

LOOKING FOR CRASSULACEAE ON MADEIRA

Marco Cristini has become well-known as an expert on Crassulaceae. Here, he tells us about his exploration of Madeira. Photographs by Marco Cristini

Introduction

Madeira is an island situated in the Atlantic Ocean, 520km west of Morocco (Figure 1). Geographically, it belongs to Africa, but it was settled by the Portuguese in the fifteenth century and has been part of Portugal since then. Together with the Azores, the Canary islands and Cape Verde, Madeira forms the so-called Macaronesia, a bioregion rich in plant endemisms, many of which are relics of the flora that covered most of Northern Africa before the expansion of the Sahara desert and the disappearance of the laurisilva (laurel forest) from the shores of the Mediterranean. Madeira means “wood” in Portuguese, since the island was entirely covered by a subtropical rainforest when the first settlers arrived. In following decades, they set fire to many areas to clear the land for farming, but the northern slopes managed to escape the worst of the deforestation

process and are now a UNESCO World Heritage Site.

I visited Madeira for ten days in August 2022 to look for the endemic *Crassulaceae* species. The island is well connected to the main European airports, but is considerably less touristic than Tenerife or Gran Canaria, enabling visitors to catch a glimpse of a genuine Macaronesian environment. In the following pages, I will offer a brief overview of the most botanically interesting places I visited, with a few remarks on the plants I observed.

The Funchal area

Several *Crassulaceae* species grow near Funchal, the main city of the island, from which one can easily reach the other towns by either bus or car, therefore I decided to stay in Funchal and start exploring Madeira from its surroundings. On the first day, I took the cable



Figure 1. Map of Madeira (source: www.madeira-reisetipps.com).



Figure 2. The church of Nossa Senhora do Monte, north of Funchal.

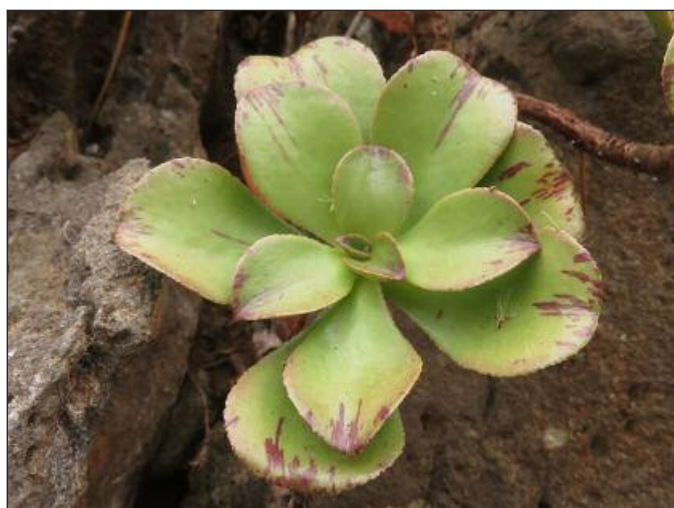


Figure 3 & 4. *Aeonium glutinosum* growing near Monte.



Figure 5. The stem of *Aeonium glutinosum* is quite sticky.



Figure 6. Flowers of *Aeonium glutinosum* on the upper levata of Ribeira do Curral das Freiras.



Figure 7. An almost stemless *Aeonium glutinosum* near Moledos.

railway to Monte, a village located north of Funchal (at an altitude of 550m) which is famous for the church of Nossa Senhora do Monte, where Charles I of Austria (1887–1922), the last Austro-Hungarian Emperor, is buried (Figure 2). Monte is the starting point of several paths crossing the surrounding mountains. I suggest to avoid that leading northwards to the chapel of Nossa Senhora da Paz, since it is uphill and remarkably free of *Crassulaceae* species apart from the omnipresent dry inflorescences of *Umbilicus rupestris*, which I observed throughout the island. According to Short (1994), both *Umbilicus rupestris* and *U. horizontalis* grow on the island, but the latter has been recorded infrequently and I suspect that some specimens of *U. rupestris* with flowers looking more horizontal than usual have been mistaken for *U. horizontalis*. Be that as it may, all inflorescences were spent at the time of my visit and I was unable to verify the presence of two different *Umbilicus* species on the island, although the dry specimens I saw looked quite similar to *U. rupestris*.

The path leading southwards from Monte to the Botanical Garden of Funchal is by far more rich in succulents. The first species that is likely to be spotted is *Aeonium glutinosum*, which is very common on Madeira (Figures 3&4). It is a shrub usually up to 60cm tall (but I saw specimens taller than 1m in shaded locations). Stems are ascending or decumbent, 7–20mm in diameter, sticky and therefore often covered with dust and debris, making them



Figure 8. A bushy *Aeonium glutinosum* on the old coastal road west of São Vicente.



