HYDROCHARITACEAE

Limnobium laevigatum (Humb. & Bonpl. ex Willd.) Heine, 2*n* = 28; Brazil, Paraíba, *L.P. Felix 10554*.

ORCHIDACEAE

Plectrophora cultrifolia (Barb.Rodr.) Cogn., 2*n* = 56; Brazil, Santa Cantarina, *L.P. Felix & M. Guerra 16576*.

PLANTAGINACEAE

Angelonia campestris Nees & Mart., 2*n* = 28; Brazil, Sergipe, *J.M.P. Cordeiro, L.P. Felix, M. Almeida & J.P. Araújo 518*.

POLYGONACEAE

Triplaris americana L., 2*n* = 22; Brazil, Paraíba, *J.M.P. Cordeiro*, *1267*.

SAPINDACEAE

Magonia pubescens A.St.-Hil., 2*n* = 30; Brazil, Monte Alegre, *J.M.P. Cordeiro 757*.

VITACEAE

Cissus pulcherrima Vell., 2*n* = 36; Brazil, Tocantins, *J.M.P. Cordeiro 776*.

IAPT chromosome data 31/8

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All materials CHN.

CONVOLVULACEAE

Cuscuta africana Willd., 2*n* = 30; South Africa, Western Cape, *M.A. García 3920* (MA).

Cuscuta angulata Engelm., *n* = 15, 2*n* = 30; South Africa, Western Cape, *M.A. García 3922* (MA).

Cuscuta approximata Bab., 2*n* = 28; Spain, Segovia, *M.A. García 6482* (TRTE).

Cuscuta bonafortunae Costea & I.García, 2*n* = 30; Mexico, Michoacán, *I. García-Ruiz 8391* (CIMI, WLU).

Cuscuta brachycalyx (Yunck.) Yunck., 2*n* = 30; U.S.A., California, *S. Stefanović 15-22* (TRTE).

Cuscuta campestris Yunck., 2*n* = 60; Serbia, Vojvodina, 03 Sep 2008, *M. Šarić s.n*., UTM-1569 (TRTE).

Cuscuta cephalanthi Engelm., 2*n* = 60; U.S.A., Iowa, 15 Sep 2015, *R. Lutz & R. Tallent s.n*., UTM-1567 (TRTE).

Cuscuta chapalana Yunck., 2*n* = 30; Mexico, Jalisco, *I. García-Ruiz & al. 8064*, UTM-1563 (CIMI, TRTE, WLU).

Cuscuta chilensis Ker Gawl., *n* = 15, 2*n* = 30; Chile, 15 Jan 2011, *M. Costea s.n*. (WLU).

Cuscuta compacta Juss. ex Choisy, 2*n* = 30; U.S.A., Texas, 03 Sep 2015, *S. Stefanović s.n*., UTM-1566 (TRTE).

Cuscuta corymbosa var. *grandiflora* Engelm., 2*n* = 30; Mexico, Michoacán, 19 Dec 2007, *M. Costea & I. García-Ruiz s.n*. (CIMI, WLU).

Cuscuta costaricensis Yunck., 2*n* = 30; Mexico, Jalisco, *I. García-Ruiz 8052* (CIMI, WLU).

Cuscuta cotijana Costea & I.García, 2*n* = 30; Mexico, Michoacán, *I. García-Ruiz & al. 7560* (CIMI, NY, US, WLU).

Cuscuta desmouliniana Yunck., 2*n* = 30; Mexico, Sonora, *Van Devender & al. 2007-1094* (ARIZ, WLU).

Cuscuta epithymum (L.) L., 2*n* = 32; Spain, Cantabria, *M.A. García 6486*, UTM-1573 (TRTE). 2*n* = 34; Spain, Segovia, *M.A. García 6483*, UTM-1571 (TRTE).

Cuscuta erosa Yunck., 2*n* = 30; U.S.A., Arizona, Aug 2013, *J. Cowles s.n*. (WLU).

Cuscuta glomerata Choisy, *n* = 15, 2*n* = 30; U.S.A., Iowa, 31 Jul 2015, *R. Lutz s.n*., UTM-1565 (TRTE).

Cuscuta grandiflora Kunth, 2*n* = 30; Peru, Cusco, 20 Aug 2007, *M. Costea s.n*. (WLU).

Cuscuta gronovii Willd. ex Roem. & Schult., 2*n* = 60; Canada, Ontario, 26 Jul 2015, *M.A. García s.n*. (TRTE).

Cuscuta indecora Choisy, 2*n* = 30; Mexico, Zacatecas, 14 Aug 2012, *A.V. Ibarra s.n*. (SAGARPA, WLU).

Cuscuta monogyna Vahl, 2*n* = 30; Israel, *G. Wizen s.n*., UTM-1348 (TRTE).

