

2. ADINA Salisbury, Parad. Lond. t. 115 [“116”]. 1808.

水团花属 shui tuan hua shu

Chen Tao (陈涛); Charlotte M. Taylor

Shrubs or small trees, unarmed, often deciduous; buds conical. Raphides absent. Leaves opposite, distichous or decussate, usually with domatia; stipules persistent or deciduous, interpetiolar, bifid, nodes with a ring of persistent trichomes exposed after stipules fall. Inflorescences terminal and/or in axils of uppermost leaves, capitate with 1[to several] globose heads, pedunculate with peduncles usually articulate in basal half and bearing stipuliform bracts at middle, many flowered, bracteate; bracteoles linear to linear-spatulate. Flowers sessile, bisexual, monomorphic. Calyx limb 5-lobed. Corolla white, salverform to slenderly funnellform, glabrous inside; lobes 5, valvate in bud. Stamens 5, inserted in upper part of corolla tube, partially to fully exerted; filaments short, glabrous; anthers basifixed. Ovary 2-celled, ovules many in each cell, pendulous on axile placentas attached to upper 1/3 of septum; stigma globose to obovoid, exerted. Fruiting heads globose, at maturity shattering easily. Fruit capsular, obconic, septically then loculicidally dehiscent into 4 valves separating from base to apex from each other and from septum, cartilaginous to papery, with septum persistent or tardily deciduous, with calyx limb persistent on septum; seeds numerous, small, fusiform to oblanceoloid, flattened to rounded, with embryo portion obovoid, ellipsoid, oblong, or trigonous, sometimes with short wing at one or both ends.

Four species: China, Japan, Korea, Thailand, Vietnam; three species in China.

- 1a. Deciduous low shrubs; leaves distichous, subsessile to shortly petiolate, petioles to 2 mm, leaf blade 2.5–4 × 0.8–1.2 cm; flowering heads borne separately on axillary or sometimes apically paired peduncles 3. *A. rubella*
- 1b. Evergreen shrubs or small trees; leaves decussate, petiolate, petioles 2–12 mm, leaf blade 4–18 × 1.5–6 cm; flowering heads borne separately on axillary or sometimes apically paired peduncles and/or infrequently or often in cymes of 3 or 5.
 - 2a. Leaf blade 4–12 × 1.5–3 cm, abaxially glabrous or sparsely puberulent on costa, petioles 2–6 mm; stipules persistent to caducous, 3–8 mm, puberulent to glabrous, lobes lanceolate to ovate; flowering heads infrequently in cymes of 3 1. *A. pilulifera*
 - 2b. Leaf blade 6–18 × 2.3–6 cm, abaxially sparsely to densely puberulent on veins to throughout, petioles 3–12 mm; stipules caducous, 4–5 mm, glabrous, lobes narrowly triangular; flowering heads often in cymes of 3 or 5 2. *A. pubicostata*

1. *Adina pilulifera* (Lamarck) Franchet ex Drake, J. Bot. (Morot) 9: 207. 1895.

水团花 shui tuan hua

Cephalanthus pilulifer Lamarck, Encycl. 1: 679. 1785; *Adina globiflora* Salisbury; *A. globiflora* var. *tonkinensis* Pitard; *A. pilulifera* var. *tonkinensis* (Pitard) Merrill ex H. L. Li.

Shrubs or small trees, evergreen, 1–5(–10) m tall; branches angled to terete, puberulent to glabrescent, often lenticellate, with bark usually gray. Leaves decussate; petiole 2–6 mm, glabrous or puberulent; blade drying papery to stiffly papery, narrowly elliptic, elliptic-lanceolate, obovate-oblong, oblanceolate, or obovate-oblanceolate, 4–12 × 1.5–3 cm, adaxially glabrous, abaxially glabrous or sparsely puberulent on costa, base acute to cuneate or obtuse, apex acute to acuminate with tip usually ultimately blunt; secondary veins 6–12 pairs, usually with foveolate and/or pilosulous domatia; stipules persistent to caducous, in outline ovate, 3–8 mm, puberulent to glabrous, deeply bifid, lobes lanceolate to ovate, acute to acuminate, erect to spreading. Inflorescences puberulent to glabrous; peduncles 2–5 cm, with bracts ca. 2 mm; flowering heads borne separately on axillary or sometimes apically paired peduncles and/or infrequently in cymes of 3, 4–6 mm in diam. across calyces, 8–12 mm in diam. across corollas; bracteoles linear to linear-clavate, 1.3–1.8 mm. Calyx puberulent to glabrescent; ovary portion obconic, 0.5–1 mm, surrounded at base by a strigose ring; limb deeply lobed, lobes linear-oblong or spatulate, 1–1.8 mm, with

apex thickened. Corolla white, narrowly funnellform, outside puberulent or hirtellous to glabrous; tube 2–3.5 mm; lobes ovate-oblong, 0.5–1 mm, obtuse. Stigma globose to obovoid, ca. 0.2 mm, exerted for 3–5 mm. Fruiting heads 7–11 mm in diam. Capsules obcuneate, 2–5 mm, puberulent to glabrescent; seeds ca. 2 mm. Fl. Jun–Sep, fr. Jul–Dec.

Thickets or sparse forests at streamsides, at roadsides, or in valleys; 200–400 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Japan, Vietnam].

