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Lichens of St Helena and Ascension Island

ANDRÉ APTROOT*

ABL Herbarium, G.v.d.Veenstraat 107, NL-3762 XK Soest, the Netherlands

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Lichens are the dominant organisms on most of the South Atlantic island of St Helena. In total, 220 different species were found during a recent survey, most of which have never been reported from the island. Previously, less than 50 lichen species were reported from the island, one half of which are most probably incorrect records. The total number of lichens known from the island now stands at 225. Most species could be identified, but the following, most probably endemic, species are described as new to science: ***Dolichocarpus seawardii***, which is only the second species in this genus, the type being from Chile; ***Dermatiscum pusillum***, which is only the third species in this African genus; ***Dimelaena triseptata***; ***Xanthoparmelia beccae***; and four *Ramalina species*, ***Ramalina geniculatella***, ***R. ketner-oostrae***, ***R. rigidella***, and ***R. sanctae-helenae***. The lichen flora has many species in common with that of the geologically much younger Ascension Island, where just under 100 species were recently found by the author, most of which are equally new to that island. *Lecanora sanctae-helenae*, previously known as the only endemic lichen of St Helena, was also found to be abundant on Ascension Island.

ADDITIONAL KEYWORDS: *Dermatiscum* – *Dimelaena* – *Dolichocarpus* – new species – *Ramalina* – South Atlantic island – *Xanthoparmelia*.

INTRODUCTION

St Helena is a subtropical, volcanic, mid-Atlantic island between Africa and South America, which is geologically old (*c.* 15 million years) and quite isolated, with Ascension Island *c.* 1000 km to the northwest and the Tristan da Cunha archipelago at a greater distance to the south. The endemic flora and fauna of St Helena have suffered considerably from human impact over recent centuries. However, lichens are prominent in many places, often forming the dominant flora. Although some endemic species had already been described in the 19th century from the semi-desert zone, the lichen flora of the island is poorly understood. A detailed lichen survey was carried out in October 2006, and the results were compared with neighbouring islands and mainland countries.

*E-mail: andreaptroot@wanadoo.nl

LITERATURE REPORTS

Only one old publication is devoted to the lichens of St Helena (Leighton, 1869). It cites 40 lichen taxa, half of which are highly unlikely and probably misidentifications. Most interestingly, three of the species (*Lecanora personata*, *Lecidea approximans*, and *Lecidea lactescens*) are described as new to science. Reports of these from elsewhere have not been published, nor have they been synonymized with taxa from outside the island, although they have all been reclassified in other genera, as *Aspicilia personata*, *Buellia approximans*, and *Blastenia* or *Huea lactescens*. Internet sites, such as the 'Internet Checklist of St Helena Lichens', do not add anything to this earlier publication.

The reports of lichens from St Helena are scattered throughout several other publications, sometimes merely repeats of the Leighton data, but some additional ones are provided, including several described as new to science. Müller (1893) described the additional endemic *Lecanora sanctae-helenae*, still accepted in a current monograph (Dickhäuser, Lumbsch & Feige, 1995), which was, until this recent

work, known only from St Helena. Dodge (1959, 1971) is the most proficient, but not necessarily the most reliable, source, describing three species new to science: *Parmelia mellissii* (now *Parmotrema mellissii*), which was subsequently identified to be widespread in the tropics; *Parmelia sanctae-helenae*, which is a synonym of the common *Rimelia reticulata* (Hale & Fletcher, 1990); and *Parmelia wildeae* (now *Xanthoparmelia wildeae*), which is still accepted (Hale, 1990) and, furthermore, is known from South America. Interestingly, only one of five previously identified *Ramalina* species was correctly reported from St Helena (Krog, 1994), and this is the non-endemic *R. arabum*, which was reported under another name (*R. rubrotincta*) from Ascension Island.

No reports of St Helena lichens were encountered in the monographs consulted in the present study, other than that of *Parmelinopsis spumosa* (as *Parmelina spumosa*) by Hale (1976).

A detailed evaluation of the literature reports pertaining to species described from St Helena, usually based on an examination of specimens, is given below. The identity of several other literature reports remains uncertain until the material has been found and examined. Five species appear to have been correctly reported from St Helena, but could not be found recently, suggesting that they have vanished since 1811. These are *Cladia aggregata*, *Cladonia chlorophaea*, *Dictyonema glabratum*, *Erioderma unguigerum*, and *Teloschistes scorigenus*. These species probably all grew formerly in high-elevation open areas, much of which is now extensively covered by the introduced New Zealand flax (*Phormium tenax*).

PREVIOUSLY COLLECTED MATERIAL

From an evaluation of the literature, it soon became apparent that nearly all lichens ever collected on St Helena are currently held in the Natural History Museum, London; this includes material relating to most of the 19th century records cited as being housed at Kew. An Internet search of databased herbaria did not reveal any other major collection of materials, and the only larger one was, anyway, on loan to London. Therefore, in September 2006, a visit was made to the Natural History Museum, London, where over 250 lichen specimens from St Helena were studied, including the type specimens of the purported endemics, as well as recent, unpublished collections (by Q.C.B. Cronk in 1987 and L. Balfe in 2002) and material collected by the entomologist E. Beattie from the Prosperous Bay Plain area.

Not all specimens recorded in the literature could be found, but specimens representing nearly all different taxa were found amongst the above collections. The macroscopic, microscopic, and chemical study of the specimens supported an evaluation of virtually all the literature reports (see Table 1).

VEGETATION ZONES

Following massive human impact on St Helena, the present vegetation zones can be characterized as follows (from the sea to the mountains, modified after Cronk, 2000): coastal cliffs, semi-desert, agricultural zone, and tree fern thicket.

The north- and west-exposed coastal cliffs up to an altitude of *c.* 200 m are almost devoid of lichens. The same phenomenon has been reported from Ascension Island (Tehler, 1985). It is probably too dry, as fog apparently begins at higher elevations. However, the south- and east-exposed coastal cliffs are very rich in lichens.

The semi-desert is the area of main lichenological interest in St Helena. Lichens are present in most places, and often abundant. Within this zone, three main lichen vegetation types can be distinguished: (1) soil crusts; (2) boulder fields; and (3) vertical cliffs.

The vegetation of the vertical cliffs is the richest in abundance, but not necessarily in diversity. The boulder fields are the richest in diversity, as there are boulders interspersed with soft sandy patches supporting soil crusts. The soil crusts occur on some sandy desert areas, often with a low diversity. In addition, special habitats with a few extra or characteristic species include: (1) overhanging cliffs; (2) ledges with run-off along gullies; and (3) shrubs.

All endemic lichens from St Helena are known from the semi-desert zone, being dominant in most places. They are treated in detail below.

The agricultural zone consists of an area with plantations, most housing, scrubs, hedges, etc. Lichens occur here and there, especially on the roadside, *Erythrina* trunks and branches, wood, and boulders. In general, the lichen species are subtropical (to tropical or temperate) and widespread elsewhere. From a random sample collection of lichens from this zone, it would be impossible to determine from which country, or even which continent, they originated.

The tree fern thicket contains the remnants of the original forest, and most of the endangered endemic plants occur here. The lichen flora is essentially that of tropical mountains; it resembles that of the Green Mountains on Ascension Island and the mountains in Brazil (e.g. Carassa) or Uruguay, but is, of course, much poorer in species, undoubtedly because of the small size of the forested area and the very wet conditions, which are better suited to bryophytes and ferns.

The collecting localities are listed in Tables 1–2, and Tables 1 and 2 list the full composition of the lichen vegetation at selected places on St Helena and

Table 1. Lichens of St Helena, October 2006

Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	misc.	Distribution	New to
Acarospora citrina														14x													Pantropical	Island
Acarospora impressula				4x	5x	6x										16x	17x								25x		Cosmopolitan	Island
Agonimia pacifica																								24x			Pantropical	Africa
Agonimia papillata																				20c							Pantropical	Africa
Amandinea lecideina	1x		3x		5x			8x	9x	10x	11x		13x	14x	15x	16x	17x	18x									Cosmopolitan	Island
Amandinea submontana												12c											23c				Africa & S. America	Island
Anisomeridium distans																									25x		N. America	S. Hemisphere
Arthonia antillarum																			19c								Pantropical	Island
Arthonia cf. *complanata*																			19c								Pantropical	ID uncertain
Aspicilia contorta			3x	4x	5x				9x			12x	13x	14x	15x		17x	18x						24x			Cosmopolitan	Island
Bacidia laurocerasi																			19c								Cosmopolitan	Island
Bacidia medialis																			19c								Pantropical	Island
Brigantiaea leucoxantha																			19c	20c	21c						Pantropical	Island
Buellia aethalea																16x											Cosmopolitan	Island
Buellia halonia	1x		3x					8x	9x	10x	11x	12x	13x		15x	16x	17x	18x						24x	25x		Africa & America	Island
Buellia mamillana																16x											America	Africa
Buellia stellulata											11x	12x															Cosmopolitan	Island
Buellia subaethalea												12x					17x	18x									America	Africa
Buellia subalbula									9x																25x		Pantropical	Island
Buellia tesserata	1x		3x	4x	5x	6x		8x	9x	10x	11x		13x	14x	15x	16x	17x	18x	19x	20x	21x						Pantropical	Island
Bulbothrix decurtata																								24x			Africa	Island
Byssoloma leucophthalmum																					21c						Pantropical	Island
Byssoloma subdiscordans																				20c	21c						Pantropical	Island
Caloplaca cf. *bolacina*	1x		3x	4x	5x	6x		8x	9x	10x	11x	12x	13x	14x	15x	16x	17x	18x	19x	20x	21x			24x	25x		America	ID uncertain
Caloplaca crenularia					5x				9x	10x	11x		13x	14x	15x		17x	18x						24x	25x		Europe & Macaronesia	S. Hemisphere
Caloplaca cf. *dalmatica*	1x		3x	4x	5x	6x		8x	9x	10x	11x	12x	13x	14x	15x	16x	17x	18x		20x				24x	25x		Europe	ID uncertain
Caloplaca flavocitrina				4c	5xc				9x	10x	11x		13x	14c	15x	16x	17x	18x		20x	21xc	22x		24x			Europe & Macaronesia	S. Hemisphere
Caloplaca flavovirescens	1x		3x	4x		6x			9x	10x	11x	12x			15x	16x	17x	18x		20x	21xc	22x		24x	25x		Cosmopolitan	Island
Caloplaca haematodes					5x	6x		8x	9x	10x	11x		13x	14x			17x	18x						24x			Africa	Island
Caloplaca cf. *holocarpa*																16x											Cosmopolitan	ID uncertain
Caloplaca cf. *sublobulata*																16x											Australia & Africa	ID uncertain
Candelaria concolor			3x	4x	5x			8x	9x	10x				14x		16x			19x					24x	25x		Cosmopolitan	Island
Candelariella efflorescens					5x				9x															24x			N. America	S. Hemisphere
Catillaria chalybeia																								24x			Cosmopolitan	Island
Catillaria nigroisidiata					5x						11x					16x									25x		W. Europe	S. Hemisphere
Chrysothrix xanthina	1x		3x	4x	5x			8x	9x	10x		12xc	13x	14x		16x	17x	18x	19xc	20xc	21xc	22x		24x	25x		Pantropical	Island
Cladonia corniculata												12x					17x	18x	19c	20xc	21x	22xc		24x			S. hemisphere	Africa
Cladonia nana																				20x							Pantropical	Island
Cladonia marionii												12x							19x	20x	21x	22x		24x			Subantarctic island	Africa
Cladonia mauritiana												12x								20x		22x					Indian Ocean islands	Atlantic Ocean
Coccocarpia palmicola										10x		12x					17x	18x	19c	20xc	21xc	22xc		24x			Pantropical	Island
Collema cf. *coccophorum*				4x						10x			13x														Cosmopolitan	ID uncertain
Dermatiscum pusillum				4x		6x		8x						14x			17x										Endemic	Science
Dibaeis sorediata																				20x		22x					Pantropical	Island

