatum* of Kiklades (Runemark, 1996) which differs from *H. umbellatum* subsp. *hirsutum* (eglandular, 10 stamens) in having few glandular hairs and 2–3 stamens.

\**Moehringia sedoides* (Pers.) Loisel.

$2n = 24$ , CHN. France, Alpes-Maritimes, Fontan, Caïros, limestone cliff, 680 m, 2 Jul 1994, *Médail F96-51*, *Médail F96-54* (MARS); France, Alpes-Maritimes, Vallée du Paillon, Peille, cliff, 650 m, 11 May 2009, *Verlaque F09-112* (MARS 00030) [Fig. 9B].

Our chromosome counts are the first for this very rare and protected rupicolous endemic species of the E Alpes-Maritimes. Most species of this genus possess the same diploid number.

**CISTACEAE**

▼ *Helianthemum lunulatum* DC.

$2n = 22$ ,  $n = 11$ , CHN. France, Alpes-Maritimes, La Brigue, Pointe de Marguareis, 2130 m, 9 Jul 1995, *Aboucaya F95-146* (MARS) [Fig. 9C].

This first count of French legally protected populations confirms the previous report from Liguria (Favarger, 1997). This rupicolous endemic species of Ligurian Alps belonging to the monotypic sect. *Macularia* Dunal can be considered as a paleo-endemic species.

\**Helianthemum numularium* subsp. *berterianum* (Bertol.) Breistr.

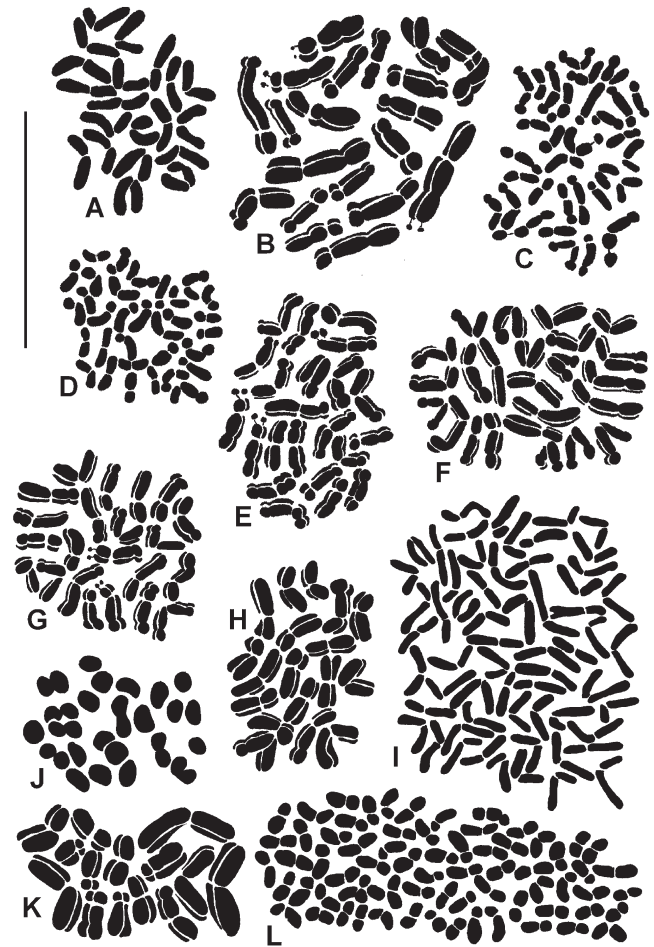
$2n = 20$ , CHN. France, Alpes-Maritimes, Vallée du Carei, above Castellar, on limestone, 360 m, 11 May 2009, *Verlaque F09-102* (MARS 00017, MARS 00019) [Fig. 9D].

Our count is the first for this endemic subspecies of Ligurian Alps and N Apennines. This diploid number agrees with previous reports of many authors for the other taxa of this European complex.

**CRASSULACEAE**

*Sedum fragrans* 't Hart

$2n = 20$ ,  $n = 10$ , CHN. France, Alpes-Maritimes, Vallée de la Roya, near Tende, limestone cliff, 1500 m, 2 Jul 1994, *Médail F96-58* (MARS) [Fig. 9E].