H. L. Li (J. Arnold Arbor. 25: 317. 1944) recognized *Adina pilulifera* var. *tonkinensis* for Chinese plants from Guangxi, Hainan, and Yunnan but did not there explain their separation from the typical variety; no subsequent authors, including H. H. Hsue and H. Wu (in FRPS 71(1): 274–275. 1999), have recognized infraspecific taxa within this widespread species.

2. *Adina pubicostata* Merrill, J. Arnold Arbor. 21: 385. 1940.

毛脉水团花 mao mai shui tuan hua

Shrubs or small trees, evergreen, 1–8 m tall; branches angled to terete, puberulent to glabrescent, often lenticellate, with bark usually grayish to reddish brown. Leaves decussate; petiole 3–12 mm, glabrous to densely puberulent; blade drying papery to stiffly papery, narrowly elliptic, elliptic-oblong, lanceolate, or oblanceolate, 6–18 × 2.3–6 cm, adaxially glabrous, abaxially sparsely to densely puberulent on veins to throughout, base acute to cuneate or obtuse, apex acute to acuminate with tip usually ultimately blunt; secondary veins 6–12 pairs, usually

Fl. China 19: 69–70. 2011.

with foveolate and/or pilosulous domatia; stipules caducous, in outline ovate, 4–5 mm, glabrous, deeply bifid, lobes narrowly triangular, acute, erect to spreading. Inflorescences densely puberulent; peduncles 2–5 cm, with bracts ca. 2 mm; flowering heads borne separately on axillary or sometimes apically paired peduncles and/or often in cymes of 3 or 5, 6.5–7 mm in diam. across calyces, 10–11 mm in diam. across corollas; bracteoles linear to linear-clavate, 1–2 mm. Calyx puberulent to glabrescent; ovary portion obconic, 0.5–1 mm, surrounded at base by a pilosulous ring; limb deeply lobed; lobes narrowly spatulate, ca. 1 mm, with apex cucullate to thickened. Corolla white, narrowly funnelform, outside puberulent to glabrous; tube 2–3 mm; lobes ovate, 1–1.5 mm, subacute. Stigma globose to obovoid, ca. 0.2 mm, exserted for 3–5 mm. Fruiting heads 8–9 mm in diam. Capsules obcuneate, 2–2.5 mm, pilosulous at apex to glabrescent in lower portions, with persistent calyx lobes (on persistent septum) 1.2–2 mm; seeds 1.2–2 mm. Fl. Jun, fr. Jul–Nov or rarely into Jan.

Forests; 400–1200 m. Guangxi, Hunan [Vietnam].

This species has previously been included in *Adina pilulifera* (Ridsdale, Blumea 24: 357–358. 1979; H. H. Hsue & H. Wu, FRPS 71(1): 275. 1999); however, with more material now available it can be clearly distinguished from that species.

3. *Adina rubella* Hance, J. Bot. 6: 114. 1868.

细叶水团花 xi ye shui tuan hua

Low shrubs, deciduous, 1–3(–6) m tall; branches angled to terete, puberulent to tomentulose or glabrescent, sometimes lenticellate, with bark usually reddish brown. Leaves distichous, subsessile to shortly petiolate; petiole to 2 mm; blade drying papery, lanceolate, ovate-lanceolate, lanceolate-elliptic, or ovate-oblong, 2.5–4 × 0.8–1.2 cm, adaxially puberulent to glabrous, abaxially glabrescent to puberulent or sparsely pilosulous at least along veins, base obtuse to rounded, apex acute or acuminate; secondary veins 5–7 pairs, with pilosulous domatia; stipules persistent to deciduous, ligulate to ovate in outline, 2–5 mm, puberulent to glabrous, deeply bilobed, lobes narrowly triangular, acute to acuminate, erect to reflexed. Inflorescences densely puberulent or strigillose to glabrescent; peduncles 1–5 cm, with bracts 2–4 mm; flowering heads borne separately on axillary or sometimes apically paired peduncles, 4–7 mm in diam. across calyces, 10–12 mm in diam. across corollas; bracteoles linear or linear-clavate, 1–2 mm. Calyx puberulent to glabrescent; ovary portion obconic, 0.8–1 mm; limb deeply lobed, lobes spatulate or spatulate-clavate, 1–2 mm, at apex thickened, rounded, papillose. Corolla white or flushed with pink or purple on lobes, slenderly funnelform, outside glabrescent, puberulent, or hirtellous with trichomes often purple-red; tube 2–3 mm; lobes deltoid to ligulate, 0.5–1 mm, acute to obtuse. Stigma obovoid, 0.2–0.3 mm, exserted for 3–4 mm. Fruiting heads 8–12 mm in diam. Capsules oblong-obcuneate, 3–4 mm, puberulent, hirtellous, or glabrescent; seeds ca. 1.5 mm. Fl. and fr. May–Dec.

Wet sites at streamsides, riversides, and sand beaches; below 100–600 m. Fujian, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi, Shaanxi, Zhejiang [Korea].

This is a widespread and frequently collected species. The stipules are sometimes completely split, with the lobes falling separately, and can be confused with triangular entire stipules if care is not taken. How (Sunyatsenia 6: 249. 1946) noted that this species is effective for stabilization of slopes.

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