Figure 9. *Aeonium glandulosum* near Monte.

appear dark or even black (Figure 5). Rosettes are 12–22cm in diameter, with pale green to deep green leaves, 7–12cm long, 3–5.5cm broad, 2–4.5mm thick, obovate-spatulate, slightly wavy, acute on the apex, glabrous, sticky (especially in the first stages of growth), with darker stripes along the central axis and near the apex. Inflorescences are 15–60cm tall, with a sticky stem. Flowers have 8–11 yellow petals, with reddish veins on the lower surface. In mid-August, most inflorescences were spent, but I was able to see a few flowers still open (Figure 6).

A. glutinosum can take on different shapes: plants growing on cliffs are often almost stemless (Figure 7), whereas in flat locations the succulent may look similar to a small *A. arboreum* (Figure 8). This plant was once used by Madeiran fishermen to reinforce and waterproof fishing nets, which were rubbed with



Figure 10. A flat *Aeonium glandulosum* on the old coastal road west of São Vicente.

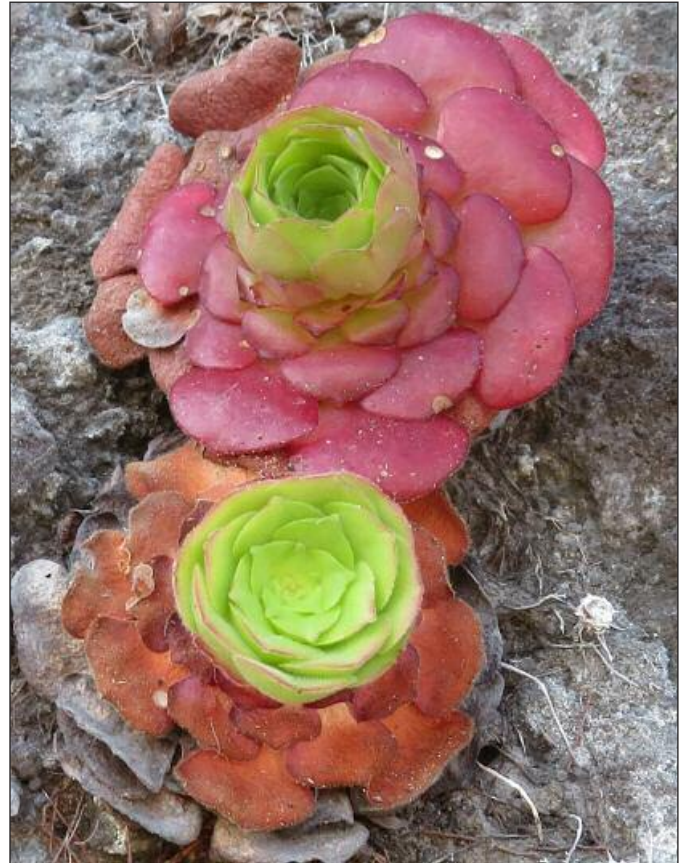


Figure 11. Two cup-shaped *Aeonium glandulosum* on the old coastal road west of São Vicente.



Figure 12. *Sedum fusiforme* on Pico do Rancho.



Figure 13. Flowers of *Sedum fusiforme* on Pico do Rancho.

fragments of the stem until they became dark and perfectly smooth, almost as if they had been covered with a layer of wax (Lowe 1868). A similar practice was also widespread on Lanzarote with *A. balsamiferum* and in Portugal with *A. arboreum* (Bolle 1892).

Climbing down towards Funchal, I saw several spent inflorescences of *Aichryson* and a small plant of *Aichryson divaricatum*, which is however more widespread in the upper laurisilva. Small specimens of *Aichryson villosum* were present as well. At an altitude of around 350m, I spotted the second endemic *Aeonium* of Madeira, namely *A. glandulosum* (Figure 9), which is said to grow mainly on cliffs along the northern coast, but I observed plenty of specimens in southern Madeira (one even near Ponta do Garajau, in the southernmost part of the island), in shady and sheltered places, where it is often only exposed to direct sunlight for a few hours a day. Unlike *A. glutinosum*, *A. glandulosum* is mostly a single plant, only occasionally with a few stolons. Stems are inconspicuous and very short, bearing rosettes

