

CDF Checklist of Galapagos Phytopathogenic Fungi

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Abstract

This Checklist of Galapagos Phytopathogenic Fungi includes a total of all 80 taxa reported from the Galapagos Islands.

For each name, detailed information is provided: its Galapagos distribution in islands groups or bioregions generated from the specimen records, comments about the taxonomy (especially synonyms), the origin (native and introduced), taxon status (accepted vs. rejected records) and relevant literature references.

Introduction

This publication lists all species of Galapagos Phytopathogenic Fungi currently known.

Pathogens known to cause diseases of Galapagos plants included in this checklist are so-called **phytopathogenic fungi**. Strictly speaking some are not true fungi, but have a similar growth form and ecology as true fungi.

Some phytopathogenic fungi are endemic to Galapagos infecting only endemic or native plants. *Uredo scalesiae* for example is a rust fungus described from the endemic plant genus *Scalesia*.

However, with the introduction of a wide variety of food crops new species of phytopathogenic fungi have also arrived in the archipelago.

These newly introduced species are often rather host specific, adapted to infect a particular plant species only. Generalists are relatively rare but have the potential to cause significant damage among the native flora.

Even species expected not switch hosts can potentially be problematic: if they were introduced with a host plant that is a close relative of a Galapagos native it is possible that these pathogens may also infect the native species. Native species that were protected against diseases by the extreme geographical isolation of the archipelago are thus now subjected to new pathogens.

Nevertheless, specific pathogens that only infect a particular plant can potentially be also very useful. If these species only infect a particular invasive plant they could potentially be used as a very effective biological control agent for this particular invasive species.

Currently a rust fungus is being investigated for biological control of the extremely invasive blackberry (*Rubus nivea*), a plant that is one of the worst transformers of the natural vegetation of the Galapagos highlands.

This checklist of phytopathogenic fungi does not include other plant pathogens or parasites: Viruses, protozoans and bacteria that infect plants remain largely unknown, and invertebrates feeding on plants, although often also causing significant damage, are not necessarily parasites of a single host species only. Their ecological role is generally more complex. Some species for example have larvae that are plant parasites, but their adults no longer

feed on the host plant.

Methods

This checklist of all known Galapagos Phytopathogenic Fungi is automatically generated using the online database of the Charles Darwin Foundation Galapagos Species Checklist.

All CDF Galapagos Species Checklists represent the synthesis of many different records: literature citations, data from previously unpublished reports (grey literature), specimen records of natural history collections located in Galapagos and all over the world. To the best of their knowledge authors of the individual checklists revised all available data. When new information becomes available, the taxonomy of a group changes or new species are discovered, the CDF online database and thus this publication becomes updated.

For many poorly known species groups the higher taxonomic classification still regularly changes according to how our knowledge about species being related changes. In many well known groups the phylogeny is somewhat stable, but to avoid confusion, in particular for groups where taxonomic changes are frequent, all checklists presented here are sorted alphabetical according to genus name and specific epithet. Please refer to the website for the currently accepted taxonomic hierarchy of each group.

Please be aware that the distribution presented here is automatically generated from specimen records and does not always accurately reflect the known distribution for all species.

For marine species, the distribution generally refers to the five main bioregions of the archipelago (Far Northern, Northern, Western, South Eastern and the Elisabeth Bay Bioregion). For the terrestrial species more than 120 islands, islets and small rocks have been aggregated into Islands Groups, thus, for example, the island group "Santa Cruz" includes smaller islands like Santa Fé, Plaza Norte, Plaza Sur, Baltra, Daphne Mayor, Daphne Minor, and others.

IUCN red-list assessments presented here may deviate from the global IUCN list for the following reasons:

- for well known species groups like vascular plants or vertebrates updates proposed to the IUCN are shown instead of the outdated, but currently accepted status;
- for poorly known species groups (e.g., lichenized fungi) a general assessment is currently not possible and the list presented here is a regional red-list list for Galapagos archipelago.

