

IOPB COLUMN

edited by Karol Marhold & Gonzalo Nieto Feliner

IAPT/IOPB chromosome data 1

edited by Karol Marhold

INTRODUCTION

The new series, IAPT/IOPB Chromosome Data, presented here, is a continuation of the long-term activity of the International Organisation of Plant Biosystematists (now interest group of the International Association for Plant Taxonomy) in supporting the research and publication of data on chromosome numbers and ploidy levels. Polyploidy is a frequent phenomenon in plant evolution that produces fast and substantial changes in the genetic composition of the organisms, which seem to foster diversification. It is now widely acknowledged that most plants have undergone one or more episodes of polyploidization during their evolutionary history and thus its importance cannot be overestimated. With the rapid development of methods of molecular systematics, the knowledge of the ploidy level of the studied plant material acquires a new dimension as compared to the early days of publication of the IOPB Chromosome Number Reports in TAXON. In the 60s, 70s and 80s, chromosome numbers were used as an independent source of taxonomic (and phylogenetic) information while the last decade demands ploidy information to correctly interpret molecular data, particularly from ribosomal and low-copy nuclear genes and from fingerprinting markers. Our intention is not only to publish available data on chromosome numbers and ploidy levels of vascular plants, which otherwise might remain unpublished, but also to encourage further research in this respect.

The hundred parts of the series IOPB Chromosome Number Reports (from the 67th part on called Chromosome Number Reports), edited first by O. T. Solbrig and Å. Löve and later by Å. Löve only, were published in TAXON from 1964 to 1988. Under the editorship of C. A. Stace this activity continued in the IOPB Newsletter, where eighteen parts of the IOPB Chromosome Data were published from 1989 to 2002. The contributions

published in TAXON from 1964 to 1988 can be accessed via JSTOR (www.jstor.org). The whole set of these contributions, including those published in the IOPB Newsletter will be available soon also via the IOPB webpage www.iopb.org.

Following the current publication policy of TAXON, the abbreviated version of the IAPT/IOPB Chromosome Data will be published in the printed version of TAXON, while its full version will appear in the electronic edition only. Electronic versions will be available from INGEN-TACONNECT (<http://www.ingentaconnect.com/content/iapt/tax>) as well as via the IOPB webpage. The printed version will include the chromosome number or ploidy level, the country of origin of the material and unequivocal reference to the voucher specimen. This will include the collector's name and the acronym of the herbarium collection in which the specimen is deposited. In addition, either the collection number or the exact date of the collection, or the number of the specimen in the particular herbarium collection should be provided. The electronic version should include a full description of the locality (preferably including geographical coordinates) and full citation of the voucher specimen. Data based on material of unknown wild origin or not documented by herbarium specimens cannot be published in this series. Vouchers must be deposited in a public herbarium listed in Index Herbariorum (<http://sciweb.nybg.org/science2/IndexHerbariorum.asp>). The potential contributors should follow the format of the most recent instalment of the series. Additional information, e.g., acknowledgements, must be included in the electronic version.

The first counts for a taxon, first counts for a new number for a taxon, or data or counts from an unexplored part of the distribution area of a taxon will be given preference.

The contributors are encouraged to provide photographs of mitotic or meiotic figures and comments,

All materials for the chromosome column should be submitted electronically to: Karol Marhold, karol.marhold@savba.sk (Institute of Botany, Slovak Academy of Sciences, SK-845 23 Bratislava, Slovakia and Department of Botany, Charles University, CZ 128-01 Prague, Czech Republic). The full version of this contribution is available in the online edition of TAXON. 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.

including citation of relevant literature, which will be published in the electronic version. In exceptional cases, the column editor may recommend that such comments appear also in the printed version. Images of voucher specimens might be deposited on the IOPB web page.

Recent developments in flow cytometry enable a much more detailed study of variation within species and populations. Therefore, the IAPT/IOPB Chromosome Data series will also publish DNA ploidy level estimates, provided that the contributions fulfil some basic quality requirements. Such data will be marked with the abbreviation “FCM” as opposite to the abbreviation “CHN” referring to the directly counted chromosome numbers. The data quality requirements include the use of an internal standard close in its size to the measured material, the use of young and undamaged tissues, all peaks being symmetrical, and reference peaks of approximately the same size as those of the studied material. More details can be found in the paper by Doležel & Bartoš (2005) or can be provided on request by the series editor. All DNA ploidy levels for the particular taxon should be confirmed also by chromosome counting. The authors should be aware of potential problems of flow cytometric DNA ploidy level estimation for which they are referred to in the paper by Suda & al. (2006), published in the present issue of TAXON. Details of the methods of the FCM analysis should be provided in the electronic version. Similarly, we encourage the publication of densitometric DNA ploidy levels that will be marked as DM in our series. Again, the data should comply with basic quality requirements and potential contributors should consult the paper by Greilhuber & Tensch (2001) for details.

