

Contributions to the bulb flora of Ilias (NW Peloponnese, Greece): *Alliaceae*

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Abstract. The bulb flora of prefecture (nomos) Ilias in NW Peloponnese, Greece is documented with an emphasis on its distribution within the administrative unit. Families, genera and species are presented in alphabetical order. Each taxon is accompanied by a photograph, description, habitat, ecology and distribution dot map. The Alliaceae comprising the genera *Allium* and *Nothoscordum* are treated in this first contribution.

Key words: *Alliaceae*, *Allium*, *Nothoscordum*, distribution maps, Greece, NW Peloponnese

Introduction

Bulb plants adapt well to survive the hot dry summers and cool winters of southern Greece. We decided to investigate the distribution of these plants in the prefecture (nomos) of Ilias (Fig. 1) Strictly speaking, bulb plants are Monocotyledons with a single cotyledon and floral parts in threes or multiples of three. However, we treat as bulb plants those plants which die down in the hot dry months to an underground storage organ and thus include all plants with corms, tubers and rhizomes, i.e., geophytes. Dicotyledons with two cotyledons and floral parts often in fours or fives, and having such underground organs are included. The numerous hardy terrestrial orchids (12 genera and ca. 45 species *fide Flora Hellenica Database*) are excluded as their distribution in Greece is fairly well-recorded by professional and amateur orchidologists who are not always in agreement regarding taxonomic delimitation of a species, e.g., Pedersen & Faurholdt (2007) on *Ophrys*, and Kretzschmar & al. (2007) on *Anacamptis*, *Orchis* and *Neotinea*.

According to our estimates approximately a hundred species of bulb plants belonging to 14 families occur in nomos Ilias. They are presented in alphabetical family

order in a series of articles. The present publication begins with the *Alliaceae* which comprises two genera, *Allium* and *Nothoscordum*.



Fig. 1. Map of Greece showing the administrative units with nomos Ilias indicated in red.

Material and methods

Field studies have been carried out in the prefecture (nomos) of Ilias. One of the authors (K.G.) is a 'resident botanist' and therefore in a superbly privileged position to monitor and document the occurrences of the plant populations. A key to the species, photographs, short descriptions, habitat, ecology, and distribution maps are provided for the taxa which are listed in alphabetical order. The general range within and without the prefecture is also indicated. For external distribution, reference is made to Floras of the neighbouring countries and Plants of the World online (Kew Science). Chromosome counts are based on Greek material; if from nomos Ilias, the locality is provided. Descriptive terminology is as used in English language Floras, e.g., *Flora Europaea*, *Mountain Flora of Greece*. Unqualified measurements refer to length or height.

Three taxa are Greek endemics of which two are restricted to the mountainous area in the northeast, and one is widespread in the region.

Results and discussion

ALLIACEAE

Allium L.

Bulbous plants smelling of onion or garlic. Leaves with a sheathing base. Flowers in terminal umbel enclosed by spathe before anthesis. Perianth segments free or slightly connate at base. Style gynobasic.

A large genus of ca. 700 species in the northern hemisphere (Grey-Wilson 2010), including some important ornamental, culinary and medicinal plants — ca. 16 species in nomos Ilias, one autumn-flowering. The onion (*Allium cepa*), leek (*A. porrum*) and garlic (*A. sativum*) are widely grown and persist when cultivation is abandoned.

Key to species

1. Spathe 1-valved 2.
- Spathe 2-valved or deeply 4-lobed 11.
2. Stem very short; umbel almost sessile at ground level *chamaemoly*
- Stem more than 10 cm; umbel not at ground level ... 3.
3. Bulblets stipitate *roseum*
- Bulblets absent or not stipitate 4.
4. Filaments included 5.

