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continued on the back inside cover

Cover: Life and death in one night - wolf hunting the hare. Mixed media—gouache, acrylics, pen & colour pencils. © Dupati Poojitha.

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ARTICLE

Noteworthy records of vascular plants from the West Bank, occupied Palestinian territories

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Abstract: This study reports noteworthy data records on 23 species belonging to 19 families of vascular plants from the West Bank (occupied state of Palestine). For 15 uncommon/rare species, the newly collected data meaningfully extend their range: *Saccharum spontaneum*, *Cyrtomium falcatum, Eleocharis palustris, Crypsis factorovskyi, Coincya tournefortii, Medicago ciliaris, Abutilon theophrasti, Anabasis oropediorum, Allium rothii, Fallopia convolvulus, Glycyrrhiza echinata, Plantago major, Pseuderucaria clavata, Lupinus palaestinus*, and *Cistanche violacea.* Eight other species are recorded for the first time in the West Bank: *Tordylium cordatum, Bergia ammannioides*, *Sambucus ebulus*, *Araujia sericifera, Euphorbia graminea, Potamogeton nodosus, Cyrtomium falcatum,* and *Ulmus minor.* Three of those eight species (*Araujia sericifera, Euphorbia graminea,* and *Cyrtomium falcatum*) are not local in the studied region (introduced species). The fact that three of the eight new records were introduced indicates that human disturbance is becoming dominant here as elsewhere in the world. Such data are useful as Palestine is currently implementing a new National Biodiversity Strategy and Action Plan and one of its actions is focused on the conservation of rare species of plants and combatting introduced/invasive species.

Keywords: Biodiversity, conservation, flora, geographic distribution, range extension, rare species, State of Palestine.

تقدم هذه الدراسة سجلات بيانات جديرة بالملاحظة عن 23 نوعًا تنتمي إلى 19 عائلة من النباتات الوعائية من الضفة الغربية (دولة فلسطين المحتلة). بالنسبة لـ 15 نوعًا غير شائع/نادر ، تعمل البيانات المجمعة حديثًا على توسيع نطاقها بشكل مفيد: Saccharum spontaneum ،Cyrtomium falcatum ،Eleocharis palustris ، Crypsis Factorovskyi ،Coincya Tournefortii ،Medicago ciliaris ،Abutilon theophrasti ،Anabasis oropediorum ،Allium rothii ، Fallopia convolvulus ،Glycyrrhiza echinata ،Plantago الكبرى، Pseuderucaria clavata. و ،Cistanche violacea تم الترمس الفلسطيني، . تسجيل ثمانية أنواع أخرى لأول مرة في الضفة الغربية وهي: Tordylium cordatum ،Bergia ammannioides،Sambucus ebulus ،Araujia sericifera ،Euphorbia graminea ،Potamogeton nodosus ،Cyrtomium falcatum ،Ulmus minor في ثلاثة من هذه الأنواع الثمانية ليست محلية المنطقة المدروسة (أنواع مُستوردة). تشير حقيقة إدخال ثلاثة من السجلات الثمانية الجديدة إلى أن الاضطراب البشري أصبح مهيمنًا هنا كما هو الحال في أماكن أخرى من العالم. مثل هذه البيانات مفيدة حيث أن فلسطين حاليًا تنفيذ استراتيجية وخطة عمل وطنية جديدة للتنوع الحيوي، وأحد أنشطتها يركز على الحفاظ على الأنواع النادرة من النباتات

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Author contributions: Qumsiyeh—conception, writing, editing manuscript; Al-Sheikh—field work, data colletion, species identification, writing; Hubbieh—field work.

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INTRODUCTION

The small geographic area of Palestine boasts diverse habitats because of the geologic history of the African and Arabian tectonic plates' movements that resulted in high mountains but also the lowest point on earth at the Dead Sea. This geologic history and Palestine's geographic location at the nexus of the Eurasian and African continents allowed this area to have diverse habitats and to include floristic elements covering five assemblages: Mediterranean, Irano-Turanian, Saharo-Sindian, Coastal, and Ethiopian-Sudanese. The local flora was studied showing significant floral biodiversity (e.g., Zohary 1966, 1972; Feinburn-Dothan 1978, 1986; Danin 2004; Al-Sheikh 2019), but much remains to be explored, including updating the presence, ecology, and conservation status of many families and groups. New distributional records from the West Bank (occupied Palestinian Territories) are being published now (Al-Sheikh & Mahasneh 2016; Pahl & Qumsiyeh 2021; Al-Sheikh & Qumsiyeh 2021, 2022; Gideon & Qumsiyeh 2023; Qumsiyeh & Al-Sheikh 2023).