Table 1. *Continued*

Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	misc.	Distribution	New to
Dimelaena oreina				4x										14x		16x											Cosmopolitan	Island
Dimelaena radiata	1x	2x	3x		5x							12x		14x		16x											Europe, America & Macar.	Island
Dimelaena triseptata		2x		4x	5x						11x		13x				17x							24x	25x		Endemic	Science
Diploicia canescens			3x											14x	15x		17x								25x		Cosmopolitan	Island
Diploschistes caesioplumbeus			3x	4x	5x	6x				10x	11x				15x	16x	17x	18x		20x	21x			24x	25x		Cosmopolitan	Island
Diploschistes euganeus													13x														Europe, Africa	Island
Diploschistes muscorum										10x	11x	12x				16x	17x	18x		20x	21x			24x			Cosmopolitan	Island
Diploschistes prominens																16x	17x								25x		Europe, Macaronesia	S. Hemisphere
Dirina insulana s.s.						6x		8x	9x	10x	11x		13x	14x	15x	16x	17x	18x			21x			24x	25x		Ascension, Madeira	Island
Dirina insulana f. *soralifera*						6x		8x						14x		16x											Ascension, Madeira	Island
Dirinaria applanata			3x	4x	5x					10x	11x	12x	13x	14x	15x	16x	17x	18x						24x	25x		Pantropical	Island
Dirinaria flava																									25x		Africa	Island
Dirinaria picta									9x										19c		21xc			24x			Pantropical	
Dolichocarpus seawardii																	17x							24x			Endemic	Science
Endocarpon pallidum				4x		6x			9x							16x											Cosmopolitan	Island
Endocarpon pusillum	1x		3x	4x	5x								13x	14x	15x	16x								24x	25x		Cosmopolitan	Island
Enterographa anguinella							7x	8x									17x				21x				25x		Pantropical	Island
Enterographa multilocularis																					21c						S. America	Africa
Erioderma sorediatum																	17x	18x		20c		22c					Pantropical	
Eugeniella sp.																					21c						ID uncertain	ID uncertain
Euopsis pulvinata					5x	6x							13x			16x	17x								25x		Cosmopolitan	Island
Fellhanera bouteillei																				20c	21c	22c					Cosmopolitan	Island
Fellhanera cf. *montana*																				20c							S. America	ID uncertain
Fissurina cf. *inquinata*																				20c							Pantropical	ID uncertain
Fissurina sp.																				20x	21x						ID uncertain	ID uncertain
Flavoparmelia soredians	1x				5x								13x	14x	15x	16x	17x	18x							25x		Cosmopolitan	Island
Flavopunctelia flaventior																		18x									Cosmopolitan	Island
Gassicurtia acidobaeomyceta																						22c					Africa & America	Island
Graphis cf. *assimilis*																			19c								Pantropical	ID uncertain
Graphis crebra																					21c						Pantropical	Island
Graphis elegans																				20c							Cosmopolitan	Island
Graphis furcata												12c															Pantropical	Island
Graphis marginata																			19c								Pantropical	Island
Haematomma fenzlianum			3x		5x			8x	9x	10x	11x	12x		14x	15x	16x	17x	18x		20x	21x	22x	23c	24x	25x		Pantropical	Island, trees
Hafellia leptoclinoides								8x																			Europe, Macaronesia	Island
Heppia lutosa				4x	5x											16x											Cosmopolitan	Island
Heterodermia circinalis																		18x		20x	21c	22c					America	Africa
Heterodermia galactophylla																		18x		20xc	21xc	22c					Pantropical	Island
Heterodermia isidiophora																			19c	20c	21xc						Pantropical	Island
Heterodermia leucomela																			19c	20c							Pantropical	
Heterodermia podocarpa																				20c							Pantropical	Island
Heterodermia propagulifera																	17x	18x	19c	20c	21xc						Pantropical	Island

Heterodermia speciosa	1x		5x		8x	9x	10x	11x		13x	14x	15x		18x		20c	21xc	22x		24x	25x		Pantropical		
Heterodermia verruculifera														18x			21c	22c					Pantropical		Island
Hyperphyscia adglutinata						9x		11x			14x	15x											Cosmopolitan		Island
Hyperphyscia granulata													16x		19c								Pantropical		Island
Lecanactis subabietina															19c								Europe		S. Hemisphere
Lecanactis epileuca					7x	8x				13x	14x		16x	17x	19c		21c			24x	25x		S. America		Africa
Lecanographa farinulenta																							S. America		Africa
Lecanora cf. *barkmaniana*															19c								Europe		ID uncertain
Lecanora cf. *compallens*																			27c				Europe		ID uncertain
Lecanora cf. *confusa*																				23c			Europe		ID uncertain
Lecanora cf. *expallens*																20c	21c						Europe		ID uncertain
Lecanora jamesii																			27c				Europe, Macaronesia		S. Hemisphere
Lecanora cf. *leprosa*									12c								21c			23c			Pantropical		ID uncertain
Lecanora pseudistera	1x		4x	5x		9x		11x		13x	14x	15x	16x	17x	18x						24x	25x	Pantropical		Island
Lecanora sanctae-helenae	1x	3x	4x	5x	6x	8x	9x	10x	11x	12xc	13x	14x	15x	16x	17x	18x	19c	20x	21xc	22x	23c	24x	25x		Endemic & Ascension		Trees
Lecanora sulfurescens						8x	9x						16x										Pantropical		Island
Lecanora tropica								10x	11x							19c		21c					Pantropical		Island
Lecidea cf. *leucothallina*																							Europe		ID uncertain
Lecidella buelliastrum		3x		5x	6x	8x	9x	10x	11x	12x	13x	14x	15x	16x	17x	18x					24x	25x	S. America, Australia		Africa
Lecidella chodati				5x	6x	8x	9x	10x	11x	12x	13x	14x	15x	16x	17x	18x					24x	25x	S. hemisphere, Europe & Macar.		Island
Lepraria cf. *lobificans*	1x						9x	10x	11x		13x	14x	15x		17x	18x	19x	20x	21xc	22x		24x	25x	Cosmopolitan		ID uncertain
Lepraria sipmanianum							9x	10x		12x		14x	15x	16x	17x	18x		20x	21x	22x		24x	25x	Pantropical		Island
Lepraria usnica	1x	3x	4x	5x	6x	8x	9x	10x	11x		13x	14x	15x	16x	17x	18x	19x	20x	21x	22x		24x	25x	Pantropical		Island
Lepraria xerophila	1x										13x	14x	15x										N. America, Europe		S. Hemisphere
Leprocaulon arbusculum																						24x	Pantropical		Island
Leprocaulon tenellum											12x	13x			17x	18x		20x	21x			24x	25x	Pantropical		Island
Leptogium azureum																		20c	21c					Pantropical		Island
Leptogium cochleatum															17x								Pantropical		Island
Leptogium cyanescens	1x			5x				10x	11xc	12x	13x				17x	18x		20c	21x			25x	Cosmopolitan		
Leptogium millegranum																		20c	21xc				Pantropical		Island
Lobaria patinifera																	19c	20c	21c				Pantropical		Island
Megalaria albocincta																		20c	21c	22c			Europe, America & Macar.		S. Hemisphere
Megalospora tuberculosa																	19c	20xc	21xc	22xc			Pantropical		Island
Milospium graphideorum																			21x				Europe, America & Macar.		S. Hemisphere
Normandina pulchella															17x	18x	19c	20xc	21xc	22xc			Cosmopolitan		Island
Ochrolechia africana						8x	10x						16x				19c					24x	Pantropical		Island
Opegrapha corticola																	19c		21c				Europe		S. Hemisphere
Opegrapha calmigena																			21c				Cosmopolitan		Island

Table 1. *Continued*

Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	misc.	Distribution	New to
Opegrapha saxigena																	17x										N. Hemisphere	S. Hemisphere
Opegrapha subelevata							7x										17x							24x			N. Hemisphere	S. Hemisphere
Pannaria cf. *conoplea*												12x							19c	20xc							Cosmopolitan	ID uncertain
Pannaria fulvescens																			19c								Pantropical	Island
Pannaria tavaresii																			19x								Europe, Macaronesia	Island
Parmelinopsis horrescens																					21c						Pantropical	Island
Parmelinopsis minarum																										27c	Pantropical	Island
Parmelinopsis spumosa												12c							19c	20c	21c						Pantropical	
Parmotrema austrosinense	1x								9x		11x	12x	13x	14x	15x	16x	17x	18x	19c					24x			Pantropical	Island
Parmotrema crinitum																			19c	20c					25x		Cosmopolitan	Island
Parmotrema grayanum										10x	11x																Europe, Africa, Macaronesia	Island
Parmotrema mellissii																			19c	20c	21xc						Pantropical	
Parmotrema tinctorum																					21x						Pantropical	Island
Peltula euploca					5x	6x			9x	10x						16x				20x	21x				25x		Cosmopolitan	Island
Peltula impressa						6x				10x																	Pantropical	Island
Peltula obscurans						6x				10x																	Pantropical	Island
Pertusaria hymenea																	17x	18x	19c	20c							Cosmopolitan	Island
Pertusaria pertusa																					21x			24x			Cosmopolitan	Island
Pertusaria subventosa																		18x	19c	20xc	21xc						Pantropical	Island
Peterjamesia circumscriptum																	17x							24x			Cosmopolitan	Africa
Phaeophyscia hispidula										10x	11x						17x				21xc						Pantropical	Island
Phyllopsora buettneri																			19c								Pantropical	Island
Physcia atrostriata																			19c								Pantropical	Island
Physcia dimidiata																					21c						Cosmopolitan	Island
Physcia sorediosa	1x								9x	10x	11x			14x	15x	16x	17x		19c	20xc	21xc			24x	25x		Pantropical	Island
Porina cf. *chlorotica*																	17x										Cosmopolitan	ID uncertain
Porina coralloidea																					21c						Europe, Macaronesia	S. Hemisphere
Porina nucula																					21c						Pantropical	Island
Protopannaria pezizoides																				20c							Cosmopolitan	Island
Pseudocyphellaria aurata												12x					17x	18x	19c	20xc	21xc						Cosmopolitan	
Pseudocyphellaria crocata																				20c							Cosmopolitan	
Pseudopyrenula diluta																				20c							Pantropical	Island
Psilolechia lucida																			19x	20x	21xc	22x					Cosmopolitan	Island
Psora cf. *cerebriformis*	1x			4x		6x				10x	11x		13x			16x											America	ID uncertain
Psoroglaena cubensis																				20c							Pantropical	Island
Psorotichia cf. *schaereri*						6x																					Cosmopolitan	ID uncertain
Punctelia stictica																	17x										Europe, Africa, America & Macar.	Island
Pyrenula acutispora																			19c	20c							Macaronesia	S. Hemisphere
Pyrenula laevigata																					21c						Europe, America & Macar.	Africa
Pyrenula macrocarpa																										28c	Pantropical	Island
Pyrenula sp.																				20c							ID uncertain	ID uncertain
Pyxine cocoes											11x																Pantropical	Island
Pyxine daedalea											11x																Pantropical	Island
Pyxine petricola										10x	11x			14x		16x	17x	18x							25x		Pantropical	Island

Pyxine subcinerea												14x												Pantropical	Island
Ramalina arabum						8x				12xc				16x	17x	18x			21c		24x	25x		Macaronesia & Africa	
Ramalina cf. *canariensis*																							30c	Cosmopolitan	ID uncertain
Ramalina geniculatella		3x				8x					13x		15x			18x					24x	25x		Endemic	Science
Ramalina ketner-oostrae											13x	14x		16x	17x							25x		Endemic	Science
Ramalina lacera															17x									Pantropical	Island
Ramalina maderensis						8x						14x		16x							24x	25x		Macaronesia	S. Hemisphere
Ramalina nervulosa																							30c	Pantropical	Island
Ramalina peruviana																	19c		21c					Pantropical	Island
Ramalina rigidella		3x	4x			8x			11x	12x	13x	14x	15x	16x	17x	18x	19x		21x		24x	25x		Endemic	Science
Ramalina sanctae-helenae	1x	3x	4x	5x	6x	8x	9x	10x	11x	12x	13x	14x	15x	16x	17x	18x	19x		21x		24x	25x		Endemic	Science
Rimelia clavulifera																18x								Pantropical	Island
Rimelia pseudoreticulata																						25x		Europe & Macaronesia	S. Hemisphere
Rimelia reticulata	1x	3x	4x	5x	6x	8x	9x	10x	11x	12xc	13x	14x	15x	16x	17x	18x	19xc	20xc	21xc	22xc	24x	25x		Cosmopolitan	
Rinodina oxydata				5x							13x			16x								25x		Cosmopolitan	Island
Roccella allorgei	1x	3x		5x	6x	8x		10x	11x	12xc	13x	14x	15x	16x	17x	18x	19xc		21x		24x	25x		Europe & Macaronesia	S. Hemisphere
Roccella endocrocea						8x						14x									24x	25x		Africa	Island
Roccella montagnei																							30c	Africa & Asia	Island
Roccellina accedens																			21x		24x			Chile	Africa
Roccellina jamesii					6x	8x		10x						16x	17x									Ascension	Island
Sarcographa tricosa																	19c							Pantropical	Island
Sticta fuliginosa																		20c						Cosmopolitan	Island
Sticta tomentosa																		20c						Pantropical	
Syncesia decussans								10x						16x	17x				21x					C. & S. America	S. Hemisphere
Syncesia effusa																			21x					C. & S. America	S. Hemisphere
Teloschistes flavicans		3x	4x							12xc	13x	14x	15x	16x	17x	18x	19xc	20xc	21xc		24x	25x		Cosmopolitan	
Tephromela atra																	19x	20x						Cosmopolitan	Island
Thelopsis isiaca								10x																Pantropical	Africa
Thelotrema lepadinum																	19x	20x						Cosmopolitan	Island
Toninia aromatica												14x												Cosmopolitan	Island
Toninia austroafricana															17x									S. Africa	Island
Toninia ruginosa			4x																					Africa	Island
Toninia sedifolia	1x			5x										16x										Cosmopolitan	Island
Trapelia coarctata																		20x						Cosmopolitan	Island
Trapeliopsis gelatinosa																			21x					Cosmopolitan	Island
Usnea baileyi																	19c	20c	21xc	22x	24x	25x		Pantropical	Rock, island
Usnea dasaea																	19c							Pantropical	Island
Usnea exasperata																						25x		Africa	Island
Usnea firmula																			21c					Africa	Island
Usnea leprosa																	19c	20c						Africa	Island
Usnea liechtensteinii																					24x			Africa	Island
Usnea pulvinata										12x						18x		20x						Europe, Africa	Island
Usnea rubicunda																	19c	20c	21xc					Cosmopolitan	Island
Verrucaria cf. *fuscella*																18x								Cosmopolitan	ID uncertain