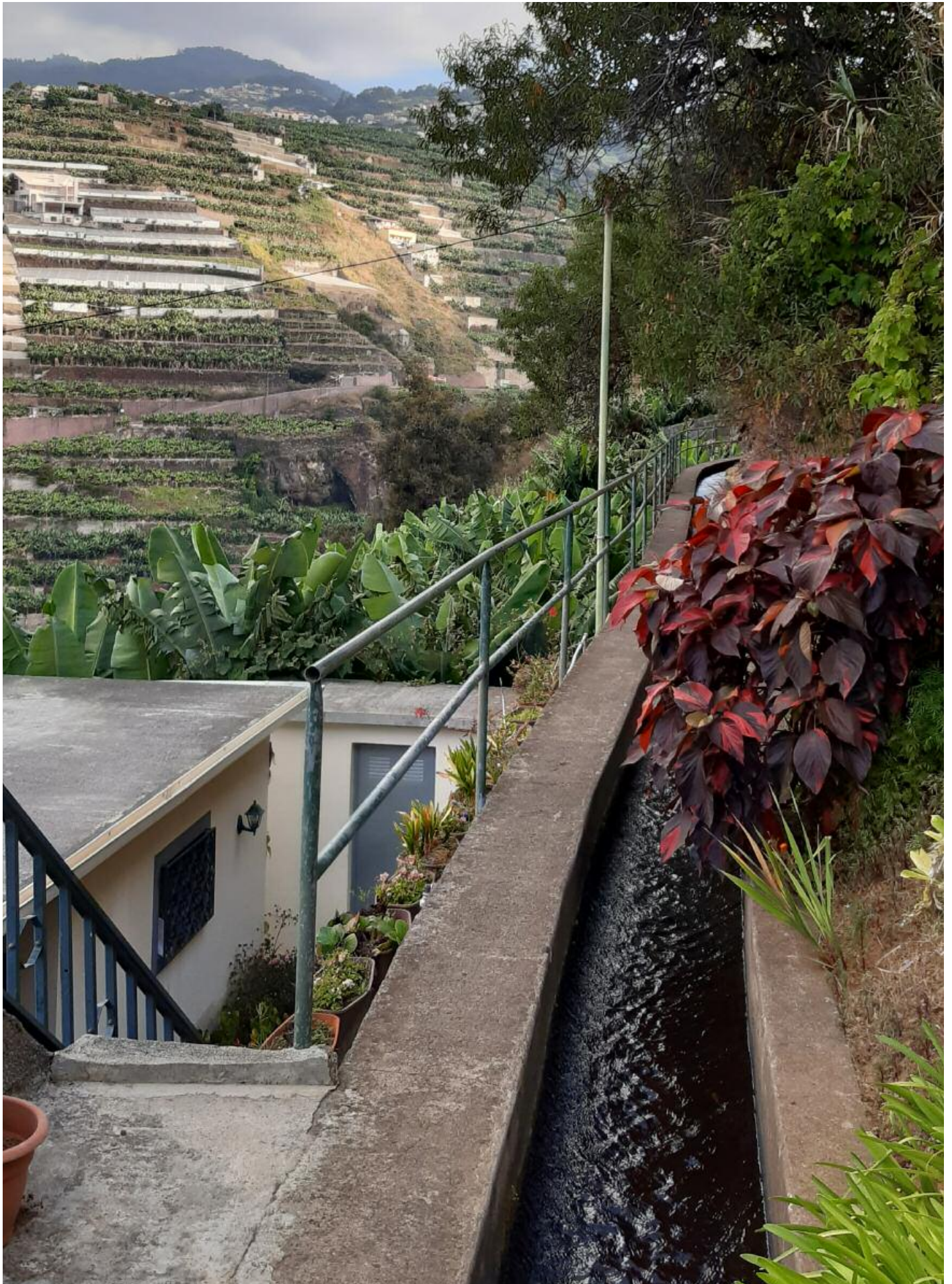


Figure 14. The lower *levada* in the Nuns' Valley.



Figure 15. *Sedum fusiforme* on the lower levada in the Nuns' Valley.

12–45cm in diameter, often cup-shaped. Leaves are light green when young, purple-red when more mature and exposed to the sun, 6–20cm long, 3–8cm wide, 3–5mm thick, imbricate, obovate or oblanceolate, finely pubescent, mucronate, with acute apex and margins adorned with cilia and small glands (hence the name), with a discernible smell of balsam. According to Praeger (1932), *A. glandulosum* grows in

summer, when the rosette becomes cup-shaped, while in winter it is flatter, unlike the Canary Island species, which mostly grow in winter, but I observed both cup-shaped and flat specimens in August 2022 (Figures 10 & 11). Inflorescences are 6–30cm tall and flowers have on average 8–13 yellow petals. The anthesis usually takes place between April and July. I was unable to spot an open flower and didn't see many recent inflorescences, thereby confirming what was already noted by Arnold (2005) and Schulz (2007), namely that there are massive flowerings in some years, whereas only a few specimens produce inflorescences in others.

Another good place to observe Madeiran succulents is the path between Cabo Girão and Pico do Rancho. Cabo Girão is a high cliff overlooking the ocean, on whose summit there is a *miradouro* (observation point) with a stunning view of the southern coast of Madeira. It can easily be reached by bus, and then it is possible to walk (downhill) to Funchal. The path crosses a mountain called Pico do Rancho, where I saw the rare *Sedum fusiforme*, a small



Figure 16. Ponta de São Lourenço.