The flora is threatened by human activities including climate change, pollution, habitat destruction, overexploitation, invasive species, and Israeli settlement activities (Qumsiyeh & Abusarhan 2021; Qumsiyeh 2024). Nearly a third of the known species of plants in the West Bank are rare or threatened (Al-Sheikh & Qumsiyeh 2022). Recently, a new protected area network for the state of Palestine Gaza Strip, and the West Bank was created and approved at the highest level of government (see Qumsiyeh et al. 2023).

Together with the new National Biodiversity Strategy and Action Plan (NBSAP), the plans to manage the protected areas highlighted understanding plant distributions and the presence of invasive species to facilitate habitat conservation and to face the human-induced threats to the environment. These gaps in knowledge are important to address to bridge the science-policy-practice gap for plant conservation. Hence, a program was developed to collect field data and herbarium specimens, especially from protected areas to fill that gap. The knowledge of the flora of the West Bank is expanded with 23 noteworthy records.

MATERIALS AND METHODS

The survey covered areas of the West Bank (occupied Palestinian Territories) over five years 2019–2024). Some data was collected before (2015–2019) but starting in 2019, field efforts were intensified while taking into account some pauses during the COVID-19 pandemic and the 2023/2024 conflict that resulted in Israeli restrictions on the Palestinian movement. Plants were observed, photographed, and specimens were collected by the team of the Palestine Institute for Biodiversity and Sustainability (PMNH) at Bethlehem University. Data collected include locality coordinates, elevation, dates collected, and notes on habitats. Species morphological descriptions given below as well as identification are from published sources (Zohary 1966, 1972; Davis 1972; Feinbrun-Dothan 1978, 1986). Voucher herbarium specimens were prepared and deposited in the herbarium collection of the Palestine Museum of Natural History and catalogued and numbered in the collection for future reference (numbers given below as PMNH-H). For each species, we give (in order) the Latin name, location collected, coordinates, elevation, date, and herbarium number. Comparison with literature records and especially data posted at https://biogis.huji.ac.il/ (henceforth BIOGIS) was done for geographic distribution to assess the extension of ranges and whether they are native or introduced. Accepted Latin names were verified on the World Flora Online (WFO) plant list database to ensure that the names are up-to-date and not synonyms.

RESULTS

Family Amaryllidaceae

***Allium rothii* Zucc.**

Bethlehem Governorate, Kisan, 31.589 N & 35.256 E, altitude 582 m, 11.iii.2021, PMNH H0269; and 31.584 N & 35.258E, altitude 573 m, 24.ii.2024; Khalil Governorate, Bani Naim, 31.528 N & 35.214 E, altitude 573 m, 01.iv.2019, PMNH H 1223.

A bulbous plant, bulb ovoid, 3–4 cm in diameter. Stem 6–15 cm. Leaves many, lanceolate, 0.6–3 cm, smooth margin, spread on the ground, longer than stem. Spathe persistent, shorter than the hemispherical umbel with dense flowers. Perianth stellate, white with a purple or greenish midvein. Filaments and anthers are dark purple as long as perianth. Ovary dark purple. Style short. Flowering February–April. This species was noted rarely in areas north of the Naqab and seems to exist in disjointed batches in the transition zone of the Irano-Turanian to the Mediterranean zone in the southern part of the West Bank (BIOGIS and our data).

Family Asclepiadaceae

***Araujia sericifera* Brot.** (Image 1)

Qalqilia Governorate, Sanneria, 32.168 N & 35.025 E, altitude 131 m, 11.xi.2020, PMNH H0694.

Description from Santa Cruz & Cordero (2018): Sub-shrub climbing or vine, up to 5 m long, evergreen, lactiferous. Stem pubescent, unbranched or branched, circular. Taproot, with a main axis and smaller secondary branches. Leaves simple, entire, opposite, with petiole of 10–20 mm long, ovate-oblong, ovate-lanceolate, 40–95 × 15–60 mm, apex acuminate, base truncate, upper surface green and glabrous, and under surface canescent and densely pubescent. Inflorescences are axillary of 2–5 flowers, sometimes solitary, pedicels 10–16 mm long. Calyx with 5 sepals, ovate or lanceolate. Corolla lobes 5 patent, oblong or ovate-acuminate, apex obtuse, white or greenish dorsally. Androecium with 5 stamens. Seeds ca. 400 per fruit, 6.3–7.8 × 2.8–3.5 mm, compressed, oval-lanceolate, rough, with pappus sericeous, 25 × 40 mm long, white, deciduous. Flowering July–September. This species, originally from South America (Federici et al. 1988), was introduced to Europe and more recently to historical Palestine, primarily in coastal areas. This is the first record from the West Bank, but we expect to find this species in other parts of the West Bank with similar habitats.