Cuscuta obtusiflora Kunth, 2*n* = 30; Mexico, Jalisco, *I. García-Ruiz & al. 8256* (CIMI, WLU).

Cuscuta occidentalis Millsp., 2*n* = 30; U.S.A., California, *S. Stefanović 13-06* (TRTE).

Cuscuta pacifica Costea & M.A.R.Wright, 2*n* = 30; U.S.A, California, *S. Stefanović 15-23* (TRTE).

Cuscuta purpurata Phil., 2*n* = 30; Chile, *M. Muñoz 5144* (SGO, TRTE, WLU).

Cuscuta sandwichiana Choisy, 2*n* = 150; U.S.A., Hawaii, *Degener & Degener 36596*, UTM-155 (TRTE).

Cuscuta sidarum Liebm., 2*n* = 30; Mexico, Michoacán, *I. García-Ruiz & al. 7584* (CIMI, WLU).

Cuscuta subinclusa Durand & Hilg., 2*n* = 30; Mexico, Baja California, 01 May 2014, *M. Costea s.n*. (WLU).

Cuscuta tinctoria var. *floribunda* (Kunth) Costea, *n* = 15; Mexico, Temascaltepec, *I. García-Ruiz & al. 8588* (CIMI, WLU).

Cuscuta tinctoria Mart. ex Engelm. var. *tinctoria*, 2*n* = 30; Mexico: Michoacán, *I. García-Ruiz & al. 7575* (CIMI, WLU).

Cuscuta umbrosa Beyr. ex Hook., 2*n* = 30; U.S.A., Iowa, 13 Sep 2013, *Watson s.n*., UTM-1564 (TRTE).

Cuscuta volcanica Costea & I.García, *n* = 15; Mexico, Jalisco, *I. García-Ruiz & al. 7567* (CIMI, WLU).

IAPT chromosome data 31/9

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IAPT chromosome data 31/8

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

CONVOLVULACEAE

Cuscuta africana Willd.

*2*n* = 30, CHN. South Africa, Western Cape, Outeniqa Pass, near small resting area on road N9-12 towards George, 33°53′26.88″S, 22°24′11.52″E, 28 Nov 2007, *M.A. García 3920* (MA-877241) [Figs. 15A, 18A].

Cuscuta angulata Engelm.

**n* = 15, 2*n* = 30, CHN. South Africa, Western Cape, De Hoop Nature Reserve, sand road towards Potberg Nature Reserve, 34°25′50.52″S, 20°42′27.72″E, 04 Dec 2007, *M.A. García 3922* (MA-877242) [Figs. 15B,C, 18B].

Cuscuta approximata Bab.

2*n* = 28, CHN. Spain, Segovia Province, Maderuelo, Hoces del Riaza Natural Park, near Linares water reservoir, 41°32′18.47″N, 03°33′27.73″W, 01 Jul 2015, *M.A. García 6482* (TRTE) [Fig. 15D].

Cuscuta bonafortunae Costea & I.García

*2*n* = 30, CHN. Mexico, Michoacán, Municipio Zamora: Libramiento Sur-Sureste de Zamora, 19°56′59″N, 102°15′07″W, 1740 m, *I. García-Ruiz 8391* (CIMI, WLU) [Figs. 15E, 18C].

Cuscuta brachycalyx (Yunck.) Yunck.

*2*n* = 30, CHN. U.S.A., California, Mariposa Co., Yosemite NP, Wawona, near hotel, 07 Jun 2015, *S. Stefanović 15-22* (TRTE) [Fig. 15F].

Cuscuta campestris Yunck.

**2*n* = 60, CHN. Serbia, Vojvodina Province, Lukićevo, 45°20′40″N, 20°30′30″E, 03 Sep 2008, *M. Šarić s.n*., UTM-1569 (TRTE) [Figs. 15G, 18D]. Voucher grown from seeds in UTM greenhouse.

Cuscuta cephalanthi Engelm.

2*n* = 60, CHN. U.S.A., Iowa, Williams Prairies Preserve, 15 Sep 2015, *R. Lutz & R. Tallent s.n*., UTM-1567 (TRTE) [Fig. 15H]. Voucher grown from seeds at UTM greenhouse.

Cuscuta chapalana Yunck.

*2*n* = 30, CHN. Mexico, Jalisco, Tlajomulco, between Poterillos and Trojes, 19 Dec 2007, *I. García-Ruiz & al. 8064*, UTM-1563 (CIMI, TRTE, WLU) [Figs. 15I, 18E]. Voucher grown from seeds at UTM greenhouse.

Cuscuta chilensis Ker Gawl.

**n* = 15, 2*n* = 30, CHN. Chile, La Campana National Park, 32°55′55.8″S, 71°04′52.4″W, 15 Jan 2011, *M. Costea s.n*. (WLU) [Figs. 15J, 18F].

