

# THE VARIETY OF GIBRALTAR'S FLORA

Leslie Linares / Lcdo. en C.C. de la Educación, Universidad de Londres

## Abstract.

*Although Gibraltar covers an area of only two and a quarter square miles, it contains a richness in its flora which is not commensurate with its size. About 600 species of flowering plants can be found in Gibraltar. This richness comes about mainly because of the variety of habitats which can be found in such a small area. These habitats include: limestone cliffs, rocky shoreline, sandy shoreline and consolidated sand-dunes, maquis, garrigue, steppe. Although a few species can be found in most of these habitats, each one harbours a unique community of plants which often cannot be found outside the particular habitat. Special mention must be made of the East Side sand slopes and Windmill Hill Flats. This presentation will consist of an illustrated tour of each habitat, concentrating on the typical plants found in them, and in particular those which are not found outside the habitat concerned. Illustration will be through colour slides.*

## Resumen.

*Aunque Gibraltar solo cubre una superficie de unos 8 kilómetros cuadrados, contiene una riqueza florística mas grande de la que le correspondería por su tamaño. Unas 600 especies de plantas vasculares se pueden ver en Gibraltar.*

*Esta riqueza es resultado de la variedad de habitats que se encuentran en una zona tan pequeña. Estos incluyen: acantilados de caliza, orillas rocosas, orillas arenosas y dunas consolidadas, matorral (maquis y garrigue), terreno abierto.*

*Aunque pocas especies crecen en todos estos habitats, cada uno alberga una comunidad única de plantas que muchas veces no pueden verse fuera de cada uno de ellos. En esto destacan los arenales del lado este y Windmill Hill Flats. Esta presentación dará un tour de cada habitat, concentrándose en las plantas típicas de cada uno, sobre todo las que no se encuentran fuera de cada uno.*

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The flora of Gibraltar consists of around 520 species, representing a total of 85 families and 328 genera. These totals include native species and also introduced species which have become naturalised or semi-naturalised. When one considers that Gibraltar has an area of just two and a quarter square miles, and definitely not all in its natural state, it may seem quite surprising to find such a large variety of species. However it should not come as such a surprise since Gibraltar contains very diverse habitats, even in such a small area. These habitats include:

- (a) Maquis
- (b) Clearings in the Maquis, including firebreaks
- (c) Garigue
- (d) Steppe
- (e) Limestone cliffs and rocky outcrops
- (f) Coastal cliffs
- (g) Consolidated coastal sand dunes
- (h) Rocky shoreline
- (i) Urban areas and waste ground

