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Augmenting Lebanon's Flora: Documentation of Eighteen Newly Recorded species and Noteworthy observations on Rediscovered Taxa

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ABSTRACT

A sustained, countrywide botanical exploration facilitated the recognition of a remarkable assemblage of species newly added to Lebanon's floristic inventory, encompassing diverse taxonomic groups. The presence of these taxa in a variety of unique ecological settings—previously overlooked or insufficiently studied—underscores the significance of this contribution to the understanding of Lebanon's biodiversity. This investigation reports previously unrecorded taxa, Ambrosia confertiflora DC. (Asteraceae), Clinopodium graveolens subsp. rotundifolium (Pers.) Govaerts (Lamiaceae), Colchicum antilibanoticum Gomb. (Colchicaceae), Colchicum feinbruniae K.Perss. (Colchicaceae), Centaurea depressa M.Bieb., synonymized as Cyanus depressus (M.Bieb.) Soják. (Asteraceae), Chenopodium giganteum D.Don. (Amaranthaceae), Echium arenarium Guss. (Boraginaceae), Echinops spinosissimus subsp. spinosus Greuter (Asteraceae), Geranium columbinum L. (Geraniaceae), Iris wallisiae T.Hall & Seisums (Iridaceae), Lamium moschatum subsp.micranthum (Boiss.) Mennema (Lamiaceae), Nothoscordum×borbonicum Kunth (Amaryllidaceae), Parietaria judaica subsp. judaica (Urticaceae), Plantago lanceolata var. dubia (L.) Lilj. (Plantaginaceae), Physalis ixocarpa Brot. ex Hornem. (Solanaceae), Senecio vulgaris var. denticulatus (O.F.Müll.) Hyl. (Asteraceae), Silene caramanica Boiss. & Heldr. (Caryophyllaceae) and Verbascum qulebicum Post. (Scrophulariaceae). All collected specimens were subjected to a standardized curation protocol—including photographic documentation, harvesting, desiccation, and long-term deposition as herbarium vouchers in the K. Addam Herbarium at AUL University (Lebanon). Their taxonomic diagnoses, ecological profiles, and spatial distributional data are articulated with comprehensive precision.The identification of newly recorded taxa was substantiated through a comparative updated nomenclature, morphological descriptions, phenological notes, and photographic documentation to facilitate accurate identification. This research underscores the necessity of biodiversity monitoring and conservation efforts to safeguard Lebanon's unique plant heritage analysis with existing floras and contemporary literature. Furthermore, this study provides.

Keywords: *Systematic botany; Mediterranean region; Lebanese flora; newly documented taxa".*

Introduction

The Mediterranean Basin is acknowledged as one of the 36 global biodiversity hotspots, distinguished by its extensive biodiversity and elevated levels of endemism. The region's distinctive interplay of climatic, geological, and ecological factors renders it a vital focus for conservation initiatives [1]. It encompasses extensive regions of southern Europe, Middle East and North Africa, with a total area estimated at roughly 2.3 million square kilometers with a total area of approximately 2.3 million square kilometers [2]. It stretches from Macaronesia in the west to the Levant in the east; however, the inclusion of certain areas can vary based on differing perspectives. For instance, definitions of Macaronesia may vary, with some incorporating only Madeira and the Canary Islands [3], while others encompass the entirety of Macaronesia, including the Azores and Cape Verde [4]. Its importance is underscored by its capacity to sustain a variety of ecosystems [5], such as forests, shrublands, and grasslands, even in the face of anthropogenic pressures and the effects of climate change [6].

As of 2023, more than 1,000 protected areas have been designated throughout the Mediterranean Basin, encompassing roughly 10% of the region's terrestrial expanse [7]. Nonetheless, significant deficiencies persist in the protection of critical biodiversity hotspots, especially in North Africa and the Eastern Mediterranean [8].

The Eastern Mediterranean Basin, particularly the Levantine highlands where Lebanon is located, is globally acknowledged as one of the most intriguing conservation areas. It is a key area within the Mediterranean basin, distinguished by its exceptionally high concentration of floral diversity, which is one of the region's most extraordinary attributes [9].

As a central hotspot of global conservation significance, Lebanon constitutes a crucial sector of the Mediterranean basin and is distinguished by one of the densest assemblages of plant diversity observed internationally [10, 11, 12].

Lebanon's biodiversity encompasses not only its indigenous species but also reflects its role as a hub for plant migration and dispersal. The interaction of numerous environmental factors has facilitated the coexistence of plants with varied ecological roles, ranging from species with medicinal value to those crucial for soil stabilization and erosion prevention [13].

Despite its modest area of 10,452 km^2—substantially smaller than that of other Mediterranean countries such as France, Italy, Greece, Palestine, Syria, and Turkey—Lebanon continues to serve as a critical refuge for a wide array of native, endemic, and exceptionally rare species [14]. Its rich geological history, complex topography, and distinctive Mediterranean climate together position Lebanon as one of the most botanically

diverse nations in the region. These factors also underscore its significance as a sanctuary for numerous rare, indigenous, and endemic species [11].

Renowned as a repository of exceptional botanical diversity, Lebanon continues to unveil a plethora of wild herbs, many of which remain previously undocumented. Persistent botanical exploration across its diverse landscapes has revealed numerous plant species that augment its already abundant and ecologically significant flora [10].

Lebanon's flora has been thoroughly documented by botanists like Tohme and Tohme, Mouterde, Post, Dinsmore, Khodr Addam, and Mounir Bou-Hamdan [11, 15, 16, 17]. In 2014, Tohme and Tohme recorded 2,612 plant species, spanning 770 genera and 155 families. Their inventory also noted 58 species previously identified by Mouterde and Post but not confirmed in their own surveys [15].

However, the precise quantification of Lebanon's flora remains elusive due to inconsistent and non-standardized documentation practices. Numerous species have been mentioned in non-peer-reviewed texts without accompanying herbarium specimens or other forms of academic validation. Furthermore, certain relevant studies conducted by international scientists have surfaced sporadically during literature reviews on platforms such as ResearchGate, further complicating efforts to establish a definitive record of the country's botanical wealth [15].

The dearth of specialized taxonomists within Lebanon further exacerbates these challenges. Botanical taxonomy, an intricate discipline, demands extensive expertise, resilience, and an inherent passion for the natural world. Over a rigorous 25-year period of systematic fieldwork, researchers K. Addam and M. Bou-Hamdan have identified and recorded over 300 previously undocumented plant species in Lebanon and new world records [9, 18].

Commencing in 2013, the documentation of these results has been published in a phased manner, with voucher specimens rigorously preserved within K. Addam's Herbarium at the Arts, Sciences, and Technology University, Lebanon (AUL), and continued scholarly dissemination of these data is in progress [15].

The discovery of these species is often attributed to their growth in ecologically challenging and geographically remote areas, including high-altitude mountains, rugged terrains, and rural regions. Access to these locations is further impeded by Lebanon's volatile political climate, particularly along its borders with Syria, where active conflict and the rugged, inaccessible terrain significantly hinder botanical exploration and research [19].