Table 1. *Continued*

Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	misc.	Distribution	New to
Waynea stoechadiana									9x						15x												Europe, N. Africa	S. Hemisphere
Xanthoparmelia alabamensis									9x				13x	14x	15x	16x								24x	25x		N. America	S. Hemisphere
Xanthoparmelia beccae												12x	13x				17x								25x		Endemic	Science
Xanthoparmelia caliginosa					5x								13x				17x	18x							25x		Africa	Island
Xanthoparmelia molybdiza	1x			4x	5x	6x		8x	9x	10x	11x		13x	14x	15x	16x	17x	18x						24x	25x		Africa	Island
Xanthoparmelia phaeophana		2x										12x					17x								25x		Africa, Australia	Island
Xanthoparmelia pseudocongensis	1x				5x	6x		8x	9x	10x	11x	12x		14x	15x	16x								24x	25x		Africa	Island
Xanthoparmelia squamans													13x														Africa	Island
Xanthoparmelia subramigera	1x		3x	4x	5x	6x		8x	9x	10x	11x		13x	14x	15x	16x	17x	18x	19x	20x	21x			24x	25x		Pantropical	Island
Xanthoparmelia wildeae												12x	13x												25x		S. America	
Xanthoria parietina																	17x	18x			21x						Cosmopolitan	Island

1. Prosperous Bay Plain, on track of runway south of Trig Point. Slope with boulders and soil crusts. 15°56.923′S, 5°39.019′W(Astro DOS 71/4) altitude 325 m.
2. Prosperous Bay Plain, near beginning of Signal House track. Soft lava dust with soil crusts. 15°56.891′S, 5°38.972′W(Astro DOS 71/4) 144 altitude 330 m.
3. Prosperous Bay Plain, on track of access road to Bone Gully. Slope with boulders and soil crusts. 15°57.067′S, 5°39.596′W(Astro DOS 71/4) altitude 330 m.
4. Prosperous Bay Plain, Bone Gully. Soft lava dust with soil crusts. 15°57.269′S, 5°39.704′W(Astro DOS 71/4) altitude 350 m.
5. Prosperous Bay Plain, south of Widow Slope. Slope with boulders and soil crusts. 15°57.461′S, 5°39.450′W(Astro DOS 71/4) altitude 325 m.
6. Prosperous Bay Plain, Dry Gut upstream of proposed fill. Smooth basalt slope, occasionally wet. 15°57.610′S, 5°39.281′W(Astro DOS 71/4) altitude 325 m.
7. Prosperous Bay Plain, Dry Gut at proposed fill. Overhanging basalt cliffs. 15°57.706′S, 5°39.240′W(Astro DOS 71/4) altitude 325 m.
8. Prosperous Bay Plain, north slope of Dry Gut on track of runway at proposed fill. Vertical basalt cliff. 15°57.641′S, 5°39.080′W(Astro DOS 71/4) altitude 280 m.
9. Rupert's Village, lower slopes behind farm. Slope with boulders and soil crusts. 15°55.010′S, 5°42.962′W(Astro DOS 71/4) altitude 40 m.
10. Rupert's Valley, lower slopes at beginning of ascent of haul road. Vertical basalt cliff. 15°55.547′S, 5°42.436′W(Astro DOS 71/4) altitude 100 m.
11. Rupert's Valley, lower slopes at proposed quarry site. Slope with boulders and soil crusts. 15°55.769′S, 5°42.191′W(Astro DOS 71/4) altitude 110 m.
12. Rupert's Hill, along Pipe Path. Slope with boulders and soil crusts. 15°55.011′S, 5°42.098′W(Astro DOS 71/4) altitude 425 m.
13. Bryan's Rock. Slope with boulders and soil crusts. 15°55.968′S, 5°39.633′W(Astro DOS 71/4) altitude 400 m.
14. South of Gregory's Battery. Vertical basalt cliff. 15°55.800′S, 5°39.966′W(Astro DOS 71/4) altitude 300 m.
15. Bradleys, north of Government Garage. Slope with boulders and soil crusts. 15°56.651′S, 5°39.572′W(Astro DOS 71/4) altitude 350 m.
16. Above Jamestown, along track to Saddle Battery. Vertical basalt cliff. 15°55.744′S, 5°42.817′W(Astro DOS 71/4) altitude 250 m.
17. The Barn, along God's Path. Vertical basalt cliffs and slope with boulders and soil crusts. 15°54.929′S, 5°40.428′W(Astro DOS 71/4) altitude 475 m.
18. The Haystack. Vertical basalt cliffs and slope with boulders and soil crusts. 15°54.880′S, 5°39.829′W(Astro DOS 71/4) altitude 600 m.
19. Hutts Gate, along road. Trees and road walls. 15°57.353′S, 5°42.246′W(Astro DOS 71/4) altitude 650 m.
20. High Peak. Basalt cliff with trees. 15°58.495′S, 5°44.371′W(Astro DOS 71/4) altitude 700–750 m.
21. Peak Dale, near Old Luffkins. Slope with large basalt boulders and trees. 15°59.422′S, 5°44.719′W(Astro DOS 71/4) altitude 600–700 m.
22. Diana's Peak. Slope with tree ferns and basalt cliff. 15°57.7′S, 5°42.4′W(Astro DOS 71/4) altitude 800 m.
23. South of Boxwood Hill. Slope with trees. 15°58.6′S, 5°40.2′W(Astro DOS 71/4) altitude 375 m.
24. South of Little Stone Top. Slope with large basalt boulders and soil crusts. 15°58.507′S, 5°40.038′W(Astro DOS 71/4) altitude 375 m.
25. Great Stone Top. Slope with basalt boulders and soil crusts and vertical basalt cliff. 15°58.530′S, 5°39.672′W(Astro DOS 71/4) altitude 400–480 m.
26. Fisher's Valley, near waterfall. Vertical basalt cliff. 15°57.007′S, 5°39.495′W(Astro DOS 71/4) altitude 300 m.
27. Longwood, near church. Roadside trees. 15°56.695′S, 5°41.380′W(Astro DOS 71/4) altitude 490 m.
28. Mount Pleasant. Garden. 15°58.202′S, 5°43.197′W(Astro DOS 71/4) altitude 600 m.
29. High Knoll Fort. On fortress walls. 15°56.370′S, 5°43.288′W(Astro DOS 71/4) altitude 600 m.
30. St Paul's Cathedral. Churchyard. 15°57.096′S, 5°43.460′W(Astro DOS 71/4) altitude 600 m.

c, on tree and/or wood; x, on rock and/or soil.

Table 2. Lichens of Ascension Island, October 2006

Name	31	32	33	34	35	36	37	38	Distribution if not on Helena	New to
Acarospora citrina			x	x	x	x				Island
Agonimia pacifica								x		Island
Agonimia tristicula							x		Cosmopolitan	Island
Amandinea lecideina		xc	xc	x	x	x	x	x		Island
Arthrorhaphis citrinella		xc	x	x					Cosmopolitan	Island
Buellia aethalea			x							Island
Buellia dispersa			x						Cosmopolitan	Island
Buellia halonia			x	x	x	x				Island
Buellia mamillana			x	x				x		Island
Buellia stellulata			x							Island
Buellia tesserata			x		x	x				Island
Byssoloma subdiscordans							c			Island
Caloplaca cf. *bolacina*	x	x	xc	x	x	x	x	x		Island
Caloplaca crenularia			x	x						Island
Caloplaca cf. *dalmatica*		x		x		x	x	x		Island
Caloplaca flavocitrina							x	x		Island
Caloplaca flavovirescens				x				x		Island
Candelaria concolor			x							Island
Canoparmelia carneopruinata						x			Pantropical	Island
Chrysothrix xanthina		x	xc	x	x	xc	xc	x		Island
Coccocarpia palmicola				x	x	x	xc	x		Island
Collema furfuraceum								x	Cosmopolitan	Island
Dibaeis sorediata							x			Island
Diploschistes caesioplumbeus			x							Island
Diploschistes muscorum							x	x		Island
Diploschistes prominens					x					Island
Dirina insulana s.s.				x	x	x	x	x		
Dirina insulana f. *sorediata*				x	x	x	x	x		
Dirinaria applanata		x	c							Island
Dirinaria confluens		x	x	x	x	xc		x	Pantropical	
Dirinaria flava		x	xc	x	x	xc		x		
Endocarpon pallidum								x		Island
Endocarpon pusillum			x	x			x			Island
Enterographa anguinella					x					Island
Euopsis pulvinata			x							Island
Fellhanera bouteillei							c			Island
Flavoparmelia soredians										Island
Graphis elegans							c			Island
Haematomma fenzlianum				x	x			x		
Hafellia leptoclinoides			x							Island
Heterodermia galactophylla							xc			Island
Heterodermia leucomela							c			
Heterodermia obscurata							xc		Pantropical	Island
Heterodermia podocarpa							xc			Island
Heterodermia propagulifera							xc			Island
Heterodermia speciosa							xc			Island
Heterodermia verruculifera							x			Island
Hyperphyscia adglutinata			c		x	c				Island
Lecanographa farinulenta								x		Island
Lecanora leprosa			c			c				Island
Lecanora pseudistera	x	x	xc		x					Island
Lecanora sanctae-helenae					x	x		x		Island
Lecanora sulfurescens										Island
Lecanora sulphurella			x	x	x	x				Island
Lecidella chodati		x				x	x	x		Island
Lepraria cf. *lobificans*			x		x	x				Island
Lepraria sipmanianum							x			Island
Lepraria usnica		x	xc	x	x	x	x	x		Island
Leptogium cyanescens				x			xc	x		Island
Megalospora tuberculosa							xc			Island

Table 2. *Continued*

Name	31	32	33	34	35	36	37	38	Distribution if not on Helena	New to
Milospium graphideorum								x		Island
Normandina pulchella							xc			Island
Ochrolechia africana					x	x		x		Island
Opegrapha multipuncta					x				Europe, Macaronesia	Island
Opegrapha subelevata				x	x					Island
Parmelinopsis minarum						x	xc			Island
Parmotrema austrosinense						x	x			Island
Parmotrema crinitum					x	x				Island
Parmotrema grayanum						x				Island
Peltula euploca	x	x	xc	x		x				Island
Peltula obscurans	x	x	c							Island
Pertusaria flavicans			x	x	x					Island
Pertusaria pertusa								x		Island
Pertusaria sp.						x				Island
Physcia atrostriata							xc			Island
Physcia poncinsii			c				x			Island
Physcia sorediosa		x	xc	x	x		x			Island
Pseudocyphellaria crocata							c			Island
Pyxine petricola		x		x	x	x				Island
Ramalina chondrina							c		Macaronesia	Island
Ramalina lacera							xc	x		Island
Ramalina nervulosa							x			Island
Ramalina peruviana					x	xc	x	xc		Island
Rimelia cetrata						x			Pantropical	
Rimelia reticulata			xc	x	x	xc	xc	xc		Island
Rinodina sp.			c							Island
Roccella allorgei				x	x	x	x	x		Island
Roccella montagnei			x							Island
Roccellina jamesii				x	x	x		x		
Roccellina suffruticosa							x		S. America	Africa
Sticta weigelii							x		Pantropical	Island
Teloschistes flavicans				x	x	xc	xc	xc		
Trypethelium ochroleucum							c			Island
Usnea baileyi							c			Island
Usnea dasaea							c			Island
Usnea rubicunda							xc			Island
Xanthoparmelia alabamensis				x		x				Island
Xanthoparmelia molybdiza			x							Island
Xanthoparmelia pseudocongensis					x					Island
Xanthoparmelia subramigera		x	xc	x	x	x		x		Island

31. Georgetown, Longbeach, coastal lava field. 7°55.4′S, 14°24.3′W altitude 5 m.
32. South of Georgetown near crossroads. Lava field. 7°56.413′S, 14°24.660′W altitude 30 m.
33. West of Two Boat Village. Lava field on slope with large basalt boulders and soil crusts. 7°56.181′S, 14°22.520′W altitude 175 m.
34. East slope of Sisters Peak. Lava field on slope with large basalt boulders and soil crusts. 7°55.977′S, 14°21.971′W altitude 275 m.
35. Lady Hill. Lava field on slope with large basalt boulders and soil crusts. 7°56.637′S, 14°22.880′W altitude 300 m.
36. Top of Sisters Peak. Lava field on slope with large boulders, shrubs and soil crusts. 7°55.580′S, 14°22.311′W altitude 350–450 m.
37. Green Mountain, around Cottage. Forest with basalt cliffs and soil crusts. 7°57.5′S, 14°21′W altitude 750–800 m.
38. Cricket Valley. Basalt cliffs with trees and soil crusts. 7°56.859′S, 14°19.581′W 137 altitude 400 m.
c, on tree and/or wood; x, on rock and/or soil.

Ascension Island, respectively; additional species identified in the material from St Helena are given in the column entitled 'Miscellaneous' in Table 1. All species without pertinent literature reports in Tables 1 and 2 are newly reported for the particular island, for Africa, or even for the Southern Hemisphere, as indicated.

In many places, endemic lichens are the dominant native vegetation on St Helena. Unlike bryophytes (Wigginton, 2006) and, especially, phanerogams and many animal groups, there are no invasive lichens, and none are to be expected in the future.

Dramatic changes in the lichen flora and vegetation are invariably attributable to changes in habitat, be

it microclimatic conditions, global warming, or various sources of air pollution. The endemic lichens detailed below are notable exceptions to this rule; apparently they (and their relatives from other Atlantic islands) have lost their ability for long-distance dispersal; therefore, their spores are apparently not viable and reproduction occurs vegetatively by fragmentation.

MATERIAL AND METHODS

A detailed survey of the literature, Internet sites, and databases was carried out. Over 250, mostly unpublished, specimens from St Helena, including types of some purported endemics, as well as 250 specimens from Ascension Island and 100 from Tristan da Cunha, were studied at the Natural History Museum, London. Fieldwork was carried out by the author in October 2006 on both St Helena and Ascension Island. Many selected areas in the dry zones of St Helena, particularly Prosperous Bay Plain, as well as some agricultural and a few upland areas, were investigated in detail.