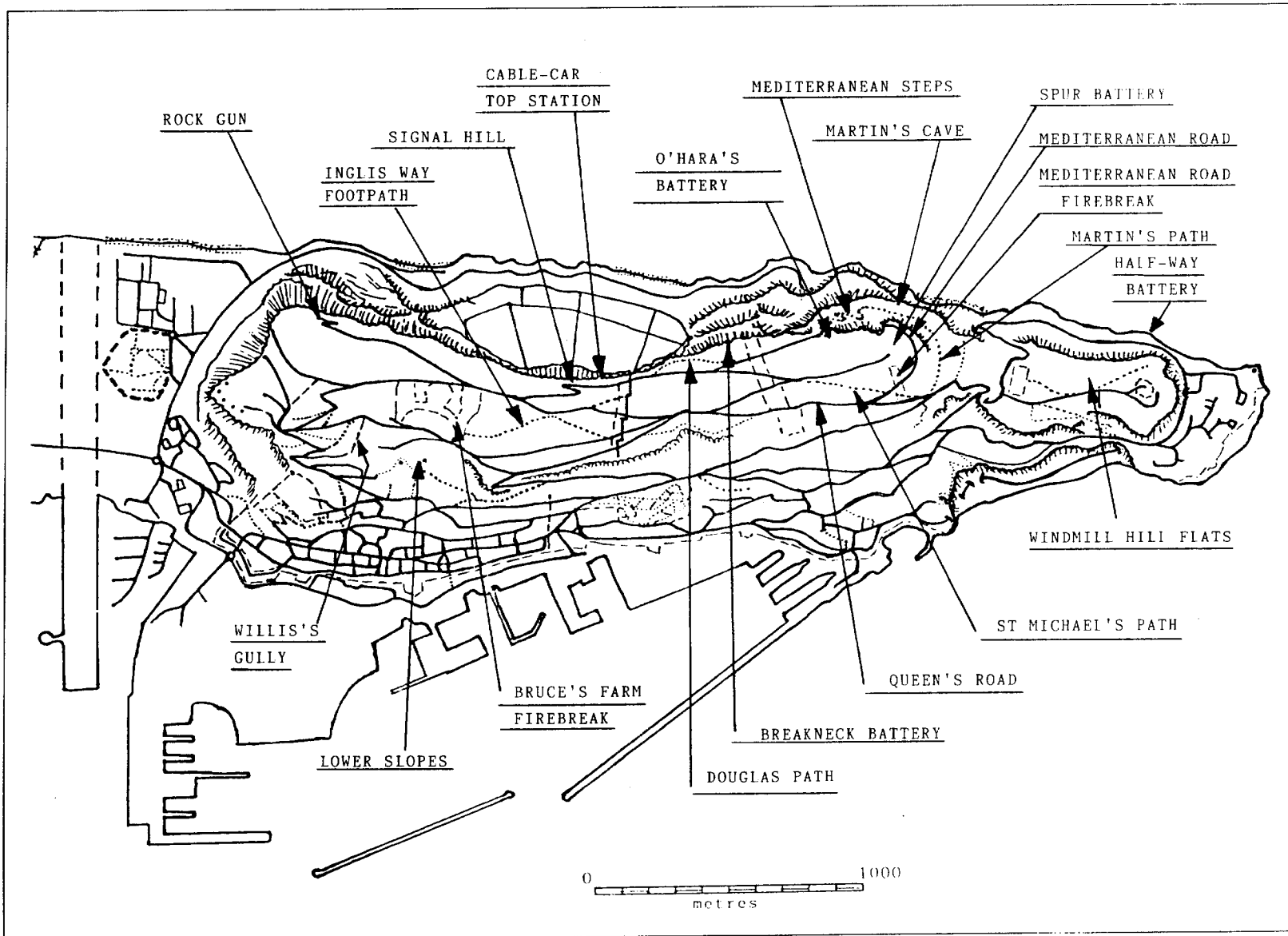
Each of these habitats harbour a distinct community of plants, but at the same time, the closeness to each other results in many species being found across all or some of these habitats. This paper attempts to highlight those species which may typically be found in each of the above habitats, and comments on those which are of special interest.

### **The Maquis**

This covers most of the Upper Rock and contains typical Mediterranean scrub vegetation. Among these are:

*Olea europaea* L.; *Pistacia lentiscus* L.; *Pistacia terebinthus* L.; *Rhamnus alaternus* L.; *Calicotome villosa* (Poiret) Link; *Coronilla valentina* L.ssp *glauca* (L.) Batt.; *Teline linifolia* (L.)Webb & Berth; *Osyris quadripartita* Salzm. ex Decne; *Aristolochia baetica* L.; *Clematis cirrhosa* L.; *Jasminum fruticans* L.; *Rubia peregrina* L.; *Lonicera implexa* Aiton; *Ruscus hypophyllum* L.; *Smilax aspera* L.; *Tamus communis* L..

There are scattered specimens of *Quercus coccifera* L.; *Celtis australis* L.; *Anagyris foetida* L.; *Ceratoniasiliqua* L.; *Crataegus monogyna* Jacq. ssp *brevispina* (G.Kunze) Franco; *Phillyrea latifolia* L.. These latter species are not common, and some very localised, e.g. *Q. coccifera* can only be found around Breakneck Battery, and *P. latifolia* in a small area North of the cable-car station.