MATERIALS AND METHODS

The comprehensive Phytodiversity survey of the Lebanese floristic territory was initiated by Dr. Khodr Addam in collaboration with Mr. Mounir Bou-Hamdan and was conducted over a protracted temporal framework extending from the year 2000 through 2025. This longitudinal investigation was conceived with the explicit objective of elucidating the taxonomic composition and ecological distribution of vascular plant taxa across Lebanon's multifaceted biogeographical mosaic. The research strategically prioritized the inclusion of ecologically underrepresented and topographically heterogeneous localities, extending across the latitudinal and longitudinal breadth of the nation, and encompassing a broad array of Phytoecological zones, including mesic forest ecosystems, palustrine and riparian wetlands, and xeric grassland assemblages, each selected to ensure maximal representation of the country's endemic and regional floristic heterogeneity.

Field-based botanical sampling adhered rigorously to standardized taxonomic collection protocols, ensuring the systematic acquisition of morphologically complete specimens, inclusive of both vegetative and reproductive structures. Specimens were promptly processed in situ using portable plant presses and desiccated under ambient conditions to obviate microbial degradation and structural distortion. Taxonomic determinations were predicated upon sustained, methodologically iterative fieldwork and specimen-level analyses conducted over a continuous 25-year period, thereby affording temporal depth and phenological resolution to species-level identifications.

All collected specimens were permanently accessioned into the Dr. Addam Herbarium, housed at the Arts, Sciences, and Technology University in Lebanon (AUL, Beirut), where they constitute a critical reference repository for regional and transregional taxonomic research. Comprehensive ancillary metadata—comprising high-precision geospatial coordinates, altitudinal data, habitat typologies, and interspecific ecological interactions—were meticulously recorded contemporaneously with collection, thereby embedding each specimen within a detailed ecological and geographical framework.

In alignment with best practices in conservation biology and ethical botanical stewardship, geolocation data pertaining to rare, endemic, or otherwise conservation-sensitive taxa have been intentionally redacted from the public record. Conditional access to these data may be granted to qualified researchers upon formal request, contingent upon the substantiation of scientific intent and ethical compliance.

Specimens were initially identified in the field using regional guides and keys, then analyzed in the lab. Identification was confirmed by comparing them with Dr. Addam Herbarium (AUL, Beirut) collections and consulting regional taxonomic experts.

In its culmination, the present investigation extends the pioneering work of Dr. Khodr Addam and Mr. Mounir Bou-Hamdan in the botanical exploration of Lebanon, formally documenting eighteen previously unrecorded species—including both novel and re-encountered taxa—and accentuating observations of critical scientific relevance.

All newly documented species were systematically cross-referenced with Tohme and Tohme (2007) to confirm their recorded presence in Lebanon [16]. Noteworthy discrepancies in plant nomenclature and illustrations have been identified, corrected, and explicitly addressed in relation to the *Illustrated Flora of Lebanon* within the context of this study. Moreover, it is important to emphasize that extensive fieldwork and rigorous scientific investigation over several years have revealed numerous additional inaccuracies—totaling several dozen—underscoring the need for ongoing critical evaluation of existing floristic records.

Any species not recorded in this flora were checked in other regional floras for their presence in Lebanon: Flora of Syria Palestine and Sinai [17], Flore Libano-Syrienne [20, 21, 22], Flora of Turkey and the East Aegean Islands [23] , and Nouvelle Flore du Liban et de la Syrie [24], Haber and Semaan [25], Flora Palaestina [26, 27], Plant List and Plants of the World Online (Kew) [28], WFO [29], Flora of Turky [30],

Flora of Cyprus dynamic checklist [31], and Flora Italiana [32].

NB. Lebanon and Syria are frequently treated as a unified phytogeographical entity ("LS"), irrespective of whether a taxon has been documented exclusively in one of the two countries, due to the integration of data directly sourced from the Med-Checklist (1981–2008).

Following initial taxonomic determination, specimens were subjected to meticulous verification through comparative analysis with authenticated reference collections preserved at the Dr. Addam Herbarium (AUL, Beirut), augmented by critical consultation with recognized authorities in plant systematics. Newly encountered taxa were systematically documented through exhaustive morpho-taxonomic characterization, incorporating diagnostic descriptions, high-definition photographic plates, and scientifically rendered illustrations. Each record was scrupulously corroborated against peer-reviewed floristic literature and authoritative taxonomic repositories.

All nomenclatural acts and taxonomic treatments were executed in full compliance with the stipulations of the International Code of Nomenclature for algae, fungi, and plants (ICN), ensuring adherence to globally accepted systematic protocols [33].

RESULTS

1 - Ambrosia confertiflora DC. (Asteraceae)

Figure 1 - Ambrosia confertiflora

Description: Perennial, herbaceous, attaining a height of 20–100 (occasionally up to 200) cm, characterized by an erect, bristly stem with a pubescent texture, green to brown. The foliage is aromatic, multilobed, and frequently alternate, with petioles measuring 10–35 mm in length.

Leaf blades extend 40–85 (up to 150) mm long and 20–35 (rarely up to 55) mm wide, exhibiting an opposite arrangement near the base and an alternate pattern along the upper stem. Leaves are lanceolate to ovate, typically 2- to 4 pinnately lobed, with base varying from cuneate to truncate, entire distal leaf edges, and both abaxial and adaxial surfaces bearing a fine strigillose to sericeous indumentum, often displaying a greyish hue and dotted with glands. The herb is monoecious, producing numerous diminutive staminate flowers aggregated into erect inflorescences, while the pistillate flowers, devoid of petals, are situated within leaf axils, enclosed by a cup-shaped involucre. Pistillate flower heads, clustered proximally to the staminate ones, each comprising one to two florets borne on peduncles measuring 0.5–2 mm. Involucres are cup-shaped, 1.5–3 mm or more in diameter, fine strigillose covering. Fruit is spiny bur, varying from pyramidal to pyriform in shape, measuring 1–2 mm in length, and exhibiting a strigillose to pilosulous surface. It bears 10–20 recurved spines and encloses a solitary seed, 3–4 mm in diameter [34, 35, 36, 37].

Location: Khaldeh, a coastal town located 12 km south Beirut, district Mount Lebanon Governorat, Alt 20m.

Figure 21

Phenology: October to February.

Habitat: A typical Mediterranean climatic regime characterized by hot, highly humid summers, mild and favorable autumn and spring seasons, and cool, precipitation-rich winters. The species is primarily distributed along coastal zones.

Specimen and accession number in K. Addam Herbarium: 12112365-001.

2 - Clinopodium graveolens subsp. rotundifolium (Pers.) Govaerts (Lamiaceae). Bisynonym. Acinos rotundifolius Pers

Figure 2- Clinopodium graveolens subsp. rotundifolium

Description: Annual, erect to recumbent 3–30 cm, stem usually crispate and dimly long hairy, barely and glandular. Leaves, 5–17 × 3–13 mm, glandular, puberulous to crispate or dimly long-haired, lanceolate-ovate or obovate to orbicular, upper part shallowly or remarkably serrate, apex mucronate. Verticillasters 1 to10, flowers 2 to 12. Calyx 5–9 mm, glandular, ± dimly long-hairy, upper teeth 1–2.5 mm, lower teeth 2–3.5 mm, projecting or not above lower teeth, spreading to recurved or parallel. Corolla pale blue to purple or pink, (7–)8–12(–14) mm [38].

