

Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã ass. nova

Crucianelletalia Sissingh 1974

Euphorbio paraliae-Lotion glauci Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã all. nova

Euphorbio paraliae-Lotetum glauci Jardim,

Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã ass. nova

lotetosum glauci

plantaginetosum maderensis Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã subass. nova.

CAKILETEA MARITIMAE Tüxen & Presing ex Br.-Bl. & Tüxen 1952

Cakilion maritimae Pignatti 1953

Salsolo kali-Cakiletum aegyptiacae Costa & Mansanet 1981

Aknowledgment: the authors would like to thank the most valuable support of the *Direcção Regional de Florestas da Secretaria Regional do Ambiente e Recursos Naturais da Região Autónoma da Madeira*.

Roberto Jardim; Jardim Botânico da Madeira, Funchal, robertojardim.sra@gov-madeira.pt. **Miguel Sequeira;** Depto. Biologia, Universidade da Madeira, Funchal, sequeira@uma.pt. **Jorge Capelo;** Depto. de Ecologia, Recursos Naturais e Ambiente. Estação Florestal Nacional, jorge.capelo@efn.com.pt. **Carlos Aguiar;** Escola Superior Agrária de Bragança; cfaguiar@ipb.pt. **José C. Costa;** Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, Lisboa, jccosta@isa.utl.pt. **Dalila Espírito-Santo;** Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, dalilaesanto@isa.utl.pt. **Mário Lousã;** Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, Lisboa, mariolousa@isa.utl.pt

XXXVII: The vegetation of Madeira: V - *Lino stricti-Stipetum capensis*, ass. nova and *Vicio costei-Echietum plantagini*, ass. nova, two new semi-nitrophylous associations from Porto-Santo Island (Archipelag of Madeira)

Porto Santo is a deeply eroded oceanic island. The human uses of the territory led to a massive destruction of its primitive vegetation cover and its substitution by new types of vegetation constituted by plants adapted to the novel perturbation regimes introduced by human settlers. A vegetation cover once dominated by trees or shrubs that evolved isolated from herbivory during millions of years, was replaced since the XV century by herbaceous anthropogenic vegetation, dominated by neophytes, adapted to perturbation events imposed by mammal herbivores (goats and rabbits) and by dry-farming agriculture (mostly barley). Agriculture and grazing together with low climatic precipitation levels promoted subnitrophylous types of herbaceous vegetation. So, today's Porto Santo vegetation is largely dominated by two, yet undescribed, herbaceous subnitrophylous phytocoenosis: *Lino stricti-Stipetum capensis* and *Vicio costei-Echietum plantagini*.

1. ***Lino stricti-Stipetum capensis*** Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã associatio nova hoc loco [typus: table 1 relevé #17]. This is the most conspicuous vascular plant community in Porto Santo [it is also present on Ponta de São Lourenço (NE of Madeira Island) and on dryer and warmer slopes of the southern Madeira]. It ranges from a basal infra-mediterranean semi-arid stage to the thermomediterranean dry inferior stage.