Cuscuta compacta Juss. ex Choisy

2*n* = 30, CHN. U.S.A., Texas, Taylor Co., 03 Sep 2015, *S. Stefanović s.n*., UTM-1566 (TRTE) [Fig. 15K]. Voucher grown from seeds at UTM greenhouse.

Cuscuta corymbosa var. *grandiflora* Engelm.

*2*n* = 30, CHN. Mexico, Michoacán, San Pedro Tesistan, 20°13′23″N, 103°24′35.4″W, 19 Dec 2007, *M. Costea & I. García-Ruiz s.n*. (CIMI, WLU). [Figs. 15L, 18G].

Cuscuta costaricensis Yunck.

*2*n* = 30, CHN. Mexico, Jalisco, La Manzanilla, La Rosa Amarilla, 18 Dec 2007, *I. García-Ruiz 8052* (CIMI, WLU) [Figs. 16A, 18H].

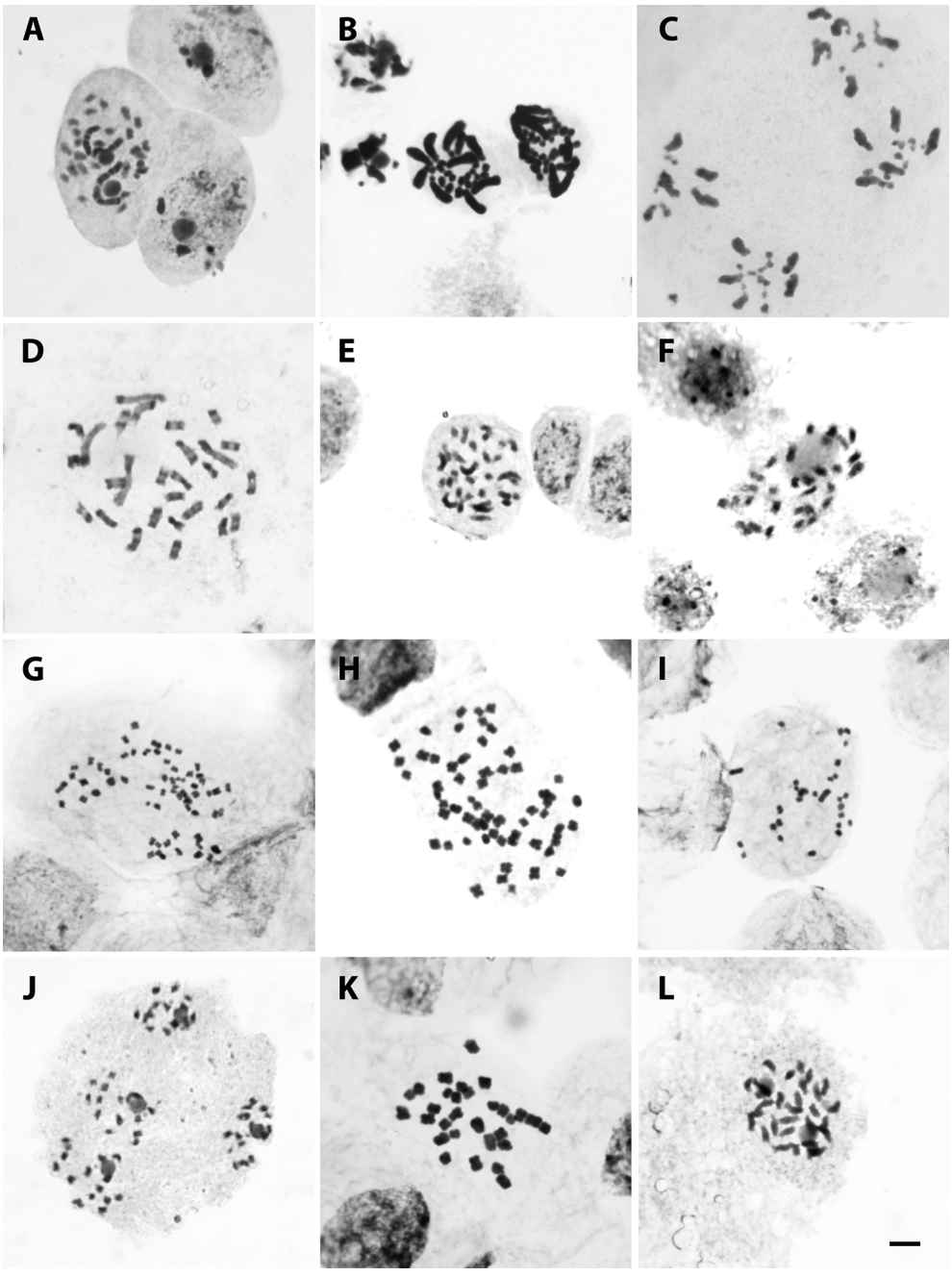

Fig. 15. Mitotic or meiotic chromosomes of *Cuscuta* species. **A,** *C. africana*; **B,** *C. angulata*; **C,** Telophase II of *C. angulata*; **D,** *C. approximata*; **E,** *C. bonafortunae*; **F,** *C. brachycalyx*; **G,** *C. campestris*; **H,** *C. cephalanthi*; **I,** *C. chapalana*; **J,** Telophase II of *C. chilensis*; **K,** *C. compacta*; **L,** *C. corymbosa* var. *grandiflora*. — Scale bar = 5 µm.

