
Diagnostic characters: *Albuca tenuifolia* can be easily identified by its hypogaeal and proliferous, irregularly compressed bulbs; filiform and straight leaves that bear minute and sessile papillae (only visible under microscope); glabrous peduncle and pedicels; erect pale yellow-green flowers; strongly hooded inner tepals; all stamens bearing fertile anthers; subglobose ovary with divergent paraseptal crest; and a narrowly obpyramidal trigonous style.

The characteristic form of the inner tepal tips, strongly hooded and resembling a mitre (Figure 2a) together with the erect flowers, place *A. tenuifolia* in *A. subg. Mitrotepaulum* (= A. sect. Branchion). For further details and discussion on subgeneric arrangement of *Albuca* see Müller-Doblies (1987, 1995).


Diagnostic characters: *Albuca shawii* is characterized by its hypogaeal, ovoid, and mostly solitary bulbs; filiform leaves with usually coiled apices; leaves, penduncle, and pedicels with evident, stipitate glands; nodding yellow-green flowers; inner tepals with a slight apical hood and a triangular structure facing downwards; only the three inner stamens bearing fertile anthers; the outer stamens commonly lacking anthers; oblong ovary with almost straight paraseptal crest; and the shorter and widely obpyramidal trigonous style.

The inner tepal tips of *A. shawii* are neither strongly hooded nor hinged (Figure 2b), a character which, together with the nodding flowers, place this species in *A. subg. Falconera* (= A. sect. Falconera) (cf. Müller-Doblies 1987, 1995) The species is the type of *A. sect. Trianterha* U.Müll.-Doblies (= A. ser. Trianterha (U.Müll.-Doblies) J.C.Manning & Goldblatt), characterized by the presence of only three fertile anthers.

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ITEACEAE

TAXONOMIC AND NOMENCLATURAL NOTES ON THE GENUS CHORISTYLIS

Since the description of the sub-Saharan African *Choristylis* and its only species, *C. rhamnoides* by Harvey in 1842, the family position of this woody shrub or small tree has been uncertain. We review the taxonomic status and family position of the genus and summarize its nomenclatural history. Harvey (1862), Hooker (1865), Mildbraed (1934), Boutique (1964) and Liben (1969) referred *Choristylis* to Saxifragaceae, and Engler...

Saxifragaceae are exclusively herbaceous with exstipulate leaves. Escalloniaceae are trees with exstipulate leaves and a parietal placentation, whereas in the woody Iteaceae the leaves are always stipulate, placentation is axile and the pollen grains are unusual in being 2-porate and subsisopolar (Erdtman 1955; Agababian 1960). Polen in Escalloniaceae is shed as monads and the grains and subisopolar (Erdtman 1955; Agababian 1960). Pol- len in Iteaceae also differ from Escalloniaceae in their bitemnic and crassinucleate ovules. Escalloniaceae have unigemnic and tenuinucleate ovules. The crassinucleate condition was deter- mined in both Itea and Choristylis (Mauritzon 1933, fide Kubitzki 2006). APG III (2009) place Escalloniaceae in an order of its own, the Escalloniales. Fossil flowers resembling those of Iteaee and dating from the Turo- nian stage of the Late Cretaceous have been found in the Raritan Formation, New Jersey, and leaves ascribed to Iteaee and dating to the Eocene have been described from the Klondike Mountain Formation, Washington (Hersmen et al. 2003; Friis et al. 2011).

Molecular analyses place Itea and Choristylis in the core Saxifragales, sister to Pterostemon Schauer (Pter- ostemonaceae) (Savolainen et al. 2000; Fishbein et al. 2001). Pterostemonaceae (Engl.) Small is a monogenic family of two species of shrubs native to tropical and subtropical Mexico. This family, formerly associated with Grossulariaceae s.l., Escalloniaceae, and Hydrange- aeae by some authors, is currently included in Iteaee by APG III (2009). Studies done by Bohm et al. (1999) showed that the flavonoid profiles of Pterostemon consist of C-glycosylflavones and 3-O-glycosides of querce- tin, which resembles very closely that observed in Iteaee. The presence of C-glycosylflavones in these two genera provides additional support for the closeness of their relationship. In contrast, Saxifragaceae, Crusgallaceae, and other members of the Saxifragales are characterized by flavonol production (Bohm et al. 1988).