- Filaments exserted 7.
5. Outer tunics coriaceous, fibrous; anthers often brick-red before dehiscence
..... *callimischon* subsp. *callimischon*
- Outer tunics membranous; anthers yellowish or brownish 6.
6. Leaves ciliate; pedicels 3–4 times as long as perianth; perianth segments remaining white with age
..... *subhirsutum* subsp. *subhirsutum*
- Leaves glabrous or sparsely pilose; pedicels less than 3 times as long as perianth; perianth segments darkening reddish-purple with age ... *trifoliatum*
7. Stem more than 40 cm tall; perianth segments pink, purple or greenish-white 8.
- Stem usually less than 40 cm tall; perianth segments greenish-white 10.
8. Bulblets numerous *ampeloprasum*
- Bulblets few 9.
9. Umbel subglobose; perianth segments purple; leaves less than 4 cm wide *amethystinum*
- Umbel hemispherical; perianth segments magenta, pink or greenish-white; leaves to 5 cm wide
..... *commutatum*
10. Outer tunics white, papery; leaves sheathing stem up to umbel; pedicels almost equal
..... *chamaespathum*
- Outer tunics membranous or coriaceous; leaves sheathing stem halfway; inner pedicels longer than outer
..... *guttatum* subsp. *tenorei*
11. Plants from the northeast, at altitudes of ca. 2000 m 12.
- Plants occurring from sea level to 1080 m 14.
12. Outer tunics coriaceous, splitting longitudinally into fibres *oreohellenicum*
- Outer tunics membranous 13.
13. Filaments exserted, purple in upper part
..... *flavum* subsp. *tauricum*
- Filaments included, colour uniform *frigidum*
14. Spathe deeply 2-4-lobed, shorter than umbel; perianth segments pink to dark reddish-purple; filaments exserted
..... *sphaerocephalon* subsp. *sphaerocephalon*
- Spathe 2-valved, the longer exceeding umbel; perianth segments white, greenish-white, tawny brown or pink; filaments included 15.
15. Pedicels unequal; umbel lax, hemispherical to ovoid *paniculatum*
- Pedicels almost equal; umbel subglobose .. *pallens*

Allium amethystinum Tausch (Figs. 2:1 & 4)

Bulb subglobose, with few bulblets; outer tunics membranous. Stem 40–110 cm. Leaves 3–7, fistulose, canaliculate, sheathing lower 1/3 of stem, usually withered before anthesis. Spathe 1-valved, caducous. Umbel subglobose, dense, many-flowered. Perianth segments purple. Filaments exerted, inner tricuspidate; anthers yellow.

South and central parts of Ilias. Open stony places, cultivated fields, roadsides, sea level to 850 m. Flowering May. C and E Mediterranean region.

Allium ampeloprasum L. (Figs. 2:2 & 4)

Bulb broadly ovoid, with numerous bulblets; outer tunics membranous. Stem 50–150 cm. Leaves 4–10, to 4 cm wide, slightly canaliculate above, keeled below, sheathing lower 1/3–1/2 of stem. Spathe 1-valved, caducous. Umbel globose, dense, many-flowered. Pedicels unequal. Perianth segments pale to deep pinkish-purple. Filaments exerted, inner tricuspidate; anthers creamy yellow.

South and central parts of Ilias. Coastal areas, olive groves, fields, footpaths and roadsides, mainly cultivated and disturbed ground, sea level to 785 m. Flowering June to July. The leek (*A. porrum* L.) is a cultigen derived as a result of selection over many years (Tutin & al. 1980). Mediterranean region and SW Asia.

Allium callimischon Link subsp. *callimischon* (Figs. 2:3 & 4)

Often forming small tufts. Bulb narrowly ovoid; outer tunics coriaceous, fibrous. Stem 10–30 cm. Leaves 3–5, filiform, glabrous, sheathing stem almost up to umbel, withered before anthesis. Spathe 1-valved, filiform at apex, erect, persistent. Umbel 8–25-flowered, fastigiate. Pedicels unequal, suberect. Perianth segments white to pale pink with brown or reddish midvein, without spots. Filaments included; anthers often brick red before dehiscence. — $2n = 16$ (Garbari & al. 1989).

Widespread throughout Ilias. Rocky slopes, *Quercus* woodland, phrygana, olive groves, archaeological sites, 10–1080 m. Flowering September to December (autumn). Endemic to Greece.

Allium chamaemoly L. (Figs. 2:4 & 4)

Bulb subglobose; outer tunics papery, pitted. Stem very short. Leaves 2–5, patent spreading, forming a basal rosette, ciliate, sheathing stem completely. Spathe 1-valved, 2–4 lobed, persistent. Umbel al-

most sessile at ground level. Pedicels recurved in fruit. Perianth segments white with green or reddish-purple midvein. Filaments included; anthers yellow. — $2n = 22$ (Phitos & al. 1990, material from Mt Lambia).

Northeast, south and central parts, scattered. Sandy ground, archaeological sites, 100–1000 m. Flowering December to March. S Europe from Spain to S Balkans.

