A New Species of Cardamine (Brassicaceae) from South-eastern Australia and a Key to Cardamine in Australia

Ian R. Thompson

School of Botany, The University of Melbourne, Parkville, 3010, Victoria, Australia.

Abstract

A new species Cardamine tryssa I.Thomps. from south-eastern Australia is described and illustrated. A key to Cardamine species occurring in Australia is also presented.

Introduction

Cardamine L. is a genus of c. 200 species in the Brassicaceae that occurs predominantly in temperate and/or high altitude regions around the world. Twelve indigenous species occur in Australia, mostly in the south-east, and there are four introduced species. During studies of Australian Cardamine (Thompson 1996, Thompson & Ladiges 1996) a few specimens similar to but smaller than typical Cardamine franklinensis I.Thomps. were examined. Subsequent field collections at a Victorian locality and re-examination of herbarium material from interstate herbaria have consolidated the case for recognizing this entity as a new species.

Taxonomy

Cardamine tryssa I.Thomps., sp. nov.

A Cardamine franklinensis I. Thomps. caulibus gracilioribus, foliis tenuioribus sine pinnis, inflorescentiis paucifloris, floribus minoribus, differt.


Annual herb to 15 cm high, tap-rooted, glabrous. Stems erect, slender, 0.5–0.8 mm diam. Leaves mid-green, thin. Rosette leaves 5–10, persistent at flowering, simple, 20–80 mm long; petiole 10–60 mm long; lamina elliptic, oblong-elliptic or obovate, 7–20 mm long, 5–10 mm wide; apex obtuse to rounded; base cuneate; margins entire or with 1–3 crenations or lobes per side, the lobes not longer than broad. Cauline leaves 0–2, 7–20 mm long; subsessile or petiole to c. 3 mm long; lamina obovate to narrow-elliptic, entire or crenations 1 or 2 per side. Inflorescences racemose, indeterminate, of 3–15 flowers; pedicels 2–4 mm long at anthesis. Flowers with sepals green or purple, ovate, 1.3–1.8 mm long; petals white internally, usually pink externally, spatulate, 2.5–4 mm long; stamens 6; stigma subsessile at anthesis. Fruit with mature pedicels erecto-patent, 5–10 mm long; siliquas erect to suberect, linear, 20–25 mm long, 0.7–1 mm wide; style to 1.5 mm long. Seeds elliptic, 0.8–1.0 mm long. (Fig. 1.)

Etymology: The epithet alludes to its diminutive nature, slender stems, thin leaves and small flowers (Gk: tryssos, delicate).

Figure 1. Cardamine tryssa, habit. The flowering stems are secondary; and the primary stem has been largely lost. (Holotype: I.R.Thompson 311, MEL). Scale bar = 1 cm.
Distribution and Conservation Status. A rare species known from three mainland locations (Fig. 2): near Lake Tyers in East Gippsland, Victoria; from Cave Creek in the Southern Tablelands, N.S.W.; and from De Salis Creek in the A.C.T. There is also an old record from Pontville, in south-east Tasmania. The N.S.W. locality is within Kosciuszko National Park and the A.C.T. locality is within Namadgi National Park.

Habitat. Recorded from areas of limestone geology in open forest. In the East Gippsland location it occurs in open forest adjacent to a river on a moderately steep slope.

Notes. Cardamine tryssa is similar to C. franklinensis in habit and leaf shape. However, C. tryssa is not as robust, has thinner leaves, the rosette leaves do not develop pinnatisect segments, inflorescences are fewer-flowered, and flowers are smaller. Cardamine tryssa is readily distinguished from other small-flowered (petals < 5 mm long) species of Cardamine in Australia by its leaf morphology. Also, petals of C. tryssa are pink abaxially in at least some populations, whereas most other small-flowered species have entirely white petals. An exception is a small-flowered form of C. lilacina which has been recorded from eastern Victoria. C. tryssa appears to behave largely as an annual, but possibly could persist into a second season.

