



عاماً
من الحماية
YEARS OF
PROTECTION

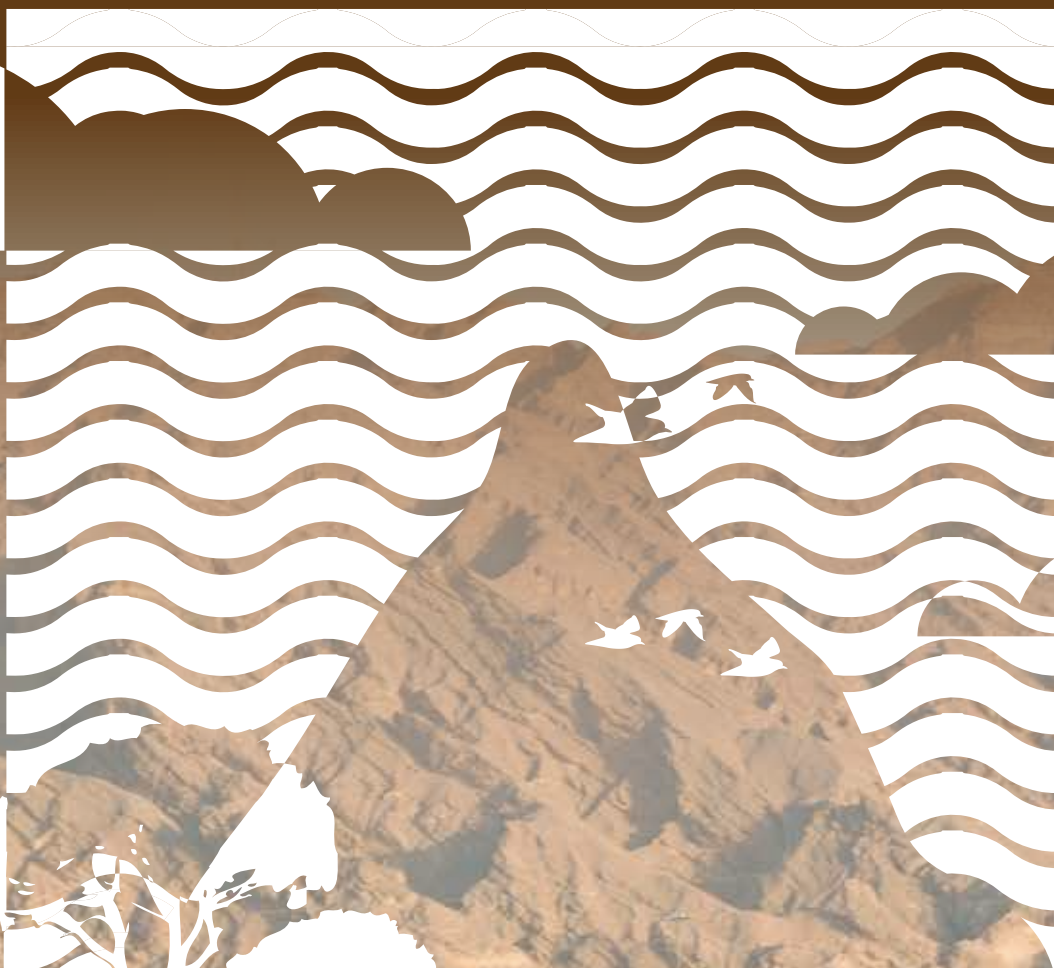


هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

BIODIVERSITY ANNUAL REPORT

ABU DHABI 2018

*STATUS OF RARE &
THREATENED PLANTS
OF JEBAL HAFIT*



INTRODUCTION

Jebal Hafit, due to its higher elevation (1,240 m above sea level) and hospitable climatic conditions, is floristically rich, with 209 species of vascular plants. This accounts for about 47% of the flora of Abu Dhabi. The majority of the plant families in the region are represented by a single genus and species. Biogeographically the flora of this region shows an affinity to Makran, the coastal region of Iran and Pakistan.

