

Notes on *Stipa* (Poaceae) in Australia and Easter Island

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Abstract

Everett, J. and Jacobs, S.W.L. (National Herbarium of New South Wales, Royal Botanic Gardens, Sydney, Australia 2000) 1990. Notes on *Stipa* (Poaceae) in Australia and Easter Island. *Telopea* 4(1): 7–11. The applications of the names of three South American species are reviewed and it is concluded that *S. caudata* is the correct name for one of the species introduced into Australia, but that *S. brachychaeta* is also established in this country. *S. horridula* Pilger (1922), described from Easter Island, is lectotypified and reduced to a synonym of *S. scabra* Lindley subsp. *scabra*. Possible means of introduction of *S. scabra* to Easter Island and its apparent population fluctuations there are discussed.

Introduction

In the treatment of the Australian species of *Stipa* (Vickery, Jacobs & Everett 1986) there were some intractable problems that, at the time, we were not in a position to solve. We are now able to provide more information on, and a suggested treatment for, one problem and the solution to another.

(i) *S. caudata*, *S. brachychaeta* and *S. bertrandii*

We included the following note under *S. caudata* Trin. (Vickery et al. 1986: 39):

'*S. caudata* has been known in Australia as *S. brachychaeta* Godron, Mem. Sect. Sci. Acad. Sci. Montpellier 1: 450 (1853). (The latter name appears on some of our determinavit labels.) These two South American species are difficult to distinguish. They are generally said to be distinguished by:

- (i) *S. caudata* having hairs on the margins and midrib of the lemma, and a broader caryopsis with an eccentric stylar appendage;
- (ii) *S. brachychaeta* having hairs all over the lemma surface, and a narrower caryopsis with a centric stylar appendage.

The type of *S. brachychaeta* (Godron, (NCY!)) has lemmas showing both character states on the one inflorescence. In Australian specimens, the only caryopses we have found are immature and in a glasshouse-grown specimen (Morris, 19.1.1981 (HO)); and these match the description of *S. caudata*. We have as yet been unable to find caryopses of either *S. brachychaeta* or *S. caudata* for comparison. We are using the earlier name *S. caudata* although we are not yet convinced the situation is fully understood.'

Caro and Sanchez (1971) revised the complex of three species containing *S. caudata*, *S. brachychaeta*, and *S. bertrandii* Philippi. Collections in many major herbaria confuse the three. We borrowed as many specimens as possible of the three species from South American herbaria, especially those specimens that had been seen by either Caro or Sanchez. From the revision and the specimens it was clear that the three species were closely related but distinct. It was also clear that mature caryopses were the most reliable way of distinguishing *S. brachychaeta* from *S. caudata* and *S. bertrandii*. With more recent Australian collections we now have some with mature caryopses. It is also

now apparent that at least two species of the complex are present in Australia. Mature seeds are not common and it appears that, in Australia, reproduction and dispersal is at least partly dependent on the cleistogenes produced in the basal leaf sheaths.

Three Australian specimens, two from Merriwa (N.S.W., CWS) and one from Quirindi (N.S.W., NWS), match *S. brachychaeta*.

The commoner of the two taxa in Australia is either *S. caudata* or *S. bertrandii*. Caro and Sanchez (1971) distinguished these two species by:

- (i) the lemmas of *S. caudata* being hairy on the midnerve and margins and glabrous between the midnerve and the first lateral nerve, and having leaves 1–3 mm wide and,
- (ii) the lemmas of *S. bertrandii* being hairy on the midnerve and margins and glabrous between the midnerve and the (two) lateral nerves, and having leaves 3–7 mm wide.

The distinctions as given are precise but, judging from the determinations of Caro and Sanchez, the situation is rather more complex. We can see no justification for dividing this Australian material into two taxa; equally we can see no reason to change the name of that taxon so are maintaining the name *S. caudata* for the bulk of our Australian material.