### Clearings and Firebreaks

Clearings in the Maquis are few and far between. The main clearings are due to the hand of man, such as in the case of the firebreaks and disused catchment areas. But here we also include roadsides and footpaths which provide excellent habitats for plants. Among the most commonly found are: *Chamaerops humilis* L.; *Rumex intermedius* DC.; *Ranunculus bullatus* L.; *Lobularia maritima* (L.)Desv. (actually found in virtually all habitats); *Oxalis pes-caprae* L.; *Geranium purpureum* Vill.; *Ruta angustifolia* Pers.; *Anagallis arvensis* L. (the blue form is widespread, but the scarlet form is very rare, except at Windmill Hill where it is common.); *Centaurium erythraea* Rafn ssp *erythraea*; *Convolvulus althaeoides* L. ssp *althaeoides*; *Vinca difformis* Pourret ssp *difformis*; *Teucrium lusitanicum* Schreber; *Lavandula dentata* L.; *Linaria tristis* (L.) Miller; *Pallenis spinosa* (L.)Cass. ssp *spinosa*; *Carlina corymbosa* L. ssp *corymbosa*; *Andryala integrifolia* L.; *Asphodelus ramosus* L.; *Scilla peruviana* L.; *Allium roseum* L.; *Asparagus albus* L.; *Narcissus papyraceus* Ker-Gawler ssp *papyraceus*; *Gladiolus communis* L. ssp *byzantinus* (Miller) A.P.Hamilton; *Melica minuta* L. *Freesia refracta* (Jacq.)Ecklon ex Klatt may be found in many places, and over the last few years has been increasing in numbers. The same can be said of *Acanthus mollis* L. ssp *platyphyllos* Murb. which is taking over many roadsides, clearings and firebreaks.

The Leguminosae are well represented, and common ones are *Psoralea bituminosa* L.; *Lathyrus clymenum* L.; *Trifolium stellatum* L.; *Trifolium tomentosum* L.; *Lotus collinus* (Boiss.)Heldr., and many others.

Less common are: *Delphinium pentagynum* Lam.; *Reseda alba* L.; *Euphorbia characias* L. ssp *characias* (which is restricted to an area below Signal Hill); *Asteriscus aquaticus* (L.)Less. (which is restricted to the Southern end of Inglis Way footpath); *Scilla autumnalis* L.; *Asparagus aphyllus* L.; *Leucojum autumnalis* L.; *Iris flifolia* Boiss. (which is restricted to Douglas Path and Rock Gun); *Cheilanthes acrosticha* (Balbis)Tod. (which may only be found along St.Michael's Path and Queen's Road below); *Carthamus lanatus* L. ssp *baeticus* (Boiss. & Reuter)Nyman (which is restricted to a very small area along Queen's Road).

Quite rare are *Asplenium billotii* F.Schultz and *Asplenium onopteris* L.. This is not surprising since these prefer more acid soil. However, these two species have found themselves a rather surprising niche: the bases of the stems and roots of *Chamaerops humilis*. It is quite likely that here they have the most suitable conditions possible on the Rock. *A. billotii* may only be found along Mediterranean Steps, and *A.onopteris* along Douglas Path.

Apart from most of the above plants, Bruce's Farm Firebreak also contains a few plants which cannot be found elsewhere on the Rock. These are: *Hypericum perforatum* L.; *Nepeta tuberosa* L. ssp *tuberosa*; *Campanula rapunculus* L.; *Parentucellia viscosa* (L.)Caruel (though limited numbers are also found on the Lower Slopes). Mediterranean Road Firebreak is also the only site for *Logfia gallica*(L.)Cosson & Germ., while it also contains a good stand of *Sideritis arborescens* Salzm. ex Bentham ssp *arborescens*, *Polygala rupestris* Pourret and *Euphorbia exigua* L. which are rare. *Daphne gnidium* L. may be found in some of the firebreaks and nowhere else.