**Fig. 8.** A–I, Somatic metaphase: A, *Tordylium apulum*,  $2n = 20$ ; B, *Atractylis cancellata*,  $2n = 20$ ; C, *Carduus litigiosus* subsp. *litigiosus*,  $2n = 32$ ; D, *C. litigiosus* subsp. *horridissimus*,  $2n = 32$ ; E, *Centaurea balbisiana* subsp. *balbisiana*,  $2n = 22$ ; F, *C. balbisiana* subsp. *aemilii*,  $2n = 24$ ; G, *C. balbisiana* subsp. *verguinii*,  $2n = 22$ ; H, *Phagnalon rupestre* subsp. *annoticum*,  $2n = 18$ ; I, *Serratula lycopifolia*,  $2n = 60$ . J, Metaphase I: *Cardamine asarifolia*,  $n = 24$ . K–L, Somatic metaphase: K, *Hesperis inodora*,  $2n = 14$ ; L, *Campanula macrorrhiza*,  $2n = 68$ . — Scale bar = 10  $\mu$ m

Our count agrees with the only previous report ('t Hart, 1983) for this rupicolous and protected endemic species of Maritime and Ligurian Alps.

**EUPHORBIACEAE**

\**Euphorbia canuttii* Parl.

$2n = 14$ ,  $n = 7$ , CHN. France, Alpes-Maritimes, Vallée du Carei, above Castellar, shaded place, 520 m, 11 May 2009, *Verlaque F09-100* (MARS 00023, MARS 00024); France, Alpes-Maritimes, Vallée du Carei, above Castellar, on limestone, 500 m, 11 May 2009, *Verlaque F09-101* (MARS 00025, MARS 00026) [Fig. 9F].

Our counts are the first for this endemic taxon of the SW Alps (500–1600 m), considered as species in old floras (Rouy, 1910; Fournier, 1947), then as subspecies of the W European *E. hyberna* L. (Tutin in Tutin & al., 1968). However, this taxon deserves to conserve its specific status, because its base chromosome number ( $x = 7$ ) and its diploid level highly differs from the base number ( $x = 9$ )

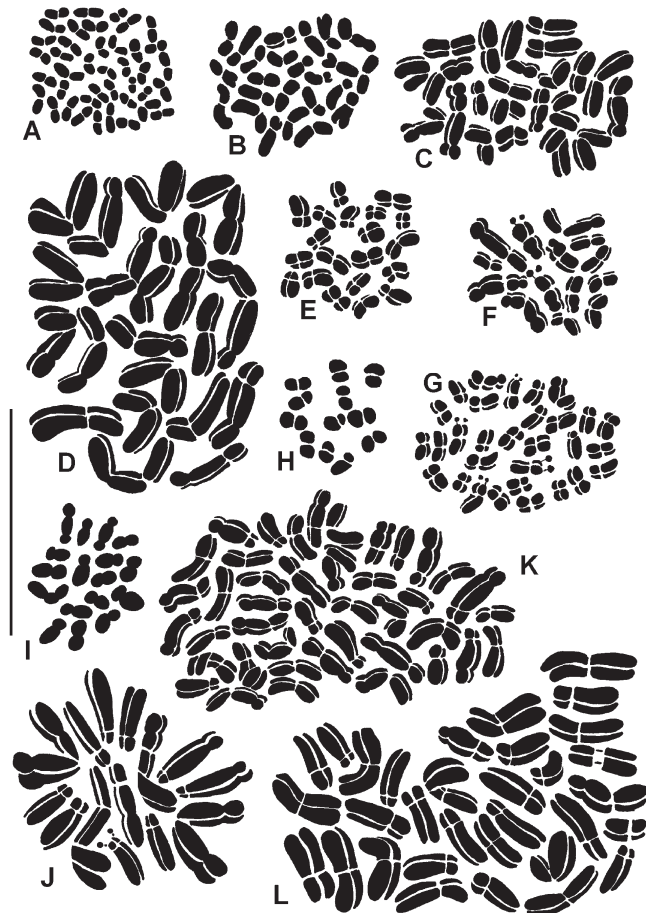
and the tetraploid level ( $2n = 36$ ) of *E. hyberna* (Contandriopoulos, 1957; Cesca, 1963). Among distinctive characters, *E. canutii* possesses rugulose-reticulate and reddish seeds, vs. smooth and pale brownish-grey in *E. hyberna* (including subsp. *insularis* (Boiss.) Briq.), but further investigations are needed.

#### FABACEAE

\**Hedysarum brigantiacum* Bourn. & al.

$2n = 14$ , CHN. France, Hautes-Alpes, above Aiguilles, Ristolas, le pré Michel, meadow, 1650 m, 19 Jul 1999, *Verlaque F99-167* (MARS 00035; MARS 00036).