Key to Cardamine in Australia
Note: The term pinnate is used for leaves if well-defined petiolule and blade portions are evident; otherwise the term pinnatisect is used.

1. Stems and/or upper surface of leaves at least sparsely haired (close inspection necessary, ideally using low power magnification)
   2. Upper surface of leaves (excluding margins) glabrous
      3. Terminal segment of lower- to mid-cauline leaves with mostly 2–4 lobes per side, sometimes fewer, l:w > 1.2; siliquas erect to sub-erect, forming an angle of < 30° with rachis; natural environments, commonly by streams .................
         ..............................................................................................................................................C. microthrix
   3: Terminal segment of lower- to mid-cauline leaves with 0–1 lobes per side, or if 2, l:w < 1.2; siliquas strongly divergent, forming angle of > 30° with rachis; urban environments (nurseries, garden beds and gutters) .........................*C. aff. flexuosa
2: Upper surface of leaves (excluding margins) bearing scattered hairs

Primary stem usually shorter than rosette leaves or lacking and then long-pedicellate flowers arising directly from base; leaves simple or pinnate with 1 or 2 pairs of lateral pinnae; if stem developed, pedicels commonly arising in whorls of 3 or 4; flowers often apetalous or with fewer than 4 petals; siliquas less than 1 mm wide; urban environments ......................... C. corymbosa

4: Primary stem usually longer than rosette leaves; leaves pinnate with 1–6 pairs of lateral pinnae; pedicels alternating among rachis; flowers usually with 4 petals; siliquas 1–1.5 mm wide; urban or natural environments

5: Stems glabrous or sparsely hairy; cauline leaves 0–3, rarely more, hairs on leaves not obviously tubercle-based; inflorescence rachis straight, developing fruits usually clearly overtopping open flowers; stamens mostly 4; siliquas forming an angle of < 45° with rachis, valves glabrous or hairy; widespread in urban and a range of natural environments ............... C. hirsuta

5: Stems sparingly to moderately hairy; cauline leaves mostly > 3, sometimes fewer if plant stunted, hairs on leaves ±distinctly tubercle-based; inflorescence rachis often flexuose, developing fruits not or hardly overtopping open flowers; stamens mostly 6; siliquas forming an angle of > 45° with rachis, valves glabrous; urban and sometimes natural environments in moist, shady habitats ......................... C. flexuosa

1: Stems and leaves glabrous

6: Perennials, horizontal stem growth extensive, sometimes also much branched and forming dense broad clumps; alpine or sub-alpine

7: Stems slender, 1–2 mm in diam., hardly succulent; ascending stems often unbranched, sometimes few-branched, rosettes not developing where stem turns vertical or rosette leaves up to 6; subalpine to alpine areas of N.S.W. and Vic ......................................................... C. astoniae

7: Stems robust, mostly 2–5 mm diam., succulent, ascending stems often few–several-branched, developing ±loose rosettes of many leaves; endemic to alpine zone of Mt. Kosciuszko region .................................. C. robusta

6: Annuals, or perennials, extensive horizontal growth lacking, but sometimes rootstock of rosetted perennials elongating in small increments each season, and sometimes branching

8: Stems erect or trailing, to c. 60 cm long; cauline leaves 7–many, pinnatisect, segments of higher leaves ±linear; petals > 5 mm long; mature style > 1.5 mm long; lowland swamps ........................................ C. tenuifolia

8: Stems erect or ascending, mostly < 30 cm long; cauline leaves mostly 0–6, not divided or division various; petals and mature style various lengths; habitat various

9: Plants developing subtuberous roots; petals white, 5–8 mm long; lowland, western Vic., south-eastern S.A., Tas. (only one collection in past 100 years) ........................................................................................................... C. gunnii

9: Plants not developing subtuberous roots; petal colour and length various; lowland to alpine; distribution various

