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STIPA L. IN TASMANIA - HISTORICAL NOTES:

TAXONOMIC CONTRIBUTIONS 1768-1968 AND

THE TYPE LOCALITY OF *STIPA FLAVESCENS* LABILL.

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(with two text-figures and two plates)

ABSTRACT

Short notes are given on the history of the study of *Stipa* L. in Australia with particular emphasis on the Tasmanian contribution. The type locality of the enigmatic *S. flavescens* Labill., is established as Robert's Hill, Bruny Island.

TAXONOMIC CONTRIBUTIONS 1768-1968

Introduction

Australia has a special significance in the history of the world's study of *Stipa* as some of the first species descriptions in the genus were based on Australian specimens collected by the earliest of the Antipodean explorers. Labillardière (1804) described *S. elegantissima* a West Australian species and *S. flavescens* from Tasmania, both of which he collected while accompanying Bruni D'Entrecasteaux on the expedition searching for the missing explorer La Perouse (Labilladière 1799). Robert Brown (1810, 1835) described five more Australian *Stipa* species, which were included in the plant collections he made between 1802-1805 while travelling with Matthew Flinders on board the *Investigator*.

Outside of Australia the Russian botanist Trinius (1831) was one of the earliest contributors to the world's literature on *Stipa* with his description of *S. ramosissima*, an Australian species. With Ruprecht in 1842 he published "Species Graminum Stipaceorum" which included two other *Stipa* species of Australian origin, *S. commutata* and *S. pubinodis*, the latter being Tasmanian. The German taxonomists Sprengel (1827) at Halle, Steudel (1854) at Stuttgart, and much later Pilger (1904) and Mez (1921) both at Berlin, working on herbarium collections which included Australian material, brought more order into the genus as then known. Work on the Australian *Stipa* flora after 1920 was concentrated at Kew (Hughes 1921, 1922; Hubbard 1925; Summerhayes and Hubbard 1927).

Within Australia, Bentham (1878) assisted by Baron von Mueller, and also Bailey (1902), Rodway (1903), and Black (1922) based the *Stipa* sections of their floras on the earlier works of Labilladière (1804), R. Brown (1810, 1835) and J.D. Hooker (1855-60).

D.K. Hughes, working on the type collections at the Herbarium, Royal Botanic Gardens, Kew, revised the Australian species of *Stipa* (1921, 1922), and enumerated 43 endemic species although greatly handicapped by the nature of the material. Most of the specimens in this collection had been gathered in autumn and winter, and were either overmature or immature. Some were incomplete, and in general there was insufficient variety of specimens to give a true picture of the range of living plants within each entity. Nevertheless Hughes' Revision was a most useful work and it provided the basis for subsequent investigations of the genus. Ewart (1931), Gardner (1952), Willis (1962), Burbidge (1966), and Burbidge and Gray (1970) have all made use of it

in compiling their floras.

The type material of the bulk of the Australian species is held at Kew. In addition to the generally poor quality of the specimens, the difficulty of obtaining this material for study in Australia has resulted in a considerable degree of confusion between species. A new revision which is urgently required is currently in progress (Dr J.W. Vickery *pers. comm.*). Relatively few type specimens are lodged in Australian Herbaria. They include those belonging to the species described in the various State Journals by Tate (1885, South Australian species), Reader (1897-1901, Victorian species), Black (1918, 1920, 1941, South Australian species), Vickery (1951, New South Wales species), Blake (1952, Queensland species), and Townrow (1970, Tasmanian species).

Consequent upon the accidents of history, and the routes travelled by the first Australian explorers, Tasmania features largely in the early accounts of *Stipa* species in Australia.

The early explorers 1768-1800

Joseph Banks and Daniel Solander accompanied Captain Cook on his first voyage to the Southern Hemisphere (1768-71), (Hooker 1859), and collected the very first Australian *Stipa* specimens in the vicinity of Botany Bay near Sydney. They knew nothing of the existence of Tasmania.

The first botanists to set foot in "Insula Van Diemen", as Tasmania was called, were David Nelson and William Anderson who accompanied Cook on his third voyage. They landed at Adventure Bay in January 1777, late in the growing season (Hooker 1859). *Stipa* occurs rarely in that vicinity at the present time, and predictably was not among their plant collections.