Location: Yammouneh, Makneh, and Ras Baalbek constitute key localities within the Baalbek region of Lebanon. Yammouneh, encompassing a lake, a protected natural area, and an inhabited municipality, is positioned approximately 104 km northeast of Beirut within the Baalbek District of the Baalbek-Hermel Governorate, at an elevation of about 1400 m a.s.l. The surveyed material was additionally collected from Makneh (~1000 m a.s.l.) and Ras Baalbek (~900 m a.s.l.), further contributing to the floristic characterization of this montane landscape.

Figure 21

Habitat: It inhabits rocky slopes, frequently on calcareous substrates, as well as wetland and semi-desert environments characterized by low precipitation and elevated summer temperatures. The species exhibits broad ecological tolerance across diverse freshwater systems, including lakes, rivers, streams, extensive ponds, and artificial channels, provided that adequate sunlight and water availability are maintained.

Specimen and accession number in K. Addam Herbarium: 941762-001.

3 - Colchicum antilibanoticum Gomb. (Colchicaceae)

Figure 3- Colchicum antilibanoticum

Description: Corm oblong in form, measuring approximately 2–3 cm in length and 1–2 cm in width. Tunics, red brown to chestnut, not very long at the collar. Leaves 3-5, semi-erect or curve, appearing before the end of anthesis, narrow, long attenuated at the top. Flowers 1-10 (15), huge, white or pink with tepals of 1 - 2 cm. length, rarely 3 cm., lanceolate linear (more or less acute), 2 times as long as the stamens. Tube 3-4 times longer than perianth. Filaments, thickened towards base. Anthers 3-5 mm, black-brown, linear. Straight styles, extending beyond the anthers and with punctate stigmas. Fruit 1 cm. long, oval- trigonal [39, 40].

Location: Ayha, incorporating a village, plain, lake, and temporary wetland, is located in the Rashaya District of southern Beqaa Governorate, approximately 87.6 km from Beirut, at elevations of 1300–1500 m, while Yanta is situated at an altitude of 1500 m.

Figure 21

Phenology: November – December.

Habitat: The species is distributed across cold semi-arid environments characterized by extremely hot, arid summers and relatively cold, wet winters, with temperatures ranging from −1 to 36 °C, occasional snow events, and annual rainfall of 150–450 mm, occurring at elevations up to 1500 m. Its preferred habitats include stony grasslands, sparsely vegetated rocky slopes, bush clearings, and scattered trees, with substrates that are exceedingly dry in summer yet retain partial moisture during the flowering period [1].

Specimen and accession number in K. Addam Herbarium: 281120-001

4 - Colchicum feinbruniae K.Perss. (Colchicaceae)

Figure 4- Colchicum feinbruniae.

Description: A striking species that emerges in early autumn. Tuber 3-4 cm in diameter elliptic ovoid. Leaves, elliptic-ovoid 5-9 and 15-25 cm length, 1.5-2cm width, develop after flowering following the onset of heavy rains, blue green, erected, entire, arranged in rosette, truncate at the end, slightly sickle-shaped, lanceolate-lanceolate, leaflet margin is smooth, absent of stipule. Flowers 15 (20), sizable, huge. Petals range from pale to dark pink-purple and are highly tessellated icately. Anthers, initially appear dark purple, turn bright yellow when the pollen is released, and finally become greyish green. The style is longer than the stamen and often broadens at the tips [41, 42].

Location: Mazraat Alsied, in Bsharri Cedars and in Kfardebian. Mazraat Alsied is a mountainous village in the highlands of the Byblos District in the Keserwan-Jbeil Governorate, Alt 1140 m, 60.4 km far from Beirut, in Bsharri Cedars Alt 1900 m and in Kfardebian Alt 1600 m.

Figure 21

Phenology: October to February.

Habitat: Occupying exposed rocky mountain habitats, the species thrives on substrates spanning slightly acidic to alkaline conditions in environments characterized by challenging abiotic factors. Climatic conditions include cold, frequently snow-covered winters with an annual precipitation of approximately 1200 mm, and harsh summers accompanied by extended physiological drought, with a clear preference for full sunlight [1].

Specimen and accession number in K. Addam Herbarium: 391765-001.

5 - Centaurea depressa M.Bieb. Homotypic synonym: Cyanus depressus (M.Bieb.) Soják. (Asteraceae)

Figure 5- Centaurea depressa

Description: Annual herb, attaining 20–60 cm in height, with numerous stems arising from the basal region, spreading and moderately to openly branched distally, densely gray-tomentose. Leaves similarly gray-tomentose; petiolate, basal and proximal cauline. Blades oblong, 5–10 cm long, margins pinnatifid or entire with the terminal segment largest; apices obtuse. Mid and distal cauline leaves sessile, linear-lanceolate to oblong; blades generally of comparable dimensions, mucronate and entire. Flowers 25–35 mm in diameter; sterile flower corollas spreading, dark blue, 25–30 mm and enlarged, whereas fertile flower corollas are purple, ca. 15 mm. Cypselae brown, 4.5–6 mm, puberulent proximally near the attachment scar, otherwise glabrous; pappus composed of an outer series of unequal, rigid bristles 2–8 mm long, and an inner series of slender scales approximately 1.5 mm. Capitula radiate, borne singly on peduncles. Involucres ovoid to campanulate, 15–20 mm in length. Phyllaries with green laminas, outer series ovate, inner series oblong; margins glabrous, appendages erect, silvery-white to brown, scarious, and fringed with slender teeth 1.5–2 mm in length.[43, 44, 45, 46]
Location: Ras Baalbek Ras Baalbek, Baalbek District, Baalbek-Hermel Go [47] vernorate, Alt 1000 m,123 km far from Beirut.

Figure 21
Phenology: October to February.
Habitat: The species occurs in cold semi-arid climates, characterized by rainless, hot summers and cooler, wetter winters, with temperatures ranging from −1 to 36 °C and occasional snowfall, and an annual precipitation of 150–450 mm. It is distributed across high elevations from 869 to 1200 m, reaching up to 1500 m. Populations are typically found on dry, rocky slopes, in shrub clearings, and in treeless tundra-like montane habitats, where soils remain extremely dry during summer but become semi-moist during the flowering period. [11].
Specimen and accession number in K. Addam Herbarium: 621916-001.

6 - Chenopodium giganteum D.Don. (Amaranthaceae)

Figure 6– Chenopodium giganteum.

Description: Annual, 20–240 cm in height, presenting as a multi-branched shrub with erect stems. Young leaves are typically covered with purple vesicular hairs exhibiting a magenta hue, which gradually turns green as the foliage matures. Leaf blades rhombic to ovate, attaining dimensions up to 20 × 16 cm. Inflorescences terminal, forming panicles bearing hermaphroditic flowers. Flowers comprise five perianth segments and five stamens. Seeds approximately 1.5 mm in diameter. [48, 49].
Location: Mount Sannine, within the Mount Lebanon range and the Keserwan District, attains 2,628 m above sea level and lies approximately 45.5 km from Beirut.

Figure 21
Phenology: October to February
Habitat: The species inhabits limestone-based substrates on mountain slopes and rocky valleys. Snow cover persists from mid-elevation areas upwards until May, followed by a prolonged dry season from May to October. The landscape is characterized by scrub-dominated vegetation and scattered trees, with bare soil and stones constituting up to 60% of the surface, and occasional rock outcrops.
Specimen and accession number in K. Addam Herbarium: 2362430-001.

