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## A Revision of the genus *Stellaria* (Caryophyllaceae) in Australia

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### Abstract

A review of the species of *Stellaria* L. occurring in Australia is provided. The genus is represented by 10 species, of which *S. papillata* C.H.Mill. & J.G.West is described as new, as are 3 subspecies: *S. angustifolia* subsp. *rotundisepala* C.H.Mill. & J.G.West, *S. multiflora* subsp. *collaris* C.H.Mill. & J.G.West and *S. multiflora* subsp. *nebulosa* C.H.Mill. & J.G.West. Two new combinations are made, namely *S. angustifolia* subsp. *tenella* (Benth.) C.H.Mill. & J.G.West, based on *S. glauca* Hook. var. (?) *tenella* Benth. and *S. leptoclada* (Benth.) C.H.Mill. & J.G.West, based on *Stellaria glauca* var. (?) *leptoclada* Benth. Lectotypes are selected for *S. angustifolia* Hook., *S. caespitosa* Hook.f., *S. glauca* Hook. var. (?) *tenella* Benth., *S. filiformis* (Benth.) Mattf., *S. flaccida* Hook., *S. multiflora* Hook., *S. pungens* Brongn. and *S. squarrosa* Hook. Notes, maps, illustrations and an identification key are provided for all taxa occurring in Australia.

**Keywords:** Caryophyllaceae, *Stellaria*, Australia, revision, taxonomy, nomenclature.

### Introduction

This paper is a precursor to the treatment of *Stellaria* L. (Caryophyllaceae) for the *Flora of Australia* series and provides names for four new taxa, as well as typification and nomenclatural information. *Stellaria* consists of about 120 species (Morton 2005) and is found throughout temperate areas worldwide and at higher altitudes in tropical areas. There are a few weedy species, such as *S. media* (L.) Vill. and *S. graminea* L., which are found almost worldwide.

*Stellaria* belongs to the family Caryophyllaceae Juss., subfamily Alsinoideae Beilschm. Members of this subfamily are distinguished from subfamily Caryophylloideae Arn. by their free sepals and from the subfamily Paronychoideae Meisn. by their exstipitate leaves (Conn 1983; Chater & Heywood 1993; McNeill 1962). The genus is characterised by the presence of five sepals and five petals which are usually bifid; however in some species the petals are markedly reduced or absent. The closest related genera are currently thought to be *Cerastium* L. and *Holosteum* L. (Fior et al. 2006; Harbaugh et al. 2010).

There are currently six endemic species and three introduced species recognised with one further new endemic species and three endemic subspecies being described here. Two additional new combinations have also been made.

In Australia some of the endemic species appear to be closely related and form complexes. The ‘*angustifolia* group’ usually occurs in wetter areas and is morphologically similar to northern hemisphere species, particularly *S. palustris* L. This complex is distinguished

by the presence of sessile leaves, five fully-formed bifid petals, ten stamens, and by the absence of staminodes. It currently consists of two species, namely *S. leptoclada* (Benth.) C.H.Mill. & J.G.West, and *S. angustifolia* Hook., the latter with three subspecies. It can be difficult to separate these taxa without good flowering or fruiting material. Two additional species, *S. flaccida* Hook. and *S. pungens* Brongn., have some affinities with the ‘*angustifolia* group’ but are quite distinct, particularly in habit and vegetative characters. A second ‘*multiflora* group’ occurs in dryer or harsher regions such as coastal or inland dunes, on islands or in alpine areas. It is distinguished by the presence of leaves with narrowed and elongated bases so that they often appear petiolate (although they are technically still sessile) and by the reduction in size, form and number of floral structures. This ‘*multiflora* group’ consists of three species: *S. filiformis* (Benth.) Mattf., *S. papillata* C.H.Mill. & J.G.West and *S. multiflora* Hook., the last with three subspecies.

This occurrence of such complexes seems to be common in the genus in the northern hemisphere taxa as well. There have been a number of studies carried out on the North American *S. longipes* Goldie complex using both morphological and molecular analyses. The results from these studies (Chinnappa & Morton 1984; Chinnappa et al. 2005) showed that environmental factors influence key characters such as inflorescence type and the occurrence of scarious bracts. Chinnappa & Morton (1984) stated that “it proved possible to ‘change’ several of the ‘species’ into other ‘species’ simply by altering the environmental conditions under which they were growing” (Chinnappa & Morton 1984;

**Table 1.** Summary of subgeneric classification schemes for *Stellaria*.

	Fenzl (1840)	Pax & Hoffmann (1934)
<b>Section</b>	b. 'Eustellaria'	I. 'Eustellaria'
<b>Subsection</b>	α. <i>Petiolares</i>	1. <i>Petiolares</i>
Species listed	<i>S. media</i> , <i>S. flaccida</i>	<i>S. media</i> , <i>S. pallida</i>
<b>Subsection</b>	δ. <i>Larbreae</i>	4. <i>Larbreae</i>
Species listed	<i>S. graminea</i>	<i>S. graminea</i> , <i>S. palustris</i>
<b>Subsection</b>	ε. <i>Spinescentes</i>	5. <i>Spinescentes</i>
Species listed	<i>S. squarrosa</i> , <i>S. pungens</i>	<i>S. pungens</i>
<b>Unplaced species</b>		<i>S. multiflora</i>

Chinnappa et al. 2005). Due to this plasticity Morton (2005) decided to adopt a broad concept of *S. longipes* and only recognized one infraspecific taxon. By contrast *S. media* and *S. pallida* are two members of the 'media group' that, together with *S. neglecta* Weihe, have been variously interpreted as varieties, subspecies or, as here, species following most recent authors such as Chen & Rabeler (2001) and Morton (2005).

### Taxonomic History

*Stellaria* was first described by Linnaeus (1753) with several European taxa listed, including *S. nemorum* L., *S. dichotoma* L., *S. radians* L., *S. graminea*, *S. cerastoides* L., *S. biflora* L. and *S. holostea* L. This last taxon was chosen by Hitchcock & Green (1929) as the type species of the genus. To date there have been no major worldwide revisions; the closest is the synopsis published in *Die Natürlichen Pflanzenfamilien* by Pax & Hoffmann (1934). Most publications have been regional floras such as for the British Isles (Clapham et al. 1952), Europe (Chater & Heywood 1993), China (Chen & Rabeler 2001) and North America (Morton 2005).

*Species.* The first Australian species of *Stellaria*, *S. pungens* was illustrated and named by Brongniart in 1834, for which no description was provided and currently no specimen has been located. W.J. Hooker (1834) published two species, *S. angustifolia* and *S. squarrosa* Hook., in the same year, two more species, *S. flaccida* and *S. multiflora*, in 1836 (Hooker 1836) and a further species, *S. caespitosa* Hook. in 1840 (Hooker 1840).

The first treatment of the genus for Australia was by Bentham (1863) in which he listed five species. This comprised the introduced species *S. media*, and three endemic species, *S. multiflora*, *S. pungens* and *S. flaccida*. The fifth species listed was the northern hemisphere *S. glauca* With. Bentham included *S. angustifolia* under *S. glauca*. Additionally two infraspecific taxa, *S. glauca* var. (?) *leptoclada* Benth. and *S. glauca* var. (?) *tenella* Benth. were published by Bentham. He also described another species, *Drymaria filiformis* Benth. which was later transferred to *Stellaria* (Mattfeld 1938).

During the late 1800's the use of the name *S. glauca* was replaced by the name *S. palustris* Ehrh. ex Retz (Mueller 1887) and this name was in common usage until the later part of the 1900's. During the 1980's until the current day the consensus has been that this taxon is truly Australian and the name *S. angustifolia* has been applied (Doust 1990, Miller & West 1996).

The introduced species *S. graminea* (Curtis 1956) and *S. pallida* (Dumort.) Crep. (Eichler 1965) were first reported as occurring in Australia in the second half of the twentieth century.

No new names for Australian taxa have been published since the first half of the twentieth century; however some informal names have been used in various state floras in the second half of the twentieth century. In this treatment *S. media*, *S. multiflora*, *S. pungens*, *S. flaccida*, *S. filiformis* (Benth.) Mattf., *S. graminea* and *S. pallida* are recognised. *Stellaria multiflora* is divided into three subspecies, two of which are new. *S. angustifolia* is resurrected and divided into three subspecies, one of which is new and one is a new combination based on Bentham's *S. glauca* var. (?) *tenella*. Bentham's *S. glauca* var. (?) *leptoclada* is raised to species level. *S. papillata* is newly described for Australia.

*Suprageneric classification.* Fenzl (1840) published the first suprageneric classification for Caryophyllaceae, which was enlarged upon by Pax & Hoffmann (1934). Many of their tribal and subtribal names have not been used in recent literature (Rabeler & Bittrich 1993) as these classifications were based upon "arbitrary interpretations of morphology" (Bittrich 1993). It has been suggested that convergent evolution of morphological characters, such as reduction or loss of floral parts, makes it difficult to define a clear cut classification (Smitsen et al. 2002). Some work has subsequently been done on the higher level classification of Caryophyllaceae using molecular techniques. These studies have shown that while the family Caryophyllaceae is monophyletic, none of the subfamilies as currently defined are and more work needs to be done to determine a phylogenetically robust classification (Smitsen et al. 2002, Fior et al. 2006). Harbaugh et. al. (2010) have proposed to abandon subfamilies within the Caryophyllaceae and recognize

at least 11 tribes to deal with the polyphyletic nature of the family. They propose to include *Stellaria* in the tribe Alsineae, which agrees with Pax & Hoffmann's (1934) classification.

*Subgeneric classification.* The infrageneric classification of *Stellaria* was published by Fenzl (1840). This was then expanded by Pax & Hoffmann (1934). All of the Australian species were placed in the section *Stellaria* (as '*Eustellaria*' Fenzl). They included the introduced species *S. graminea*, *S. media* and *S. pallida* as well as the endemic species *S. flaccida* and *S. pungens* in these classifications (Table 1). Pax & Hoffmann (1934) mentioned *S. multiflora* in the biogeographic discussion but did not place the species in their classification. As the majority of the *Stellaria* species were not included, the classification has not been taken up in Australian literature.

### Morphology

*Leaves.* In the family Caryophyllaceae the leaves are most commonly opposite, decussate, usually sessile or subsessile or sometimes petiolate (Bittrich 1993). In Australia, the *Stellaria* species have leaves that are either sessile, as in the majority of the '*angustifolia* group', *S. pungens* and the introduced species *S. graminea* or appearing petiolate, as in the majority of the '*multiflora* group' and *S. flaccida*, similar to what occurs in the introduced species *S. media* and *S. pallida*. On the narrow petiolate portion of the leaf there is always some tissue so it is not truly a petiole. There is a tendency that the petiolate nature of the leaf is more pronounced towards the base of the plant and this shortens and the leaf becomes sessile towards the apex and particularly in the flowering sections of the plant.

Leaf shapes in the family range from linear, needle shaped or grass-like to broadly ovate; some are rigid and acute or even spiny at the apex (Bittrich 1993). In the Australian *Stellaria* species the leaf shape has an even greater variation, ranging from filiform, linear, elliptic, ovate, obovate, as well as variation in width from narrow to broad. This character needs to be used with caution as the leaves can become progressively longer and narrower as the plant develops (Chinnappa & Morton 1984). In Australia the only species that may become rigid and has a spiny apex is *S. pungens*.

In the transition from the vegetative to the flowering parts of the plant either of two leaf states occurs. In the first state which is listed in the keys and descriptions as 'Leaves a continuous series', the structures subtending the flowers, which are technically bracts, appear the same as the lower leaves and one cannot distinguish between them as they remain the same texture, colour and shape but they gradually become smaller and, if petiolate, this becomes shorter and even sessile towards the extremities of the plant. The alternative character state which is listed in the keys and descriptions as 'Leaves not a continuous series' is characterized by

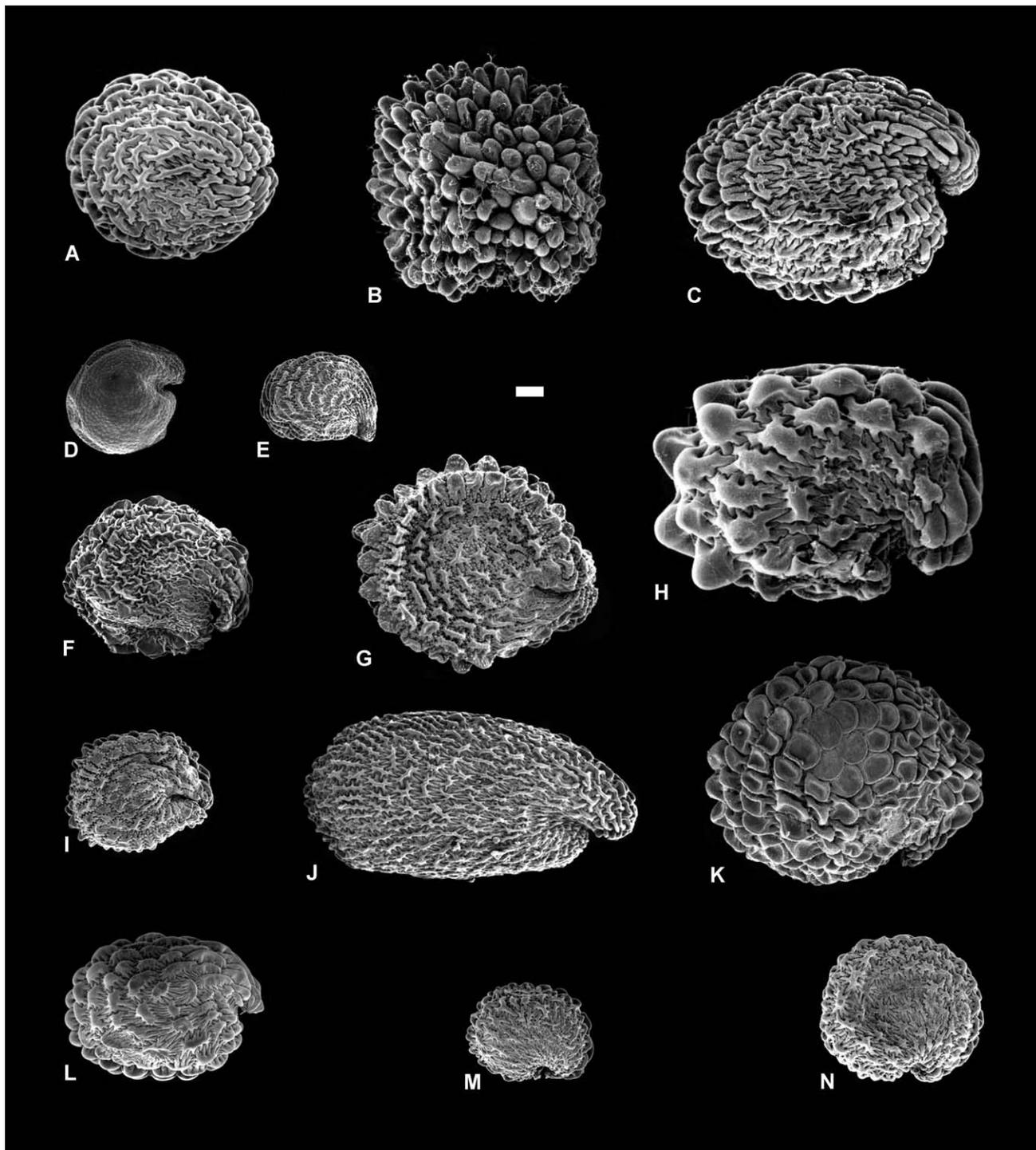
the abrupt change from leaves to bracts where the size is markedly reduced, they are always sessile and the texture usually changes from green and leafy to white and scarious. However, one must be cautious in applying absolute values to leaf shape and size as it has been observed that these characters can be altered by altering environmental factors (Chinnappa & Morton 1984).

*Inflorescence structure.* In the Caryophyllaceae the inflorescence can be few to many flowered determinate (monotelic) thyrses, partial inflorescences that are mostly dichasia, or more rarely monochasia (Bittrich 1993). In the Australian *Stellaria* species the most common inflorescence states are a monochasium, a few flowered partial monochasium or one to two flowered. Only larger specimens of *S. angustifolia* and all specimens of *S. filiformis* have the more common family character of dichasia, while all three introduced species, *S. graminea*, *S. media* and *S. pallida*, also have a dichasial inflorescence.

This type of inflorescence can cause problems in interpretation since the type of inflorescence can change as the plant matures, particularly from a single or few-flowered state to the partial monochasium to a many flowered monochasium. In the North American species, *S. longipes*, research has found that environmental factors can influence the number of flowers in the inflorescence and the development of the scarious floral leaves or bracts (Chinnappa & Morton 1984). The second character, the development of the scarious bracts, has not been observed to change in the only Australian species, *S. filiformis*, that has this character state. This study found that flower size was not affected by changing environmental conditions and is a good character to use when determining species.

*Floral structures.* In the Caryophyllaceae the flowers are generally actinomorphic and normally consist of three, four or five tetra- or pentamerous whorls (Bittrich 1993). In *Stellaria* there are five sepals with most commonly five petals which are usually deeply bifid. The stamens are usually in one or two whorls of five, and while the number may be reduced or supplemented with staminodes the total number is never more than ten.

In Australia there are two flower types. The first flower type is correlated with the '*angustifolia* group', *S. flaccida*, *S. pungens* and the introduced species *S. graminea*. These have five sepals, five deeply bifid petals about the same length as the sepals and ten stamens in two whorls and no staminodes. This is the same pattern found in many of the Northern hemisphere taxa. The second type is correlated with the '*multiflora* group' and the introduced species *S. media* and *S. pallida*. These have five sepals, five or less bifid petals that are small, usually less than half the length of the sepals, or reduced to small fragments or totally absent. There are usually two to five stamens and zero to five staminodes, except for subsp. *multiflora* and subsp. *nebulosa* which have three to ten stamens. When there are five or less stamens



**Fig. 1. SEM of seeds.** A–C *Stellaria angustifolia*: A subsp. *angustifolia*; B subsp. *rotundisepala*; C subsp. *tenella*. D *S. filiformis*. E *S. graminea*. F *S. leptoclada*. G *S. media*. H *S. flaccida*. I *S. pallida*. J *S. papillata*. K *S. pungens*. L–N *S. multiflora*: L subsp. *multiflora*; M subsp. *collaris*; N subsp. *nebulosa*. Scale bar: 100µm. — A A.C. Beauglehole 82200 (CANB 364207); B J.H. Willis s.n. (MEL 501962); C R.A. Black s.n. (MEL 1579640); D A. Cooper s.n. (NSW 145525); E A.H.S. Lucas s.n. (NSW 29863); F R. Coveny et. al. 8954 (NSW 298626); G C.H. Miller & J. Palmer 590 (CANB 409321); H W.M. Curtis s.n. (HO 29492); I C.H. Miller & J. Palmer 603 (CANB 409333); J J. Carrick 3135 (AD 97207083); K J. McKean WL 5189 (CANB 327583); L L.G. Adams 1644 (CANB 166831); M H.S. McKee 11668 (CANB 319264); N J.S. Whinray 1150 (CANB 442426).

present they are positioned opposite the sepals and have a slightly enlarged base.

*Fruits and Seeds.* There are two to five or rarely more styles, free to the base and clearly distinct from the ovary, a character that occurs throughout the subfamily

Alsinoideae (Bittrich 1993). In *Stellaria* the style number is usually three, rarely two, four or five. This also holds for the Australian species where it is extremely rare to find more than three styles.

For the tribe Alsineae the fruit is a capsule that normally opens with valves or teeth equal to or twice

the number of carpels, or is rarely indehiscent (Bittrich 1993). In *Stellaria* the number of valves is twice the number of carpels and in the Australian species this is six, very rarely more. The surface texture of the capsule valves is usually translucent to opaque and relatively smooth. There is one species in Australia, *S. papillata* that has the surface covered in distinct papillae. On maturity the valves split, usually for more than half their length or almost to the base and the apices of the valves displace, either moving only slightly outward so the valves remain almost straight, the apices curve out so they are recurved or the valves curl completely around to be revolute. Also the valve alignment can either remain in place, retaining the capsule shape or displace outwards, giving a spreading appearance. Capsule characters such as colour and angle of the valves have been shown to be defining characters as they are not affected by environmental factors (Chinnappa & Morton 1984).