Jacques-Julien de Labilladière, who went in search of La Perouse with Bruni D'Entrecasteaux in the ship *La Recherche* (Labillardière 1799; Stafleu 1967a), visited Tasmania twice. He first landed at Storm Bay in late autumn on April 23rd 1792, and in the ensuing month collected mostly shrubs and small herbs. The return visit of the Expedition to Adventure Bay (January 22nd-March 1st 1793) was earlier in the season although still rather late for obtaining first class *Stipa* material. Labillardière then explored widely in the vicinity, collecting many plant specimens along the shores of the newly discovered channel between Bruny Island and the mainland (named D'Entrecasteaux in honour of his Captain). There is little doubt that the type material of *S. flavescens* Labill. was collected during that time, probably in the vicinity of Simpsons Pt. or Robert's Hill on North Bruny (see p.218). Labillardière's first set of plants (i.e. of best quality) was later acquired by P.B. Webb who in turn bequeathed his herbarium to the Grand Duke of Tuscany and the town of Florence. Most of these specimens are still at the herbarium (FI) (Stafleu, 1967b).

The Brown and Hooker period 1800-1890

Robert Brown came to Tasmania eleven years after Labillardière's short visits. Engaged as naturalist to Matthew Flinders on his voyage to New Holland in the *Investigator*, Brown arrived in Tasmania in January 1804 with the first British settlers in northern Tasmania. He collected plants, including the type material of *Stipa semibarbata*, near the mouth of the River Tamar around Port Dalrymple (George Town). During the later part of his nine months' visit, between February and September 1804, he collected specimens in southern Tasmania around Risdon Cove, along the River Derwent, and also on Table Mountain (Mount Wellington) which he found "uncommonly productive" of new species (Hooker 1859; Brown quoted in Stearn 1962). *Stipa* was not well represented among the 700 species he recorded for Tasmania in his PRODROMUS (Brown 1810, 1835). Of the eight *Stipa* species listed therein only *S. semibarbata* and *S. flavescens* occurred in Tasmania. Colonel Paterson, Lieutenant Governor of Tasmania from 1804 to 1810, who founded Launceston, was keenly interested

in plants and sent specimens to Sir Joseph Banks, and to Robert Brown after the latter returned to England in October 1805 (Hooker 1859).

Paterson's great friend and companion R.C. Gunn was outstanding amongst the further half dozen keen naturalists and collectors in Tasmania who added to the growing herbaria of Banks, Brown and later the Hookers, father and son. Gunn collected widely all over Tasmania between 1832 and 1850, at Circular Head, Emu Bay, Rocky Cape, the Asbestos Range and Hampshire Hills, the Western Mountains, Flinders and other Bass Strait Islands, the East Coast, Derwent Valley, St. Clair, Echo and Arthurs Lakes, west to Macquarie Harbour, and along the Franklin and Huon Rivers (Hooker 1859). Several of his *Stipa* specimens are cited by Hughes (1921, 1922). Unfortunately he chose to give each species rather than each specimen a collection number, so that the same number appears on several of his specimen sheets to the subsequent perplexity of taxonomists. Some incorrect original identifications led to further confusion.

Sir Joseph Hooker, who sailed with James Clark Ross as assistant surgeon and experimental botanist on the Antarctic Voyage of H.M. discovery ships *Erebus* and *Terror* (1839-43), visited Tasmania twice and stayed with Sir John Franklin. The latter, founder of the "Tasmanian Society" (1842), a part forerunner of the Royal Society of Tasmania (*Comme*. Dr. William Bryden in the Clive Lord Memorial Lecture: "Tasmanian Science and Scientists in the 1840's" delivered to the Royal Society of Tasmania 3.4.1973), and a friend of Sir William Hooker (Sir Joseph's father), was Sir Joseph's host from the end of July to 12th October, 1840, and again from 6th April to 6th July, 1841, both of which were winter periods. During his second visit, Hooker examined the fossil forests at Rosegarland Estate (Allan 1967, p. 125), from whence came the splendid conifer trunk which adorns the entrance to the Geological Section at the British Museum. He included four species of *Stipa* in the FLORA TASMANIAE (Hooker 1855-60), of which *S. flavescens* Labill. and *S. setacea* R. Br. were based on records in the earlier publications of Labillardière (1804) and Brown (1810), while *S. semibarbata* R. Br. and *S. pubescens* R. Br. were from his own observations "common on dry soils". Subsequent investigation (Townrow 1978, p.254) has shown that he was not justified in placing *S. pubinodis* Trin. in synonomy with *S. pubescens*. He also confused *S. setacea* with what was later distinguished as *S. variabilis* Hughes, and found it impossible to separate *S. semibarbata* and *S. mollis* R. Br. The latter separation is still a matter for conjecture (Townrow 1978, p.245).

