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Plant data survey in Porto Santo (Madeira Archipelago, Portugal): an update

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With 2 tables

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ABSTRACT: The present contribution updates BORGES *et al.* (2008)'s "A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos". Since then, and until the summer of 2019, 131 new taxa were cited, namely 30 bryophytes, one pteridophyte and 100 spermatophytes.

Based on the compilation of written and unpublished information about the diversity of terrestrial plants cited for Porto Santo, the present work lists 696 taxa, including 134 bryophytes, 13 pteridophytes and 549 spermatophytes.

Two species of mosses, *Sematophyllum substrumulosum* (Hampe) E. Britton and *Tortula lanceolata* R. H. Zander are recorded for the first time from Porto Santo, corresponding to material collected in 2018.

Additionally, 12 species of spermatophytes, all cultivated, are referred for the first time to the island. Two species of pteridophytes, *Ophioglossum lusitanicum* L. and *Hymenophyllum wilsonii* Hook are proposed to be considered extinct.

Keywords: agrodiversity, bryophytes, crop wild relatives, pteridophytes, spermatophytes.

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RESUMO: O presente trabalho atualiza a publicação “A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos” (BORGES *et al.*, 2008). Após essa publicação e até ao verão de 2019, foram citados 131 novos táxones, nomeadamente 30 briófitos, um pteridófito e 100 espermatófitos.

Tendo por base a compilação de informação escrita e não publicada sobre a diversidade de plantas terrestres citadas para o Porto Santo, neste trabalho são referidos 696 táxones, incluindo 134 briófitos, 13 pteridófitos e 549 espermatófitos.

Dois espécies de musgos, *Sematophyllum substrumulosum* (Hampe) E. Britton e *Tortula lanceolata* R. H. Zander são referidas pela primeira vez para o Porto Santo, correspondendo a material recolhido em 2018.

Adicionalmente, 12 espécies de espermatófitos, todos cultivados, são referidos pela primeira vez para a ilha. Duas espécies de pteridófitos, *Ophioglossum lusitanicum* L. e *Hymenophyllum wilsonii* Hook são propostos como extintos.

Palavras-chave: agrobiodiversidade, briófitos, parentes silvestres de cultivares, pteridófitos, espermatófitos.

INTRODUCTION

Porto Santo is an eastern Atlantic Ocean island, about 40 km to the NE of Madeira; it developed as a submarine shield volcano, dating from 18-14.5 Ma, and presents an emerged area of 42 km² (MATA *et al.*, 2013).

The island of Porto Santo, 12 km long in the NE-SW direction and 6 km wide, in the N-S direction, has a flat and smooth morphology, with Pico do Facho standing out with a maximum altitude of 517 m. This island is surrounded by six islets – Ilhéu de Baixo, Ilhéu de Cima, Ilhéu de Ferro, Ilhéu da Fonte da Areia, Ilhéu das Cenouras, Ilhéu de Fora, and two rocky outcrops – Baixa do Meio and Baixa dos Barbeiros.

During its early geological phase, the territory was colonized by pioneer species, such as lichens and nonvascular plants (*i.e.*, bryophytes). Together with other living beings, these species contributed to the formation of soil layers able to progressively sustain more complex communities, eventually reaching the forest ecosystem structure.

Over thousands of years, natural phenomena of expansion and competition probably occurred, dictating the evolution of a biodiversity in absence of human influence, until the beginning of settlement by the Portuguese, in the first quarter of the 15th century.

The first reference to the plants of Porto Santo is by Luiz de Cadamosto, who visited Porto Santo in 1455 and mentions the dragon tree, *Dracaena draco* L. and its uses by the local population (CADAMOSTO, 1867).

