

## 23. REMUSATIA Schott in Schott & Endlicher, Melet. Bot. 18. 1832.

岩芋属 yan yu shu

Li Heng (李恒 Li Hen); Peter C. Boyce

*Gonathanthus* Klotzsch.

Herbs, small to medium sized, seasonally dormant, epiphytic or epilithic, rarely terrestrial, latex-bearing. Tuber subglobose, producing erect to spreading, unbranched or branching stolons from axils of scarious, deciduous cataphylls; stolons producing small, ovoid tubercles at nodes, each invested by numerous apically hooked scales (minute cataphylls). Leaves 1 or 2; petiole sometimes slender, sheath relatively short; leaf blade peltate, cordate-lanceolate to cordate-ovate, apex acuminate; basal veins well developed, primary lateral veins pinnate, forming submarginal collective vein very close to margin, marginal vein also present, secondary and tertiary laterals arising from primaries at a wide angle, then arching toward leaf margin and forming inconspicuous interprimary collective veins, higher order venation reticulate. Inflorescences solitary or up to 3 together, appearing with or without leaf; peduncle shorter than petioles. Spathe strongly constricted between tube and blade, sometimes with secondary constriction above spadix (this group formally recognized as a separate genus: *Gonathanthus*); tube with convolute margins, persistent, enclosing female zone and sterile zone of spadix; limb yellow or red, longer than tube, fully expanded or remaining convolute and opening only at base, sometimes becoming reflexed (in *Remusatia vivipara* and *R. yunnanensis*), later deciduous. Spadix sessile or subsessile, much shorter than spathe; female zone subcylindric, ca. 1/2 as long as spathe tube, separated from male zone by much narrower zone of sterile male flowers; male zone ellipsoid or subclavate, fertile to apex, obtuse. Flowers unisexual, naked. Male flowers 2- or 3-androus; stamens connate into cuneate-clavate, 4-6-sulcate synandrium; fused filaments distinct; common connectives somewhat excavated at apex; thecae 4–6, oblong to ellipsoid, dehiscing by apical porelike slit; synandrodes each ± elongated. Pistils lacking associated staminodes; ovary subcylindric to subglobose, 1-loculed or partially 2–4-loculed at apex; ovules many, hemiorhithropous; funicle short to long; placentae 2–4 and parietal or placenta 1 and basal; stylar region very shortly attenuate or appearing lacking; stigma disciform-subcapitate or slightly 3- or 4-lobed. Fruit an obovoid to globose, many-seeded berry; infructescence ellipsoid, borne within persistent spathe tube. Seed ellipsoid to subglobose, covered by thick, fleshy sarcotesta or testa verruculose to irregularly costate; embryo axile, ovoid to subglobose, short; endosperm copious.  $2n = 28, 42$ .

Four species: S and SE Asia, one (*Remusatia vivipara*) extending from Africa and Madagascar to tropical Asia, Australia, and the Pacific islands; four species (one endemic) in China.

- 1a. Spathe with 2 constrictions, 1 separating tube and limb, 1 separating limb into 2 parts, proximal part subglobose, distal part narrowly lanceolate, apex long acuminate ..... 4. *R. pumila*  
1b. Limb of spathe with only 1 constriction separating tube and limb.  
2a. Bulbiferous stolons erect, simple, stout ..... 1. *R. vivipara*  
2b. Bulbiferous stolons creeping or pendulous, simple or much branched, slender.  
3a. Limb of spathe semispreading to erect, not reflexed ..... 2. *R. hookeriana*  
3b. Limb of spathe initially erect, later spreading and soon reflexed ..... 3. *R. yunnanensis*

**1. Remusatia vivipara** (Roxburgh) Schott in Schott & Endlicher, Melet. Bot. 18. 1832.

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*Arum viviparum* Roxburgh, Hort. Bengal. 65. 1814 [“*viviparum*”]; *Caladium viviparum* (Roxburgh) Nees; *Colocasia vivipara* (Roxburgh) Thwaites; *Remusatia bulbifera* Vilmorin; *R. formosana* Hayata.

