Table S1. The 91 species of Schisandraceae currently accepted, with their geographic ranges, flower color, and pollination observations

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| --- | --- | --- |
| ***Species*** | **Geographic range** | **Flower morphology; pollen vectors and references** |
| ***Illicium* 48 named species and 1 unnamed (possibly new) species;**  **15 with investigated pollen vectors** |  |  |
| *Illicium angustisepalum* A.C. Smith | Anhui, Fujian, Guangdong, China | Tepals white or pale yellowish, elliptic to elliptic-oblong |
| *Illicium anisatum* L. | Japan | Tepals white. Various insects, mainly flies and beetles (Takahashi, 2006b) |
| *Illicium arborescens* Hayata | Taiwan, China | Tepals red to pale red, obovate-oblong, papery to fleshy. Flowers with midge eggs and larvae in flowers (seen by SXL on photos taken by S-M. Chaw in Taipei, 20 Aug. 2007) |
| *Illicium brevistylum* A.C. Smith | Guangdong, Guangxi, S Hunan, Yunnan, China | Tepals pale red, suborbicular, papery (outer) to fleshy (inner) |
| *Illicium burmanicum* E. H. Wilson | Yunnan, China; Myanmar | Tepals white |
| *Illicium cambodianum* Hance | Southern Indo-China, S. Myanmar | Tepal color unknown |
| *Illicium cauliflorum* Merr. | Sarawak, Borneo | Tepal color unknown |
| *Illicium cubense* A.C. Smith | Cuba | Tepals white |
| *Illicium difengpi* B. N. Chang | Guangxi, China | Tepals purplish-red to red |
| *Illicium dunnianum* Tutcher | Fujian, Guangdong, Guangxi, Guizhou, Hunan, China | Flower thermogenic, cecidomyiid pollinated, but midge genus not correctly identified (Luo et al. 2010\*); ***Resseliella*,** this study: Fig. 3A, B, C |
| *Illicium ekmanii* A.C. Smith | Dominican Republic & Haiti | Tepals yellow |
| *Illicium floridanum* J. Ellis | Southwest North America; studied in Louisiana, USA | Tepals red.Long list of visitors, cecidomyiids frequent, but no proof of pollen transport by any insect; flowers thermogenic (Thien et al. 1983, 2009) |
| *Illicium griffithii* J. D. Hooker & Thomson | S Xizang, China; Bhutan; NE India | Tepals white oblong-obovate (inner), papery to thinly leathery (outer) to fleshy (inner) |
| *Illicium* *guajaibonense* (Imkhanitskaya) Judd & Abbott | Cuba | Tepals purple |
| *Illicium henryi* Diels | Central to West China | Tepals red. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium hottense* Guerrero, Judd & Morris | Haiti | Tepals yellow |
| *Illicium jiadifengpi* B. N. Chang | Southwest China | Tepeals white. ***Eusphalerum*:** this study: Fig. 3B |
| *Illicium kinabaluense* A.C. Smith | Borneo | Tepal color unknown |
| *Illicium lanceolatum* A. C. Smith | Central to East China | Tepals red. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium leiophyllum A.C. Smith* | Hong Kong, China | Tepals suborbicular-triangular, papery with membranous margin (outer) to fleshy (inner) |
| *Illicium macranthum* A. C. Smith | S Yunnan, China | Tepals white. ***Eusphalerum*:** plant and beetle not sequenced |
| *Illicium majus* Hook. f. & Thomson | Probably West China, India! | Tepals red. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium manipurense* Watte ex King | Northern Myanmar and adjacent Assam | Tepal color unknown |
| *Illicium merrillianum* A.C. Smith | W Yunnan, China; Myanmar | Tepals cherry red |
| *Illicium mexicanum* A.C. Smith | Mexico | Tepals red |
| *Illicium micranthum* Dunn | Southwest China | Tepals red.***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium modestum* A.C. Smith | S Yunnan, China | Tepals greenish yellow, elliptic to oblong-elliptic, papery |
| *Illicium myanmarnicum* E.H. Wilson | W Yunnan, China; Myanmar | Tepals white or purple, elliptic to oblong-elliptic to oblong-obovate |
| *Illicium oligandrum* Merrill & Chun | Guangxi, Hainan, China | Tepals greenish yellow to pale yellow; ***Resseliella*:** this study: Fig. 3B & C |
| *Illicium pachyphyllum* A.C. Smith | S Guangxi, China | Tepals pink, purplish red, or white, obovate to oblong |