Both *S. caudata* and *S. brachychaeta* will key to 'Group B' in Vickery et al. (1986) and can be distinguished by the following key:

- 1 Caryopsis obovoid, the style base central; lemma surface more or less hairy all over though often with a bare area between the midnerve and first lateral nerve, especially towards the apex. ***S. brachychaeta***
- 1* Caryopsis broadly obovoid or almost gibbous, the style base eccentric; lemma surface hairy along the midrib and between the outermost lateral nerves on the margin, the area between the midnerve and the first lateral nerve more or less glabrous. ***S. caudata***

S. brachychaeta was not included in Vickery et al. (1986) so a description is given here.

****S. brachychaeta*** Godron (1853: 450); Rosengurtt, de Maffei & de Artucio (1970: 73); Caro & Sanchez (1971: 638).

TIPIFICATION: Caro and Sanchez (1971) cite a specimen held at MPU and labelled in Delile's handwriting as the type. There is a specimen with the rest of Godron's herbarium held at NCY(!) labelled in Godron's handwriting. Unfortunately, the date on this latter specimen could be interpreted as being later than 1853. This is clearly a case requiring lectotypification but it is preferable for someone more familiar with all the species of the group to select a lectotype.

Caespitose perennial to c. 1 metre high with a basal tuft to three quarters the height, without rhizomes. Culms erect, terete, not compressible, smooth to slightly ribbed; nodes 2–5, ± exserted, glabrous, not or only slightly swollen. Leaf sheaths becoming loose with age, glabrous; basal sheaths 3–6 mm wide, slightly ribbed, margins glabrous; upper sheaths 2–3.5 mm wide, strongly ribbed, margins glabrous except for a few hairs 0.4–1.5 mm long near the ligule. Ligule truncate, membranous, 0.1–0.5 mm long, ciliate with hairs 0.5–1.5 mm long, also with a tuft of hairs at the sides; auricles absent. Leaf blade expanded to tightly rolled, 1–2.5 mm wide, to 50 cm long; abaxial surface strongly ribbed, glabrous; adaxial surface strongly ribbed, minutely scabrous; margin minutely scabrous. Panicle 15–25 cm long, exserted, with distant fascicles of unequal, few-flowered, compound branches, contracted, c. 2.5 cm wide (excluding awns); axis terete to slightly flattened, moderately ribbed, scaberulous on the margins;

branches to 8 cm long, angled, scaberulous along the angles with hairs c. 0.1 mm long; pedicels to c. 8 mm long, slightly angled, scaberulous along the angles with hairs c. 0.1 mm long. *Spikelets* 6–7 mm long (excluding awn), gaping. *Glumes* subequal, hyaline with chlorenchyma bands associated with the nerves, acuminate; lower glume 6–7 mm long, glabrous or scaberulous along the midrib with hairs minute–0.2 mm long, lower 40–50% 3-nerved, the remainder 1-nerved; upper glume 5.5–7 mm long, glabrous or scaberulous along the midrib with hairs minute–0.2 mm long, lower 40–50% 3-nerved, the remainder 1-nerved. *Floret* cylindrical, 4.5–6 mm long (including callus), with a weakly developed neck. *Lemma* surface scaberulous with minute tubercles, with hairs 0.2–1 mm long mainly on the midrib and margins but also scattered variously or more or less glabrous (especially in the upper half) in the region between the midrib and lateral nerves; lobes 0.1–0.2 mm long; coma of hairs 0.2–0.7 mm long. *Callus* c. 0.5 mm long, straight, blunt, densely sericeous with white hairs to 0.3 mm long. *Awn* 1–1.5 cm long, once or twice bent, c. 0.2 mm wide near the base; column 4–6 mm long, 2–3 mm to the first bend, straw-coloured, scaberulous with minute hairs; bristle straw-coloured, scaberulous with minute hairs. *Palea* \pm equal to the lemma, \pm smooth, with a row of hairs 0.2–0.6 mm long down the centre back. *Lodicules* 3; 2 abaxial, membranous, \pm oblong, 0.6 mm long; paleal membranous, acute, c. 0.3 mm long. *Anthers* 2.5 mm long, penicillate. Only immature caryopsis seen, obovoid, c. 2 mm long [2–3 mm long in non-Australian specimens], embryo 30% the length, hilum c. 75% the length, the stylar appendage \pm centric. Cleistogenes present in the lower leaf sheaths.

DISTRIBUTION: An introduction from South America, recorded from near Merriwa (CWS) and Quirindi (NWS), New South Wales.