Since then, several works have been published, the information of which was included in “A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos” by BORGES *et al.* (2008). These authors compiled the published information on the biodiversity of

Porto Santo, as well as of the islands of Madeira, Desertas and Selvagens. They consider taxa down to the subspecies rank recognized in primary publications until 2008, and thus list for Porto Santo 104 bryophytes, comprising four hornworts, 60 liverworts and 40 mosses (SÉRGIO *et al.*, 2008; in BORGES *et al.*, 2008), 13 pteridophytes and 450 spermatophytes (JARDIM & SEQUEIRA, 2008; in BORGES *et al.*, 2008).

More than 18 years later, new papers, reports and other works have been published, such as the application of the Island of Porto Santo to the UNESCO Biosphere Reserve (2019), which addresses aspects of the plant cover of the island and refers new records and taxa for science.

Among the works published after 2008 about vascular flora, the following are worth highlighting: CARVALHO *et al.* (2010), CARVALHO *et al.* (2013), FERNANDES & CARVALHO (2014), JARDIM & SEQUEIRA (2010), JARDIM & SEQUEIRA (2011a), JARDIM & SEQUEIRA (2011b), JARDIM & SEQUEIRA (2011c), JARDIM & SEQUEIRA (2014), and JONES *et al.* (2014). Regarding bryophytes, the following works are worth mentioning: LOBO (2008), SIM-SIM *et al.* (2010), and FONTINHA *et al.* (2012).

MATERIAL AND METHODS

The published and reported information about bryophytes, pteridophytes and spermatophytes in Porto Santo was compiled, and unpublished information was collected.

In addition to the bibliography, the database of Information and Documentation System (IDS) of ISOplexis Genebank, University of Madeira (ISOplexis GRIN-Global) was consulted, concerning agrobiodiversity (cultivated species) and crop wild relatives.

Complementary inventories were carried out, in order to confirm the presence of taxa and update the existing information.

Intraspecific taxonomic categories referring to subspecies and variety were considered; hybrids were not taken into account.

In general, taxonomy and nomenclature for nonvascular plants follow SÉRGIO *et al.* (2008), whereas for vascular plants they follow JARDIM & SEQUEIRA (2008).

RESULTS

According to the accomplished compilation, 696 taxa of terrestrial plants are recorded from Porto Santo, 134 of which correspond to bryophytes (four hornworts, 68 liverworts and 62 mosses), 13 are pteridophytes and 549 are spermatophytes.

The list of BORGES *et al.* (2008) was used as a base-line information source, to which 131 new taxa, comprising 30 bryophytes (Table 1), one pteridophyte (*Asplenium onopteris* L.) and 100 spermatophytes (Table 2) reported in the subsequent 12 years were added.

DISCUSSION

Concerning bryophytes, nine species of liverworts and 21 species of mosses are mentioned, including two Madeira endemics (*Frullania sergiae* Sim-Sim, S. Fontinha, R. Mues & U. Lionand and *Riccia atlantica* Sérgio & Perold). Two species of mosses, *Sematophyllum substrumulosum* (Hampe) E. Britton and *Tortula lanceolata* R. H. Zander are recorded for the first time from Porto Santo, corresponding to material collected in 2018.

Among pteridophytes, *Asplenium onopteris* L. is recorded for the first time from Porto Santo and considered a native species. *Ophioglossum lusitanicum* L., cited by Costa for Porto Santo between 1938-1941, as stated by PICKERING (1962), has never been observed again in nature, and we propose to consider it extinct. The same is proposed for *Hymenophyllum wilsonii* Hook, a species that was considered as doubtful by JARDIM & SEQUEIRA (2008), and that has not been observed in nature over the last 12 years.