Cuscuta cotijana Costea & I.García

*2*n* = 30, CHN. Mexico, Michoacán, Cotija, Los Gallineros, 16 Feb 2007, *I. García-Ruiz & al. 7560* (CIMI, NY, US, WLU) [Fig. 16B]. Chromosomes counted from seedlings.

Cuscuta desmouliniana Yunck.

*2*n* = 30, CHN. Mexico, Sonora, Cañon Los Anegados, 28°02′09″N, 111°08′05″W, 18 Nov 2007, *Van Devender & al. 2007-1094* (ARIZ, WLU) [Fig. 16C]. Chromosomes counted from seedlings.

Cuscuta epithymum (L.) L.

2*n* = 32, CHN. Spain, Cantabria Province, Puerto Palombera descending to Saja, 43°05′20.70″N, 04°14′49.45″W, 11 Jul 2015, *M.A. García 6486*, UTM-1573 (TRTE) [Fig. 16D].

**2*n* = 34, CHN. Spain, Segovia Province, Maderuelo, Hoces del Riaza Natural Park, near Linares water reservoir, 41°32′18.47″N, 03°33″27.73″W, 01 Jul 2015, *M.A. García 6483*, UTM-1571 (TRTE) [Fig. 16E].

Cuscuta erosa Yunck.

*2*n* = 30, CHN. U.S.A., Arizona, Santa Rita Experimental Range, foothills of the Santa Rita, Aug 2013, *J. Cowles s.n*. (WLU) [Figs. 16F, 18I]. Chromosomes counted from seedlings.

Cuscuta glomerata Choisy

n = 15, 2*n* = 30, CHN. U.S.A., Iowa, Williams Prairie, 31 Jul 2015, *R. Lutz s.n*., UTM-1565 (TRTE) [Fig. 16G]. Voucher grown from seeds at UTM greenhouse.