Introducing this new series, we would like to emphasize the undiminished importance of chromosome counting, especially in less explored taxa and areas.

*Gonzalo Nieto Feliner, IOPB President
Karol Marhold, IOPB President-Elect*

Literature cited

- Doležel, J. & Bartoš, J.** 2005: Plant DNA flow cytometry and estimation of nuclear genome size. *Ann. Bot. (Oxford)* 95: 99–110.
- Greilhuber, J. & Tensch, E. M.** 2001: Feulgen densitometry: some observations relevant to best practice in quantitative nuclear DNA content determination. *Acta Bot. Croat.* 60: 285–298.
- Suda, J., Krahulcová, A., Trávníček, P. & Krahulec, F.** 2006. Ploidy level versus DNA ploidy level: an appeal for consistent terminology. *Taxon* 55: 447–450.

Matthias Baltisberger & Marion Voelger

Institute of Integrative Biology, ETH Zurich, CH-8092 Zurich, Switzerland; balti@ethz.ch

All materials CHN, collected by Baltisberger & Voelger, Greece.

AMARYLLIDACEAE

Sternbergia sicula Tineo ex Guss., $2n = 22$ (Z/ZT 13802, 13841).

ASTERACEAE

Aster squamatus (Spreng.) Hieron., $2n = 20$ (Z/ZT 13834).

Conyza bonariensis (L.) Cronquist, $2n = 54$ (Z/ZT 13836).

Mycelis muralis Dumort., $2n = 18$ (Z/ZT 13829).

BRASSICACEAE

Allyssoides utriculata (L.) Medik., $2n = 16$ (Z/ZT 13865).

FABACEAE

Medicago arborea L., $2n = 32$ (Z/ZT 13871, 13894).

Trifolium angustifolium L., $2n = 16$ (Z/ZT 13831; 13832).

Trifolium campestre Schreb., $2n = 14$ (Z/ZT 13830).

LAMIACEAE

Salvia triloba L. f., $2n = 14$ (Z/ZT 13893).

Stachys argolica Boiss., $2n = 34$ (Z/ZT 13800, 13870).

Stachys candida Bory & Chaub., $2n = 34$ (Z/ZT 13797, 13839, 13862, 13895).

Stachys canescens Bory & Chaub., $2n = 34$ (Z/ZT 13796, 13838, 13864).

Stachys spreitzenhoferi subsp. *virella* D. Perss., $2n = 34$ (Z/ZT 13798, 13840).

Stachys swainsonii Benth., $2n = 34$ (Z/ZT 13795, 13869).

PAPAVERACEAE

Glaucium flavum Crantz, $2n = 12$ (Z/ZT 13863).

POACEAE

Setaria verticillata (L.) P. Beauv., $2n = 18$ (Z/ZT 13835).

ROSACEAE

Sarcopoterium spinosum Spach, $2n = 28$ (Z/ZT 13833).

URTICACEAE

Urtica pilulifera L., $2n = 26$ (Z/ZT 13837).

ZYGOPHYLLACEAE

Tribulus terrestris L., $2n = 24$ (Z/ZT 13872).

E. Durant McArthur & Stewart C. Sanderson

United States Department of Agriculture, Forest Service, Rocky Mountain Research Station, Shrub Sciences Laboratory, Provo, Utah 84606, U.S.A.; dmcarthur@fs.fed.us.

SALICACEAE

Salix arizonica Dorn, $n = 19$, CHN; U.S.A., Granfelt 97-8 (SSLP).

Mohammad Reza Rahiminejad

Department of Biology, Faculty of Sciences, Isfahan University, Hezar Jarib Street, 81746-73441, Isfahan, Iran; mrr@sci.ui.ac.ir.