Allium chamaespathum Boiss. (Figs. 2:5 & 4)

Bulb ovoid; outer tunics white, papery. Stem 20–40 cm. Leaves 2–3, fistulose, canaliculate, sheathing stem up to umbel, usually withered by anthesis. Spathe 1-valved, deciduous, but often remaining, supported by uppermost leaf. Umbel globose or hemispherical, many-flowered. Pedicels almost equal. Perianth segments white to pale green. Filaments slightly exerted, inner tricuspidate; anthers yellow. — $2n = 16$ (Bothmer 1974).

South and central parts of Ilias. Limestone slopes, field margins, sea level to 400 m. Flowering late September to October. Balkan Peninsula.

Allium commutatum Guss. (Figs. 2:6 & 4)

Resembling *A. ampeloprasum*. Bulb subglobose; outer tunics enclosing large bulblets. Stem to 150 cm. Leaves 5–11, to 5 cm wide, glabrous, canaliculate above but not keeled. Spathe 1-valved, with long beak, caducous. Umbel hemispherical, many-flowered. Perianth segments magenta, pink or greenish-white. Filaments exerted, inner tricuspidate; anthers creamy yellow.

West central, near the harbour of Katakolo. Coastal areas, fallow fields and disturbed ground, sea level to 100 m. Flowering July. C and E Mediterranean region.

Allium flavum subsp. *tauricum* (Rchb.) K. Richt. (Figs. 2:7 & 5)

Often forming tufts. Bulb ovoid; outer tunics membranous. Stem 10–40 cm, glaucous. Leaves 2–3, linear, subterete, glaucous, glabrous, sheathing stem ca. halfway. Spathe 2-valved, persistent, the longer much exceeding umbel. Umbel lax, hemispherical or fastigiate. Pedicels unequal, curving downwards at anthesis. Perianth colour variable but usually tinged a dull brownish-purple. Filaments exerted, purple in upper part; anthers yellow.

Northeastern part of Ilias (Mts Lambia, Skiado-vouni, Erimanthos). Stony and rocky habitats, to 2000 m. Flowering July to August. Balkans to SW Asia.



Fig. 2. *Allium* species in nomos Ilias: 1, *A. amethystinum* 2, *A. ampeloprasum* 3, *A. callimischon* subsp. *callimischon* 4, *A. chamaemoly* 5, *A. chamaespathum* 6, *A. commutatum* 7, *A. flavum* subsp. *tauricum* 8, *A. frigidum* 9, *A. guttatum* subsp. *tenorei*.