Due to favourable climatic conditions and the topography, Jebal Hafit is home to many plant species which could not survive in the surrounding desert habitat. Several authors have contributed to a better understanding of the flora of Jebal Hafit since 1998. Environment Agency-Abu Dhabi has been conducting regular systematic surveys around Jebal Hafit which has resulted in the discovery of many new species in and around the vicinity of the mountains.

There are three main vegetation types that are characteristic of the mountain habitat of Jebal Hafit, these are: *Acacia tortilis* parkland, montane wadi vegetation and the dwarf shrub vegetation of the rocky slopes. The area is inhabited by several regional and local endemic species in addition to many rare and threatened species. The rare tree species found at high altitude includes oriental cherry (*Acridocarpus orientalis*), hop bush (*Dodonea viscosa*), fig tree (*Ficus johannis* ssp. *johannis*, Figure 18), desert thorn (*Lycium shawi*), wild drumstick (*Moringa peregrina*, Figure 20) and Christ's thorn (*Ziziphus spina – christi*). *Acacia* (*Acacia tortilis*) and ghaf trees (*Prosopis cineraria*) are common in the lower slopes of the mountain with the succulent shrub *Euphorbia larica* (Figure 19).

Apart from the native species, many exotic invaders have gained foothold in the mountains and are surviving well. But they remain somewhat rare and do not pose any threat to the native plant community.





TOPOGRAPHY AND CLIMATE

Jebel Hafit, lying south to the city of Al Ain, is an outlier of the Hajar mountains. The climate is of a bi-seasonal Mediterranean type, characterised by high temperature and low rainfall. Rainfall occurs mainly during the cooler winter months. Mean annual rainfall is in the region of 100 mm similar to the rest of the UAE. Diverse topography, deep inaccessible wadis, montane ecosystems and vertical cliffs are among the fascinating landscapes and physical structures of the area.