All materials CHN; Rh = Herbarium Rahiminejad

CHENOPODIACEAE

Chenopodium album L., $2n = 54$; U.K., Stace s.n. (LTR, Rh 3, 4),

- Bowen s.n.* (LTR, Rh 65), *Wurzell s.n.* (LTR, Rh 69), *Spiers s.n.* (LTR, Rh 71), *Leslie s.n.* (LTR, Rh 79), *McAllister s.n.* (LTR, Rh 95, 191), *Rahiminejad s.n.* (LTR, Rh 103, 104), *Philp s.n.* (LTR, Rh 26, 37, 47), *Rahiminejad & Gornall s.n.* (LTR, Rh 149), *Rabey s.n.* (LTR, Rh 83, 84, 113), *Chater s.n.* (LTR, Rh 58, 59), *Ingram s.n.* (LTR, Rh 63); Denmark, *Strid s.n.* (LTR, Rh 80); U.S.A., *Wilson s.n.* (LTR, Rh 129, 132); Sweden, *Dahl s.n.* (LTR, Rh 146); Italy, *s.coll. s.n.* (LTR, Rh 160); Spain, *Romero s.n.* (LTR, Rh 161, 162); Iran, *Rahiminejad s.n.* (LTR, Rh 11).
- Chenopodium berlandieri* Moq., $2n = 36$; Mexico, *Wilson s.n.* (LTR, Rh 141).
- Chenopodium bushianum* Aellen, $2n = 36$; U.S.A., *Wilson s.n.* (LTR, Rh 134).
- Chenopodium ficifolium* Sm., $2n = 18$; U.K., *Rahiminejad s.n.* (LTR, Rh 100), *Rahiminejad & Gornall s.n.* (LTR, Rh 188), *Philp s.n.* (LTR, Rh 32, 35, 38, 41, 44, 45 & 52), *Rabey s.n.* (LTR, Rh 116).
- Chenopodium giganteum* D. Don, $2n = 54$; Czech Republic, *Dvořák s.n.* (LTR, Rh 157).
- Chenopodium glaucum* L., $2n = 18$; Iran, *Rahiminejad s.n.* (LTR, Rh 5, 159).
- Chenopodium hybridum* L., $2n = 18$; U.K., *Bowen s.n.* (LTR, Rh 66), *Wurzell s.n.* (LTR, Rh 70, 150).
- Chenopodium murale* L., $2n = 18$; Iran, *Mozafarian s.n.* (LTR, Rh 16), *Ghahraman s.n.* (LTR, Rh 196); U.K., *Spiers s.n.* (LTR, Rh 72 & 73), *Wurzell s.n.* (LTR, Rh 153), *Rabey s.n.* (LTR, Rh 87, 88, 89, 124).
- Chenopodium novopokrovskyanum* (Aellen) Uotila, $2n = 36$; CHN, Iran, *Rahiminejad s.n.* (LTR, Rh 6, 21, 176, 178).
- Chenopodium opulifolium* Schrad. ex W.D.J. Koch & Ziz., $2n = 54$; CHN, Portugal, *Stace s.n.* (LTR, Rh 105, 106); Iran, *Rahiminejad & Ghaemmaghami s.n.* (LTR, Rh 180).
- Chenopodium polyspermum* L., $2n = 18$; U.K., *Stace s.n.* (LTR, Rh 2), *Conolly s.n.* (LTR, Rh 64).
- Chenopodium probstii* Aellen, $2n = 54$; Portugal, *Stace s.n.* (LTR, Rh 105, 106, 107), *Sahebi s.n.* (LTR, Rh 158).
- Chenopodium strictum* Roth, $2n = 36$; U.S.A., *Wilson s.n.* (LTR, Rh 128).
- Chenopodium suecicum* Murr., $2n = 18$; U.K., *McAllister s.n.* (LTR, Rh 96, 190, 191); Sweden, *Dahl s.n.* (LTR, Rh 146, 147, 148), *Jonsell s.n.* (LTR, Rh 155); Finland, *Alanko s.n.* (LTR, Rh 163, 164, 194), *Uotila s.n.* (LTR, Rh 165, 195).

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Matthias Baltisberger and Marion Voelger

Institute of Integrative Biology, ETH Zurich, CH-8092 Zurich, Switzerland; balti@ethz.ch

AMARYLLIDACEAE

Sternbergia sicula Tineo ex Guss.

$2n = 22$, CHN. Greece, Rocks, Acrocorinth, S.W. of Corinth, N. Corinth, 400 m, 13 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13802, 13841).

ASTERACEAE

Aster squamatus (Spreng.) Hieron.

$2n = 20$, CHN. Greece, Gefira (Nea Monemvasia), N. Lakonia, 0–5 m, 9 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13834).

