

**Notas do Herbário Florestal
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†1. *Novarum Flora Lusitana Commentarii*
In memoriam A.R. Pinto da Silva
(1912 - 1992)

***Sonchus parathalassius* J.G. Costa ex R.
Jardim & M. Seq., a new species from
Porto Santo Island (Madeira
Archipelago)**

The woody pachycaulous species of *Sonchus* L. (Asteraceae) are included in subgenus *Dendrosonchus* Sch. Bip. ex Boulos and are endemic to the macaronesian archipelagos of Canaries (14 species), Madeira (3 species) and Cape Verde (1 species), except for one species common to Canary Islands and western coast of Morocco (BOULOS, 1972, 1974; LEE *et al.*, 2005). In Madeira Archipelago this subgenus was so far thought to be represented by 4 endemic taxa, *Sonchus fruticosus* L. f., *S. pinnatus* Aiton, *S. ustulatus* Lowe subsp. *ustulatus* and *S. ustulatus* subsp. *maderensis* Aldridge (PRESS, 1994; JARDIM & MENEZES DE SEQUEIRA, 2008).

The Madeiran botanist José Gonçalves da Costa (1899-1967) started to publish in 1946 a commented list of plants of Porto Santo Island (COSTA 1946, 1948). J. G. Costa added 54 *taxa*, including the description of new species, subspecies and varieties, based on the observations and collecting during a 3 years stay on Porto Santo, between October 1938 and August 1941. On the introduction of the

first publication COSTA (1946) mentioned a new species of perennial *Sonchus*, as "*Sonchus parathalassia* sp. n." from Ilhéu de Baixo, the largest Porto Santo islet, also named Ilhéu da Cal, but never published a diagnosis or description of this new species.

COSTA (1946, 1948) listed species from 20 families (Ranunculaceae to Leguminosae) and described new taxa according to the plant list order, *Fumaria muralis* Sond. ex W.D.J. Koch var. *lacostrum* J.G. Costa in 1946 and *Vicia sativa* L. subsp. *devia* J.G. Costa and *Vicia atlantica* J.G. Costa (= *V. costae* A. Hansen) in 1948. The same year J.G. Costa left Madeira to Mozambique, which is probably the reason why the description of the perennial *Sonchus* of Porto Santo was never published.

J. G. Costa was the first author to refer a perennial *Sonchus* for Porto Santo Island. In fact, LOWE (1868) and MENEZES (1914) only cited for Porto Santo *S. oleraceus* L.

PICKERING (1962) published a checklist of the flowering plants and ferns of the Island of Porto Santo and referred that the name "*Sonchus parathalassa*" without description in Costa's list should be disregarded. Curiously, C.H. Pickering referred to the finding of an endemic *Sonchus* sp., from the Ilhéu das Cenouras, another Porto Santo islet, that "await determination". However, this supposed new species of *Sonchus* was, also, never published.

HANSEN (1969) cited for Porto Santo only *Sonchus fruticosus* (as *S. squarrosus* DC.), whereas BOULOS (1974) referred solely to *Sonchus ustulatus*, based on the specimens collected by C.H. Pickering in 1961, on Ilhéu das Cenouras, deposited at Kew. ERIKSSON *et al.* (1974) cited *Sonchus ustulatus* and *S. fruticosus* for

Porto Santo Island. Latter ALDRIDGE (1976) included Porto Santo on the distribution of *Sonchus ustulatus* subsp. *maderensis*.

HANSEN & SUNDING (1979, 1985, 1993) referred *S. fruticosus* and *S. ustulatus* subsp. *maderensis* for Porto Santo synonymizing "*Sonchus parathalassicus* Costa" as *Sonchus ustulatus*. VIEIRA (1992) cited the same taxa for Porto Santo but synonymized "*Sonchus parathalassicus* Costa" under *S. ustulatus* subsp. *ustulatus* (that he did not mention for Porto Santo). PRESS (1994) also assigned the same two taxa to Porto Santo, not referring the name proposed by J. G. Costa.

FONTINHA & JARDIM (1999) confirmed the observations by PICKERING (1962) about the occurrence of a perennial branched *Sonchus* on Ilhéu das Cenouras, different from those cited for Madeira Archipelago. JARDIM & MENEZES DE SEQUEIRA (2008) considered questionable the existence of *S. fruticosus* in Porto Santo.