Regarding spermatophytes, 100 taxa are mentioned; eight of them are Porto Santo endemics (*Echium portosanctense* J. A. Carvalho, Pontes, Batista-Marques & R. Jardim; *Fumaria muralis* Sond. ex W. D. J. Koch subsp. *muralis* var. *laeta*; *Helichrysum melaleucum* Rchb. subsp. *roseum* (Lowe) R. Jardim & M. Seq.; *Lotus glaucus* Aiton

subsp. *floridus* (Lowe) R. Jardim & M. Seq.; *Monizia edulis* Lowe subsp. *santosii* F. Fernandes & J. A. Carvalho; *Sideritis candicans* Aiton var. *multiflora*; *Sonchus parathalassius* J. G. Costa ex R. Jardim & M. Seq.; *Pericallis menezesii* R. Jardim, K. E. Jones, M. Carine & M. Sequeira), three species are Madeira endemics [*Carduus squarrosus* (DC.) Lowe; *Rubia fruticosa* Aiton subsp. *fruticosa* and *Sibthorpia peregrina* L.] and one is a Macaronesia endemic (*Laurus novocanariensis* Rivas Mart. *et al.*).

BORGES *et al.* (2008) refer *Siderites candicans* for Porto Santo, but not the *multiflora* variety that is endemic to that island. The same happens with *Fumaria muralis* Sond. ex W. D. J. Koch, and its subspecies *muralis* variety *laeta*, endemic to Porto Santo; *Helichrysum melaleucum*, and its subspecies *roseum* described by JARDIM & SEQUEIRA (2011c); *Lotus glaucus*, and its subspecies *floridus* described by JARDIM & SEQUEIRA (2011a); and *Monizia edulis*, and its subspecies *santosii*, described by FERNANDES & CARVALHO (2014). The laurel tree, *Laurus novocanariensis*, occurred naturally in Porto Santo (SOUSA, 2005), but it became extinct and was afterwards reintroduced.

As for agrodiversity, 32 taxa are reported, corresponding to locally grown crops and its varieties such as: garlic (*Allium sativum* L.), onion (*Allium cepa* L.), strawberry tree (*Arbutus unedo* L.), oats (*Avena sativa* L.), chard [*Beta vulgaris* subsp. *cicla* (L.) W. D. J. Koch], borage (*Borago officinalis* L.), pepper [*Capsicum baccatum* L. var. *pendulum* (Willd.) Eshbaugh], locust bean (*Ceratonia siliqua* L.), watermelon [*Citrullus lanatus* (Thunb.) Matsum. & Nakai], melon (*Cucumis melo* L.), cucumber (*Cucumis sativus* L.), pumpkin (*Curcubita maxima* Duchesne, *C. moschata* Duchesne ex Poir., *C. pepo* L.), carrot (*Daucus carota* L.), barley (*Hordeum vulgare* L.), pitaia [*Hylocereus undatus* (Haworth) Britton & Rose], sweet potato [*Ipomoea batatas* (L.) Lam.], grass pea (*Lathyrus sativus* L.), apple tree [*Malus domestica* (Borkh.) Borkh.], mulberry (*Morus nigra* L.), olive tree (*Olea europaea* L.), Lima bean (*Phaseolus lunatus* L.), common beans (*Phaseolus vulgaris* L.), date palm (*Phoenix dactylifera* L.), peas (*Pisum sativum* L.), peach tree [*Prunus persica* (L.) Batsch], pear tree (*Pyrus communis* L.), potato (*Solanum tuberosum* L.), wheat (*Triticum aestivum* L.), vine (*Vitis vinifera* L.) and corn (*Zea mays* L.).

To these species, 14 crop wild relatives (CWR) are added, of which four endemic taxa of Porto Santo: *Helichrysum melaleucum* subsp. *roseum*, *Lotus glaucus* subsp. *floridus*, *Monizia edulis* subsp. *santosii* and *Sonchus parathalassius*.

Table 1 – Update of the list of bryophytes reported by SÉRGIO *et al.* (2008).

