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

XXXV: The vegetation of Madeira: III - *Diplazio caudati-Perseetum indici* ass. nova and *Rhamno glandulosi-Sambucetum lanceolati* ass. nova: two new hygrophillic forest associations from Madeira Island .

Descriptions of forest vegetation of Madeira Island included, so far, two types of climatophylous broadleaf forest vegetation – *Clethro arboreae-Ocoteetum foetentis* and *Semele androgynae-Apollonietum barbujanae* – with an arboreal *stratum* respectively dominated by two *Lauraceae* trees: *Ocotea foetens* [til] and *Apollonias barbujana* [barbusano]. Recently, we discovered that the other *Lauraceae* Madeira's tree – *Persea indica* [vinhático] – is the dominant tree in a third type of broadleaf forest - *Diplazio caudati-Perseetum indici* ass. nova. This is an edaphohigrophylous forest, proper of middle and lower-course permanent streams, over fairly thick colluvial (rarely alluvial) substrata. It ranges from the termomediterranean sub-humid stage to the mesomediterranean humid stage. Its characteristic combination involves: *Persea indica*, *Dryopteris aitoniana*, *Woodwardia radicans*, *Diplazium caudatum*, *Pteris incompleta*, etc. Nowadays, the *Diplazio-Perseetum indici* is a rare phytocoenosis because *Persea indica* is a source of noble wood and many of its habitats were also suitable for agriculture. The prickly scrub communities of the *Rubio agostinhoi-Rubetum bollei* were identified as the subseral stage of the *Diplazio-Perseetum indici*. It is also possible that at least some *Salix canariensis* communities (*Scrophulario hirtae-Salicetum canariensis*), occupied today former *Persea indica* forests biotopes. Its geovicarious edaphohigrophylous community in the western Canary Islands (*Ixantho-Laurion*) is a mixed wood of *Persea indica* and *Ocotea foetens* (*Diplazio caudati-Ocoteetum foetentis*, vd. RIVAS-MARTÍNEZ *et al*. (1993), *Itin. Geobot*. 7 : 169-364).

In turn, in steep torrential upper-course stream riffles, with coarse stony substrata, in the scope of the *Clethro-Ocoteetum foetentis* climatophyllous stage, the *Diplazio caudati-Perseetum indici* is substituted by an yet undescribed nanophanerophitic phytocoenosis – *Rhamno glandulosi-Sambucetum lanceolati* ass. nova – dominated by *Sambucus lanceolata* and *Rhamnus glandulosa*. Due to partial *habitat* simmilarity (clearings in the canopy) *Euphorbia mellifera* sometimes tends to co-dominate the community as is the less specialized caulirosetted element. Nevertheless, the presence in the *Rhmano-Sambucetum lanceolati* of a wealth of escio-hygrophillous ferns [*e.g. Woodwardia radicans, Diplazium caudatum, Stegnogramma pozoi*], supports its syntaxonomical differentiation from the mesophytic *caulirosulati* communities of the *Isoplexido sceptri-Euphorbietum melliferae.* In the opposite direction, the absence of other caulirosetted plants [*Isoplexis sceptrum, Musschia wollastonii, Melanoselinum decipiens*] allows also to distinguish both communities.

Both associations are affiliated to the *Sibthorpio peregrinae-Clethrion arboreae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000; *Pruno hixae-Lauretalia novocanariensis* Oberdorfer *ex* Rivas-Martínez *et al*. 1977 *corr*. Rivas-Martínez *et al*. 2002; *PRUNO HIXAE-LAURETEA NOVOCANARIENSIS* Oberdorfer 1965 corr. Rivas-Martínez *et al*. 2002.

1 - ***Rhamno glandulosi - Sambucetum lanceolati*** Rivas-Martínez, Capelo, J.C. Costa, Jardim, Sequeira, Aguiar, & Lousã associatio nova hoc loco
[*typus*: table 1 , relevé #1].

[=*Clethro arboreae-Ocoteetum foetentis* variante de *Isoplexis sceptrum* sensu CAPELO *et al*. (1999) Veget. Madeira I. *Silva Lusit*. 7(2) : 263, 264 & tab. 4: inv. 8, 9 e 10].

2 - ***Diplazio caudati-Perseetum indici*** Jardim, Sequeira, Capelo, J.C. Costa, Aguiar & Lousã

associatio nova hoc loco

[*typus:* table 2, relevé #2].

[Scale: Br.-Bl. Modified by Reichelt & Wilmanns (1973) – *Vegetationsgeographie* - in class 2, it adds: 2m= less than 5%; 2a= 5-15%; 2b=15-25%].

[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) - *Itinera Geobotanica* 15(2) : 697-813. Sometimes names are shortened to the last infra-specific rank].

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Table 1 - *Rhamno glandulosi-Sambucetum lanceolati*