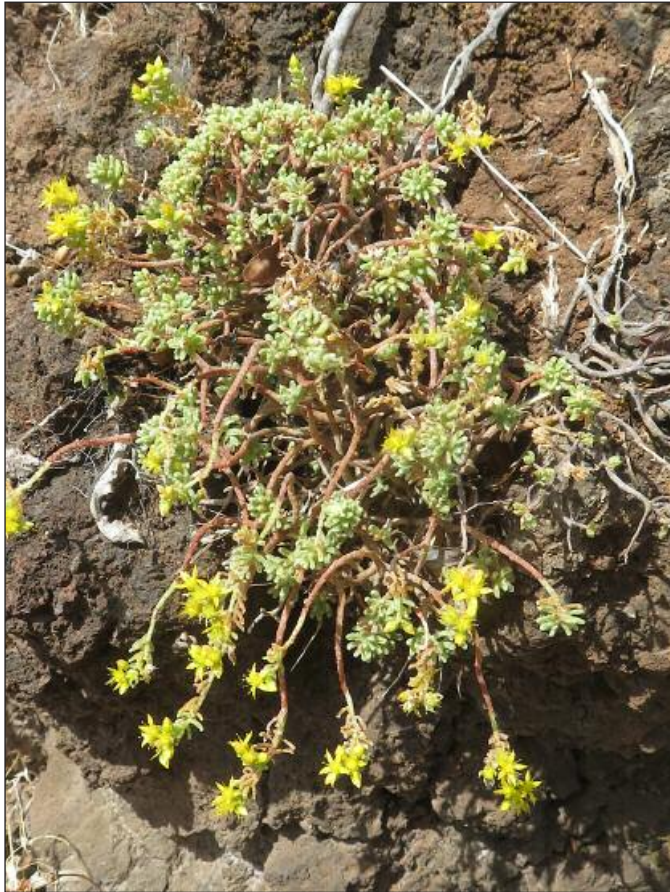


Figure 17. *Sedum nudum* growing at Machico.

succulent up to 15–20cm tall, with several tortuous branches bearing alternate, sessile, elliptic to oblong, subterete leaves, 5–10mm long, which are often crowded at the stem tips (Figure 12). Leaves are usually glaucous and show a brownish red central stripe if exposed to the sun. Inflorescences are quite short (4–8cm) and with a few flowers bearing acuminate, yellow petals, 7–9mm long, sometimes mottled or spotted with red on the inside. I was fortunate enough to spot several inflorescences still in bloom (Figure 13). *S. fusiforme* grows on rocks and stone walls along the path and also on the cliffs overlooking the sea, which are its main habitat. On Pico do Facho, I also spotted the omnipresent *Aeonium glutinosum*, as well as a few small and reddish specimens of *Aeonium glandulosum*. When I reached the shore, 500m east of Camara de Lobos, I noted that *A. glutinosum* grows at an altitude of less than 10m, on some rocks in front of the sea, in a place which is possibly reached by some spray of sea water during storms.

A must-see for every tourist visiting Funchal are the so-called *levadas*, aqueducts bring-



Figure 18. Flowers of *Sedum nudum* at Machico.



Figure 19. *Aichryson villosum* near Santo António da Serra.



Figure 20. *Aeonium x meyerheimii* near Machico.

ing water from the mountains to the coast that have been carved into cliffs and rock faces. They are made up by the duct itself, which is mostly open, and a narrow footpath between the duct and the precipice, which is usually



Figure 21. São Vicente seen from the old coastal road.

(but not always!) provided with a handrail (Figure 14). On the eastern slope of the so-called Nuns' Valley (valley of Ribeira do Curral das Freiras in Portuguese), located between Camara de Lobos and Funchal, there are two *levadas* crossing a *Crassulaceae*-rich area. The lower *levada* is the most difficult of the two, and definitely not recommended for those suffering from vertigo, but you can find nice specimens of *Aeonium glandulosum* and plenty of *Sedum fusiforme* along it, at an altitude of around 200m (Figure 15), as well as *Aeonium glutinosum*, *Aichryson villosum* and the omnipresent *Umbilicus rupestris*. The upper *levada*, which can be reached from the neighbourhood of Santa Quitéria, is easier in the first part and allows you to observe *Aeonium glandulosum*, *A. glutinosum*, *Aichryson villosum* and possibly *A. divaricatum* as well (I spotted several glabrous, dry inflorescences that might well belong to this species). However, the *levada* becomes much trickier 2km north of Santa Quitéria, where I had to turn back, since it was interrupted by several waterfalls, which made the narrow footpath slippery, and was partially

obstructed by ferns and other plants.

Less interesting is the Levada dos Tornos, leading from Caniço to Curral dos Romeiros, along which I only observed *Aichryson divaricatum* and *Umbilicus rupestris*. Curral dos Romeiros is the starting point of another *levada*, namely Levada do Bom Sucesso, which is richer in succulents, since I found *Aeonium glandulosum* (only at an altitude of around 600m), *A. glutinosum*, *Aichryson villosum* and *Umbilicus rupestris*. However, the *levada* becomes increasingly tricky while leading northwards and must be abandoned at the end, since it disappears into a gallery. I suggest to turn back as soon as the first waterfalls cross the *levada*.

Eastern Madeira

One of the most popular excursions on Madeira is the path crossing Ponta de São Lourenço, a narrow peninsula at the eastern tip of the island with impressive views of the ocean (Figure 16). I went there mainly because *Sedum nudum* had been spotted between Caniçal and Ponta de São Lourenço (Lowe



Figure 22. *Sedum brissemoretii* along the coastal road east of São Vicente.

