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XXXIV: The vegetation of Madeira: II - woody caulirosetted communities of evergreen forest clearings: *Euphorbion melliferae* all. nova.

The endemic caulirosetted microphanerophytes [with a rosette of leaves on top of a long woody few-branched naked stem] – *e.g. Euphorbia mellifera*, *Isoplexis sceptrum, Melanoselinum decipens*, *Musschia wollastonii* and *Sonchus fruticosus* – are among the most striking plants of Madeira Island. They are often found in the "levadas" artificial system of channels that runs through the *Ocotea foetens* forest [*Clethro arboreae-Ocoteetum foetentis*]. These plants organize themselves in a particular phytocoenosis – *Isoplexido sceptri-Euphorbietum melliferae* ass. nova. – that reflects a worldwide recurrent phenomenon in forest ecosystems: the presence of plants adapted to cuts in the continuous crown layer of dense forest, such as dry ravines, forest clearings produced by tempests, landslides and other natural disturbances. "Levadas" are artificial simulations of these natural habitats.

Since irregular streams, with rocky ground, found amidst the *Pruno-Lauretalia* forest share some of the above described habitat features, some caulirosetted elements are also found there. Thus, the *Isoplexido-Euphorbietum melliferae* phytocoenosis is somewhat floristically and physiognomically similar to the *Rhamno glandulosi-Sambucetum lanceolati* [riparian higrophyllous leafy shrub community, see note XXXV], but can easily be differentiated from it by the absence of *Rhamnus glandulosa* and *Sambucus lanceolata*, the scarcity of esciohygrophilous ferns and the abundance of *Trifolio-Geranietea* characteristics.

The caulirosetted microphanerophytes share a common physiognomy [caulirosetted] and ecology [heliophyllous], belonging to the same functional group [C-strategist in the primary strategies of GRIME, 2001, *Plant Strategies, Vegetation Processes and Ecosystem Proprieties*] and many of them evolved from herbaceous ancestors (e.g. *Sonchus*: KIM *et al*., 1996, *Proc. Natl. Acad. Sci. USA* 93: 7743-7748) that managed to adapt to an island without indigenous mammal herbivores, once almost totally covered by dense forest vegetation. A coarse comparison can be made with the *Trifolio-Geranietea* herbaceous vegetation, of which the *caulirosulati* would be a woody evolutionary equivalent.

Phisiognomical, ecological and floristical independence of this vegetation, as a special type among forest groupings [*Pruno-Lauretalia*] suggests that the rank of *alliance* should be used: *Euphorbion melliferae*. The biogeograhical scope of the proposed alliance should include, most probably, the vicariant *Euphorbia mellifera* dominated communities also found in the Canary Islands [c.f. RIVAS-MARTÍNEZ *et al*. (1993), *Itin. Geobot*. 7: 169-364].

* ***Euphorbion melliferae*** Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã alliancia nova hoc loco

[Typus: *Isoplexido sceptri-Euphorbion melliferae* Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã ass. nova; characteristic taxa: *Euphorbia mellifera, Isoplexis sceptrum*, Melanoselinum decipens*, Musschia wollastonii *, Sonchus fruticosus**; *territorial of Madeiran Province]. Affiliated to the *Pruno hixae-Lauretalia novocanariensis* Oberdorfer ex Rivas-Martínez *et al*. 1977 *corr*. Rivas-Martínez *et al*. 2002; *PRUNO - LAURETEA NOVOCANARIENSIS* Oberdorfer 1965 corr. Rivas-Martínez *et al*. 2002].

1 - ***Isoplexido sceptri-Euphorbietum melliferae*** Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã associatio nova hoc loco

[*typus*: relevé #2 table 1]

[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 - *Isoplexido sceptri-Euphorbietum melliferae*

# of relevé	1	2	3
m.s.m. (1=10m)	102	102	.
Area (m^2)	400	400	300
Aspect	NW	NW	NE
Characteristic combination			
Euphorbia mellifera	2	3	3
Isoplexis sceptrum	1	2	1
Sonchus fruticosus	3	2	1
Erysimum bicolor	1	1	1
Melanoselinum decipiens	2	1	.
Musschia wollastonii	1	2	.
Characteristic of higher syntaxa			
Clethra arborea	.	1	+
Teline maderensis	+	.	.
Erica maderinicola	+	+	
Rubus bollei	+	.	.
Rubia agostinhoi	+	.	
Vaccinium padifolium	.	+	+
Phyllis nobla	1	2	2
Sibthorpia peregrina	.	.	1
Rosa mandonii	.	+	.
Ocotea foetens - pl.			1
Succisa pratensis	+	1	.
Origanum virens	.	+	.
Geranium palmatum	1	2	1
Pericallis aurita	+	.	+
Bystropogon punctatus	+	1	+
Dactylorhiza foliosa	+	.	.
Ageratina adenophora	1	.	.
Rubus bollei	.	+	+
Argyranthemum pinnatifidum	+	+	.
Erigeron karvinskianus	+	1	+
Hypochaeris radicata	.	+	.
Festuca donax	+	1	.
Pteris incompleta	.	+	1
Cirsium latifolium	.	+	+
Tolpis macrorhyza	.	1	.
Cedronella canariensis	+	.	.
Stegnogramma pozoi	.	+	+
Arachniodes webbianum	.	+	.
Aichryson divaricatum	+	.	+
Ranunculus cortusifolius	.	+	+
Carex peregrina	.	+	.
Blechnum spicant	.	+	.
Carex lowei	.	+	+
Dryopteris aitoniana	.	+	.
Davallia canariensis	.	+	.
Brachypodium sylvaticum	.	1	+
Doodia caudata	.	+	.

Sites: 1,2 Folhadal; 3: Fajã da Nogueira.

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