	Taxon	Reference
L, N	<i>Asterella africana</i> (Mont.) A. Evans.	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Brachythecium rutabulum</i> var. <i>atlanticum</i> Hedenäs	LOBO (2008)
M, N	<i>Bryum caespiticium</i> Hedw.	LOBO (2008)
M, N	<i>Bryum capillare</i> Hedw.	LOBO (2008)
M, N	<i>Bryum radiculosum</i> Brid.	LOBO (2008)
M, N	<i>Campylopus brevipilus</i> Bruch & Schimp	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Ceratodon purpureus</i> (Hedw.) Brid.	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Entosthodon obtusus</i> (Hedw.) Lindb.	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Epipterygium tozeri</i> (Grev.) Lindb.	LOBO (2008)
L, N	<i>Fossombronia caespitifformis</i> De Not. ex Rabenh.	LOBO (2008)
L, N	<i>Fossombronia husnotii</i> Corb.	LOBO (2008)
L, MAD	<i>Frullania sergiae</i> Sim-Sim, S. Fontinha, R. Mues & U. Lion	LOBO (2008)
M, N	<i>Grimmia trichophylla</i> Grev.	LOBO (2008)
M, N	<i>Hymenostylium recurvirostrum</i> (Hedw.) Dixon	LOBO (2008)
M, N	<i>Hypnum cupressiforme</i> var. <i>resupinatum</i> (Hedw.) Dixon	LOBO (2008)
M, N	<i>Kindbergia praelonga</i> (Hedw.) Ochyra	LOBO (2008)
M, N	<i>Leptopascum leptophyllum</i> (Müll. Hal.) J. Guerra & M. J. Cano	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Leucodon treleasei</i> (Cardot) Paris	LOBO (2008)
L, N	<i>Lophocolea bidentata</i> (L.) Dumort.	LOBO (2008)
L, N	<i>Lophocolea minor</i> Nees	LOBO (2008)
M, N	<i>Microbryum starckeanum</i> (Hedw.) R. H. Zander	LOBO (2008)
M, N	<i>Oedipodiella australis</i> (Wager & Dixon) Dixon	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Pleuridium subulatum</i> (Hedw.) Rabenh.	LOBO (2008)
L, MAD	<i>Riccia atlantica</i> Sérgio & Perold	SIM-SIM <i>et al.</i> (2010)
L, N	<i>Riccia crozalsii</i> Levier	LOBO (2008)
M, N	<i>Sematophyllum substrumulosum</i> (Hampe) E. Britton	NR
L, N	<i>Targionia lorbeeriana</i> Müll. Frid.	SIM-SIM <i>et al.</i> (2010)
M, N	<i>Tortula lanceolata</i> R. H. Zander	NR
M, N	<i>Trichostomum brachydontium</i> Bruch	LOBO (2008)
M, N	<i>Zygodon rupestris</i> Schimp. ex Lorentz	LOBO (2008)

L – Liverwort; M – Moss; MAD – Madeira Endemic; N – Native; NR – New Record.

Table 2 – Update of the list of pteridophytes and spermatophytes reported by JARDIM & SEQUEIRA (2008).