Others who contributed to the pool of Tasmanian *Stipa* herbarium material during the 19th century include John Llotsky, who was active in the Tasmanian Alps in 1830, whose collections were dispersed (Hooker 1859), Captain Home who collected *S. stuposa* Hughes from Port Arthur and Hobart Town in 1848, and W.H. Archer F.L.S. Archer, Registrar General of Victoria from 1859, was a keen statistician whose strong botanical and zoological interests were encouraged by Baron F. von Mueller. He collected a Herbarium of Tasmanian Plants (Nairn *et al.* 1969). Mueller himself collected *S. pubinodis* from the Latrobe River Area (Mersey River, 1854, *Mueller*). S.G. Hannaford, editor of the Launceston Times, and later (1870) Librarian of the Tasmanian Public Library at Hobart (Mennell 1892) also kept a Herbarium of Tasmanian Plants. Some *Stipa* specimens from the Archer, Mueller and Hannaford collections are at Hobart (H) while Home's specimen of *S. stuposa* is at the British Museum of Natural History (BMNH).

The Rodway period 1890-1930

Leonard Rodway, Honorary Botanist to the Tasmanian Government from 1896 to 1932, was also dentist on the honorary staff of the Hobart Hospital (Chisholm *et al.* 1958). He made extensive collections of plants in southern Tasmania, and left numerous *Stipa* specimens which were collected from areas between Brighton and Dromedary north of Hobart, to Blackmans Bay in the south. His specimens at Hobart and Kew have collecting dates ranging from 1890 to 1935.

Historical notes on *Stipa* in Tasmania

Five *Stipa* species are listed by him in the TASMANIAN FLORA (Rodway 1903): *S. pubescens*, *S. setacea*, *S. flavescens* and *S. semibarbata* were retained from Hooker's list (1855-60), with the further addition of *S. teretifolia* Steud. and a new variety, *S. pubescens* var. *aphylla* Rodway.

Four of Rodway's contemporaries deposited specimens of Tasmanian *Stipa* at the National Herbarium of New South Wales (NSW). J.H. Maiden, Curator of the Technological Museum Sydney from 1881 (Johns 1922), and R.H. Cambage, Chief Mining Surveyor (N.S.W.) (Johns 1922) together collected *S. stuposa* at Sandy Bay in January 1902. J.B. Cleland, Professor of Pathology at Adelaide University, a keen ornithologist and botanist and later president of the Royal Society of New South Wales (1917) (Legge 1971, 2), collected *S. mollis* at Launceston in November 1912. A.H.S. Lucas, a scientist and schoolteacher in Sydney and Professor of Mathematics at the University of Tasmania for two years (Legge 1971, 5) collected many plants while in Hobart in December 1923, among which were *Stipa teretifolia (=S. stipoides)*, *S. variabilis* and *S. semibarbata*.

The post 1920's period of inertia

Dwindling interest in taxonomic botany after the 1920's was reflected in *Stipa* research by a paucity of collected specimens and a dearth of publications.

The ensuing twenty years of *Stipa* collecting in Tasmania are represented by four specimens: 1926, *Black* (K); 1931, *Davies* (NSW) (William Davies of the Welsh Plant Breeding Institute, Aberystwyth); 1932, *White* (NSW) (C.T. White, Government Botanist, Queensland); and Jan 1937, *G.* and *C. Davis* (NSW).

The Curtis period 1943 to the present time

Dr W.M. Curtis, was appointed to the Botany Department of the University of Tasmania in 1943 retiring at the end of 1966. She has maintained a profound interest in taxonomic botany, and has collected widely throughout the State. Her specimens of *Stipa* (1943-59) await treatment for the Monocot section (Part 4) of the STUDENT'S FLORA OF TASMANIA, to be published shortly (Curtis, 1956-).