1868; Stephenson 1998b), but I was unable to find any specimen apart from a single tuft growing right behind a small restaurant named Casa do Sardinha. I do not know for certain if *S. nudum* was brought there on purpose, but I suspect it, since nearby rocks and cliffs were entirely devoid of any *Crassulaceae* species. I only spotted a few, tiny and much stressed specimens of *A. glutinosum* near the narrowest point of the peninsula, on a south-facing slope. I walked on the coastal road until Caniçal and then along the path leading from this town to Pico do Facho, but was again unable to spot *Sedum nudum*, although 't Hart (1998) found it on this mountain. I only observed *Aeonium glutinosum* there.

After a few days, I returned to the eastern part of Madeira and decided to explore the area around Machico. This time, I had more luck. Just outside the town, I found plenty of *Sedum nudum* on a path named Caminho das Voltinhas, at an altitude of less than 50m, on rocks facing north-east. It is a nice, small and bushy succulent, with tortuous, brittle, much-branched stems up to 5–10cm tall (Figure 17).



Figure 23. A flower of *Sedum brissemoretii* east of São Vicente.



Figure 24. *Aeonium glandulosum* growing on rock cliffs over the old coastal road west of São Vicente.



Figure 25. *Sedum farinosum* near Pico do Jorge.

Leaves are linear to oblong, rounded, terete, green, often tinged with red, 3–6mm long. Inflorescences bear few tiny, 5-merous, yellow



Figure 26. *Aichryson divaricatum* near Boca das Torrinhas.

flowers, and were in full bloom during my visit (Figure 18). Together with *Sedum nudum*, I spotted several plants of *Aeonium glandulosum*, *A. glutinosum* and *Umbilicus rupestris*. Then, I again found *S. nudum* at an altitude of around 200m. As far as aichrysons are concerned, I only spotted *A. villosum* in a very shady and damp place near Santo António da Serra (at around 250m; Figure 19). The path between Machico and Santo António da Serra is botanically rewarding but tiring, since it is uphill and initially crosses a sunny slope with little shade or fresh air. The Levada do Caniçal, north of Machico, is easier and boasts the same species of the other path with the exception of *Sedum nudum*. Here, I also spotted a cross between *A. glandulosum* and *A. glutinosum*, namely *A. xmeyerheimii* (Figure 20). Its rosette is clearly intermediate between those of its parents.

Northern Madeira

Turning now to northern Madeira, the village of São Vicente offers a good opportunity to spot several species of *Crassulaceae*. The cliffs on the coast, right behind the houses located in



Figure 27. A flower of *Sedum farinosum* near Boca da Encumeada.

front of the ocean (Figure 21), are covered with *Sedum brissemoretii*, a small succulent which is quite similar to *Sedum nudum*, but grows in entirely different habitats. In fact, *S. brissemoretii* can usually be found in full shade, whereas *S. nudum* prefers sunny places. Moreover, the latter is often tinged with red and has club-shaped leaves that are upturned at the ends. On the other hand, *S. brissemoretii* is almost never bronzed and its leaves show no tendency to turn up at the ends (Figure 22). Flowers differ as well, since they are tiny and with narrow petals in *S. nudum* (see Figure 18), much bigger and with wider, paler petals in *S. brissemoretii* (Stephenson 1998b; see Figure 23). *Sedum brissemoretii* is listed as vulnerable in the IUCN Red List, with allegedly 250–1000 mature individuals, but I observed hundreds of plants on the cliffs immediately behind São Vicente. The plant has been spotted on the northern coast of Madeira near Seixal and Porto Moniz as well (Hamet 1925; Stephenson 1998b; Capelo 2004), not to mention the populations seen around Calheta, Paul do Mar and Santana ('t Hart 1999; Brand 2016), therefore I believe that by far more than 1000 mature specimens survive in the wild. As stated by the Red List page on this succulent (Carvalho 2011), an updating of its status is needed.

Taking good pictures of *Sedum brissemoretii* in São Vicente can be difficult without an excellent telephoto lens. Fortunately, it grows abundantly along the coastal road east of the village, both on the rocks on which a chaplet has been built and on the cliffs next to the road



Figure 28. *Sedum farinosum* near Boca das Torrinhas.

itself. However, the best place to see the *Crasulaceae* growing in this area is undoubtedly the old coastal road west of the village, which was abandoned after the construction of a new road with many galleries. The old road can easily be reached from São Vicente and the cliffs over it are covered with well-grown specimens of *Aeonium glandulosum* (Figures 24 & 33). I only spotted a few plants of *Sedum brissemoretii* here, together with *A. glutinosum* and several spent inflorescences of an aichryson species, possibly *A. villosum*. The first part of the old road is quite safe, although littered with fallen rocks and branches. However, it becomes more tricky after briefly rejoining the new road and is interrupted by a waterfall shortly afterwards. Going on should be possible, but I contented myself with the plants I had already seen and turned back, since the road surface was becoming too slippery.