10: Annuals; inflorescences indeterminate, primary inflorescence commonly of > 10 flowers; siliquas forming an angle of 30–45° with rachis; urban environments (nurseries, garden beds, gutters) .............. ................................................................................................................ C. aff. flexuosa

10: Annuals or perennials; inflorescences determinate or indeterminate, primary inflorescence of 2–many flowers; siliquas erect or nearly so; natural environments

11: Annuals; rosette usually entirely lost before first fruits mature; all basal leaves with base of terminal blade/segment/pinna attenuate to broad-cuneate; inflorescences from upper cauline leaves commonly
overlapping the primary inflorescence; inflorescences determinate, mostly 2–7-flowered; lowlying areas; inland plains of N.S.W., Vic., and south-eastern S.A.

12 Lower- to mid-cauline leaves undivided and ± narrow-linear or pinnatisect with 1 or occasionally 2 segments per side; segments unlobed, not narrower at base or base >1/2 the width of segment

...............C. lineariloba

12: Lower- to mid-cauline leaves pinnate or pinnatisect with 2 or 3 pinnae/segments per side; segments often lobed, narrower at base, base < 1/2 the width of segment

...............C. moirensis

11: Annuals or perennials; rosette often more persistent than above; at least the earlier basal leaves with base of terminal blade/segment/pinna truncate to cordate, or if cuneate the terminal blade/segment/pinna > 7 mm wide and/or cauline leaves entire, l:w c. 3; inflorescences from upper cauline leaves not overlapping the primary inflorescence; inflorescences determinate or indeterminate, 2–many-flowered; habitat and region various but not as above

13 Leaves all simple, ± spathulate, or some pinnatisect, the terminal segment longer than broad, narrow to broad cuneate basally, lateral segments sessile, obovate

14 Rosette leaves undivided or usually a proportion with lateral segments; cauline leaves often deeply cleft, sinuses acute; inflorescences of up to 30 or more flowers; sepals 1.8–3 mm long, petals 4-7 mm long

...............C. franklinensis

14: Rosette leaves undivided; cauline leaves not deeply cleft, sinuses not acute; inflorescences of up to 15 flowers; sepals 1.3–1.8 mm long, petals 2.5–4 mm long

...............C. tryssa

13: Commonly at least some basal leaves pinnate, terminal pinna, or blade of simple leaves, c. as long as broad, base truncate to cordate

15 Perennials, rootstock with persistent leaf bases clustered as evidence of previous seasons’ rosettes; petals entirely white or pink abaxially, 4–12 mm long; seeds 1.2–2.5 mm long; hills at moderate altitudes to alpine

...............C. lilacina

15: Annuals or biennials, rootstock not developing as above; petals white, 2–4 mm long; seeds 0.7–1.3 mm long; lowland to subalpine

16 Mid-cauline leaves pinnate, lamina of terminal pinna 6–30 mm wide, frequently 2–4 lobes per side, sometimes fewer; margins of pinnae bearing a few to several minute hairs (thorough inspection with magnification may be required)

...............C. microthrix

16: Mid-cauline leaves pinnate or pinnatisect, if pinnate, lamina of terminal pinna < 8 mm wide, entire or with 1 shallow lobe per side; margins of pinnae quite glabrous

17 Cauline leaves 0–3, if 2 or 3 the uppermost cauline leaf mostly < 2.5 cm long; racemes somewhat congested, rachis finally < 4 cm long; pedicels and rachis sometimes minutely papilllose; hilly country to subalpine

...............C. papillata

17: Cauline leaves 2–6, uppermost cauline leaf mostly > 2.5 cm long; racemes somewhat lax, rachis of at least primary inflorescence commonly finally > 4 cm long; pedicels and rachis never papilllose; lowland regions

...............C. paucijuga
Acknowledgements
I am grateful to staff at MEL for general assistance and for use of facilities and collections, and to the directors/curators of CANB and NSW for the loan of material.

References