Numbers of the species included in this list are auto-generated. Adding up the number of species in each category will not always equal the total number indicated. Some species have insufficient data to be categorized while others (e.g., category eradicated) will not be included in the total.

Results

Names of taxa included in this checklist: 80 (43 accepted, 32 unidentified taxon, 2 doubtful, 3 preliminary identification).

Origin of the taxa included: 15 accidental, 12 cultivated, 20 endemic, 25 indigenous, 1 questionable endemic.

1. *Actinocymbe* sp. 1

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

2. *Alternaria brassicae* (Berk.) Sacc.

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Lewia

Origin: Introduced, Accidental.

Galapagos Distribution: San Cristóbal.

References: Kirk, P. (ed.) et al. (2010).

3. *Asperisporium caricae* (Speg.) Maubl.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Isabela, Santa Cruz.

4. *Camillea obularia* (Fr.) Laessøe, J.D. Rogers & Lodge
Taxon status: Identification not yet confirmed.
Origin: No Data.
Galapagos Distribution: Santa Cruz.

5. *Cercoseptoria sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Index Fungorum: anamorphic Mycosphaerella
Origin: Native, Endemic.
Galapagos Distribution: Santa Cruz.
References: Kirk, P. (ed.) et al. (2010).

6. *Cercospora apii* Fresen.
Taxon status: Accepted name; taxon occurs in Galapagos.
Index Fungorum: anamorphic Mycosphaerella
Origin: Introduced, Cultivated.
Galapagos Distribution: Floreana, Isabela.
References: Kirk, P. (ed.) et al. (2010).

7. *Cercospora sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Index Fungorum: anamorphic Mycosphaerella
Origin: Native, Indigenous.
Galapagos Distribution: Santa Cruz.
References: Kiener, L.C. et al. (1834-70).

8. *Cercospora sp. 2*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: Native, Indigenous.
Galapagos Distribution: Santa Cruz.

9. *Cerotelium fici* (Castagne) Arthur
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Santa Cruz.

10. *Chaconia ingae* (Syd.) Cummins
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Santa Cruz.

11. *Chaetothyrium sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

12. *Cladosporium sphaerospermum* Penz.

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Davidiella

Origin: Native, Indigenous.

Galapagos Distribution: Isabela, Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

13. *Claviceps sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: No Data.

Galapagos Distribution: Santa Cruz.

14. *Coniothyrium sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Leptosphaeria

Origin: Native, Endemic.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

15. *Corynespora sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Corynesporasca

Origin: Introduced, Accidental.

Galapagos Distribution: Isabela, San Cristóbal.

References: Kirk, P. (ed.) et al. (2010).

16. *Fusarium cf. oxysporum* Schldl.

Taxon status: The identification of this taxon or its occurrence in Galapagos is doubtful.

Index Fungorum: anamorphic Gibberella

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

17. *Fusicoccum sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Diaporthe

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

18. *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela.
19. *Gnomonia sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: Introduced, Cultivated.
Galapagos Distribution: Santa Cruz.
20. *Hemileia vastatrix* Berk. & Broome
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: San Cristóbal, Santa Cruz.
21. *Julella aviceniae* (Borse) K.D. Hyde
Taxon status: Accepted name; taxon occurs in Galapagos.
F. Bungartz: non-lichenized phytopathogen
Origin: Native, Indigenous.
IUCN Red List: Data Deficient.
Galapagos Distribution: San Cristóbal.
22. *Kordyana celebensis* Gäum.
Taxon status: Accepted name; taxon occurs in Galapagos.
possibly a synonym but nomen nudum?: *Kordyana cubensis*
Origin: Native, Indigenous.
Galapagos Distribution: Santa Cruz.
References: Barreto, R.W. et al. (1988).
23. *Lembosia sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: Native, Questionable Endemic.
Galapagos Distribution: Santa Cruz.
24. *Meliola sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: Native, Endemic.
Galapagos Distribution: San Cristóbal, Santa Cruz.
25. *Microsphaera diffusa* Cooke & Peck
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Floreana, San Cristóbal.