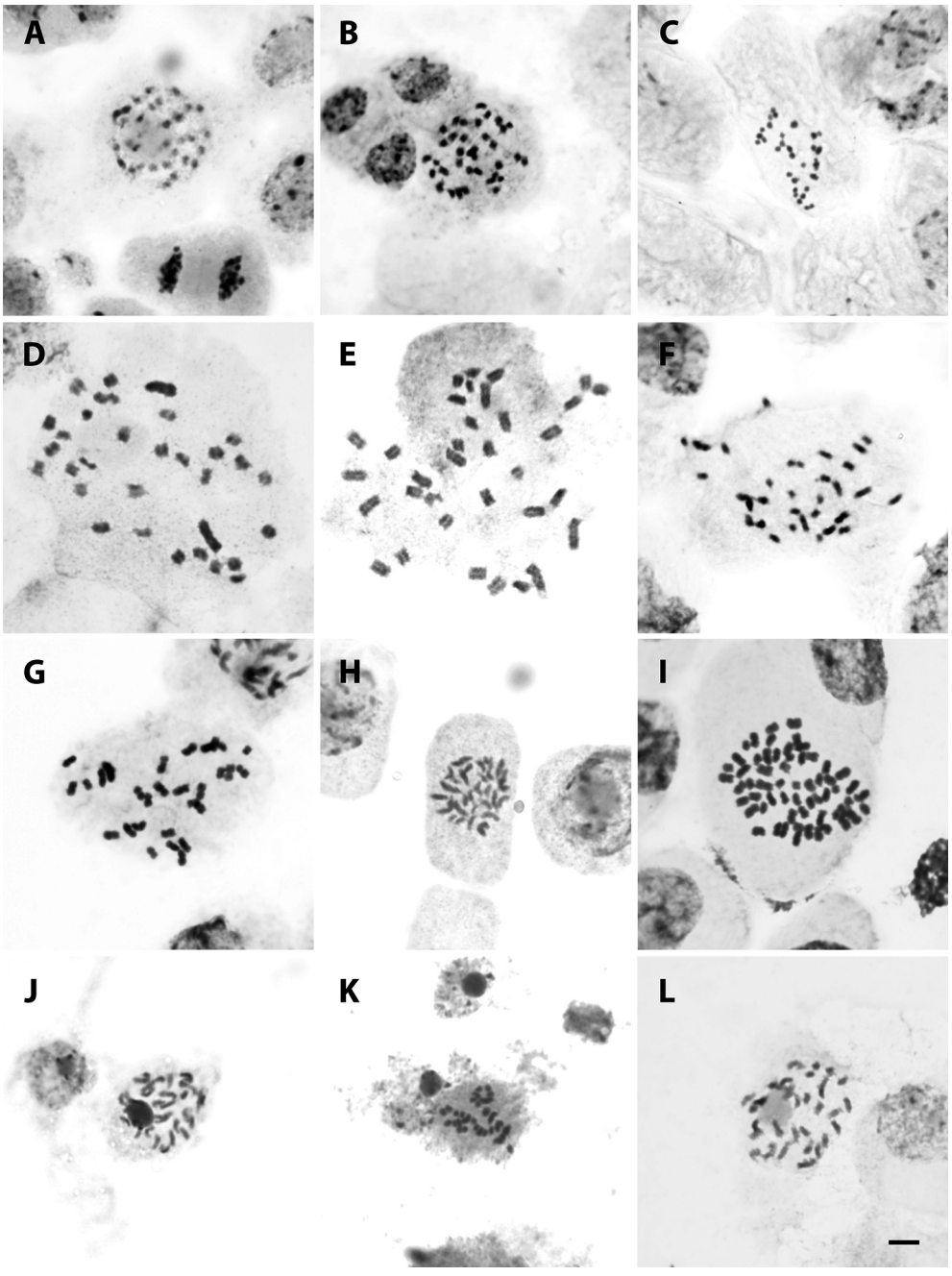

Fig. 16. Mitotic chromosomes of *Cuscuta* species. **A,** *C. costaricensis*; **B,** *C. cotijana*; **C,** *C. desmouliniana*; **D & E,** *C. epithymum*; **F,** *C. erosa*; **G,** *C. glomerata*; **H,** *C. grandiflora*; **I,** *C. gronovii*; **J,** *C. obtusiflora*; **K,** *C. occidentalis*; **L,** *C. pacifica* var. *pacifica*. — Scale bar = 5 μm.

Cuscuta grandiflora Kunth

*2*n* = 30, CHN. Peru, Cusco Region, entrance to archaeological site Tipón, 13°33′45.54″S, 71°47′57.62″W, 20 Aug 2007, *M. Costea s.n*. (WLU) [Figs. 16H, 18J].

Cuscuta gronovii Willd.

2*n* = 60, CHN. Canada, Ontario, Caledon, Terra Cotta, Credit River, 26 Jul 2015, *M.A. García s.n*. (TRTE) [Figs. 16I, 18K].

Cuscuta indecora Choisy

2*n* = 30, CHN. Mexico, Zacatecas, Municipio Luis Moya, 22°26′35.70″N, 102°13′41.68″W, 14 Aug 2012, *A.V. Ibarra s.n*. (WLU) [Fig. 17A]. Voucher grown from seeds at UTM greenhouse.

Cuscuta monogyna Vahl

2*n* = 30, CHN. Israel, Kursi, 32°49′34.9″N, 35°38′59.6″E, 2012, *G. Wizen s.n*., UTM-1348 (TRTE) [Fig. 17B]. Voucher grown at UTM greenhouse from seeds.

Cuscuta obtusiflora Kunth

*2*n* = 30, CHN. Mexico, Jalisco, 2–3 km N of San Diego, *I. García-Ruiz & al. 8256* (CIMI, WLU) [Figs. 16J, 18L].

Cuscuta occidentalis Millsp.

*2*n* = 30, CHN. U.S.A., California, San Diego Co., Anza-Borrego Desert State Park, Hwy S2, mile 11.5 W side, 21 Apr 2013, *S. Stefanović 13-06* (TRTE) [Fig. 16K].