N.T. Burbidge, Curator of Herbarium Australiensis, C.S.I.R.O., Canberra, S.T. Blake, Research Botanist, Division of Primary Industries, Brisbane, and J.W. Vickery, National Herbarium Sydney, came to Hobart to attend the A.N.Z.A.A.S. Conference of 1949, and made *Stipa* collections on the A.N.Z.A.A.S. botanical excursions. Duplicate sheets of these collections were subsequently deposited at Kew, Hobart, Sydney and Canberra.

Dr. Vickery revisited Tasmania with Dr. M.E. Phillips (Botanical Gardens, Canberra) in January 1962 and collected *Stipa* and other specimens for the Canberra Botanical Gardens Herbarium.

The current work on *Stipa* (Townrow 1970, 1974, 1978) commenced in 1965 with general collecting and recording of distribution of taxa. The study of type specimens on long loan from Kew has greatly facilitated an understanding of the genus both in Tasmania and in Australia as a whole.

THE TYPE LOCALITY OF *STIPA FLAVESCENS* LABILL.

The question of the identity of the enigmatic *S. flavescens* and its possible conspecificity with the well accepted taxon *S. compacta* Hughes revolved round two main issues: firstly the re-examination of the leaf blade section of the type of *S. flavescens* to obtain verification of Hughes' data; secondly the discovery of new specimens which would match the type of *S. flavescens*. That specimen has cleistogamous florets with *S. compacta*-like lemma characters coupled with thickened, terete leaf blades and membranous hairless ligules up to 4mm long.

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Re-examination of a leaf blade section of the type of *S. flavescens* revealed a lignification pattern agreeing with that shown in Hughes' drawing for *S. compacta* (Hughes 1921, p.29, fig. 31a) not as in that for *S. flavescens* (*l.c.* p.19, fig. 6a) so that a search for specimens having leaf blades with a continuous hypodermis was no longer necessary.

It was assumed that the best place to look for new specimens matching the type material would be the type locality if that could be rediscovered.

As in the case of *Stipa elegantissima* Labill., and *Leptospermum glaucescens* Labill. (Willis 1967), Labillardière occasionally by mistake wrote "in capite van Diemen" instead of "in terra van Leuwin" and vice versa on some of his specimen labels. Therefore it was possible that *S. flavescens* might have come from Western Australia and not Tasmania as he stated (1804).

That *S. flavescens* was first collected in Tasmania, and the whereabouts of the type locality, is established with reasonable certainty by the ecological and historical evidence which follows.

The type sheet of *S. flavescens* at Kew has on it three packets which contain loose bits of plant material. Packet 1 labelled "originally stuck on sheet" in Hughes' handwriting, contains lemmas and loose bits from the type collection. Packet 2 contains lemmas sorted out of the material in Packet 1 by P.F. Morris and labelled by him *"S. pubescens"*. Packet 3 contains bits taken from a panicle of the type collection of *S. flavescens*. The lemmas in Packet 2, I identify as belonging to the endemic Tasmanian species *Stipa aphylla* (Rodway) Townrow. Thus the type specimen of *S. flavescens* must have been collected from Tasmania and not from Western Australia.

The endemic *S. aphylla* is restricted to the margins and open areas of dry sclerophyll in coastal and near coastal parts of south-eastern Tasmania with rainfall under about 1020mm p.a. (Townrow 1974). Its major flowering period begins in early December and ends at the beginning of February, about two weeks earlier than that of *S. flavescens* (called *S. compacta* in Townrow 1974) which grows in low coastal sandy areas, and flowers from mid-September to mid-July. Therefore it is most probable that the type material of *S. flavescens* was collected, along with *S. aphylla*, no later than late February or very early March close by or at the margin of dry sclerophyll in a low coastal sandy area. I have recorded *S. flavescens*, then ascribed to *S. compacta*, growing in the vicinity of *S. aphylla* on one occasion only (in January 1974, see below) and regard it as an unusual combination in present day circumstances as most of the appropriate low lying dry sclerophyll has been cleared for grazing.

Labilladière's first visit to Tasmania (23 April-28 May 1792) was too late in the season for the collection of both *S. flavescens* and *S. aphylla* in flower, therefore he must have collected them during his second visit between 22 January-1 March 1793. Even so, this was very late in the flowering season, which circumstance explains the poor quality of his *Stipa* specimens.

