Native Plants of Malta

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Introduction

The Maltese Islands, nestled in the heart of the Mediterranean, offer a unique window into the botanical diversity fostered by the interplay of geography, climate, and human history. Despite their modest size, the islands serve as home to an astonishing variety of native plants; over a thousand vascular plant species have been recorded, of which several hundred are believed to be truly indigenous to Malta. These figures are all the more remarkable considering the islands' limited land area, lack of mountains and rivers, and the relatively young soils derived mainly from limestone.

Malta's flora tells a story of both resilience and adaptation. Their evolution has been shaped by the islands' isolation, the movement of peoples and animals, and the climatic fluctuations of the Mediterranean basin. Through the ages, species have migrated, retreated, or emerged anew, resulting in a complex web of plant life with deep affinities to the western and North African Mediterranean, but shaped uniquely by Malta's environmental conditions. Endemic plants, found nowhere else in the world, are a testament to this long and fascinating history of adaptation within such a constrained geographical space.

The nature and composition of native plant communities across the Maltese landscape reflect a mosaic of habitats, each with its own assemblage of emblematic species. From the hardy shrubs inhabiting windswept coastal cliffs and garigue plateaux to the remnants of ancient woodland, every habitat supports a collective memory of ecological processes that have unfolded over thousands of years. Maquis, steppes, and saline marshes add further variety, all shaped continuously by both natural forces and centuries of human intervention.

Some native plants stand out as cultural icons, such as the Maltese Rock-centaury, the national plant; the endangered Sandarac Gum Tree, the national tree; and more than two dozen other species that occur only within the Maltese archipelago. Each tells its own story of evolutionary success, vulnerability, and the ongoing struggle for survival amid habitat change, urbanization, and the encroachment of invasive alien species. The survival of these unique plants hangs in a delicate balance shaped by relentless pressures and dedicated conservation efforts.

Today, the flora of Malta is at a critical junction. While the islands' natural heritage continues to be celebrated and studied, it is increasingly threatened by habitat loss, invasive species, and the demands of human development. Yet hope remains: legal protection, reintroduction programs, and a growing public consciousness all help to ensure that the native plants of Malta will endure to enrich future generations.

This book seeks to be a comprehensive and accessible guide to Malta’s native plants, shedding light on their habitats, ecological significance, and the challenges they face. By understanding and appreciating these irreplaceable species and the natural beauty they impart to the Maltese islands, we can contribute in our own ways to their continued survival and safeguarding for years to come.

CHAPTER ONE: The Maltese Archipelago: A Mediterranean Stage

Nestled in the heart of the Mediterranean Sea, almost equidistant between the southern tip of Sicily and the coast of North Africa, lies the Maltese archipelago. This small island nation occupies a strategically significant position, a stepping stone between continents that has influenced its history, culture, and, crucially, its natural world. Its geography, seemingly simple at first glance, provides the fundamental canvas upon which the vibrant tapestry of Maltese native plants has been woven over millennia. The islands themselves are relatively diminutive, collectively spanning an area of approximately 316 square kilometres, a modest stage for the botanical diversity they harbour.

The archipelago is primarily composed of three inhabited islands: Malta, the largest; Gozo, to the northwest, known for its more rural character; and tiny Comino, situated between the two, famous for its Blue Lagoon and largely uninhabited. Several smaller, uninhabited islets and rocks dot the surrounding waters, including Filfla, off the southwestern coast of Malta, and the islands of St. Paul. Each island, despite sharing the overarching geological and climatic conditions, presents subtle variations in topography and exposure that contribute to the mosaic of habitats found across the nation.

Malta's physical geography is characterised by low-lying terrain, a significant departure from the mountainous landscapes found in many other Mediterranean regions. There are no towering peaks or extensive mountain ranges here. Instead, the islands feature rolling hills, fertile valleys, and dramatic coastal cliffs, particularly along the southern and western shores of Malta and Gozo. The highest point on Malta, Ta' Dmejrek, reaches a modest elevation of just 253 metres above sea level, highlighting the predominantly gentle contours of the landmass.

A defining feature of the Maltese landscape is the absence of permanent rivers or natural lakes. This scarcity of freshwater is a critical factor shaping the flora, favouring species adapted to arid or semi-arid conditions for significant parts of the year. Water resources are limited to ephemeral streams that flow only after heavy rainfall, and a few small, perennial springs, often found in valley bottoms or coastal areas. This hydrological reality means that plants must be resilient, capable of surviving long periods without consistent access to surface water, relying instead on sporadic rainfall and underground reserves.