In *Stellaria* the seeds are small (0.4–3 mm long), numerous, rarely few or one, roundish to reniform, usually laterally compressed and the testa is variously sculptured by more or less papilliform cells, rarely completely smooth (Bittrich 1993). In Australia, *Stellaria* has these seed characters and further study is needed to determine reliable characters to separate the taxa. The cell shape is always stellate, although this can be sometimes hard to see, particularly in *S. filiformis* (Fig. 1D), which has a very small, light-coloured seed, c. 0.5 mm long, that has a semi translucent testa and is smooth with small raised pits in the middle of the cells. The rest of the taxa have well defined stellate cells that are often inflated in the centre to form either a ridge when the cell is long and thin, such as *S. papillata* (Fig. 1J) and *S. angustifolia* subsp. *angustifolia* (Fig. 1A), or hills when the cell shape is more rounded, such as *S. multiflora* subsp. *nebulosa* (Fig. 1N). The cells are much more raised on the outer dorsal surface of the seeds. In some cases these inflated cells become almost finger-like, such as in *S. flaccida* (Fig. 1H) and *S. pungens* (Fig. 1K), and in an extreme case the finger-like projections cover the entire seed so that the stellate cell shape can no longer be seen, such as in *S. angustifolia* subsp. *rotundisepala* (Fig. 1B), which is not seen in any other taxa in Australian *Stellaria*. The introduced species, *S. media* (Fig. 1G) and *S. pallida* (Fig. 1I), also have the addition of small papillae on the arms of the stellate cells, a character that is not present in any of the Australian species of *Stellaria*.

From the North American *S. longipes* study none of the morphological characters was shown to be associated with polyploidy; nor was there any consistent association between chromosome number and geographic distribution (Chinnappa et al. 2005). From this study it was shown that the Arctic populations were generally low, single flowered plants lacking scarious bracts, while progressive development in internode length, flower number and presence of scarious bracts were observed in more southerly populations. In

Australia *Stellaria* is restricted to the southern part of the continent and no obvious association can be observed between morphological traits and latitude. There may be reason to think that the predominance of the monochasial inflorescence is due more to the harsher, drier environmental conditions found in Australia rather than a difference in latitude. The presence of scarious bracts is only found in the Australian species *S. filiformis* which has a distribution across the southern part of Australia from Wyalong in New South Wales to Cowcowing in Western Australia in sandy soils with high summer temperatures and low rainfall. There are more of the monochasial species, such as those in the '*angustifolia* group' and the '*multiflora* group' that grow both north and south of *S. filiformis*.

### Typifications

*Ronald C. Gunn and Robert W. Lawrence collections from Tasmania.* Some of the type material for the Australian *Stellaria* species is from collections made by Gunn and Lawrence in Tasmania. Due to a number of peculiarities of their collecting and recording methods some difficulties have arisen in determining type material. The numbers on Gunn and Lawrence labels refer to their species numbers and not collecting numbers. There is often more than one collection that has the same number but different collection dates. Where there is only a year written on the label this indicates the year of dispatch of the parcel to London and not the actual collection date of the collection. There are cases where there is also a full collection date on the same label and this is later than the dispatch date as the parcel was sent later than expected. Some of these collections were collected by other people and Gunn arranged these collections within his own numbering system (Buchanan 1988).

*Collections from England.* All material from K and BM was searched for types. Many of the names published by Bentham are typified with material from Herb. Hookerianum (K), often annotated by Bentham. No type specimens were found in Bentham's own Herbarium (Herb. Benthamianum, K).

### Materials & methods

This review has been based on dried material from the following herbaria: AD, BM, BRI, CANB (incl. CBG), CHR, DNA, HO, K, LD, MEL, NSW, OXF and PERTH. Limited field work was undertaken in New South Wales, the Australian Capital Territory, Victoria and New Zealand.

For Scanning Electron Microscopy (SEM), Fig. 1, seeds were mounted onto 10 mm diameter metal stubs using double sided tape. All samples were coated with gold before observation in a Jeol 6400 Scanning Electron Microscope at an accelerating voltage of 15kV. Images taken using B&W polaroid camera. Facilities provided by the CSIRO Black Mountain Microscopy Centre, A.C.T.

## Taxonomic Treatment

### *Stellaria* L.

*Sp. Pl.* 1: 421 (1753). — Type species: *S. holostea* L., *fide* Hitchcock & Green, *Prop. Brit. Bot.*: 155 (1929).

Annual or perennial herbs, glabrous or sparsely hairy. *Leaves* opposite; stipules absent; floral leaves herbaceous to scarious. *Flowers* in spreading dichasia to partial monochasia, or solitary or 2-flowered, 5-merous, bisexual. *Sepals* 5, free, usually narrow to broadly ovate. *Petals* usually 5, free, bifid, shorter to longer than sepals, in some taxa reduced or absent. *Stamens* 1–10. *Staminodes* 0–5. *Ovary* 1-celled; styles 3, free to base; *placentation* free-central. *Fruit* a conical capsule, splitting to middle or below, 6-valved. *Seeds* 2 to many, subdiscooid to nautiloid to obloid; testa minutely to prominently tuberculate.

*Distribution & habitat.* A genus of about 120 species (Morton 2005) found throughout temperate areas worldwide and at higher altitudes in tropical areas. There are a few weedy species, such as *S. media* and *S. graminea* that occur almost worldwide.

In Australia *Stellaria* is represented by 10 species including both endemic and introduced elements. The genus is distributed in temperate areas from southern Queensland, throughout New South Wales, Victoria, Tasmania, the southern parts of South Australia and Western Australia and central parts of the Northern Territory. There are three introduced species of which two, *S. media* and *S. pallida*, have become naturalised and distributed throughout the native range of the genus in Australia and extend northwards to the tropics in Queensland, the Northern Territory and Western Australia. A third introduced species, *S. graminea*, has a very localised distribution in alpine areas of New South Wales and Victoria, subalpine areas in Tasmania, and the hills of southern Fleurieu Peninsula, South Australia.

*Stellaria* is found in a wide range of habitats in Australia from coastal dunes, heathlands, grasslands, herblands, swamps, fern communities in gully forests, underlying open eucalypt or *Callitris* woodlands, rainforests, alpine bogs, mallees and Chenopodiaceae or *Leptospermum* scrublands. The endemic species are often associated with wetter areas such as watercourses, areas that seasonally flood, drainage areas or dams. The weedy species are often associated with disturbed areas such as roadside drains, dams or cultivated areas. They can grow in a wide variety of soil types from sands to clays and on almost any rock type.

The native Australian species of *Stellaria* are endemic and do not occur in nearby countries such as New Zealand and Papua New Guinea. New Zealand has five native species and four introduced species (Webb et al. 1988). Two of their introduced taxa, *S. media* and *S. graminea*, also occur in Australia. One of the Australian species, *S. flaccida*, shows affinities with the New Zealand endemic *S. parviflora* Hook.f. Much less is known about the flora of Papua New Guinea, with

only one introduced species, *S. media*, and one native species, *S. stellatopilosa* Hayata, present (van Royen 1982). *S. stellatopilosa* appears to have affinities with *S. decipiens* Hook.f. from New Zealand.

*Etymology.* The name derives from the Latin *stella* (a star) and *aria* (connected with), an allusion to the radiating, deeply bifid petals.

*Note.* Species are treated here in alphabetical order as there is no satisfactory infrageneric treatment available at this time.

### 1. *Stellaria angustifolia* Hook.

*J. Bot. (Hooker)* 1: 250 (1834). — **Type citation:** "Mr. Lawrence, Formosa, (n. 241,) Mr. Gunn, (n. 238.)". **Lectotype (here designated):** Formosa, Lawrence n. 241, Aquatic (K, Herb. Hooker p.p. [3 pieces to the right hand side of the pencil line]). **Isolectotype:** RWL[awrence] 241, Aquatic. (NSW). **Residual Syntypes:** [Gunn] 238, 1833 (NSW p.p.); Gunn's Herbarium of Tasmanian Plants. (n. 238). (NSW p.p.).

*Stellaria caespitosa* Hook.f., *J. Bot. (Hooker)* 2: 411(1840). — *Stellaria glauca* var. (?) *caespitosa* (Hook.f.) Benth. *Fl. Austral.* 1: 158 (1863). — **Type citation:** "In a marsh at Circular Head. Mr. Gunn (n. 652 and 653?)". **Lectotype (here designated):** In a marsh at Circular Head, Gunn 652?, 1837 (K, Herb. Hooker p.p. [2 pieces on the top right hand side of the pencil line]).

*Stellaria palustris* auct. non Ehrh. ex Retz.: F.Muell., *Key Syst. Victorian Pl.* 1: 166 (1887); C.Moore, *Handb. Fl. N.S.W.* 99 (1893); W.A.Dixon, *Pl. N.S.W.* 77 (1906); J.M.Black, *Fl. S. Austral.* 2: 231 (1924); Ewart, *Fl. Victoria:* 491 (1931); J.H.Willis, *Handb. Pl. Victoria* 2: 136 (1972); W.M.Curtis, *Stud. Fl. Tasman.* 1: 70 (1975); K.Chorney in Jessop & Toelken, *Fl. S. Austral.* 1: 235 (1986).

*Stellaria glauca* auct. non With.: Benth., *Fl. Austral.* 1:158 (1863); Tate, *Handb. Fl. Extratrop. S. Austral.* 43 (1890); F.M.Bailey, *Queensl. Fl.* 1: 87 (1899).

Annual or perennial, stems tall and slender to spreading or prostrate, with slender rhizome which may root from nodes; stems (5–) 11–60 (–90) cm long, usually single stemmed or branching from base, glabrous to scabrous. *Stem and inflorescence leaves* forming continuous series, sessile, not clasping, narrowly ovate, linear, narrowly elliptic or narrowly obovate, (3.5–) 10–40 (–60) mm long, 0.9–3 (–3.9) mm wide, apex acute to subacute, rarely obtuse, margin entire, rarely recurved, glabrous to scabrous all over, sometimes with 2–5-celled hairs on margins. *Inflorescence* axillary and solitary, interrupted monochasia of 2–7 flowers, monochasia of 5–7 flowers or rarely dichasia of 7–23 flowers. *Pedicels* (15.5–) 20–72 (–90) mm long, slender, erect in fruit, glabrous to scabrous, often quadrangular, ridged or grooved. *Sepals* 1.5–8 (–9) mm long, acute to acuminate, obtuse, or folded over to form hood, sometimes with hood thickened, the margin entire, rarely minutely ragged. *Petals* 2.4–7.5 (–9) mm long, usually about equal to sepals to twice sepal length; bifid to deeply bifid. *Stamens* 10. *Staminodes* 0. *Styles* 0.8–4 (–5.3) mm long. *Capsule* ellipsoid to ovoid, (2.8–) 3.5–6.8 (–8.5) mm long, (1.8–) 2.4–4 (–5) mm wide, from

**Key to Species of *Stellaria* in Australia**

- 1. Leaves sessile but lower leaves at least, appearing petiolate
  - 2. Internodes with single line of hairs for entire length
    - 3. Petals present; fertile stamens 3–5, rarely 2; all seeds dark in colour, usually > 1 mm long ..... 6. \* *S. media*
    - 3: Petals absent; fertile stamens 2, rarely more; at least some seeds pale to midbrown, < 1 mm long ..... 8. \* *S. pallida*
  - 2: Internodes without single line of hairs
    - 4. Petals present, > ½ sepal length, > 2 mm long
      - 5. Plant erect, fine-stemmed, to 20 (–30) cm long; sepals glabrous; fruit < 5 mm long, < 2.5 mm wide .. 5. *S. leptoclada*
      - 5: Plant lax, to 50 cm long; sepals with hairs or ciliate along some margins, often hairs also on sepal back or midrib; fruit > 5 mm long, > 2.5 mm wide ..... 3. *S. flaccida*
    - 4: Petals absent or if present, < ½ sepal length, < 2 mm long ..... 7. *S. multiflora*
- 1: Leaves sessile
  - 6. Petals absent or if present < ½ sepal length, < 2 mm long
    - 7. Inflorescence a dichasium; stem leaves in basal rosette, filiform, herbaceous to fleshy; floral leaves linear to ovate to lanceolate, usually scarious; seeds with minute tubercles, appearing smooth (Fig. 3a–g) ..... 2. *S. filiformis*
    - 7: Inflorescence axillary and solitary or a monochasium; leaves in continuous series, stem leaves not in basal rosette and not filiform; floral leaves herbaceous, never scarious; seeds with prominent tubercles, appearing reticulate (Fig. 3h–n)
    - 8. Capsule valves thick, opaque, covered with angular papillae; seeds obloid to ellipsoid, 1–2 per capsule, 1.3–1.9 mm long ..... 9. *S. papillata*
    - 8: Capsule valves thin, semitransparent, smooth; seeds suborbicular or kidney-shaped or broad-ellipsoid, more than 2 per capsule, < 1.3 mm long ..... 7. *S. multiflora*
  - 6: Petals present, > ½ sepal length > 2 mm long
    - 9. Flowers 5 or more, usually either a monochasium or dichasium
      - 10. Stems, leaves and sepals sparsely to densely covered with long curly hairs; leaf apex usually pungent; sepal apex usually pungent, never hooded ..... 10. *S. pungens*
      - 10: Stems, leaves and sepals glabrous, scabrous or if hairs present then these not long or curly; leaf apex acute to subacute, never pungent; sepal apex acute to obtuse, never pungent, hooded or not
      - 11. Leaves not a continuous series; floral leaves much smaller, scarious, sparsely to densely ciliate along entire length; outer sepals often ciliate along entire length; sepal apex not hooded; inflorescence a dichasium ..... 4. \* *S. graminea*
      - 11: Leaves a continuous series; floral leaves herbaceous, glabrous, scabrous or with short hairs basally; sepals glabrous or scabrous; sepal apex hooded or not; inflorescence a monochasium, an interrupted monochasium or solitary, rarely a dichasium
        - 12. Stems usually glabrous to scabrous; leaves never in basal rosette; sepal apex straight, rarely hooded; seed usually > 1 mm long ..... 1. *S. angustifolia* (mostly subsp. *angustifolia*)
        - 12: Stems sparsely covered with short hairs or scabrous; leaves often arising from loose basal rosette; sepal apex straight, not hooded; seeds usually < 1 mm long ..... 5. *S. leptoclada*
    - 9: Flowers usually solitary, rarely 2–3-flowered
      - 13. Stems, leaves and sepals sparsely to densely covered with long curly hairs; leaf apex acute to pungent; sepal apex acute to pungent, never hooded ..... 10. *S. pungens*
      - 13: Stems, leaves and sepals glabrous, scabrous or rarely some margins with short hairs; leaf apex acute to subacute, not pungent; sepal apex acute to obtuse, not pungent, hooded or straight ..... 1. *S. angustifolia* (mostly subsp. *rotundisepala* and *tenella*)

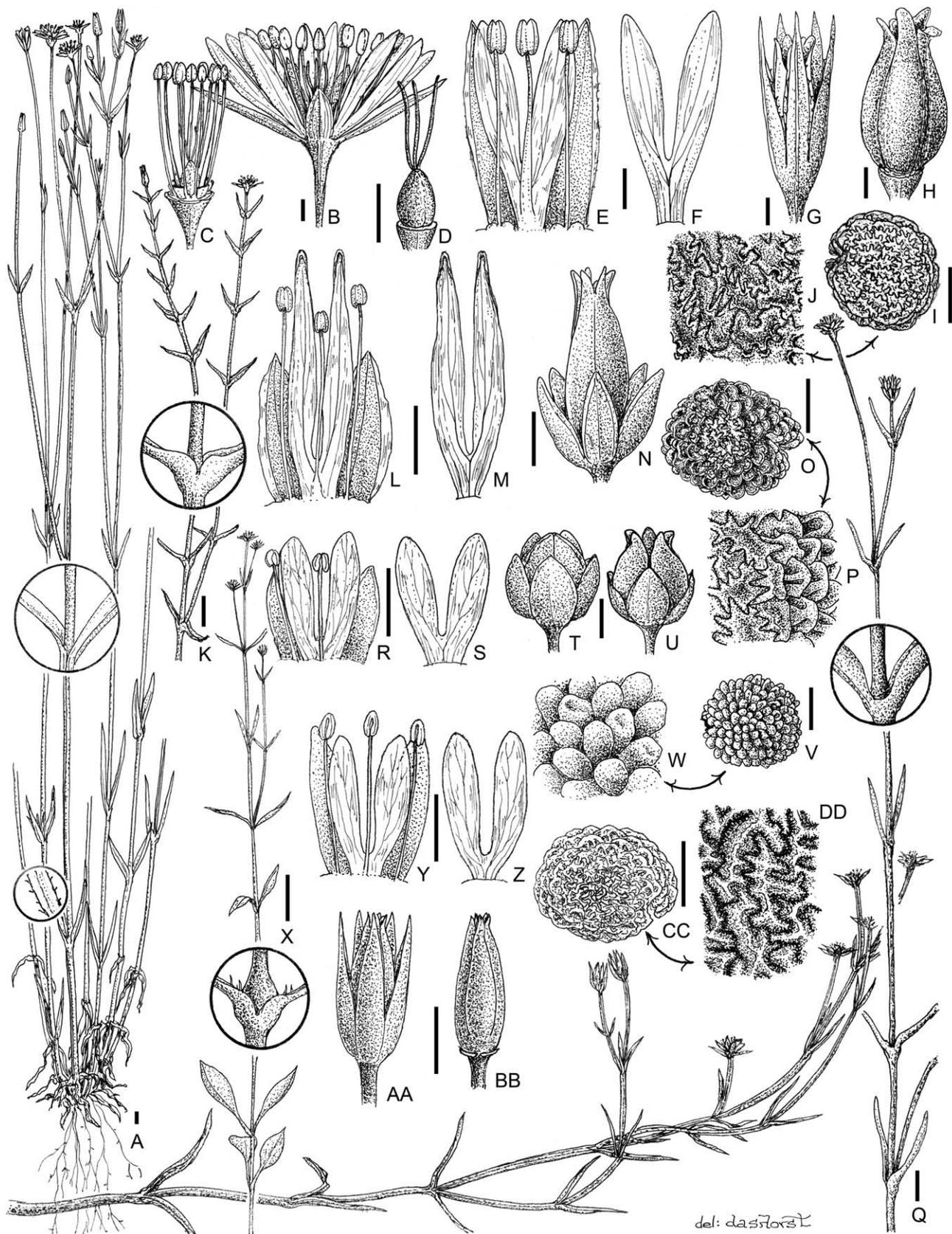
1/3 shorter to 4 times longer than sepals; *valves* straight to spreading, apex straight, recurved to revolute, rarely twisted sideways. *Seeds* 2–33, suborbicular to ellipsoid, flattened top and bottom, (0.5–) 0.8–1.2 (–1.4) mm long, light brown to grey brown to reddish brown or purplish, tubercles ridged, wrinkled to rounded and narrow, spiny in appearance.

*Distribution.* A widespread endemic species in temperate Australia, from southern Queensland, throughout New South Wales, Victoria, southern South Australia (including Kangaroo Island) and Tasmania.

*Notes.* Further study of this taxon is much needed. Historically, this taxon has been referred to the European species either *S. palustris* or *S. glauca* (a synonym of *S. palustris*) in the Australian literature. Bentham (1863) noted instances where the Australian plants differed

from the European specimens, but retained the taxon in *S. glauca* and placed *S. angustifolia* in synonymy. He also reduced *S. caespitosa* to a variety under *S. glauca*. Other authors have used *S. palustris* and have also used Bentham’s infraspecific taxa, but at different ranks.