Field observations in Porto Santo Island and islets, Madeira and Desertas and the examination of collected material as well as herbarium specimens (MADJ, MADM, MADS, K and BM) allowed the recognition of a new species of *Sonchus* subgen. *Dendrosonchus* endemic to Porto Santo distinct from *S. ustulatus*, *S. fruticosus* and *S. pinnatus*. The putative *Sonchus ustulatus* subsp. *maderensis* and *S. fruticosus* from Porto Santo correspond to this new species. The specimens collected by J.G. Costa on Ilhéu de Baixo and by C. Pickering on Ilhéu das Cenouras belong to the same new taxon. Since J.G. Costa was the first author to observe this new *Dendrosonchus* species and due to the fact that he named it, although without a description, the validation of the name

and the description of this new species from Porto Santo is proposed here as:

Sonchus parathalassius J.G. Costa ex R. Jardim & M. Seq., sp. nov.

≡ *Sonchus parathalassia* J.G. Costa in Bol. Mus. Munic. Funchal, 2: 66 (1946), nom. nud.

= *Sonchus ustulatus sensu auct. fl. Portus Sancti*.

Nanophanerophyto ad usque 90 cm alto a Soncho ustulato affinis sed differt caule lignoso robusto superne valde ramoso foliis ad apicem caule rosulato; inflorescentia erecta ad usque 60 cm alta ultima tertiam irregulater ramificans, capitulis plusquam sexaginta; foliis pennatipartitis anguste triangularis longe acuminatis lobis lateralibus 5-9, lobo terminali deltoidis longe acuminatis vel acuminati-caudatis 30-82 mm longo.

Description: Suffruticose perennial to perennial shrubby plant (Figure 1A), up to 90cm. STEM thick, branched, woody, up to 4 cm diameter. LEAVES (Figure 1B) 28-35 x 8-14cm, fleshy, glabrous, sessile with a persistent sheathing base, disposed in rosettes at the tips of the stems, elliptic-lanceolate to oblong-lanceolate, pinnatipartite, attenuate to the base, midrib 5-8 mm attenuate to the apex; lobes 5-9 pairs, ± opposite to alternate, 3.5-5.1 x 2.1-3.5cm, narrowly triangular, long acuminate, entire to scarcely irregularly dentate; terminal lobe triangular, acuminate to acuminate-caudate, 3-8 cm, larger than the upper pair of lateral lobes; interlobular space round; caulinar leaves smaller and less divided. INFLORESCENCE (Figure 1C) a terminal, upright, branched corymbose cyme, main axis up to 60cm, branching usually at the terminal 1/3, 2-3 branched,

last order branches with up to 2-4 pedunculate capitula; peduncles green becoming purplish and broader towards the obconic apex; inflorescence bracts triangular, long acuminate, small, 1.6-5.2 mm; CAPITULA (Figure 1D) numerous, 60-90; ovoid-conical, up to 18 x 15 mm; involucre bracts purplish to yellow-greenish with yellow-greenish apex; outer bracts ca. 9, 1.1-2.7 x 1.5-2.0 mm, small, triangular, base thick, adpressed, purplish with yellow-greenish margins, slightly scarious, apex ciliate; intermediate bracts ca. 6, 5.3-7.6 x 1.3-1.9 mm, oblong, apex yellow-greenish, ciliate, slightly retroflexed; inner bracts ca. 20, 10.2-12.7 x 1.1-1.8 mm, linear-oblong, purplish-yellow to yellow, apex retroflexed and ciliate. FLORETS 12.6-15.3 mm; ligules 7.0-9.2 x 1.5-2.3 mm, narrow-oblong, yellow; corolla-tube 4.4-5.0 mm, white, pubescent. CYPSELA 2.8-2.9 x 0.8-1 mm, oblong-elliptical, compressed brown. PAPPUS white; bristles 7.7-8.5 mm, scabrid; flexuous hairs 5.0-5.3 mm, less scabrid, fasciculate.

Types: PORTUGAL, MADEIRA, Porto Santo: Ilhéu da Cal, Costa, MADM (holotype, Figure 2); Porto Santo: Ilhéu de Baixo, VI-1939, Costa, MADS 815 (isotype);

Other specimens: PORTUGAL, MADEIRA, Porto Santo: Rocha das Cenouras, on steep volcanic rock facing south, 100 ft, 20-IV-1961, C. Pickering 324, K; Ilhéu das Cenouras, 9-V-1979, R. Santos, MADJ 5987; Ilhéu da Cal, vertente E no topo N, 14-IV-2004, R. Jardim, MADJ 11014; Miradouro no Pico Castelo. 6-XII-2008, M. Sequeira, 5701, UMad; Pico do Concelho, vertente N, alt.270m, 18-IV-2011, R. Jardim, 1091, UMad; Pico Castelo, vertente NW, alt. 240m, 10-VII-

2011, R. Jardim 1215, MA 844022 (UMad); Pico Branco, Lombo dos Amarelos, vertente NE, alt. 150m, 13-VII-2011, R. Jardim 1241, UMad.