Family Cyperaceae

***Eleocharis palustris* (L.) Roem. & Schult.**

Jinsafut, Qalqilia Governorate, 32.053 N & 35.134 E, altitude 412 m, 14.iii.2021, PMNH-H 0372.

A perennial plant with creeping rhizomes. Stem leafless, erect, glaucous, ended with a solitary terminal spikelet of inconspicuous greenish-brown flowers. Leaves bladeless, brown sheaths clustered at the base of the stem. Flowering March–July. According to BIOGIS , it is common in the coastal areas of Palestine and was supposedly observed in two areas in the West Bank: West of Qusin near Nablus (2022 & 2023) and in the Dheisheh area of Bethlehem (1985). The latter is now a highly urbanized area, and despite the visit, it was not located. It was found in humid habitats in the periphery of a vernal pool near Jinsafut (see Qumsiyeh et al. 2022) and this seems to be also its habitat in other parts of the Mediterranean.

Family Dryopteridaceae

***Cyrtomium falcatum* (L.f.) C.Pres.**

Ramallah Governorate, Southwest of Deir Ibzei, 31.093 N & 35.124 E, altitude 575 m, 10.ix.2021, PMNH H 0286.

A perennial fern with a large rhizome. Leaves are made up of 6–10 pairs of shiny bright green leaflets. Each leaflet has a flat to wavy to slightly toothed margin and a netlike pattern of veins. Sori is held by brown or black indusial on the underside of each leaflet. It is native to eastern Asia. Nevertheless, as stated by POWO (2024), this plant was introduced in various regions around the world. *Cyrtomium falcatum* is a popular ornamental plant and was brought into the country but finding it in the wild in crevices in soft rock (first record in the West Bank in the wild) indicates its potential spread, an issue discussed by Van Valkenburg et al. (2014).

Family Caprifolaceae

***Sambucus ebulus* L.** (Image 1A)

Ramallah Governorate, Ain Sinia, 31.972 N & 35.229 E, altitude 644 m, 14.viii.2020, PMNH-H0322; Bethlehem Governorate, Battir, Ain Battir, 31.727 N & 35.138 E, altitude 650 m, 23.vi.2009, PMNH-H 0414; Hebron Governorate, Ain Hasaka, 31.564 N & 35.090 E, altitude 904 m, 02.v.2018, PMNH-H 0415.

Glabrous, perennial herb, 0.5–2 m with creeping rhizome. Leaves have 3-6 paired leaflets; leaflets lanceolate to elliptic, serrate, 7–15 x 2–6 cm. Stipules ovate. Inflorescence with three primary flat-topped rays, 7–10 cm in diameter. Flowers white; anthers purple. Fruits drupe globose, black. Flowering July-August in wet areas. This species is known in the wild from Europe, Turkey, Syria, Lebanon, northern Iraq, and northern Iran (Ebadi & Hisoriev 2011). The species was not reported from Jordan (Al-Eisawi 2013; Taifour & El-Oqlah 2017). As per BIOGIS it is around Jish in the upper Galilee, in Ein Shalaf just south of lake Tiberias, and in Sataf west of Jerusalem. This record is the first in the West Bank. The plant has numerous medicinal uses (Jabbari et al. 2017).

Family Chenopodiaceae

***Anabasis oropediorum* Maire** (Image 1)

Bethlehem Governorate, Al Rashaydeh area, Wad Hasasah, 31,575 N & 35.383 E, altitude 168 m, 07.iii.2015, PMNH H 1631; Bethlehem Governorate, Al Rashaydeh area, entrance of Wadi Darajeh, 31,572 N & 35.383 E, altitude 157 m, 24.ii.2024, PMNH H 1632.

Small shrub 25–60 cm. Stems divergent at the base, woody to nearly half of their length; branches opposite with nearly equal internodes. Leaves reduced to 2-lobed short cupule; pointed at the young stems' apices. Flowers opposite with perianth having five membranous wings 5–7 mm long; ovate-orbicular; white or pink. Ovary papillose; stigma thick; papillose. Embryo spiral

coiled. Flowering October–November. There are four undated and undocumented mentions of this species in the West Bank (BIOGIS). Our two documented records (with herbarium specimens) for this rare species are noteworthy.

Family Cruciferae

***Coincya tournefortii* (Gouan) Alcaraz, T.E.Díaz, Rivas Mart. & Sánchez-Gómez**

Jenin Governorate, National Agricultural Research Center, Arraba meadow, 32.77 3 N & 35.261 E, altitude 267 m, 14.ii.2017, PMNH-H0887.