*Stellaria palustris* specimens from England and northern Europe have erect, linear leaves on the stems and floral leaves that are markedly shorter, ovate to narrowly ovate and often scarious and the inflorescence is usually a terminal dichasial cyme. *S. angustifolia* specimens have linear to lanceolate leaves, floral leaves which are in a continuous series, and the inflorescence can be axillary and solitary, or an interrupted monochasium, a monochasium or occasionally a dichasium in larger plants. As the species can usually be distinguished from each other, *S. angustifolia* is treated here as a separate entity from the widespread European taxon *S. palustris*.



**Fig. 2. A–J** *Stellaria angustifolia* subsp. *angustifolia*: **A** habit; **B** flower; **C** flower with petals & sepals removed; **D** gynoecium; **E** part of flower showing sepal, petal and stamen arrangement; **F** petal; **G** capsule showing position in relation to sepals; **H** mature capsule; **I** seed, side view; **J** seed coat cell detail. **K–P** *S. angustifolia* subsp. *tenella*: **K** habit; **L** part of flower showing sepal, petal and stamen arrangement; **M** petal; **N** capsule; **O** seed, side view; **P** seed coat cell detail. **Q–W** *S. angustifolia* subsp. *rotundisepala*: **Q** habit; **R** part of flower showing sepal, petal and stamen

It is evident that the taxa in the ‘*angustifolia* group’ are closely related, particularly in their vegetative characteristics. The taxon which has been consistently referred to as var. *tenella* can be separated from other plants by its smaller size, mat forming habit with short internodes, sepals that end in a hooded structure, petals that are usually about twice the sepal length and flowers that are almost always solitary and axillary. However, under favourable growing conditions the plants can become larger, more erect and with longer internodes and more flowers. The plants at the smaller end of the spectrum can for the most part be readily separated and match well with the type specimens of var. *tenella*. Bentham (1863) compared var. (?) *tenella* to var. *caespitosa*, but commented that *tenella* is smaller and much more slender, with crowded, very small leaves.

Applying the epithet var. *caespitosa* to plants is more problematic as most of the characters used are size related and this is very dependent on the environmental conditions in which the plants grow. Examination of the type specimen of *S. caespitosa* has revealed that the plants have more characters in common with the type specimen of *S. angustifolia* than the type specimen of var. *tenella*. They are closer in size and there are more flowers per plant, the leaves are similar in shape, and while the growth is sometimes mat-forming, the leaves never seem to be as fine as those of var. *tenella*. The sepals are often subacute and slightly hooded especially in bud, but they can usually be differentiated from var. *tenella* plants, particularly when in fruit. We feel that var. *caespitosa* is toward the smaller end of the *S. angustifolia* spectrum, but there are not enough consistent characters to warrant the separation of the taxon from *S. angustifolia*. Bentham (1863) considered *S. glauca* var. *caespitosa* distinct in its inflorescence characters but commented that specimens showed “a very gradual passage” towards *S. glauca* in leaves as well as sepals.

Bentham’s taxon var. (?) *leptoclada* is always recognisable from the other taxa in its growth form and inflorescence structure as well as its limited distribution, and has been raised to species level here.

#### Nomenclatural notes.

*Stellaria angustifolia* Hook. One sheet from Herbarium Hookerianum held at K contains type material. The sheet has two collections. The first label on the right hand side of the pencil line is ‘Aquatic Formosa. Van D’s Land. n. 241. Lawrence’; it matches the protologue and locality information and is thus designated as the lectotype. A separate label with ‘Arenaria L.R.’ is a Cunningham collection from the Lachlan River in NSW and is not type material.

Three sheets from NSW contain type material. The first sheet has three collections with the following labels; ‘238/1833’, ‘238/1842 Marsh Formosa 7/12/42’ and ‘238/1842 Marlborough 5/1/41’. Only the specimen with the label ‘238/1833’ has been designated as a residual syntype as the other specimens post-date publication. The second sheet has a single plant with the label ‘RWL[awrence] 241 aquatic’ on it and it has been designated as an isolectotype. The third sheet has the label ‘Gunn’s Herbarium of Tasmanian Plants 238’ and has been designated as a residual syntype.

*Stellaria caespitosa* Hook.f. One sheet from Herb. Hookerianum held at K contains type material. The sheet has three collections. Only the collection on the top of the sheet on the right hand side of the pencil line with the label ‘In a marsh at Circular Head, Gen 652?, 11 Jan 1837’ matches the protologue and is here designated as the lectotype. The collection with the label ‘Oatlands, [Gunn] 652, Nov 1835 also contains line drawings of floral and seed characters drawn by Hooker. The sepal illustrated is a typical *S. angustifolia* shape with an acute apex which contradicts Hooker’s description of *S. caespitosa* which is “calycibus ovato-lanceolatis subacutis”.

#### Key to subspecies of *S. angustifolia*

1. Sepals (3–) 4–8 (–9) mm long, apex acute to acuminate; petals (3.5–) 4.5–7.5 (–9) mm long, about equal to sepals; fertile stamens > 3 mm long. . . . . a. subsp. *angustifolia*
- 1: Sepals 1.5–2.5 mm long, apex folded over to form hood; petals 2–3.2 (–3.9) mm long, longer than to twice sepal length; fertile stamens < 3 mm long
  2. Sepals narrow ovate to elliptic, apex obtuse or acute, hood never thickened; pedicel usually < 20 mm long; seed tubercles semi-inflated ridges. . . . . b. subsp. *tenella*
  - 2: Sepals round or broad elliptic, apex obtuse, hood sometimes thickened; pedicel > 20 mm long, seed spiny, with narrow, pointed prominent tubercles. . . . . c. subsp. *rotundisepala*

#### 1a. *Stellaria angustifolia* Hook. subsp. *angustifolia*

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45e–f (1996), as *S. angustifolia*.

Annual or perennial, weak to tall and spreading to 75 (–90) cm long, glabrous to scabrous. *Stem and inflorescence leaves* as a continuous series, sessile, linear, narrowly ovate to lanceolate, rarely obovate (9–) 10–40 (–60) mm long, 0.9–3 (–3.9) mm wide, acute or rarely subacute, margin rarely recurved, occasionally with short hairs. *Inflorescence* solitary, an interrupted monochasium, monochasium, or rarely a dichasium. *Pedicels* (15.5–) 20–72 (–90) mm long, slender, erect in fruit. *Sepals* narrowly to broadly ovate or elliptic, (3.5–) 4–8 (–9) mm long, acute to acuminate. *Petals* (3.5–)

arrangement; **S** petal; **T–U** flower with immature (**T**) and mature (**U**) capsule; **V** seed, side view; **W** seed coat cell detail. **X–DD** *S. leptoclada*: **X** habit; **Y** part of flower showing sepal, petal and stamen arrangement; **Z** petal; **AA** flower showing capsule; **BB** mature capsule; **CC** seed, side view; **DD** seed coat cell detail. Scale bars: habits (**A, K, Q, X**) 5 mm; flowers & fruits 1mm; seeds (**I, O, V, CC**) 0.5 mm. — **A, E–H** R. Schodde 1224 (AD 96227132); **B–D** D. Hunt 2876 (AD 96913165); **I–J** Bushman 214 (AD 98232306); **K–P** R. Bates 21927 (AD 99010076); **Q–W** R.J. Bates 27162 (AD 99206284); **X–DD** J.R. Hosking s.n. (CANB 00710190).

4–7.5 (–9) mm long, usually about equal to sepals; bifid. *Stamens* 10, filaments 3.3–6 (–6.5) mm long. *Staminodes* 0. *Styles* 2.2–4 (–5.3) mm long. *Capsule* ellipsoid to ovoid, (2.8–) 3.5–6.8 (–8.5) mm long, (2–) 2.5–4 (–5) mm wide, shorter than to equal to sepals or sometimes slightly longer; *valves* straight to spreading, apex straight, recurved to revolute, rarely twisted sideways. *Seeds* 8–33, suborbicular to ellipsoid, (0.6–) 0.8–1.2 (–1.4) mm long, light brown to grey brown to reddish brown; tubercles semi-inflated ridges. **Fig. 1A, 2A–J.** Flowering: Sep.–Mar.

*Distribution and habitat.* The taxon is widespread in southeastern Australia. It occurs south from Stanthorpe in Queensland, as well as west in the Warrego and Darling River systems. In New South Wales, it occurs along the Great Dividing Range from Armidale, through the Blue Mountains, along the Southern Highlands and alpine areas of Kosciuszko National Park. In Victoria, it also occurs in alpine areas along the Great Dividing Range and as far south as Port Phillip as well as to the west across mountain areas and in the Delatite, Delegate and Dry River systems. It also occurs along entire length of the Murray River system. It is rare in Tasmania where it occurs in the Ouse River system. In South Australia, it occurs in higher altitudes, in the Mt Gambier area, as well as the entire length of the Mt Lofty Ranges to Fleurieu Peninsula and Kangaroo Island (Fig. 6A).

Locally common, widespread herb growing in wet areas amongst grasslands, herblands, sedgeland, lignum thickets in swamps, along watercourses particularly after flooding or underlying in open woodlands or *Acacia* or eucalypt forest; rarely in disturbed areas such as roadside drains or dams. Most commonly found in higher altitude areas of ranges above 500 m, rarely found at sea level, where it is associated with large rivers. Grows in rich soils of basalt origin or deep cracking clays through to light sandy soils derived from granites.

*Selected specimens (of c. 300 seen)*

QUEENSLAND: Darling Downs, 6 km N of Goondiwindi, 8 Sep. 2001, *A.R. Bean 17796* (CANB); Darling Downs Wyberba, 30 Dec. 1962, *S.T. Blake 21994* (MEL, NSW); Warrego District, Currawinya National Park, S end of Corni Paroo Waterhole, 17 Sep. 1992, *R.W. Purdie 4151* (CANB).

NEW SOUTH WALES: North Western Plains, 7.5 km N of Bruxner Highway at Yetman on road to Yelarbon, 7 Oct. 1990, *R.G. Coveny & R.O. Makinson 14480* (CANB, MEL, NSW); Ca 10 miles S of old Jindabyne, 8 Jan. 1963, *C.W.E. Moore 3594* (CANB, NSW); ‘Winbar’ about 40 miles S of Louth (Tundulya block area near mill), 28 Sep. 1976, *C.W.E. Moore 7390* (CANB); Black Swamp, 55 km N of Deniliquin, Oct. 1974, *W.E. Mulham 791* (NSW).

AUSTRALIAN CAPITAL TERRITORY: Cotter River district, Between Jack’s Creek and the Cotter River, 14 Dec. 1960, *R. Schodde 1224* (AD, CANB, NSW).

VICTORIA: Barmah State Park, Murray Valley Study area Sector F, subblock 40B, 18 Nov. 1985, *A.C. Beauglehole 82200* (CANB, MEL, NSW); E. Highlands, Wonnangatta Stn., upstream from Dry Rv. S17, 7 Jan. 1993, *E.A. Chesterfield 3570* (CANB, MEL); Dargo High Plains, 17 Jan. 1990, *J. Strudwick 804* (MEL).

TASMANIA: Central Highlands, Wihareja Lagoon 9 km NE of Waddamana, Feb. 1984, *A. Moscal 6571* (HO); Stone Hut, between Ouse River and Great Lake, 25 Jan. 1980, *J.J. Yates s.n.* (HO).

SOUTH AUSTRALIA: Kangaroo Island, Ravine des Casoars, s.dat., *R.J. Bates 30356* (AD, CANB); Murray, Upper Saunders Creek Gorge, s.dat., *R.J. Bates 35608* (AD, CANB); Southern Mount Lofty Range, ca 2 km S of Spring Mount Trig point, which is ca 8 km SE of Myponga (Myponga is near coast, ca 55 km SSW of Adelaide), 23 Nov. 1966, *E.A. Shaw 734* (AD, CANB, NSW).

**1b. *Stellaria angustifolia* subsp. *tenella* (Benth.)**

**C.H.Mill. & J.G.West, comb. nov.**

*Stellaria glauca* With. var. (?) *tenella* Benth., Fl. Austral. 1: 158 (1863). — *Stellaria palustris* Retz. var. *tenella* (Benth.) J.M.Black, Fl. S. Austral. 2: 231 (1924). —

**Type citation:** “Victoria. Near Melbourne, *Adamson*; Glenelg river, *Robertson*. Tasmania. Derwent river and Kitt’s Group in Bass’s Straits, *R. Brown*; granite rocks in St. Patrick’s river, *Gunn*”. **Lectotype (here designated):** Victoria, Glenelg river, *Robertson* (K, Herb. Hooker).

**Residual syntype:** Victoria. Melbourne, *F. Adamson*, 17/4/[18]53 (K, Herb. Hooker). **Excluded syntypes:** *R. Brown*, Derwent River (BM, K p.p.); V. D. Land, *Gunn 652*, St Patrick’s River 16/11/[18]44 (K, Herb. Hooker). — see *S. multiflora*.

*Arenaria axillaris* Luehm. ex Ewart, Victorian Naturalist 23: 42–43 (1906). — *Stellaria glauca* var. *axillaris* (Luehm. ex Ewart) Ewart, Proc. Roy. Soc. Victoria 19(2): 34 (1907). — **Type Citation:** “Mr. St. Eloy D’Alton, C.E.; from a peat swamp near Dimboola”. **Holotype:** MEL, n.v. **Isotype:** NSW 117582.

*Stellaria caespitosa* auct. non Hook.f.: C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 235 (1996).

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45h–i (1996), as *S. caespitosa*.

Annual, spreading mat, straggly or shortly erect herb to 14 (–20) cm long, with many short, vegetative side shoots, rooting at nodes, glabrous or rarely scabrous. *Stem and inflorescence leaves* a continuous series, sessile, lanceolate, narrowly ovate or linear, often falcate, (1.5–) 2–10 (–17.5) mm long, (0.4–) 0.6–1.5 (–2.3) mm wide, acute. *Inflorescence* axillary and solitary or rarely 2 flowers on same stem. *Pedicels* (2.7–) 6–14.5 (–20) mm long, usually deflexed in mature fruit. *Sepals* elliptic to ovate, (1.3–) 1.6–2 (–2.4) mm long, obtuse or acute, apex folded over to form a hood, hood 0.1–0.45 mm long, sometimes margins minutely serrate or ragged. *Petals* 2–3.2 (–3.9) mm long, slightly longer to twice sepal length, deeply bifid. *Stamens* 10, rarely 1 or 2 missing. *Staminodes* 0. *Styles* (1.5–) 1.9–2.6 mm long. *Capsule* ellipsoid or ovoid, (2.5–) 2.9–3.7 mm long, (1.4–) 1.6–2 mm wide, equal to up to twice as long as sepals; *valves* straight or spreading, apex only straight or slightly recurved. *Seeds* 4–9, ellipsoid or suborbicular, 0.9–1.2 mm long, red to dark ruby red, tubercles semi-inflated ridges. **Fig. 1C, 2K–P.** Flowering: Sep.–May.

*Distribution and habitat.* The taxon occurs in New South Wales from Rules Point on the Murrumbidgee

River, south to Lake Eucumbene, Hume Weir then west along the entire length of the Murray River system and in surrounding drainage areas. In Victoria it occurs in the east around the Goulburn River and coastal areas near Sale and in the west, it is scattered through the Grampians and Dimboola areas. In South Australia it occurs in the Naracoorte to Mount Gambier area and in the Mount Lofty Hills. In Tasmania it occurs on the north and west coasts and is recorded from one locality in the highlands at Oatlands (Fig. 6B).

Locally common in moist areas around swamps, rivers, lakes or dams. Often found growing in muddy or grassy areas after water has receded under open eucalypt woodlands. Found growing in rich damp soils.

#### Nomenclatural Notes.

*Stellaria glauca* var. *tenella* Benth. Four sheets from K contain type material. One sheet from the Herbarium Hookerianum has a label '1/20 44 Glenelg river 401' and written on the sheet is 'Victoria Robertson'. Additionally the name '*Stellaria glauca* var *tenella*' is written in what is thought to be Bentham's handwriting. This is a match to the locality in the protologue and the specimens match the description with very small leaves, few small flowers and sepals being rather obtuse. As these specimens are the best match to the protologue, this sheet is here designated as the lectotype.

The second sheet from the Herbarium Hookerianum has a label with '65 Melbourne 17/4/53' and written on the sheet is 'F. Adamson' and again 'var *tenella*' is written in what is thought to be Bentham's handwriting. The collection matches the locality and specimen details in the protologue but has fewer plants so it has been designated as a residual syntype.

The third sheet has two collections. The collection above the pencil line has a blue label with 'R. Brown, Iter Australiense, 1802–5 No. 5210 *Stellaria glauca* With. var. *tenella* Derwent River'. The collection below the pencil line has a blue label with "R. Brown, Iter Australiense, 1802–5 No. 5210 *Stellaria glauca* With. var. *tenella* Kent's Group Bass Straits'. The top collection matches Bentham's locality data but the bottom collection has Kent's Group rather than Kitt's Group as in the protologue. Additionally, the specimens do not match the description, as the sepals are acute rather than blunt. The collections are both *S. multiflora* and there is no indication that this sheet belonged to Herbarium Hookerianum, so the top collection is considered here to be excluded syntype material.

The fourth sheet is from the Herbarium Hookerianum and has the following labels: '652 St Patricks Rv 16/11/44 V. D Land Gunn;' and '652 Collected on Granite rocks at St Patricks River at an elevation of about 2000 feet'. Again while the locality information matches the protologue, the specimens of this collection do not match the description with the sepals being acute rather than obtuse. The specimens are all *S. multiflora* and so these are considered here to be excluded syntype material.

One sheet from BM contains type material. It has a blue label with 'R. Brown Iter Australiense 1802–5 No. 5210 Genus Caryophyll prop Polycarpiem & Alsenem Derwent V D Land 1804'. This collection matches the collection on the top half of the third Kew sheet. The specimens of this collection are *S. multiflora* and do not match the description, and so are considered here to be excluded syntype material.

*Arenaria axillaris* Luehm. ex Ewart. From examination of the isotype in NSW this taxon belongs to *S. angustifolia* subsp. *tenella*. At present the specimen from MEL has not been seen. This specimen is referred to being in the Melbourne Herbarium by Ewart in 1906. A search of MEL needs to be undertaken to ensure it still exists.

#### Selected specimens (of c. 105 seen)

NEW SOUTH WALES: Barmah adjacent to Murray River upstream from Echuca, 22 Feb. 1979, *E.A. Chesterfield s.n.* (NSW); Hume Weir, Albury District, 29 Dec. 1965, *R.J. Flynn s.n.* (NSW); Southern Tablelands, Kosciuszko National Park, southern end of Tantangara Reservoir, 26 Jan. 2007, *R.W. Purdie 6325* (CANB); Lake Victoria, Far SW of NSW, June 1945, *Tolley s.n.* (AD).

VICTORIA: Kulkyn Forest, Far NE corner, Chalka Creek, 24 km (15m) NE of Hattah PO, 14 Oct. 1972, *A.C. Beauglehole 40570* (MEL); Wallpolla Island, 26 Oct. 1972, *A.C. Beauglehole 40649* (MEL); Barmah Regional Park Grid 152: Murray Valley Study Area, 1 Jan. 1985, *A.C. Beauglehole 83536* (MEL); Corangamite Study area, between Lake Terangpom and Lake Gnarpurt, 26 km WSW of Cressy PO, 24 km NE of Camperdown, 15 Oct. 1977, *G.J. Hirth s.n.* (MEL); Nyah State Forest about 4 km N of Nyah, 6 Feb. 1977, *N. Macfarlane 985* (MEL); Cairn Curran Reservoir, near Pyrenees Highway Bridge, Grid J9, North Central Study Area, 11 Jan. 1983, *E.E. Perkins s.n.* (MEL); Lake Hume, just east of old Tallangatta, 0.5 km east of Tallangatta Vallet turnoff on Murray Valley Highway, 22 Jan. 1981, *N.H. Scarlett 81-22* (MEL); Wangaratta to Milawa road, c. 9–10 km SE of Wangaratta. Oxley Flats, 8 May 1980, *I. Tankard s.n.* (MEL).