Etymology: The specific epithet "*parathalassius*" derives from the Greek *Para* near and *Thalassa* sea, presumably used by J.G. Costa as a reference to the habitat in sea cliffs. The name *Sonchus parathalassius* is given by J.G. Costa in the specimen here elected as holotype, although the name invalidly published (COSTA, 1946) as "*S. parathalassia*", does not agree with the gender of the genus.

Distribution: *Sonchus parathalassius* is endemic from Porto Santo, occurring on the main island, in Pico Castelo, Pico Branco, Pico Concelho and also on the surrounding islets, namely in Ilhéu da Cal (or Ilhéu de Baixo), Ilhéu das Cenouras, Ilhéu de Cima (or Ilhéu do Farol), Ilhéu de Fora and Ilhéu da Fonte da Areia.

Habitat: Chasmo-comophyte in rocky slopes, usually, on north exposed sea cliffs, in the islets up to 100m (Figure 3), inland in Porto Santo Island, up to 320m.

Phenology: Flowers from April to July.

Conservation status: This new species should be considered as Critically Endangered (CR, C2a(i)), due to the scarce number of populations, reduced occupancy and occurrence area as defined by IUCN (2001), and heavy grazing by rabbits.

Taxonomic remarks: *Sonchus parathalassius* closely resembles *S. ustulatus* s.s. but differs by the shrubby habit up to 90 cm, penatipartite leaves with almost entire lobes, long

acuminated terminal lobe and inflorescence characters (insertion, branching, number of capitula). The shrubby habit mainly observed in the islets could be related with older plants less grazed by rabbits. Heavy grazing by goats in Porto Santo Island until recently (1995) added to rabbit herbivory, could explain the very late discovery of this species. Table 1 summarizes the diagnostic characters of *Sonchus parathalassius* and compares them with the other Madeiran *Dendrosonchus*.

Nomenclature: The revision of the herbarium specimens and of nomenclatural aspects of the Madeiran *Dendrosonchus* taxa, further led to propose the recognition of former *Sonchus ustulatus* var. *latifolia* Lowe at a specific rank and the recognition of *Sonchus ustulatus* var. *imbricatus* Lowe at a subspecific level.

1. *Sonchus latifolius* (Lowe) R. Jardim & M. Seq., comb. nov.

≡ *Sonchus ustulatus* Lowe var. *latifolia* Lowe in Trans. Cambridge Philos. Soc., 4: 23 (1831). [*bas.*]

≡ *Sonchus ustulatus* Lowe subsp. *maderensis* Aldridge in Bot. Macaronés., 2: 91 (1977) [1976 publ. 1977], *pro parte*.

2. *Sonchus ustulatus* Lowe subsp. *imbricatus* (Lowe) R. Jardim & M. Seq., comb. nov.

≡ *Sonchus ustulatus* Lowe var. *imbricata* Lowe, Man. Fl. Mad., 1(5): 548 (1868). [*bas.*]

= *Sonchus ustulatus* Lowe subsp. *maderensis* Aldridge in Bot. Macaronés., 2: 91 (1977) [1976 publ. 1977], *pro parte*.

Key to the *Sonchus* subgen.

Dendrosonchus species in Madeira Archipelago:

1. Leaves petiolate *S. pinnatus*
- Leaves sessile, the bases sheathing the stem. 2

2. Caulirosulate shrub up to 4 m high; inflorescence with large leafy bracts and capitula up to 30 x 15 mm: *S. fruticosus*
- Suffruticose or caulirosulate shrub up to 90 cm high; inflorescence with very small bracts and capitula up to up to 18 x 15 mm 3

3. Suffruticose to caulirosulate shrub up to 90 cm high; capitula numerous, more than 60, disposed in a terminal irregularly branched, inflorescence branching from the upper 1/3. *S. parathalassius*
- Suffruticose with short woody caudex up to 30 cm high; capitula fewer, up to 30, disposed in a regularly branched (usually dichotomous), inflorescence branching from the lower 1/3 - 1/2. 4