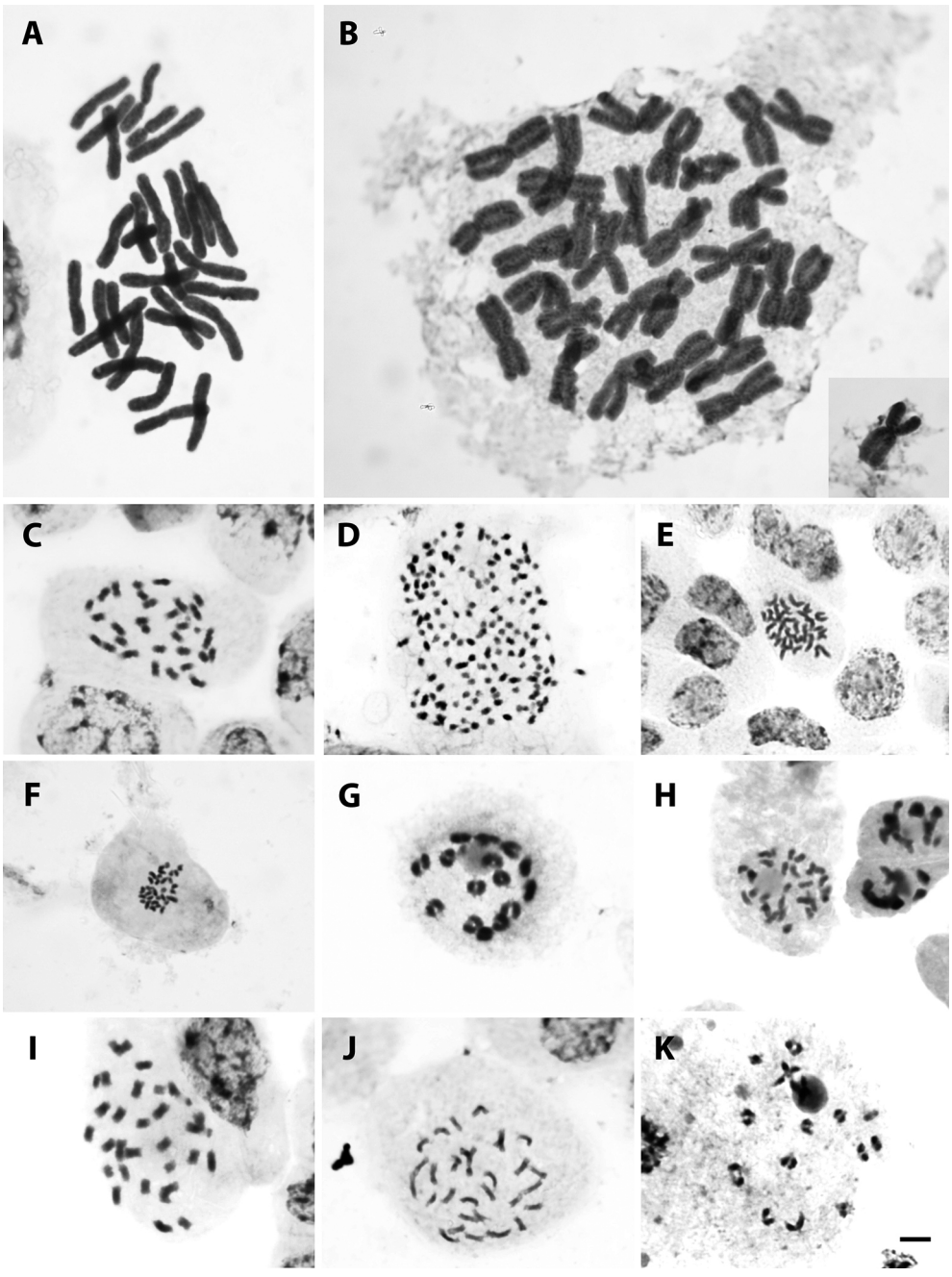

Fig. 17. Mitotic or meiotic chromosomes of *Cuscuta* species. **A,** *C. indecora*; **B,** *C. monogyna* (inset: one chromosome lying at some distance from the main group); **C,** *C. purpurata*; **D,** *C. sandwichiana*; **E,** *C. sidarum*; **F,** *C. subinclusa*; **G,** Diakinesis of *C. tinctoria* var. *floribunda*; **H,** *C. tinctoria* var. *tinctoria*; **I,** *C. umbrosa*; **J,** *C. volcanica*; **K,** Diakinesis of *C. volcanica*. — Scale bar = 5 µm.

Fig. 18. Flowers of *Cuscuta* species. **A,** *C. africana*; **B,** *C. angulata*; **C,** *C. bonafortunae*; **D,** *C. campestris*; **E,** *C. chapalana*; **F,** *C. chilensis*; **G,** *C. corymbosa* var. *grandiflora*; **H,** *C. costaricensis*; **I,** *C. erosa* (photo: Jillian Cowles); **J,** *C. grandiflora*; **K,** *C. gronovii*; **L,** *C. obtusiflora*; **M,** *C. pacifica* var. *pacifica*; **N,** *C. purpurata* (photo: Sergio Moreira & Melica Muñoz Schick); **O,** *C. sidarum*; **P,** *C. subinclusa*; **R,** *C. tinctoria* var. *tinctoria*; **S,** *C. tinctoria* var. *floribunda*; **T,** *C. volcanica*. — All photographs by the authors except for those indicated otherwise.

Cuscuta pacifica Costea & M.A.R.Wright var. *pacifica*

*2*n* = 30, CHN. U.S.A, California, Solano Co., San Pablo Bay NWR, along Hwy 37, 09 Jun 2015, *S. Stefanović 15-23* (TRTE) [Figs. 16L, 18M].

Cuscuta purpurata Phil.

*2*n* = 30, CHN. Chile, Region III, Quebrada al S de Bahía Salado, 13 Oct 2010, *M. Muñoz 5144*, UTM-1433 (SGO, TRTE, WLU) [Figs. 17C, 18N]. Voucher grown from seeds at UTM greenhouse.