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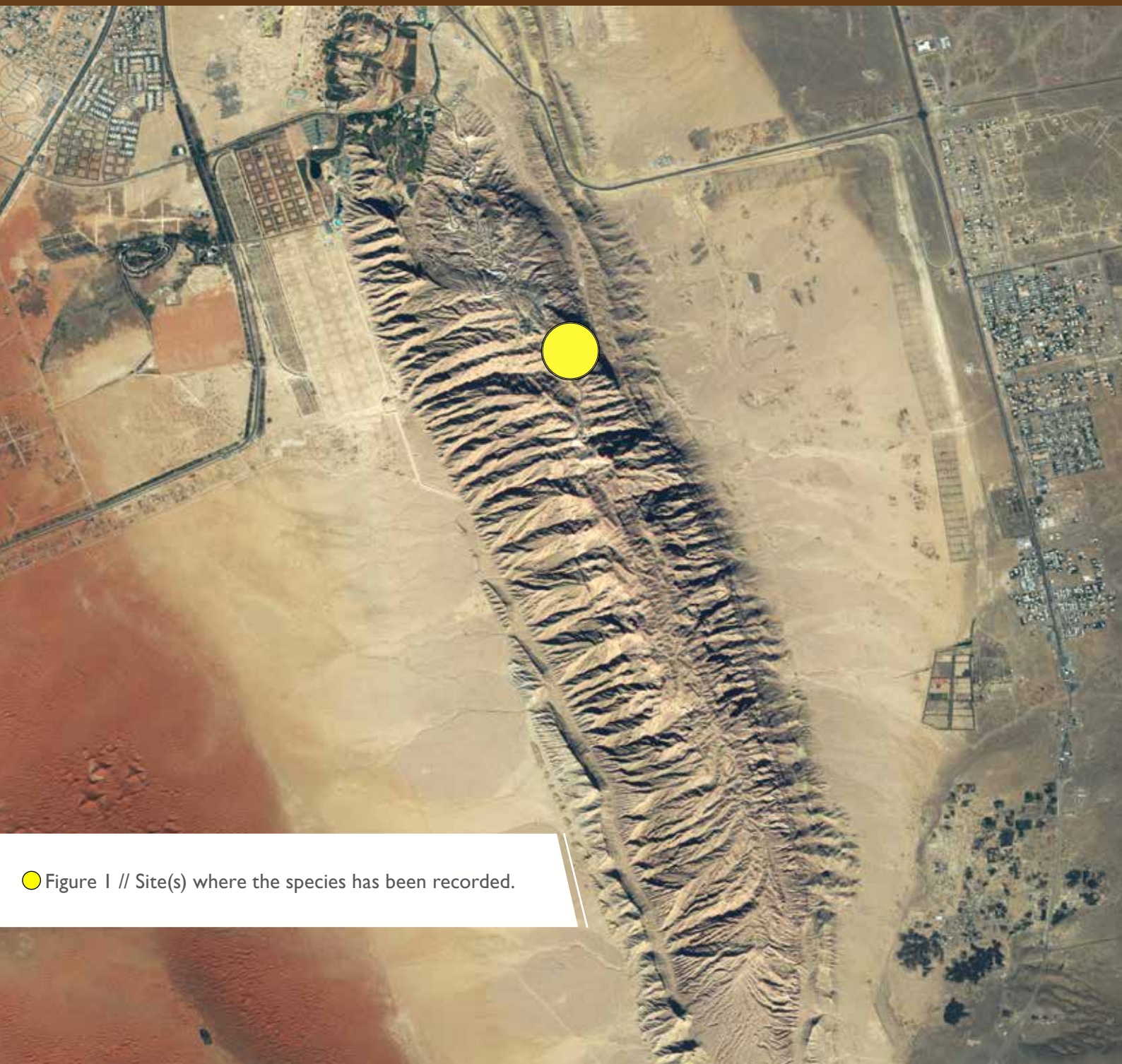
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RARE AND THREATENED PLANTS OF THE MOUNTAIN

Many rare and threatened species are restricted to the mountain and its surrounding area. The following section gives an account of some of the rare and threatened plants of the mountain.

ORIENTAL CHERRY

The oriental cherry (*Acridocarpus orientalis*) is a small evergreen tree, restricted only to Wadi Tarabat in Jebel Hafit. This is the only location in the UAE where the species is known to occur. The species is found among the rocks in shady locations (Figures 1,2). There is also very little evidence of natural regeneration of the species in the wild. Non-availability of adequate moisture for germination might be one of the limiting factors contributing to the poor regeneration in the natural habitat. Efforts to regenerate through propagating plants from stem cuttings and have, so far, been unsuccessful. Seedlings were produced from seeds collected from the wild while grown under nursery conditions.



● Figure 1 // Site(s) where the species has been recorded.

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Figure 2 // Oriental cherry at Wadi Tarabat

DWARF PALM

The dwarf palm (*Nannorrhops ritchieana*), which is one of the two native species of palm found in the UAE, is known only from a single location at a high altitude in Jebel Hafit. This is a small palm with a branched trunk. In the UAE, the species is known from the Northern Emirates and the Hajar Mountains, where isolated clumps are found.

The palm grows in wadis and depressions in the mountains (Figures 3,4). In former times the dwarf palm was of great economic importance in the Arabian Peninsula. The most important of these were the tackle and ropes for the large trawl-nets which were used in the sardine fishing industry. It is used for the production of baskets, camel and donkey harnesses, mats and hand-held fans. The leaves are purgative and used in the treatment of diarrhoea and dysentery.

Dwarf palm is the single species in the genus *Nannorrhops*. As the species is rare and considered as vulnerable and if forms a part of UAE culture and tradition the species is worth protecting. An action plan has been developed and implementation of the action is underway for the conservation of the species.

05



● Figure 3 //Site(s) where the species has been recorded.