7 - Echium arenarium Guss. (Boraginaceae)

Figure 7- Echium arenarium

Description: Biennial, spiky-tuberculous 10-25 cm, stem, branched, slender, decumbent, with ascending yellowish hairs. Leaves covered with hair, one vein, the lower ones small, spatulate, petiolate, obtuse, upper ones and bracts lanceolate, half-embracing in the heart. Flowers, small, blue, subsessile, lower ones usually extra-axillary, in clusters at the end long. Calyx extremely hispid, with greenish-yellow hairs, lightly accrescent, with lanceolate lobes. C corolla 8-9 mm, tubular-conical 2 - 1/2 mm carpels, keeled on the back and tubercular [50, 51].
Location: Rawche-Beirut Alt About 30 m and Sibline Alt 180 m.

Figure 21
Phenology: April – May.
Habitat: The species inhabits regions characterized by a Mediterranean climatic regime, with hot, highly humid summers, mild and favorable autumn and spring seasons, and cool, precipitation-rich winters. It is typically distributed along coastal zones and rocky seashores.
Specimen and accession number in K. Addam Herbarium: 1352017-001.

8 - Echinops spinosissimus subsp. spinosus Greuter. (Asteraceae)

Figure 8- Echinops spinosissimus subsp. spinosus Greuter

Description: Annual, stems 15–60 cm long, hairy, erect to decumbent, and extensively branched.Leaves: Simple, opposite, long-petiolate; blades 2–7 cm broad, palmately divided into 5–9 primary segments, each deeply cleft into linear secondary divisions; two leaves per node along the stem. Flowers: 15–20 mm, pink to purple, few, borne on elongated pedicels and slender peduncles; flowers actinomorphic. Sepals 5, 5–11 mm long, each terminating in a bristle 2 mm long; petals 5, obovate to cordate, 7–11 mm long, purple, rounded or slightly notched with prominent venation, slightly exceeding the sepals; petals and sepals free, not fused. Stamens 10, filaments free; style 1.5 cm long, terminating in a slender beak 3–5 mm long; stigmas 2 mm. Fruit: Mericarps 5, 2.2–2.8 mm, smooth, sparsely bristly; seeds finely pitted. [52, 53].
Location: Zaaroor is a ski resort on the eastern slopes of Mount Sannine in the Matn District of Mount Lebanon Governorate, Alt 1700 m, 40.9 km far from Beirut. Also found in Mairouba, Touaite.and Tarshish.

Figure 21
Habitat: The species thrives in well-drained, non-calcareous sandy soils under full sunlight, occurring on mountain slopes and rocky valleys. Snow persists from mid-elevation zones upward until May, after which a prolonged dry period extends from May through October. The vegetation is characterized by scattered scrub and small trees, with up to 60% of the substrate comprising bare soil and stones, interspersed with occasional rock outcrops.
Phenology: June to August.
Specimen and accession number in K. Addam Herbarium: 761716-001.

9 - Geranium *columbinum* L. (Geraniaceae)

Figure 9- Geranium columbinum

Description: Annual herb. Stems 15–60 cm long, hirsute, erect to decumbent, and moderately branched. Leaves, simple, opposite, long-petiolate; blades 2–7 cm broad, palmately divided into 5–9 primary segments, each deeply cleft into linear secondary divisions; two leaves per node along the stem. Flowers, 15–20 mm, pink to purple, few, borne on elongated pedicels and slender peduncles; actinomorphic. Sepals 5, 5–11 mm long, each terminating in a bristle ca. 2 mm long; petals 5, obovate-cordate, 7–11 mm long, purple, rounded or slightly notched with prominent venation, barely exceeding the sepals; petals and sepals free, not fused. Stamens 10, filaments free; style 1.5 cm long, terminating in a slender beak 3–5 mm long; stigmas 2 mm. Fruit and Seeds, mericarps 5, 2.2–2.8 mm, smooth, sparsely bristly; seeds finely pitted [54, 55, 56].
Location: Bchamoun is a city (about 6 km east of Khalde) in Mount Lebanon Governorate Kaza of Aaley, both Mohafazah. Altitude about 200 m, about 12 km far from Beirut.

Figure 21
Phenology: February – May.
Habitat: "The species occurs under a Mediterranean climatic regime, characterized by hot, highly humid summers, mild and favorable autumn and spring seasons, and cool, precipitation-rich winters. It is typically found in proximity to pine forests and along roadsides.
Specimen and accession number in K. Addam Herbarium: 112754-001.

10 - Iris wallisiae T.Hall & Seisums. (Iridaceae)

Figure 10- Iris wallisiae

NB: Discrepancies between the information gathered from various sources and the original publication by Tony Hall and Arnis Seisums [57] on this plant, which is endemic to Lebanon and Syria, prompted us to undertake a description of our own. Following several years of field observation, we documented morphological characteristics and measurements, compared them with the original description, and supplemented the account with additional findings.

Description: Bulbous perennial, rhizome (elongated oval bulb, 45 – 55 mm long, 25 – 35 mm diameter). Rhizome tunic (Outer bulb scale) 4-6, dark brown, coriaceous, becomes membranous in the inner layers, with parallel longitudinal fibers, consists of several layers 4-6, the inner layer is membranous Inner bulb scale, ivory in color that transitions to amber in the upper third while the remaining two-thirds of the bulb exhibits a dark creamy hue. Roots, multiple fleshy roots that persist during the dormancy phase. Stem, extremely short 5 – 10 mm, 4 – 5 mm diameter, cylindrical glabrous, light green, surrounded by leaves and bearing one flower. Leaves 40 - 60 mm x 7 - 13 mm, strap-like ensiform meaning they are long and narrow with pointed tips, green to bluish-green, (with parallel prominent veins covered by fine papillose (10 to 30 veins), the central one is made up of two adjacent veins) usually overlapping at the base, forming a single plane, leaves are arranged typically in two ranks (2-ranked) 3 leaves on one side and 2 on the other side, often fan out at the base, a white, obscurely ciliated edge (by fine papillose) that turns to brown orange color when the flower is totally mature. Leaves growth is during anthesis, and they are distributed two on one side and three on the opposite side. Sheath, membranous, envelopes the entire stem and leaves base, spathe (Bract and bracteole) 25 – 50 mm x 14-20 mm, subequal, soft-textured, membranous (with white edge), light to yellowish green, wide at the base, extends between two-thirds to entire length of the perianth tube. Flower, 60-8 mm height x 60-80 mm diameter, variable in colour Blue white to blue-violet with yellow signals, large standards that remain above the horizontal during flowering and only reflex as the flower fades. This contrasts with many other Juno irises, where the standards are smaller and more reflexed. Ovary 15 – 20 mm x 6-8 mm diameter, elongated ellipse, glabrous, yellowish. Standard (Petal) 20 - 30 mm x 10 - 14 mm, bluish white to blue violet, spatulate with wavy edges and dark longitudinal veins. In young flowers, standards stand upright above the horizon, but as they mature, they bend downward below the horizon Blade of Standard 14 mm 8 mm x 10 mm- 14 mm, oval, wavy edges and dark longitudinal veins. NB: Iris wallisiae possesses proportionally enlarged standards (inner tepals), which exceed one-half the length of the outer tepals (falls). This is a major distinction from the Juno group Irises. At the time of blooming, the standards remain predominantly horizontal or marginally below, initiating downward curvature as the blossom matures. Fall (Sepal) 35 mm – 50 mm x 20 mm – 30 mm, oblanceolate, wide, blue-white to blue-violet with wavy edges and dark longitudinal branched veins, and with a yellow keel towards the top, fall rises at a 45° angle before curving downward in its final third. Fall keel 30mm- 45mm x 4mm - 8mm, yellow, dotted with a bundle of elongated black dots from the beginning of its lower quarter to the end of its third quarter, widened above the middle, then attenuated into a narrow protruding blade. Haft of Fall, wide yellowish green. Beard, No beard. Crest 10 mm -14 mm x 15 mm – 20 mm, headed up, serrated and split in half, with pale yellow to orange-yellow crest and surrounding zone to falls. Stigma 2 mm – 3 mm x 7 mm – 9 mm, arc shape, serrated and wavy edges at the end of the arc style and split at the top. Style arm 25 mm – 30 mm x 12 mm – 15 mm diameter, arched upwards, canalicular, with a prominent groove extends longitudinally on its back. Protruding from its upper end the stigma and the crest. Filament 20 – 25 x 1mm – 1.5 mm white membranous, thicker at the bottom. Anther 14 mm – 17 mm x 1.6 mm - 2.6 mm, spear-shaped, pointed tip, beige color [57].