TASMANIA: Oatlands, 4 Jan. 1913, *R.A. Black s.n.* (MEL); Pennerowne Point, 26 Jan. 1984, *A.M. Buchanan 2822* (HO); Mouth of Lagoon River, Jan. 1954, *W.D. Jackson 318* (HO).

SOUTH AUSTRALIA: Near Eden Valley, 13 Jan. 1990, *R.J. Bates 21927* (AD); Southern Lofty, Upper M[ount] Bold Reservoir, 21 Mar. 1993, *R.J. Bates 31800* (AD, CANB); Hundred of Robertson, ca 10 km S of Naracoorte, 24 Sep. 1962, *D. Hunt 1423* (AD); Cox Scrub, 16 Feb. 1990, *D.E. Murfet 908* (AD); Shores of Millbrook Reservoir, 11 Mar. 1962, *D.E. Symon 2072* (AD, BRI, CANB, NE).

#### 1c. *Stellaria angustifolia* subsp. *rotundisepala*

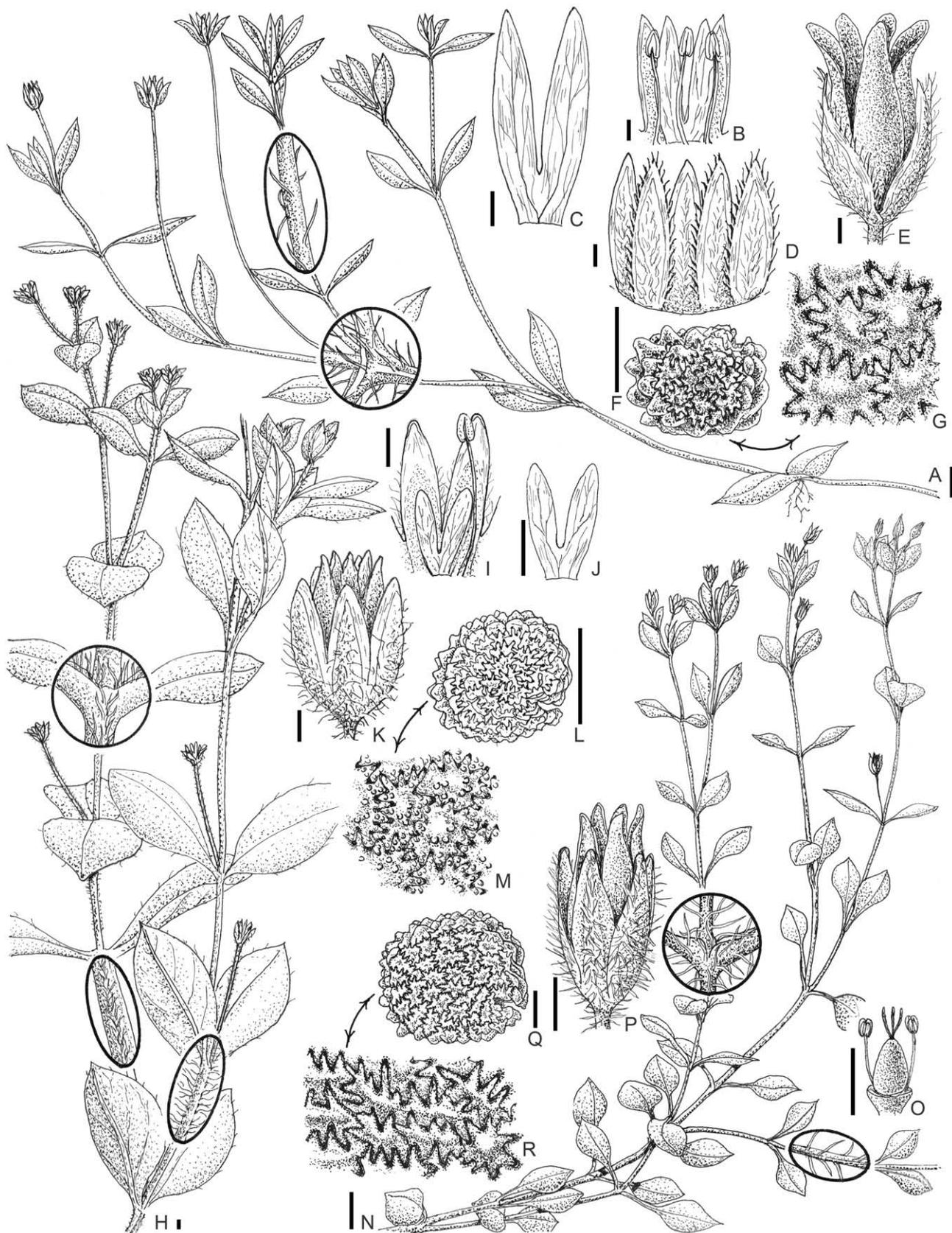
**C.H.Mill. & J.G.West, subsp. nov.**

*A subsp. angustifolia et subsp. tenella (Benth.) C.H.Mill. & J.G.West sepalis rotundatis vel late ellipticis, apice obtuso et plicato cucullato formenti; seminibus tuberculiis angustis rotundatis prominentibus, distinguenda.*

**Holotypus:** New South Wales, At Source of Murray R[iver], 6 Jan. 1992, *R.J. Bates 27162* (AD 99206284).

**Isotypi:** CANB, NSW, MEL, NY.

*Stellaria angustifolia* subsp. *Timbarra River (N.A.Wakefield 4853)* C.H.Mill. in Austral. Pl. Name Index database (APNI), <http://www.anbg.gov.au/cgi-bin/apni> [accessed



**Fig. 3. A–G** *Stellaria flaccida*: **A** habit; **B** part of flower showing sepal, petal and stamen arrangement; **C** outer view of sepals; **D** petal; **E** capsule showing position in relation to sepals; **F** seed, side view; **G** seed coat cell detail. **H–M** *S. media*: **H** habit; **I** part of flower showing sepal, petal and stamen arrangement; **J** petal; **K** flower showing capsule; **L** seed, side view; **M** seed coat cell detail. **N–R** *S. pallida*: **N** habit; **O** part of flower showing ovary, stamens and style arrangement; **P** flower showing sepals and mature capsule; **Q** seed, side view; **R** seed coat cell detail. Scale bars: habits (**A**, **H**,

6 May 2010] & Austral. Pl. Cens. database (APC), <http://www.anbg.gov.au/cgi-bin/apc> [accessed 6 May 2010].

Annual, slender, erect, usually single stemmed, (6–) 11–25 cm long, glabrous. *Stem and inflorescence leaves* a continuous series, sessile, obovate or linear or ovate or narrower, (3.5–) 6–9.5 (–13) mm long, 0.9–1.8 mm wide, acute to subacute, rarely obtuse. *Inflorescence* axillary and solitary or an interrupted monochasium of 2–3 flowers. *Pedicels* (22–) 27–40 mm long, slender, erect in fruit. *Sepals* round to broad-elliptic, 1.5–2.1 mm long, obtuse, apex folded over to form a hood, sometimes with hood thickened. *Petals* 2.4–3 mm long, longer than sepals, bifid. *Stamens* 10. *Staminodes* 0. *Styles* 0.8–1.5 mm long. *Capsule* ellipsoid to ovoid, (2.9–) 3.4–4.6 mm long, (1.8–) 2.4–3.1 mm wide, from 2 to 4 times longer than sepals; *valves* straight, apex straight. *Seeds* 2–5 (–7), suborbicular, 0.9–1.4 mm long, mid brown to reddish brown to purplish, tubercles very narrow rounded projections totally covering the seed, giving a spiny appearance. **Fig. 1B, 2Q–W.** Flowering: Jan.

*Distribution and habitat.* This taxon is restricted to high altitudes around the source of the Murray and Turross Rivers in Kosciuszko National Park in New South Wales and Timbarra River in East Gippsland, Victoria (Fig. 6C).

Found in alpine areas in wet bogs with mixed herbfields.

*Notes.* Subsp. *rotundisepala* is distinguishable from the other subspecies by its distinct seed and floral characters. Currently only three specimens are known and further collecting is needed in the areas where it occurs to obtain more information about it.

*Etymology.* Subsp. *rotundisepala* has been named to reflect the unique shape of the sepals which is not found in any other species in Australia; from the Latin *rotundus* for round and *sepalum* for a sepal.

#### *Specimens examined*

NEW SOUTH WALES: S. Tablelands, Dillundoo Valley, 11 Jan. 1970, *J.H. Willis s.n.* (MEL, NSW).

VICTORIA: East Gippsland, Timbarra River, 13 Jan. 1959, *N.A. Wakefield 4853* (MEL).

## 2. *Stellaria filiformis* (Benth.) Mattf.

Repert. Spec. Nov. Regni Veg. Beih. 100: 148, tab. VII (1938). — *Drymaria filiformis* Benth., Fl. Austral. 1: 162 (1863). — **Type Citation:** “W. Australia, *Drummond, n. 694.*” **Lectotype (here designated):** Swan River *Drummond n. 694* (K, Herb. Hooker p.p., 2 plants on right hand side of sheet). **Isolectotypes:** (K, Herb. Hooker; MEL 723012).

*Euthales* (?) *filiformis* de Vriese, Pl. Preiss. 1(3): 414 (1845).

— **Type citation:** “In solo sublimoso fertili prope praedium rusticum Dom. Marell, York, d. 30m. Martii 1840. Herb. Preiss. No. 1889.” **Holotype:** L (Herb. Lugd. Bat. sh. 909.62-546), n.v, fide J.H. Kern, Blumea 13(1): 116 (1965).

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45n–o (1996).

Annual with erect to spreading stems to 15 (–22) cm long, glabrous. *Leaves* forming a basal rosette, sessile, filiform, (4–) 7–20 (–26.5) mm long, (0.2–) 0.4–1.2) mm wide, subacute, herbaceous to fleshy; *inflorescence leaves* sessile, linear to ovate to lanceolate, (0.7–) 1–6.4 (–13) mm long, (0.25–) 0.4–1.1 mm wide, acute, scarious or sometimes herbaceous. *Inflorescence* a dichasium. *Pedicels* 2–11 (–16) mm long, wiry, erect in fruit. *Sepals* 2–4 mm long, acute to obtuse. *Petals* (0.5–) 1–1.5 (–2) mm long, shorter than half sepal length, deeply bifid. *Stamens* (2–) 3–5. *Staminodes* 0–5. *Styles* 0.2–0.6 mm long. *Capsule* narrow, ovoid to ellipsoid, (2–) 2.5–4.5 (–5.5) mm long, 1–1.5 mm wide, equal to twice sepal length; *valves* straight, rarely spreading, apex straight. *Seeds* 5–13, suborbicular, 0.5–0.75 mm long, cream, light to mid brown, smooth, with minute conical tubercles. **Fig. 1D, 4A–H.** Flowering: (June–) Aug.–Nov.

*Distribution and habitat.* This taxon has a disjunct distribution across southern Australia. There are isolated records in the Wyalong district in New South Wales. In Victoria it is confined to the north-west region around Wyperfeld National Park, south to the Grampians area and then westwards across to the south-east of South Australia as well as the Eyre Peninsula. In Western Australia it occurs from the Fraser Range in the east, Lake King, Cowcowing and west across to the Irwin River (Fig. 6D).

Locally common in mallee scrub, eucalypt woodlands and heathlands often in sandy soils and well drained shallow sandy loams, sometimes in the swales between dunes.

*Common Name.* Thread starwort.

*Notes.* *Stellaria filiformis* is distinct as it is the only species in Australia with a basal rosette of filiform leaves and it lacks prominently tuberculate seeds. Instead the seeds are smooth with minute conical tubercles, usually with pits in the top (Fig. 1D) and while the cell shape is similar to those of the subspecies of *S. multiflora*, the seeds are much smaller than those of the subspecies of *S. multiflora*.

*Stellaria filiformis* shows affinities with *S. multiflora* as they share similar habitats and reduced petals and stamens. The collections made in New South Wales are all from the 1920s. It is unusual that there are no other known collections, as the habitat in which the taxon occurs in other states is found in the central west to south west of New South Wales.

*Nomenclatural Notes.*

*Drymaria filiformis* Benth. Two sheets from Herbarium Hookerianum held at K contain type material. One sheet has two collections on it. The collection on

N) 5 mm; flowers & fruits 1 mm; ovary (O) & seeds (F, I, P) 0.5 mm. — A–G *B. Copley 5175* (AD 97810081); H–J *C.R. Alcock 605* (AD 966220095); N–R *C.R. Alcock 10738a* (AD 99021068).

the left hand side (LHS) of the pencil line has the label 'West Australian Goldfields Spencer Moore 1895' and is not considered part of the type collection. The collection on the right hand side (RHS) of the pencil line has '694 Swan river Drummond' written on the sheet and matches the protologue and has thus been designated here as the lectotype. Also written in pencil on the sheet is a description of *Drymaria filiformis* which is thought to be in Bentham's handwriting.

A second K sheet has the label 'Swan R[iver]. Drummond No 694 Pres? By W.W. Sanders, Esq. FLS'. This sheet matches the other type material and thus has been designated here as an isolectotype.

One sheet from MEL, (MEL 723012) has the label 'W.A. J Dr' with a tag with the number 694 located on the specimen. As the collecting information and the specimen match the type material this has also been designated here as an isolectotype.

*Euthales* (?) *filiformis* de Vriese. This is a legitimate taxon, as Kern (1965) discusses. It is the oldest name available for the species but, as the epithet *filiformis* is already occupied in the genus *Stellaria*, it cannot be transferred to that genus, and as such is unavailable for use.

#### *Selected specimens (of c. 70 seen)*

NEW SOUTH WALES: Pine Ridge, Wyalong, Nov. 1920, *A. Cooper s.n.* (BRI, CANB, NSW); Central W. Slopes, Upper slope of Wamboyne Mountain, W of Lake Cowal, Dec. 1993, *A.N. Rodd & A. Clements 9245* (NSW).

VICTORIA: Wyperfeld National Park, junction of track with Dattuck Track, ca 3 mls ENE of Eastern Lookout, 1 Oct. 1968, *A.C. Beauglehole 28770* (CANB, MEL); Sunset Country, E to W track, c. 35 km S of Meringur, 23 Sep. 1981, *J.H. Browne 52* (MEL, NSW); Wandown Fauna Reserve, 10 miles ENE of Annuello, 5 Sep. 1970, *N. Macfarlane 537* (MEL).

SOUTH AUSTRALIA: Northern Flinders Ranges; Baratta Hill, 11 Sep. 1986, *R.J. Bates 7164* (AD); Eyre Peninsula; Gawler Ranges, 24 Sep. 1989, *R.J. Bates 21078* (AD); Gammon Ranges ca. 65 km E of Leigh Creek, Near mouth of gorge of Arcoona Creek S of Arcoona Bluff Range, 17 Sep. 1956, *Hj. Eichler 12685* (AD); Murray; Lowan Conservation Park, 1 Oct. 1981, *A.G. Spooner 7895* (AD).

WESTERN AUSTRALIA: Goldfield Ranges survey, Flat north of range, c. 9km NE of Bungalbin Hill, 28 Sep. 1995, *M. Gibson & M. Lyons 3356 p.p.* (CANB); Cowcowing, Aug. 1904, *M. Koch 1122* (HO, PERTH); Central South, Eyre Hwy ca 23 miles (37km) E of Fraser Range, 6 Sep. 1963, *J.H. Willis s.n.* (MEL); 23 km S of Lake Grace township, 8 Sep. 1967, *P.G. Wilson 6225* (PERTH); 26 km W of Warriedar HS, 26 Sep. 1986, *P.G. Wilson 12267a* (PERTH).

### 3. *Stellaria flaccida* Hook.

Companion Bot. Mag. 1(9): 275 (1836). — *S. media* var. *flaccida* (Hook.) Hook.f., Bot. Antarct. Voy. III. (Fl. Tasman.) 1: 43 (1855). — **Type Citation:** 'Mr. Gunn (n. 450.)'. **Lectotype (here designated):** Common near Launceston amongst rocks where shaded, *Gunn 450* (K, Herb. Hooker p.p. [LHS of the pencil line], Kew Loan Number 0589-86-5). **Isolectotype:** 450 very common in dense shady thickets growing under logs, etc., [*Gunn*] (K, Herb. Hooker p.p. [LHS of the pencil line], Kew Loan Number 0589-86-7).

*Stellaria flaccida*  $\beta$  Hook., J. Bot. (Hooker) 2: 411 (1840), nom. inval.

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45j–k (1996).

Perennial, stems lax to 50 cm long, which may root at nodes, with creeping rhizome, almost glabrous to sparsely hairy. *Stem and inflorescence leaves* a continuous series, subsessile to appearing petiolate; narrow ovate, elliptic, broad ovate or obovate, (5–) 7–20 (–23) mm long, (1–) 2–10 (–17) mm wide, acute, margin entire or undulate with hairs few to almost ciliate, flaccid. *Inflorescence* axillary and solitary to a monochasium of up to 6 (–10) flowers. *Pedicels* (13–) 20–73 (–80) mm long, erect to pendant in fruit. *Sepals* 3.5–6.5 (–7.5) mm long, margins glabrous to ciliate. *Petals* (3.7–) 4–7.5 (–8.2) mm long, equal to or longer than sepals, deeply bifid. *Stamens* 10. *Staminodes* 0. *Styles* 2.2–3.7 mm long. *Capsule* usually ovoid, 5.2–7.7 mm long, (2.9–) 3.4–5 (–5.5) mm wide, equal to twice sepal length; *valves* spreading, rarely straight, apex recurved or twisted sideways, rarely straight. *Seeds* 4–14, suborbicular to obloid, 1.3–2.2 (–2.6) mm long, light grey-brown to almost black, tubercles rounded to shortly ridged, inflated. **Fig. 1H, 3A–G.** Flowering: Sep.–Mar.

*Distribution and habitat.* This taxon occurs on the tablelands and coastal plains of south-eastern Australia from southern Queensland to Tasmania, excluding the Bass Strait Islands. It also occurs westward from the Otway Ranges, and Dandenongs in Victoria as well as in the Southern Lofty Ranges and on Kangaroo Island in South Australia (Fig. 6E).

The species grows in damp sites associated with rivers and creeks in fern communities, rainforests, and wet sclerophyll to tall open eucalypt forests, often with grassy understorey; often found in disturbed areas such as along roadsides and tracks. It occurs on a range of soil types from sands to silts and clays and on granite, basalt, limestone and sandstone.

*Notes.* The indumentum of the sepal margins varies considerably with the most common state consisting of two sepals with glabrous margins, one sepal with one margin ciliate and one margin glabrous, and two sepals with both margins ciliate. The degree of hairiness of the margins varies from almost glabrous with a few hairs on the base of the margins to densely ciliate along the entire margin; almost every state between the two has been observed. This pattern of distribution of the hairs is also found in the introduced taxon *S. graminea*. Specimens on the edges of the distribution range, particularly in Queensland and South Australia, tend toward *S. angustifolia* in being more glabrous and having leaves closer to linear.

#### *Nomenclatural Notes.*

*Stellaria flaccida* Hook. Two sheets from Herbarium Hookerianum held at K contain type material. The

first sheet has two collections, the first on the LHS of the pencil line has a label with '[Gunn] 450 Stellaria flaccida Common near Launceston, amongst rocks where shaded' and hand written on the sheet is 'No. 450. Mr. Gunn Van D's Land St. flaccida Hook' in what is thought to be Hooker's handwriting. As this information and the specimen match the protologue it is here designated as the lectotype. On the RHS of the sheet is another collection from Kiama NSW and it is not type material.