### Garigue

Many of the plants which grow on clearings of the Maquis may also be found in the few Garigue habitats on the Rock. A special mention must be made of the area between Martin's Path and Spur Battery, including Mediterranean

Road. On the Upper parts of this area, grow *Cistus albidus* L., *Cistus salvifolius* L. and *Helianthemum origanifolium* (Lam.)Pers. ssp *origanifolium*. These are plants of more acid soil, so the conclusion must be reached that there must be a pocket of acid soil in these parts.

*Cliffaces and Rocky outcrops generally*

Again, many of these plants also grow on clearings of the Maquis, but thrive best among limestone rocks, be it on the Rock face or in outcrops of limestone anywhere on the Upper Rock. Typical of these are:

*Polypodium australe* Fee; *Cerastium gibraltarium* Boiss.; *Iberis gibraltaria* L.; *Umbilicus horizontalis* (Guss.)DC.; *Sedum sediforme* (Jacq.)Pau; *Sedum album* L.; *Sedum rubens* L.; *Saxifraga globulifera* Desf.; *Thapsia villosa* L.; *Thymus willdenowii* Boiss.; *Allium triquetrum* L.; *Arisarum simorrhinum*. Durieu.

Quite rare are *Dianthus caryophyllus* L. (which is restricted principally to Rock Gun and Douglas Path); *Anthyllis vulneraria* L. ssp *maura* (G.Beck.)Lindb. (which is very rare and may only be found along the ridge from O'Hara's Battery to Signal Hill); *Chaenorrhinum villosum* (L.) Lange ssp *villosum*; *Selaginella denticulata* (L.)Link (which is very rare and is only found on damp rocks deep inside Williss' Gully and also in the Southern Gully of the



*Malcolmia littoa* and *Ononis natrix* on the east sand slopes

Lower Slopes). Of special interest is *Echium boissieri* Steudel, which is rare and is only found on the cliffs above Mediterranean Steps.

### *Coastal areas, including cliffs and shoreline, but not the Eastern sand slopes*

This rather hostile habitat harbours quite a number of interesting species, some of which are quite rare. Nearer the sea may be found *Suaeda vera* J.F.Gmelin (which is rare), *Limonium emarginatum* (Willd.) O.Kuntze and *Frankenia laevis* L.. Further up, may be found *Limonium sinuatum* (L.) Miller; *Senecio leucanthemifolius* Poir.; *Mesembrianthemum nodiflorum* L. (which is rare) and *Mesembrianthemum crystallinum* L. (which is very rare and restricted to the area around Half-way Battery). Also at this latter site may be found the very rare *Spergularia fimbriata* Boiss.. Common in this habitat are *Senecio bicolor* (Willd.) Tod. ssp *cineraria* (DC.) Chater; *Glaucium flavum* Crantz.; *Daucus carota* L. ssp *maximus* (Desf.) Ball.; and *Disphyma crassifolium* L. Bolus which has become naturalised in the area.

### *The Eastern Sand Slopes*

This is a habitat which contains a rich and diverse community of plants. This would seem unlikely if seen during the summer, but during a short flowering period between April and June, the slopes are ablaze with colour. Typical of the plants are:

*Silene nicaeensis* All.; *Delphinium nanum* DC.; *Malcolmia littorea* (L.) R.Br.; *Cakile maritima* Scop. ssp *maritima*; *Ononis natrix* L. ssp *ramosissima* (Desf.) Batt.; *Lotus creticus* L.; *Crithmum maritimum* L.; *Linaria pedunculata* (L.) Chaz.; *Centaurea sonchifolia* L.; *Dipcadi serotinum* (L.) Medicus ssp *serotinum*; *Allium sphaerocephalon* L. ssp *sphaerocephalon*; *Vulpia alopecuroides* (Schousboe) Dumort; *Elymus farctus* (Viv.) Runemark ex Melderis; *Cyperus capitatus* Vandelli; *Rumex bucephalophorus* L.. Most of these may only be found here.