If the northern coast of Madeira is the habi-



Figure 29. *Aichryson villosum* near Boca das Torrinhas.

tat of *Sedum brissemoretii*, the central part of the island hosts another endemic stonecrop, namely *Sedum farinosum* (Figure 25). This species has often been reported from the western slopes of Pico Ruivo (1862), but I found plenty east of it. Instead of taking the tradi-

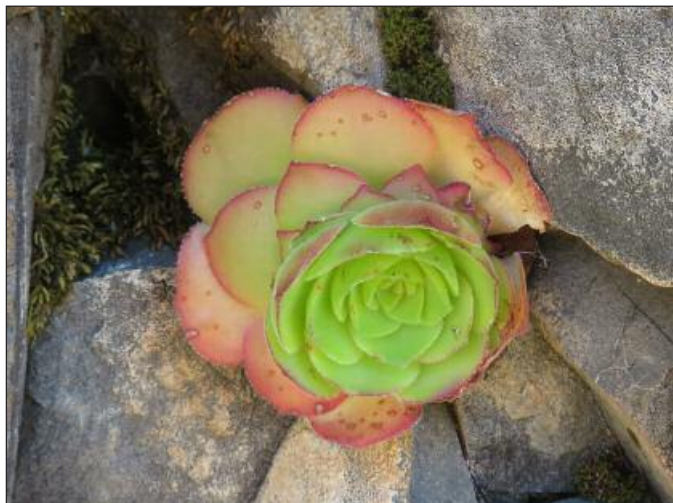


Figure 30. *Aeonium* aff. *glandulosum* near Casado, at an altitude of around 1700m.



Figure 32. *Sedum nudum* growing at Moledos, in southwestern Madeira.

tional tour of the central mountains of Madeira (hence arriving at an altitude of 1600m by car and then proceeding on foot towards the top of the mountain), I climbed from Faja dos Cardos and reached Boca das Torrinhãs after a couple of hours. Around 1300m, I found plenty of *Aichryson divaricatum*, a nice bushy succulent up to 50–60cm tall, with glabrous, rhomboid-orbicular, obtuse, pea-green leaves and 6- or 7-merous yellow flowers (Figure 26). Several specimens were in full bloom and they were much bigger than those I observed in other parts of the islands.

Shortly afterwards, I found the first colonies of *Sedum farinosum*, an attractive, mat-forming succulent with stems 4–8cm tall. Its most remarkable feature are the highly pruinose, ovoid to oblong, obtuse, semiterete, 3–6mm long, whitish leaves. Flowers are 5-merous and



Figure 31. A few reddish *Aeonium glutinosum* growing at Moledos.

white. Most of the inflorescences I saw were already spent, but I was able to spot a few flowers that were still open (Figure 27). *S. farinosum* is generally considered as rare (Jardim & Francisco 2000; Stephenson 2020), but I found plenty of it from Boca das Torrinhãs (1300m) to Boca da Encumeada (1100m), happily growing not only on rocks and cliffs (Figure 28), but even on the path itself. I imagine that the plant is equally widespread on the mountains south and north of the path (as indicated by Capelo 2004), therefore it seems to be pretty common in the mountainous, central part of Madeira. I also spotted several nice specimens of *Aichryson villosum* between Boca das Torrinhãs and Pico do Jorge (Figure 29). This succulent is usually smaller than *A. divaricatum*, being 3–15cm tall, and densely pubescent (hence the name: *villosus* means “hairy” in Latin). Its leaves are 10–30mm long, 8–25mm wide (but much smaller, immature specimens can often be found), rhomboid-spathulate and obtuse; flowers are 6- to 9-merous and yellow. I was unable to see an open flower in August 2022.

Near Casado, at an altitude of around 1700m, I saw a puzzling aeonium growing on a stone wall (Figure 30). At first sight, it looked like a small *A. glandulosum*, but its leaves were less pubescent and much stiffer. It might well be a cross between *A. glandulosum* and *A. glutinosum* (i.e. *A. ×meyerheimii*). Still, its leaves were not sticky and the specimen of *A. ×meyerheimii* I observed on the Levada do Caniçal looked quite different. Possibly, it is a local, high-altitude form of *A. glandulosum*.

Western Madeira

The only trip I made to western Madeira was to Arco da Calheta, in the hope of finding the extremely rare *Aichryson dumosum*, which reportedly grows in a single locality at around 300–400m. Although I think I managed to find the locality mentioned by Lowe (1868) and inspected “heaps or beds of bare loose rocky fragments” and stone walls (where the succulent is said to grow) for the best part of one day, I was unable to find it. While there, I took several pictures of an area covered with basaltic rocks with the telephoto lens of my camera and I possibly spotted a few dry, aichryson-like inflorescences upon re-examining the images, but this might well be wishful thinking... However, my trip was not entirely fruitless, since I saw several nice specimens of *Aeonium glutinosum* with reddish leaves (Figure 31) and a healthy population of *Sedum nudum*, growing at an altitude of around 300m (Figure 32).