| *Illicium parvifolium* Merr. | Florida, USA; studied in Alexander Springs, FL | Tepals red, mainly Cecidomyiidae, but no record of pollen transfer (White & Thien 1985) |
| *Illicium peninsulare* A.C. Smith | Malay Peninsula | Tepal color unknown |
| *Illicium petelotii* A.C. Smith | S. China; N Vietnam | Tepals red. ***Resseliella*:** this study (19-20 April 2015; Tables S2 & S4), but plant and midge sequences both poor |
| *Illicium philippinense* Merrill | Taiwan, China; Philippines | Tepals white, elliptic to obovate-oblong |
| *Illicium ridleyanum* A.C. Smith | Malay Peninsula | Tepals red |
| *Illicium simonsii* Maximowicz (incl. *I. fargesii* fide Flora of China) | Guizhou, Sichuan, Yunnan, China; India; Myanmar | Tepeals white. ***Eusphalerum*:** this study: Fig. 3B |
| *Illicium sp.* Cui 184 | Guangdong, China | Tepals red. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium spathulatum* Y. C. Wu, perhaps a synomym of *I. majus* | Southwest China | Tepals red |
| *Illicium stapfii* Merr. | Borneo | Tepal color unknown |
| *Illicium sumatranum* A.C. Smith | Sumatra | Tepal color unknown |
| *Illicium tashiroi* Maximowicz | Taiwan, China; Japan (Ryukyu Islands) | Tepals white, narrowly oblong |
| *Illicium tenuifolium* (Ridley) A.C. Smith | Malay Peninsula | Tepal color unknown |
| *Illicium ternstroemioides* A.C. Smith | Fujian, Hainan, China | Tepals red, papery to slightly fleshy |
| *Illicium tsaii* A.C. Smith | SE Yunnan, China | Tepals white, oblong |
| *Illicium tsangii* A. C. Smith | Guangdong, China | Flower thermogenic, cecidomyiid pollinated, but midge genus not correctly identified (Luo et al. 2010\*); ***Resseliella***: Fig. 3B (midge sequencing failed) |
| *Illicium verum* J. D. Hooker | Guangxi, China | Tepals red, yellow-white. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Illicium wardii* A.C. Smith | NW Yunnan, China; Myanmar | Tepals pale yellow, white, or sometimes pinkish, |
| ***Kadsura,* 15-20 species, 4 with investigated pollen vectors** |  |  |
| *Kadsura acsmithii* R.M.K. Saunders | Borneo (Sarawak and Kalimantan) | Outer tepals pale (yellowish) green, tinged red, innermost pink to deep red |
| *Kadsura angustifolia* A.C. Smith | Guangxi, China; Vietnam | Tepals, whitish |
| *Kadsura borneensis* A.C. Smith | Borneo | Tepals yellow |
| *Kadsura celebica* A.C. Smith | Indonesia, Tomohon, Minahassa | Tepal color unknown |
| *Kadsura coccinea* (Lem.) A.C. Smith | Central SW China; Myamar; Vietnam | ***Resseliella:*** Luo et al., 2017 and this study: Fig. 3A, B, C |
| *Kadsura heteroclita* (Roxb.) Craib | Fujian, Guangdong, Guangxi and Guizhou in China | ***Resseliella:*** Luo et al., 2017 and this study: Fig. 3A, B, C |
| *Kadsura induta* A.C. Smith | W Guangxi, SE Yunnan | Tepal color unknown |
| *Kadsura japonica* (L.) Dunal | Taiwan, China; Japan, Korea | Tepals yellow; nectary on the adaxial surface of the inner tepals (Saunders 1998) |
| *Kadsura lanceolata* King | Malay Peninsula, Sumatra, Borneo, Sulawesi, Moluccas | Outer tepals pink to dark red, inner tepals cream to bright yellow; inner tepals cream to bright yellow |
| *Kadsura longipedunculata*  Finet & Gagnepain | East to West China | Pollen-feeding *Megommata* (Yuan et al., 2008), midge later re-identified as *Resseliella kadsurae* (Yukawa et al., 2011; ovipositing, not pollen-feeding ***Resseliella*:** Luo et al., 2017 and this study: Fig. 3A, B, C |
| *Kadsura marmorata* A.C. Smith | Borneo (Sabah and Sarawak), Philippines (Mindanao and palawan) | Tepals yellowish, outermost tepals sometimes greenish |
| *Kadsura oblongifolia* Merrill | Guangdong, Guangxi, Hainan in China | ***Resseliella*:** Luo et al., 2017 and this study: Fig. 3A, B, C |
| *Kadsura philippinensis* Elmer | Luzon, Mindanao, Philippines | Tepals White or dull yellow |
| *Kadsura renchangiana* S.F. Lan | NE Guangxi, Guizhou, China | Tepals yellow |
| *Kadsura scandens* Blume | Malay Peninsula, Sumatra, Java, Bali | Tepals white, pale yellow, or red, outer tepals occ. pale green, tinged red |
| *Kadsura verrucosa* (Gagne.) A.C. Smith | Indochina, Malay Peninsula, Sumatra, Java | Tepals yellow, cream, or pink |