Geologically, the islands are predominantly formed from sedimentary rocks, primarily

various types of limestone deposited over millions of years during periods when the region was submerged beneath a warm, shallow sea. This limestone bedrock underpins the entire landscape, influencing soil development, water drainage, and the very structure of the land. The porous nature of limestone allows rainwater to quickly percolate through, contributing to the lack of surface water bodies and driving the development of karst features, such as sinkholes and underground caves.

The soils derived from this limestone are typically shallow and relatively young, often mirroring the composition of the underlying rock. These soils are frequently alkaline, a condition that suits certain plant species while being unsuitable for others. The thin soil cover, particularly on exposed rocky plateaux and slopes, presents another challenge for plant life, limiting the rooting depth available and requiring plants to be adapted to anchoring themselves in rocky crevices or surviving with minimal substrate. Erosion, exacerbated by historical land use practices and the infrequent but intense rainfall, also contributes to the thinness of the soil layer in many areas.

Malta's climate is classic Mediterranean, characterised by distinct seasons that impose significant selective pressures on the flora. Summers, typically spanning from June to September, are hot, dry, and sunny, with average daily temperatures often exceeding 30°C and prolonged periods without rainfall. The intense solar radiation and lack of precipitation during this time necessitate adaptations in plants to conserve water, such as small or waxy leaves, deep root systems, or the ability to enter dormancy until more favourable conditions return.

Conversely, winters, from December to February, are mild and relatively wet, providing the much-needed rainfall that sustains plant growth throughout the year. Average daytime temperatures in winter hover around 15°C, rarely dropping below freezing. While the bulk of the annual precipitation occurs during these months, rainfall patterns can be erratic, with intense downpours followed by dry spells. This variability adds another layer of complexity for plant survival, favouring species capable of rapid growth when water is available and enduring drought when it is not.

Spring and autumn serve as transitional seasons, offering milder temperatures and varying amounts of rainfall. Spring, from March to May, is a period of rapid growth and flowering for many species, capitalising on the accumulated winter moisture and increasing daylight hours. Autumn, from September to November, can see a resurgence of plant activity after the summer dormancy, particularly if early rains arrive. These shoulders of the year are crucial for the life cycles of many native plants, dictating the timing of flowering and seed set.

The total average annual rainfall in Malta is relatively low for the Mediterranean region, typically ranging from 500 to 600 millimetres. This limited amount, coupled with the high evaporation rates during the hot summer, underscores the aridity that characterises the islands for a significant portion of the year. Plants have evolved

ingenious strategies to cope with this water stress, from ephemeral species that complete their life cycle rapidly after rain to succulents that store water in their tissues.

Wind is another significant climatic factor influencing plant life, particularly in coastal and exposed areas. Prevailing winds from the northwest can be strong, carrying salt spray far inland, which limits the distribution of salt-sensitive species. The Scirocco, a hot, dry wind originating from the Sahara Desert to the south, occasionally sweeps across the islands, bringing with it dust and further exacerbating arid conditions, posing a severe challenge for plants already stressed by summer heat and drought.

The unique combination of Malta's geographical position, limestone geology, low elevation, lack of surface freshwater, and distinct Mediterranean climate creates a specific set of environmental filters that shape the composition of its native flora. These factors favour resilient, adaptable plants capable of thriving in rocky, shallow soils, enduring prolonged summer drought, and coping with exposure to wind and salt spray in coastal zones. The varied microhabitats created by subtle changes in elevation, slope aspect, shelter, and proximity to the coast further enhance the diversity of plant communities across the archipelago.

The central Mediterranean location also places Malta at a crossroads for plant dispersal. Its flora exhibits affinities with species found in Sicily, North Africa, and both the western and eastern Mediterranean basins. This biogeographical mix is a result of historical land bridges, prevailing winds, and the movement of seeds by birds and other animals over vast periods. While many species are widespread Mediterranean elements, others have more restricted distributions, highlighting Malta's role as part of a broader regional flora while also possessing its own unique botanical identity.