Conyza bonariensis (L.) Cronquist

$2n = 54$, CHN. Greece, Ancient Mycenae, S.W. of Corinth, N. Argolis, 250 m, 13 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13836).

Mycelis muralis Dumort.

$2n = 18$, CHN. Greece, Slope above Prionia, Mount Olympus, N. Pieria, 1400 m, 2 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13829).

BRASSICACEAE

Alyssoides utriculata (L.) Medik.

$2n = 16$, CHN. Greece, Slope near Spilios Agapitos, Mount Olympus, N. Pieria, 1850–2000 m, 2 Sept 2002 *Baltisberger & Voelger s.n.* (Z/ZT 13865).

FABACEAE

Medicago arborea L.

$2n = 32$, CHN. Greece, Hermioni, S.E. of Nafplio, N. Argolis, 0–5 m, 14 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13871, 13894).

Trifolium campestre Schreb.

$2n = 14$, CHN. Greece, Zastena, Pilion peninsula, N. Magnisia, 20 m, 4 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13830).

Trifolium angustifolium L.

$2n = 16$, CHN. Greece, Zastena, Pilion peninsula, N. Magnisia, 20 m, 4 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13831); Lefktro, near Stoupa, Mani peninsula, N. Messinia, 50 m, 7 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13832).

LAMIACEAE

Salvia triloba L. f.

$2n = 14$, CHN. Greece, Lefktro, near Stoupa, Mani peninsula, N. Messinia, 50 m, 7 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13893).

Stachys argolica Boiss.

$2n = 34$, CHN. Greece, Rocks and walls, fortress Palmidi, Nafplio, N. Argolis, 50–216 m, 12 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13800, 13870).

Stachys candida Bory & Chaub.

$2n = 34$, CHN. Greece, Rocks above Exochori, E. of Kardamili, Mani peninsula, N. Messinia, 500 m, 8 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13797, 13839, 13862, 13895).

Stachys canescens Bory & Chaub.

$2n = 34$, CHN. Greece, Rocks above Lefktro, near Stoupa, Mani peninsula, N. Messinia, 150 m, 7 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13796, 13838, 13864).

Stachys spreitzenhoferi subsp. *virella* D. Perss.

$2n = 34$, CHN. Greece, Rocks and walls in Monemvasia, N. Lakonia, 10–110 m, 9 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13798, 13840).

Stachys swainsonii Benth.

$2n = 34$, CHN. Greece, Rocks near Chryso, W.S.W. of Delfi, N. Fokis, 50–80 m, 5 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13795, 13869).

PAPAVERACEAE

Glaucium flavum Crantz

$2n = 12$, CHN. Greece, Gefira (Nea Monemvasia), N. Lakonia, 0–5 m, 9 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13863).

POACEAE

Setaria verticillata (L.) P. Beauv.

$2n = 18$, CHN. Greece, Gefira (Nea Monemvasia), N. Lakonia, 0–5 m, 9 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13835).

ROSACEAE

Sarcopoterium spinosum Spach

$2n = 28$, CHN. Greece, Lefktro, near Stoupa, Mani peninsula, N. Messinia, 50 m, 7 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13833).

URTICACEAE

Urtica pilulifera L.

$2n = 26$, CHN. Greece, Rocky slope, Acrocorinth, S.W. of Corinth, N. Corinth, 500 m, 13 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13837).

ZYGOPHYLLACEAE

Tribulus terrestris L.

$2n = 24$, CHN. Greece, Ancient Mycenae, S.W. of Corinth, N. Argolis, 250 m, 13 Sept 2002, *Baltisberger & Voelger s.n.* (Z/ZT 13872).

E. Durant McArthur & Stewart C. Sanderson

United States Department of Agriculture, Forest Service, Rocky Mountain Research Station, Shrub Sciences Laboratory, Provo, Utah 84606, U.S.A. dmcarthur@fs.fed.us.

SALICACEAE

Salix arizonica Dorn

$n = 19$, CHN. U.S.A. Arizona, Apache County: East Fork Little Colorado River, First Medina Exclosure below Colter Reservoir Dam, 33° 56' 52" N, 109° 28' 35" W, 2893 m, 5 Jun 1997, *Granfelt 97-8* (SSLP).

Mohammad Reza Rahiminejad

Department of Biology, Faculty of Sciences, Isfahan University, Hezar Jarib Street, 81746-73441, Isfahan, Iran; mrr_ir@hotmail.com.

CHENOPODIACEAE

Chenopodium album L.