Table 1 - *Lino stricti-Stipetum capensis*

# of relevé	17	19	38	41	42	44	45
m.s.m.	50	50	150	70	80	287	168
Area	10	80	20	10	16	4	4
Cover	80	90	90	90	80	80	75
Slope (degree)	50	40	25	20	15	30	35
Aspect	S	S	SW	S	SE	S	S
Characteristics							
<i>Stipa capensis</i>	3	4	4	5	3	3	4
<i>Brachypodium distachyon</i>	2	2	2	2	2	1	.
<i>Plantago lagopus</i>	.	.	+	2	1	1	+
<i>Medicago polymorpha</i>	+	.	+	1	+	+	.
<i>Silene gallica</i>	.	.	+	2	+	.	+
<i>Avena barbata</i> subsp. <i>lusitanica</i>	.	.	1	1	+	+	.
<i>Scorpiurus muricatus</i>	1	+	+	.	1	.	.
<i>Linum strictum</i>	1	2	1	.	.	.	.
<i>Rapistrum rugosum</i>	.	.	+	2	.	1	.
<i>Hedypnois cretica</i>	+	2	+	.	.	.	.
<i>Misopates orontium</i>	+	1	.	.	.	.	+
<i>Echium plantagineum</i>	.	+	.	1	.	+	.
<i>Euphorbia terracina</i>	+	+	.	.	+	.	.
<i>Sonchus oleraceus</i>	+	.	+	+	.	.	.
<i>Galactites tomentosa</i>	+	.	+	.	+	.	.
<i>Lolium multiflorum</i>	.	.	2	.	2	.	.
<i>Asphodelus fistulosus</i>	2	1	.	.	.	.	.
<i>Eruca vesicaria</i>	1	+	.	.	.	.	.
<i>Hippocrepis multisiliquosa</i>	1	+	.	.	.	.	.
<i>Medicago truncatula</i>	.	+	.	1	.	.	.
<i>Astragalus pelecinus</i>	.	.	+	.	1	.	.
<i>Trifolium angustifolium</i>	.	.	.	1	+	.	.
<i>Sonchus tenerrimus</i>	+	+	.	.	.	.	.
<i>Anagallis arvensis</i>	.	+	.	.	.	.	+
<i>Trifolium scabrum</i>	.	.	+	.	.	.	+
<i>Hordeum leporinum</i>	.	.	.	.	.	+	+
<i>Avena fatua</i>	.	.	.	.	+	+	.
<i>Lolium rigidum</i>	.	.	.	2	.	.	.
<i>Bromus diandrus</i>	.	.	.	.	.	2	.
<i>Ammi majus</i>	1	.	.	.	.	.	.
<i>Lagurus ovatus</i>	.	.	1	.	.	.	.
<i>Beta maritima</i>	+	.	.	.	.	.	.
<i>Erodium chium</i>	+	.	.	.	.	.	.
<i>Mesembryanthemum crystallinum</i>	+	.	.	.	.	.	.
<i>Mesembryanthemum nodiflorum</i>	+	.	.	.	.	.	.
<i>Silene noturna</i>	.	+	.	.	.	.	.
<i>Bromus madritensis</i>	.	.	+	.	.	.	.
<i>Rapistrum rugosum</i> subsp. <i>linnaeanum</i>	.	.	.	.	+	.	.
<i>Trifolium glomeratum</i>	.	.	.	.	+	.	.
<i>Erodium malacoides</i>	.	.	.	.	.	+	.
<i>Lamarckia aurea</i>	.	.	.	.	.	+	.
<i>Euphorbia helioscopia</i>	.	.	.	.	.	+	.
<i>Chenopodium murale</i>	.	.	.	.	.	+	.
<i>Calendula arvensis</i>	.	.	.	.	.	.	+
<i>Erodium botrys</i>	.	.	.	.	.	.	+

Table 1 - *Lino stricti-Stipetum capensis*

# of relevé	17	19	38	41	42	44	45
<i>Papaver rhoeas</i>	+
Companions							
<i>Hyparrhenia sinaica</i>	+	.	.	+	+	.	.
<i>Leontodon longirostris</i>	.	.	+	.	+	.	+
<i>Plantago cf. ovata</i>	+	2	.	.	.	.	.
<i>Psoralea bituminosa</i>	.	.	.	1	+	.	.
<i>Ononis diffusa</i>	+	+
<i>Convolvulus altheoides</i>	.	.	+	.	+	.	.
<i>Cynodon dactylon</i>	.	.	.	1	.	.	.

More: + *Herniaria cinerea* in 1; + *Trifolium campestre*, + *Plantago coronopus*, + *Cynara cardunculus* var. *ferocissima*, + *Phagnalon saxatile* in 3; + *Petrorhagia nanteuilli*, + *Polycarpon tetraphyllum*, + *Reseda luteola* in 6.

Places: 17 Porto Santo: next to the Hotel Baleira; 19 Porto Santo: Pico Ana Ferreira; 38 Madeira: Piedade (Ponta de S. Lourenço); Madeira: 41, 42 Baía de Abra (Ponta de S. Lourenço); 44 Madeira: Funchal, S. Martinho; 45 Madeira: Caniço, Miradouro do Garajau

It is easily identified by its dominant – *Stipa capensis* – which has its phenological optimum in March/April. *Lino-Stipetum capensis* can be distinguished from other peninsular and canarian *Stipeta capensis* by the simultaneous presence, among other species, of *Silene gallica*, *Echium plantagineum*, *Astragalus pelecinus*, *Hippocrepis multisiliquosa*, *Euphorbia terracina*, *Linum strictum* and *Beta maritima*. Its collocation in the early summer blooming, grass dominated, alliance *Taeniathero-Aegilopion geniculatae* seems more accurate than in the xeric and desertic *Resedo lanceolatae-Moricandion*, because there isn't any characteristic species of this latter alliance in the Portuguese atlantic islands.

2. ***Vicio costae-Echietum plantagini***
Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã associatio nova hoc loco [typus: table 2] - This community, in "climatophylous habitats", is restricted to higher peaks of the island (e.g. Pico do Facho-517m and Pico Branco-450m), in the upper dry to sub-humid termomediterranean (punctually mesomediterranean) stage. In dryer

ombrotypes the organization of this community is only possible in water compensated biotopes. Likewise, the *Vicio-Echietum plantagini* is dominated by neophytes but its characteristic combination includes three important Porto Santo endemics: *Vicia costae*, *V. ferreirensis* and *Fumaria muralis* var. *laeta*. We suspect that these species primarily occupied forest clearings [*Trifolio-Geranietea sanguinei?*] but, later, were able to survive in the anthropogenic habitats.