Only two areas visited between 22 January and 1 March 1793 fulfil the habitat requirements for the type locality of *S. flavescens*. They are Pointe de Riche (Simpson's Point) on the western side of the Baie de l'Isthme (Simpson's or Isthmus Bay), and the tip of Cap le Grand (Kinghorne Point, west of Robert's Hill), both on Bruny Island. Other areas such as those around Recherche Bay are too wet. Partridge Island, which is not too wet, is ruled out because Labillardière called there too late in the season (20 May 1792); also a search of this Island made in 1974 on the anniversary of his visit revealed no *S. aphylla* and only one depauperate specimen of *S. flavescens*. Figure 1, which shows the possible type localities, is based on a combination of a tracing of Beautemps-Beaprè's "Carte Particulaire du Canal D'Entrecasteaux

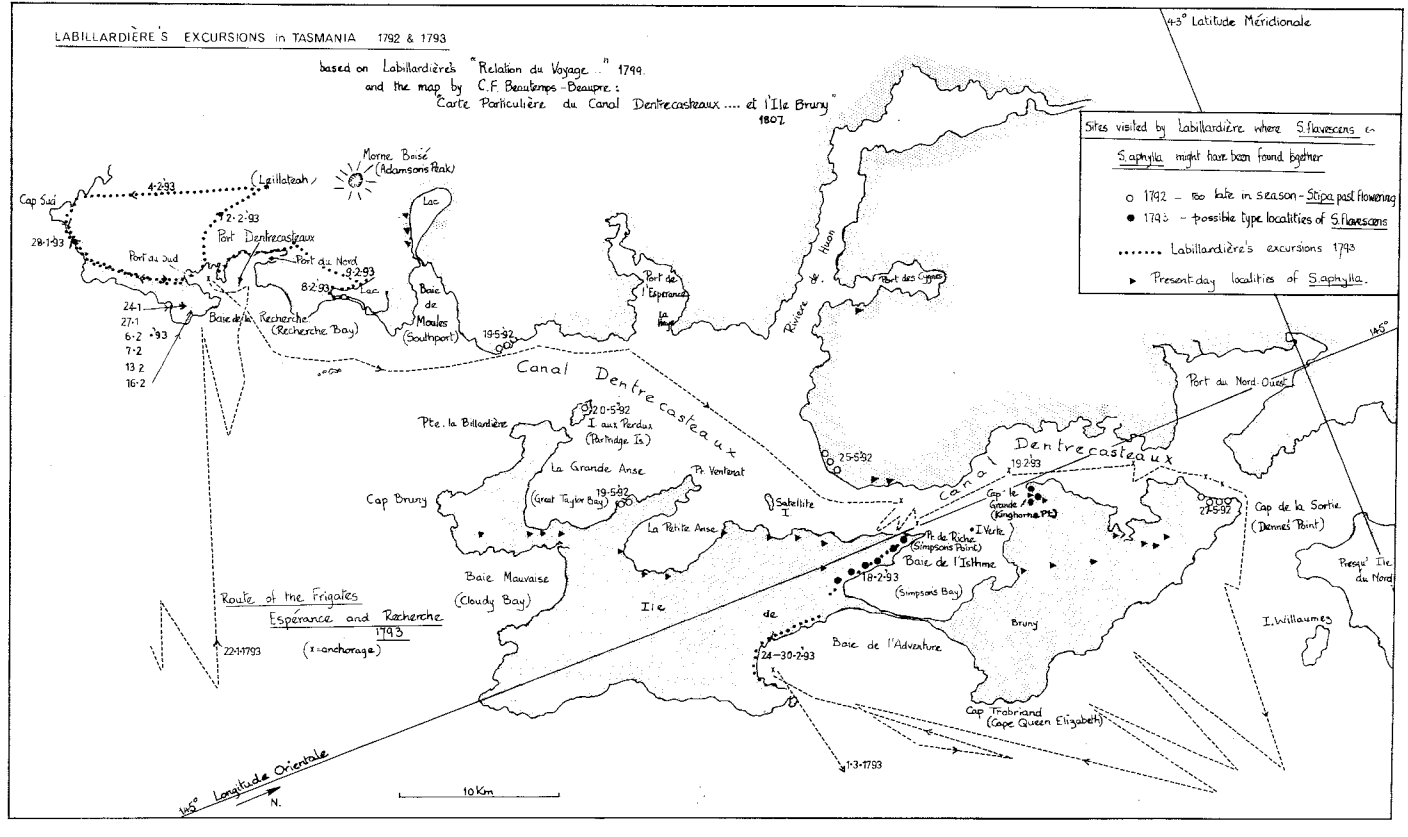

FIG. 1. - Sketch map of Bruny Island and the adjacent Tasmanian Coastline based on a tracing of C.F. Beautemps-Beauprè's map of 1807, showing the sites visited by Labillardière in 1792 and 1793 where *Stipa flavescens* might have been found in association with *S. aphylla* i.e. where the annual rainfall is less than about 1020mm, close by or at the margin of dry sclerophyll in a low lying sandy area. (Also figured are Labillardière's excursion routes of 1793).