Many identifications were made in the field with the aid of a hand lens and chemical reagents, but selected samples were collected, almost all of which have now been identified and labelled, and will be preserved at ABL, BM, and B, with some duplicates to be returned to St Helena. The collected specimens were studied by dissecting and compound microscopes, and, in some cases, by ultraviolet (UV) light and thin layer chromatography (TLC) using toluene, dioxane, and acetic acid as solvents.

NEW SPECIES TO SCIENCE ENDEMIC TO ST HELENA

DERMATISCUM PUSILLUM APTROOT SP. NOV. (FIGS 1–4)

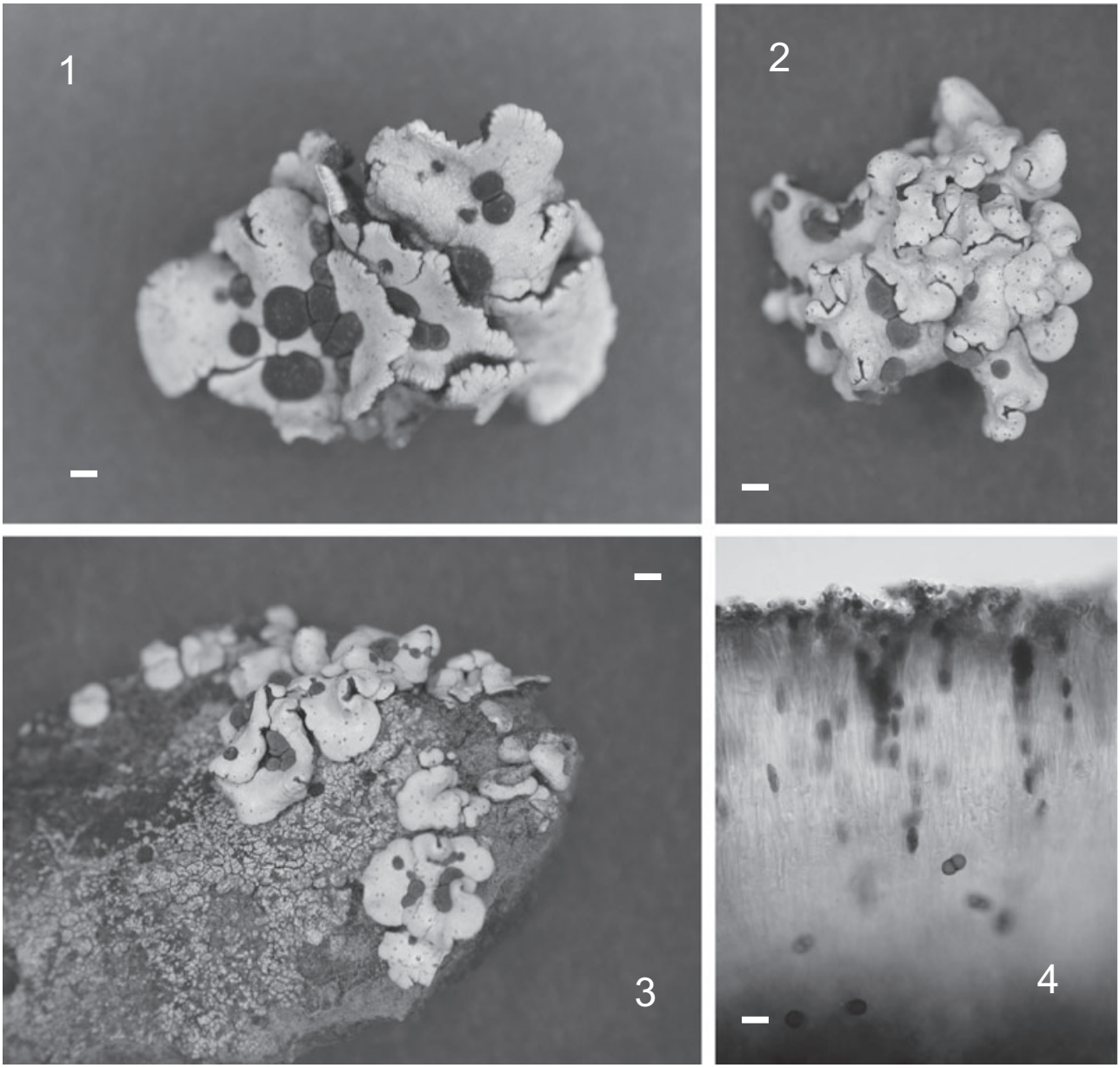
Type: St Helena. South of Gregory's Battery, on basalt, altitude 300 m, 19.x.2006, *A. Aptroot 66357* (holo. B; iso. ABL).

Diagnosis: Dermatiscum saxicolum thallo umbilicato, griseo vel viridescens, subtus nigro, apotheciis rotundatis, immarginatis, convexis, nigris sed albopruinosis, ascosporibus uniseptatibus brunneus, acidis salacinicis et consalacinicis et saepe atranorinis continens.

Description: THALLUS umbilicate, grey to usually greenish-grey above, black below, dull, smooth, sometimes with faint radial cracks, up to 2 cm in diameter, generally 0.5–3.0 mm thick, initially unilobate, but soon dividing into closely appressed but often contorted lobes. Cortex distinct, densely irregularly cellular, in section pigmented pinkish, *c.* 20 μm thick, full of tiny crystals. Photobiont in an irregular layer underneath the cortex, consisting of up to *c.* 15 μm long, mostly ellipsoid cells of *Trebouxia s.l.* Medulla of irregular, rather dense, *c.* 3 μm wide hyphae, without crystals. APOTHECIA numerous, black but white pruinose, sessile, round, up to *c.* 3 mm, initially flush with the thallus and surrounded by a ring of tiny broken thallus fragments (resembling young *Trapelia coarctata* apothecia), later convex and seemingly immarginate. Epithecium dark brown to black, consisting of *c.* 3 μm wide blackened paraphyse tip cells. Hymenium hyaline, not inspersed, *c.* 100–150 μm high. Asci cylindrical, with eight ascospores. Paraphyses *c.* 1 μm wide, septate but only branched towards the tips. Hypothecium dark brown to black, often extending downwards, *c.* 100–150 μm high. Excipulum dark brown, thin (*c.* 20 μm wide) and inconspicuous, of *c.* 5 μm wide paraplectenhymatous cells. All colours unchanged in KOH. Ascospores one-septate, dark brown, ellipsoid, straight, 11–12.5 × 6–6.5 μm, wall thin and dark, ornamented with low warts (*c.* 15 per cell in optical view), lumina rounded with a *c.* 1.0–1.5 μm thick endospore layer, constricted at the septum, septum twice as thick as the wall, *c.* 0.5 μm thick, dark brown, slightly wider near the wall. Pycnidia immersed, ostiole black, conidia bacillar, hyaline, *c.* 4 × 1 μm. Thallus (at least medulla) calcium hypochlorite (C–), KOH+ red, *para* fenylenediamine (PD+) red, UV–. Chemistry: salazinic and consalazinic acids and usually also atranorin (TLC).

Additional material: St Helena. Prosperous Bay Plain, Bone Gully, on basalt, altitude 350 m, 16.x.2006, *A. Aptroot 66224* (ABL); Prosperous Bay Plain, north slope of Dry Gut, on basalt, altitude 280 m, 17.x.2006, *A. Aptroot 66267* (ABL).

Distribution and ecology: This is only the third species accepted in this genus; the other two are *Dermasticum fallax* Brusse and *Dermasticum thunbergii* (Ach.) Nyl., known only from Africa, from which it differs by its small and relatively thick thallus and often greenish colour; the chemistry and the constricted spores with low warts are also distinctive. It occurs on boulders and rock outcrops on Prosperous Bay Plain, The Barn, and Gregory's Battery. The only marked variation between the specimens is in the thallus colour, which can be grey or greenish-grey, apparently correlated with the concentration of atranorin.



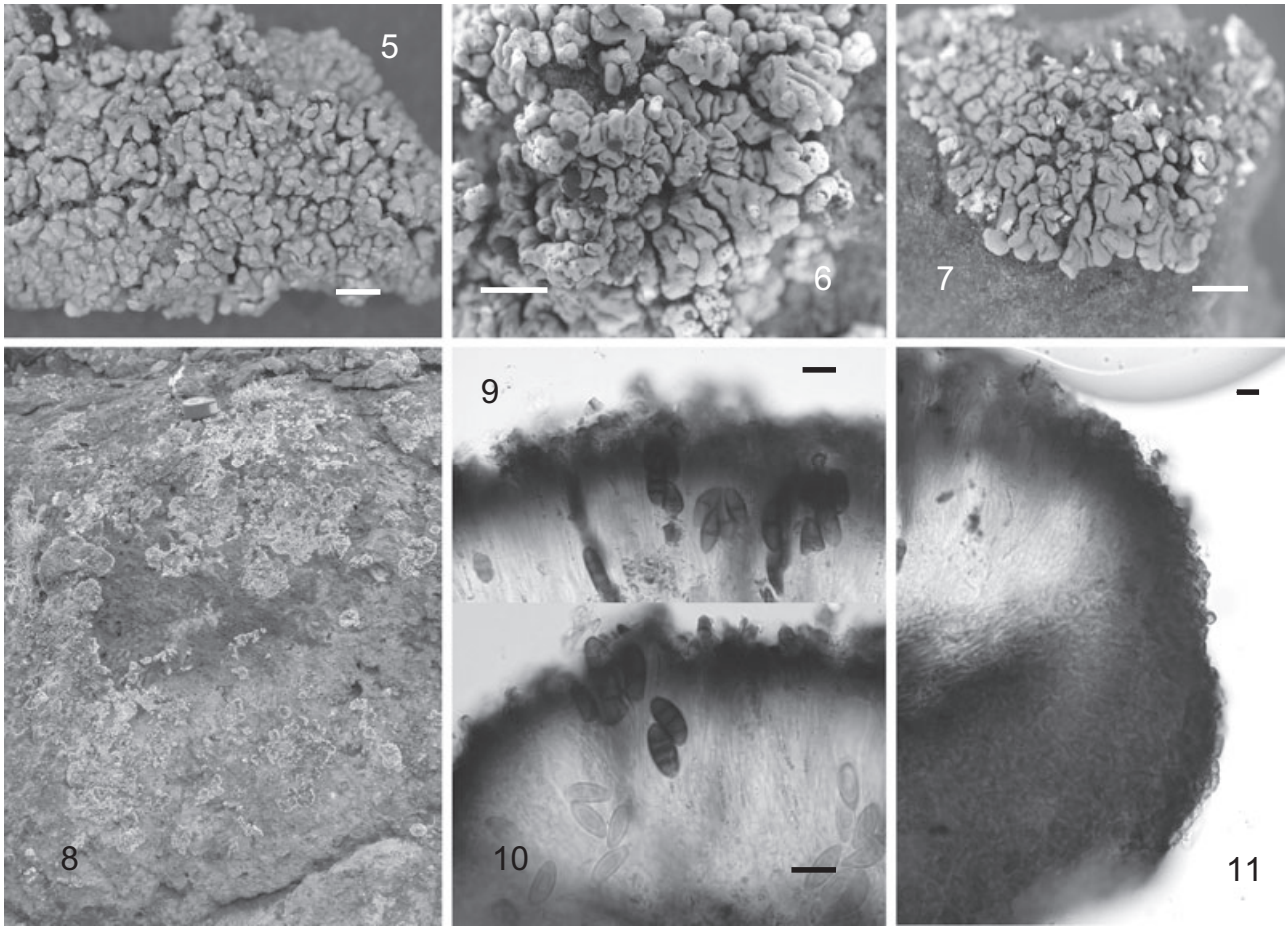
Figures 1–4. ***Dermatiscum pusillum***. Figs 1–3. Habitus. Fig. 4. Apothecium section. Scale bars: 1 mm, Figs 1–3; 15 μm, Fig. 4.

DIMELAENA TRISEPTATA APTROOT **SP. NOV.**
(FIGS 5–11)

Type: St Helena. Prosperous Bay Plain, south of Widow Slope, on basalt, altitude 235 m, 17.x.2006, *A. Aptroot 66235* (holo. B; iso. ABL).

Diagnosis: Dimelaena saxicola vel terricola thallo ochraceo, lobis convexis, apotheciis nigris sessilis, stipitatitibus coloratibus, ascosporibus vulgo triseptatibus, acidus xanthonicus continens.