| ***Schisandra,* 27 named species,**  **2 unnamed (possibly new) species, 4 species that prob. belong in *Kadsura*;**  **8 with investigated pollen vectors** |  |  |
| *Schisandra arisanensis* Hayata | Eastern, Western, Central China | Tepals pale yellow, yellow, orange, or red, |
| *Schisandra bicolor* Cheng | Eastern and Central China | Tepals red to greenish. Pollinated exclusively by ***Resseliella*** (Fang et al., 2011) |
| *Schisandra chinensis* (Turczaninow) Baillon | NE China; N Japan; Korea; Russia (Far East) | Tepals white to yellow; flies (cecidomyiids?), thrips, no proof of pollen transport (Takahashi, 2004) |
| *Schisandra elongata* (Blume) Baillon | Endemic to Java | Tepals yellow (outermost greenish) |
| *Schisandra glabra* Rehder | Southern North America | Flies and beetles; flowers thermogenic (Liu et al., 2006) |
| *Schisandra glaucescens* Diels. | Chongqing, W Hubei, China | Tepals white to yellow |
| *Schisandra grandiflora* (Wallich) Hooker & Thomson | Xizang, China; Bhutan; N India; Nepal | Tepals white, cream-white, or sometimes pink-tinged |
| *Schisandra henryi C. B. Clarke* | Central to West China | Pollen-feeding *Megommata* (Yuan et al., 2007), midge later re-identified as *Resseliella kadsurae* (Yukawa et al., 2011; ovipositing, not pollen-feeding ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra incarnata* Stapf. | SW and W Hubei, China | Tepals flesh-pink to deep, flesh-pink |
| *Schisandra lancifolia* (Rehder & E. H. Wilson) A.C. Smith | SC Sichuan, NW W Yunnan, China | Tepals white, yellow, orange, red, or pink |
| *Schisandra longipes* (Merrill & Chun) R.M.K. Saunders | N Guangdong, N Guangxi, China | Tepals pale yellow |
| *Schisandra micrantha* A. C. Smith | Yunnan, China; N India; Myanmar | Tepals yellow and sometimes tinged pink or orange |
| *Schisandra neglecta* A.C. Smith | Yunnan, China; Bhutan; NE India; Myanmar; Nepal | Tepals white, yellow, orange, or pink |
| *Schisandra perulata* Gagnepain | N. Vietnam; N. Thailand | Tepals yellow or red |
| *Schisandra macrocarpa Q. Lin & Y. M. Shui* (morphologically close to *S. plena*) | Endemic to Southerast Yunnan, Southwest China | Tepals greenish, yellowish or yellow red, nearly spherical |
| *Schisandra parapropinqua Q. Lin & Y. M. Shui* (morphologically close to *S. plena*) | Endemic to Guizhou and Yunnan, Southwest China | Tepals yellowish green, innermost ones pink at adaxial side red, spherical |
| *Schisandra plena A.C. Smith* (DNA indicates this is a *Kadsura*) | S and SW Yunnan, China; NE India | Tepals white to pale yellow but red at base |
| *Schisandra propinqua* (Wallich) Baillon (DNA indicates this is a *Kadsura*) | W China; N India; Indonesia; E Myanmar; Nepal; Thailand | Tepals cream, yellow, orange, pink, or purplish |
| *Schisandra pubescens* Hemsley & E.H. Wilson | Chongqing, W Hubei, Sichuan, China | Tepals yellow, orange, or red |
| *Schisandra pubinervis* (Rehder & E. H. Wilson) R. M. K.Saunders, | Hubei, Sichuan, China | Tepals yellow |
| *Schisandra repanda* (Siebold & Zucc.) Radlk. | Japan | Tepals red to greenish. Cecidomyiid (Takahashi, 2006a); ***Resseliella*** (Fang et al., 2011); ***Resseliella*** (Tsujita and Miyake, 2015) |
| *Schisandra rubriflora*  Rehder & E. H. Wilson | Sichuan and Yunnan, China; India; Myanmar | ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra sp.*\_Luo 761 | Yunnan China | Tepals yellow. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra sp.*\_Wang 193 | Hunnan in China | Tepals yellow. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra sphaerandra* Stapf | Sichuan and Yunnan, China | Tepals red. ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra sphenanthera* Rehder & E. H. Wilson | Most of China except in the NE | Pollen-feeding *Resseliella* and thrips (Du et al. 2012); ***Resseliella*:** this study: Fig. 3A, B, C |
| *Schisandra tomentella* A.C. Smith | S Sichuan, China | Tepals yellow |
| *Schisandra viridis* A. C. Smith | East and Central China | Tepals yellow |