4. Leaf-lobes linear-lanceolate, more than 2x as long as wide, toothed; bracts without appendices. *S. ustulatus*
- Leaf-lobes ovate, rarely rhombic, not more than 2x as long as wide, subentire; bracts with conspicuous appendices. *S. latifolius*

Concluding remarks: LEE *et al.* (2005) molecular studies indicate that Madeiran *Dendrosonchus* species derive from a Tenerife ancestor. Moreover the coastal *S. ustulatus* and *S. latifolia* (as *S. ustulatus* subsp. *maderensis*) were the basal taxa from which a radiation process initiated to other ecologies. However, the recognition of *S. parathalassius* as Porto Santo endemic and the fact that this island is older than Madeira (14 My vs.

5.6 My) suggests a possible basal position of this endemism in the Madeiran *Dendrosonchus* taxa. Therefore, possibly *Sonchus parathalassius* derived from the Canarian ancestor, dispersed to Madeira Island and rapidly radiated in the other Madeiran *Dendrosonchus* species, in accordance with the proposed patterns by LEE *et al.* (2005). In fact, *S. parathalassius* has characters similar to *S. ustulatus* (e.g. leaves), *S. pinnatus* (e.g. inflorescence ramification) and to *S. fruticosus* (e.g. habit). Further studies, namely molecular, should contribute to

clarify the phylogenetic position of *Sonchus parathalassius* in subgen. *Dendrosonchus*.

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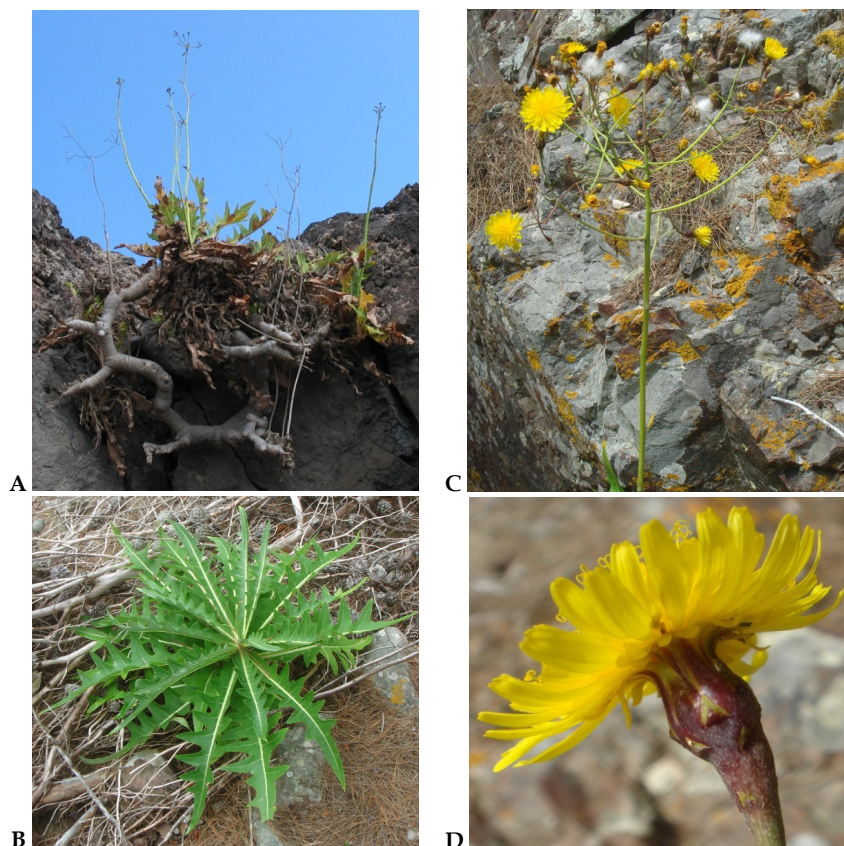


Figure 1 – *Sonchus parathalassius*. A, Habit, Ilhéu da Cal, 14-IV-2004; B, Leaf rosette, Porto Santo, Pico Castelo, 20-V-2011; C, Inflorescence, Porto Santo, Pico Castelo, 10-VII-2011; D, Capitula, Porto Santo, Pico Castelo, 10-VII-2011; all photos R.Jardim