Description: THALLUS placodioid, forming patches of up to 7 cm in diameter, ochraceous, Cretaceous, up to 3 mm thick, corticate, smooth in the centre, whitish pruinose at the lobe tips. Lobes strongly convex, irregularly branching, alternating wider than high and then up to 3 mm wide (before branching) or higher than wide and then *c.* 1 mm wide (just after branching). Lower surface pale yellowish-white. Cortex densely irregularly cellular, in section pigmented pinkish, *c.* 20 μm thick, without crystals. Photobiont in a rather regular *c.* 40 μm thick layer below

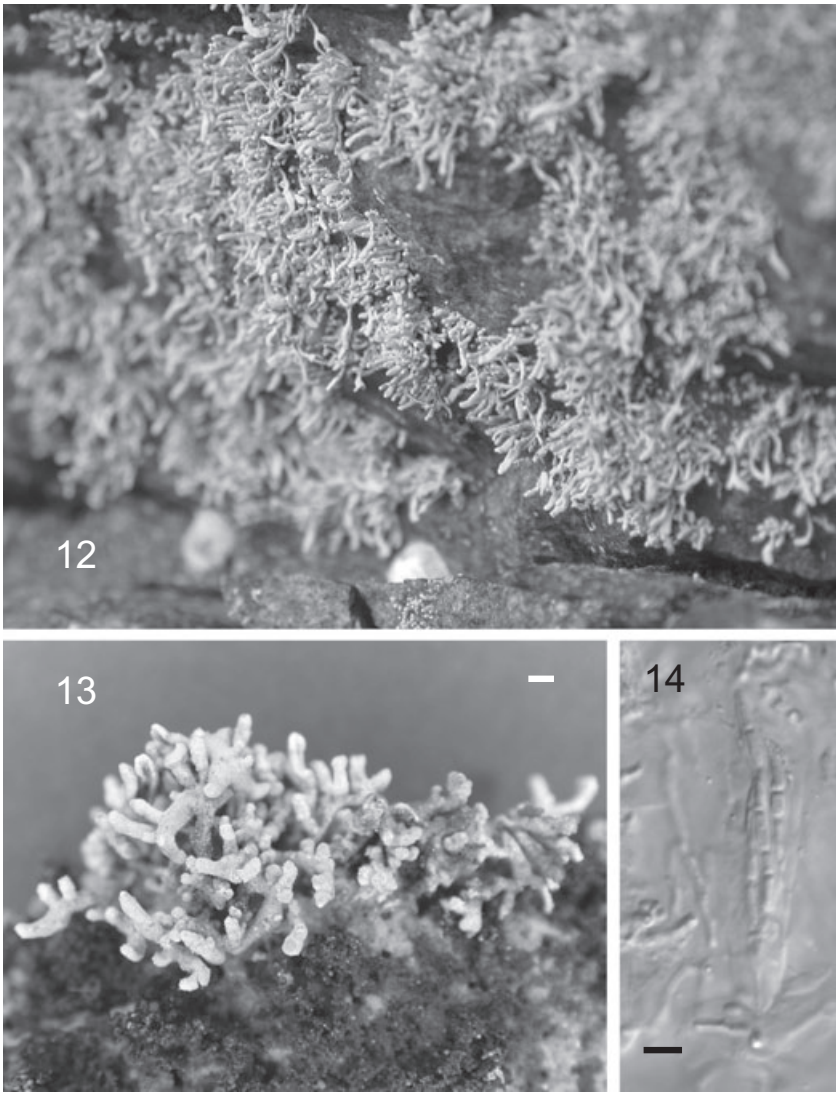


Figures 5–11. ***Dimelaena triseptata***. Figs 5–8. Habitus. Figs 9–11. Apothecium section. Scale bars: 1 cm, Figs 5–7; 15 μm, Figs 9–11.

the upper cortex, cells globose, *c.* 6 μm in diameter, partly in tetrads, belonging to *Trebouxia s.l.* Medulla of irregular, rather lax, *c.* 4 μm wide hyphae, encrusted with tiny crystals. APOTHECIA absent or present, sparse, sessile, round, black, up to *c.* 0.8 mm, without thalline margin. Epithecium dark brown to black, consisting of *c.* 3–4 μm wide blackened paraphyse tip cells. Hymenium hyaline, not inspersed, *c.* 80–90 μm high. Asci cylindrical, with eight ascospores. Paraphyses *c.* 2 μm wide, septate but only branched towards the tips. Hypothecium dark brown to black, *c.* 60–75 μm high, not extending downwards; a fuscous brown to red–brown coloured *c.* 80–100 μm high layer homologous with a stipe is present below the hypothecium. Excipulum dark brown, thin (*c.* 20 μm wide), of *c.* 5 μm wide irregularly prosoplectenhymatous cells, internally bordering on the coloured stipe. All colours unchanged in KOH. Ascospores initially simple, soon one- to (in majority) three-septate, dark brown, fusiform, mostly straight, 17–22 × 6–8 μm, wall thin and dark, not ornamented, lumina initially angular, later rounded with a *c.* 1.0–1.5 μm thick endospore layer, not constricted at the septa, septa twice as thick as the wall, *c.* 0.5 μm thick, dark brown, endospore thickening, often conspicuously wider near the attachment point of the septa and the outer wall. Conidia not observed; emergent grey dots occur regularly and could be pycnidia or young apothecia. Thallus (medulla) C–, KOH+ pale yellow, PD–, UV–. Chemistry: an unidentified xanthone (TLC).

Additional material: St Helena. Prosperous Bay Plain, near beginning of Signal House Track, on lapilli soil, altitude 330 m, 16.x.2006, *A. Aptroot 66213* (ABL); Bryan's Rock, on basalt, altitude 400 m, 19.x.2006, *A. Aptroot 66347* (ABL).

Distribution and ecology: This is a member of a small genus (less than ten species known, cf. Mayrhofer *et al.*, 1996), which is most diverse in arid regions of the Southern Hemisphere. It differs from all other



Figures 12–14. ***Dolichocarpus seawardii***. Figs 12, 13. Habitus. Fig. 14. Apothecium section. Scale bars: 1 mm, Fig. 13; 5 μm, Fig. 14.

species in the genus by its ochraceous colour and three-septate, relatively large ascospores. The convex lobes and the stipe colour are also distinctive, and resemble some *Pyxine* species, which differ by the foliose growth form and black lower surface. It occurs on dusty plains and boulder fields on Prosperous Bay Plain, The Barn, Little and Great Stone Top, etc.

DOLICHOCARPUS SEAWARDII APTROOT **SP. NOV.** (FIGS 12–14)

Type: St Helena. The Barn, along God's Path, on basalt, altitude 475 m, 20.x.2006, *A. Aptroot 66460* (holo. B; iso. ABL).

Diagnosis: Dolichocarpus saxicolus thallo fruticuloso ramoso, cylindrico, applanato ad apicis, apotheciis lirelliformis nigris, subtus ad apicis, ascosporibus bivel quatroseptatibus, acidus erythrinus continens.

Description: THALLUS fruticose, up to 8 mm long, irregularly branched, ochraceous. Branches *c.* 0.4–0.7 mm wide, cylindrical, flattened towards the tips and often curled downwards, without a well-developed cortex. Medulla of anastomosing, *c.* 4–6 μm wide hyphae, heavily encrusted with tiny hyaline erythrin crystals. Photobiont dispersed through the medulla, an orange *Trentepohlia* with *c.* 10 μm diameter cells. APOTHECIA below the flattened branch tips, flush with the thallus, round to usually elongate,

unbranched, up to *c.* 0.5 × 2.5 mm, brown to black, without margin. Epithecium fuscous brown, *c.* 15 µm high. Hymenium pale yellowish-brown, not inspersed, *c.* 80 µm high. Asci cylindrical, with eight ascospores. Paraphyses *c.* 1 µm wide, anastomosing. Hypothecium pale brown. Excipulum absent. All colours unchanged in KOH. Ascospores two- to four-septate, hyaline, linear-clavate with middle cell largest, straight, 16–20 × 3–5 µm, without gelatinous sheath, becoming brown when postmature. Conidia not observed. Thallus C+ red, KOH–, PD–, UV+ whitish. Chemistry: erythrin (TLC).

Additional material: St Helena. South of Little Stone Top, on basalt, altitude 375 m, 22.x.2006, *A. Aptroot 66614* (ABL).

Distribution and ecology: This is only the second species in the genus; the type species of the genus, *Dolichocarpus chilensis* R.Sant., is only known from Chile (Santesson, 1949), where it grows on cactus spines in a fog desert. The new species is smaller than the type, and grows on wet, overhanging rock ledges, secure from disturbance. It occurs on The Barn and below Little Stone Top, where it forms large patches. The phylogenetic position of the genus *Dolichocarpus* has not been investigated, but there is no doubt that it belongs to Rocellaceae. The apothecia are strikingly similar to *Enterographa* and it may well be the fruticose derivative of this genus.

Etymology: This is a very unexpected find, and I name this species in honour of the distinguished lichenologist professor Dr M. R. D. Seaward, who suggested that I carry out the lichen survey of St Helena.

ENDEMIC *RAMALINA* SPECIES

Ramalina species are very common on basalt (Figs 15–18), especially in the semi-desert, but also on cliffs elsewhere on St Helena. A detailed morphological and chemical study was carried out, and comparisons were made with material and descriptions of published species from other regions in the world, including all species known from other islands in the Atlantic Ocean. The conclusion is that no less than four undescribed endemic *Ramalina* species occur on St Helena, where all species seem to be well distributed and quite common, often even abundant and vegetation-forming. A key to all *Ramalina* species occurring on Atlantic islands, including the species described below, will be published separately (Aptroot & Schumm, 2008). The following new taxa can be recognized.

RAMALINA GENICULATELLA APTROOT SP. NOV. (FIGS 19–24)

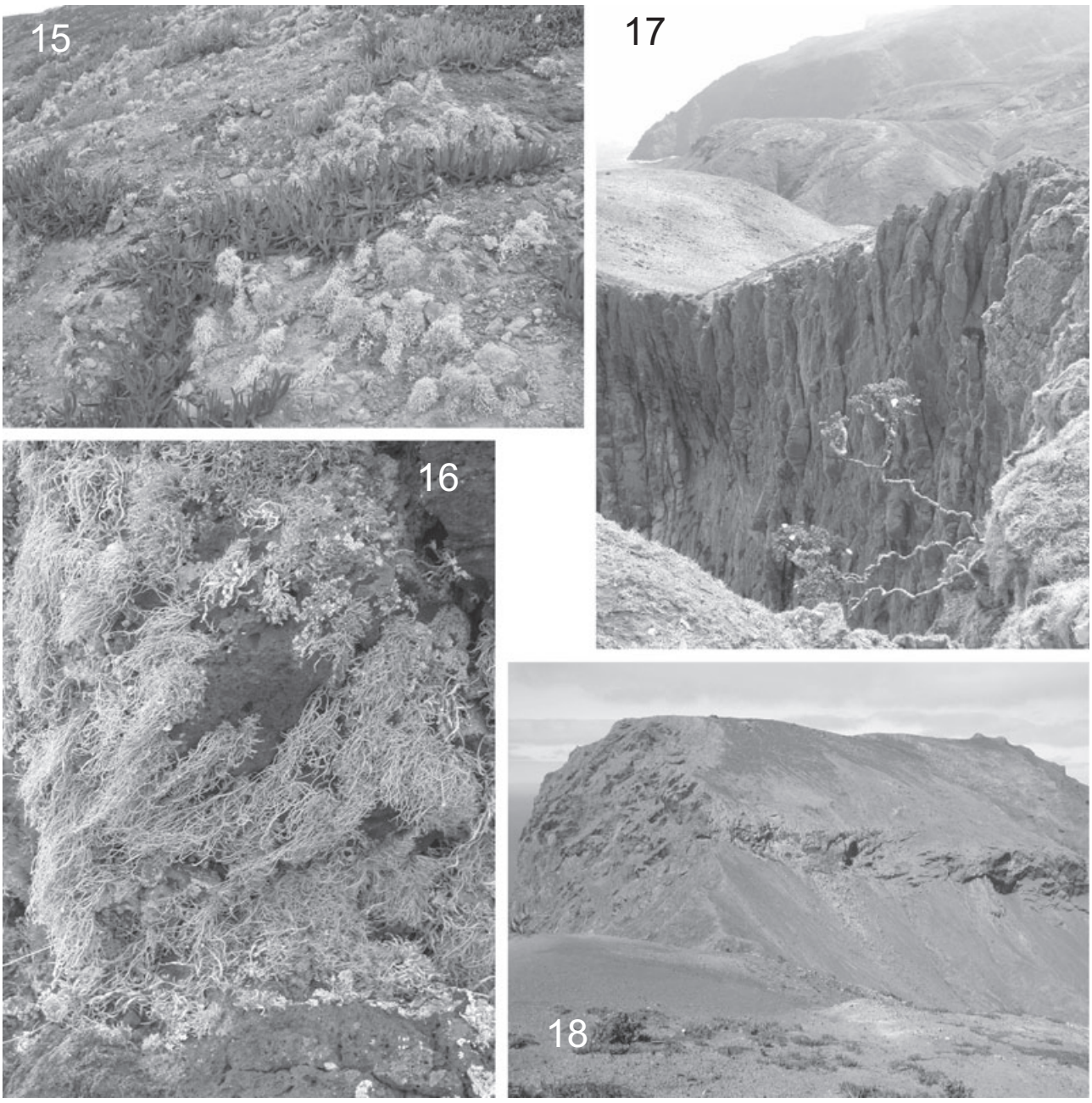
Type: St Helena. Prosperous Bay Plain, on track of access road north of Bone Gully, on basalt, altitude 330 m, 17.x.2006, *A. Aptroot 66215* (holo. B; iso. ABL).

Diagnosis: Ramalina saxicola, thallo canaliculato curvato pseudocyphellato, sorediis desunt, apotheciis laminalis cupulatis geniculatis, saepe acidis boninicis et protocetraricis continens.

Description: THALLUS initially shrubby, becoming pendant with age, up to 20 cm in diameter but usually much smaller (*c.* 7 cm), without distinct holdfast, relatively sparingly antler-like branched, partly terete, but mostly flattened, never contorted, not canaliculate, never perforate, relatively slender, *c.* 0.5–1.2 mm wide, *c.* 0.2–0.5 mm thick, with at most few inconspicuous warts, greenish-grey, most parts with conspicuous whitish linear pseudocyphellae, the overall colour therefore pale grey. Branches generally linear, often bent below the apothecia (geniculate). Branch tips often minutely curved, usually not blackened. Thallus without soredia. Thallus section with conspicuous, rounded strands of cartilaginous tissue in the medulla and at the surface, which are mostly hyaline, but brownish in section near the surface. Photobiont in irregular groups throughout the medulla. Cortex indistinct. APOTHECIA common, *c.* 1–2 mm, rarely up to 3 mm in diameter, initially cupular but becoming distorted and somewhat convex when old, laminal, disc yellowish-grey, margin with white pseudocyphellae and in section with rounded strands of hyaline cartilaginous material like the thallus, ascospores straight to slightly curved, 10–12 × 4.0–5.5 µm. Conidia not observed. Thallus (medulla) C–, KOH–, PD+ red or PD–, UV–. Chemistry: usnic acid with or without boninic and protocetraric acids (TLC).