\* In 2009, we collected midges on nursing-stage and dropped flowers of *I. dunnianum* and *I. tsangii* and these samples contained larvae of *Clinodiplosis*, but no adults; we therefore used the name *Clinodiplosis* in our 2010 paper. In 2015, we collected midges from *Kadsura coccinea*, this time taking extra care to include both larvae and adults from inside the flowers or just ovipositing. The 2015 samples contained only females and larvae that belonged to *Resseliella.*

**References:**

Du, W., Huang, L-J., Wang, X-F. 2012. Deceit pollination and the effect of deforestation on reproduction in dioecious *Schisandra sphenanthera* (Schisandraceae) in central China. *Journal of Systematics and Evolution* 50: 36–44.

Fan, J-H., Thien, L.B., Luo, Y-B. 2011. Pollination systems, biogeography, and divergence times of three allopatric species of *Schisandra* in North America, China, and Japan. *Journal of Systematics and Evolution* 49: 330–338.

Liu Z, Hao G, Luo YB, Thien LB, Rosso SW, Lu AM, Chen ZD. 2006. Phylogeny and androecial evolution in Schisandraceae, inferred from sequences of nuclear ribosomal DNA ITS and chloroplast DNA *trnL-F* regions. *International Journal of Plant Sciences* 167: 539–550.

Luo S, Chaw S, Zhang D, Renner SS. 2010. Flower heating following anthesis and the evolution of gall midge pollination in Schisandraceae. *American Journal of Botany* 97: 1220–1228.

Luo, S. T-T. Liu, F. Cui, Z-Y. Yang, X-Y.Hu, and S. S. Renner. Coevolution with resin midges as pollinators leading to resin-covered nurseries in flowers and floral traits enforcing different midge oviposition places. (New Phytologist, 5 Nov. 2016).

Takahashi H. 2004. Pollination biology of *Schisandra chinensis* (Schisandraceae). *Journal of Plant Research* 117, Supplement: 50.

Takahashi H. 2006a. The pollination mechanism of *Schisandra repanda* (Schisandraceae). *Journal of Plant Research* 119, Supplement: 56–57.

Takahashi H. 2006b (in Japanese). Pollination biology of four species in the ANITA grade in Japan [*Schisandra chinensis, Schisandra repanda, Kadsura japonica, Illicium anisatum*]. <http://repository.lib.gifu-u.ac.jp/handle/123456789/2822>

Thien LB, Bernhardt P, Devall MS, Chen Z-D, Luo Y-B, Fan J-H, Yuan L-C, Williams JH. 2009. Pollination biology of basal angiosperms (ANITA grade). *American Journal of Botany* 96: 166–182.

Thien LB, White DA, Yatsu LY. 1983. The reproductive biology of a relict –*Illicium floridanum* Ellis. *American Journal of Botany* 70: 719–727.

Tsujita, S., and T. Miyake. 2015.Molecular phylogenetic analysis of gall midges visiting Schisandra repanda. 62nd Annual meeting of Ecological Society of Japan, Kagoshima (in Japanese). <http://www.esj.ne.jp/meeting/abst/62/PA2-162.html>

White DA, Thien LB. 1985. The pollination of *Illicium parviflorum* (Illiciaceae). The Journal of the Elisha Mitchell Scientific Society 101, 15-18.

Yuan LC, Luo YB, Thien LB, Fan JH, Xu HL, Chen ZD. 2007. Pollination of *Schisandra henryi* (Schisandraceae) by female, pollen-eating *Megommata* species (Cecidomyiidae, Diptera) in South-central China. *Annals of Botany* 99: 451–460.

Yuan LC, Luo YB, Thien LB, Fan, JH, Xu, HL, Yukawa, J., Chen ZD. 2008. Pollination of *Kadsura longipedunculata* (Schisandraceae), a monoecious basal angiosperm, by female, pollen-eating *Megommata* sp. (Cecidomyiidae: Diptera) in China. *Biological Journal of the Linnean Society* 93: 523536.

Yukawa J, Sato S, Xu H-L, Tokuda M. 2011. Description of a new species of the genus *Resseliella* (Diptera: Cecidomyiidae), a pollinator of *Kadsura longipedunculata* (Schisandraceae) inChina, with comments on its flower-visiting habit. *Entomological Science* 14: 297–303.