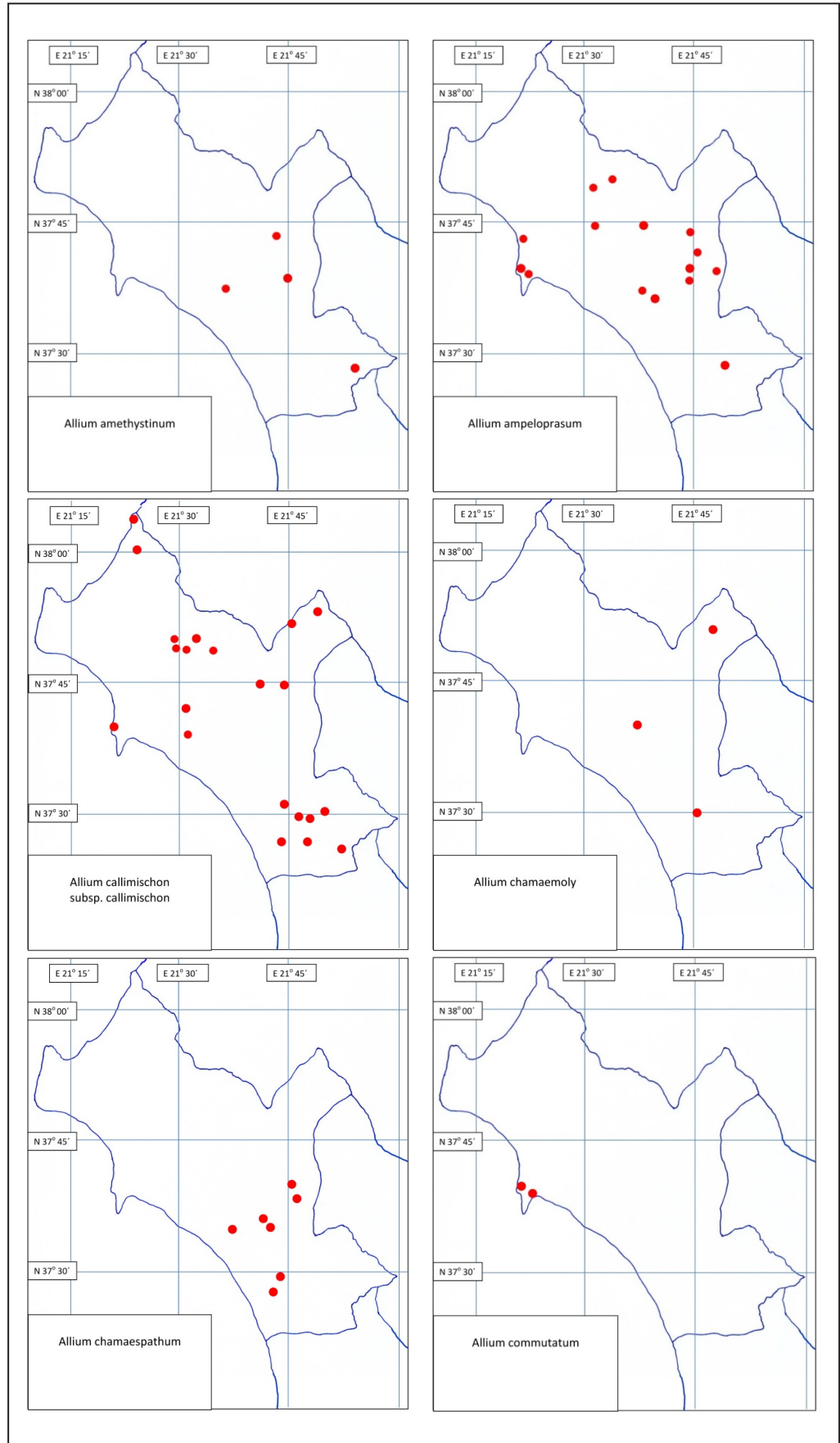


Fig. 4. Distribution of *Allium* species in nomos Ilias.