As far as *Aichryson dumosum* is concerned, it should be a biennial plant with 20cm long stems, sometimes bushy in the upper quarter. Stephenson (1998a) reports that “in the wild only the top quarter or so of the plant is seen as the rest is hiding in a rock crack. Leaves are much longer and proportionately narrower in comparison to either of the two other endemic aichryson [...]. The whole plant is finely pubescent and terminates in simple, open inflorescences of 5-10-partite golden yellow flowers”. The succulent lives in an area of only 100 square metres and is considered as critically endangered. The good news is that it was seemingly spotted in July 2021, according to the iNaturalist website (<https://www.inaturalist.org/observations/86050474>), therefore it should still be present in the wild.

Conclusion

Madeira hosts a rich succulent flora and most *Crassulaceae* species are easy to find, provided that one knows where to look for them. A good map is essential, but a valid alternative can be the Kompass app, which I found useful in countless occasions, since it not only shows you the same map whose unfolding can be hazardous when you are precariously bal-



Figure 33. *Aeonium glandulosum* on the old coastal road west of São Vicente, Madeira.

anced on a windy *levada*, but also your position and direction. As I already mentioned, Madeira is by far less touristic than the Canary Islands, a circumstance that has its obvious advantages, but also a few drawbacks, most notably the fact that paths are often not well-marked and sometimes disappear without any apparent reason before reaching their destination. Moreover, tracks are less in number than on the Canaries, therefore trekkers are often forced to walk on roads and pay close attention to cars, which can go remarkably fast even on minor streets. Finally, my 1:50,000 Kompass map proved to be quite obsolete on more than one occasion, since I found recent paths that were not recorded and several ones that had been engulfed by vegetation or were nowhere to be found, not to mention tracks that had become veritable roads in the meantime. In short, an updated map of the island (possibly 1:25,000; those issued by the Portuguese army are of little use as they do not indicate paths) and better marks on the tracks would be highly desirable.

This said, a trip to Madeira is undoubtedly rewarding for all people interested in succu-

lent plants. The endemic flora of the “island of wood”, its stunning landscapes, intriguing architecture and rich history will provide visitors with plenty of fond memories, enabling them to catch a glimpse of how Macaronesia looked like before the arrival of the first European settlers.

Bibliography

- ARNOLD, J. (2005). Madeira: Not Just a Holiday Destination. *British Cactus & Succulent Journal* **23**: 161–163.
- BOLLE, C. (1892). Botanische Rückblicke auf die Inseln Lanzarote und Fuerteventura. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* **16**: 224–261.
- BRAND, T. (2016). Die endemischen sukkulenten Crassulaceen Madeiras. *Kakteen und andere Sukkulente* **67**: 205–210.
- CAPELO, J. (ed.) (2004). A paisagem vegetal da Ilha da Madeira. *Quercetea* **6**: 3–200.
- CARVALHO, J.A. (2011). *Sedum brissemoretii*, in: *The IUCN Red List of Threatened Species*: e.T162212A5558692 (<https://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T162212A5558692.en>). Last accessed on 21 August 2022.
- DE MENEZES, C.A. (1914). *Flora do Archipelago da Madeira (Phanerogamicas e Cryptogamicas Vasculares)*, Funchal.
- HAMET, R. (1925). Sur quelques Crassulacées asiatiques critiques et sur un *Sedum* nouveau de Madère. *Bulletin de la Société Botanique de France* **72**: 50–82.
- JARDIM, R. & FRANCISCO, D. (2000). *Flora Endémica da Madeira*, Funchal.
- JARDIM, R., FERNANDES, F.M. & CARVALHO, J.A. (2006). *Flora Vascular*, in: B.F. FARIA (ed.), *Fauna e Flora da Madeira. Espécies Endémicas Ameaçadas: Vertebrados e Flora Vascular*, Madeira, pp. 39–133.
- LIU, H.Y. (1989). *Systematics of Aeonium (Crassulaceae)*. Taichung (Taiwan).
- LOWE, R.T. (1831). *Primitiae faunae et florae Maderae et Portus Sancti: sive species novae vel hactenus minus rite cognitae animalium et plantarum in his insulis degentium breviter descriptae*. *Transactions of the Cambridge Philosophical Society* **4**: 1–70 (reissued in: R.T. LOWE, *Primitiae faunae et florae Maderae et Portus Sancti. Two Memoirs on the Ferns, Flowering Plants, and Land Shells of Madeira and Porto Santo*, London 1851).
- LOWE, R.T. (1868). *A Manual Flora of Madeira and the Adjacent Island of Porto Santo and the Desertas*, vol. 1, London.
- MOTTRAM, R. (2015). *Aeonium* nothospecies. *Crassulacea* **4**: 1–43.
- PRAEGER, L.R. (1932). *An Account of the Sempervivum Group*, London (reprinted New York 1967 and Stuttgart 2012).
- SCHULZ, R. (2007). *Aeonium in Habitat and Cultivation*. San Bruno (California).
- SHORT, M.J. (1994). *Crassulaceae*, in: J.R. PRESS & M.J. SHORT (eds.), *Flora of Madeira*, London, pp. 130–137.
- STEPHENSON, R. (1994). *Sedum Cultivated Stonecrops*, Portland (Oregon).
- STEPHENSON, R. (1998a). Madeiran *Aichryson* Species. *Sedum Society Newsletter* **44**: 34–36.
- STEPHENSON, R. (1998b). Macaronesian Yellow-Flowered *Sedum*. Part 1: Madeiran Species. *Sedum Society Newsletter* **45**: 60–67.
- STEPHENSON, R. (2017). Madeiran Beauty - *Sedum farinosum* - and its Lineage. *Sedum Society Newsletter* **120**: 38–39.
- STEPHENSON, R. (2020). *Sedum farinosum*, a Red-Listed Species. *Cactus & Succulent Review* **25**: 45.
- 'T HART, H. (1998). Macaronesian Yellow-Flowered *Sedum* Part 2: Evolution and systematics of Macaronesian *Sedum*. *Sedum Society Newsletter* **47**: 3–11.
- 'T HART, H. (1999). Macaronesian *Sedum* Part 3. *Sedum Society Newsletter* **49**: 67–72.