Less common are:

*Dianthus broteri* Boiss. & Reuter; *Euphorbia baetica* Boiss.; *Cachrys libanotis* L.; *Verbascum giganteum* Willk. ssp *martinezii* Valdes; *Jasione montana* L. ssp *blepharodon* Boiss. & Reuter; *Hypochaeris salzmanniana* DC.; *Reichardia gaditana* (Willk.) Coutinho; *Pancratium maritimum* L..

Even less common are:

*Silene littorea* Brot.; *Erodium laciniatum* (Cav.) Willd.; *Cutandia maritima* (L.) W.Barby (which is rare and becoming more so with the dumping of rubble on the site where they grow); *Eryngium maritimum* L. (which is very rare, only 6 plants having been observed to date); *Medicago marina* L. (which is very rare, and has been almost totally wiped out due to the dumping/reclamation taking place over their only site).

### *Steppe: Windmill Hill Flats*

Windmill Hill Flats, and to a lesser degree Europa Flats below, provide a unique habitat on the Rock. The habitat is very exposed to strong winds, the soil is poor and drains quickly, and all in all, offers plants a rather hostile environment. The result is a community of tough plants, many of which are found elsewhere but a number of which are not. Within this area, there are also more protected parts which form a Garigue habitat, while a small area is quite overgrown, resembling low Maquis.

Much of the flat area is covered by *Asteriscus maritimus* (L.) Less., but other plants cover the ground, among which are *Ornithogalum orthophyllum* L. ssp. *baeticum* (Boiss.) Zahar; *Salvia verbenaca* L. (which only grows here); *Gynandris sisyrinchium* (L.) Parl.; *Aegilops geniculata* Roth. (which only grows here); *Romulea bulbocodium* (L.) Sebastiani & Mauri; *Scolymus hispanicus* L.; *Echium plantagineum* L. (which only grows here); *Mantisalca salmantica* (L.) Briq. & Cavillier (which only grows here); *Minuartia geniculata* (Poir.) Thell.; *Centaurea calcitrapa* L. (which is rare and only grows here); *Tetragonolobus purpureus* Moench; *Hedysarum coronarium* L. (which is rare on the Rock, and only grows here); *Rapistrum rugosum* (L.) All. ssp. *rugosum* (which only grows here); *Ecballium elaterium* (L.) A. Richard. There are also some very rare plants: *Thesium humile* Vahl (of which there are very few plants, around 10); *Crocus serotinus* Salisb. ssp. *salzmannii* (Gay) Mathew (which is restricted to a very small area); *Atractylis cancellata* L. (which is rare and apart from here, also grows in a small stand at Martin's Path); *Echium parviflorum* Moench (which is rare and only found here, except for a few plants at Martin's Cave).

#### *Urban areas and waste ground*

The plants which use these habitats have plenty to choose from: construction sites, derelict ground, the city walls, the walls of ancient monuments e.g. Moorish Castle, rooftops, pavements and roadsides especially outside the city walls, gardens and other planted plots, etc. There are no special plants to mention here since they are common throughout the region and beyond, but suffice to name just a few of the most common: *Urtica membranacea* Poir.; *Parietaria judaica* L.; *Chenopodium ambrosioides* L.; *Sagina apetala* Ard ssp. *apetala*; *Umbilicus rupestris* (Salisb.) Dandy; *Malva sylvestris* L.; *Torilis arvensis* (Hudson) Link ssp. *neglecta* (Schultes) Thell.; *Nicotiana glauca* R.C. Graham; *Antirrhinum majus* L. ssp. *cirrhigerum* (Ficalho) Franco; *Trachelium caeruleum* L. ssp. *caeruleum*; *Solanum villosum* Miller; *Chrysanthemum coronarium* L.

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