Figure 4 // Dwarf palm

EASTERN MARSH HELLEBORINE

Figure 5 // Helleborine orchid in flower

06



Epipactis veratrifolia, commonly known as the helleborine orchid, has been recorded from a wet wadi in the mountain. This is the only native orchid species of the UAE. The species has been recorded from northern regions of the UAE (Figures 5,6). The occurrence of this rare orchid on Jebal Hafit expands the eastern distribution of the species from previous records. This new information underlines the importance of biodiversity conservation in the region as it enabled the obtaining of new data that filled the distribution gap for this species.

Epipactis veratrifolia is reported as Least Concern as per IUCN Red List but endangered in the Arabian Peninsula. The species is included under Annex B of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Systematic monitoring of this orchid in the wadi has been done for a year. The existing population can be conserved by systematic monitoring; protecting the habitat and *ex-situ* conservation methods like artificial propagation, re-introduction and seed collections.



● Figure 6 // Site(s) where the species has been recorded.



Figure 7 // Maiden hair fern growing in the rocky cliffs in one of the wadis at higher elevation

MAIDEN HAIR FERN

Ferns are poorly represented in the flora of UAE. Maiden hair fern (*Adiantum capillus - veneris*) is one of the two fern species found in the mountain. They are known from only two wadis on Jebel Hafit. They are a very delicate species found in shaded locations among rocks, seepage areas and wet cliffs. The continuous supply of water in the wadis provide microclimatic and substrate conditions suitable for the survival of this species. It is considered as Near Threatened in the region, (Figures 7, 8,9)