Our count is the first for this endemic orophyte of the SW Alps. It belongs to the Arctic-alpine complex *H. hedysaroides* (L.) Schinz & Thell. with  $2n = 14$  in Europe (Favarger, 1953) like other species of *Hedysarum* sect. *Gamotion* Basiner, vs.  $2n = 16$  in the rest of the genus.



**Fig. 9.** A–G, Somatic metaphase: **A**, *Holosteum umbellatum* subsp. *hirsutum*,  $2n = 40$ ; **B**, *Moehringia sedoides*,  $2n = 24$ ; **C**, *Helianthemum lunulatum*,  $2n = 22$ ; **D**, *H. numularium* subsp. *berterianum*,  $2n = 20$ ; **E**, *Sedum fragrans*,  $2n = 20$ ; **F**, *Euphorbia canutii*,  $2n = 14$ ; **G**, *Micromeria marginata*,  $2n = 30$ . **H**, Metaphase I: *Ballota frutescens*,  $n = 12$ . **I–J**, Pollinic mitose: **I**, *Teucrium lucidum*,  $n = 17$ ; **J**, *Delphinium dubium*,  $n = 16$ . **K–L**, Somatic metaphase: **K**, *Lavatera punctata*,  $2n = 42$ ; **L**, *Ranunculus canutii*,  $2n = 32$ . — Scale bar = 10  $\mu$ m.

#### LAMIACEAE

\**Ballota frutescens* (L.) Woods

$2n = 24$ ,  $n = 12$ , CHN. France, Alpes-Maritimes, Vallée du Pailon, near Peille, cliff, 650 m, 11 May 2009, *Verlaque F09-111* (MARS 00022) [Fig. 9H].

Our diploid count is the first for this legally protected endemic species of the Alpes-Maritimes. Characterized by a chromosome number unique in the genus ( $2n = 18$  to 28), and belonging to the monotypic *B.* sect. *Acanthoprasium* Benth., this rupicolous and pungent species can be considered as a paleo-endemic.

\**Micromeria marginata* (Sm.) Chater

$2n = 30$ , CHN. France, Alpes-Maritimes, Thiéry, Forêt Domaniale de La Madone, clearing in pine forest, rocky place, 1280 m, 17 Jun 2009, *Verlaque & Vila F09-151* (MARS 00021); France, Alpes-Maritimes, Roubion, Bois Falcon, 1630 m, 31 Oct 1991, *CBNMED-Lavagne S09-64* [Fig. 9G].

Our counts are the first for this rupicolous endemic species of Maritime and Ligurian Alps.

\*\**Teucrium lucidum* L.

$2n = 34$ ,  $n = 17$ , CHN. France, Alpes-Maritimes, Fontan, Caïros, forest edge, rocky place, 400 m, 2 Jul 1994, *Médail F96-52* (MARS) [Fig. 9I].

New for this widespread endemic species of SW Alps, our count differs from  $2n = 32$  found by Fernandez Casas & al. (1978) from botanical garden materials. By its karyological and morphological characters *T. lucidum* seems to be an ancient taxon of the closely related Mediterranean complex *T. chamaedrys* L. ( $2n = 58–64$ , 78–80 ...). In *Teucrium* sect. *Chamaedrys* (Mill.) Schreb. such aneuploid variations are only known in the two insular W Mediterranean endemic species: *T. marum* L. and *T. subspinosum* Pourr. ( $2n = 28–32$ ; Verlaque & al., 1991).

#### LILIACEAE

*Lilium pomponium* L.

$2n = 24$ , CHN. France, Alpes-Maritimes, Tende, Vallée de Réfrei, 1800 m, 2 Jul 1994, *Médail F95-147*, *Médail F95-148* (MARS); France, Alpes-Maritimes, Revest-les-Roches, near Mont Vial, rocky place, 1350 m, 17 Jun 2009, *Verlaque & Vila F09-150* (MARS 00020).

These counts agree with previous reports for this protected endemic species of the Maritime and Ligurian Alps. All European endemic *Lilium* (L. sect. *Liriotypus* Asch. & Graebn.) have the same diploid number, but they show a clear karyotypic evolution. According to the westward-radiation hypothesis *L. pomponium* and *L. pyrenaicum* Gouan would be the youngest species (Muratovic & al., 2010).

#### MALVACEAE

\**Lavatera punctata* All.