Additional material: St Helena. Numerous specimens (ABL, B).

Distribution and ecology: This species is characterized by its flattened, sparingly irregularly branched thallus with linear pseudocyphellae and laminal, solitary, large (*c.* 1–2 mm) apothecia. The thallus is markedly geniculate at an apothecium insertion. The thallus usually contains boninic and protocetraric acids. There is no close relative identified outside St Helena, but this species may be close to boninic acid-containing *R. sanctae-helenae*. It occurs on boulders and cliffs on the Prosperous Bay Plain and almost everywhere elsewhere on the island. The incorrect Leighton record of *R. ceruchis* (Ach.) DNot. (which is a South American



Figures 15–18. Habitats rich in *Ramalina* species. Figs 15, 16. Prosperous Bay Plain. Fig. 17. Little Stone Top. Fig. 18. The Barn.

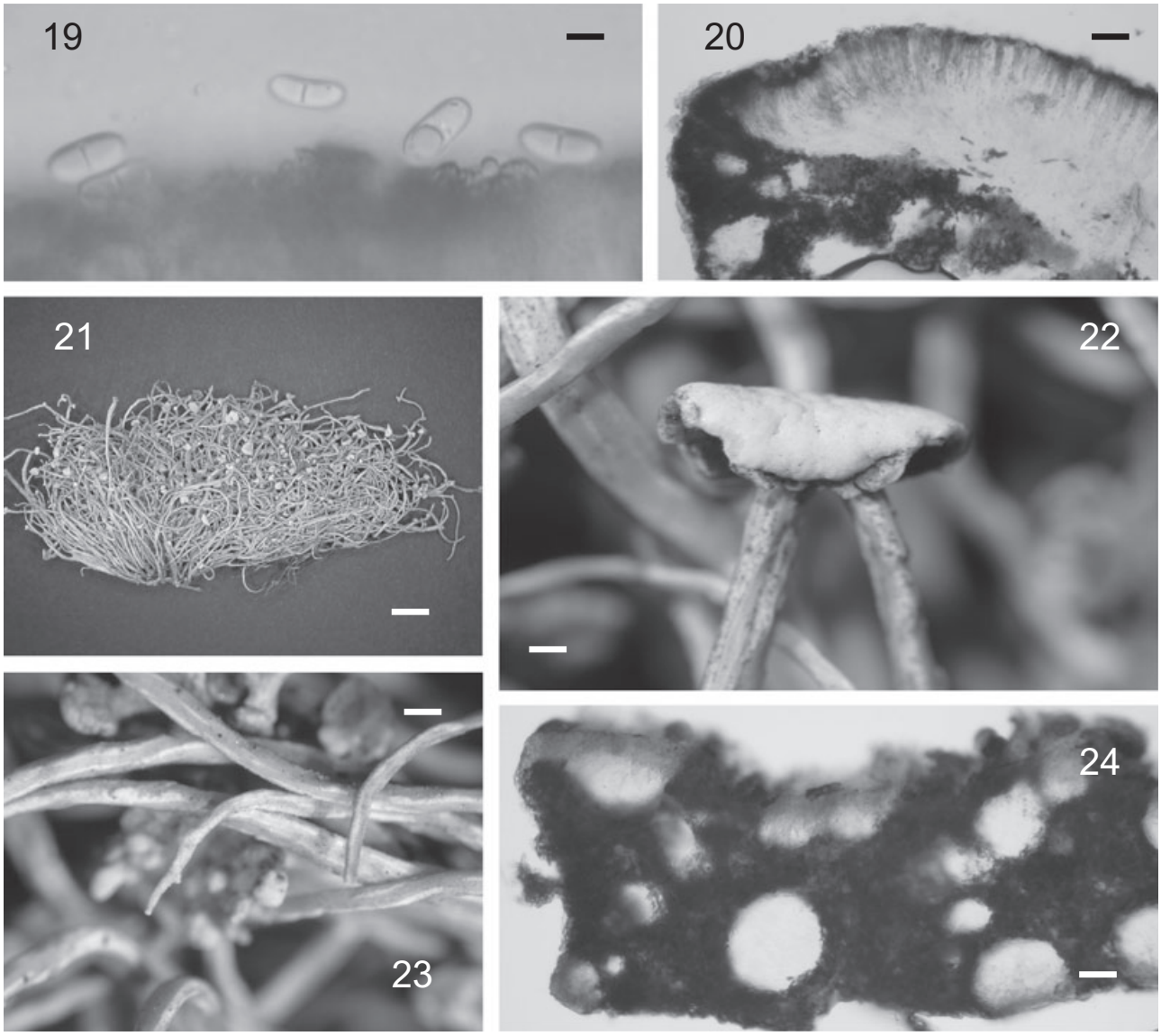
endemic occurring along the Pacific coast only) may well have referred to this species.

RAMALINA KETNER-OOSTRAE APTROOT **SP. NOV.**
(FIGS 25–29)

Type: St Helena. South of Gregory's Battery, on basalt, altitude 300 m, 19.x.2006, *A. Aptroot 66677* (holo. B; iso. ABL).

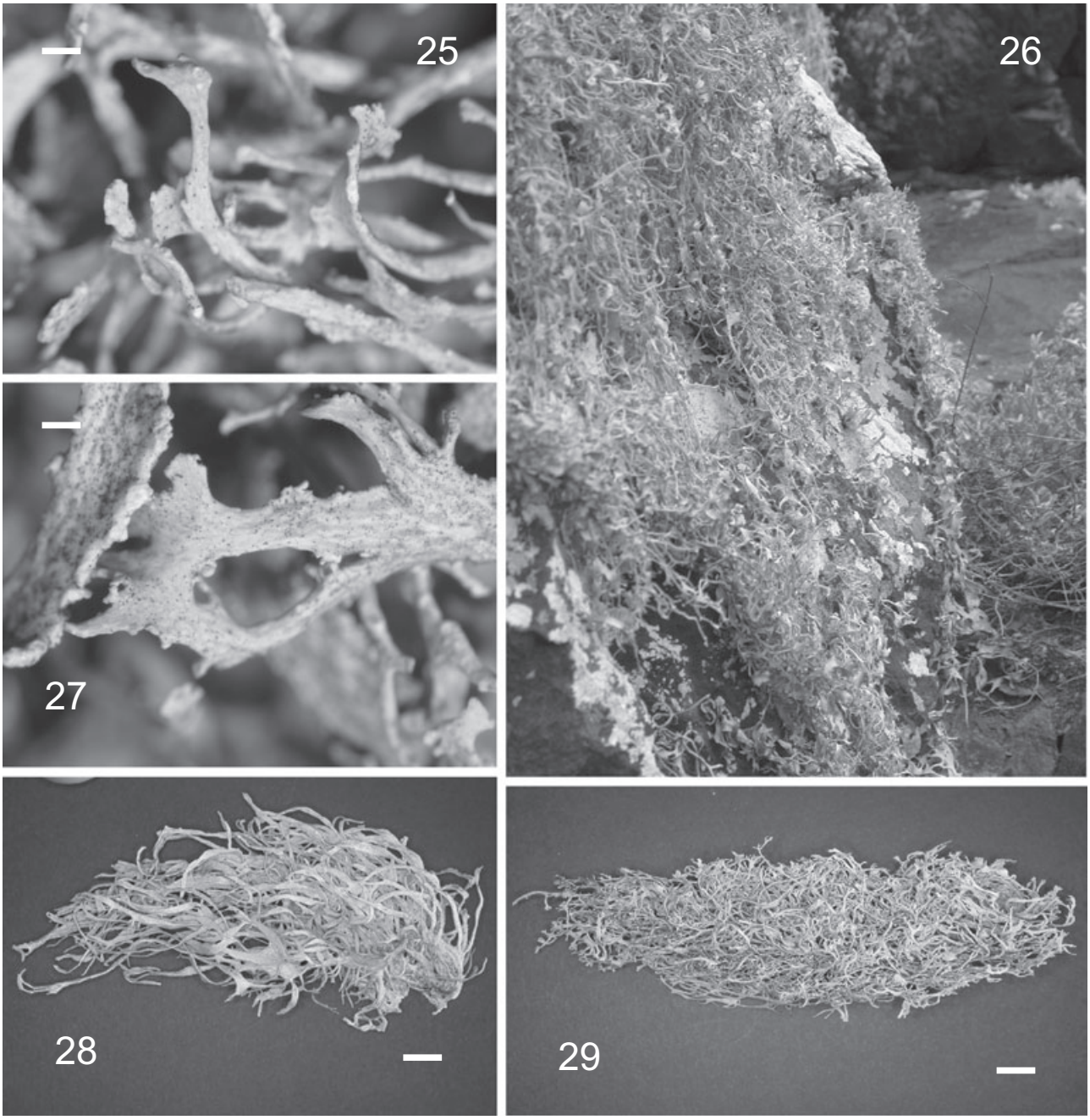
Diagnosis: Ramalina saxicola, thallo papyraceo contorto pseudocyphellato, sorediis desunt, apotheciis desunt, saepe acidis norsticticis continens.

Description: THALLUS initially shrubby, becoming pendant with age, up to 12 cm long but usually much smaller (*c.* 7 cm), without distinct holdfast, relatively sparingly antler-like branched, partly



Figures 19–24. ***Ramalina geniculatella***. Fig 19. Ascospores. Fig. 20. Apothecium section. Fig. 21. Habitus. Fig. 22. Apothecium. Fig. 23. Lobe tips. Fig. 24. Thallus section. Scale bars: 5 μm, Fig. 19; 50 μm, Fig. 20; 0.5 cm, Fig. 21; 0.5 mm, Figs 22 and 23; 50 μm, Fig. 24.

terete, but mostly flattened, often partly conspicuously corkscrew-like contorted, not canaliculate, sometimes perforate, papery thin, *c.* 0.3–4.0 mm wide, *c.* 0.2–0.3 mm thick, with at most a few inconspicuous warts, greenish-grey, most parts with numerous inconspicuous whitish linear pseudocyphellae that are confluent to fill most of the surface, the overall colour therefore pale grey. Branches in outline generally flabellate. Branch tips distinctly flabellate but generally divided into attenuating tips, sometimes minutely warted along the margins, usually not blackened, but often pinkish because of the decomposition of norstictic acid. Thallus without soredia, but tips in some specimens swollen and soredia-like abraded. Thallus section with conspicuous, rounded strands of cartilaginous tissue in the medulla and at the surface, which are mostly hyaline, but brownish in section when reaching the surface. Photobiont in irregular groups throughout the medulla. Cortex indistinct. APOTHECIA unknown. Conidia not observed. Thallus (medulla) C–, KOH+ yellow > red or KOH–, PD+ red or PD–, UV–. Chemistry: usnic acid, usually with (rarely without) norstictic and connorstictic acids (TLC).



Figures 25–29. ***Ramalina ketner-oostrae***. Habitus. Scale bars: 0.5 mm, Figs 25, 27; 0.5 cm, Figs 28, 29.

Additional material: St Helena. Numerous specimens (ABL, B).

Distribution and ecology: This species is characterized by a papery thin, flattened, flabellate but ultimately attenuating, often contorted, sparingly irregularly branched thallus without pseudocyphellae. The thallus usually contains norstictic acid. There is no close relative identified outside St Helena, but this species may be close to *R. rigidella*. It occurs on cliffs on the Prosperous Bay Plain and elsewhere on the island.

Etymology: This species is named in honour of the Dutch lichenologist and ecologist Rita Ketner-Oostra.

RAMALINA RIGIDELLA APTROOT **SP. NOV.**
(FIGS 30–34)

Type: St Helena. Prosperous Bay Plain, north slope of Dry Gut, on basalt, altitude 280 m, 17.x.2006, *A. Aptroot 66263* (holo. B; iso. ABL).

Diagnosis: Ramalina saxicola, thallo angulato pseudocyphellato, sorediis schizideoideis, apotheciis desunt, acidis norsticticis et connorsticticis continens.

Description: THALLUS initially shrubby, soon becoming pendant with age, up to 80 cm long but usually much smaller (*c.* 10 cm), without distinct holdfast, relatively richly largely dichotomously branched, mostly terete to angular, never contorted, not canaliculate, never perforate, relatively slender, up to 2 mm wide, but generally *c.* 0.2–0.5 mm thick, with at most few inconspicuous warts, greenish-grey, most parts with conspicuous whitish linear pseudocyphellae, the overall colour therefore pale grey. Branches generally linear. Branch tips often minutely curved, usually not blackened. Thallus with irregular, terminal or lateral soredia bearing schizidioid, more or less corticate soredia. Thallus section with conspicuous, rounded to angular strands of cartilaginous tissue in the medulla and at the surface, which are mostly hyaline, but brownish in section when reaching the surface. Photobiont in irregular groups throughout the medulla. Cortex indistinct. APOTHECIA not observed. Conidia not observed. Thallus (medulla) C–, KOH+ yellow > red, PD+ red, UV–. Chemistry: usnic acid with norstictic and connorstictic acids (TLC).

Additional material: St Helena. Numerous specimens (ABL, B).

Distribution and ecology: This species is characterized by an angular, richly irregularly branched thallus with linear pseudocyphellae-like lines and lateral to terminal tiny schizidioid soredia. The thallus contains norstictic and connorstictic acids. This may be a relative of *R. arabum* (Dill. ex Ach.) Meyen & Flot. It occurs on boulders and cliffs in the Prosperous Bay Plain and almost everywhere else on the island, even on the walls of High Knoll Fort.