The second sheet has two collections on it. The first label attached to the specimen on the LHS of the pencil line, has '450 Stellaria flaccida Hook Very common in dense shady thickets growing under logs, etc' on it. This information matches the protologue and thus is here designated as the isolectotype. The second label has '450/1842 V D Land Gunn Circular Head 4/11/37' written on it, which post-dates publication and is thus not considered to be type material. This collection also has a handwritten note in Hooker's hand; 'Stellaria flaccida  $\beta$  450 Gunn V D land'. This name was invalidly published by Hooker (1840).

#### Selected specimens (of c. 235 seen)

QUEENSLAND: Mount Merino, Beerenbano Lookout, 2 Dec. 1970, I.R. Telford 2625 (BRI, CANB).

NEW SOUTH WALES: 12 miles S of Nowedoc, Pigeon Top and track, 7 Nov. 1972, J. Carrick 3287 (AD); SE Coast, Mt Dromedary near central Tilba, which is ca 190 km N of Vic border, 26 Apr. 1973, R.J. Chinnock 266 (AD); NT, Eastern side of current Barrington trail c. 100 m S of TO to Little Murray camping area, Barrington Tops National Park, 9 Apr. 2003, J.R. Hosking & B.J. Neilly 2301 (CANB).

VICTORIA: On track to summit of Mt Ellery, between Big River Track and summit, 22 Feb. 1984, D.E. Albrecht & B.J. Conn 211 (BRI, MEL); Near Delegate [Mount], 8 Jan. 1992, R.J. Bates 27246 (AD); D26 Grampians, Victoria Range, Victoria Range Track (W of Sawmill Track), on top of range, 14 Jan. 1969, A.C. Beaglehole 30262 (MEL); Gippsland region, Wilson's Promontory National Park. Along road from carpark to Mt Oberon, 6 Dec. 1975, H.J. Eichler 21793 (CANB).

TASMANIA: Four Mile Stream, 6 km S of Falmouth, 23 Nov. 1974, R.J. Chinnock 2180 (AD); Ferntree, Mt Wellington, 1 Jan. 1972, J.H. Hemsley 6658 (HO, NSW); Midlands, Kubla Khan Cave State Reserve ca 10 km W of Mole Creek township, 16 May 1983, A. Moscal 2392 (HO); Central Highlands, East slope of Archers Sugarloaf, Feb. 1986, A. Moscal 12501 (HO); Ben Lomond Tower Hill, East Tower, Feb. 1980, M.G. Noble 29078 (HO).

SOUTH AUSTRALIA: Kangaroo Island, Ravine des Casoars, s.dat., R.J. Bates 30356 (AD, CANB); Ravine des Casoars, s.dat., R.J. Bates 30425 (AD, CANB); Waterfall Gully, near Adelaide, 16 Nov. 1887, J.H. Maiden s.n. (NSW).

#### 4. \* *Stellaria graminea* L.

Sp. Pl. 1: 422 (1753). — **Type Citation:** 'Habitat in siccis juniperetis sepibus Europea'. **Lectotype:** Herb. Burser XI: 111 (UPS n.v.; LINN 584, photo), fide Jonsell & Jarvis in Nordic J. Bot. 14: 159 (1994).

**Illustration.** C.H. Mill. & J.G. West in N.G. Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45g (1996).

Perennial, usually erect single or several stemmed to 60 (–89) cm long, sometimes with short vegetative side

shoots, with a slender rhizome and frequently rooting at nodes, glabrous except for hairs on margins of leaves and some sepals. *Stem leaves* sessile, narrow ovate, linear or obovate, (7.3–) 10–30 (–35) mm long, (1.6–) 2–5 (–5.3) mm wide, acute to subacute, herbaceous; *inflorescence leaves* sessile, ovate to broadly ovate, triangular, (1.8–) 2.5–6 (–9.2) mm long, (0.6–) 1–2 (–2.6) mm wide, scarious, rarely green. *Inflorescence* usually a dichasium. *Pedicels* (9–) 15–50 (–75) mm long, slender, erect in fruit, usually ridged. *Sepals* (2.3–) 3–6 (–6.7) mm long, margins glabrous to ciliate, acute. *Petals* (1.5–) 2.2–5.2 (–5.9) mm long, shorter than to longer than sepals, very deeply bifid. *Stamens* 10, often innermost whorl of 5 reduced but functional. *Staminodes* 0. *Styles* (1–) 1.5–3.5 (–4) mm long. *Capsule* ovoid to ellipsoid, 3.3–4.8 mm long, 1.8–2.8 mm wide, equal to or longer than sepals; *valves* straight, apex straight or sometimes upper margin recurved. *Seeds* 6–10 (–26), suborbicular to ellipsoid, (0.5–) 0.8–1.2 mm long, reddish brown to ruby red, tubercles narrow ridges, semi-inflated. **Fig. 1E, 5A–G.** Flowering: Nov.–Feb.

**Distribution and habitat.** This species has been collected only a few times from five localised areas in Australia. It appears to have been introduced into Tasmania first in the early 1900s at Tyenna and Junee River. The last collection on the main island was at Junee River in 1942. One specimen has been collected from King Island in 1979. In Victoria it has only been collected once from the Cann River in 1946. In New South Wales several collections dating from 1951 until 2007 have been made in the Kosciuszko region. In South Australia one specimen has been collected from Parawa in 1984 (Fig. 6F). The native range is thought to be most of Europe but the species has also spread and is now found throughout Europe and North America and is considered to be a weed (Chater & Heywood 1993).

This is a rare weed that is found in very damp areas on the edges of rivers, swamps, lakes in grassland or *Leptospermum* scrub. It grows in soils that retain moisture such as black mud or granites.

**Notes.** *Stellaria graminea* can be distinguished from the endemic *S. angustifolia* by its dichasial inflorescence that has differentiated floral leaves and by its distinct pattern of hairs on the sepal margins. This pattern of hairs is also found in the Australian species *S. flaccida*. This character is also useful to distinguish *S. graminea* from the European species *S. palustris*. *S. graminea* can be distinguished from *S. flaccida* by its dichasial inflorescence that has dimorphic floral leaves.

#### Specimens seen

NEW SOUTH WALES: S. Tablelands, [Kosciuszko], Diggers Ck, 25 Jan. 1951, L.A.S. Johnson & E.F. Constable s.n. (NSW); Southern Tablelands, Kosciuszko National Park, on track from Charlottes Pass to Blue Lake on right hand side in drainage line on last hillside before, 22 Feb. 2007, J. McAuliffe et al. 732 (CANB); S. Tablelands, [Kosciuszko], White River area, 24 Jan. 1967, T.Y. Stead s.n. (NSW); S. Tablelands, [Kosciuszko], Diggers Ck Lake, National Park, 2 Feb. 1978, J. Thompson 2777 (NSW).

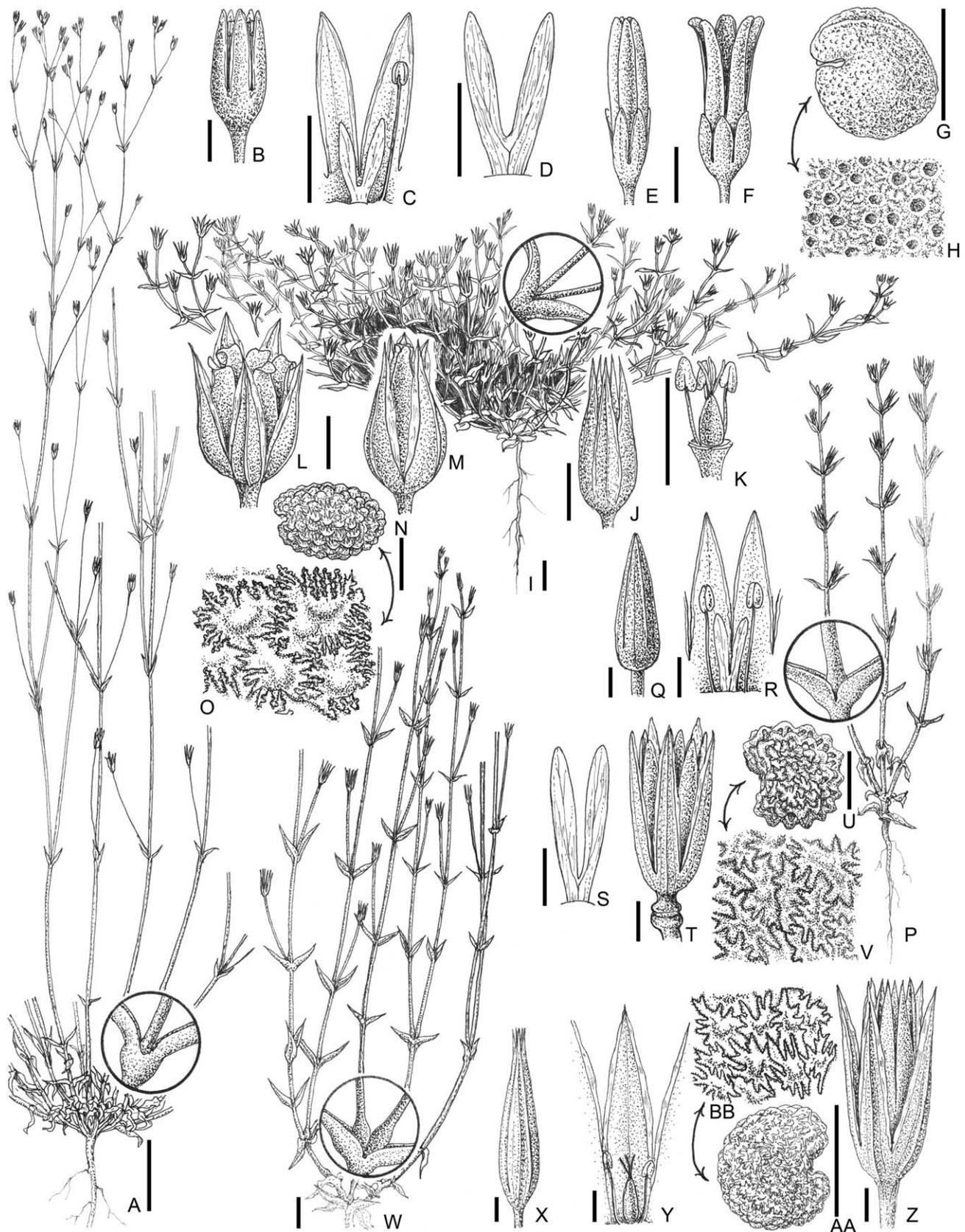


Fig. 4. A–H *Stellaria filiformis*: A habit; B flower; C part of flower showing sepal, petal and stamen arrangement; D petal; E flower showing mature capsule; F flower with opened capsule; G seed, side view; H seed coat cell detail. I–O *S. multiflora* subsp. *multiflora*: I habit; J flower; K part of flower showing ovary, stamen and style arrangement; L flower showing mature capsule; M flower with immature capsule; N seed, side view; O seed coat cell detail. P–V *S. multiflora* subsp. *collaris*: P habit; Q flower; R part of flower showing sepal, petal and stamen arrangement;

VICTORIA: East Gippsland, Cann River Grid Z31, 1946, N.A. Wakefield 3691 (MEL).

TASMANIA: June River, 19 Dec. 1942, H. & J. Gordon s.n. (HO); Waratah, Dec. 1924, A.H.S. Lucas s.n. (NSW); King Island, Sea Elephant River, 9 Jan. 1979, D.I. Morris 7964 (HO); East Coast Tyenna, Nov. 1903, L. Rodway s.n. (HO).

SOUTH AUSTRALIA: 2 km W of Parawa, 28 Jan. 1984, R.J. Bates 3652 (AD).

**5. *Stellaria leptoclada* (Benth.) C.H.Mill. & J.G.West, comb. nov.**

*Stellaria glauca* var. (?) *leptoclada* Benth., Fl. Austral. 1: 158 (1836). — **Type citation:** “New England, C. Stuart”.

**Holotype:** New England, C. Stuart (K, Herb. Hooker).

*Stellaria* sp. *leptoclada* (B.G.Briggs 2194) C.H.Mill. In: Austral. Pl. Name Index database (APNI), <http://www.anbg.gov.au/cgi-bin/apni> [accessed 6 May 2010] & Austral. Pl. Cens. database (APC), <http://www.anbg.gov.au/cgi-bin/apc> [accessed 6 May 2010].

Annual, fine, small, weak to erect, single or several stemmed to 20 (–30) cm long, sometimes arising from (loose) basal rosette, glabrous, scabrous or with hairs sparsely scattered on stems. *Stem and inflorescence leaves* a continuous series, often attenuate, appearing petiolate; narrowly obovate, linear to narrowly ovate, (2–) 3–17 (–20) mm long, (0.6–) 0.8–2 (–3.4) mm wide, acute to subacute, entire, margin scabrous, toothed or with short hairs on lower parts, rarely scabrous on midrib. *Inflorescence* a monochasium. *Pedicels* (9–) 14–34 (–45) mm long, slender, erect, often reflexed in fruit, glabrous or slightly scabrous. *Sepals* (3–) 3.5–5.2 (–5.6) mm long, acute to acuminate. *Petals* (3–) 3.4–5 mm long, shorter than to slightly longer than sepals; deeply bifid. *Stamens* 10. *Staminodes* 0. *Styles* (1–) 1.5–2.2 mm long. *Capsule* narrowly ovoid to ellipsoid, rarely broader, 3.2–4.8 (–5.5) mm long, 1.5–2.4 mm wide, usually equal to slightly longer than sepals, rarely shorter than sepals, *valves* spreading or straight, apex straight or recurved. *Seeds* (5–) 10–14 (–22), suborbicular, rarely broadly reniform, (0.55–) 0.6–0.85 (–1.1) mm long, light to mid or reddish-brown, tubercles narrow ridges, semi-inflated. **Fig. 1F, 2X–DD.** Flowering: Aug.–Jan.

*Distribution and habitat.* There is a single specimen known from south-east Queensland in the Silverwood area. The remaining specimens have been collected from New South Wales mostly from the Great Dividing Range from Boggabri in the north to Gloucester in the south (Fig. 6G).

Scattered to locally common in moist sites in undisturbed grassland under open woodlands or forests. It grows on granites or soils derived from granite, or rarely on serpentine or basaltic soils.

*Notes.* *S. leptoclada* is a relatively rare herb that has frequently been overlooked. *S. leptoclada* can be

distinguished from *S. angustifolia* using habit, leaf shape, indumentum and floral characters. It differs from *S. graminea* in its habit, leaf shape and lack of differentiated floral leaves. It also has a much more restricted geographic distribution. See also notes under *S. angustifolia*.

*Selected specimens (of c. 40 seen)*

QUEENSLAND: Silverwood, Sep. 1922, C.T. White 1713 (BRI).

NEW SOUTH WALES: Near Cobar, Sep. 1910, L. Abrahams s.n. (NSW); Watchimbark Creek, NW of Gloucester, 21 Sep. 1968, D.F. Blaxell & R.G. Coveny 6 (NSW); Graman, Jan. 1959, T.V. Bourke s.n. (NSW); Coulson’s Creek, foot of Liverpool Range, N of Merriwa, 28 Sep. 1968, B.G. Briggs 2194 (NSW); Warialda, Aug. 1933, F. Browne s.n. (NSW); North Western Slopes, Warrabah National Park, semi-cleared area, 2.5 km E of camping area, 5 Oct. 2001, L.M. Copeland 3198 (CANB); NW Slopes, Ashford Road via Bonshaw Road, 17 Oct. 1993, R.G. Coveny & A.J. Whalen 16649 (CANB); Attunga State Forest, 27 Sep. 1985, J.R. Hosking 323 (CANB, NE); North-west Slopes, eastern side of Woodsreef mine, 27 Aug. 1992, J.R. Hosking 516 (CANB, MEL, NE); [Dumaresq] dam, above walking track, 18 Oct. 1990, S. McIntyre s.n. (NSW); Wallangra, 28 Sep. 1929, Ex Herb Rodway 603 (NSW); Glenn Innes, Mar. 1913, H. Wenzholz s.n. (NSW).

**6. \* *Stellaria media* (L.) Vill.**

Hist. Pl. Dauphiné (Villars) 3(1): 615. (1789). — *Alsine media* L., Sp. Pl. 1: 272 (1753). — **Type citation:** ‘Habitat in Europea cultis’. **Lectotype:** Herb. Linn. No. 388.1 (LINN, Photo), fide Turrill in Turrill & Milne-Redhead, Fl. Trop. E. Africa, Caryophyllaceae: 24 (1956); image also available at <http://www.nhm.ac.uk/jdsml/research-curation/research/projects/linnaean-typification>

*Stellaria media* (L.) Cirillo, Essent. Pl. Char. Comment. 36 (1784), nom. inval.

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45a–b (1996).

Annual, semi-erect to erect herb to 40 (–56) cm long with long straggly branches, may root from nodes, with single line of hairs down internodes and pedicels and hairs on the back of sepals and leaf margins. *Stem and inflorescence leaves* a continuous series, the lower leaves are often petiolate, narrowed, very attenuate, 1–15 (–18) mm long, upper part broad ovate to ovate to elliptic, rarely linear, (3.5–) 6–18 (–24.5) mm long, (1–) 2–10 (–14) mm wide, acute, often undulate. *Inflorescence* a condensed, leafy dichasium. *Pedicels* (2.1–) 4–16 (–22) mm long, erect in fruit. *Sepals* 3–5.5 (–6) mm long, obtuse, often forming small hood, often with purple mark, outer sepal backs sparsely to densely hairy, frequently glandular, rarely glabrous. *Petals* (1.6–) 2.5–3.6 mm long, half to almost sepal length, deeply bifid. *Stamens* 3–5. *Staminodes* 0, rarely 1–3. *Styles* 0.5–0.8 (–1) mm long. *Capsule* ovoid to ellipsoid, (3–) 4–6 (–6.5) mm long, 2.2– 3.5 (–3.8) mm wide, just

S petal; T flower showing mature capsule and thickened collar on pedicel; U seed, side view; V seed coat cell detail. W–BB *S. multiflora* subsp. *nebulosa*: W habit; X flower; Y part of flower showing sepals, ovary, stamen and style arrangement; Z flower showing mature capsule; AA seed, side view; BB seed coat cell detail. Scale bars: habits (A, I, P, W) 5 mm; flowers & fruits 1 mm; petals (D, S), ovary (K) & seeds (G, N, U, AA) 0.5 mm. — A–H R.J. Chinnock 7348 (CANB 00523485); I–N R.J. Bates 30390 (AD 99328276); O–U H.J. Eichler 12833 (AD 95727048); V–AA R.J. Bates 25994 (AD 99146306).

shorter than to longer than sepals; *valves* spreading, apex recurved or straight. *Seeds* (5–) 7–15, discoid to flattened-ellipsoid, (0.8–) 0.9–1.2 (–1.4) mm long, red to black to dark purplish-brown, tubercles rounded hills, semi-inflated, cell walls with minute papillae. **Fig. 1G, 3H–M.** Flowering: all year, but predominantly July–Dec.

*Distribution and habitat.* Occurs in the North from Bundaberg, Queensland along the east coast and Great Dividing Range through New South Wales to the Victorian coast and mountains, along the Murray floodplain and west to South Australia from Adelaide and surrounding ranges as far west as Port Lincoln. Also occurs in eastern Tasmania and the Bass Strait Islands. There are a few records for the Northern Territory from Alice Springs and in Western Australia from coastal areas from Albany to just north of Perth. Also a single specimen is known from Kununurra in northern Western Australia. There are also scattered occurrences outside these areas in gardens (Fig. 6H). The native range is thought to be throughout Europe except in the extreme north (Chater & Heywood 1993), but it is currently found on every continent, absent only from the polar regions and very dry areas. It is an important economic weed of crops.

*Stellaria media* is a common introduced weed, especially in areas of disturbance such as roadsides, waterways and areas of cultivation. Usually found in shady or moist places in coastal dunes, grass or herbfields, gully forests, open forests, heathlands, scrubs or swamps. Grows on most substrates from rocky soils to sands.