	Taxon	Reference
I	<i>Agave americana</i> L.	CARVALHO <i>et al.</i> (2013)
I	<i>Achyranthes sicula</i> (L.) All.	JARDIM & SEQUEIRA (2014)
I	<i>Agapanthus praecox</i> Willd. subsp. <i>Orientalis</i> (F. M. Leight) F. M. Leight	JARDIM & SEQUEIRA (2014)
I	<i>Allium sativum</i> L.	ISOPlaxis GRIN-Global
I	<i>Allium cepa</i> L.	NR
I	<i>Aloe arborescens</i> Mill.	ABREU <i>et al.</i> (2008)
I	<i>Amaryllis belladonna</i> L.	JARDIM & SEQUEIRA (2011c)
NP	<i>Anchusa azurea</i> Mill.	JARDIM & SEQUEIRA (2014)
I	<i>Arbutus unedo</i> L.	JARDIM & SEQUEIRA (2014)
C	<i>Asparagus aethiopicus</i> L.	JARDIM & SEQUEIRA (2014)
P, N	<i>Asplenium onopteris</i> L.	NR
I	<i>Atriplex semibaccata</i> R. Br.	JARDIM & SEQUEIRA (2014)
I	<i>Avena sativa</i> L.	NR
I	<i>Beta vulgaris</i> subsp. <i>cicla</i> (L.) W. D. J. Koch	NR
I	<i>Borago officinalis</i> L.	NR
I	<i>Bromus catharticus</i> Vahl	JARDIM & SEQUEIRA (2011c)
I	<i>Capsicum baccatum</i> L. var. <i>pendulum</i> (Willd.) Eshbaugh	NR
MAD	<i>Carduus squarrosus</i> (DC.) Lowe	JARDIM & SEQUEIRA (2014)
I	<i>Ceratonia siliqua</i> L.	SØDERGAARD, P. (1995)
I	<i>Chamaesyce serpens</i> (Kunth) Small	JARDIM & SEQUEIRA (2014)
I	<i>Chasmanthe aethiopica</i> (L.) N. E. Br.	JARDIM & SEQUEIRA (2014)
I	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	ISOPlaxis GRIN-Global
I	<i>Conyza sumatrensis</i> (Retz.) E. Walker	JARDIM & SEQUEIRA (2014)
I	<i>Cotyledon orbiculata</i> L.	JARDIM & SEQUEIRA (2011c)
I	<i>Cucumis melo</i> L.	NR
I	<i>Cucumis sativus</i> L.	NR
I	<i>Cupressus macrocarpa</i> Hartw.	JARDIM & SEQUEIRA (2011c)
I	<i>Curcubita maxima</i> Duchesne	ISOPlaxis GRIN-Global
I	<i>Curcubita moschata</i> Duchesne ex Poir.	ISOPlaxis GRIN-Global
I	<i>Curcubita pepo</i> L.	ISOPlaxis GRIN-Global
I	<i>Cydonia oblonga</i> Mill.	ISOPlaxis GRIN-Global
C, I	<i>Cyperus eragrostis</i> Lam.	ABREU <i>et al.</i> (2008)
C, I	<i>Cyperus involucratus</i> Rottb.	JARDIM & SEQUEIRA (2014)
I	<i>Cytisus striatus</i> (Hill) Rothm.	JARDIM & SEQUEIRA (2014)
I	<i>Daucus carota</i> L.	NR
I	<i>Digitaria ciliaris</i> (Retz.) Koeler	JARDIM & SEQUEIRA (2014)
I	<i>Digitaria sanguinalis</i> (L.) Scop.	JARDIM & SEQUEIRA (2014)
I	<i>Diplotaxis tenuifolia</i> (L.) DC.	JARDIM & SEQUEIRA (2014)
IP	<i>Dittrichia viscosa</i> (L.) Greuter	JARDIM & SEQUEIRA (2014)
I	<i>Dodonaea viscosa</i> (L.) Jacq.	JARDIM & SEQUEIRA (2014)
E	<i>Echium portosanctense</i> J. A. Carvalho, Pontes, Batista-Marques & R. Jardim	CARVALHO <i>et al.</i> (2013)

Table 2 (continued).