Judging from the size of the specimens (25 cm; see Fig. 33) on the 150-year-old walls of High Knoll Fort, and the largest specimens seen (80 cm, on The Barn; see Fig. 34), individual specimens might reach an age of several centuries on some exposed cliffs, probably as much as 500 years. This new species is one of the larger macrolichens in the world, and it is somewhat surprising that it escaped attention until the 21st century. A possible reason may be that St Helena has never been visited before by a lichenologist. Moreover, the many general botanists who visited the island often did so after a long voyage, stopping at many other Atlantic islands, each of which has areas with abundant *Ramalina* vegetation which may seem identical to a non-specialist; therefore, they may not have felt the urge to explore the St Helena *Ramalina* species.

RAMALINA SANCTAE-HELENAE APTROOT **SP. NOV.**
(FIGS 35–38)

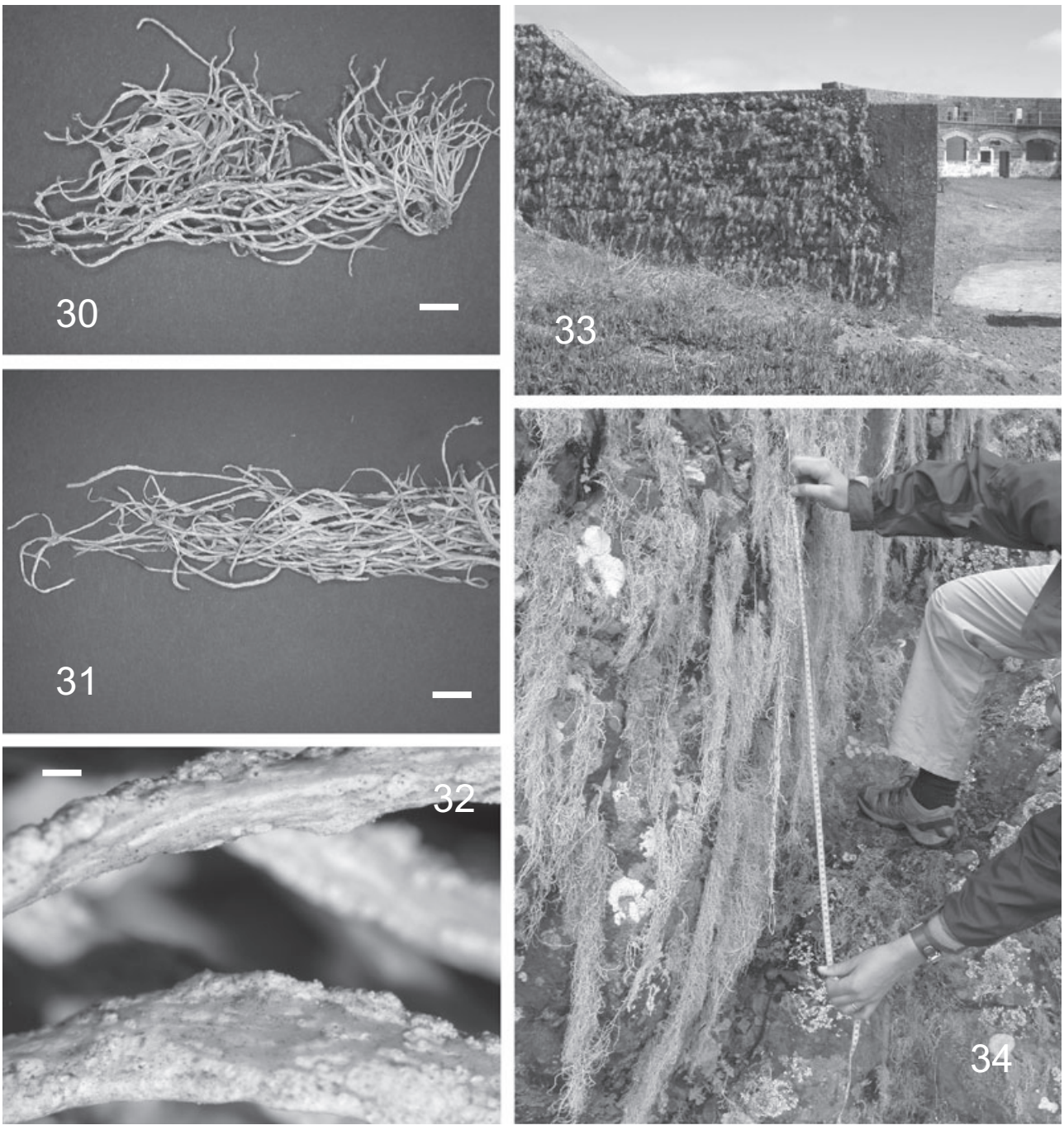
Type: St Helena. Prosperous Bay Plain, north slope of Dry Gut, on basalt, altitude 280 m, 17.x.2006, *A. Aptroot 66266* (holo. B; iso. ABL).

Diagnosis: Ramalina saxicola, thallo applanato pseudocyphellato, sorediis desunt, apotheciis laminalis cupulatis non geniculatis, saepe acidis boninicis et protocetraricis, rarius acidis divaricaticis continens.

Description: THALLUS initially shrubby, becoming pendant with age, up to 40 cm long but usually much smaller (*c.* 7 cm), without distinct holdfast, relatively sparingly to richly antler-like branched, partly terete, but mostly flattened, never contorted, not canaliculate, sometimes perforate, partly relatively broad, up to 3 cm wide, but generally *c.* 1.0–2.5 mm wide, *c.* 0.3–0.7 mm thick, with at most few inconspicuous warts, greenish-grey, most parts with conspicuous whitish linear pseudocyphellae, leaving seemingly branched greenish interspaces, the overall colour therefore pale grey. Branches generally linear, not bent below the apothecia. Branch tips often minutely curved, usually not blackened. Thallus without soredia. Thallus section with conspicuous, rounded strands of cartilaginous tissue in the medulla and at the surface, which are mostly hyaline, but brownish in section when reaching the surface. Photobiont in irregular groups throughout the medulla. Cortex indistinct. APOTHECIA rather common, up to 3 mm in diameter, mostly cupular but becoming sometimes convex when old, laminal, disc yellowish-grey, margin with white pseudocyphellae and in section with rounded strands of hyaline cartilaginous material like the thallus, ascospores straight to slightly curved, 10–12 × 4.0–5.5 µm. Conidia not observed. Thallus (medulla) C–, KOH+ yellow > red or KOH–, PD+ red or PD–, UV+ whitish or UV–. Chemistry: usnic acid with or without either boninic and protocetraric acids or with divaricatic acid (TLC).

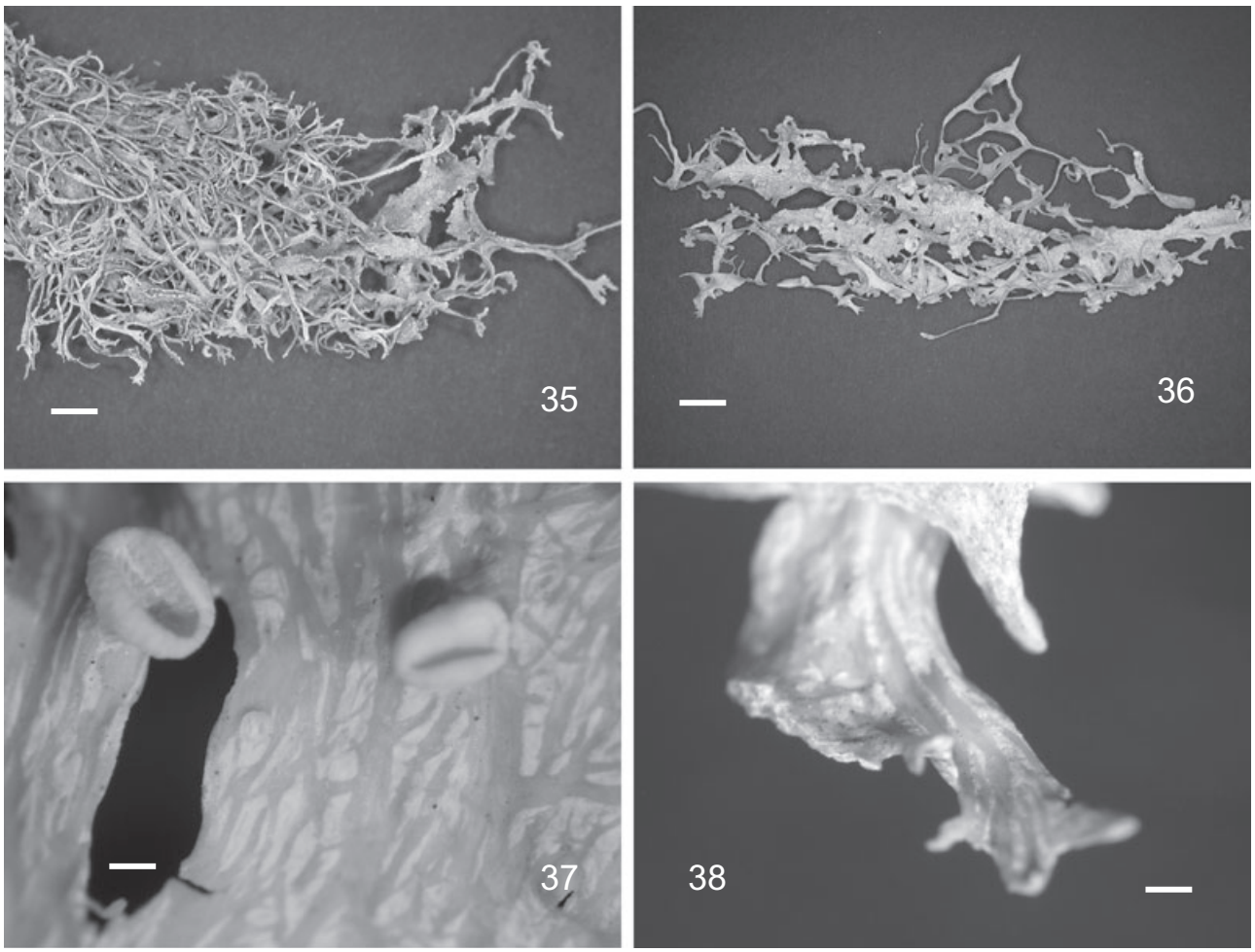
Additional material: St Helena. Numerous specimens (ABL, B).

Distribution and ecology: This species is characterized by a flattened, sparingly to richly antler-like branched thallus with linear pseudocyphellae-like lines and



Figures 30–34. ***Ramalina rigidella***. Figs 30–34. Habitus. Fig. 33. On wall of High Knoll Fortress. Fig. 34. Ancient specimens on The Barn. Scale bars: 0.5 cm, Figs 30, 31; 0.5 mm, Fig. 32.

often numerous, small (*c.* 0.5 mm) laminal apothecia. The thallus is not geniculate at an apothecium insertion. Two strains have been identified, each characterized by the secondary metabolites, as follows: I, boninic and protocetraric acids; II, divaricatic acid. Occasionally, no medullary substances are present. There is no close relative identified outside St Helena, but this species may be close to two other endemic *Ramalina* species of St Helena, as it shares several morphological trends, and the boninic acid strain shares its chemistry with *R. geniculatella*. The species is known from all over the island, in semi-desert areas and on cliffs. The incorrect Leighton record of *R. scopulorum* (Retz.) Ach. [a synonym of



Figures 35–38. ***Ramalina sanctae-helenae***. Figs 35, 36. Habitus. Fig. 37. Apothecia. Fig. 38. Lobe tips. Scale bars: 1 cm, Figs 35, 36; 0.5 mm, Figs 37, 38.

R. siliquosa (Huds.) A.L.Sm. restricted to boreal to temperate coasts in the Northern Hemisphere] should be referred to this species.

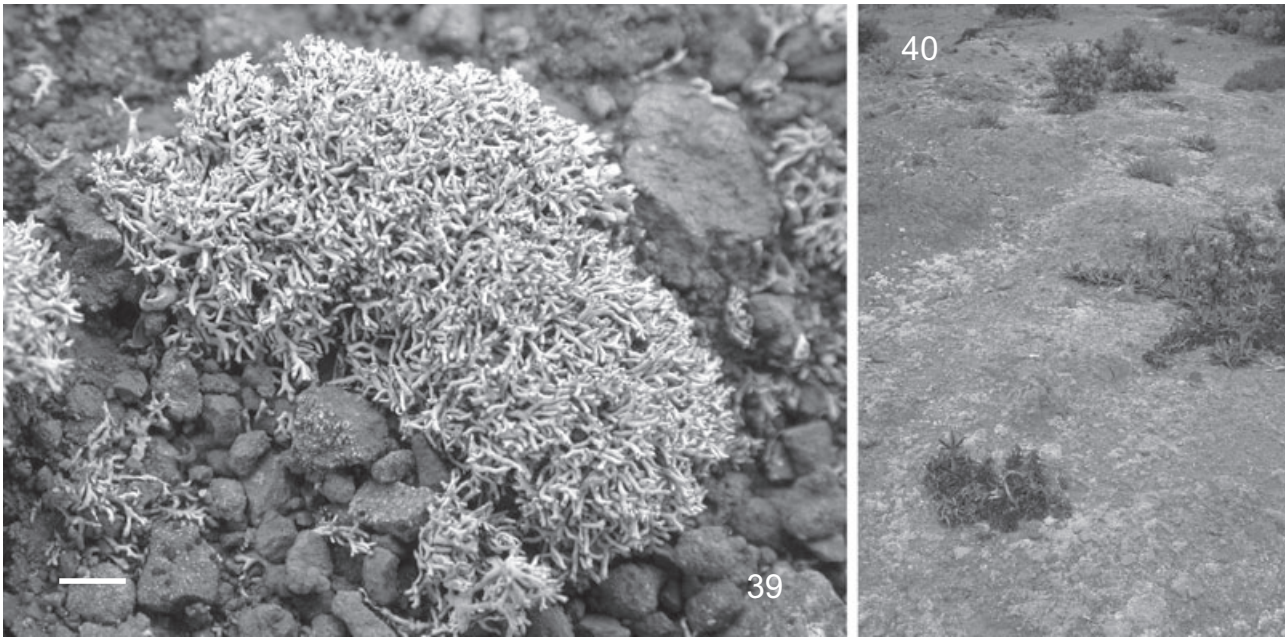
The presence of various strains is not uncommon in a lichen species, but certainly indicates that the species is evolutionarily old, and that it is on the verge of speciating into several (sub)species. The fact that some other endemic *Ramalina* species from St Helena seem to be at least party related to this already old complex species suggests that speciation of endemic *Ramalina* on St Helena has been going on for a long time, probably for most of the 15 million years the island has been in existence, and most probably after the arrival of a single precursor species from Macaronesia.