The extensive coastline, disproportionately long relative to the islands' small land area, provides a wealth of diverse coastal habitats. From sheer, wave-battered cliffs rising dramatically from the sea to sheltered rocky inlets, small sandy coves, and brackish marshlands, the coastal zone presents a unique set of environmental challenges and opportunities for plant life. High salinity, constant exposure to wind and salt spray, and limited freshwater availability necessitate specialised adaptations in the plants that inhabit these areas, leading to distinct coastal plant communities.

While the landscape today bears the indelible marks of thousands of years of human activity, including agriculture, urbanisation, and quarrying, the underlying geography and climate continue to exert a fundamental influence on the types of native plant communities that can survive and thrive. The historical transformation of the landscape, which will be explored in a later chapter, has altered the distribution and extent of these communities, but their fundamental character remains intrinsically linked to the physical and climatic environment of the Maltese archipelago. Understanding this foundational geography and climate is the essential first step in

appreciating the resilience, adaptability, and unique beauty of Malta's native plants.

The subtle undulations of the terrain mean that even small changes in elevation or the aspect of a slope can create microclimates, influencing temperature, humidity, and exposure to sun and wind. Sheltered valleys, for example, retain moisture more effectively than exposed hilltops, supporting different assemblages of plants. The orientation of a slope towards the north or south also dictates the amount of direct sunlight received, impacting soil temperature and moisture levels, and thus the plant species that can colonise the area.

The porous limestone, while limiting surface water, allows for the formation of underground water lenses, particularly where impermeable clay layers are present below the limestone. These limited underground water sources are vital for certain plant species, allowing them to access moisture during the dry summer months when the surface soil is parched. The location and extent of these water lenses can influence the presence of more water-dependent native plants in specific areas, even within an otherwise arid landscape.

The interaction between the limestone geology and the Mediterranean climate also contributes to the formation of specific landforms that provide unique niches for plant life. Karst features like dolines (sinkholes) can collect deeper pockets of soil and offer more sheltered conditions than the surrounding rocky terrain, supporting a different array of plant species. Eroded rock formations and fissures in cliffs provide toeholds for rupestral plants, which are adapted to growing in minimal substrate on vertical or near-vertical surfaces.

The intensity of the summer sun, while challenging, is also a defining characteristic of the Maltese climate that influences plant adaptations. Many native plants have evolved mechanisms to cope with high light levels and UV radiation, such as developing reflective leaf surfaces or producing protective pigments. The long hours of sunshine also support high rates of photosynthesis during the milder, wetter months, allowing plants to store energy and resources to survive the subsequent dry period.

The mild winters, conversely, allow for growth and flowering during a time when many plants in more temperate climates are dormant. This enables a distinct seasonality in the Maltese flora, with many herbaceous species and bulbs (geophytes) completing their life cycles during the cooler, wetter months and dying back to underground storage organs or seeds to survive the summer drought. This winter growth period is crucial for the overall productivity of the ecosystem.

Despite the general aridity, certain low-lying coastal areas and inland depressions can experience temporary flooding after heavy rainfall, leading to the formation of temporary ponds or marshy ground. These ephemeral freshwater or brackish habitats, though limited and unpredictable, support a small but specialised flora adapted to

fluctuating water levels, providing a glimpse into the types of plant communities that might exist if permanent freshwater sources were more abundant.

The relatively small size of the islands means that the influence of the sea is pervasive. Even inland areas are not far from the coast, and maritime influences, such as salt spray and sea breezes, can be felt further inland than might be expected in larger landmasses. This proximity to the sea contributes to the mildness of the winter climate, buffering temperatures, but also presents challenges for many plants due to the constant presence of salt in the environment.

The geological history of the islands, including their past connections and separations from larger landmasses, has also played a role in shaping the flora, influencing which species were able to colonise the islands and when. While the physical geography and current climate define the immediate environmental pressures, this deeper history provides the context for understanding the origins and relationships of the native plant species found in Malta today. These historical influences will be explored in greater detail in subsequent chapters.

In essence, the Maltese archipelago, with its distinctive geography and Mediterranean climate, presents a challenging yet ultimately rewarding environment for plant life. The combination of limited freshwater, shallow limestone soils, hot dry summers, and coastal influences has favoured a flora characterised by resilience, adaptability, and a unique blend of species with affinities to different parts of the Mediterranean basin. This physical setting is the fundamental backdrop against which the fascinating story of Malta's native plants unfolds.

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