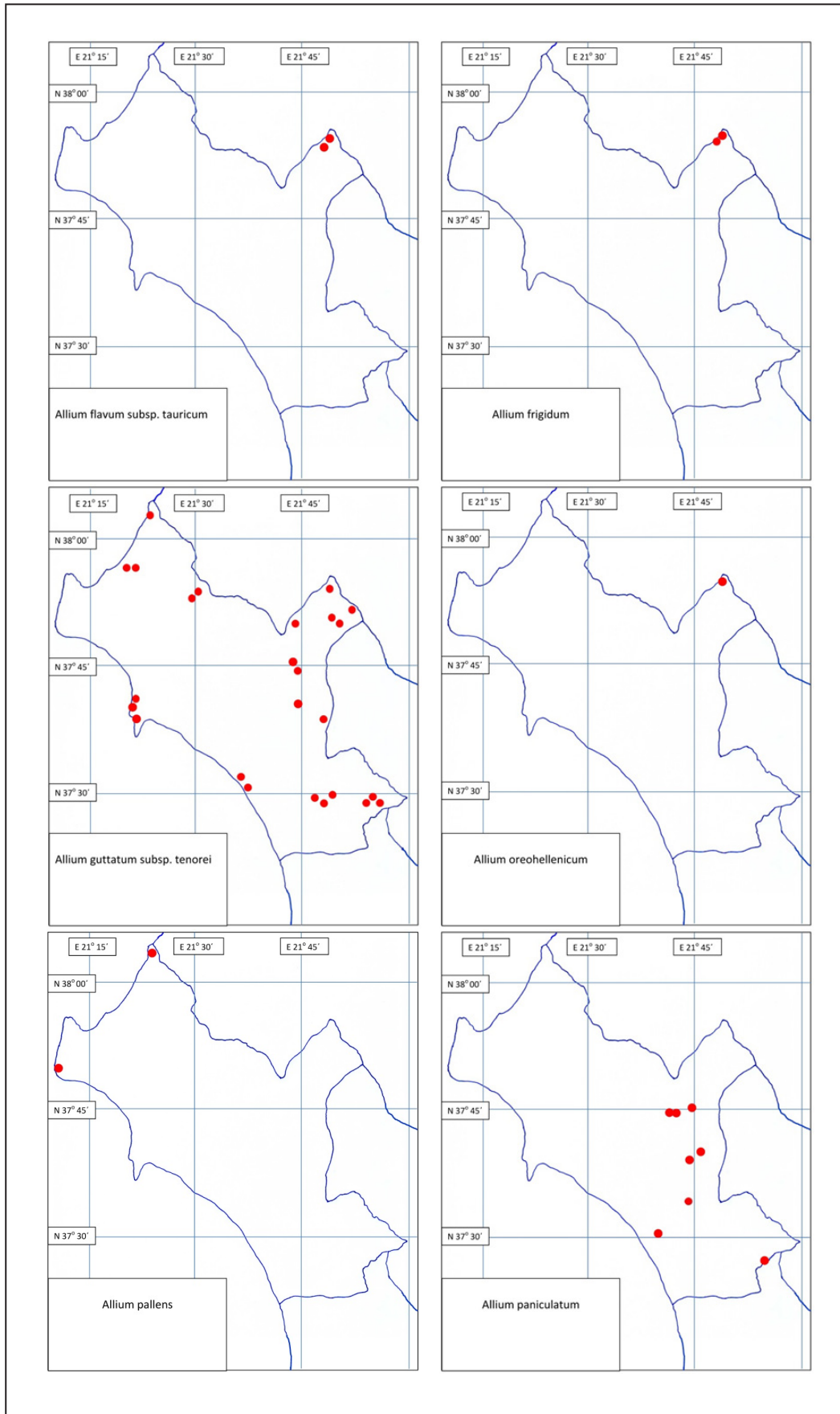


Fig. 5. Distribution of *Allium* species in nomos Ilias.

Allium frigidum Boiss. & Heldr. (Figs. 2:8 & 5)

Often forming tufts. Bulb ovoid; outer tunics membranous, brown. Stem 10–20 cm. Leaves 2–3, filiform, canaliculate, sheathing stem in lower 1/3. Spathe 2-valved, shorter than umbel. Umbel lax, fastigiate, with 3–15 flowers. Pedicels unequal. Perianth segments cream suffused purplish-pink. Filaments included; anthers slightly exerted, creamy yellow.

Northeastern part of Ilias, in the mountains. Rock ledges, screes, subalpine meadows, ca. 2000 m. Flowering June to July. Endemic to Greece (Peloponnese).

Allium guttatum subsp. **tenorei** (Parl.) Soldano (Figs. 2:9 & 5)

Bulb ovoid; bulblets few or absent; outer tunics membranous or coriaceous. Stem 15–50 cm, semi-terete. Leaves 2–5, linear, fistulose, sheathing stem halfway. Spathe 1-valved with long beak, caducous. Umbel ovoid-globose, dense, many-flowered. Inner pedicels longer than outer, erect in fruit. Perianth segments greenish-white, with green or pink stripe. Filaments exerted, inner tricuspidate; anthers yellow.

Widespread in Ilias but absent from centre. Coastal dunes, in *Pinus halepensis* and *Quercus* forest, cultivated ground, sea level to 780 m. Flowering June to July. SE Europe to SW Asia.

Allium oreohellenicum Tzanoud. & al. (Figs. 3:1 & 5)

Bulb ovoid with few bulblets; outer tunics dark brown, coriaceous, splitting longitudinally into fibres. Stem 10–20 cm. Leaves 2–3, filiform, glabrous, sheathing stem halfway, withered at anthesis. Spathe 2-valved, the longer much exceeding umbel. Umbel lax, 7–15-flowered. Pedicels unequal. Perianth segments white suffused lilac or pale pink. Filaments included or slightly exerted; anthers creamy yellow. — $2n = 24$ (triploid, Tzanoudakis & al. 2019).

Northeastern part of Ilias, in the mountains. Rocky slopes, ca. 2000 m. Flowering mid-July to August. Endemic to Greece, occurring in NW Peloponnese as well as Sterea Ellas, Evvia, S and N Pindos (*vide Flora Hellenica Database*).

Allium pallens L. (Figs. 3:2 & 5)

Bulb narrowly ovoid; outer tunics membranous. Stem 20–50 cm. Leaves 3–4, linear, glabrous, sheathing stem up to halfway. Spathe 2-valved, the longer exceeding umbel, persistent. Umbel subglobose. Pedicels almost equal. Perianth segments greenish-white

or pink. Filaments included; anthers yellow, slightly exerted. — $2n = 32$ (tetraploid, Karavokyrou & Tzanoudakis 1991).

Northwestern part of Ilias, coastal. Dry places with *Pinus halepensis*, disturbed habitats, sea level to ca. 30 m. Flowering June to July. Mediterranean region.