Cuscuta sandwichiana Choisy

*2*n* = 150, CHN. U.S.A., Hawaii, Hawaii Island (Big Island), Punaluu beach, 20 Dec 1984, *Degener & Degener 36596*, UTM-155 (TRTE) [Fig. 17D]. Voucher grown from seeds at UTM greenhouse.

Cuscuta sidarum Liebm.

*2*n* = 30, CHN. Mexico, Michoacán, Aquila, 18°35′52.43″N, 103°30′5.17″W, 22 Feb 2007, *I. García-Ruiz & al. 7584* (CIMI, WLU) [Figs. 17E, 18O].

Cuscuta subinclusa Durand & Hilg.

*2*n* = 30, CHN. Mexico, Baja California Norte, Hills on the W side of Road 1, N of San Vicente, 31°25′41.16′N, 116°19′22.96′W, 589 m, 01 May 2014, *M. Costea s.n*. (WLU) [Figs. 17F, 18P].

Cuscuta tinctoria var. *floribunda* (Kunth) Costea

**n* = 15, CHN. Mexico, Temascaltepec, E de La Peña, on road to Temascaltepec, 27 Dec 2012, *I. García-Ruiz & al. 8588* (CIMI, WLU) [Fig. 17G, 18S].

Cuscuta tinctoria Mart. ex Engelm. var. *tinctoria*

***2*n* = 30, CHN. Mexico: Michoacán, Venustiano Carranza, San Pedro, 20 Feb 2007, *I. García-Ruiz & al. 7575* (CIMI, WLU) [Fig. 17H, 18R].

Cuscuta umbrosa Beyr. ex Hook.

*2*n* = 30, CHN. U.S.A., Iowa, Cerro Gordo Co., 13 Sep 2013, *Watson s.n*., UTM-1564 (TRTE) [Fig. 17I]. Voucher grown from seeds at UTM greenhouse.

Cuscuta volcanica Costea & I.García

*2*n* = 30, *n* = 15, CHN. Mexico, Jalisco, Mazamitla, road to Santa Maria del Oro, 17 Feb 2007, *I. García-Ruiz & al. 7567* (CIMI, WLU) [Figs. 17J,K, 18T].

Flower buds were collected and fixed in the field, stained in darkness with 4% Wittman's hematoxylin for at least 24 hours and mounted and squashed in 45% acetic acid. Alternatively, stems, seedlings, or flower meristems were prefixed in 8-hydroxyquinoline 0.002 M for 24 hours at 10°C, fixed in Carnoy's solution for 24 h at room temperature, hydrolysed in HCl 5N for 20 minutes, washed in distilled water, and squashed and mounted in 45% acetic acid. The slides were frozen in liquid nitrogen to remove the coverslip, air-dried and chromosomes stained with 1% hematoxylin for a few seconds, washed with distilled water, air-dried and permanent mounts prepared in Canada balsam. All materials, CHN. Those specimens grown from seeds and used for DNA extraction and further studies are indicated with UTM (University of Toronto Mississauga) followed by collection number.

Cuscuta (dodders) is one of the most diverse groups of obligate parasitic plants, comprising about 200 species (Costea & al., 2015), many of which have a substantial economic and ecological importance (Costea & Tardif, 2006; Costea & Stefanović, 2009). Systematics of the genus has been challenging in the past because of rampant hybridization and the lack of morphological characters, but several recent molecular studies have provided an explicit and robust phylogenetic framework for this group (García & al., 2014). Albeit limited, the currently available evidence indicates that *Cuscuta* may represent the genus with the broadest karyotypic and genome size diversity among all angiosperms. First, it includes species not only with regular monocentric but also with holocentric chromosomes (Pazy & Plitmann, 1994; García, 2001), a feature found in a very few phylogenetically scattered groups of plants. Also, dodders exhibit significant karyotype variation and diversity in chromosome size, with reported chromosome numbers varying from $2n = 8$ to $2n = 60$ (Pazy & Plitmann, 1995; García & Castroviejo, 2003). In addition, the genus has a high variation in nuclear DNA content (McNeal & al., 2007).

For our study, counts were obtained from 32 taxa (31 species plus one variety) belonging to the four subgenera of *Cuscuta*. New counts are provided for 22 species and new cytotypes for 3 species. All the images are shown at the same magnification to visualize the diversity in chromosome size in the genus. Holocentric chromosomes are present in species of *Cuscuta* subg. *Cuscuta*, in this study represented by *C. approximata* and *C. epithymum*. The cytotype of *C. epithymum* with $2n = 32$ chromosomes was reported by García & Castroviejo (2003) and is here illustrated for the first time. The karyotype is bimodal, with one pair of chromosomes clearly longer than the rest (Fig. 16D). We report a new cytotype for this species with $2n = 34$ chromosomes, having chromosomes of similar size (Fig. 16E).