$2n = 42$ , CHN. France, Alpes-Maritimes, Valbonne, Bouillide, riverside, 140 m, 4 Sep 2008, *CBNMED-Morvant S09-02* (MARS) [Fig. 9K].

This is the first count for this annual and ruderal Mediterranean species. Rare and protected in France where it reaches its W limit in Provence.

#### RANUNCULACEAE

\**Delphinium dubium* (Rouy & Foucaud) Pawł.

$2n = 32$ ,  $n = 16$ , CHN. France, Hautes-Alpes, Risoul, Les chalpes, bank of mountain stream, 1090 m, 19 Jul 1999, *Verlaque F99-160* (MARS 00038); France, Hautes-Alpes, above Aiguilles, Ristolas, le Pré Michel, meadow, 1650 m, 19 Jul 1999, *Verlaque F99-165* (MARS 00039) [Fig. 9J].

Our count is the first for this endemic orophyte of the SW Alps (1550–2700 m). It presents a tetraploid level like the closely related perennial orophytes: the Pyrenean *D. montanum* DC. and the W

Carpathian *D. oxysepalum* Borbás & Pax, while most *Delphinium* are diploid (Jalas & Suominen, 1989).

▼ *Ranunculus canutii* Coss. ex Ardoino

$2n = 32$ , CHN. France, Alpes-Maritimes, Nice, Plateau Tercier, 800 m, 11 May 2009, *Verlaque F09-108* (MARS 00028) [Fig. 9L].

In France, *R. canutii* (= *R. garganicus* p.p.) is regarded as a protected endemic plant of Alpes-Maritimes and Toscana (Fournier, 1947; Noble & Diadema, 2011). However, in the complex *R. millefoliatus* Vahl. (incl. *R. garganicus* Ten.), this taxon is omitted (even in synonymy) in recent European flora (Pignatti, 1982; Tutin in Tutin & al., 1993). The first for France, our count confirms the tetraploid level only found in Toscana near Grosseto (Garbari & Tornadore, 1970 as *R. garganicus*). All the many previous reports indicated a diploid level ( $2n = 16$ ) for *R. garganicus* and *R. millefoliatus* in Italy, Bulgaria and Greece (Jalas & Suominen, 1989). Whatever its status, hitherto *R. canuti* is the only tetraploid cytotype known, located at the NW limit of the complex. Further investigations are needed.

**ROSACEAE**

\**Potentilla delphinensis* Gren. & Godr.

$2n = 56$ , CHN. France, Hautes-Alpes, La Salette, dry grassland, 1900 m, 11 Jul 2001, *Caille F-Sal3* (MARS 00041, MARS 00042).

Our polyploid counts are the first for this protected orophyte, endemic to the French Hautes-Alpes (1500–2500 m). Morphological and karyological features show that it is a neo-endemic species issued from *P. grandiflora* L. ( $2n = 28$ ) as one of the putative parents.

*Potentilla grandiflora* L.

$2n = 28$ , CHN. France, Hautes-Alpes, La Motte-en-Champsaur, 1800 m, 27 Jul 2001, *Caille F-M4* (MARS 00044).

Our count confirms previous French and Helvetic reports of this SW European orophyte.

New chromosome numbers have been found for 18 of the 30 taxa studied here. Thus, we have contributed to extending knowledge of the SE France flora. Karyological characteristics of these endemic and rare taxa exhibit the biogeographical particularities of this region, which fulfills a double function: conservation and differentiation. One-third of the studied taxa belongs to the conservative endemism including paleo- and patroendemics (sensu Favarger & Contandriopoulos, 1961), i.e., taxa morphologically isolated (*Helianthemum lunulatum*, *Ballota frutescens*) and taxa with lower ploidy levels than closely related species (e.g., *Hesperis inodora*, *Euphorbia canutii*, *Teucrium lucidum*), respectively. The other taxa represent the active endemism including schizo- and neo-endemics, i.e., vicariants with the same chromosome number (e.g., *Carduus litigiosus*, *Moehringia sedoides*), and new cytotypes with higher polyploid levels than closely related species (e.g., *Holosteum umbellatum* subsp. *hirsutum*, *Ranunculus canutii*, *Potentilla delphinensis*), respectively.

**Literature cited**

Baksay, L. 1957. The cytotaxonomy of the species *Chrysanthemum maximum* Ram., *Centaurea montana* L., *Serratula lycopifolia* (Vill.) Kern., and *Bupleurum falcatum* L., ranging in Europe. *Ann. Hist.-Nat. Mus. Nail. Hung.*, ser. nov., 8: 155–168.