Table 1 - Diagnostic and comparative characters of *Sonchus parathalassius*

	<i>Sonchus parathalassius</i>	<i>Sonchus ustulatus</i>	<i>Sonchus latifolius</i>	<i>Sonchus pinnatus</i>	<i>Sonchus fruticosus</i>
Habit	Suffruticose to shrub, up to 90 cm	Suffruticose up to 30 cm high	Suffruticose up to 30 cm high	Caulirosulate shrub up to 2m	Caulirosulate shrub up to 4 m high
Leaves	28-35 x 8-13.6 cm	14-40 x 5-12 cm	13-40 x 5-13 cm	13-40 x 4-15 cm	28-67 x 7-18 cm
Incision	Pinnatipartite	pinnatisect	Pinnatipartite to pinnatisect	Pinnatipartite to pinnatisect	Sinuate to pinnatifid
Insertion	Sessile with sheathing base	Sessile with sheathing base	Sessile with sheathing base	Petiolate	Sessile with sheathing base
Lateral lobes	5-9	9-15	3-10	10-16	2-6
Shape and size	Narrowly triangular, long acuminate, 35-51 x 21-35 mm	Linear-lanceolate, to rhombic, 16-40 x 12-27 mm	Ovate, to obovate, 19-40 x 12-28 mm	Linear-lanceolate to triangular, 25-80 x 15-32 mm	Rounded to triangular, 18-36 x 38-43 mm
Terminal lobe	30-82 mm, triangular, acuminate to acuminate-caudate	18-37 mm, narrow acuminate-lanceolate or subcaudate	19-30 mm, lanceolate to ovate	20-65 mm, triangular-caudate	100-150 mm, broadly triangular
Margin	Entire to irregularly scarcely dentate	Dentate	Subentire	Irregularly dentate to subentire	Denticulate
Inflorescence	Branched, spreading corymbose cyme	Regularly branched corymbose cyme	Regularly branched corymbose cyme	Branched, spreading corymbose cyme	Branched corymbose cyme
Axis	60 cm, branching in the terminal 1/3	15-50 cm, branching from lower 1/3-1/2	15-50 cm, branching from lower 1/3-1/2	35 - 90 cm, branching from lower 1/3-1/2	30-60, branching from lower 1/3
Capitula	60-90	8-24(-30)	(4-) 8-14	Up to 100 or more	Up to 100 or more
Diameter	2.5-3.5 cm	4 cm	5.5-6.5 cm	3-5 cm	4-7 cm
Capitula bracts	35, in 5 series	28-29, in 4 series	30, 5 series	28-29, 4 series	67-70, 7 series
Outer bracts	1.2-2.7 x 1.5-2.0 mm, triangular, adpressed	1.6-4.0 x 1.8-2.6 mm, triangular, adpressed	3-6.3 x 3.1-3.9 mm, triangular, adpressed, appendix ca. 4 mm (truncate to lobate)	1.0-1.7x1.7-2.0 mm, triangular, adpressed	11.5-14.2 x 2.5-4.6 mm, long acuminate, retroflexed
Intermediate	5.3-7.6 x 1.3-1.9 mm, oblong, slightly retroflexed	7.9 x 2.3 mm, lanceolate	8.1x4.2 mm, triangular acuminate	9.1x2.6 mm, lanceolate	11.8-14.8 x 3.4-5.4 mm, obovate to spatulate, retroflexed
Inner	10.2-11.7 x 1.1-1.8 mm, linear-oblong, retroflexed	8.2 x 1.5 linear-lanceolate, retroflexed	12.4-13.3 x 2.8-4.4 mm, linear-lanceolate, retroflexed	9.6-9.8 x 2.0-2.6 mm, linear-lanceolate, retroflexed	19.1-19.3 x 1.2-1.6 mm, linear-lanceolate, retroflexed
Corolla-tube	4.4-5.0 mm	4.8-5.6 mm	7.4-9.2 mm	4.9-7 mm	12.7-13.5 mm
Ligule	7.0-9.2 x 1.5-2.3 mm	5.8-8 x 1.9-2.8 mm	10.6-20 x 3.4-4.3 mm	5.9-6.8 x 1.4-1.9 mm	13.9-18.6 x 2.7-2.9 mm
Cypselas	2.8-2.9 x 0.8-1 mm	2.6-2.8 x 0.8 mm	3-3.8 x 1-1.3 mm	2.1-2.7 x 0.6-1 mm	3.3-4.5 x 1-1.2 mm



Figure 2 – *Sonchus parathalassius* J.G. Costa ex R.Jardim & M.Seq., holotype. MADM



Figure 3 – *Sonchus parathalassius*, habitat. Ilhéu de Cima, 14-IV-2004, photo: R. Jardim

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