$2n = 54$, CHN. U.K., England, Huntingdonshire, W. of Huntingdon, near junction of A1 and A14 roads, *Stace s.n.* (LTR-Rahiminejad 3, 4), U.K., England, Dorset, Abbotsbury, Tithe Barn, GR 30/58, *Bowen s.n.* (LTR-Rahiminejad 65), U.K., England, Rye House, Hackney, *Wurzell s.n.* (LTR-Rahiminejad 69), U.K., England, E. Sussex, Brighton, *Spiers s.n.* (LTR-Rahiminejad 71), U.K., England, Surrey, R.H.S. Wisley, GR 51/061578, *Leslie s.n.* (LTR-Rahiminejad 79), U.K., England, Cheshire, ex Ness Botanic Garden, *McAllister s.n.* (LTR-Rahiminejad 95), U.K., England, Leicestershire, Rushy-mead, *Rahiminejad s.n.* (LTR-Rahiminejad 103, 104), U.K., England, E. Kent, Aylesford, GR TC732589, *Philp s.n.* (LTR-Rahiminejad 26, 37, 47), U.K., England, Nottinghamshire, on road from Lincoln to Newark, GR 43/86, *Rahiminejad & Gornall s.n.* (LTR-Rahiminejad 149), U.K., England, S. Lancashire, Southport, *McAllister s.n.* (LTR-Rahiminejad 191), U.K., Guernsey, GR 275765, *Rabey s.n.* (LTR-Rahiminejad 83), U.K., Guernsey, GR 332754, *Rabey s.n.* (LTR-Rahiminejad 84), U.K., Guernsey, GR 312829, *Rabey s.n.* (LTR-Rahiminejad 113), U.K., Wales, Cardiganshire, 300 m S.W. of Broadwell, GR 22/211483, *Chater s.n.* (LTR-

Rahiminejad 58), U.K., Wales, Cardiganshire, 250 m N.N.E. of Ty-Gwyn, Mwnnt, Turnip field, 40 m, GR 22/3440, *Chater s.n.* (LTR-Rahiminejad 59), U.K., Scotland, Fife, near Dunbog, edge of pea field, GR 23/177310, *Ingram s.n.* (LTR-Rahiminejad 63), U.S.A., Minnesota, Clay, *Wilson s.n.* (LTR-Rahiminejad 129), U.S.A., Alaska, Yukon, *Wilson s.n.* (LTR-Rahiminejad 132), Denmark, Copenhagen, Allerød, *Strid s.n.* (LTR-Rahiminejad 80), Sweden, Göteborg, N. Tynnered, Västerleder highway, *Dahl s.n.* (LTR-Rahiminejad 146), Italy, Pisa, *s.coll. s.n.* (LTR-Rahiminejad 160), Spain, Granada, *Romero s.n.* (LTR-Rahiminejad 161), Spain, Almeria, *Romero s.n.* (LTR-Rahiminejad 162), Iran, Isfahan, Zaghmar, *Rahiminejad s.n.* (LTR-Rahiminejad 11).

Chenopodium berlandieri Moq.

$2n = 36$, CHN. Mexico: Pubela, Ahuazotepec, *Wilson s.n.* (LTR-Rahiminejad 141).

Chenopodium bushianum Aellen

$2n = 36$, CHN. U.S.A., North Dakota, Custer, *Wilson s.n.* (LTR-Rahiminejad 134).

Chenopodium ficifolium Sm.

$2n = 18$, CHN. U.K., England, Leicestershire, Rushmead, *Rahiminejad s.n.* (LTR-Rahiminejad 100), U.K., England, Derbyshire, Foston, *Rahiminejad & Gornall s.n.* (LTR-Rahiminejad 188), U.K., England, E. Kent, Aylesford, GR TC732589, *Philp s.n.* (LTR-Rahiminejad 32, 35, 38, 41, 44, 45, 52), U.K., Guernsey, GR 336842, *Rabey s.n.* (LTR-Rahiminejad 116).

Chenopodium giganteum D. Don

$2n = 54$, CHN. Czech Republic, Brno, *Dvořák s.n.* (LTR-Rahiminejad 157).

Chenopodium glaucum L.

$2n = 18$, CHN. Iran, Isfahan, Isfahan University campus, *Rahiminejad s.n.* (LTR-Rahiminejad 5), Iran, Isfahan, Zeyar, *Rahiminejad s.n.* (LTR-Rahiminejad 159).

Chenopodium hybridum L.