*Common name.* Chickweed, Common Chickweed.

*Notes.* *S. media* is frequently confused with *S. pallida*. From close examination of Australian material and limited overseas material it has become apparent that there are problems in the delimitation of these two taxa. The main character that distinguishes them is the presence or absence of petals. In the Australian specimens of *S. pallida* petals are always absent, and the character state of reduced or minute petals does not occur. However, non-Australian literature indicates that this is not always the case overseas (Clapham et al. 1952; Morton 1972; Rabeler 1988; Chater & Heywood 1993; Morton 2005).

In Australian specimens of *S. media* the petals are always present and easily visible. In occasional specimens the petals may be very short but they are always bifid. However, there are several other characters where there is a slight overlap between the two taxa. The most useful character to distinguish the two species is the number of stamens. *S. media* usually has 3 – 5 stamens present or very rarely only two. *S. pallida* has 2 stamens or very rarely 3 or 4. Seed colour and size can also be useful. In less than 10% of *S. pallida* specimens seeds measure more than 0.8 mm in diameter. *S. pallida* has either pale seeds only or a mixture of dark and light seeds in one capsule. The seeds in *S. media* are usually

1 mm or larger in diameter, rarely less. The colour of *S. media* seed is brown to black or occasionally medium brown but they are never pale when mature. *S. pallida* has shorter stigmas (0.5 mm or shorter) and these tend to be spreading and reflexed. By contrast, *S. media* has longer stigmas (0.5 mm or longer) and these are mostly erect with only the apex revolute.

Characters traditionally used in keys to separate these taxa such as sepal length, the presence of glandular hairs on backs of sepals and the attachment of the upper leaves show too much variation and overlap to be useful.

In non-Australian literature these two taxa have usually been treated separately, particularly in recent years (Chater & Heywood 1993; Chen & Rabeler 2001; Morton 2005). This is also the case in the Australian literature (Curtis 1975; Chorney 1986; Doust 1990; Miller & West 1996). Chromosome numbers also support this separation with *S. media* having  $2n=40, 42, 44$  and *S. pallida* having  $2n=22$  (Chen & Rabeler 2001; Morton 2005).

*Nomenclatural Notes.* In some Australian literature the authorship of *S. media* has been given as “(L.) Cirillo”. However Cirillo (1784) did not validly publish the combination, as he did not definitely associate the generic name and the specific epithet.

#### *Selected specimens (of c. 295 seen)*

QUEENSLAND: Leslie Dam, 10km W of Warwick, 3 Oct. 2000, *G.N. Batianoff & C. Appelman 2010375* (CANB); Athol Hall, near Westbrook, about 11 km SW of Toowoomba, 05 Sep. 1947, *S.L. Everist 3156* (BRI); Jolly’s Falls, c. 2.5km WNW of the Summit railway siding, 12 Sep. 2003, *B.L. Lepshi et al. 4955* (CANB); In grounds of CSIRO Long Pocket Laboratories, Indooroopilly, Brisbane, 19 July 1973, *V.K. Moriarty 1330* (CANB).

NEW SOUTH WALES: S. Tablelands, Bendethera Caves, 20 miles [32 km] c. W of Moruya, 10 May 1966, *E.F. Constable 6863* (NSW); Murrumbidgee River, in Euroley State Forest (1 km N of entrance), 20 Sep. 1992, *C.H. Miller & J. Palmer 590* (CANB); Broken Hill, 24 Oct. 1927, *A. Morris s.n.* (AD); North Coast Clouds Creek, via South Grafton, 1 Nov. 1949, *H.M. Provisional School 31* (NSW); C. Tablelands, Cocks R, 6 miles [9.6 km] W of Little Hartley, 30 Aug. 1970, *J. Thompson 628* (NSW).

AUSTRALIAN CAPITAL TERRITORY: S. Tablelands, Turner, Canberra, 5 Sep. 1964, *H.S. McKee 11590* (NSW)

VICTORIA: Gippsland region, Raymond Island, SW corner, 14 km SE of Bairnsdale, 27 Sep. 1992, *I. Crawford 1885* (CANB, MEL, NSW); Just inside entrance of Johnson Swamp Game Reserve, 4.6 km off Kerang to Leitchville Road, 24 Sep. 1992, *C.H. Miller & J. Palmer 601* (CANB); Port Phillip Bay, Mud Island, Oct. 1983, *J. Yogovic s.n.* (MEL).

TASMANIA: King Island, Councillor Island, east coast of King Island, 8 July 1966, *W. Bartlett s.n.* (HO); Central Highlands, Wild Dog Tier, Mar. 1984, *A. Moscal 6787* (HO); Mt. Field, beside Sitzmark Lodge, Mt. Field National Park, 6 Jan. 1978, *J.M.B. Smith 320* (HO); Lenah Valley, 2 Aug. 1963, *P.A. Tyler s.n.* (HO); East Coast East of Bicheno township, on seaward side, Jan. 1983, *J.G. West 4833* (HO); Furneaux Group, Mount Chappell Island, 12 Aug. 1973, *J.S. Whinray 1141* (MEL); Kents group, Deal Island, Lighthouse Gully, 29 Nov. 1970, *J.S. Whinray 1251* (CANB).

NORTHERN TERRITORY: AZRI [Arid Zone Research Institute, Alice Springs], 18 Oct. 1985, *P.K. Latz 10260* (DNA); Alice Springs, 19 Sep. 1977, *A.S. Mitchell 419* (AD, DNA).

SOUTH AUSTRALIA: Southern Eyre Peninsula, 12 Ellen St, Port Lincoln, 19 Aug. 1965, *C.R. Alcock 605* (AD, NSW); Southern Lofty, Onkaparinga Gorge, Oct. 1991, *R.J. Bates 25970* (AD, CANB); South-eastern, 71 Crouch St, Mt Gambier, 11 Oct. 1969, *B. Copley 2826* (AD, NSW); Koonamore Station, ca. 400 km NNE of Adelaide, near Bindyi, Mustering Pdk no. 3, 7 Sep. 1973, *M.D. Crisp 547* (CANB); Nixon-Skinner Conservation Park, Hundred of Myponga, Section 245, 25 Sep. 1974, *T.M. Heddle & R.B. Heddle WSK27* (AD); Bool Lagoon, ca 25 km S of Naracoorte, 18 Sep. 1961, *D. Hunt 436* (AD); Northern Flinders Range, Leigh Creek township, (ca 280 km NNE of Pt Augusta), East Park, 27 Sep. 1971, *T.R.N. Lothian 5162* (AD); Southern Flinders Range, Mambray Creek (Mt Remarkable National Park), ca 40 km SSE of Port Augusta, Lower Alligator Creek area, 7 July 1974, *D.J.E Whibley 4379* (AD).

WESTERN AUSTRALIA: Lake William, West Cape Howe, 30 km W of Albany, 10 Sep. 1987, *G.J. Keighery & J.J. Alford 1819* (PERTH); Oria Orchards, Packsaddle Plain, 8.3 km from Kununurra PO bearing 218 degrees, 2 Aug. 2002, *A.S. Mitchell 7341* (CANB); Pig Saleyard, Mt Barker, 1 Sep. 1979, *G. Perry 948* (PERTH).

**7. *Stellaria multiflora* Hook.**

Companion Bot. Mag. 1: 275 (1836). — **Type Citation:** ‘*Mr. Gunn (n. 451)*’. **Lectotype (here designated):** V D’s Land, *Mr Gunn No. 451* [maybe written in Hookers hand] (K, herb. Hooker p.p., two plants in centre of sheet inside pencil line box).

*Stellaria* sp. *Cooyar* (*A.R.Bean 10622*) Qld Herbarium, Austral. Pl. Name Index database (APNI), <http://www.anbg.gov.au/cgi-bin/apni> [accessed 6 May 2010] & Austral. Pl. Cens. database (APC), <http://www.anbg.gov.au/cgi-bin/apc> [accessed 6 May 2010].

*Stellaria glauca* var. *tenella* auct. non Benth.: Benth., Fl. Austral. 1:158 (1863), p.p., only with respect to Robert Brown’s and Gunn’s Tasmanian collections.

Annual with slender taproot, sometimes rooting at nodes; glabrous or with sparse hairs on stems and leaf margins; stems prostrate and mat-forming or spreading to erect, to 25 (–45) cm long. *Stem and inflorescence leaves* in a continuous series, sessile to appearing petiolate; obovate to elliptic to ovate to lanceolate or linear, (1.5–) 2.5–11 (–17.5) mm long, (0.3–) 0.7–2.5 (–3.5) mm wide, acute to obtuse, glabrous or with hairs sparse on lower half of margin. *Inflorescence* of (2–) 3–15 (–27) flowers, interrupted monchasium to a well-developed monochasium. *Pedicels* 0.5–2.0 (–2.6) mm long, erect in fruit, quadrangular, smooth, collar beneath fruit present or absent. *Sepals* 2–5.5 (–6) mm long, acute to acuminate, straight or bent. *Petals* 0 or 2–5, rarely 6, (0.2–) 0.4–1 (–1.2) mm long, shorter than half sepal length, shortly bifid or entire. *Stamens* (2–) 3–10. *Staminodes* 0–5. *Styles* 0.2–0.8 mm long. *Capsule* narrow to broad, ovoid to ellipsoid, (2–) 2.5–5.5 (–6) mm long, 1–2.5 (–3.5) mm wide, from 0.75 to 1.5 times sepal length; *valves* spreading or straight, apex straight, recurved to revolute in upper half. *Seeds* (3–) 5–21 (–25), suborbicular to broadly ellipsoid to reniform, 0.5–1 (–1.3) mm long, yellow, light to mid brown,

sometimes reddish, tubercles rounded to narrow ridges, often inflated. Flowering (Jul.–) Aug.–Dec. (–Feb.).

*Distribution.* A widespread endemic species in temperate Australia, from south-eastern Queensland, eastern New South Wales, Victoria, southern South Australia, south-western Western Australia, Tasmania and the Bass Strait Islands.

*Notes.* *S. multiflora* is a taxon of considerable variability and requires further study. We have decided to recognise some of the more obvious variation at subspecies level as there is sufficient evidence to warrant this but more work needs to be done.

The members of the *S. multiflora* can be distinguished by the reduction of the floral structures, particularly the petals and stamens. These characters are variable, which is problematic for the identification of these taxa. However by using a combination of characters, or indeed a shared lack of characters, the following taxa can be determined. It is interesting that one of the key characters for delimiting the genus *Stellaria*, the presence of bifid petals is not always observed in this complex. The petals when present are usually minute, less than 1 mm long and can be reduced to fragments. The stamens are also reduced, usually less than 1 mm long and staminodes are also sometimes present.

The specimen *A.R. Bean 10622* (*Stellaria* sp. *Cooyar*) has been examined and belongs to *S. multiflora*. The specimen is very immature and the floral characters place the specimen in either subsp. *multiflora* or subsp. *nebulosa*. Mature fruit is required to place it definitively.

*Nomenclatural Notes.*

*Stellaria multiflora* Hook. One sheet from Herbarium Hookerianum held at K contains type material. The first label attached to the top LHS of the sheet with one plant is ‘451/1842 Launceston 15/10/41’. As the collecting date post-dates publication, it is not considered to be type material. The second label in the middle of the sheet, defined by a pencil line, has two plants with the following written on the sheet; ‘No. 451 Stell. multiflora Hook. V. Ds L and Mr Gunn Petals 0’. Gunn 451 matches the protologue and thus is here designated as the lectotype. The third label at the bottom of the sheet associated with several plants has ‘1077 V. D[iemens] Land JDH[ooker]’ written on it and as this does not match the protologue, it is not considered to be type material.

**Key to subspecies of *S. multiflora***

- 1. Mature fruit broadly ellipsoid, usually > 2 mm wide; valve apex strongly revolute. . . . . **a.** subsp. *multiflora*
- 1: Mature fruit narrowly ovoid to narrowly ellipsoid, < 2 mm wide; valve apex straight or slightly recurved, never revolute
- 2. Fruiting pedicels with distinct collar, pedicel at collar > 0.5 mm wide; petals 3–5 (–6), minute but usually bifid. . . . . **b.** subsp. *collaris*
- 2: Fruiting pedicels lacking collar, pedicel c. 0.5 mm wide or less; petals absent. . . . . **c.** subsp. *nebulosa*

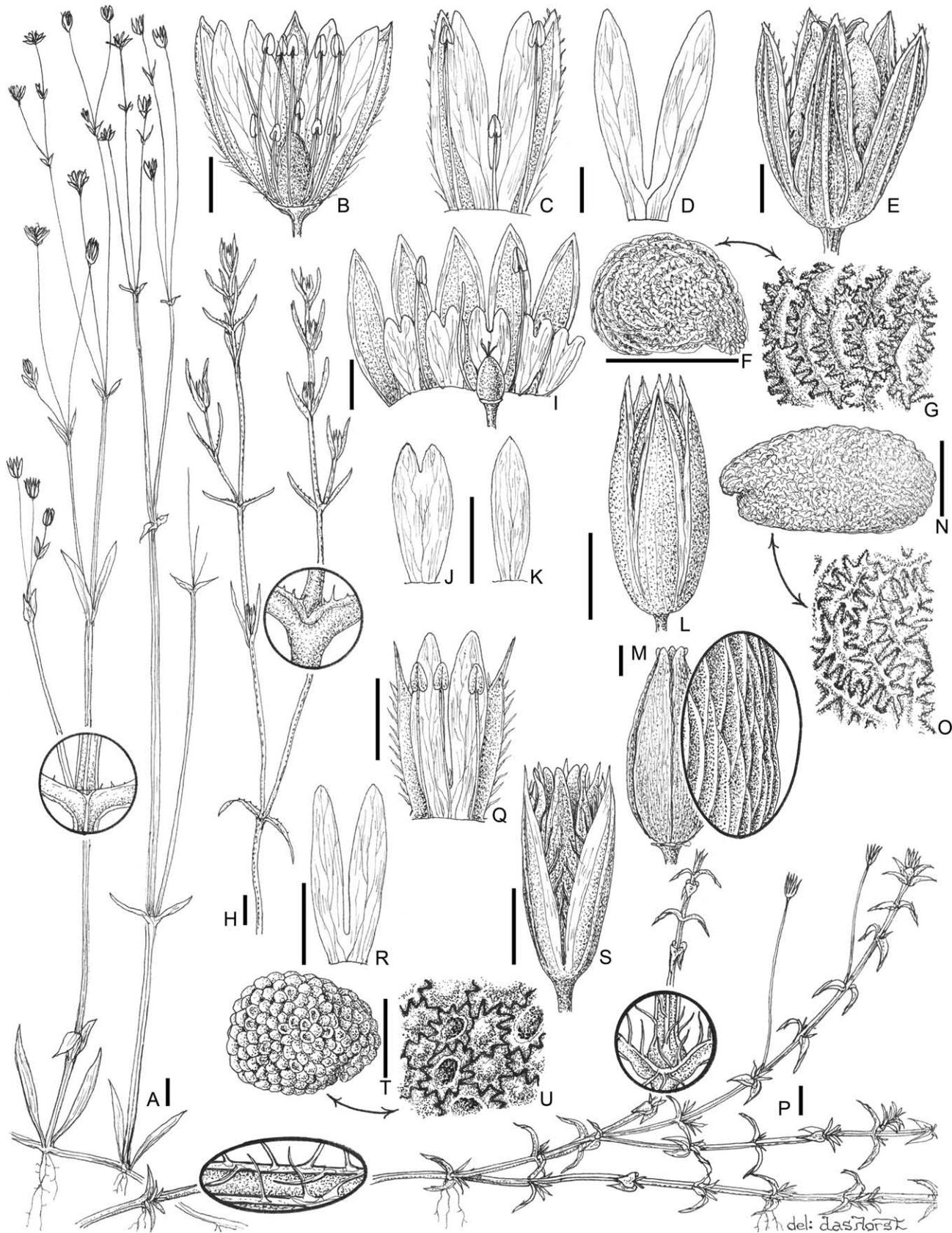


Fig. 5. A–G *Stellaria graminea*: A habit; B cross section of flower showing sepal, petal and stamen arrangement; C part of flower showing detail of sepal, petal and stamen; D petal; E capsule showing position in relation to sepals; F seed, side view; G seed coat cell detail. H–O *S. papillata*: H habit; I part of flower showing sepal, petal and stamen arrangement; J–K petal; L flower showing capsule; M mature capsule showing detail of surface papillae; N seed, side view; O seed coat cell detail. P–U *S. pungens*: P habit; Q part of flower showing sepals, petals and stamen arrangement; R petal;

**7a. *Stellaria multiflora* Hook. subsp. *multiflora***

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45r–t (1996).

Annual, often mat-forming or erect to 16 (–36) cm long, sometimes rooting at nodes, glabrous. *Stem and inflorescence leaves* in a continuous series, sessile to appearing petiolate; obovate, elliptic, ovate or linear, (3–) 4–9.8 (–11.5) mm long, (0.6–) 1–2.5 (–3.5) mm wide, acute to subacute. *Inflorescence* a monochasium. *Pedicels* 0.5–10 (–20) mm long, collar absent. *Sepals* (2–) 2.5–4.5 (–5) mm long. *Petals* 0, sometimes 2–4, (0.2–) 0.5–0.8 (–1) mm long, shortly bifid or reduced to a single arm. *Stamens* 5–10. *Staminodes* usually 0, sometimes 1–4. *Styles* 0.3–0.6 mm long. *Capsule* broad ellipsoid, (2–) 2.5–5 (–5.5) mm long, (1.5–) 2–3 (–3.5) mm wide, 0.75 to 1.25 times sepal length; *valves* straight or spreading, apex strongly revolute. *Seeds* (5–) 7–21, suborbicular to broadly ellipsoid, 0.5–1 (–1.3) mm long, yellowish, light to mid to reddish brown, tubercles rounded ridges, inflated. **Fig. 1L, 4I–O.** Flowering: Aug.–Nov.

*Distribution and habitat.* Subsp. *multiflora* is widespread but uncommon. There is one record from south-eastern Queensland from the Bunya Mountains collected in 1919, but the majority of collections are found in south-eastern Australia from the southern tablelands and alpine areas of New South Wales, eastern Victoria and central to eastern Tasmania. There are a few scattered collections in south-central and south-western Victoria. It also occurs in the Mt Lofty Ranges and on Kangaroo Island in southern South Australia. There are also a few collections from south-west Western Australia, one collected in 1867 from Porongurup, one collected in 1986 from Hamersley Inlet and a couple of early collections by J. Drummond with a locality of Swan River (Fig. 6I).

It grows in various habitats from damp eucalypt forests to woodlands and grasslands, alpine to subalpine areas or rarely found in coastal situations. Grows in rocky sites or shallow soils overlying granite or dolerite.

*Selected specimens (of c. 110 seen)*

QUEENSLAND: Bunya [Mountains] RAOU Exn, Oct. 1919, C.T. White s.n. (BRI).

NEW SOUTH WALES: South Coast, 2 km N of Nungatta (47 km SW of Eden), 14 Oct. 1974, R.G. Coveny & J. Armstrong 5777 (NSW); Southern Tablelands, 'Royalla' S boundary, E of Jerrabomberra Creek, 3.1 km ENE of Lobb Hill, 11 Dec. 1998, I. Crawford 5074 (CANB); Tumberumba, The Glen, 7 Nov. 1949, E.J. McBarron 3956 (NSW); S. Tablelands, Myanba Gorge Lookout, 25 km E of Bombala, Coolangubura National Park, 10 Sep. 1998, J. Miles s.n. (NSW); Creek W of the Perisher, 8 Apr. 1979, J. Thompson 3091 (NSW); 1 mile E of Gaerlock Homestead, Countegany area, 4 Aug. 1969, T. & J. Whaitte 3251A (NSW).