Kubitzki (2006) relegates Choristylis to the syn- onymy of Itea, a genus with about 19 species, of which 15 species (ten endemic) occur in south and southeast Asia and Malaysia (Jin & Ohba 2001), one in Paki- stan (Siddiqi 2005), one in Japan (Ohwi 1965), one in North America (Morin 2009) and one species in Africa (Verdcourt 1973, 1983). Members of Iteaee have spi- rally-arranged or alternate, glandular-dentate, serrate to spinose leaves with superposed axillary buds, paniculate to racemose inflorescences with rather small 5-merous flowers, and septicidally dehiscent fruits, with the valves often remaining attached by the stigma. The flowers have a hypanthium, the corolla is valvate, and there are only two carpels. Flowers of Saxifragaceae have four or five free sepals and petals, with stamens as many as or twice as many as the sepals, and the pistil consisting of 2–5 united carpels. Although the carpels of Iteaee are free initially, they become partly or completely united along the style (Ge et al. 2002; Kubitzki 2006).

The African Choristylis is notably disjunct from other members of Iteaee, which are exclusively Northern Hemi- sphere in distribution, extending from south and south- east Asia from the Himalayas to China, Taiwan, Japan, Java, the Philippines, and southeast United States of America. Choristylis, however, is similar in habit, leaf, flower, fruit, and seed characters to Iteaee. Members of Iteaee have alternate or spirally arranged, glandular ser- rate or dentate to spinose-dentate leaf margins with the lateral or tertiary veins ending at the margin in a gland or spine (the same condition as in Choristylis) to rarely entire. The leaf venation is seemingly 3-veined from or near the base in Choristylis and pinnately veined in all species of Iteaee. Both genera have similar, small, 5- merous, creamy white or greenish yellow flowers borne in axillary or terminal panicles or racemes, often superposed in groups of two or three. In Choristylis the inflorescences are shorter than the leaves, up to 45 mm long, whereas most Iteaee species have long, drooping, elongated panicles or racemes, up to 60–200 mm long, much longer than the leaves (Jin & Ohba 2001; Siddiqi 2005; Morin 2009). The flowers in both genera have a turbinate or obconic calyx-tube adnate to the base of the ovary and with five lobes; the petals are valvate and persistent; the stamens are inserted at the margin of a hypogynous disc and are included or exerted; the ovary is 2-locular, superior to half-inferior; the styles are undivided or ± deeply divided, but apically coherent at anthesis. The fruit is a septicidally dehiscent capsule with a persistent perianth in both genera. Given the gen- eral morphological similarity between the two genera and their identical pollen we agree with Kubitzki (2006) that the range of variation of characters, such as ovary position (nearly superior to half inferior), the degree of fusion of the styles (undivided or ± deeply divided,) and ramification and length of inflorescences (terminal or axillary panicles or racemes), makes the maintenance of Choristylis impossible.

Benthem (1865) kept Choristylis and Iteaee separate when only a few species of Iteaee were known, and stated that the one Iteaee species from America (I. virginica L.) and one from Japan (I. japonica Oliv.) are deciduous and that their seeds are oblong and flattened, distinguishing them from the Asian species, which are evergreen trees and their seeds are fusiform. Since then many more species of Iteaee have been described and Engler (1891, 1930) consequently took up these characters mentioned by Benthem and used them to distinguish two sections in Iteaee, namely sect. Deciduae Engl. for the American and Japan species, and sect. Sempervirentes Engl. for the Asian species.

Although Kubitzki (2006) argued that Engler’s sec- tions (1891, 1930) in Iteaee could not be upheld with the inclusion of Choristylis within Iteaee, the seed mor- phology of Choristylis differs enough from the other species to warrant a section of its own in the genus Iteaee. Chori- stylis is an evergreen scrambling shrub or tree and the seeds are irregularly obovoid or oblong-obovoid, flat- tened, sculptured and slightly curved (Verdcourt 1973, tab. 1,13; Kubitzki 2006, fig. 70G). We accordingly
describe a new section within *Itea* to accommodate the single African species.

**TAXONOMY**

*Itea* L. sect. *Choristylis* (Harv.) Jordaen, sect. nov. et stat. nov. *Choristylis* Harv.: 19 (1842). Similar to sect. *Sempervirente* Engl. in its evergreen habit but differing in its leaves seemingly three-veined from or near the base, short inflorescences less than 45 mm long, and seeds which are irregularly obovoid or oblong-obovoid, flattened, sculptured and slightly curved.

Type species: *Itea rhamnoides* (Harv.) Kubitzki. (=*Choristylis rhamnoides* Harv.)


![FIGURE 1.—Itea rhamnoides. A, flowering twig, × 1; B, leaf with irregular glandular-serrate margin, × 2; C, young flower, × 15; D, mature flower, × 15; E, fruit, × 15. A & C taken from Thode A318 (PRE); B taken from Dahlstrand 2669 (PRE); D taken from Jordaan 3938 (PRE); E taken from Theron 3648 (PRU). Artist: Daleen Roodt.](image-url)
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Choristylis shirensis Baker f.: 13, t. 3/1–6 (1894). Type: Malawi, Mt. Milanj [Mulanje, 1891, Whyte 53 (BM–Aluka image!, lectotype, designated here; Z–Zürich Virtual Herbarium!, isotype). [Whyte 53 in the British Museum is chosen as the lectotype as the best representative specimen among the available syntypes].