	Taxon	Reference
I	<i>Eucalyptus robusta</i> Sm.	JARDIM & SEQUEIRA (2014)
I	<i>Euphorbia ingens</i> E. Mey.	ABREU <i>et al.</i> (2008)
E	<i>Fumaria muralis</i> Sond. ex W. D. J. Koch subsp. <i>muralis</i> var. <i>laeta</i>	JARDIM <i>et al.</i> (1998)
I	<i>Galinsoga parviflora</i> Cav.	JARDIM & SEQUEIRA (2014)
I	<i>Galinsoga quadriradiata</i> Ruiz & Pav.	JARDIM & SEQUEIRA (2014)
N	<i>Gastroidium ventricosum</i> (Gouan) Schinz & Thell	JARDIM <i>et al.</i> (2003)
C, E	<i>Helichrysum melaleucum</i> Rchb. subsp. <i>roseum</i> (Lowe) R. Jardim & M. Seq.	JARDIM & SEQUEIRA (2011c)
I	<i>Hibiscus rosa-sinensis</i> L.	ABREU <i>et al.</i> (2008)
I	<i>Hordeum vulgare</i> L.	ISOPlexis GRIN-Global
I	<i>Hylocereus undatus</i> (Haworth) Britton & Rose	ISOPlexis GRIN-Global
I	<i>Ipomoea batatas</i> (L.) Lam.	ISOPlexis GRIN-Global
C, I	<i>Ipomoea pes-caprae</i> (L.) R. Br.	JARDIM & SEQUEIRA (2014)
I	<i>Lampranthus multiradiatus</i> (Jacq.) N. E. Br	ABREU <i>et al.</i> (2008)
I	<i>Lantana camara</i> L.	JARDIM & SEQUEIRA (2014)
I	<i>Lathyrus sativus</i> L.	ISOPlexis GRIN-Global
MAC	<i>Laurus novocanariensis</i> † Rivas Mart. Lousa, Fern. Prieto, E. Dias, J. C. Costa & C. Aguiar	NR
I	<i>Lepidium virginicum</i> L.	JARDIM & SEQUEIRA (2014)
C, E	<i>Lotus glaucus</i> Aiton subsp. <i>floridus</i> (Lowe) R. Jardim & M. Seq.	JARDIM & SEQUEIRA (2011a)
I	<i>Malephora crocea</i> (Jacq.) Schwantes var. <i>crocea</i>	JARDIM & SEQUEIRA (2014)
I	<i>Malus domestica</i> (Borkh.) Borkh.	ISOPlexis GRIN-Global
C, IP	<i>Medicago lupulina</i> L.	JARDIM & SEQUEIRA (2014)
C, I	<i>Medicago sativa</i> L.	JARDIM & SEQUEIRA (2014)
C	<i>Mercurialis annua</i> L.	CARVALHO <i>et al.</i> (2013)
I	<i>Metrosideros excelsa</i> Sol. ex Gaertn.	JARDIM & SEQUEIRA (2014)
C, E	<i>Monizia edulis</i> Lowe subsp. <i>santosii</i> F. Fernandes & J. A. Carvalho	FERNANDES & CARVALHO (2014)
I	<i>Morus nigra</i> L.	ABREU <i>et al.</i> (2008)
I	<i>Myoporum laetum</i> G. Forst.	CARVALHO <i>et al.</i> (2013)
I	<i>Morella faya</i> Aiton	NR
I	<i>Nerium oleander</i> L.	ABREU <i>et al.</i> (2008)
I	<i>Nicandra physalodes</i> (L.) Gaertn.	JARDIM & SEQUEIRA (2011c)
I	<i>Olea europaea</i> L.	BRITO (2009)
I	<i>Opuntia subulata</i> (Muehlenpf.) Engelm	JARDIM & SEQUEIRA (2014)
N	<i>Orobanche ramosa</i> L. subsp. <i>nana</i> (Reut.) Cout.	CARVALHO <i>et al.</i> (2013)
I	<i>Oxalis debilis</i> Kunth	JARDIM & SEQUEIRA (2014)
I	<i>Paspalum dilatatum</i> Poir.	JARDIM & SEQUEIRA (2011c)
I	<i>Passiflora edulis</i> Sims	ISOPlexis GRIN-Global
I	<i>Pennisetum purpureum</i> Schum.	JARDIM & SEQUEIRA (2014)
E	<i>Pericallis menezesii</i> R. Jardim, K. E. Jones, M. Carine & M. Sequeira	JONES <i>et al.</i> (2014)
I	<i>Phaseolus lunatus</i> L.	ISOPlexis GRIN-Global

Table 2 (continued).