Tuber depressed globose, 2–4 × 3.5–5 cm; stolons erect, simple, stout; bulbils ellipsoid, 0.5–2.5 mm, stout; bristles to 1.5 mm, stout. Cataphylls 4 or more, brownish, broad, concealing peduncle, ca. 15 × 3 cm. Petiole 19–42 cm, proximal 1/4 sheathing; leaf blade glossy on both sides, pale green abaxially, green adaxially, oblong-ovate or lanceolate, 11–33 × 7–19.5 cm, sinus 1.5–3 cm; intramarginal vein indistinct. Flowering before leaves develop. Peduncle 6–12 cm. Spathe tube green outside, 3–5 × 1.3–2 cm; limb initially erect, later reflexed, yellow inside, obovate, 5.3–11.5 × 2.5–9 cm, narrowed to base, apex acute, apiculate. Spadix: female zone 1.7–2 cm × 7–9 mm,

with 3 or 4 whorls of sterile ovaries at apex and 1 or 2 whorls at base; sterile zone 1.1–2.5 cm, slender, tapering distally; male zone yellowish, clavate, cylindric, 1.5–2.2 cm × 4–7 mm. Fl. Apr–Sep.  $2n = 28, 42$ .

Subtropical forests, epiphytic, on rocks, cliff ledges; 700–1900 m. Taiwan, Xizang, Yunnan [Bangladesh, Bhutan, India, Indonesia (Java), N Laos, Nepal, Sri Lanka, N Thailand, N Vietnam; Africa, SW Asia, N Australia, Madagascar, Pacific islands].

The tubers are poisonous. They are used externally to treat mastitis, traumatic injuries, abscesses, and swellings.

**2. Remusatia hookeriana** Schott, Oesterr. Bot. Z. 8: 133. 1858.

早花岩芋 zao hua yan yu

*Gonathanthus ornatus* Schott; *Remusatia ornata* (Schott) H. Li & Q. F. Guo.

Herbs, cormous. Tuber dark outside, white inside, depressed globose, 0.5–3 × 0.5–3 cm; new roots and buds appearing at apex in Apr–May; stolons much branched, spreading, pendulous, sometimes simple and creeping; bulbils numerous,

smaller. Cataphylls white, lanceolate, ca. 9 cm, membranous, convolute around both leaf and flower buds. Leaves 2, appearing in Jun (after anthesis), spreading one after another; petiole tinged reddish, with darker markings, up to 45 cm × ca. 8 mm; leaf blade becoming purple abaxially, green adaxially, ovate-lanceolate, first leaf up to 30 × 13 cm, membranous, peltate and cordate at base, long acuminate at apex; second leaf appearing from sheath in proximal part of petiole of first leaf, petiole 10–20 cm, leaf blade smaller, ca. 14 × 4.5 cm. Flowering before leaves develop. Peduncle greenish, 4–13 cm × 1.5–3.5 mm. Spathe 3–7 cm; tube convolute, green outside, dark purple inside, ovoid, 1.3–2.7 cm × 5–10 mm; limb deciduous, semispreading to erect, entirely yellow-green, ovate, 2–4.5 × ca. 3.3 cm, apex acute. Spadix sessile, yellow-green, shorter than spathe; female zone yellow-green, ca. 11 × 4 mm; female flowers partly 4-loculed; ovary ovoid, ca. 1.1 mm in diam.; stigma sessile, disciform; placentae parietal; ovules many, orthotropous; sterile zone attenuate, yellow, ca. 7 × 2 mm; sterile male flowers rhombic or elliptic, apex truncate; male zone capitate, ellipsoidal, to 9 × 5 mm, apex obtuse; male flowers clavate or cuneate, apex truncate, with fleshy connective, with 4–6 oblong thecae opening by a terminal pore. Fl. May.  $2n = 28$ , 42.

Evergreen forests, on mossy rocks or tree stumps; 1800–2800 m. Yunnan [Bhutan, India (Assam, Himachal Pradesh), Nepal, N Thailand].

The plants from C Yunnan have a triploid chromosome number of 42, but plants from Dulongjiang and from Dali are diploid with different karyotypes.

**3. Remusatia yunnanensis** (H. Li & A. Hay) A. Hay, World Checkl. & Bibliogr. Araceae, 442. 2002.

云南岩芋 yun nan yan yu

*Gonathanthus yunnanensis* H. Li & A. Hay, Acta Bot. Yunnan. 14: 375. 1992.