It is annual, 20–70 cm, hispid below, glabrous above. Radical leaves rosulate, petiolate, lyrate-pinnatisect. Lateral lobes 4–12, oblong, dentate-crenate. Inflorescences 10–20 flowers pale yellow, corymbose. Calyx 3–4 mm, Petals 6–8 mm, linear or oblong. Fruiting pedicels 1–4 cm, fruit 3–6 cm, erect, glabrous. Seeds brown. Flowering January–April. Habitat in sandy soil. This plant was found growing in deep rich terra rosa fields of the Arraba meadow. The species is widespread in coastal areas of historic Palestine. In the West Bank, this is the third record after Ain Yabrud and Lubban Al-Sharqiya noted on BIOGIS.

Family Cruciferae (Brassicaceae)

***Pseuderucaria clavata* (Boiss. & Reut.) O.E.Schulz** (Image 1)

Bethlehem Governorate, AlRashaydeh desert, 31.479 N & 35.364 E, altitude 257 m, 07.iii.2015, PMNH-H1624.

Annual, glabrous, 10–35 cm. Stem ascending, branching from the base. Leaves fleshy; 3–9 cm; petiolate; pinnatisect into linear terete lobes; radical leaves broader and longer petioles. Calyx violet; 6–10 mm. Petals 13–22 mm; pale violet; long-clawed. Fruit erect; 35–75 × 2 mm; linear; terminating style with a minute stigma. Flowering February–April. This species was observed by Danin in the southeastern part of the West Bank, near Ain Gedi (BIOGIS) near our locality. These are the northernmost records of the species which is found mostly in the Naqab in our region and is a very rare species.

Family Elatinaceae

***Bergia ammannioides* Heyne ex Roth**

Sanour, Jenin Governorate, 32.370 N & 35.255 E, altitude 347 m, 30.vi.2024, PMNH-H2199.

Annual, 10–25 cm, stems pinkish, hairy, erect, branched from the base. Leaves 10–30 x 5–10mm, opposite elliptic- oblong to oblanceolate, acute, serrate with pointed tips except in the basal part. Flowers in subsessile axillary clusters. Sepals 5, pinkish, 1.2–1.5 mm, lanceolate, acuminate, membranous margins, ciliolate. Petals 5, lanceolate, acute, white, shorter than sepals. Stamens 5, as long as petals, anthers pale yellow. Ovary 5-celled, subglobose; stigmas 5, reddish. Seeds numerous, 0.2–0.3 mm, ovoid, brown. Flowering August–September. The species is known from Africa to Asia and into Australia (https://powo.science.kew.org/). In the studied region, it is reported from very few localities in Jordan and the coastal and Galilee regions of historic Palestine. This is the first record of this species and this family in the West Bank.

Euphorbiaceae

***Euphorbia graminea* Jacq.** (Image 1)

Nablus Governorate, Nablus, 32.220 N & 35.266 E, altitude 540 m, 05.i.2023, PMNH-H 1611; 32.214 N & 35.280 E, altitude 550 m, 10.i.2024, PMNH-H1610.

A perennial herb 30–80 cm high with milky juice. Stem erect, pentagonal, glabrous. Leaves alternate, petiolate, ovate-rounded, 17–40 mm long, 10–20 mm wide, entire, acuminate. Cyathia together with a peduncle cyme, and leaf-bracts opposite, linear or lanceolate, involucres turbinate; petaloid appendage 2–4 (5), white, obcordate at apex. Stamen 13–20, basifixed, inner filament ca. 1 mm, outer ones ca. 0.5 mm; anther yellow; female flower pedicel pubescent; ovary, 3 carpels, styles 3. Capsules 2 mm long, 3 mm diameter, exserted out of involucre, pedicel ca. 4 mm long, each carpel with 1 seed; seed 3 (Webster & Burch 1967). This perennial herb, originally from South America, is commonly found growing along roadsides (https://www.worldfloraonline.org/taxon/wfo-0000962344). This is the first record of this introduced species (native to Mexico), in the West Bank.

Family Malvaceae

***Abutilon theophrasti* Medik.**

Qalqilia Governorate, Falamia, 32.224 N & 35.015 E, altitude 106 m, 27.vi.2022, PMNHH-H1135.