Specimens collected by Heldreich 'pr. Lintzi' in NW Ilias have been named *A. rhodopeum* Velen. Brullo & al. (1998: 64) considered *A. rhodopeum* subsp. *rhodopeum* conspecific with *A. paniculatum* L. var. *villosulum* Halácsy (see <http://jacq.org/detail.php?ID=546967> for lectotype of *A. paniculatum* var. *villosulum*). However, Heldreich's specimens were originally identified by Halácsy as *A. paniculatum* and not as *A. paniculatum* β *villosulum* (Halácsy 1904: 256). Below the description of β *villosulum* Halácsy provided a paragraph on additional localities of *A. paniculatum* and only in the penultimate line, was a single (additional?) locality of β *villosulum* cited (Attica: in campis prope De Keleiam [Dekeliam] Tatoi hodie, July 1888, Halácsy). We have now seen Heldreich's specimens from Lintzi and they are clearly not *A. rhodopeum* as the leaf sheaths are glabrous and not hairy. The specimens belong to *A. pallens* L., a species rare in Ilias, known to occur in a small population of 5–7 plants not far distant from Lintzi, at an altitude of 2 m in Loutra Yrminis, Kounopeli.

Allium paniculatum L., s. lat. (Figs. 3:3 & 5)

Bulb narrowly ovoid; outer tunics membranous, brown. Stem 20–70 cm. Leaves 3–5, linear, shallowly canaliculate, usually glabrous, sheathing stem up to halfway. Spathe 2-valved, the longer much exceeding umbel, persistent. Umbel lax, hemispherical to ovoid. Pedicels unequal. Perianth segments white, tawny brown or pink. Filaments included; anthers yellow, slightly exerted. — $2n = 16$ (Dianellidis 1951).

South and central parts of Ilias. Dry stony habitats, olive groves, cultivated fields, abandoned quarries, from sea level to 550 m. Flowering June to July. S & C Europe eastwards through Anatolia and Iran to C Asia.

Allium roseum L. (Figs. 3:4 & 6)

Bulb ovoid or subglobose, usually with numerous stipitate bulblets; outermost tunics crustaceous, pitted, pale brown; inner tunics smooth. Stem 15–60 cm, terete. Leaves 2–4, almost basal, linear, flat, glabrous. Spathe 1-valved, deeply 3–4-lobed, persistent. Umbel