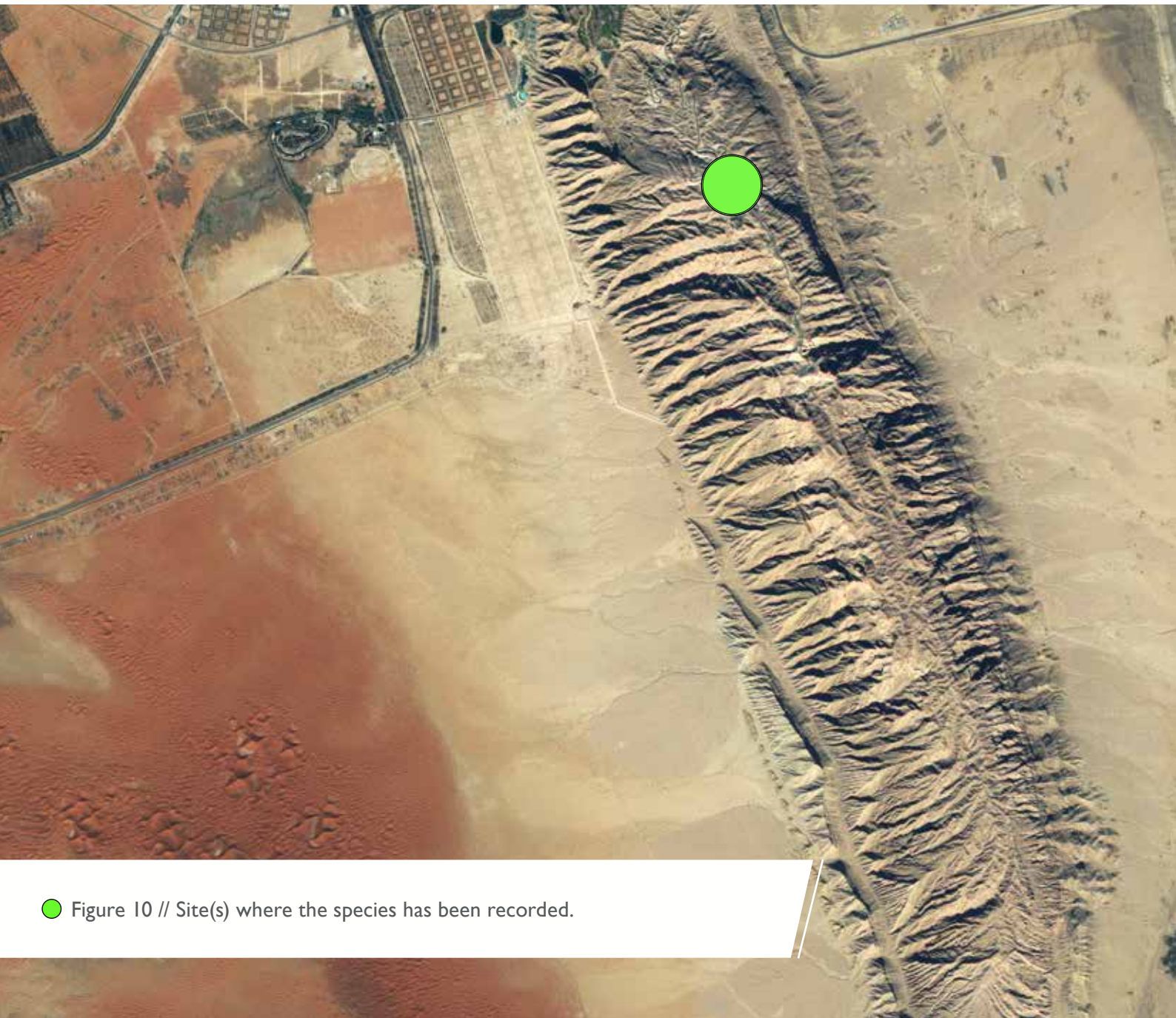


Figure 8 // Maiden hair fern

● Figure 9 // Site(s) where the species has been recorded.

CARALLUMA ARABICA

This succulent plant has been found only in one wadi in Jebal Hafit at higher elevations (Figures 10,11).The plants are leafless and grow in dense clumps and produce attractive brown flowers. It is found in wadis among the rocks and can be easily overlooked if not in flower. The plants are still used for a variety of medicinal purposes.



● Figure 10 // Site(s) where the species has been recorded.