Annual, 40–60–(80) cm, tomentose. Stem single, branched above. Leaves alternate, 7–15 x 6–8 cm, long petioles, ovate-cordate, long acuminate, entire. Flowers grow on stalks, either individually or in clusters. Calyx 0.8–1 cm, campanulate. Corolla yellow, one and a half times longer than calyx; five obovate petals attached at the base, notched at the apex. Fruit 1.5–2 cm in diameter; mericarps 10–16 with awns up to 3 mm, 1–2 seeded each. Blooming: May–September. It was noted on BIOGIS from Wadi Joz in east Jerusalem but ours is the first verified West Bank record.

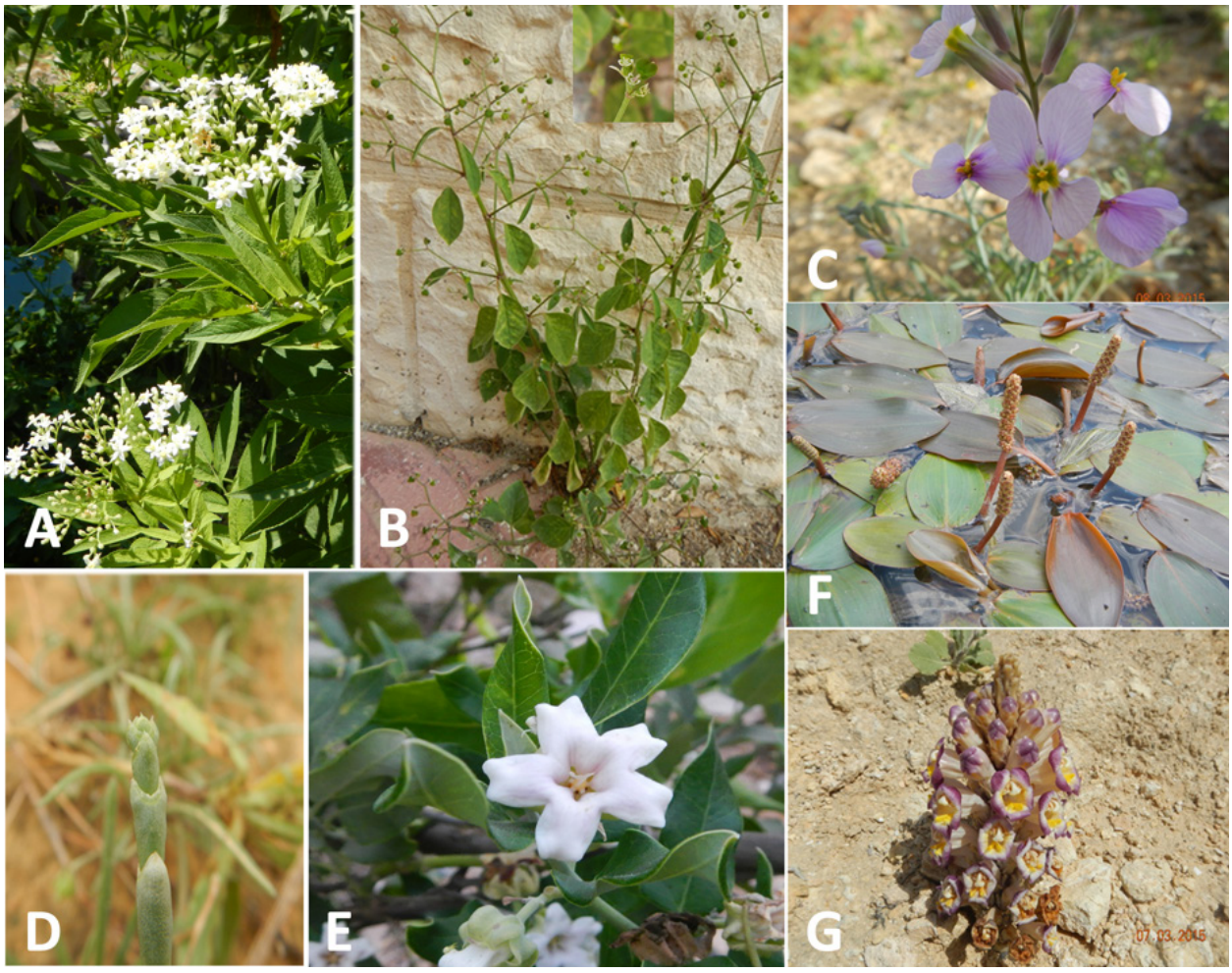

Image 1. Phenology of selected plants: A—*Sambucus ebulus* | B—*Euphorbia graminea* | C—*Pseuderucaria clavata* | D—*Anabasis oropediorum* | E—*Araujia sericifera* | F—*Potamogeton nodosus* | G—*Cistanche violacea*. © Palestine Institute for Biodiversity and Sustainability, Bethlehem University.