Bartolo, G., Brullo, S., Majorana, G. & Pavone, P. 1977. Numeri cromosomici per la flora italiana: 315–328. *Inform. Bot. Ital.* 9: 71–87.

Capineri, R., D'Amato, G. & Marchi, P. 1978. Numeri cromosomici per la flora italiana: 534–583. *Inform. Bot. Ital.* 10: 421–465.

Cardona, M.-A. & Contandriopoulos, J. 1979. Endemism and evolution in the islands of western Mediterranean. Pp. 133–169 in: Bramwell, D. (ed.), *Flora and islands*. London: Academic Press.

Cesca, G. 1963. Ricerche cariologiche ed embriologiche sulle *Euphorbiaceae*: *Euphorbia spinosa* L. e *E. hiberna* L. *Nuovo Giorn. Bot. Ital.* 70: 542–543.

Chouksanova, N.A., Svesnikova, L.I. & Alexandrova, T.V. 1968. Data on karyology of the Compositae Gisek. *Citologija* 10: 198–206.

Contandriopoulos, J. 1957. Nouvelle contribution à l'étude caryologique des endémiques de la Corse. *Bull. Soc. Bot. France* 104: 533–538.

Contandriopoulos, J. 1962. Recherches sur la flore endémique corse et sur ses origines. Thèse de la Faculté des Sciences de Marseille. *Ann. Fac. Sci. Marseille* 32: 1–350.

Contandriopoulos, J. 1990. Spécificité de l'endémisme Corse. *Atti Conv. Lincei, Accad. Naz. Lincei* 85: 393–416.

Corrias, B. 1980. Numeri cromosomici per la flora italiana: 679–700. *Inform. Bot. Ital.* 12: 121–123.

Favarger, C. 1953. Notes de caryologie alpine. II. *Bull. Soc. Neuchâtel. Sci. Nat.* 76: 133–169.

Favarger, C. 1975. Sur quelques marguerites d'Espagne et de France. Etude cytotaxonomique: *Leucanthemum*. *Anales Inst. Bot. Cavanilles* 32: 1209–1243.

Favarger, C. 1997. Notes de caryologie alpine. VI. *Bull. Soc. Neuchâtel. Sci. Nat.* 120: 19–33.

Favarger, C. & Contandriopoulos, J. 1961. Essai sur l'endémisme. *Ber. Schweiz. Bot. Ges.* 71: 384–408.

Fernandez Casas, J., Gonzalez Aguilera, J. & Ruiz Rejon, M. 1978. Notas sobre cariología de Lamiaceas. *Anales Inst. Bot. Cavanilles* 34: 723–732.

Fournier, P. 1947. *Les quatre flores de la France*. Paris: Lechevalier.

Garbari, F. & Tornadore, N. 1970. Numeri cromosomici per la flora italiana: 1–12. *Inform. Bot. Ital.* 2: 74–82.

Geslot, A. 1980. Biométrie des graines et nombres chromosomiques dans la sous-section *Heterophylla* du genre *Campanula* (Campanulaceae). *Pl. Syst. Evol.* 134: 193–206. <http://dx.doi.org/10.1007/BF00986799>

Geslot, A. & Médus, J. 1971. Morphologie pollinique et nombre chromosomique dans la sous-section *Heterophylla* (Wit.) Fed. du genre *Campanula* L. *Canad. J. Genet. Cytol.* 13: 888–894.

Guinochet, M. 1942. Recherches de taxonomie expérimentale sur la flore des Alpes et de la région méditerranéenne occidentale II. Sur quelques formes de *Campanula rotundifolia* L. s.l. *Bull. Soc. Bot. France* 89: 70–75, 153–156.

Humphries, C., Murray, B., Bocquet, G. & Vasudevan, K. 1978. Chromosome numbers of phanerogams from Morocco and Algeria. *Bot. Not.* 131: 391–404.

Jalas, J. & Suominen, J. 1989. *Atlas florae europaeae*, vol. 8. Helsinki: The Committee for Mapping the Flora of Europe and Societas Biologica Fennica Vanamo.

Jalas, J. & Suominen, J. 1994. *Atlas florae europaeae*, vol. 10. Helsinki: The Committee for Mapping the Flora of Europe and Societas Biologica Fennica Vanamo.