AUSTRALIAN CAPITAL TERRITORY: Mt. Gingera, Cotter River District, 29 Nov. 1966, L.G. Adams 1644 (CANB, NSW); Upper Cotter Valley, 24 Feb. 1959, N.T. Burbidge 6361

(CANB); Kowen area near NSW/ACT border, 30 Sep. 1959, N.T. Burbidge & M. Gray 6549 (CANB); Western base of Black Mountain, 5 Sep. 1964, H.S. McKee 11587 (CANB, NSW).

VICTORIA: Melbourne study area, Brisbane Ranges National Park, W of Nelson Lookout, 1.5 km E of Switchback Road, 3 km N of Anakie, 1 Oct. 1977, A.C. Beauglehole & E.G. Errey 56717 (MEL); Glenmaggie Regional Park, Gippsland Lakes Hinterland Study area, 21 Oct. 1984, A.C. Beauglehole 78670 (MEL); Snowfields, Snowy Range, beside headwaters of Shaws Creek, 2 km NNE from the Gorge; 5 km NNW from Mt Arbuckle, 2 Apr. 1994, N.G. Walsh 3638 (MEL).

TASMANIA: South West Hibbs Bay, 27 Jan. 1984, A.M. Buchanan 2840 (HO); East Coast, Broad River near Cluny Lagoon, 8 Oct. 1989, P. Collier 4270 (HO); North East Wedgetail Peak, 22 Oct. 1983, A. Moscal 3769 (HO); Central Highlands Little Split Rock, 8 Mar. 1984, A. Moscal 6738 (HO).

SOUTH AUSTRALIA: Southern Lofty, Upper Hermitage, R.J. Bates 29684 (AD); Kangaroo Island, Ravine des Casoars, 21 Dec. 1992, R.J. Bates 30423 (AD, CANB); Rivoli Bay, 1888, F. Mueller s.n. (MEL); SE Wirrega, ca 25 km NW of Bordertown, ca 32 km SE of Keith, 2 Oct. 1916, R. Tate s.n. (AD); Blanchetown (ca. 115 km NE of Adelaide), s.dat., R. Tate s.n. (AD 97602434).

WESTERN AUSTRALIA: Hamersley Inlet, 3.6 km WNW of Edwards Point (IRNP), 28 Sep. 1986, K. Newbey 11162 (PERTH); Porongurup Range, Castle Arch, Sep. 1958, G.G. Smith s.n. (PERTH).

**7b. *Stellaria multiflora* subsp. *collaris* C.H.Mill. & J.G.West subsp. *nov.***

*A subsp. multiflora et subsp. nebulosa pedicelo collo juxtim fructu, distinguenda; quoque a subsp. multiflora fructu maturo angusto-ovoideo < 2 mm lato, et valva apice recto nunquam revoluto, differt; et a subsp. nebulosa petalis semper praesentibus differt.*

**Holotypus:** Australian Capital Territory: Western slope of Black Mountain, 11 Oct. 1964 H.S. McKee 11668 (CANB 145524). **Isotypi:** CANB 319264, NSW.

*Stellaria* aff. *filiformis*, N.Burb. & M.Gray, Fl. Austral. Capital Terr. 166 (1970).

*Stellaria* sp. D sensu Doust in G.J.Harden, Fl. N.S.W. 1: 276 (1990).

*Stellaria* sp. 1 sensu C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 238, Fig. 45p–q (1996).

*Stellaria* sp. 1 *Flora of Victoria* (H.S.McKee 11668) C.H.Mill., Austral. Pl. Cens. database (APC), <http://www.anbg.gov.au/cgi-bin/apc> [accessed 6 May 2010].

Glabrous herb with erect to spreading stems, to 20 (–23) cm long. *Stem and inflorescence leaves* in a continuous series, sessile to appearing petiolate; obovate, linear or lanceolate, (2–) 3–11 (–13.5) mm long, 0.5–2 (–2.5) mm wide, acute to subacute. *Inflorescence* a monochasium of (2–) 5–15 (–27) flowers. *Pedicels* to 8 (–10) mm long, rarely longer with distinctive collar-like thickening present in fruit. *Sepals* 3–5.5 (–6) mm long. *Petals* 3–5 (–6), (0.2–) 0.4–1 (–1.2) mm long, usually bifid. *Stamens* (2–) 3–5. *Staminodes* 0. *Styles* 0.2–0.6 mm long. *Capsule* narrow ovoid, (2.5–) 3.5–5.5 (–6) mm long, 1–1.5 (–1.8) mm wide, 1 to 1.5 times sepal length; *valves* spreading, rarely straight, apex straight,

**S** flower showing sepals and mature capsule; **T** seed, side view; **U** seed coat cell detail. Scale bars: habits (**A, H, P**) 5 mm; flowers & fruits 1 mm; seeds (**G, O, U**) 0.5 mm. — **A–G** R.J. Bates 3652 (AD 98421323); **H–O** J. McKean 5189 (CANB 327583); **P–U** R.J. Bates 3571 (AD 98433224).

never revolute. *Seeds* (9–) 12–20 (–25), reniform to suborbicular, 0.5–0.7 (–0.8) mm long, light to reddish-brown, tubercles narrow rounded ridges, semi-inflated. **Fig. 1M, 4P–V.** Flowering: (June–) Aug.–Oct. (–Dec.)

*Distribution and habitat.* Subsp. *collaris* occurs in south-eastern Queensland, with a sporadic inland distribution from Chinchilla and Warwick. It also occurs on the slopes and plains of northern New South Wales from Cobar in the west to Breeza in the east and Temora in the south, with one collection from Black Mountain in the Australian Capital Territory. In Victoria it is found in the central districts from Bendigo west to Wyperfeld National Park. It occurs in South Australia, just across the border in Chowilla, north to Wilpena and the Gammon Ranges (Fig. 6J).

Locally common in understorey of eucalypt open forest and woodlands, *Callitris* woodlands or mallee shrublands. Grows on sandy to loam soils.

*Notes.* Subsp. *collaris* tends to be a larger, more robust plant than the other subspecies of *S. multiflora*. It is found at medium altitudes on the slopes of ranges or further west on the plains. It does not appear to grow in more extreme habitats such as alpine or coastal areas where the other subspecies of *S. multiflora* are found. This taxon has a disjunct distribution and more collecting is needed to determine the full extent of its range.

*Etymology.* The name is derived from the Latin *collare* which means collared, in reference to the collar-like structure that is present on the top of the pedicel, just under the mature fruit. This character is not found in any other *Stellaria* occurring in Australia.

#### *Selected specimens (of c. 30 seen)*

QUEENSLAND: Near Warwick, Jun. 1892, *F.M. Bailey s.n.* (NSW); Charleys Creek near Chinchilla, Sep. 1978, *G. Lithgow 21* (BRI).

NEW SOUTH WALES: Breeza, Between Gunnedah & Werris Creek, Oct. 1899, *W. Court s.n.* (NSW); Western plains, 40 km NNW of Cobar, Bundella Station, Elura mining lease, Emu Tank, 8 Sep. 1978, *M.D. Crisp 4209* (CANB); Temora, Oct. 1915, *Rev. J.W. Dwyer s.n.* (CANB); SW, Munagai Stn, 26 Jul. 1968, *T. Henshall 1062* (DNA); Trangie, Sep. 1968, *T. Hunter s.n.* (NSW); SW Plains, Monaro Vale, Sep. 1983, *D.E. Jones 1498* (NSW).

VICTORIA: Wyperfeld National Park, N of Black Flat, 19 Sep. 1968, *A.C. Beauglehole 28268* (MEL); Wimmera Study Area, Ellam Flora reserve, 18 Sep. 1986, *A.C. Beauglehole 84702* (MEL); 143rd Meridian Rd. 2–3 miles S of Murray Valley Highway SE of Robinvale, 4 Aug. 1973, *N. Macfarlane 636* (MEL).

SOUTH AUSTRALIA: Chowilla Survey 1988, On road to Hypurna (still on Chowilla Station), 5 Aug. 1988, *R.J. Bates 14866* (AD); Lochness Well Gammon Range National Park, far Northern Flinders Range, 15 Oct. 1993, *R.J. Bates 34268* (CANB); Northern Flinders Range, Gammon Ranges (ca 65 km E of Leigh Creek = Telford), Ridge N of North Tusk (ca 12 km E of Owieandana Hut), 19 Sep. 1956, *Hj. Eichler 12819* (AD); Wilpena hill slope opposite chalet, 16 Sep. 1960, *D.E. Symon 656* (AD, BRI).

#### **7c. *Stellaria multiflora* subsp. *nebulosa* C.H.Mill. & J.G.West subsp. nov.**

*A subsp. multiflora fructu maturo anguste ovoideo vel anguste ellipsoideo minus quam 2 mm lato, et valva apice recto nunquam revoluto, distinguenda; et a subsp. collaris C.H.Mill. & J.G.West pedicelo collo juxtim fructu absente, et petalis absentibus, differt.*

**Holotypus:** South Australia: Region 13 South-eastern: Marshes Swamp, 14 Oct. 1991 *R.J. Bates 25994* (CANB 470161). **Isotypus:** AD 99146306.

Herb, glabrous or occasionally with sparse hairs. Stems prostrate to erect, to 16 (–23) cm long. *Stem and inflorescence leaves* in a continuous series, sessile to appearing petiolate; obovate, linear, elliptic or occasionally narrowly ovate, (1.5–) 2.5–11 (–17.5) mm long, (0.3–) 0.7–2 (–3) mm wide, acute to subacute, glabrous or with hairs on lower half of margin. *Inflorescence* a monochasium of 2–15 (–25) flowers. *Pedicels* (1.5–) 2–20 (–26) mm long, sometimes quadrangular, collar absent. *Sepals* 2–5.5 (–6) mm long. *Petals* 0. *Stamens* 3–10. *Staminodes* 0–5. *Styles* 0.3–0.8 mm long. *Capsule* narrow, ovoid to ellipsoid, (1.9–) 3–5.4 (–6.1) mm long, 1–2 mm wide, equal to 1.3 times sepal length; *valves* spreading or straight, apex straight, sometimes slightly recurved. *Seeds* (3–) 5–17 (–21), suborbicular, sometimes ellipsoid, (0.5–) 0.7–1 (–1.2) mm long, yellowish, light to mid-brown or rarely reddish-brown, tubercles broad hills, semi-inflated. **Fig. 1N, 4W–BB.** Flowering: (Jul.–) Aug.–Dec. (–Feb.).

*Distribution and habitat.* This taxon occurs at Yetman on the northern slopes of New South Wales, in coastal areas of Victoria, from the Gippsland area to Wilson's Promontory and from the eastern Bass Strait islands to north-eastern Tasmania. It is also found in south-western areas of Victoria around Dimboola, and south-eastern South Australia around the Mount Gambier area as well as on Kangaroo Island (Fig. 6K).

Common to locally abundant in a wide range of habitats including *Eucalyptus baxteri* coastal dune scrub, heathlands, low alpine herbfields and open eucalypt forests, often in damp areas on sandy to rocky soils.

*Notes.* Currently, subsp. *nebulosa* consists of those individuals of *S. multiflora* that lack the characters of the other two subspecies and does not have any unique defining characters such as the revolute capsule valves of subsp. *multiflora* and the thickened collar-like structure on the fruiting pedicel of subsp. *collaris*. It is found in a diverse range of habitats and locations. There seems to be three groups within the distribution: one is a southern band from the north of Tasmania across the Bass Strait Islands with an outlier on the central Victorian coast; the second is centred around Dimboola in western Victoria across to eastern South Australia in the Mount Gambier region with an outlier on Kangaroo Island; and the third is from the central west of New South Wales north possibly into central Queensland. This taxon is poorly represented, particularly in the north and often these

specimens do not contain fully mature fruit to allow for a definitive identification.

*Etymology.* This subspecies has been named from the Latin *nebulosus* which means 'clouded, cloudy, misty or foggy' which reflects the definition of this taxon which is currently those individuals that remain after other elements of the species have been defined.

*Selected specimens (of c. 45 seen)*

NEW SOUTH WALES: Mt Jagungal, Kosciuszko region, s.dat., *D.N. McVean s.n.* (CANB); Nicholls Rd, Bebo State forest, 1.3 km S of Wood Bend (10.2 km N of Yetman), 23 Aug. 1987, *R.G. Coveny et al. 12701* (CANB, NSW).

VICTORIA: Grampians, Mt. Arapiles, 18 Feb. 1959, *A.C. Beaglehole 5338* (MEL); Nurcoung Flora Reserve, Wimmera Study area, Sector A, subblock 4A, 13 Nov. 1986, *A.C. Beaglehole 86892* (CANB, MEL); East Gippsland: Tildsley Forest Block. 200 m E of walking track from Gibbs Beach along 90 mile Beach. 20 m N in lee of primary dune, Nov. 1992, *A.B. Pollock s.n.* (MEL); South-west, Wilson's Promontory Pillar Point track above mouth of Tidal River, 5 Oct. 1973, *J.H. Willis s.n.* (MEL).

TASMANIA: Furneaux, Behind Planter Beach, East Flinders Island, 26 Sep. 1989, *P. Collier 4200* (HO); North East Reeves Creek Picnic Rocks, 13 Sep. 1983, *A. Moscal 2675* (HO); Kents Group; North East Island, South Hill, 29 Sep. 1971, *J.S. Whinray 1150* (CANB); Furneaux Group, Flinders Island. High dunes c. 150 yards E of entrance of East River, s.dat., *J.S. Whinray 8318* (CANB).

SOUTH AUSTRALIA: South eastern, Marshes Swamp, 14 Oct. 1991, *R.J. Bates 25992* (AD, CANB); Kangaroo Island, Ravine des Casoars, 21 Sep. 1992, *R.J. Bates 30244* (AD, CANB); South-eastern, Near Naracoorte South Primary School, c. 95 km N of Mt Gambier, 11 Sep. 1964, *D. Hunt 2132* (NSW); Ca 30 km SE of Mt Gambier, Sep. 1966, *I.B. Wilson 536* (AD, CANB).

**8 \* *Stellaria pallida* (Dumort.) Crep.**

Man. Fl. Belgique, ed. 2, 19 (1866). — *Alsine pallida* Dumort., Fl. Belg. (Dumortier) 109 (1827). — **Type citation:** 'In cultis humidis solo arenoso'. **Type:** BR?, n.v. *S. pallida* (Dumort) Pire, Bull. Soc. Roy. Bot. Belgique 2: 49 (1863), nom. inval.

*Illustration.* C.H. Mill. & J.G. West in N.G. Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 45c–d (1996).

Annual, almost prostrate, semi-erect to erect and leafy to 30 (–41) cm long, with a single line of hairs down stem internodes and pedicels. *Stem and inflorescence leaves* a continuous series, sessile to appearing petiolate, lower part narrowed, very attenuate, (0–) 2.5–10 (–16) mm long, upper part broad elliptic to elliptic or ovate, (2.5–) 4–15 (–29) mm long, (0.9–) 1.5–10 (–17) mm wide, acute, entire, often undulate, hairs sparse to almost ciliate on narrowed leaf base margin. *Inflorescence* a leafy dichasium often condensed. *Pedicels* (2–) 3–15 (–18) mm long, erect or reflexed in fruit. *Sepals* (2.2–) 2.5–4 (–5.1) mm long, obtuse, often forming small hood, rarely acute, sometimes with purple mark at apex, hairs on midrib only to densely covering backs, rarely glandular, sometimes glabrous. *Petals* 0. *Stamens* 2, rarely 3 or 4. *Staminodes* 0–2 (–4). *Styles* 0.4–0.5 (–0.6) mm long. *Capsule* ovoid to ellipsoid, (2.3–) 3–4

(4.9) mm long, (1.5–) 1.7–2.2 (–2.5) mm wide, equal to slightly longer than sepals, rarely just shorter than sepals; *valves* spreading, apex only recurved, rarely revolute. *Seeds* (6–) 8–15 (–19), discoid to flattened ellipsoid, (0.55–) 0.6–0.8 (–1) mm long, yellowish to mid-brown, rarely darker, tubercles rounded hills, semi-inflated, cell walls with minute papillae. **Fig. 11, 3N–R.** Flowering: all year around, but predominantly July–Nov.

*Common name.* Lesser Chickweed.

*Distribution and habitat.* Found at scattered localities within New South Wales, along the Great Dividing Range from Tenterfield to Canberra, with one collection inland at Broken Hill. It also occurs along the Murray River drainage system in New South Wales and Victoria. It is found throughout most areas of Victoria except alpine areas as well as throughout coastal and coastal ranges of South Australia including Kangaroo Island; the northern most collections extend into the Flinders Ranges and the western most collection is at Fowlers Bay near Ceduna. This species is uncommon in Tasmania being mainly found on offshore islands and in coastal regions but occasionally further inland. It is also uncommon in Western Australia with coastal collections from Rottnest Island and Busselton in the west, Bremer Bay in the south and Cocklebiddy in the east near the South Australian border (Fig. 6L).

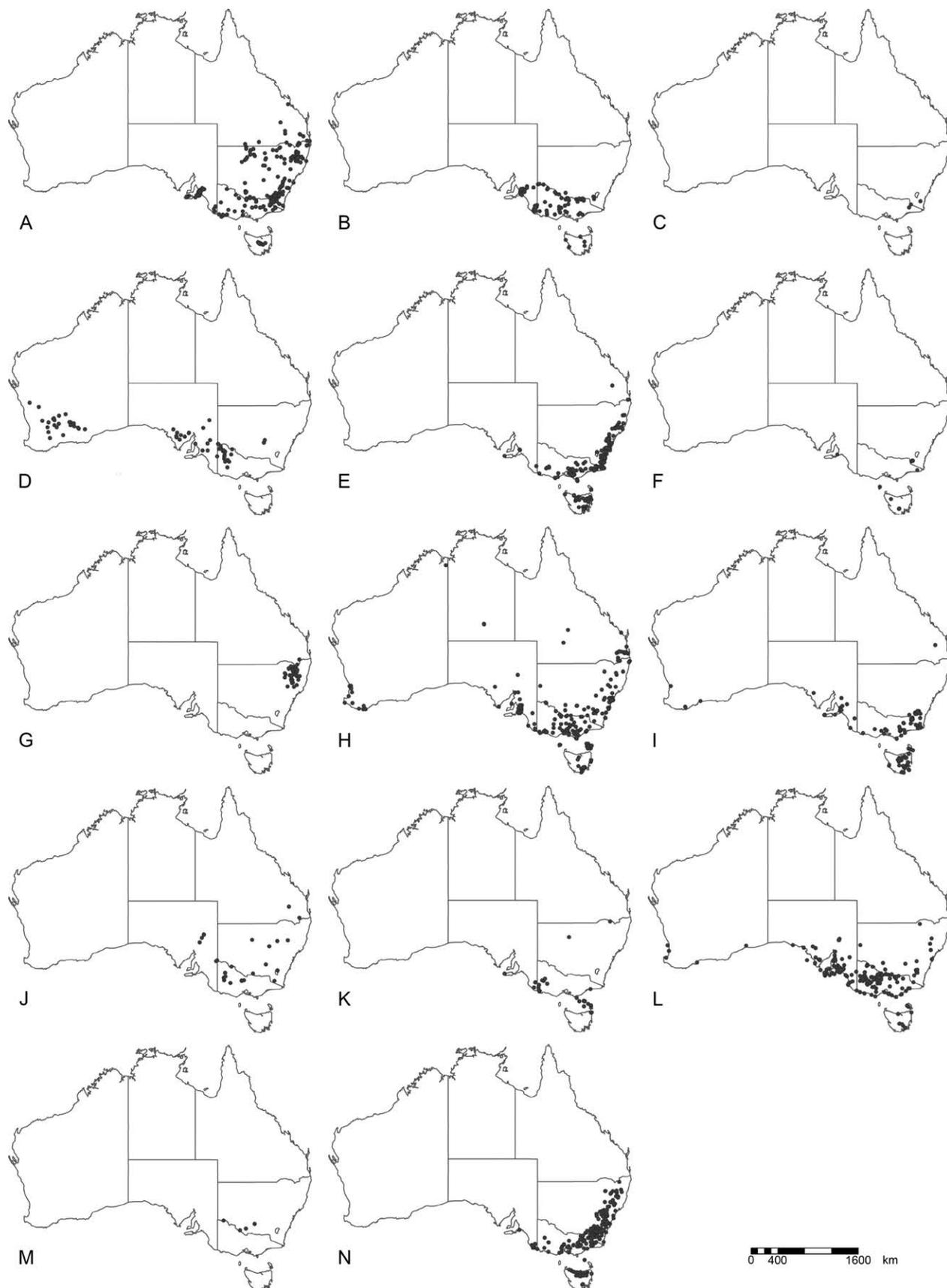
The native range of *S. pallida* extends throughout most of central to western and southern Europe (Chater & Heywood 1993). It has also spread as a weed into the Americas and Asia.