Family Orobanchaceae

***Cistanche violacea* (Desf.) Hoffmanns & Link** (Image 1G)

Bethlehem Governorate, Al Rashaydeh area, 31.488 N & 35.345 E, altitude 257 m, 07.iii.2015, PMNH H 1617.

A parasitic desert plant, up to 30 cm. Bracts longer than calyx. Calyx campanulate, glabrous, divided into lobes to its middle. Corolla 2.5–3.5 cm longer than calyx by 2.5 times, glabrous, white corolla tube, deep purple lobes, slightly curved outwards dark lilac limbs. It is characterized by a prominent yellow semi-circular fold on the lower corolla lip. This is the first record of this species in the West Bank. Reported in a few localities in the Naqab and south Jordan (El-Eisawi 2013). Medicinal and herbal uses, and worldwide distribution may make this an important global economic plant, though reproducing it ex situ might be difficult (Thorogood et al. 2021; Azab 2021).

Family Papilionaceae (Leguminosae)

***Glycyrrhiza echinata* L.**

Jenin Governorate, Sanour, 32.360 N & 35.247 E, altitude 366 m, 31.vii.2022, PMNH-H0746.

Perennial herb, 20–50 cm. Stem erect. Leaves 4–16 cm composed of 5–6 pairs of oblongs to elliptical, obtuse, or acute leaflets. Peduncles up to 7 cm. Flowers 2–4 mm, in dense 1–4 cm spherical heads. Calyx teeth are triangular. Corolla bluish. Ovary glandular. Fruiting heads 3–7 cm. spherical. Pod 1–1.5 × 0.5 cm, with prickles. 2–3 seeds. Flowering May–October. According to BIOGIS, there is only one visual but undated record from the Qabatiya area in the West Bank.

***Medicago ciliaris* (L.) All.**

Jenin Governorate, Arraba meadow, National Agricultural Research Station, 32.773 N & 35.262 E, altitude 267 m, 27.iv.2016, PMNH-H0420.

Annual, 30–50 cm. Stems procumbent or ascending. Stipules ovate, dentate with 2-fid distal tooth. Leaflets are sometimes blotched, 6–20 × 5–15 mm, obovate, and shortly apiculate. Peduncles 1–4 (rarely up to 10) flowered. Flowers 5–9 mm. Calyx hairy, teeth equal to tube or shorter. Corolla is about twice as long as calyx, yellow. Fruit large, spherical to ovoid, 10–20 mm high, spiny, covered with many-celled hairs, coils 6–10, the broadest 9–15 mm diameter, surface covered with a distinct net of veins, with about seven anastomosing veins, spines 2–4 mm long. Seeds 1–2 in each coil. Flowering March–May. Prefers damp, deep soils. This is the third locality record for this rare species in the West Bank after Ein Yabrud and Wadi Al-Joz (near Jerusalem) (BIOGIS).

***Lupinus palaestinus* Bioss.**

Qalqilia Governorate, Sanneria, 32.127 N & 35.045 E, altitude 236 m, 30.iii.2022, PMNH-H0888.

Annual, hairy. Stems 15–30 cm, erect, branched from the base. Leaves 5–177 cm, stipules 1–1.5 cm, adnate at base to petiole, petioles hairy, much longer than the blade, leaflets 6–10, subsessile, lanceolate to obovate, obtuse. Racemes many-flowered, erect, exceeding foliage. Pedicels are shorter than calyx. Flowers about 1.5–2.3 cm, erect. Calyx persistent, hirsute-villose, lower lip longer than the upper lip. Corolla is twice as long as calyx; standards white lilac; wings connate at apex, keel violet at apex. Pod hirsute-villose, 4–7 × 2 cm long, 2-4-seeded, erect, flattened, oblong-linear with a short beak. Flowering February–April. Habitat in loamy soils in coastal areas. This species was reported mostly along the coastal areas of historic Palestine, and BIOGIS has two records in the West Bank but in atypical habitats (Kafr Qaddum & Kisan). It may have arrived through soil translocation from the coast for gardens since it is not its habitat. Our specimen from the Qalqilya area is within the kind of coastal habitats where we expect to see this species.

Family Plantaginaceae

***Plantago major* L.**

Ramallah Governorate, Aboud, 32.034 N & 35.071 E, altitude 250 m, 28.iv.2012, PMNH-H 0880.

Perennial herb, glabrous. Leaves rosulate, broadly ovate or elliptic, obtuse, 3–7-veined, narrowed to a long petiole. Scapes erect as long as leaves or longer. Spikes narrow cylindrical, 5–35 cm. Bracts ovate, white margined. Calyx lobes are equal, with a green midrib. Corolla lobes are short and acute. Seeds minute, angular. Flowering March–October. It is found near streams. BOIOGIS showed unconfirmed locations in three other West Bank areas: Qusin, Jalazon, and Wadi Joz.