26. *Mycosphaerella cruenta* Latham
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela.
27. *Mycosphaerella fijiensis* M. Morelet
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: San Cristóbal.
28. *Mycosphaerella heningsii* Sivan.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela.
29. *Mycosphaerella musicola* R. Leach ex J.L. Mulder
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: San Cristóbal.
30. *Mycosphaerella sp. 1*
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: Native, Indigenous.
Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
31. *Mycosphaerella tassiana* (De Not.) Johanson
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela.
32. *Mycovellosiella fulva* (Cooke) Arx
Taxon status: Accepted name; taxon occurs in Galapagos.
Index Fungorum: anamorphic *Mycosphaerella*
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
References: Kirk, P. (ed.) et al. (2010).
33. *Mycovellosiella sidarum* (Petr. & Cif.) Deighton
Taxon status: Accepted name; taxon occurs in Galapagos.
Index Fungorum: anamorphic *Mycosphaerella*
Origin: Introduced, Accidental.
Galapagos Distribution: Santa Cruz.
References: Kirk, P. (ed.) et al. (2010).

34. *Mycovellosiella sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Endemic.

Galapagos Distribution: Floreana, Isabela, San Cristóbal.

References: Kirk, P. (ed.) et al. (2010).

35. *Neottiosporina sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Pezizomycotina

Origin: Native, Indigenous.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

36. *Oidium conspersum* (Link) Linder

Taxon status: Accepted name; taxon occurs in Galapagos.
anamorphic state of Botryobasidium conspersum J. Erikss.

Origin: No Data.

Galapagos Distribution: Santa Cruz.

37. *Oidium sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Erysiphe

Origin: Native, Endemic.

Galapagos Distribution: San Cristóbal.

References: Kirk, P. (ed.) et al. (2010).

38. *Passalora boldoae* (N. Pons) U. Braun, Crous & N. Pons

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

39. *Passalora cf. iochromatis* (Pat.) U. Braun

Taxon status: The identification of this taxon or its occurrence in Galapagos is doubtful.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

40. *Passalora sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

41. *Passalora sp. 2*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Floreana, Isabela, Santa Cruz.

42. *Periconia byssoides* (Petch) Samson, W. Gams & H.C. Evans

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Pleosporales

Origin: Native, Indigenous.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

43. *Periconia manihoticola* (Vincens) Viégas

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Pleosporales

Origin: Introduced, Accidental.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

44. *Phoma sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Pleosporales; P. Cannon: not identical with the *Phoma sp.* on *C. papaya* in Brasil

Origin: Introduced, Accidental.

Galapagos Distribution: Floreana, Isabela, Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

45. *Phoma sp. 2*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Pleosporales; P. Cannon: this species is not the anamorph of *Leptosphaeria sacchari*, a common pathogen on sugar

Origin: Introduced, Accidental.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

46. *Phoma sp. 3*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Pleosporales

Origin: Introduced, Accidental.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

47. *Phylacia globosa* Lév.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Indigenous.

Galapagos Distribution: Isabela.

48. *Phyllachora noblei* Chardón

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.

49. *Phyllachora sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Española, Floreana, Isabela, San Cristóbal, Santa Cruz.

50. *Phyllachora tragiae* (Berk. & M.A. Curtis) Sacc.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

Galapagos Distribution: Isabela.

51. *Phyllachora winteri* Sacc. & P. Syd.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, San Cristóbal, Santa Cruz.

52. *Phyllactinia dalbergia* Piroz.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

53. *Phyllosticta hiratsukae* Togashi

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Guignardia

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

54. *Phyllosticta sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Guignardia

Origin: Native, Endemic.

Galapagos Distribution: Santa Fé.

55. *Pseudocercospora meibomiaae* (Chupp) Deighton

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

56. *Pseudocercospora purpurea* (Cooke) Deighton

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Introduced, Accidental.