In Australia, *S. pallida* is an introduced weed, often locally common, especially in areas of disturbance such as roadsides, waterways and areas of cultivation. Usually found in shady or moist places. It grows in coastal dunes, grass or herbfields, gully forests, open forests, heathlands or scrubs. It usually grows in sandy soils, sometimes in shallow soils over rock or loam to clay soils.

*Notes.* See notes under *S. media*. This weed probably has a wider distribution in Australia than listed here but is often overlooked or often misidentified as *S. media*. From examining the herbarium collections it appears *S. pallida* is a relatively recent introduction to Australia. There are very few collections prior to the 1950's with the earliest collection recorded in 1905 at Tallandoon in Victoria.

*Selected specimens (of c. 200 seen)*

NEW SOUTH WALES: Murrurundi, park on Western side of New England Highway, 12 Oct. 1993, *R.G. Coveny & A.J. Whalen 16555* (CANB); Southern Tablelands, Mirringa, 8km S of ACT border, Murrumbidgee River at confluence with Gossoon Creek, 12 Oct. 1995, *I. Crawford 3168* (CANB); Central Coast Salesyards, Flemington, 28 Sep. 1968, *E.J. McBarron 15864 bis* (NSW); On road to Zara station, 0.7 km from entrance on edge of Billabong Creek, 21 Sep. 1992, *C.H. Miller & J. Palmer 595* (CANB); NW Plains, Iolanthe, c. 26 km SW of Garah, 28 Sep. 1978, *K.L. Wilson 1913* (NSW).



**Fig. 6.** Distribution maps of *Stellaria* in Australia. **A** *S. angustifolia* subsp. *angustifolia*; **B** *S. angustifolia* subsp. *tenella*; **C** *S. angustifolia* subsp. *rotundisepala*; **D** *S. filiformis*; **E** *S. flaccida*; **F** *S. graminea*; **G** *S. leptoclada*; **H** *S. media*; **I** *S. multiflora* subsp. *multiflora*; **J** *S. multiflora* subsp. *collaris*; **K** *S. multiflora* subsp. *nebulosa*; **L** *S. pallida*; **M** *S. papillata*; **N** *S. pungens*.

AUSTRALIAN CAPITAL TERRITORY: Hill opposite Cotter Pumping Station, Murrumbidgee River, 21 Aug. 1964, *J. Eadyane s.n.* (CANB, NSW).

VICTORIA: Mt Arapiles, ca 20 miles W of Horsham, the NE portion of the mount near the lookout, 3 Oct. 1963, *H.I. Aston 1064* (MEL); Grampians National Park, 30 Aug. 1983, *A.C. Beaughtole 74484* (MEL); Wilsons Promontory National Park, 15 Dec. 1983, *A.C. Beaughtole 75969* (MEL); Port Campbell National Park, W of Port Campbell, W side of Port Campbell Creek, 5 Sep. 1966, *A.C. Beaughtole & E.W. Finck 21053* (MEL); Ca 1 km inland from the mouth of the Aire River, 5 km SW of Horden river, 28 July 1980, *P.C. Heyligers 80020* (CANB); Thompsons Beach, Murray River at Cobram, 24 Sep. 1992, *C.H. Miller & J. Palmer 603* (CANB); Little Desert Salt Lake, Coynallan Parish, 15 Oct. 1966, *J.H. Willis s.n.* (MEL).

TASMANIA: Midlands Port Sorell, 20 Sep. 1986, *P. Collier 1630* (HO); East Coast Betsey Island, 15 Oct. 1983, *K. Harris s.n.* (HO); Furneaux Group, Prime Seal Island, off West coast of Flinders Island, 11 Dec. 1986, *S. Harris s.n.* (HO); North East, Picnic Rocks, 19 Sep. 1983, *A. Moscal 2836* (HO, MEL); Waddles, Hunting Grounds, Jordan river, 20 Aug. 1965, *M. Ridpath WL420* (CANB).

SOUTH AUSTRALIA: Murray Mallee, Reserve at Chauncey's Line S of Monarto South (Ca 60 km SE of Adelaide), 23 Sep. 1959, *Hj. Eichler 16201* (AD); Kangaroo Island, Block 101, Kingscote North, 24 May 1983, *G. Jackson 1590* (AD); Piccaninnie Blue Lake, ca 20 km E of Port MacDonnell (near the border of Vic & SA), 29 Aug. 1964, *T.R.N. Lothian 2935* (AD); Adelaide, Marlowe Rd, Keswick, 09 Sep. 1987, *J. Roberts 289* (CANB); Yorke Peninsula, Port Davenport, 23 Sep. 1978, *D.E. Symon 11072* (AD); 3 km W of Blinman on rd to Parachilna Gorge, 29 Sep. 1985, *J.G. West 5067* (CANB); Fowler's Bay, about 6 km W along roadside, (Fowler's Bay ca 115 km W of Ceduna), 12 Sep. 1960, *D.J.E. Whibley 608* (AD, CANB); Southern Flinders Range, Mambay Creek (Mt Remarkable National Park), ca 40 km SSE of Port Augusta, Lower Alligator Creek area, 7 July 1974, *D.J.E. Whibley 4404* (AD).

WESTERN AUSTRALIA: Eyre, SW Cocklebidy, 8 Oct. 1985, *G.J. Keighery & J.J. Alford 434* (PERTH); Rottne Island, Bickley Swamp, 14 Aug. 1987, *G.J. Keighery 9063* (PERTH); Busselton, 20 July 1987, *G.J. Keighery 9115* (PERTH); Kooljerrenup Nature reserve; 400 m S of Herron Point, 12 Oct. 2005, *G.J. Keighery 16732* (CANB); Gorden Inlet, 15 km NE of Bremer Bay, 17 Sep. 1986, *K. Newbey 11510* (PERTH).

### 9. *Stellaria papillata* C.H.Mill. & J.G.West, sp. nov.

*A Stellaria multiflora* Hook. *floribus subsessilibus, pedicelis fere minus quam 1 mm longis; capsula minus quam longitudine sepali; capsula valvis crassis et papillis angularibus tectis; seminibus grandibus, 1–2 per fructu, 1.3–1.9 mm longis, differt.*

**Holotypus:** Zara Wanganella via Hay [New South Wales], Oct. 1917, *E. Officer s.n.* (NSW 153113).

*Stellaria* sp. B sensu Doust in G.J.Harden, *Fl. N.S.W.* 1: 276 (1990).

*Stellaria* sp. 2 sensu C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, *Fl. Victoria* 3: 239–240 (1996).

*Stellaria* sp. *papillata* (*E. Officer s.n. Oct. 1917*) C.H.Mill., *Austral. Pl. Name Index database* (APNI), <http://www.anbg.gov.au/cgi-bin/apni> [accessed 6 May 2010] & *Austral. Pl. Cens. database* (APC), <http://www.anbg.gov.au/cgi-bin/apc> [accessed 6 May 2010].

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, *Fl. Victoria* 3: 236, Fig. 45u–v (1996).

Annual with slender taproot, glabrous; stems erect to ascending, to 10 (–15) cm long. *Stem and inflorescence leaves* a continuous series, sessile, linear to lanceolate, 2.5–10 (–15) mm long, 0.5–1 (–1.5) mm wide, acute, toothed or sparsely hairy on lower half of margin, occasionally appearing almost ciliate. *Inflorescence* a condensed monochasium of 3–15 (–26) flowers. *Pedicels* subsessile, (0.1–) 0.3–0.6 (–1.5) mm long, erect, smooth. *Sepals* (2–) 2.5–4.5 mm long, acute. *Petals* 1–5, 0.2–0.9 mm long, very reduced, shorter than half sepal length, shortly bifid or entire. *Stamens* 2–3. *Staminodes* 0–3. *Styles* 0.2–0.6 mm long. *Capsule* ellipsoid, rarely ovoid, (2.5–) 3–3.5 mm long, 1.5–2 mm wide, shorter than sepals; *valves* thickened, with angular papillae, straight, apex straight or incurved. *Seeds* 1–2, obloid to ellipsoid, (1–) 1.3–2 mm long, mid to reddish-brown; tubercles narrow ridges, semi-inflated. **Fig. 1J, 5H–O.** Flowering: (June–) Oct.–Dec. (–Apr.).

*Distribution and habitat.* A rare species from the south-west plains of New South Wales near Hay and Moulamein and north-western Victoria near Mildura (Fig. 6M)

*S. papillata* is found in riverine open shrubland, and degraded *Atriplex vesicaria* community now dominated by *Nitraria billardieri*, growing in heavy, grey deep-cracking clay loams.

*Notes.* Only five collections are known for *S. papillata*, despite further searching in the field. At least three of the populations have been found during systematic ecological surveys; the plants are often less than 2 cm high and are easily overlooked.

*S. papillata* has very distinctive capsule valves which are thick and covered in angular papillae, a character state that is not found in any other *Stellaria* in Australia. Additionally each capsule has one or two large broadly ellipsoid seeds.

*Etymology.* This species has been named from the Latin *papillatus*, papillate, reflecting the angular papillae on the capsule valves.

### *Specimens examined*

NEW SOUTH WALES: Toganmain Stn, Darlington Point, 5 June 1969, *J. McKean 5189* (CANB); Approx. 10 km E of Moulamein, 25 Oct. 1972, *J.C. Noble 300* (NSW); Zara Wanganella via Hay, Dec. 1905, *E. Officer s.n.* (NSW).

VICTORIA: Adjacent to Murray River W of Mildura (S. bank), Keela Station, 1 Apr. 1987, *D. Cheal s.n.* (MEL)

### 10. *Stellaria pungens* Brongn.

in Duperrey, *Voy. Monde, Atlas* [part 16] Phan., Plate 78 (1834) [plate only, no description]. — **Lectotype (here designated):** Plate 78 '*Stellaria pungens*', Brongn. in Duperrey, *Voy. Monde, Atlas* [part 16] Phan. (1834).

*Stellaria squarrosa* Hook., *J. Bot. (Hooker)* 1: 250 (1834). — **Type Citation:** '*Mr. Lawrence*, (1831) *Mr. Gunn*, (*n. 96.*)'. **Lectotype (here designated):** Van D's Land, *Mr. Gunn No 96* (K, Herb. Hooker). **Residual syntypes:** Van Diemen's Land, *Mr. Lawrence* (K, herb Hooker p.p.); Very common in rich soil in moist situations about the roots of shrubs which it frequently will ascend to the height of 3 to 4 feet, *Gunn 96* (K, Herb. Hooker p.p.).

*Illustration.* C.H.Mill. & J.G.West in N.G.Walsh & Entwisle, Fl. Victoria 3: 236, Fig. 451-m (1996).

Perennial, prostrate to erect to 43 (–60) cm long with rhizome and rooting at nodes, sparsely to densely hairy. *Stem and inflorescence leaves* in a continuous series, sessile, lanceolate to ovate, rarely narrowly elliptic to linear, 3.8–13 (–17) mm long, 0.9–3 mm wide, usually pungent, margin usually with hairs, rigid. *Inflorescence* either axillary and solitary or an interrupted monochasium of up to 6 flowers. *Pedicels* (5–) 8–33 (–40) mm long, erect in fruit, sparsely hairy. *Sepals* (4.5–) 5–9.5 (–9.8) mm long, usually pungent, outer sepal margins hairy. *Petals* 4.2–8.3 mm long, longer than sepals, deeply bifid. *Stamens* 10. *Staminodes* 0. *Styles* (2.5–) 3–5.5 (–6) mm long. *Capsule* ovoid to narrowly ovoid or ellipsoid, (4.5–) 5–8.5 (–9.3) mm long, 2.5–3.5 (–4.3) mm wide, shorter than to longer than sepals; *valves* usually spreading, apex straight or recurved. *Seeds* (4–) 6–13 (–16), suborbicular to transversely elliptic, (1.1–) 1.3–1.8 mm long, light to mid greyish brown, appearing reticulate, tubercles rounded hills, inflated. **Fig. 1K, 5P–U.** Flowering: Oct.–Feb.

*Common Name:* Prickly starwort.

*Distribution and habitat.* Widespread along the tablelands and subalpine areas of the Great Dividing Range from northern New South Wales at Mt Kaputar through to southern Victoria, extending to Tasmania, including Bass Strait islands, and south-eastern South Australia (Fig. 6N).

Common herb, usually found in shady, moist places, in wet sclerophyll forests and woodlands, damp shady grasslands, or open grassland and shrublands. It grows in rocky areas, in sandy or clay loam soils, overlying granite, limestone, basalt and sandstones.

*Notes.* This is a very distinctive species that is readily identifiable in the vegetative state due to the pungent nature of its leaves and the hairiness of all organs.

*Nomenclatural Notes.*

*Stellaria pungens* Brongn. The original publication of the name *S. pungens* consists of a plate with no associated description. As no specimen has been located so far, the plate is here designated as the lectotype. It has been extremely difficult to date the actual publication of the plate illustrating *S. pungens*. The title page for the Atlas lists the year 1826 as the publication date, but the atlas was issued in 16 parts, this date is associated with the first part. It is known that parts 12 to 14 were published in Jan 1834 (Stafleu & Cowan 1976) but the last parts of the atlas, numbered 15 & 16 have no date associated with them. In addition to this, the name *S. squarrosa* was also published in 1834 in the 3<sup>rd</sup> fascicle of *Hooker's Journal of Botany* in July. As it is possible that the Atlas parts were published pre July 1834 it has been decided to continue to retain the use of *S. pungens* for this taxon as it has previously been applied, as this will be less disruptive.

The voyage of the *Coquille* travelled around South America, across to Tahiti across the north of New Guinea and associated islands, past the Molaccas and Amboina (Indonesia) and round the west and south of Australia to Port Jackson (Buck 1953). The boat remained in Port Jackson for just over a month before sailing on to New Zealand. The only place that *S. pungens* is known to grow on this route is somewhere on the eastern part of Australia. Maiden (1910) in discussing the voyage states that the Australian plants were all collected at Port Jackson. As the voyagers were there for a month it is possible they picked up a specimen from somewhere in the Blue Mountains where the species is quite common. At this time none of the specimens collected on this voyage have been seen.

*Stellaria squarrosa* Hook. Two sheets from Herbarium Hookerianum held at K contain type material. One sheet has the label 'no. 96 Mr Gunn Van Ds Land *S. squarrosa* Hook.'. The label is written in Hooker's hand and matches the protologue and this sheet has been designated here as the lectotype.

The second sheet has multiple collections. The top label on the RHS of the sheet has '1/710 V.D. Land. Beaches at D' entrecasteaux Channel J.D.H.' but does not match the specimen details in the protologue and thus is not considered to be type material. The second label in the middle of the sheet on the LHS is '96 *Stellaria pungens* Brong Very common in rich soil in moist situations about the roots of shrubs which it will frequently ascend to the height of 3 to 4 feet', however, while the location details match the protologue, the material does not match the lectotype material and is here considered to be a residual syntype. A third label is attached to a small portion of one specimen and has 'arenaria W of Fox's River' on it. This is a Cunningham collection from NSW and is not considered to be type material. At the bottom of the same portion is written on the sheet 'Van Diemen's Land. Mr Lawrence'. This information and the specimen match the protologue and it is thus considered to be a residual syntype.

*Selected specimens (of c. 340 seen)*

NEW SOUTH WALES: Near the Crackenback River at Thredbo Village, 25 Jan. 1964, *Hj. Eichler 17829* (AD); Summit area of Mt Kaputar, Mt Kaputar National Park, 24 Nov. 1987, *J.M. Fox 87/089* (CANB, NSW); Wyanbene Cave in NW corner of the Deua NP, 14 Oct. 1988, *W. Greuter 21301* (NSW); NT, 2.7 km along Barrington Trail S of Barrington Tops Forest Rd, Barrington Tops Conservation Area, 10 Dec. 2007, *J.R. Hosking 3014* (CANB); South Coast, Tuross river catchment area, 14 km N of Yowrie, 28 km NW of Cobargo, on N side of river, 1 Oct. 1978, *A. & C. Tyrrel, 153* (CANB).

AUSTRALIAN CAPITAL TERRITORY: Namadgi National Park, Glendale Crossing, SE of crossing, 15 Jan. 1992, *J.G. West 5287* (CANB, NSW).

VICTORIA: Brisbane Ranges, Stony Creek Picnic Reserve, 16 Nov. 1986, *B.J. Conn & D.B. Foreman 2493* (NSW); The Lakes National Park, Rotamah Island, Gippsland, 28 Oct. 1986, *I. Crawford 545* (CANB); Cape Conran, 6 Jan. 1969, *T. Henshall s.n.* (NT); Snowfields, Aberfeldy, 87 km N of Moe, 26 Dec. 1994, *P.C. Jobson 3331* (CANB, NSW);

Eastern highlands, 2.1 km E along Wheelers Creek Logging Road from Colac Colac to Benambra road; c. 38 km (direct) SSW of Corryong, 2 Dec. 1991, *R.O. Makinson & P. Carmen 905* (CANB); East Gippsland, Near summit of Mt. Seldom Seen, ca 10 km SW of Wulgulmerang (W ca 80 km NNW of Orbost), 6 July 1970, *A.E. Orchard 2729* (AD, NSW); Eastern Highlands region, SSW of Mt Jim, 14 Jan. 1999, *L. Spear 43* (CANB); Crossing of Bonang-Bendoc road over Delegate River, 25 Dec. 1985, *K.R. Thiele 1079* (CANB, NSW).

TASMANIA: Ben Lomond National Park, Patersonia, 13 Dec. 1980, *A.M. Buchanan 342* (HO); North West Turners Beach, July 1986, *D.I. Morris 8631* (HO); Midlands, Kubla Khan Cave State Reserve ca 10 km W of Mole Creek township, 16 May 1983, *A. Moscal 2392* (HO); Central Highlands, Quamby Bluff (mid NE slope) 2 km SW of Golden Valley, Mar. 1986, *A. Moscal 12559* (HO); Kent's Group, Deal Island, Karitane Bay, 23 Nov. 1970, *J.S. Whinray 1235* (CANB).

SOUTH AUSTRALIA: Mt McIntyre Swamps, 26 Dec. 1983, *R.J. Bates 3571* (AD); South-eastern, Mt. Burr Forrest, off Millicent–Glencoe Road, 14 Oct. 1991, *R.J. Bates 25991* (AD); South-eastern, Honans Scrub, On low rise in S of Park, 22 Nov. 1991, *R.J. Bates 26428* (AD); Hindmarsh Falls, about 11 miles N of Victor Harbour, 24 Oct. 1967, *R. & R. Belcher 453* (MEL); South-east district, Region 13, Penola Conservation Park, at eastern edge of picnic area, 29 Oct. 1986, *P. Gibbons 573* (AD, CANB).

### Excluded Taxa

*Stellaria decipiens* Hook.f., Hooker's Icon. Pl. 7: t. 680 (1844).

*Stellaria parviflora* Banks & Sol. ex Hook.f., Bot. Antarct. Voy. II (Fl. Nov.-Zeland.) 1: 25 (1852).

The presence of these two taxa on Macquarie Island is discussed in Orchard (1993). There is some debate as to which taxon is on the island. Both species are native to New Zealand and do not occur anywhere else in Australia.

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