Figure - Our Iris wallisiae parametric scale

Location: Yammouneh, a village in the West Bekaa region within the Baalbek District of the Baalbek-Hermel Governorate, is located approximately 27 km northwest of Baalbek. The area encompasses a lake and a protected nature reserve, positioned on the northeastern slopes of the Mount Lebanon range at the confluence of Jebel al Makmel and Jebel al Mnaitra, at an elevation of ca. 1,450 m above sea level and roughly 104 km from Beirut. The species under study is additionally recorded from Jabal Lala, situated 41 km from Beirut at an elevation of 1,400 m.

Figure 21
Phenology: 2-3.
Habitat: The area encompasses a heterogeneous habitat within a fertile valley encircled by mountains, exhibiting a Mediterranean climatic regime with pronounced seasonal variation and localized microclimates. Elevations reach up to 1,660 m. The species occurs on stony grasslands, dry, rock-strewn slopes, shrub clearings, and among scattered trees, thriving in montane soils that are extremely dry during the summer yet become semi-moist during the flowering period. The village, inhabited by a few hundred residents, is notable for its abundance and diversity of Juniper trees [15].
Specimen and accession number in K. Addam Herbarium: 1031958-001.

11 - Lamium moschatum subsp. micranthum (Boiss.) Mennema (Lamiaceae).

Figure 12 - Lamium moschatum subsp. micranthum

Description: Annual, attaining up to 50 cm in height; stem erect, typically unbranched, angled, greenish to purplish, and glabrous. Leaves, opposite, simple, entire, ovate, pubescent on both surfaces; margins crenate with irregular, rounded teeth; apex obtuse to subacute; base cordate; petioles and leaves pubescent. Apical leaves frequently exhibit white to light or deep purple coloration. Inflorescence and Flowers, aromatic, hermaphroditic, zygomorphic flowers arranged in multi-flowered verticillasters on interrupted spikes. Bracts leaf-like, smaller than leaves, often exhibiting a basal white or purplish blotch. Corolla bilabiate, white; upper (adaxial) lip entire, hood-shaped, densely pubescent externally, lateral lobes triangular and glabrous; lower lip, obovate to suborbicular, 2-parted, occasionally emarginate, glabrous. Calyx, campanulate, 5-toothed, teeth spreading and pointed, margins purplish, externally pubescent. Reproductive Structures, Stamens 4 (didynamous, 2 pairs), anthers 2-thecous, pubescent; ovary superior; style single; stigma 2-lobed [58, 59].

Location: Gharifeh and Gharifeh located in the Kaza of Chouf, and Bshamoun kaza of Aaley, both Mohafazah. Mount-Lebanon, Alt 800 m, 56 km far from Beirut.

Figure 21
Phenology: March to May.
Habitat: The species occurs under a Mediterranean climatic regime, characterized by hot, highly humid summers, mild and favorable autumn and spring seasons, and cool, precipitation-rich winters. It is typically found in open habitats, along riversides amid rocky substrates, at field margins, uncultivated roadsides, on hill slopes, and in disturbed or waste grounds. [60].
Specimen and accession number in K. Addam Herbarium: 2631062-001.

12 - Nothoscordum × borbonicum Kunth (Amaryllidaceae)

Figure 13 - Nothoscordum × borbonicum Kunth

Description: Bulbous, perennial, hybrid of *N. entrerianum* × *N. gracile*, forming small, ovoid, white bulbs approximately 1.5 cm in diameter; long-lived, onion-like habit. Stem 15–60 cm tall, occasionally reaching up to 1 m, 2.5–7 mm in diameter, slender, cylindrical, solid, typically green, leafless and flowering; occasionally branched at the apex supporting the terminal umbel. Stem hollow, bearing clusters of flowers. Leaves narrow, strap-like, 15–60 cm long, 2–10 mm wide, with papery basal sheaths, faint onion-like odor, forming basal clusters of 2–10 leaves, generally drooping; glabrous, entire margins, obtuse apices. Flowers fragrant, white, 10–15 mm, arranged in umbels of 8–20 at the apex of erect flowering stems 40–100 cm tall; individual flowers borne on pedicels 10–45 mm long, radiating from a common point. Young umbels enclosed in two papery bracts (spathes) 6–15 mm long. Perianth of six tepals, 8–15 mm, white with central markings ranging from pale green to pinkish or brownish. Stamens six, yellow, 7–8 mm; ovary superior, topped with a whitish style and stigma. Fruit capsules 5–8 mm, maturing from green to pale brown, each compartment containing 4–12 black, strongly angled seeds approximately 2 mm in size [61, 62, 63, 64, 65]. This taxon is considered an escape from cultivation, yet it establishes readily and thrives under harsh natural conditions.
NB. This hybrid was mistakenly published as Allium triquetrum L. (Liliaceae) in the Lebanese Science Journal, Vol. 9, No. 2 (2008), by Georges Tohmé and Henriette Tohmé [66]. Such inaccuracies should be rectified, as precise taxonomic identification is essential in botanical research, where the morphological distinctions between taxa are readily recognizable to specialists.
Location: Beirut. Alt 78 m.

Figure 21
Phenology: March to August.
Habitat: The species occurs under a Mediterranean climatic regime, characterized by hot, intensely humid summers, cool springs, and precipitation-rich winters, with autumn and spring providing relatively mild and favorable conditions. It exhibits ecological plasticity, thriving on alkaline and saline substrates, and tolerates both moist and drought-affected environments. The species is frequently encountered along roadsides, beneath tree canopies, and within various disturbed or anthropogenically altered urban sites, including areas in capital districts.
Specimen and accession number in K. Addam Herbarium 4586-001.