C. ulugurensis Mildbr.: 191 (1934). Type: Tanganyika [Tanzania], Uluguru Mts., southern slope of Lukwangle Peak, August 1933, Schlieben 4293 (B B10016511–Aluka image!, lectotype, here designated). [The type collection of Schlieben 4293 on which Mildbraed (1934) based his name consists of two specimens, of which number B10016511 is the better specimen with more flowering material and therefore chosen as lectotype].

Evergreen scrambling shrub or small tree up to 7 m tall, with slender trailing branches, single- or multi-stemmed; stems slender, diverging from base, angular-ribbed; young branchlets often purplish, covered with short hairs. Bark on stems splitting longitudinally. Leaves spirally arranged, glossy green above, paler and dull below, hairless or with sparse hairs on the main veins below and often with domatia; lamina ovate or oblong to ovate-lanceolate, 15–103 × 9–55 mm, apex acute to shortly acuminate or rarely rounded, base cuneate to unequally rounded; margins sharply and finely hairy, up to 45 mm long, in dense clusters; bracts and bracteoles narrowly triangular, 0.5–1.5 mm long; peduncles 0–12 mm long. Flowers very small, regular, hermaphrodite or polygamous, 5-merous, creamy white or greenish yellow, sweetly scented; pedicels 1–2(–5) mm long. Calyx tube (hypanthium) short, ± 1.5 × 1.5 mm, adnate to ovary; lobes triangular, 0.5–2.0 × 0.3–0.5(–1.0) mm at base, ciliate. Petals ovate, 1.5–3.5 × 1–2 mm at base, 3-veined, hairy. Stamens slightly exserted, hairy; anthers ovoid, hairy. Disc annular. Ovary half-inferior, bicarpellate, carpels free initially, 2-locular; ovules numerous, biseriate, with axile placentation; styles 2, subulate, adnate or diverging, 0.5–1.0 mm long, yellowish, turning brown; stigmas ± 0.5 mm diam., free or sometimes cohering for a time. Fruit a septicidally dehiscent capsule, campanulate to turbinate below, conical above, 3–5(–6) × 3 mm, brownish, finely hairy, slightly ribbed, leathery. Seeds obovoid or oblong-obovoid, flattened, ± 1.0 × 0.5 mm, reticulate, brownish. Figure 1.

Diagnostic characters: Itea rhannoides can be recognized by its leaves, which are spirally arranged, ± 3-veined at or near the base, with glandular toothed margins and conspicuous tertiary reticulate venation. The ovary is half-inferior with two diverging styles, whence is derived the name Choristylis, from the Greek word chorus = separate and stylos = style. The valves of the septicidally dehiscent capsules often remain attached by the stigma.

Distribution and habitat: Itea rhannoides grows in the eastern parts of southern Africa, from the Katberg, Hogsback, Keiskammahoek, and Kentani in the Eastern Cape, northwards through KwaZulu-Natal, Swaziland and Mpumalanga to the Southpansberg in the north. From here it extends further northwards through Zimbabwe, Mozambique, and Malawi along the mountains to the Democratic Republic of the Congo, Burundi, Uganda, and Tanzania along the East African Rift, but seems to be absent from the more recent volcanic mountains in East Africa (Kenya and Ethiopia) (Verdcourt 1983) (Figure 2). The distribution coincides with that of the archipelago-like Afromontane Region of Endemism (White 1978, 1983). It grows in forest, forest margins, riverine and valley forests, open hillsides, often along streams at medium to high altitudes.

Synonymy: Harvey (1862) considered Baeobotrys rufescens E.Mey. to apply to Choristylis rhannoides, which De Candolle (1844) placed in the genus Maesa, based on a Drège specimen, and Maesa palustris Hochst. (1844), based on a Krauss specimen (Krauss 152), under Choristylis rhannoides. These synonyms, however, belong to Maesa lanceolata Forssk. (Dyer 1963). Verdcourt (1973) was the first to place the tropical African Choristylis shirensis Baker f. (1894) from Malawi and C. ulugurensis Mildbr. (1934) from Tanzania in synonymy under C. rhannoides. The name Choristylis viechersii Baker f., which appears in The International Plant Names Index [IPNI] as published on the same page where Baker described Choristylis shirensis (Baker 1894) seems to be fictitious (Verdcourt 1983). We have checked Baker (1894) and also cannot find any mention of C. viechersii. We conclude that it is a spelling error for C. shirensis.

FIGURE 2.—Distribution of Itea rhannoides, based on specimens housed in the National Herbarium, Pretoria, and in literature (Liben 1969 & Verdcourt 1973, 1983).
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