et l'Isle Bruny" in his ATLAS DE VOYAGE DE BRUNY - D'ENTRECASTEAUX (1807, pl. 39, fol.) included in De Rossels' VOYAGE DE D'ENTRECASTEAUX (1808), and of Labillardière's own account of his collecting expeditions (RELATION .... 1799, held at Kew Herbarium Library). The following extract from RELATION, 2, translated from the French, describes Labillardière's visits to Pte. Riche and Cap le Grand:-
"18th February [1793]: Got underway but had to anchor again because of the contrary current and faint winds [the anchorages for 17th and 18th February are marked close together on the map, fig. 1 just off Pte. de Riche]..... Natives appeared on the eastern shore. I hastened on shore..... one of the natives remembered Bligh's visit.. ... I walked with the natives towards Adventure Bay and then returned [to the Recherche]. Soon after sunset we weighed anchor and proceeded two leagues further and anchored. 19th February: Landed on the eastern shore and penetrated the woods where I found a new species *Exocarpus expansa*..... We were under sail by 5 p.m. We took four days to cover the couple of leagues to the extremity of the strait."

Both Pointe de Riche and Cap Le Grand, the areas suggested as type localities, are much exposed to prevailing winds, especially the western end of Cap Le Grand (Kinghorne Point and Roberts Hill). Such a bleak environment might be responsible for the thicker, more terete leaf blades and different ligule development of the type material of *S. flavescens* compared with the more usual characters as exemplified by the type material of *S. compacta*. The type specimen of *S. flavescens* shows evidence of cleistogamy (minute anthers and well developed caryopsis, Townrow 1978, p.240) which again may be connected with extreme environmental conditions. Thus the type may be a phenotypical variant of the more usual form.

Visits to both localities were made, approaching both by sea and by land, to Simpsons Point on 23 December 1973, and to Kinghorne Point on 23 December 1973 and 11 January 1974, those dates being the closest possible to arrange to the anniversary of Labillardière's visit.

S. flavescens (then assigned to *S. compacta*) was recorded at both localities growing in a few isolated patches immediately behind the strandline. *S. aphylla* was absent from Simpsons Point, but was discovered on 11 January 1974 near Kinghorne Point scattered in sparse woodland, some within 10m of the pebbly strandline, and about 400m from the closest patch of *"S. compacta"* (see fig. 2 at ▲ and plate 1 "↘"). The patch of *"S. compacta"* was situated on low sandy banks at the mouth of the small creek running into the inlet north east of Snake Island (see fig. 2 at ⁂ and plate 2). This spot with its promise of fresh water is an obvious landing place for Labillardière to have chosen from the anchorage of 19 February 1793 (fig. 2 at ⚓).

Detailed examination of representative specimens (Townrow 255 (HO)) ascribed to *S. compacta* collected from this site was made. All leaf blade sections agreed with Hughes' drawing of *S. compacta* sections. The lower culm leaves of several specimens had lopsided ciliate margined ligules up to 1mm long intermediate between those of the types of *S. flavescens* and of *S. compacta*, while the florets were cleistogamous like those of the type of *S. flavescens*. Although specimens exactly matching the type of *S. flavescens* in ligule character (membranous, up to 4mm, smooth margined) were not found, there is little reason to doubt that *S. flavescens* and *S. compacta* are conspecific.

Taking all evidence into consideration, the most likely site of the type locality of *S. flavescens* is the sandy bank area at the north end of the inlet north-east of Snake Island south of Roberts Hill, North Bruny Island (latitude 43° 10'S, longitude 147° 18') (plate 2).