Lawrence, W.J. 1931. The chromosome constitution of *Cardamine pratensis* and *Verbascum phoeniceum*. *Genetica* 13: 183–208. <http://dx.doi.org/10.1007/BF01725043>

Lihová, J., Shimizu, K.K. & Marhold, K. 2006. Allopolyploid origin of *Cardamine asarifolia* (Brassicaceae): Incongruence between plastid and nuclear ribosomal DNA sequences solved by a single-copy nuclear gene. *Molec. Phylogen. Evol.* 39: 759–786. <http://dx.doi.org/10.1016/j.ympev.2006.01.027>

Manton, I. 1932. Introduction to the general cytology of the *Cruciferae*. *Ann. Bot. (Oxford)* 46: 509–556.

Médail, F. & Diadema, K. 2009. Glacial refugia influence plant diversity patterns in the Mediterranean basin. *J. Biogeogr.* 36: 1333–1345. <http://dx.doi.org/10.1111/j.1365-2699.2008.02051.x>

Médail, F. & Quézel, P. 1997. Hot-spots analysis for conservation of plant biodiversity in the Mediterranean basin. *Ann. Missouri Bot. Gard.* 84: 112–127. <http://dx.doi.org/10.2307/2399957>

Muratović, E., Robin, O., Bogunić, F., Šoljan, D. & Siljak-Yakovlev, S. 2010. Karyotype evolution and speciation of European lilies from *Lilium* sect. *Liriotypus*. *Taxon* 59: 165–175.

Noble, V. & Diadema, K. (ed.) 2011. *La flore des Alpes-Maritimes et de la Principauté de Monaco: Originalité et diversité*. Turriers: Naturalia publications.

- Pignatti, S.** 1982. *Flora d'Italia*. 3 vols. Roma: Edagricole.
- Podlech, D.** 1962. Beitrag zur Kenntnis der Subsektion *Heterophylla* (Wit.) Fed. der Gattung *Campanula* L. *Ber. Deutsch. Bot. Ges.* 75: 237–244.
- Pogan, E., Jankun, A., Wcislo, H.** 1988. Further studies in chromosome numbers of Polish angiosperms. Part XXI. *Acta Biol. Cracov., Ser. Bot.* 30: 119–136.
- Rouy, G.** 1910. *Flore de France*, vol. 12. Tours: Société des Sciences Naturelles de la Charente-inférieure.
- Runemark, H.** 1968. Studies of the Aegean flora XIII. *Tordylium* L. (Umbelliferae). *Bot. Not.* 121: 233–258.
- Runemark, H.** 1996. Mediterranean chromosome number reports 6. *Flora Medit.* 6: 223–243.
- Salanon, R., Kulesza, V. & Offerhaus, B.** 2010. *Mémento de la flore protégée des Alpes-Maritimes*. Cabri: l'Office Nationale des Forêts.
- 't Hart, H.** 1983. Micro-endemism in *Sedum* (Crassulaceae): The sibling species *S. alsinefolium* All. and *S. fragrans* spec. nov. from French-Italian Alps. *Bot. Helv.* 93: 269–280.
- Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D.M., Valentine, D.H., Walters, S. & Webb, D.A.** 1968. *Flora Europa*, vol. 2. Cambridge: Cambridge University Press.
- Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D.M., Valentine, D.H., Walters, S. & Webb, D.A.** 1993. *Flora Europa*, vol. 1, ed. 2. Cambridge: Cambridge University Press.
- Verlaque, R., Seidenbinder, M. & Donadille, P.** 1987. Recherches cytotoxonomiques sur la spéciation en région méditerranéenne. I: Espèces à nombre chromosomique stable. *Biol. Écol. Médit.* 10: 273–289.
- Verlaque, R., Aboucaya, A., Cardona, A. & Contandriopoulos, J.** 1991. Quelques exemples de spéciations insulaires en méditerranée occidentale. *Bot. Chron. (Patras)* 10: 137–153.
- Verlaque, R., Médail, F., Quézel, P. & Babinot, J.-F.** 1997. Endémisme végétal et paléogéographie dans le Bassin Méditerranéen. *Geobios, Mém. Spéc.* 21: 159–166. [http://dx.doi.org/10.1016/S0016-6995\(97\)80083-6](http://dx.doi.org/10.1016/S0016-6995(97)80083-6)
- Vogt, R. & Oberprieler, C.** 1993. Mediterranean chromosome number reports 3. *Flora Medit.* 3: 338–340.