XANTHOPARMELIA BECCAE APTROOT **SP. NOV.**
(FIGS 39, 40)

Type: St Helena. Rupert's Hill, along Pipe Path, on lava soil, altitude 425 m, 18.x.2006, *A. Aptroot 66343* (holo. B; iso. ABL).

Diagnosis: Xanthoparmelia saxicola vel terricola thallo fruticuloso, lobis valde cylindricis, densissime ramosis, subtus nigris, denissime ramosissime isidiatis, apotheciis ignotis, acidus protocetraricus continens.

Description: THALLUS essentially foliose, but appearing fruticose, forming dense, nearly hemispherical tufts of up to 3 cm in diameter. The tufts are so dense that the substratum below is invisible, except between the outer lobes. Marginal lobes branched, convex, a bit flattened, generally *c.* 0.3 mm wide, but up to 0.8 mm wide, greenish-grey (usnic acid) above, tips blackened. Lower surface dark brown to black, especially towards the tips, with black, simple, numerous, only *c.* 0.2 mm long rhizines. Most of the thallus covered with a dense layer of richly branched, cylindrical isidia of up to 1.5 cm long (and high), which are greenish-grey (usnic acid) above, tips blackened, and dull brownish below. APOTHECIA not observed. Conidia not observed. Thallus (medulla)



Figures 39–40. ***Xanthoparmelia beccae***. Habitus. Scale bar: 2 mm, Fig. 39.

C–, KOH–, PD+ red, UV–. Chemistry: usnic and protocetraric acids (TLC).

Additional material: St Helena. Bryan's Rock, on basalt, altitude 400 m, 19.x.2006, *A. Aptroot 66355* (ABL).

Distribution and ecology: This is a very unusual coralloid species that grows in dusty areas, where it can be the only lichen species present. It also occurs in boulder field areas intermixed with a rich lichen flora. It superficially resembles *Xanthoparmelia eradicata* (Nyl.) Hale, which occurs in the Cape Region of South Africa (Hale, 1990) and has a less dense branching pattern and is not isidiate. *Xanthoparmelia beccae* occurs on soil and rock, on dusty plains, and in boulder fields on Rupert's Hill, Bryan's Rock, The Barn, and Great Stone Top.

Etymology: This species is named in honour of Rebecca Cairns-Wicks in acknowledgement for her generous help in introducing me to the plants and vegetation types of St Helena.

NON-ENDEMIC LICHEN SPECIES DESCRIBED FROM ST. HELENA

Lecanora personata Leight. was described by Leighton (1869) and subsequently named *Aspicilia personata* (Leight) Dodge (1971). The type and additional material was examined, and found to have a *Lecidella*-type of excipulum coloration (mottled green), a pale brown hypothecium, an epihymenium with black granules, and a chemistry of arthothelin and thuringione. It is therefore identified as a synonym of *Lecidella buelliastrum* (Müll. Arg.) Knoph & Rambold, known from South America and Australia (Knoph, 1990). It occurs everywhere on the island.

Lecanora sanctae-helenae Müll. Arg. was described by Müller (1893) and is still accepted in a current monograph (Dickhäuser *et al*., 1995), at which time it was known only from St Helena. It covers large areas of rock with a white thallus, with whitish, irregularly rounded, pruinose apothecia. It is locally common and found throughout the island. Surprisingly, it was also found on Ascension Island, where it is also locally common.

Lecidea approximans Leight. was described as new to science from St Helena by Leighton (1869). It was reclassified as *Buellia approximans* (Leight.) Zahlbr. by Zahlbruckner in his catalogue, and also mentioned as such by Dodge (1971). The type is fragmentary, but a further original specimen (isotype) is present on the same piece of rock that contains the type of *Lecidea lactescens*. Judging by the yellowish, C+ orange thallus and the beautiful illustrations and description by Leighton, it is most probably a synonym of *Buellia halonia* (Ach.) Tuck., known from coastal rock in South Africa and America (Scheidegger & Ruef, 1988). It occurs almost everywhere on St Helena.

Lecidea lactescens Leight. was described as new to science from St Helena by Leighton (1869). It was reclassified as *Blastenia lactescens* (Leight.) Zahlbr.

by Zahlbruckner in his catalogue, and later as *Huea lactescens* (Leight.) Dodge (1971). Currently, neither the genus *Blastenia* nor *Huea* is in use. The type (studied in the Natural History Museum, London) is tiny, and could not be studied nondestructively. It is quite likely that this species is a synonym of *Lecidella chodati* (Samp.) Knoph & Leuckert, known from Portugal, South Africa, Australia, New Zealand, and Juan Fernández (Knoph, 1990). It occurs almost everywhere on St Helena. It was also found on Ascension Island.

Parmelia mellissii Dodge, described by Dodge (1959), was subsequently found to be widespread in the tropics, and is now known as *Parmotrema mellissii* (Dodge) Hale.

Parmelia sanctae-helenae Dodge, described by Dodge (1959), is a synonym of the common and cosmopolitan *Rimelia reticulata* (Tayl.) Hale & Fletcher (Hale & Fletcher, 1990).

Parmelia wildeae Dodge, described by Dodge (1959), was subsequently named *Xanthoparmelia wildeae* (Dodge) Hale, as accepted by Hale (1990). There was, however, some doubt as to whether the original material came from St Helena, as the collector it is named after, Wilde, is not mentioned in a list of botanical collectors on St Helena by Cronk (2000). However, the species was found again on St Helena; it occurs on dusty plains and boulder fields on Rupert, Bryan's Rock, and Great Stone Top. It has also been reported from several countries in South America by Nash, Gries & Elix (1995).

SOME NOTEWORTHY SPECIES

In Table 1, the 220 species found during the recent survey are listed. For those that could be satisfactorily identified, the world distribution is given, as well as the region (if any) for which it is the first report. Most species are new to St Helena, but their occurrence may have been expected as they are widely distributed taxa. A relatively large number of species (23) are apparently reported for the first time from the Southern Hemisphere. Many of these are common in Northern Macaronesia, and their occurrence on the South Atlantic islands is not unexpected. A relatively large number of species were previously only known from South America. These are mostly crustose species of the family Roccellaceae (such as *Enterographa multilocularis*, *Lecanactis epileuca*, *Lecanographa farinulenta*, *Roccellina accedens*, *Syncesia decussans*, and *Syncesia effusa*), and highlight the same affinity as the newly described *Dolichocarpus*, which is by far the most unexpected species. The congruence in this lichen flora element is probably a result of the limited availability of their specialized habitat, namely dry, overhanging coastal rocks influenced by fog. Such conditions are common on St Helena and also in coastal Chile, where most of the above-mentioned species occur. The remaining fruticose Roccellaceae are shared with either Africa or Macaronesia. In contrast, the *Toninia*, *Usnea*, and *Xanthoparmelia* species are largely African, with the notable exception of *Xanthoparmelia alabamensis*, which has a close African relative that may be conspecific. Some usually corticolous species, including 1 m long *Usnea exasperata*, were surprisingly found hanging from rock cliffs. Some further identifications were quite unexpected, such as *Catillaria nigroisidiata* van den Boom, a very inconspicuous blackish-grey species, previously only known from the Netherlands.

COMPARISON WITH NEIGHBOURING COUNTRIES

The lichen flora of upland St Helena consists essentially of pantropical 'weeds', but that of the semi-desert shows some relationships with Ascension and the Cape Verde Islands. For example, *Ramalina maderensis* (a saxicolous species with barbatic and obtusatic acids) is also known from all archipelagos in Macaronesia, including the Cape Verde Islands. *Ramalina arabum* (both corticolous and saxicolous on St Helena) is known from the Cape Verde Islands (where it is mostly saxicolous), Ascension, South Africa, Madagascar, and the Seychelles. *Lecidella chodati* is currently known from Portugal, South Africa, Australia, New Zealand, and Juan Fernández; therefore, its occurrence on some Atlantic islands between Portugal and St Helena is possible. *Roccella montagnei*, by contrast, is at its most northern locality in the Atlantic Ocean; it is known from South and East Africa, where it is often abundant in coastal areas, and Asia (where it is common in India) and Oceania, but not from Europe or Macaronesia.

The lichen floras of the areas closest to St Helena have been scrutinized in order to evaluate the hypothesis that its supposed endemics described above do not occur elsewhere.

The lichens from the Tristan da Cunha archipelago to the south are moderately well known. It also has part of the St Helena upland lichen element, which is less developed there as trees are rare. In addition, Tristan da Cunha has numerous temperate to sub-Antarctic lichens, with many Parmeliaceae, *Cladonia*, *Placopsis*, and *Stereocaulon* species.

The lichen flora of Namibia and adjacent South Africa to the east is fairly well known. The lichen flora appears to be related to the semi-desert area on St Helena, but the congruence is, at most, only at the generic level. Few species are shared, and a large proportion of the Namibian lichens are strict endem-

ics. An obvious difference is that *Ramalina* species (an Atlantic element) are almost absent from Namibia.

The lichen flora of the closest neighbour of St Helena, Ascension Island, to the north is still poorly documented. Only a few 19th century publications are devoted to it, mostly citing the same specimens; in total, about 35 species have been reported, including the description of the purported endemic *Dirinaria adscensionis*, which is probably merely a richly fruiting morph of *Dirinaria flava*. A more convincing endemic species, *Roccellina jamesii*, was described from Ascension Island together with a few additional records (Tehler, 1985); it has now been found to be common on St Helena. Two methods were employed to augment our knowledge of the relationship between the lichen floras of St Helena and Ascension.

1. A large collection of mainly unprocessed lichens from Ascension Island in the Natural History Museum, London, collected in 1987 by the lichenologist P. W. James, has now been investigated. Over 250 specimens of this collection have been examined, mainly concentrating on taxa known to, or likely to, occur on St Helena, and on the genus *Ramalina*; however, surprisingly, none of the St Helena endemics were found in the material. An explanation may well be that Ascension Island is geologically much younger (*c.* 1.5 million years). The only *Ramalina* species that the two islands have in common are four rather widespread species, namely *R. arabum* (which was previously reported from Ascension Island under the name *R. rubrotincta*), *R. lacera*, *R. nervulosa*, and *R. peruviana*. Ascension Island itself appears not to have endemic *Ramalina* species, as all species identified are widespread.
2. In October 2006, lichen fieldwork was carried out by the author on Ascension Island. Nearly all localities suitable for lichen growth were investigated. Just under 100 species were encountered (Table 2), most of which are common with St Helena. Generally speaking, there is a poor representation of the St Helena lichen flora on Ascension Island, with only two species with a world distribution that seems to be restricted only to these two islands, namely *Lecanora sanctae-helenae* and *Roccellina jamesii*.

Although the lichen floras of the Canary and Cape Verde Islands and Madeira have been relatively well studied, those of the other Atlantic islands are less well known. About 500 publications are cited in a bibliography and checklist of the lichens of Macaronesia by Hafellner (1995), and many have appeared since, most notably a recent checklist of Azores lichens (Rodrigues & Aptroot, 2005).

The lichen flora of the Atlantic islands is characterized by two main elements.

1. A pan(sub)tropical element in the humid, usually upland (but in the Azores also wet lowland), parts. This element can contain endemics, mainly because much of the wet vegetation has been destroyed and comparable vegetation in mainland Europe and Africa has vanished, but it generally consists of widely distributed lichens.
2. A dry Mediterranean to semi-desert element which contains numerous endemics (restricted to Macaronesia or even an island group or tiny island) in a few taxonomic groups only.

Endemism is low in most lichen groups, but decidedly higher in some. In Roccellaceae, a family mainly occurring in coastal regions and most abundant on islands and coastal deserts, a strictly endemic species, *Roccellina jamesii*, is known from Ascension Island (Tehler, 1985). In Physciaceae, one supposed endemic, *Dirinaria adscensionis*, has been described from Ascension Island, but see above. However, by far the richest local endemism is found in the genus *Ramalina*: in total, 40 species are known from Macaronesia (not counting ten doubtful records), one half of which are unknown outside these islands (Aptroot & Schumm, 2008). Some occur on most Atlantic islands, others only on all or a few of the islands of one archipelago. The most striking endemism is to be found on the small (much smaller than St Helena), mostly flat island of Porto Santo off Madeira: on the old volcanic cones, no less than six species of *Ramalina* occur, none of which have ever been found elsewhere.

On St Helena, two elements with an above average percentage of lichen endemism come together: (1) it is a geologically old, isolated island; and (2) it has fog-induced lichen vegetation in semi-desert areas. Hence, the possibilities for local endemism are high.

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