Two species of the South African *Cuscuta* subg. *Pachystigma* (Engelm.) Baker & C.H.Wright have been studied: *C. africana* and *C. angulata*. The subgenus was previously cytogenetically unknown and is analysed here for the first time. These two species have $2n = 30$ monocentric chromosomes and strongly asymmetrical karyotypes, with two pairs of longer chromosomes in *C. africana* and 5 pairs in *C. angulata* (Fig. 15A–C).

Previous studies on species of *Cuscuta* subg. *Monogynella* (Des Moul.) Peter, Engl. & Prantl showed that the group is cytogenetically characterised by large monocentric chromosomes (Pazy & Plitmann, 1995; García & Castroviejo, 2003). We report $2n = 30$ chromosomes for *C. monogyna* (Fig. 17B) in accordance with previous counts on plants from Israel (Pazy & Plitmann, 1995) and Spain (García & Castroviejo, 2003). Additionally, $2n = 28$ chromosomes were reported for Iranian specimens (Aryavand, 1987).

Most of the species sampled for this study belong to *Cuscuta* subg. *Grammica* (Lour.) Peter, Engl. & Prantl, a group that represents about ¾ of the species diversity of the genus. Two species in the subgenus, *C. indecora* and *C. coryli* Engelm., both included in *Cuscuta* sect. *Indecorae* (Costea & al., 2015) were previously reported as having $2n = 30$ large chromosomes (Fogelberg, 1938). We here confirm the chromosome count for *C. indecora* and show the photograph of a mitotic metaphase (Fig. 17A). The chromosome size in this species is remarkably larger compared to any other species of *Cuscuta* subg. *Grammica* analysed in this study. We have sampled representatives of 10 out of the 15 sections recognised for the subgenus, and only

Cuscuta sect. *Indecorae* has such large chromosomes. Most species in *Cuscuta* subg. *Grammica* have either $2n = 30$ or $2n = 60$ chromosomes, but we report for the first time $2n = 150$ (decaploid) chromosome number for the Hawaiian endemic *C. sandwichiana* (Fig. 17D), a species of probable allopolyploid origin (Stefanović & Costea, 2008; García & al., 2014). This finding is remarkable because the highest known chromosome number for the genus was $2n = 60$.

Hybridization and polyploidy have likely played a significant role in *Cuscuta* species diversification (Stefanović & Costea, 2008; Costea & Stefanović, 2010; García & al., 2014, 2018). The enormous variation in chromosome type, number, size, and DNA amounts, along with a well-resolved phylogeny at multiple levels, makes *Cuscuta* a great model to study genome and chromosome evolution in plants generally, and the transition from monocentric to holocentric chromosomes in particular.

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IAPT chromosome data 31/9

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* First chromosome count for the taxon.

BROMELIACEAE

Subfamily Pitcairnioideae

**Dyckia choristaminea* Mez

$2n = 50$, CHN. Brazil, Rio Grande do Sul, Barra do Ribeiro, 30°18′52″S, 51°30′14″W, 228 m, 26 Oct 2017, *L.D. Hirsch s.n*. (ICN) [Fig. 19].

**Dyckia hebdingii* L.B.Sm.

$2n = 50$, CHN. Brazil, Rio Grande do Sul, Barra do Ribeiro, 30°18′52″S, 51°30′21″W, 239 m, 07 Oct 2015, *C.J. Breitsameter, L.D. Hirsch, F. Bered & C. Aguiar-Melo s.n*. (ICN) [Fig. 20].

**Dyckia julianae* Strehl

$2n = 50$, CHN. Brazil, Rio Grande do Sul, Barra do Ribeiro, 30°18′52″S, 51°30′14″W, 228 m, 20 Oct 2016, *L.D. Hirsch s.n*. (ICN) [Fig. 21].

Bromeliaceae is one of the most diverse families of the Neotropics (Benzing, 2000; Martinelli & al., 2008; Givnish & al., 2011), comprising approximately 75 genera and 3552 species (Gouda & al., 2018). *Dyckia* Schult. & Schult.f. is a large genus of the Pitcairnioideae subfamily (Givnish & al., 2007; Krapp & al., 2014), with 171 species (Gouda & al., 2018). Twenty-eight species of *Dyckia* have been described for the southernmost portion of Brazil, of which several are endemics (Strehl, 2004). *Dyckia choristaminea*, *D. hebdingii* and *D. julianae* are endemic to southern Brazil with restricted distribution, often occurring in sympatry (Smith & Downs, 1974; Strehl, 2004). Hirsch & al. (2019), analyzing sympatric populations of these three species through SSR markers, found an intermediate molecular profile for *D. julianae* when compared to the other two species. Such data strongly suggests a hybrid origin for *D. julianae* resulting from an ancient crossing between *D. hebdingii* and *D. choristaminea*. To better understand this issue, other approaches have to