08



Figure 11 // Fruiting in *Caralluma arabica*

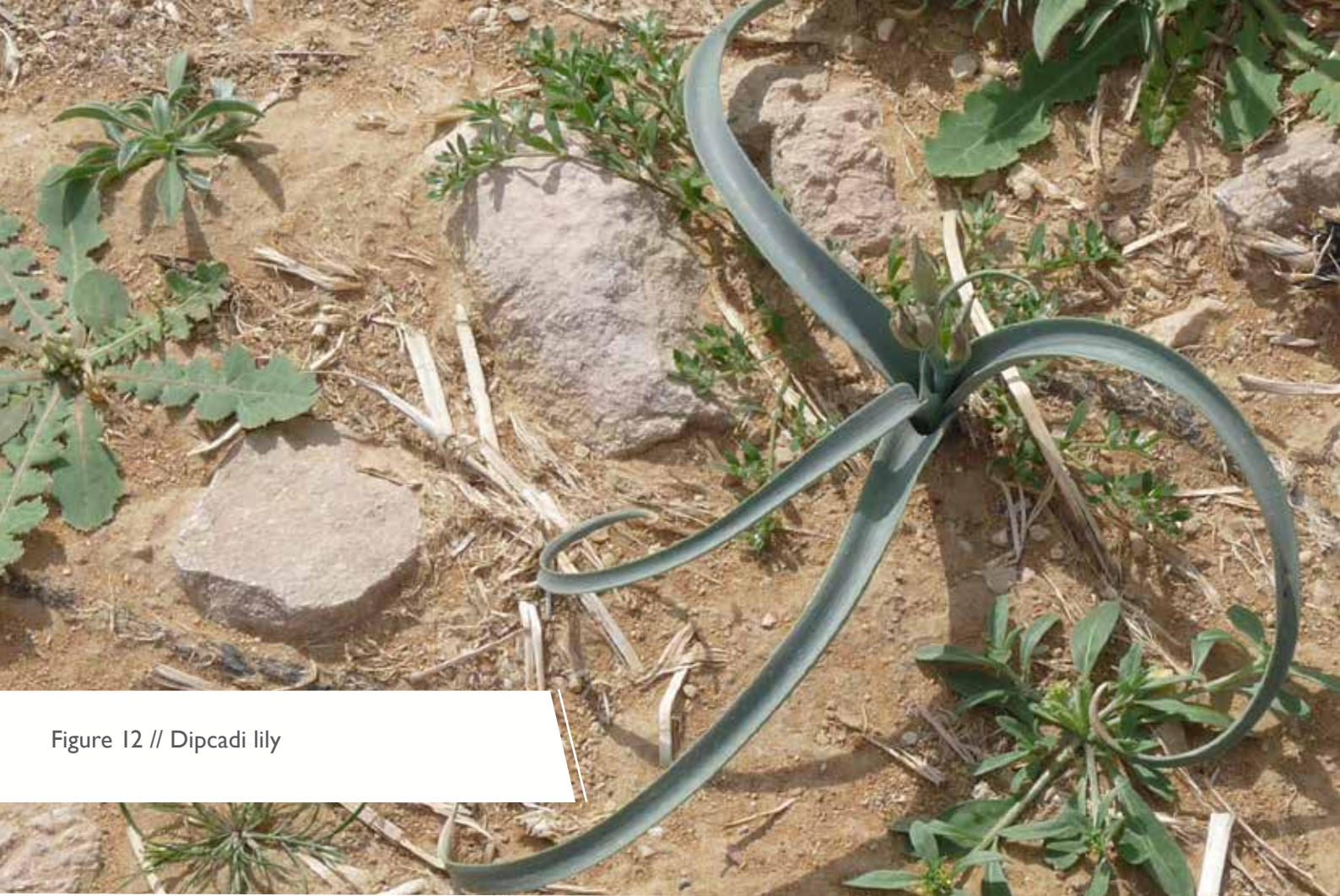


Figure 12 // Dipcadi lily

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SCHWEINFURTHIA IMBRICATA

Schweinfurthia imbricata (Figure 13) is an annual herb which has been seen growing in the gravel plains in the vicinity of Jebal Hafit. The species is recorded as critically endangered in the UAE.

Apart from these, rare species recorded from the mountains include *Notoceras bicornis*, *Viola cineraria*, *Ducrosia anethifolia*, *Herniaria maskatenensis*

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DIPCADI LILY

Dipcadi lily (*Dipcadi biflorum*) was recorded from two sites in Jebal Hafit. This is a short lived perennial bulb often seen soon after rain. This is regionally endemic and one of the two dipcadi species found in the UAE (Figure 12).



Figure 13 // *Schweinfurthia imbricata*

ALIEN SPECIES

At present the natural habitat of Jebal Hafit has been colonised by only relatively few exotic species. These include species like tropical milkweed (*Asclepias curassavica*, Figure 14), Soldier orchid (*Zeuxine strateumaticea*, Figure 15). The invasive mesquite (*Prosopis juliflora*, Figure 16) has become naturalised and present at some of the wadis in Jebal Hafit. Sodoms apple (*Calotropis procera*), an indicator of overgrazing and disturbance, was common alongside the stretches of the road and down the wadi where it did not formerly occur. The increase in the population of this species might be due to the result of intensive overgrazing. Increased human activities might be yet another reasons for the increased number of exotic invaders in the mountains.