13 - Parietaria judaica subsp. judaica syn. Parietaria officinalis subsp. diffusa (Mert. & W.D.J.Koch) Schübl. & G.Martens (Urticaceae)

Figure 14 - Parietaria judaica subsp. judaica

Description: Perennial, pubescent to strain strong enough 10-30 - (70) cm, stem erect or diffuse with numerous branches covered with rough hairs. Leaves relatively large or small, 5-20 cm x 10-15 cm, dark green, shiny, stalked, petiolate, ovate or elliptic-lanceolate, pointed at the ends, multi-serrated, alternate. Perianth, bell-shaped. Flowers, essentially hermaphroditic, greenish or whitish, germinate in the axils of the leaves without pedicles, grouped in five glomeruli, Stamens are initially stretched as clock springs, lengthen as the flowers bloom. Fruit, glossy, black alkene 2 mm long (subject to spread by ants and wind) [67].
Location: Al-Bramieh is a municipality located within the Sidon District of the South Governorate, Lebanon, approximately 35 km from Beirut. Elevations include Hlalieh at 100 m and Al Meshrif at 80 m above sea level.

Figure 21
Phenology: October to February.
Habitat: The species occurs under a Mediterranean climatic regime, characterized by hot, intensely humid summers, mild and favorable autumn and spring seasons, and cool, precipitation-rich winters. It is typically found along coastal zones, rocky seashores, and roadside habitats, particularly within the Beirut region.
Specimen and accession number in K. Addam Herbarium: 1216122-001.

14 - Plantago lanceolata var. dubia (L.) Lilj. (Plantaginaceae)

Figure 15 - Plantago lanceolata var. dubia

Figure 16 - Parametric differences between P.lanceolata and P.lanc.. var. dubia.

NB: We conducted our own description of this plant, as the available information was insufficient and could not be reliably used, considering this as a very successful step. Upon completing the description and measurements, we found that only a few characteristics of the two taxa coincide, whereas many exhibit substantial differences. A comparative table was developed to emphasize these distinctions, providing evidence that this variety merits recognition as a separate taxon rather than being regarded as a synonym of Plantago lanceolata.
Description: Main differences of P. lanceolata and P. lanceolata var. dubia shown in Table 1.

Table 1 - Main differences of P. lanceolata and P. lanceolata var. dubia

	Plantago lanceolata	Plantago dubia
Plant stem & characteristic in general	Up to 30 (60) cm	Up to 40 cm, biennial to perennial, forming a basal rosette of lanceolate hairy leaves with prominent parallel veins and entire or slightly toothed margins. It is characterized by its slender, hairy ribbed flower stalks, each topped by a subglobular or ovoid to oval-conical spike of small flowers, distinguishing it from the cylindrical spikes of other P. lanceolata varieties. The plant has a woody taproot, a dense tuft of hairs at the base of the petioles, and produces two-seeded capsules containing shiny, brown seeds.
Leaves	Glabrescent or pubescent, more or less narrow lanceolate or narrow elliptic, 10-25 (40) cm long, 1-3 (5) cm wide, long attenuated at both ends, acute at the apex. Petiolate at the base, glabrous	Densely pubescent (hairy) and papillosent, narrowly lanceolate, with prominent parallel veins (3 to 5) and entire or slightly toothed margins, 8-15 cm long, 0.6-1.2 cm wide, attenuated at both ends, acute at the apex. Petiolate at the base, densely pubescent.
Scape	Scape erect, 10-30 (60) cm, furnished with scattered white hairs.	Scape erect, 10-30(40) cm, furnished with very dense white membranous hairs.
Spikes	Epicylindrico-conical . Bracts broadly ovate, attenuated at the apex, keeled, with a wavy, eroded margin, 4-5 mm. Sepals 3-3.5 mm long, glabrous or somewhat villous at the margin, keeled, the two anterior ones usually connate. Corolla lobes ovate-acuminate. Capsule oblong.	Subglobular or ovoid to oval-conical . Bracts ovate, attenuated at the apex, keeled, with a straight and dark margin, 2-5 mm. Sepals 2.5-3.5 mm long, glabrous, keeled, the two anterior ones usually connate. Corolla lobes ovate-acuminate.

One of the most notable distinctions between *Plantago lanceolata* and *Plantago lanceolata* var. *dubia* lies in their altitudinal distribution. *Plantago lanceolata* var. *dubia* typically occurs at elevations ranging from approximately 1200 m to 1900 m, whereas *Plantago lanceolata* is generally found at lower altitudes, between about 60 m and 900m.
Location: Arz Bmahray a village in the Aley District, 41 km southeast Beirut, Altitude 1800m. Jabal Al Knaiseh Alt 1900 m., Sannine, Alt 2000m, Alzaarour Alt 1600m.

Figure 21
Phenology: June-October.
Habitat: Usually grows at higher altitudes in rocky, nutrient-poor soils, of Mediterranean climate with hot, dry summers and mild, wet snowing winters. Its habitat is a mountainous forest featuring a mix of cedar, bushy scrub and pine trees, with rocky cliffs, open grasslands, and streams at higher altitudes.
Specimen and accession number in K. Addam Herbarium: 1852589-001.

15 - Physalis ixocarpa Brot. ex Hornem. (Solanaceae)

Figure 17 - Physalis ixocarpa Brot. ex Hornem

Description Annual, attaining up to 50 cm in height; stems hairy with minute simple hairs or occasionally glabrous. Leaves, one or two per node, narrow-ovate, typically up to 6 cm long and 30 mm wide, occasionally larger; base cuneate, margins irregularly dentate or lobed; petioles up to 6 cm long. Inflorescence and Flowers, pedicels 6–10 mm long. Calyx 3.5–5 mm, lobes triangular, 1–2 mm long. Corolla broad-stellate to five-angled, 6–10 mm, pale yellow with five dull brownish blotches. Stamens with anthers 1–1.5 mm long; style 2–2.5 mm. Fruit, Fruiting calyx circular in cross-section, 15–30 mm long, pale green upon drying. [68].
Location: Beirut-Ramleh-Elbaidah, at the seashore.

Figure 21
Phenology: April to June.
Habitat: The species thrives within a Mediterranean climatic system, defined by hot and markedly humid summers, mild and favorable transitional seasons, and cool winters with substantial precipitation. It demonstrates considerable ecological tolerance, occurring on alkaline and saline substrates and persisting in both hydric environments and drought-affected, disturbance-prone sites. It is frequently encountered along coastal roadsides and on sandy maritime shores.
Specimen and accession number in K. Addam Herbarium: 2524115-001.

16 - Senecio vulgaris var. denticulatus (O.F.Müll.) Hyl. (Asteraceae)

Figure 18 - Senecio vulgaris var. denticulatus

Description: Annual, 10-60 cm (taprooted), herbage glabrous or sparsely and unevenly tomentose when young. Stem erect, branched, hairy (simple hairs) with minute. Leaves, shallow or deep pinnate lobed 61 mm x 25 mm, smaller towards the top of the plant. Leaves are sparsely covered with soft, smooth, fine hairs (can be glabrous sometimes), lobes typically sharp to rounded saw-toothed, middle cauline leaves as having lobes semicircular to triangular to oblong, margins regularly bidentate, auricles often large, but otherwise variable, and outline oblong to spathulate, leaflets spotted black at the top, ligules, usually found but not always ligulate.