Galapagos Distribution: San Cristóbal, Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

57. *Pseudocercospora rhizophorae* (Creager) U. Braun & R.F. Castañeda

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

58. *Pseudocercospora sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, San Cristóbal.

References: Kirk, P. (ed.) et al. (2010).

59. *Pseudocercospora trichophila* (Davis) U. Braun

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, Isabela.

References: Kirk, P. (ed.) et al. (2010).

60. *Pseudocercospora triumfettae* (Syd.) Deighton

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Indigenous.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

61. *Pseudoperonospora cubensis* (Berk. & M.A. Curtis) Rostovzev

Taxon status: Identification not yet confirmed.

Origin: Introduced, Cultivated.

Galapagos Distribution: San Cristóbal.

62. *Puccinia lantanae* Farl.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

Galapagos Distribution: Floreana.

References: Reid, D.A. et al. (1980).

63. *Puccinia melanocephala* Syd. & P. Syd.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Cultivated.

Galapagos Distribution: Santa Cruz.

64. *Puccinia mogiphanis* Arthur

Taxon status: Identification not yet confirmed.

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

65. *Puccinia sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Indigenous.

Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.

66. *Ramulariopsis gossypii* (Speg.) U. Braun

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Native, Endemic.

Galapagos Distribution: Floreana.

References: Kirk, P. (ed.) et al. (2010).

67. *Schizothyrium rufulum* (Berk. & M.A. Curtis) Arx

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

68. *Sclerococcum sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Pezizomycotina

Origin: No Data.

Galapagos Distribution: San Cristóbal, Santa Cruz.

69. *Sepedonium sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Hypomyces

Origin: No Data.

Galapagos Distribution: Santa Cruz.

References: Kirk, P. (ed.) et al. (2010).

70. *Septoria lantanae* Garman

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Mycosphaerella

Origin: Introduced, Accidental.

Galapagos Distribution: Floreana.

References: Kirk, P. (ed.) et al. (2010).

71. *Septoria sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Introduced, Accidental.

Galapagos Distribution: Floreana, Isabela.

References: Kirk, P. (ed.) et al. (2010).

72. *Stilbella sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Hypocreales

Origin: No Data.

Galapagos Distribution: Isabela.

References: Kirk, P. (ed.) et al. (2010).

73. *Stomiopeltis sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Endemic.

Galapagos Distribution: Santa Cruz.

74. *Taeniolella sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Index Fungorum: anamorphic Glyphium

Origin: No Data.

Galapagos Distribution: Isabela, Santa Cruz.

75. *Uredo scalesiae* Bonar

Taxon status: Accepted name; taxon occurs in Galapagos.

Index Fungorum: anamorphic Pucciniales

Origin: Native, Endemic.

Galapagos Distribution: Floreana, Isabela, Santa Cruz.

References: Kirk, P. (ed.) et al. (2010), Reid, D.A. et al. (1980).

76. *Uredo sp. 1*

Taxon status: Taxon not identified to species, subspecies, form or variety.

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

77. *Uromyces bidenticola* Arthur

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Indigenous.

Galapagos Distribution: Santa Cruz.

78. *Uromyces dolichosporus* Dietel & Holw.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Indigenous.
Galapagos Distribution: Floreana, Santa Cruz.
79. *Vestergrenia multipunctata* (G. Winter) Arx & E. Müll.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Endemic.
Galapagos Distribution: Santa Cruz.
80. *Xylaria cubensis* (Mont.) Fr.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Endemic.
Galapagos Distribution: Santa Cruz.

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Disclaimer

The Charles Darwin Foundation Galapagos Species Checklist is a continuously updated list of all species currently known from the Galapagos Islands and reflects up-to-date knowledge compiled by scientists of the Charles Darwin Foundation (CDF) in collaboration with experts from around the world. CDF shares this data publicly and invites comments, corrections and additions.

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