Family Poaceae (Graminae)

***Saccharum spontaneum* L. Wild**

Nablus Governorate, Usarin, 31.118 N & 35.303 E, altitude 687 m, 10.xii.2020, PMNH-H 0403.

Perennial grass with stiff leaves that are 0.5–1.0 cm wide, canaliculate, long attenuate, serrulate at margins, keeled with white midrib, ligule short brown ciliate. Panicle 50–60 x 6–10 cm. Silky-villose with spikelets 4–6 mm, awnless, enveloped in long white silky hairs of callus, which are twice as long as spikelets. Lemma and palea are shorter than glumes which are ciliate. Flowering September–January. A presumed record from the Ain Fashkha area was noted which was identify as "Israel", but it is in the occupied Palestinian Territories (Olsvig-Whittaker et al. 2009). That paper was not taxonomic (not associated with herbarium specimens), their identification is uncertain. In any case, the established record is of significant as this plant is rare in the region. Wild sugarcane is noted in northern Africa and Asia, with one record in Lebanon (https://www.worldfloraonline.org/taxon/wfo-0000896738).

***Crypsis factorovskyi* L.**

Qalqilia Governorate, Qarawet Bani Zaid., 32.053 N & 35.134 E, altitude 412 m, 26.viii.201(, PMNH-H 0886.

This annual plant has internodes enveloped by leaf sheaths up to half their length. Leaf blades are densely-haired, especially on the upper surface. Panicles are head-like, compressed, terminal, and axillary. Terminal heads have numerous spikelets, 4–6 mm, with short pedicels, enveloped by an involucre of two opposite coriaceous distal leaves. Glumes are shorter than spikelets, hyaline, and lanceolate; lower glumes shorter and narrower than the upper. Palea two-veined, shorter than lemma. Stamens 3. Flowering June–August. Habitat includes inundated soils in winter and dry in summer. This species is mainly in the mountains and coastal areas within 1948 areas of Palestine and is noted as "very rare" in the Galilee (BIOGIS; Danin 2004). The species prefers moist habitats and as per BIOGIS it is around a small pond in Qusin, while while it was recorded it in the vernal pool near Jinsafut after drying (see Qumsiyeh et al. 2022). Two other species of *Crypsis* were recently reported from the West Bank: *C. acuminata* Trin. and *C. alopecuroides* (Piller et Mitterpol) and Schrader (Qumsiyeh & Al-Sheikh 2021).

Family Polygonaceae

***Fallopia convolvulus* (L.) Á.Löve**

Bethlehem Governorate, Husan, 31.715 N & 32.129 E, altitude 690 m, 16.vi.2021, PMNH-H 0715.

Herbaceous vine growing to 1.5 m. Stem twine clockwise around other plant stems. Leaves alternate, petiolate, triangular 1.5–6 cm long, 0.7–3 cm wide. Flower small in short racemes, 5 green, white tepals, 5 stamens. Pistil with fused stigmas forming a head. Fruit achene with one seed. This northern European species was introduced and is now spreading in the temperate Mediterranean climate in our region. In the West Bank, there are three other localities as per BIOGIS, but two of them are arid locations and unlikely. If this interpretation is correct, then this is the second record from the West Bank.

Family Potamogetonaceae

***Potamogeton nodosus* Poir.** (Image 1)

Jenin Governorate, Sanour, 32.368 N & 35.267 E, altitude 356 m, 14.viii.2022, PMNH-H1620.

A rhizome creeping perennial herb. Leaves floating and submerged borne on petiole; floating leaves, elliptic, entire 6–15 × 2.5–4 cm in length and width; submerged leaves translucent, lanceolate up to 15 × 4 cm; entire, stipules up to 8 cm. Spike 3–6 cm with a long peduncle. Inflorescence is a spike of many small flowers arising from the water on a peduncle. Fruitlets are tiny with a short beak. Flowering May–August. This species, found in the Galilee and coastal areas, and this is the first record in the West Bank.

Family Umbelliferae (Apiaceae)

***Tordylium cordatum* (Jacq.) Poir.**

Jenin Governorate, Siri's nature reserve, 32.309N & 35.316 E, altitude 484 m, 26.ii.2016, PMNH-H1612; Jenin Governorate, Jaba`, Hraish mountain, 32.336 N & 35.256 E, altitude 738 m, 06.iv.2022, PMNH-H 1613.