Herbs, cormous, lithophytes. Tuber purple outside, white inside, globose, ca. 4 cm in diam.; bulbiferous stolons 2–4, creeping, simple, to 100 cm × ca. 4 mm, internodes 5–3.5 cm; bulbils ellipsoid, 1–3 mm, covered by 4 or 5 scales, bristles filiform and hooked, in scale axils bearing some secondary small bulbils. Leaves 2–4; petiole cylindric, 40–60 cm; leaf blade pale green abaxially, green adaxially, ovate, 20–30 × 17–20 cm, subleathery, base peltate and cordate, sinus 4–7 cm; primary veins 4 or 5 on each side, radiating from petiole and pinnately from midrib of main lobe, secondary venation pinnate from primary veins, fine intramarginal vein absent. Inflorescences 1–3, flowering when leaves develop; peduncle green, cylindric, 11–17 cm. Spatha tube green outside and inside, ovate-elliptic, ca. 3 × 1.2 cm, leathery, apex strongly constricted; limb initially erect, later spreading and soon reflexed, light purple within and dull purple beneath, base yellowish on both surfaces, obovate-oblong, ca. 8.5 × 3 cm. Spadix: female zone subcylindric, ca. 15 × 6 mm, densely flowered; female flowers 4-carpellate; ovary 1-loculed, green, ovoid, ca. 2 mm; ovules many, basal, suberect; stigma sessile, circular; sterile zone yellow, ca. 14 mm, slender; male zone yellow, broadly cylindric, ca. 17 × 4 mm, attenuate toward base, apex obtuse; synandria of 4 or 5 fused stamens; common filament obconic, apex truncate; thecae 8–10, obovoid, adnate to outside of fila-

ment and opening by a terminal pore. Fl. Aug–Sep.  $2n = 28$ \*

• Dense rain forests; ca. 1100 m. Yunnan (Yingjiang).

The combination *Remusatia yunnanensis* was attempted twice before but was not validly published (*Vienna Code*, Art. 33.4) because the basionym reference was omitted (H. Li & A. Hay, Moscow Aroid Conference 1992 Programme & Abstracts, 36. 1992) and the page number of the basionym reference was omitted (H. Li & A. Hay, Acta Bot. Yunnan., Suppl. 5: 28, 32. 1992).

**4. Remusatia pumila** (D. Don) H. Li & A. Hay, Acta Bot. Yunnan., Suppl. 5: 32. 1992.

曲苞芋 qu bao yu

*Caladium pumilum* D. Don, Prodr. Fl. Nepal. 21. 1825; *Colocasia pumila* (D. Don) Kunth; *Gonathanthus pumilus* (D. Don) Engler & K. Krause; *G. sarmentosus* Klotzsch; *Remusatia garrettii* Gagnepain.

Tuber yellowish brown outside, globose, 1–2.5 cm in diam.; bulbiferous stolons spreading, creeping, slender, branched; bulbils many, covered by brown scales; bristles filiform, hooked. Leaves 3 or 4; petiole green, cylindric, 15–40 cm, proximal 1/4–1/3 sheathing; leaf blade dull green on both surfaces, areas between primary veins sometimes purple abaxially and/or adaxially, ovate to oblong-ovate, 8–23.5 × 7–14.5 cm, papery, base peltate and shallowly cordate, apex acute or slightly acuminate, sinus 5–45 mm; primary veins 4 or 5 on each side, radiating from petiole and pinnately from midrib of main lobe, secondary venation pinnate from primary veins, fine intramarginal vein present. Inflorescence solitary, flowering when leaves develop; peduncle green, 6–10 cm. Spatha tube green, narrowly ovoid, 12–15 × ca. 10 mm; limb semispreading to erect, yellow or yellow-green on both surfaces, elongate, 13–21 cm, membranous; proximal part of limb separated into 2 parts by a constriction; proximal part subglobose, 1.5–2.5 cm, opening to reveal male zone of spadix; distal part narrowly lanceolate, 11.5–21 cm × 6–15 mm, apex long acuminate, fully opening only for a short time (less than 3 or 4 hours). Spadix sessile; female zone 5.5–7.5 × 3.5–4.5 mm; ovary green; ovules many, oblong, basal; stigma sessile; sterile zone yellow, 4–5 mm, slender; sterile flowers rhombic or oblong, flat; male zone violet, clavate, ca. 10 × 4 mm; synandria 0.6–1 mm in diam.; filaments ca. 0.7 mm. Fl. May–Jul.  $2n = 28$ .

Dense evergreen forests, on damp mossy rocks, trees, and banks; 1000–2800 m. S Xizang, Yunnan [Bhutan, India, Nepal, N Thailand].

This species is readily distinguished from the other three species by the spathe limb being constricted above the spadix as well as between the female and male zones forming a chamber enclosing the male zone of the spadix.