$2n = 18$, CHN. U.K., England, Dorset, Wareham, GR 30/98, *Bowen s.n.* (LTR-Rahiminejad 66), U.K., England: Middlesex, London, Tottenham, *Wurzell s.n.* (LTR-Rahiminejad 70, 150).

Chenopodium murale L.

$2n = 18$, CHN. Iran, Khuzestan, Bandareh Mahshahr, *Mozafarian s.n.* (LTR-Rahiminejad 16), Iran, Hormozgan, Abbomoosa Island, *Ghahraman s.n.* (LTR-Rahiminejad 196), U.K., England, W. Sussex, Hove, roadside, *Spiers s.n.* (LTR-Rahiminejad 72, 73), U.K., England, Middlesex, Stoke Newington, *Wurzell s.n.*

(LTR-Rahiminejad 153), U.K., Guernsey, GR 313829, *Rabey s.n.* (LTR-Rahiminejad 124), U.K., Guernsey: GR 335842, *Rabey s.n.* (LTR-Rahiminejad 87), U.K., Guernsey, GR 319814, *Rabey s.n.* (LTR-Rahiminejad 88), U.K., Guernsey, GR 333827, *Rabey s.n.* (LTR-Rahiminejad 89).

Chenopodium novopokrovskyanum (Aellen) Uotila

$2n = 36$, CHN. Iran, Isfahan, Isfahan University campus, *Rahiminejad s.n.* (LTR-Rahiminejad 6), Iran, Isfahan, Meimeh, *Rahiminejad s.n.* (LTR-Rahiminejad 21), Iran, Isfahan, Sofeh Park, *Rahiminejad s.n.* (LTR-Rahiminejad 176), Iran: Tehran, Shemiranat, *Rahiminejad s.n.* (LTR-Rahiminejad 178).

Chenopodium opulifolium Schrad. ex W. D. J. Koch & Ziz.

$2n = 54$, CHN. Portugal, Algarve, by road between Raposeira and Vila do Bispo, *Stace s.n.* (LTR-Rahiminejad 105, 106), Iran, Tehran, Shemiranat, *Rahiminejad & Ghaemmaghami s.n.* (LTR-Rahiminejad 180).

Chenopodium polyspermum L.

$2n = 18$, CHN. U.K., England, Leicestershire, Ullesthorpe, *Stace s.n.* (LTR-Rahiminejad 2), U.K., Wales, Caernarvonshire, Lleyl, Llaniestyn, GR 23/2633, *Conolly s.n.* (LTR-Rahiminejad 64).

Chenopodium probstii Aellen

$2n = 54$, CHN. Portugal, Algarve, by road between Raposeira and Vila do Bispo, *Stace s.n.* (LTR-Rahiminejad 105, 106), Portugal, Algarve, just N.W. of Odiáxere, *Stace s.n.* (LTR-Rahiminejad 107), Iran, Isfahan, Zeyar, *Sahebi s.n.* (LTR-Rahiminejad 158).

Chenopodium suecicum Murr.

$2n = 18$, CHN. U.K., England, Cheshire, ex Ness Botanic Garden, *McAllister s.n.* (LTR-Rahiminejad 96), U.K., England, S. Lancashire, Southport, *McAllister s.n.* (LTR-Rahiminejad 190, 191), Sweden, Göteborg, N. Tynnered, Västerleder highway, *Dahl s.n.* (LTR-Rahiminejad 146), Sweden, Göteborg, between N. Tynnered and Fiskebäck, *Dahl s.n.* (LTR-Rahiminejad 147), Sweden, Uppland, Granskäs, heap of garden soil, *Jonsell s.n.* (LTR-Rahiminejad 155), Sweden, Göteborg, Slotshogen, along the tramway, GR 930923, *Dahl s.n.* (LTR-Rahiminejad 148), Finland, Uussimaa, Helsinki, Lassila, along field margin, *Alanko s.n.* (LTR-Rahiminejad 164), Finland, Uussimaa, Helsinki, Kaisaniemi, botanical garden of the University, *Uotila s.n.* (LTR-Rahiminejad 165), Finland, Vantaa, close to Helsinki - Vantaa airport, *Uotila s.n.* (LTR-Rahiminejad 195), Finland, Uussimaa, Helsinki, Kumpula, new botanical garden of the University, *Alanko s.n.* (LTR-

Rahiminejad 163, 194).

Chenopodium strictum Roth

$2n = 36$, CHN. U.S.A., Minnesota, Clay, *Wilson s.n.*
(LTR-Rahiminejad 128).