Annual, 40–80 cm. Stem erect; branched; angular; hispidulous. Lower leaves long - petiolate, cordate, blade 4–8 cm, doubly crenate; upper leaves ovate-oblong or three sects into ovate segments. Umbels are mostly terminal long peduncles. Bracts and bracteoles many, deflexed, bracteoles long or longer than the umbellets. Petals 2–3 mm unequally 2-parted. Fruits are discoid; dimorphic; 5–7 mm; orbicular; tuberculate with a smooth margin; outer part of the margin white. Flowering April–June. The species was noted in the northern areas of historic Palestine, BIOGIS reports two localities near the border (Green Line) and inside the West Bank one from 1977 observation in the northwest of the West Bank and one in the northeast near Jalbuon. Our documented records are deeper inside the West Bank.

Family Ulmaceae

***Ulmus minor* Mill.**

Ramallah Governorate, Ain Sinia, 32.971N & 35.230E, altitude 644 m, 14.viii.2020, PMNH-H 1635.

The tree typically grows to 20–30 m with a rounded crown. The bark of the trunk is rough and furrowed in older trees to form a block pattern. The shoots are slender. The leaves are smaller than those of the related European species, hence the specific epithet minor. Leaves on juvenile growth (Suckers, seedlings) are coarse and pubescent, whereas those on mature growth are generally smooth, though remaining highly variable in form; there are generally fewer than 12 pairs of side veins. A common characteristic is the presence of minute black glands along the leaf veins, detectable with the aid of a magnifying glass. The samara is oval or obovate, glabrous, 12–15 mm long, notched at the top, with the seed close to the notch. The species is noted in northern areas of historic Palestine, and this is the first record in the West Bank and is also the most southern record of its distribution in our region.

DISCUSSION

The data presented above adds noteworthy records of 23 species strengthening knowledge of the flora of the West Bank, an area (together with the Gaza Strip) projected to be the new state of Palestine (now recognized by 160+ countries). For 15 uncommon/rare species, our data meaningfully extend their range: *Saccharum spontaneum*, *Cyrtomium falcatum, Eleocharis palustris*, *Crypsis factorovskyi, Coincya tournefortii*, *Medicago ciliaris, Abutilon theophrasti*, *Anabasis oropediorum, Allium rothii, Fallopia convolvulus, Glycyrrhiza echinata, Plantago major, Pseuderucaria clavata, Lupinus palaestinus*, and *Cistanche violacea.* Eight other species are recorded for the first time in the West Bank: *Tordylium cordatum, Bergia ammannioides*, *Sambucus ebulus*, *Araujia sericifera, Euphorbia graminea, Potamogeton nodosus, Cyrtomium falcatum,* and *Ulmus minor.* Three of those eight species *(Araujia sericifera, Euphorbia graminea,* and *Cyrtomium falcatum*) are not local in our region (introduced species). Of course, not all introduced species are invasive. This indicates that human disturbance is becoming dominant here as elsewhere in the world with a concomitant need for monitoring and

eradication programs for invasive plants. The other five are noteworthy and rare (likely threatened) species and this helps us define key areas for conservation in line with the new National Biodiversity Strategy and Action Plan.

In planning the sustainable development of any country, a better understanding of its fauna and flora is essential. Indeed, this is emphasized in the new National Biodiversity Strategy and Action Plan and the new protected areas network (Qumsiyeh et al. 2023). It was found that uploaded data on BIOGIS may not always be reliable because it can include observations by non-professionals. Alternatively, terra rosa soil brought from coastal Mediterranean areas may bring some species into the West Bank (especially around Israeli settlements), giving unusual distributional data (e.g., *Lupinus palaestinus).*

Such botanical studies usually face difficulties globally due to a lack of resources and capacity of local people. This is exacerbated in developing countries like Palestine, where doing fieldwork is extremely hazardous due to restrictions on movement by the Israeli occupation authorities. Yet, work like this is essential for conservation efforts even in difficult circumstances.

Due to habitat changes, overexploitation, climate change, pollution, invasive species, and Israeli occupation practices, a significant portion of Palestine's biodiversity is vulnerable or threatened (Al-Sheikh & Qumsiyeh 2021, 2022; Pahl & Qumsiyeh 2021; Husein & Qumsiyeh 2022; Qumsiyeh & Albardeiya 2022). Understanding distributions and aligning them with the newly designated protected area network for the nascent state of Palestine (Qumsiyeh et al. 2023) could help conservation efforts for threatened taxa.

In conclusion, such detailed floristic data is important to collect to add to the baseline for understanding flora and will eventually help in better informing and devising conservation efforts.

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