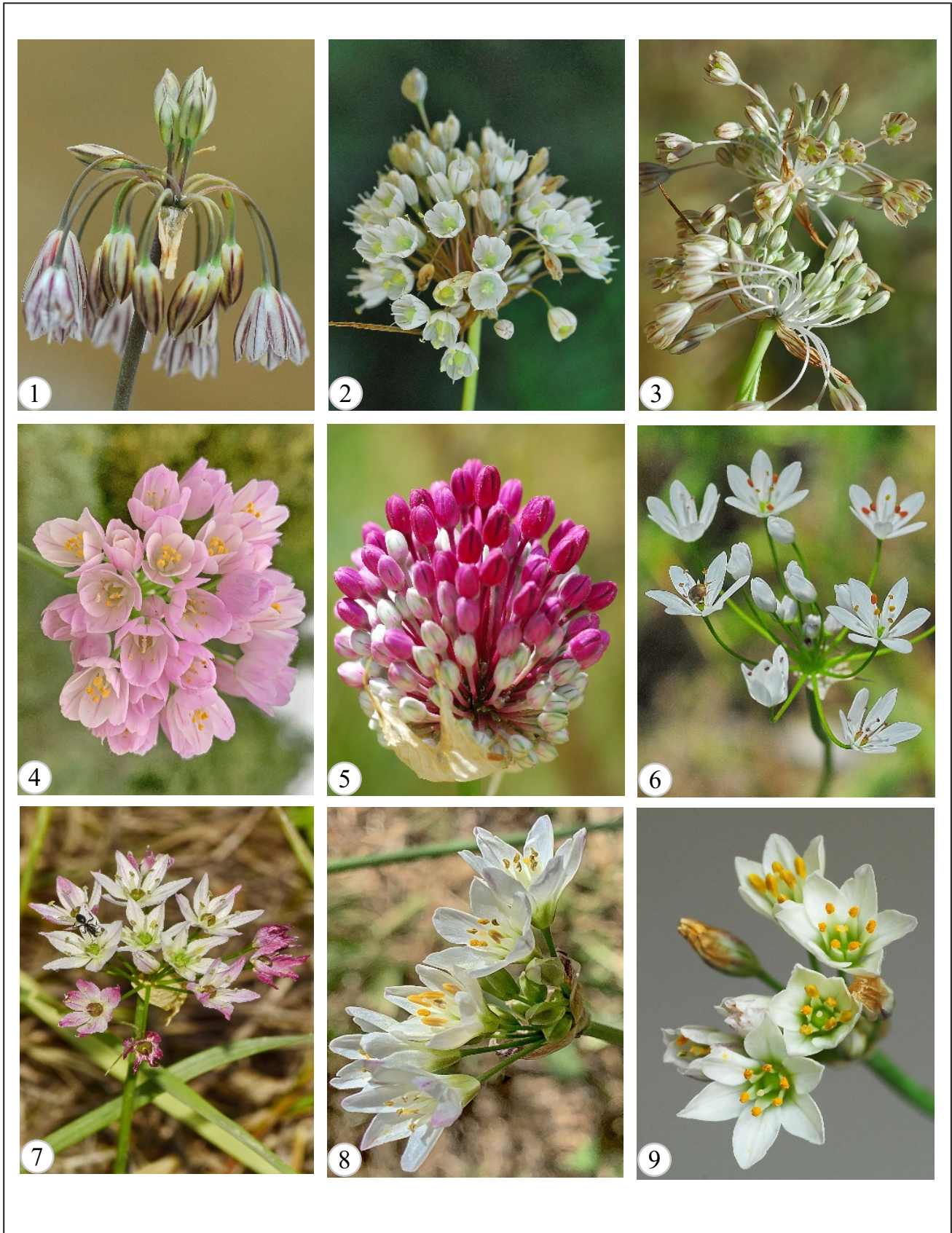


Fig. 3. *Allium* and *Nothoscordum* species in nomos Ilias: 1, *A. oreohellenicum* 2, *A. pallens* 3, *A. paniculatum* 4, *A. roseum* 5, *A. sphaerocephalon* subsp. *sphaerocephalon* 6, *A. subhirsutum* subsp. *subhirsutum* 7, *A. trifoliatum* 8 & 9, *Nothoscordum gracile*.