	Taxon	Reference
I	<i>Phaseolus vulgaris</i> L.	NR
I	<i>Phoenix dactylifera</i> L.	ABREU <i>et al.</i> (2008)
I	<i>Pisum sativum</i> L.	ISOPlaxis GRIN-Global
IP	<i>Poa trivialis</i> L.	JARDIM & SEQUEIRA (2014)
I	<i>Prunus persica</i> (L.) Batsch	ISOPlaxis GRIN-Global
I	<i>Pyrus communis</i> L.	ISOPlaxis GRIN-Global
I	<i>Quercus ilex</i> L.	ABREU <i>et al.</i> (2008)
MAD	<i>Rubia fruticosa</i> Aiton subsp. <i>fruticosa</i>	JARDIM & SEQUEIRA (2014)
N	<i>Ruppia maritima</i> L.	JARDIM & SEQUEIRA (2011c)
C, I	<i>Senecio angulatus</i> L.f.	JARDIM & SEQUEIRA (2011c)
I	<i>Setaria parviflora</i> (Poir.) Kerguelen	JARDIM & SEQUEIRA (2014)
MAD	<i>Sibthorpia peregrina</i> L.	JARDIM & SEQUEIRA (2011c)
E	<i>Sideritis candicans</i> Aiton var. <i>multiflora</i>	FRANCISCO & JARDIM (2000)
C, I	<i>Solanum mauritianum</i> Scop.	JARDIM & SEQUEIRA (2014)
I	<i>Solanum tuberosum</i> L.	NR
C, E	<i>Sonchus parathalassius</i> J. G. Costa ex R. Jardim & M. Seq.	JARDIM & SEQUEIRA (2011b)
C, IP	<i>Taraxacum officinale</i> Weber	JARDIM & SEQUEIRA (2014)
I	<i>Triticum aestivum</i> L.	ISOPlaxis GRIN-Global
I	<i>Vicia faba</i> L.	ISOPlaxis GRIN-Global
I	<i>Vitis vinifera</i> L.	ABREU <i>et al.</i> (2008)
I	<i>Zea mays</i> L.	ISOPlaxis GRIN-Global

C – Crop wild relative; E – Porto Santo Endemic; I – Introduced; IP – Possible Introduced; MAC – Macaronesia Endemic; MAD – Madeira Endemic; N – Native; NP – Possible Native; NR – New Record; P – Pteridophyte; † – Extinct.

This paper is important for decision-makers and management and nature conservation officials, especially when Porto Santo is being proposed as a UNESCO Biosphere Reserve.

Note added at proof-reading: Porto Santo was designated as UNESCO Biosphere Reserve in October 2020.

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REFERENCES

- BORGES, P. A. V., C. ABREU, A. M. F. AGUIAR, P. CARVALHO, R. JARDIM, I. MELO, P. OLIVEIRA, C. SÉRGIO, A. R. M. SERRANO & P. VIEIRA (eds.):
2008. *A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos*. Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal and Angra do Heroísmo.
- CADAMOSTO, L.:
1867. Navegações de Luiz de Cadamosto: Da Ilha de Porto Santo aonde abordei. *In: Collecção de Notícias para a História e Geografia das Nações Ultramarinas que vivem nos Domínios Portuguezes*, Tomo 2, pp. 7, Segunda Edição, Academia Real das Ciências, Typographia da Academia, Lisboa.
- CARVALHO, J. A., F. FERNANDES & A. SANTOS-GUERRA:
2013. The vascular flora of Porto Santo: A catalogue of its islets. *Boletim do Museu Municipal do Funchal*, **63** (335): 5-20.
- CARVALHO, J. A., T. PONTES, M. I. BATISTA-MARQUES & R. JARDIM:
2010. A new species of *Echium* (Boraginaceae) from the island of Porto Santo (Madeira Archipelago). *Anales del Jardín Botánico de Madrid*, **67** (2): 87-96.

FERNANDES, F & J. A. CARVALHO:

2014. An historical review and new taxa in the Madeiran endemic genus *Monizia* (Apiaceae, Apioideae). *Journal of Plant Taxonomy and Geography*, **69**: 1, 13-37.
DOI: 10.1080/00837792.2014.909648.

