Notas do Herbário da Estação Florestal Nacional (LISFA): Fasc. XVII

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 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							
Stipa capensis	3	4	4	5	3	3	4
Brachypodium distachyon	2	2	2	2	2	1	.
Plantago lagopus	.	.	+	2	1	1	+
Medicago polymorpha	+	.	+	1	+	+	.
Silene gallica	.	.	+	2	+	.	+
Avena barbata subsp. *lusitanica*	.	.	1	1	+	+	.
Scorpiurus muricatus	1	+	+	.	1	.	.
Linum strictum	1	2	1	.	.	.	.
Rapistrum rugosum	.	.	+	2	.	1	.
Hedypnois cretica	+	2	+	.	.	.	.
Misopates orontium	+	1	.	.	.	.	+
Echium plantagineum	.	+	.	1	.	+	.
Euphorbia terracina	+	+	.	.	+	.	.
Sonchus oleraceus	+	.	+	+	.	.	.
Galactites tomentosa	+	.	+	.	+	.	.
Lolium multiflorum	.	.	2	.	2	.	.
Asphodelus fistulosus	2	1	.	.	.	.	.
Eruca vesicaria	1	+	.	.	.	.	.
Hippocrepis multisiliquosa	1	+	.	.	.	.	.
Medicago truncatula	.	+	.	1	.	.	.
Astragalus pelecinus	.	.	+	.	1	.	.
Trifolium angustifolium	.	.	.	1	+	.	.
Sonchus tenerrimus	+	+	.	.	.	.	.

Table 1 - Continuação

# of relevé	17	19	38	41	42	44	45
Papaver rhoeas	.	.	.	.	.	.	+
Companions							
Anagallis arvensis	.	+	.	.	.	.	+
Trifolium scabrum			+	.	.	.	+
Hordeum leporinum	.	.	.	.	.	+	+
Avena fatua	.	.	.	.	+	+	.
Lolium rigidum	.	.	.	2	.	.	.
Bromus diandrus	.	.	.	.	.	2	.
Ammi majus	1	.	.	.	.	.	.
Lagurus ovatus	.	.	1	.	.	.	.
Beta maritima	+	.	.	.	.	.	.
Erodium chium	+	.	.	.	.	.	.
Mesembryanthemum crystallinum	+	.	.	.	.	.	.
Mesambryanthemum nodiflorum	+	.	.	.	.	.	.
Silene noturna	.	+	.	.	.	.	.
Bromus madritensis	.	.	+	.	.	.	.
Rapistrum rugosum subsp. *linnaeanum*	.	.	.	.	+	.	.
Trifolium glomeratum	.	.	.	.	+	.	.
Erodium malacoides	.	.	.	.	.	+	.
Lamarckia aurea	.	.	.	.	.	+	.
Euphorbia helioscopia	.	.	.	.	.	+	.
Chenopodium murale	.	.	.	.	.	+	.
Calendula arvensis	.	.	.	.	.	.	+
Erodium botrys	.	.	.	.	.	.	+
Hyparrhenia sinaica	+	.	.	+	+	.	.
Leontodon longirrostris	.	.	+	.	+	.	+
Plantago cf. ovata	+	2	.	.	.	.	.
Psoralea bituminosa	.	.	.	1	+	.	.
Ononis diffusa	+	+	.	.	.	.	.
Convolvulus altheoides	.	.	+	.	+	.	.
Cynodon dactylon	.	.	.	1	.	.	.

More: + *Herniaria cinerea* in 1; + *Trifolium campestre,* +*Plantago coronopus,* +*Cynara cardunculus* var. *ferocissima*, + *Phagnalon saxatile* in 3; + *Petrorhagia nanteulli,* +*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 Baia 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 characteristc 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 subhumid 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 – *Vicio costae-Echietum plantagini*

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

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