Flower, heads 8–20 in loose, corymbiform arrays, ray florets 2.3-3.0 mm long, yellow or light yellow (most reliable diagnostic character in the field, is the presence of ray florets where they are absent in var. vulgaris), calyx of 2-6 mm bracelets (prominent, black-tipped, lengths about 1/4 phyllaries), supplementary bracts of capitula: Often linear-lanceolate (variable), phyllaries ± 21mm x 4-6 mm, tips usually green, sometimes black, cypselae usually sparsely hairy, sometimes nearly glabrous. Seeds (2.4-2.8) mm average 2.5 mm. Achene, a distinct fringe of hairs often presents at apex. Pappus 6-9 mm 5-6 mm, 2n = 40. Senecio vulgaris var. denticulatus exhibits pronounced seed dormancy, likely controlled by a single major gene, and necessitates significantly more time to complete its life cycle compared to var. vulgaris. Furthermore, there is some indication that the reproductive potential of var. denticulatus is lower than that of var. vulgaris [69, 70, 71, 70, 72, 73].
Location: Rmaileh. A village located municipality in Chouf District, Mount Lebanon Governorate, Alt about 40 m, 17.5 km far from Beirut.

Figure 21
Phenology: February to October.
Habitat: Mediterranean climate portrayed by a hot, extremely humid summer, pleasurable autumn and spring, and cool rainy winter. IT grows in alkaline and saline soil, favors wet land areas and drought disturbed regions such as roadsides beside the coastline.
Specimen and accession number in K. Addam Herbarium: 321916-001.

17 - Silene caramanica Boiss. & Heldr. (Caryophyllaceae)

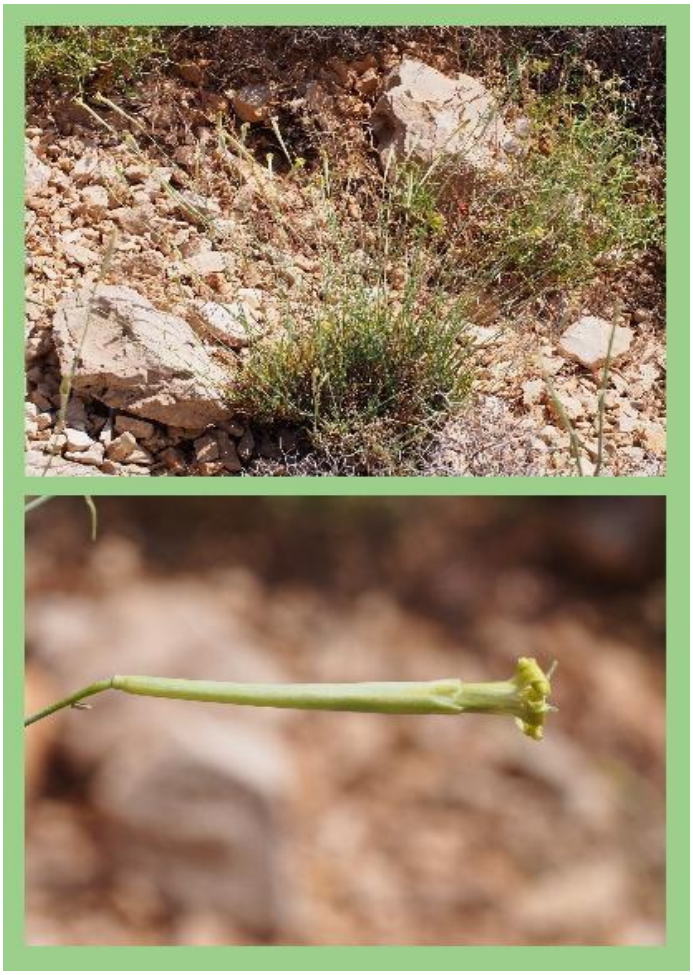

Figure 19- Silene Caramanica

Description: perennial, upright herb reaching 30–50 cm in height, with the lower portion of the stem bearing sparse fine hairs. Basal leaves are linear-lanceolate, 20–67 mm long; upper (cauline) leaves are narrower, 15–60 × 1–5 mm, and exhibit a papillose-puberulous surface. Both leaf types are less than 5 mm wide. The gap between the petal's bifurcation and the coronal scales measures 4–6.5 mm. Bracts are linear-lanceolate and do not enclose the developing flower buds. The inflorescence is racemose, with solitary flowers at the stem apex. The calyx measures 22–35 mm. Petals are 5–7.5 mm long, pale on the inner side and greenish externally, and are divided halfway. Coronal scales are 1.5–2 mm long. Both filaments and pistil are glabrous. The gynophore is smooth, 7–17 mm in length, approximately equal to or slightly surpassing the included capsule. [74].
Location: Ras Baalbek. is a village in the northern Beqaa Valley, Baalbek District, Baalbek-Hermel Governorate, Alt 1044 m, 124.1 km far from Beirut.

Figure 21
Phenology: May to August.
This species is characteristic of cold, semi-arid regions that experience dry, rain-free summers and colder, wetter winters with occasional snowfall. Temperatures typically range from −1°C to 36°C, and annual precipitation averages between 150–450 mm. It thrives at higher elevations, commonly found between 700–1200 m, occasionally reaching up to 1500 m. The plant inhabits dry, rocky hillsides, open scrublands, and treeless mountain tundra, where soils remain extremely dry in summer but become moderately moist during the flowering season [11].
Specimen and accession number in K. Addam Herbarium: 2651927-001.

18 - Verbascum qulebicum Post. (Scrophulariaceae)

Figure 20 - Verbascum qulebicum

Description: Plant 150-200 cm, covered below with a spidery coating, glabrius and reddish above. Stem, robust, angular, branching. Basal leaves petiolate briefly, blade oblong-elliptical, 20-65 X 6-20 cm, crenate or crenate-lobed, acute, wedge-shaped at the base. Stem leaves are similar but smaller, the middle ones sessile, more or less cordate at the base, the upper ones very small, glabrous and acute. Inflorescence loose, branched, forming an oblong panicle. Flowers fasciculate by 3-7 in the axils of the bracts. Bracts 2-4 mm, ovate-lanceolate, glabrous. Pedicels up to 7 mm long, bracteoles very small. Galicia 2-3 mm, glabrous, lobes linear, acute.

Corolla yellow, 20-25 mm in diameter, weakly hairy or glabrous outside. Stamens 5, anthers Medi fixed. Nets with dark purple hair. Capsule oblong-elliptical, 4-6 mm long, glabrous [40, 75, 76].
Location: Tawmat Niha Al Shouf District, Alt 1650 m, about 65 km far from Beirut.

Figure 21
Phenology: May to August.
Habitat: This species flourishes in exposed high-altitude landscapes lacking forest vegetation, typically occurring between 1,400 and 1,650 meters above sea level. Annual rainfall in these environments generally ranges from 600 to 1,100 mm. It favors rocky, mixed-textured soils and tolerates wide moisture variability, from dry to waterlogged conditions. The area experiences cool, wet winters, often accompanied by heavy snowfall that may accumulate to about one meter [11].
Specimen and accession number in K. Addam Herbarium: 19519111-001.