Sintaxonomy

STELLARIETEA MEDIAE Tüxen, Lohmeyer & Preising ex von Rochow 1951

Stellarienea mediae

Thero-Brometalia (Rivas Goday & Rivas-Martínez ex Esteve 1973) O. Bolòs 1975

Taeniathero-Aegilopion geniculatae Rivas-Martínez & Izco 1977.

Lino stricti-Stipetum capensis Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã ass. nova

Echio plantaginei-Galactition tomentosae O. Bolòs & Molinier 1969

Vicio costei-Echietum plantagini Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo ass. nova

Table 2 – *Vicia costae*-*Echietum plantagini*

# of relevé	38
m.s.m	400
Area	6
Cover	100
slope (degrees)	20
Aspect	E
Characteristics	
<i>Vicia costae</i>	1
<i>Fumaria muralis</i> var. <i>laeta</i>	1
Characteristics of higher syntaxa	
<i>Echium plantagineum</i>	4
<i>Lagurus ovatus</i>	2
<i>Avena lusitanica</i>	1
<i>Galactites tomentosa</i>	1
<i>Rapistrum lineanum</i>	+
<i>Bromus matritensis</i>	1
<i>Bromus rubens</i>	+
<i>Silene gallica</i>	2
<i>Silene vulgaris</i>	+
<i>Picris echioides</i>	1
<i>Spergula fallax</i>	1
<i>Scorpiurus muricatus</i>	+
<i>Astragalus pelecinus</i>	+
<i>Bromus diandrus</i>	+
<i>Hedypnois cretica</i>	1
<i>Medicago polymorpha</i>	1
<i>Trifolium campestre</i>	1
<i>Sherardia arvensis</i>	1
<i>Oxalis pes-caprae</i>	2
<i>Rumex canariensis</i>	2
<i>Anagalis arvensis</i>	+
<i>Lamarckia aurea</i>	1
<i>Papaver dubium</i>	+
<i>Papaver somniferum</i>	+
<i>Geranium molle</i>	+
<i>Vicia tenuissima</i>	1

38. Porto Santo: Pico Branco

[taxonomical nomenclature follows: PRESS & SHORT (1994) *Flora of Madeira*. BM. London; and also the checklist of taxa of RIVAS-MARTÍNEZ, DÍAZ, F.DEZ-GONZÁLEZ, IZCO, LOIDI, LOUSA & PENAS (2002) Vascular Plant Communities of Spain and Portugal – Addenda to the Syntaxonomical Checklist of 2001- *Itinera Geobotanica* 15(2) : 697-813. Sometimes names are shortened to the last infra-specific rank].

Roberto Jardim; Jardim Botânico da Madeira, Funchal, robertojardim.sra@

gov-madeira.pt. **Miguel Sequeira**; Depto. Biologia, Universidade da Madeira, Funchal, sequeira@uma.pt; **Jorge Capelo**; Depto. de Ecologia, Recursos Naturais e Ambiente. Estação Florestal Nacional, jorge.capelo@efn.com.pt. **Carlos Aguiar**; Escola Superior Agrária de Bragança; cfaguiar@ipb.pt **José C. Costa**, Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, Lisboa, jccosta@isa.utl.pt. **Dalila Espírito-Santo**; Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, dalilaesanto@isa.utl.pt. **Mário Lousã**; Depto. Protecção de Plantas e Fitoecologia, Instituto Superior de Agronomia, Lisboa, mariolousa@isa.utl.pt

Acknowledgment: the authors would like to thank the most valuable support of the *Direcção Regional de Florestas da Secretaria Regional do Ambiente e Recursos Naturais da Região Autónoma da Madeira*.

XXXVI: Syntaxonomical disposal of the *Euphorbia pedroi* Molero & Rovira communities, a sin-endemism of Serra da Arrábida (Portugal) sea-cliffs – *Convolvulo fernandesii* - *Euphorbietum pedroi* ass. nova

In the Serra da Arrábida, in dry rocky slopes facing the sea, occurs an endemic tree-spurge: *Euphorbia pedroi* Molero & Rovira [Sect. *Dendroides*]. *E. dendroides* dominates a xero-thermophilous permanent phytocoenosis in hyper - oceanic, topographically xeric, thermomediterranean biotopes, along with more common elements of the *Asparago* - *Rhamnion* alliance. This community was formerly identified by