# of relevé	1	2	3	4	5
m.s.m. (1=10m)	100	90	110	65	103
Area (m^2)	100	100	60	50	45
Aspect	N	NE	NW	N	N
Characteristic combination					
Sambucus lanceolata	3	1	3	2	+
Rhamnus glandulosa	1	3	1	+	3
Euphorbia mellifera	+	+	1	1	1
Diplazium caudatum	2	+	1	3	.
Festuca donax	2	2	1	1	+
Sibthorpia peregrina	+	+	1	1	1
Pteris incompleta	+	+	+	3	.
Clethra arborea	.	1	1	+	2
Sonchus fruticosus	.	1	2	.	1
Phyllis nobla	.	1	+	1	1
Isoplexis spectrum	.	+	+	.	.
Hypericum grandifolium	.	2	.	+	.
Rubia agostinhoi	.	.	+	+	1
Rosa mandonii	1	.	.	.	.
Salix canariensis	.	+	1	+	.
Laurus novocanariensis	.	.	+	1	+
Cystopteris diaphana	1	+	.	.	.
Athyrium filix-foemina	1	2	.	.	1
Rubus grandifolius	.	1	.	+	.
Cirsium latifolium	.	.	+	.	+
Ocotea foetens	.	.	.	+	.
Rubus bollei	.	.	.	1	.
Urtica morifolia	.	.	.	1	.
Hedera maderensis	.	.	.	+	.
Cedronella canariensis	.	.	.	+	.
Argyranthemum	.	.	+	+	.
Ilex perado	.	.	.	1	.
Dryopteris aitoniana	.	.	+	.	.
Dryopteris maderensis	.	+	.	.	.
Erica maderinicola	.	.	.	.	+
Vaccinium padifolium	.	.	.	.	+
Companions					
Oenanthe divaricata	2	1	1	2	1
Woodwardia radicans	.	2	3	+	3
Deschampsia argentea	1	2	1	+	.
Ranunculus cortusifolius	+	+	+	.	.
Aichrysum divaricatum	+	.	+	+	.
Ageratina adenophora	.	1	.	+	.
Tamnobryum alopecurum	2	.	.	.	.
Echinodium spinosum	2	.	.	.	1
Asterella africana	1	.	.	.	1
Porella inaequalis	1	.	.	.	.
Doodia caudata	.	.	.	1	.
Stegnogramma pozoi	.	.	.	.	+
Dactylorhiza foliosa	+	.	.	.	.
Chelidonium majus	.	.	.	+	.
Pteridium aquilinum	.	.	.	+	.
Stellaria alsine	.	.	+	.	.
Peucedanum lowei	.	.	.	+	.
Erigeron karvinskianus	.	.	.	.	+

Sites: 1, 3, 5 Folhadal; 2 Levada do Caldeirão Verde, 4 Chão de Louros

Table 2 - *Diplazio caudati-Perseetum indici*

# of relevé	1	2	3	4	5	6
m.s.m.	772	.	929	930	866	865
Aspect	S	S	.	.	W	W
Area	100	100	100	150	200	150
Characteristic combination						
Persea indica	5	4	4	2	3	4
Clethra arborea	2a	2	.	1	.	+
Laurus novocanariensis	1	2	3	4	4	2
Rubus gr. bollei	1	(+)	+	+	+	1
Phyllis nobla	1	+	+	+	.	1
Sibthorpia peregrina	2a	3	1	2	1	1
Diplazium caudatum	3	2	+	4	2a	3
Athyrium felix-foemina	1	+	+	.	1	1
Pteris incompleta	+	+	.	.	.	.
Cystopteris diaphana	1	+	+	+	+	.
Polystichium setiferum	+	+	.	.	.	.
Festuca donax	2a	.	3	1	2a	1
Asplenium onopteris	+	+	.	.	.	.
Asplenium trichomanes	+	+	.	.	.	.
Selaginella denticulata	1	+	+	+	.	.
Pericallis aurita	+	.	.	.	+	+
Vaccinium padifolium	+	.	.	.	.	.
Bystropogon punctatus	1	(+)	.	.	.	.
Sonchus fruticosus	(+)	(+)	1	.	+	.
Scrophularia hirta	(+)	.	.	.	.	.
Hypericum grandifolium	(+)	.	+	+	+	+
Hypericum glandulosum	(+)	(+)	(+)	+	.	.
Hedera maderensis	+	.	2	.	.	.
Brachypodium sylvaticum	.	1	.	.	.	.
Argyranthemum	.	+	.	.	.	.
Erica maderinicola	.	1	+	.	.	.
Euphorbia mellifera	2a	.	+	1	.	.
Lonicera etrusca	+	.	+	.	.	.
Rosa mandonii	1	.	.	.	.	.
Cedronella canariensis	.	+	.	.	1	+
Dryopteris aitoniana	.	+	+	.	.	.
Rubia agostinhoi	.	.	1	.	+	+
Salix canariensis	.	.	+	.	.	.
Myrica faya	.	.	+	.	.	.
Semele androgyna	.	.	+	.	.	.
Carex peregrina	.	.	.	.	+	.
Carex lowei	.	.	.	1	.	.
Asplenium monanthes	.	.	.	.	1	.
Asplenium onopteris	.	.	.	1	+	.
Asplenium anceps	.	.	.	.	+	.
Athyrium felix-femina	.	.	.	.	1	+
Prunella vulgaris	.	.	.	.	.	+
Selaginella denticulata	.	.	.	.	.	+
Companions						
Woodwardia radicans	.	2	3	1	1	1
Deschampsia argentea	+	.	(+)	(+)	+	+
Polypodium	+	.	.	.	.	.
Ageratina adenophora	+	.	.	.	+	1
Stegnogramma pozoi	+	+	.	.	.	.
Umbilicus rupestris	.	.	.	.	.	.
Erigeron karvinskianus	.	.	.	.	+	1
Aichryson divaricatum	.	.	.	.	+	+
Succisa pratensis	.	.	.	.	.	1
Oenanthe divaricata	.	.	.	.	.	+
Huperzia selago	.	.	.	.	.	+
Epilobium tetragonum	.	.	.	.	.	+
Dactylorhiza foliosa	.	.	.	.	.	+
Sagina procumbens	.	.	.	.	.	+

Sites: 1; Ribeira da Madalena ca. Loreto;
2,3,4: between Paúl and Loreto; 5: stream south of Pico Ferreiro; 6: south of Pico Tapeiro

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