FONTINHA, S., M. SIM-SIM, C. LOBO & L. LUÍS:

2012. *Os briófitos das zonas costeiras da Madeira – Guia de algumas espécies*. FFCUL, CEBV-FCUL, ISOPlexis-UMa, SPNM. Portugal.

ISOPlexis GRIN-Global [Internet]. ISOPlexis – Centro em Agricultura Sustentável e Tecnologia Alimentar:

2020. Available from: <http://isoplexis.uma.pt/gringlobal/>

JARDIM, R. & M. SEQUEIRA:

2008. The vascular plants (Pteridophyta and Spermatophyta) of the Madeira and Selvagens archipelagos, Pp. 123-156. In: Borges, P. A. V., Abreu, C., Aguiar, A. M. F., Carvalho, P., Jardim, R., Melo, I., Oliveira, P., Sérgio, C., Serrano, A. R. M. & Vieira, P. (eds.). *A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos*. Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal and Angra do Heroísmo.

2010. On *Plantago costae* Menezes a forgotten species of the Madeira Flora. *Silva Lusitana*, **18** (2): 239-246.

2011a. A new combination in *Lotus glaucus* complex (Fabaceae, Loteae) from Porto Santo (Madeira Archipelago). *Silva Lusitana*, **19** (1): 111-125.

2011b. *Sonchus parathalassius* J. G. Costa ex R. Jardim & M. Seq., a new species from Porto Santo Island (Madeira Archipelago). *Silva Lusitana*, **19** (2): 233-245.

2011c. Subsídios para o conhecimento da Flora do Porto Santo. *Silva Lusitana*, **19** (2): 240-245.

2014. Contributions to the knowledge of the vascular flora of Porto Santo Island (Madeira archipelago, Portugal). *Silva Lusitana*, n.º Especial: 237-256.

JONES, K., M. SEQUEIRA, M. CARINE & R. JARDIM:

2014. A new species of *Pericallis* (Senecioneae, Asteraceae) endemic to Porto Santo (Madeira, Portugal). *Silva Lusitana*, 237-256.

LOBO, C.:

2008. Contribution to the study of the bryoflora of Pico Branco – Porto Santo Island. *Boletim do Museu Municipal do Funchal*, **58** (318): 5-18.

MATA, J., P. FONSECA, S. PRADA, D. RODRIGUES, S. MARTINS, R. RAMALHO, J. MADEIRA, M. CACHÃO, C. M. da SILVA & M. J. MATIAS:

2013. O Arquipélago da Madeira. Pp. 691-746. In: R. Dias, A. Araújo, P. Terrinha & J. C. Kullberg (eds.) – *Geologia de Portugal*, Vol. II, Escolar Editora, Lisboa.

PICKERING, C. H. C.:

1962. A Check-List of the Flowering Plants and Ferns of the Islands of Porto Santo (Archipelago of Madeira). *Boletim do Museu Municipal do Funchal*, **61** (53): 33-62.

SÉRGIO, C., S. FONTINHA, M. SIM-SIM & R. FIGUEIRA:

2008. The bryophytes (Bryophyta) of the Madeira and Selvagens archipelagos. Pp. 123-156. In: Borges, P. A. V., Abreu, C., Aguiar, A. M. F., Carvalho, P., Jardim, R., Melo, I., Oliveira, P., Sérgio, C., Serrano, A. R. M. & Vieira, P. (eds.). *A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelago*. Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal and Angra do Heroísmo.

SIM-SIM, M., S. FONTINHA, L. LUÍS, C. LOBO & M. STECH:

2010. The Selvagens Islands bryoflora and its relation with islands of the Madeira and Canary Islands Archipelagos. *Nova Hedwigia*, **138**: 187-199.

SOUSA, L. M. G.:

2005. *Porto Santo. Formas de sobrevivência*.