Figure 14 // Tropical milkweed





Figure 15 \ Soldier orchid from a moist wadi



Figure 16 // Mesquite, flourishing well in the wadis

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THREATS

The main threats include habitat destruction and overgrazing. This led to the extinction of many species or many species become rare and restricted to a few areas. Increased grazing pressure by goats is indicated by the fact that many palatable dwarf shrubs are restricted to inaccessible areas or have even disappeared. Camera traps data revealed that the rare orchid species had been eaten away by goats (Figure 17) during the flowering period which will in turn affect the natural regeneration of the species. Rare species may suffer if the grazing pressure is not reduced. Uncontrolled littering in the wadis may also poses threat to the species.





Figure 17 // Feral goats recorded in camera traps from the orchid wadi

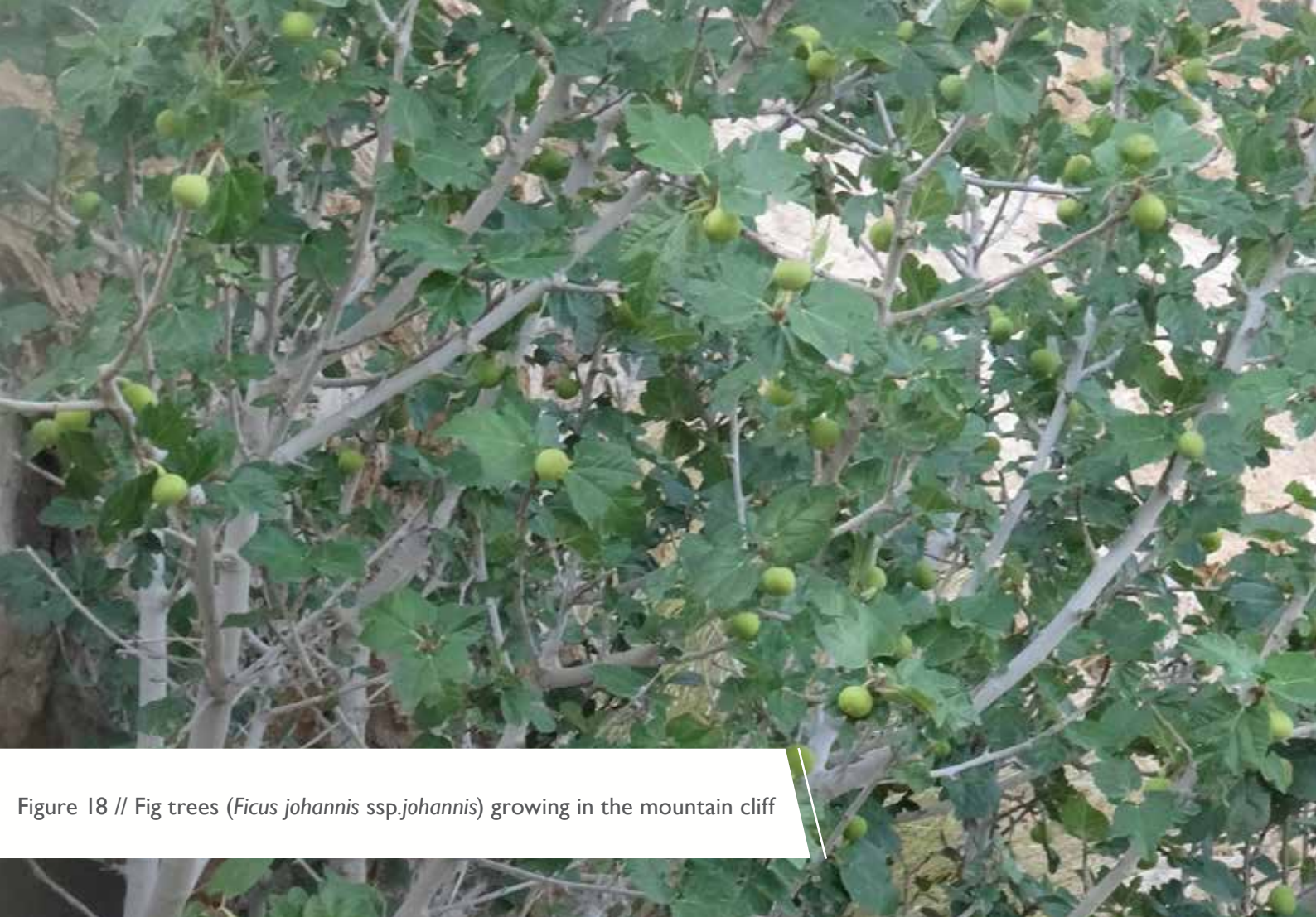


Figure 18 // Fig trees (*Ficus johannis* ssp. *johannis*) growing in the mountain cliff