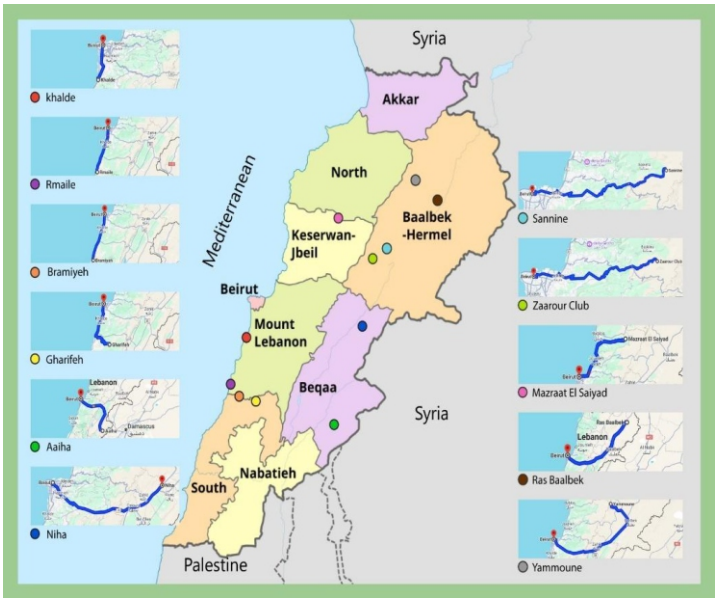

Figure 21- Species' venue substantiated within Lebanese territory

DISCUSSION

Many fascinating discoveries have emerged from our recent identification of new species, as well as from revisiting others that were previously found but not adequately described or officially recognized as a species and not a synonym. Our mission has never been about making discoveries merely for publication but about uncovering the truth behind certain classification errors. We want to emphasize that our goal is not to criticize or offend anyone for these mistakes; rather, our work is part of a respectful academic dialogue aimed at advancing accurate knowledge and its proper dissemination.
Clinopodium graveolens subsp. rotundifolium has been evaluated for inclusion in the IUCN Red List at the regional scale and is classified as Endangered (EN) in the Red List of the Flora of the State of Palestine [77]. Consequently, it is recommended that this taxon be formally recognized and incorporated into Lebanon's national list of endangered plant species.
The global conservation status of Colchicum antilibanoticum Gomb. and Colchicum feinbruniae K.Perss. has not been assessed and included in the IUCN Red List of Threatened Species. There is currently "no conservation status" for this taxon in the main IUCN database but they were listed at "Important Plant Areas of the south and east Mediterranean region Priority sites for conservation" [78]. However, the species is regarded as highly rare and is legally protected within its native distribution range, encompassing Lebanon, Syria, and the Mount Hermon region.
The global conservation status of *Centaurea depressa* M. Bieb. has not yet been formally assessed by the IUCN Red List; nevertheless, the species appears to be of very limited occurrence within Lebanon.
Echinops spinosissimus subsp. *spinosus* Greuter occurs infrequently in certain localities across Lebanon, often in association with other *Echinops* species, and warrants conservation measures to ensure its protection.
Geranium columbinum L. has a global conservation status of Least Concern (LC) on the IUCN Red List but found extremely rare in the fields near stone built walls.
NB. *Geranium columbinum L.* was published with a wrong picture in the Illustrated Flora of Lebanon by Georges Tohmé and Henriette Tohmé. Page 332 and that is why we published it.
Tohmé G, Tohmé H. Illustrated flora of Lebanon, second edition. Beirut: CNRS Lebanon publications, 2014, pp 332.
According to the Angiosperm Extinction Risk Predictions (AERP) v1, *Iris wallisiae* is predicted to be at a "threatened" level of extinction risk. As it is extremely rare in Lebanon [79], the species requires urgent conservation attention and protective measures.
Silene caramanica is a species originally endemic to southwestern Turkey [80], with its natural distribution confined to a limited area in that region, indicating its exclusive occurrence there. However, its recent documentation in Lebanon suggests that the species' endemic range now encompasses both Turkey and Lebanon. While it has not been formally categorized under IUCN threat criteria, the species' pronounced spatial confinement substantially exacerbates its exposure to environmental instability and anthropogenic pressures. Analogous cases within *Silene* highlight that such narrow endemism commonly necessitates heightened conservation prioritization.
In conclusion, *Verbascum qulebicum* Post. is an exceptionally rare species that requires urgent conservation and protective measures.

CONCLUSION

Ambrosia confertiflora DC. (Asteraceae), Clinopodium graveolens subsp. rotundifolium (Pers.) Govaerts (Lamiaceae), Colchicum antilibanoticum Gomb. (Colchicaceae), Colchicum feinbruniae K.Perss. (Colchicaceae), Centaurea depressa M.Bieb., synonymized as Cyanus depressus (M.Bieb.) Soják. (Asteraceae), Chenopodium giganteum D.Don. (Amaranthaceae), Echium arenarium Guss. (Boraginaceae), Echinops spinosissimus subsp. spinosus Greuter (Asteraceae), Geranium columbinum L. (Geraniaceae), Iris wallisiae T.Hall & Seisums (Iridaceae), Lamium moschatum subsp. micranthum (Boiss.) Mennema (Lamiaceae), Nothoscordum×borbonicum Kunth (Amaryllidaceae), Parietaria judaica subsp. judaica (Urticaceae), Plantago lanceolata var. dubia (L.) Lilj. (Plantaginaceae), Physalis ixocarpa Brot. ex Hornem. (Solanaceae), Senecio vulgaris var. denticulatus (O.F.Müll.) Hyl. (Asteraceae), Silene caramanica Boiss. & Heldr. (Caryophyllaceae) and Verbascum qulebicum Post. (Scrophulariaceae) were newly discovered, identified, and subjected to detailed taxonomic, morphological, and phenological characterization, thereby constituting first records for the Lebanese flora.

Drawing upon more than 24 years of systematic field investigations and comprehensive monitoring across diverse biogeographical localities—coupled with refined phenological analyses—the recognition of fourteen species newly documented for Lebanon has been robustly verified. The availability of multiple collected specimens further reinforces the authenticity and reliability of these novel records. A representative voucher specimen has been curated and archived in the K. Addam Herbarium at the Arts, Sciences and Technology University in Lebanon. The material was collected and taxonomically validated by Dr. K. Addam and Mr. M. Bou-Hamdan.

RECOMMENDATIONS

Biodiversity loss, along with multiple threats, endangers nearly 50,000 plant species globally. Conservation efforts face challenges due to complex interactions among threats, complicating effective management strategies [81]. Preserving unique habitats is the best approach to protect endangered species [82].

Lebanon, once known as "Green Lebanon" for its forests, now faces severe environmental degradation despite a strong history of activism [83]. To counter these challenges, conservation efforts must support ecosystem rehabilitation and sustainable management. Though deforestation and urbanization threaten plant life, increasing awareness drives conservation efforts [84].

Certain newly documented species survive due to:

a) Harsh environmental conditions in mountainous regions.

b) Remoteness limiting access.

c) Political instability, especially near the Syrian border.

d) Lack of ecotourism reduces human disturbance.

Solutions include:

a) Raising awareness via education and media, focusing on rural communities [85].

b) Controlling excessive grazing by livestock.

c) Managing urbanization to prevent habitat destruction.

d) Addressing fire threats that cause degradation of flora.

e) Regulating agriculture and land use to protect plant species.

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