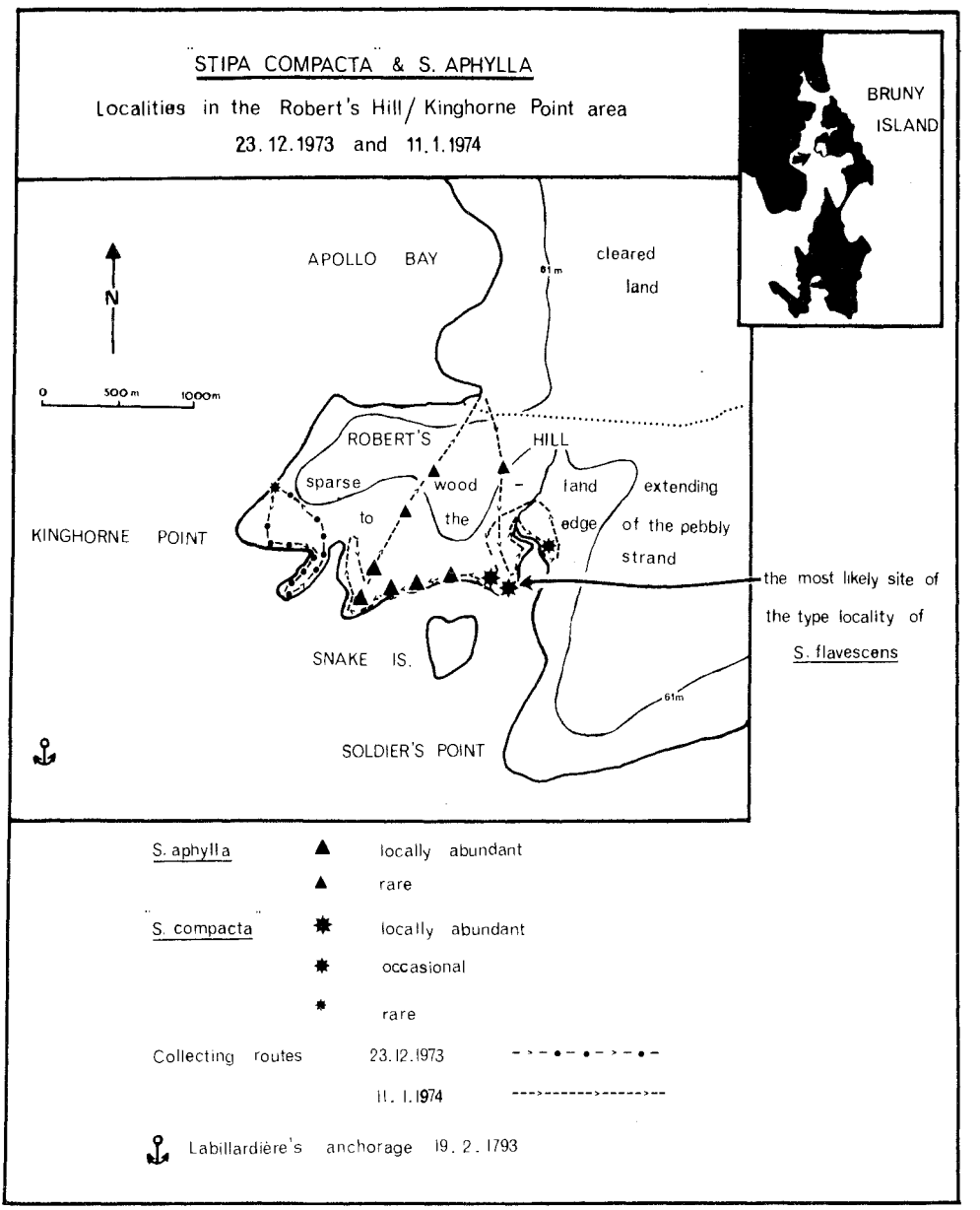

FIG. 2. - Sketch map of the Roberts Hill region of Bruny Island showing the author's collecting routes and recorded localities of *"Stipa compacta" (=S. flavescens)* and *S. aphylla*, Labillardière's anchorage in February 1793, and the most likely site of the type locality of *S. flavescens*.

PLATE 1. - Labillardière's probable landing place on 19 February 1793 - the inlet east of Kinghorne Point and north east of Snake Island; *S. aphylla* is marked with a white arrow. (Photograph taken looking west to Woodbridge).

PLATE 2. - The most likely site of the type locality of *S. flavescens* - *S. flavescens* growing on the sandy bank at the north end of the inlet north east of Snake Island. (Photograph taken looking east).

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