Figure 19 // *Euphorbia larica*, a succulent dwarf shrub found on the rocky slopes of the mountain

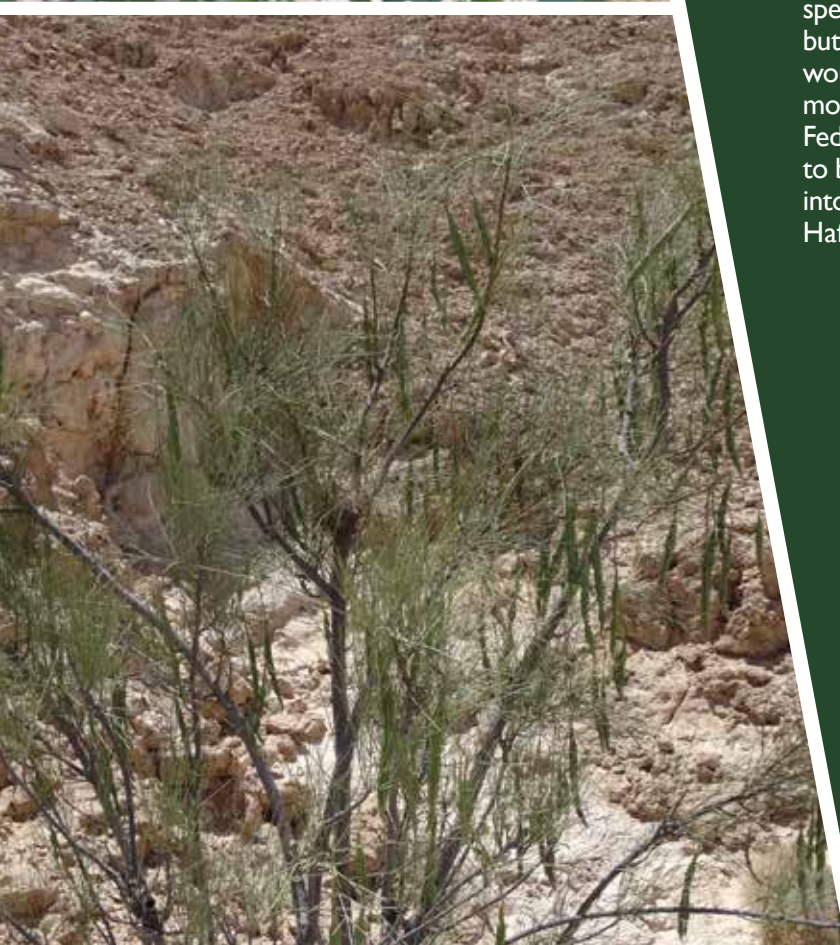


Figure 20 // Wild drum-stick tree, growing in one of the wadis at higher elevations.

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CONCLUSION

From a distance Jebal Hafit looks like a large barren rock without much biodiversity. In reality, Jebal Hafit is a very rich ecosystem with many plants and animals including regionally endemic species. Many of the rare plants are species endemic to the Arabian Peninsula. Many of these plant species are found in inaccessible wadis on the mountain, but other sites can be reached relatively easily, therefore we would encourage members of the public not to collect any mountain plants. These species are protected by relevant Federal Laws. These are also very rare species which need to be protected. We feel this report will give you a window into some of Abu Dhabi's rare mountain plants on Jebal Hafit.



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