SPECIMENS SEEN: NEW SOUTH WALES: North Western Slopes: Quirindi, *Cherry s.n.*, 23.5.1989 (NSW). Central Western Slopes: Merriwa district, *Henderson NSW 117377*, 15.11.1955 (NSW), *Merriwa Shire Council NSW 117378*, 1.1956 (NSW).

A specimen of *S. caudata* (*W.E. Mulham 1604*) with mature seed, allows us to provide the following additional information on the caryopsis of that species:

Caryopsis broadly obovoid, 2–3 mm long, embryo 25–30% the length (but not easily visible), hilum c. 90% the length, the stylar appendage eccentric.

S. caudata also usually produces cleistogenes in the lower leaf sheaths.

SELECTED SPECIMENS: NEW SOUTH WALES: South Western Slopes: Cootamundra district, *Christenson NSW 117379*, 5.11.1959 (NSW). South Western Plains: 20 km NE of Deniliquin, *W.E. Mulham 1604*, 11.1986 (NSW). VICTORIA: Parish of Dunolly, *M.J. Lindsay*, 30.11.1984 (MEL 671120). TASMANIA: Flinders Island: Erita, *Warren NSW 117376* 4.12.1979 (NSW).

(ii) *S. horridula* Pilger

This species was described in 1922 (Skottsberg 1922) from Easter Island and was considered endemic there. Only one specimen was collected, with several duplicates. Unfortunately, all of the duplicates were immature. It was obvious to us, however, that the specimen belonged to the Falcateae, thought to be a group endemic to Australia. The species then was either of interest biogeographically, or was important nomenclaturally as its epithet predated many of the names used for the Falcateae in Australia. After examining some of the duplicates (K, S, GB) it was not possible to decide to which species Skottsberg's collection belonged. No other collections of the taxon could be found. Eventually one of us (JE) was able to collect good specimens on Easter Island in 1987 and to ascertain that the taxon was *S. scabra* Lindley subsp. *scabra*.

Stipa scabra* Lindley in Mitchell (1848:31) subsp. *scabra

SYNONYM: *Stipa horridula* Pilger in Skottsberg (1922: 64, pl. 6) *syn. nov.*

LECTOTYPE, here designated: EASTER ISLAND: Isla de Pascua slope of [Mt] Katiki, Skottsberg 660, 16.6.1917 (GB; dupls S, K). There is no specimen extant at B where Pilger's types would be expected. The duplicate at GB is with many of Skottsberg's other specimens; it is the best developed and most mature of the duplicates, and has been seen and annotated by Pilger.

Stipa does not appear in a list of species of Easter Island prepared in 1911 (Knoche 1925). It was collected in 1917 ('Mt Katiki, stray patches on the western slope') by Skottsberg (1922) and described as being '... observed in this association [grassy slopes of Maunga Katiki] forming a couple of small societies on the seaward slope' (Skottsberg 1927). In 1981 it was mapped as one of the dominant species in ten areas accounting for c. 4–5% of the area of the island (Etienne et al. 1982) but by 1983 was described as being restricted to the western slope of Mt Katiki (Etienne & Faundez 1983). By 1987 it was only present in one of the eight areas visited (by JE) of the ten described by Etienne et al. (1982) and also on the western slope of Mount Katiki, but restricted to a few plants in both localities.

The introduction, spread and decline of the species on the island seems to be directly related to agricultural practices. Missionaries brought livestock to the island, supposedly from Australia, in 1860. Further imports occurred; for example, the 'Sydney Morning Herald' recorded a shipment of 400 merinos in December 1871. As well as the livestock imports providing a possible origin for the diaspores, a manager of the Williamson Balfour Pastoral Company, the company managing the island, introduced seeds of many Australian species, including 29 spp. of *Eucalyptus* during 1902–1929 (S. Rapu pers. comm.). The timing of the collections and spread of *Stipa* would probably indicate an introduction during the earlier period but either option is possible.

The sudden decline of the *Stipa* seems to be related to the rapid spread of the less palatable *Sporobolus africanus* [*S. indicus*] and the preferential grazing of *Stipa* by cattle. *Stipa* is now almost restricted to areas not readily accessible to cattle.

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