Appendix 1

Selected locations of *Crassulaceae* species growing on Madeira

In the following appendices, I indicate the position of most *Crassulaceae* species I observed on Madeira. Of course, I make no claim to completeness; these data refer exclusively to the parts of the island which I visited in 2022.

Funchal area

Cabo Girão – Pico do Rancho: *Aeonium glandulosum*, *A. glutinosum*, *Sedum fusiforme*.

Ribeira do Curral das Freiras: *Aeonium glandulosum*, *A. glutinosum*, *Aichryson villosum*, *Sedum fusiforme*, *Umbilicus rupestris*.

Funchal (Monte – Lomo do Monte): *Aeonium glandulosum*, *A. glutinosum*, *Aichryson divaricatum*, *A. villosum*, *Umbilicus rupestris*.

Levada dos Tornos: *Aichryson divaricatum*, *Umbilicus rupestris*.

Levada do Bom Sucesso: *Aeonium glandulosum* (abundant around 600 m), *A. glutinosum*, *Aichryson villosum*, *Umbilicus rupestris*.

Ponta do Garajau: *Aeonium glandulosum* (few plants near Estrada do Cristo Rei), *Aeonium glutinosum*.

Eastern Madeira

Machico: *Aeonium glandulosum*, *A. glutinosum*, *A. ×meyerheimii* (Levada do Caniçal), *Aichryson villosum* (only at Santo António da Serra, around 250 m), *Sedum nudum*, *Umbilicus rupestris*.

Ponta de São Lourenço: *Aeonium glutinosum* (few small plants), *Sedum nudum* (only behind Casa do Sardinha).

Central and Northern Madeira

Faja dos Cardos – Encumeada: *Aichryson divaricatum*, *Aichryson villosum*, *Sedum farinosum*, *Umbilicus rupestris*.

Serra de Agua: *Aeonium glandulosum*, *A. glutinosum* (both growing on rocks and stone walls along the roads ER 104 and ER 228).

São Vicente: *Aeonium glandulosum*, *A. glutinosum*, *Sedum brissemoretii*, *Aichryson sp.* (only dry inflorescences in August 2022).

Western Madeira

Arco da Calheta (Moledos): *Aeonium glandulosum* (only a single plant), *A. glutinosum*, *Sedum nudum*, *Umbilicus rupestris*.

Appendix 2

Crassulaceae species growing on Madeira

Aeonium glandulosum: Pico do Rancho, Ribeira do Curral das Freiras, Funchal (Monte – Lomo do Monte), Levada do Bom Sucesso (abundant around 600m), Ponta do Garajau (few plants near Estrada do Cristo Rei), Machico, Serra de Agua, São Vicente, Arco da Calheta (Moledos).

Aeonium glutinosum: Cabo Girão, Pico do Rancho, Ribeira do Curral das Freiras, Funchal (Monte – Lomo do Monte), Levada do Bom Sucesso, Ponta do Garajau, Machico, Ponta de São Lourenço (few and small plants), Serra de Agua, São Vicente, Arco da Calheta (Moledos).

Aichryson divaricatum: Funchal (Monte – Lomo do Monte), Levada dos Tornos, between Boca das Torrinhãs and Boca da Encumeada.

Aichryson villosum: Ribeira do Curral das Freiras, Funchal (Monte – Lomo do Monte), Levada do Bom Sucesso, Santo António da Serra (around 250m), between Boca das Torrinhãs and Pico do Jorge.

Sedum brissemoretii: São Vicente.

Sedum farinosum: between Boca das Torrinhãs and Boca da Encumeada.

Sedum fusiforme: Pico do Rancho, Ribeira do Curral das Freiras.

Sedum nudum: Machico, Ponta de São Lourenço (only behind Casa do Sardinha), Arco da Calheta (Moledos).

Umbilicus rupestris: Ribeira do Curral das Freiras, Funchal (Monte – Lomo do Monte), Levada dos Tornos, Levada do Bom Sucesso, Machico, Faja dos Cardos, Arco da Calheta (Moledos).