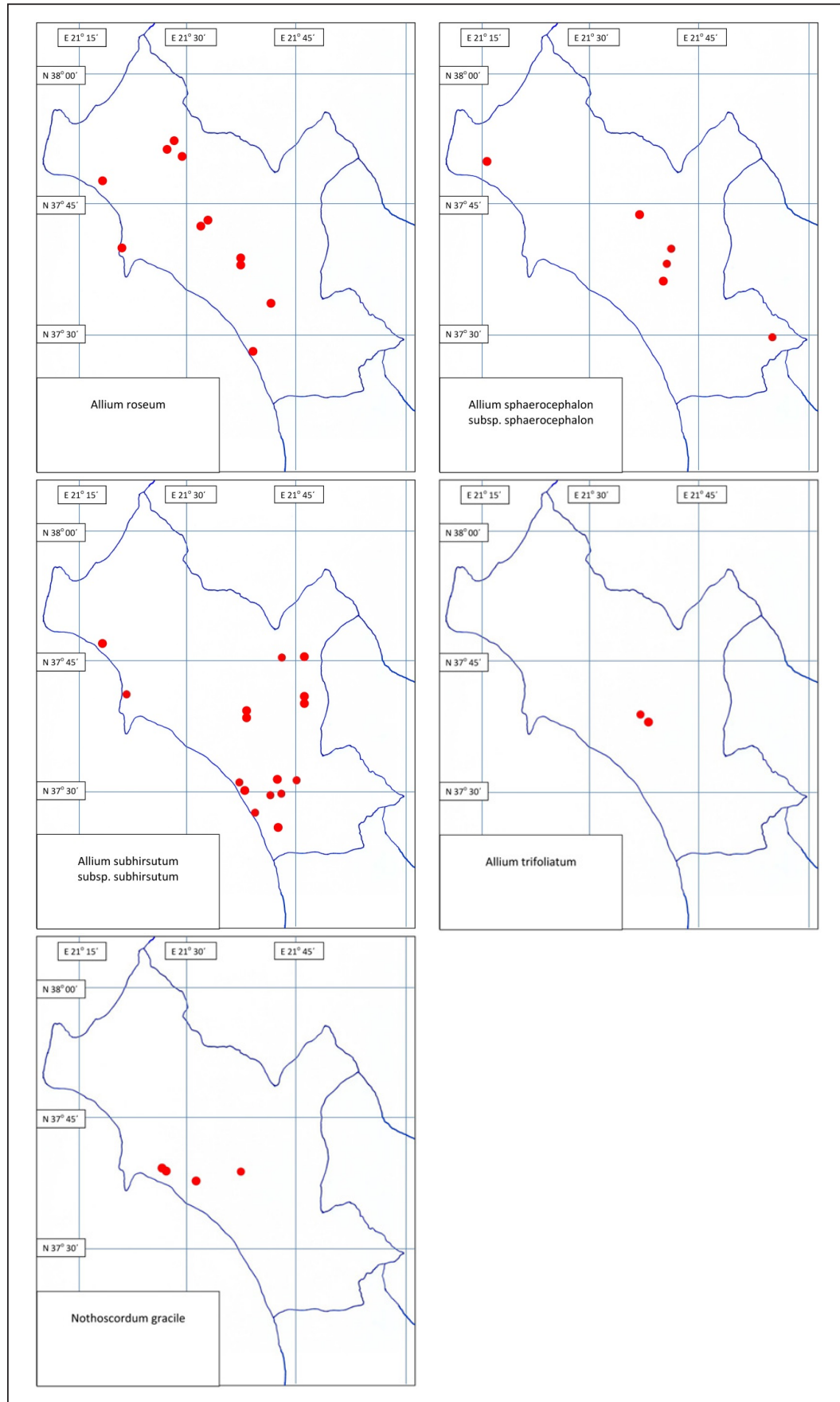


Fig. 6. Distribution of *Allium* and *Nothoscordum* species in nomos Ilias.

rather lax, hemispherical, with or without bulbils. Perianth segments rose-pink or almost white. Filaments included; anthers yellow.

Widespread in Ilias. Coastal areas, cultivated and uncultivated fields, olive groves, roadsides, sea level to 70 m. Flowering April to May. Mediterranean region eastwards to Turkey and W Asia, frequently grown as ornamental. Forms with bulbils in the inflorescence (var. *bulbiferum* DC.) and without bulbils (var. *roseum*) occur together.

Allium sphaerocephalon L. subsp. *sphaerocephalon*

(Figs. 3:5 & 6)

Bulb ovoid; bulblets stipitate, enclosed by lower leaf sheath; outer tunics membranous to coriaceous. Stem 30–50 cm. Leaves 2–6, greyish-green, semi-cylindrical, canaliculate, fistulose. Spathe 2–4-valved, shorter than umbel, persistent. Umbel subglobose, dense, many-flowered. Pedicels unequal. Perianth segments pink to dark reddish-purple. Filaments exerted, inner tricuspidate; anthers reddish.

Mainly south and central parts of Ilias, scattered. Olive groves, cultivated fields, sandy ground near river mouth, sea level to 300 m. Flowering April. A variable species, widespread in S & C Europe and SW Asia. Only one of the three subspecies occurs in nomos Ilias.

Allium subhirsutum L. subsp. *subhirsutum*

(Figs. 3:6 & 6)

Bulb subglobose, usually with bulblets; outer tunics membranous, greyish. Stem 10–40 cm, terete. Leaves 2–3, almost basal, flat, linear, ciliate. Spathe 1-valved, persistent, shorter than pedicels. Umbel lax, hemispherical or fastigiate. Pedicels 3–4 times as long as perianth. Perianth segments remaining white with age. Filaments included; anthers usually brown.

South and central parts of Ilias. In *Quercus* woodland, phrygana, olive groves, fields, near archaeological sites, sea level to 780 m. Flowering April to June. Mediterranean region.

Allium trifoliatum Cirillo (Figs. 3:7 & 6)

Resembling *A. subhirsutum* and occurring in similar habitats, but differing by the following characters: leaves glabrous or sparsely pilose; umbel broadly obconical with pedicels less than 3 times as long as perianth; perianth segments acute, white or suffused pale

pink, darkening reddish-purple with age. Filaments included; anthers yellowish.

Central part of Ilias, more common than as indicated. Olive groves, stony fields, archaeological sites, sea level to 100 m. Flowering April. Widespread in Mediterranean region.

Nothoscordum Kunth

Bulbous plants not smelling of onion or garlic. Perianth segments connate at base into a short tube. Style terminal rather than gynobasic.

Nothoscordum gracile (Aiton) Stearn

(Figs. 3:8-9 & Fig. 6)

Bulb ovoid; outer tunics membranous. Stem 30–50 cm, terete. Leaves linear. Spathe 2-valved, shorter than umbel, persistent. Umbel lax, fastigiate, with 10–15 flowers. Pedicels unequal. Perianth segments white with pink midvein, greenish beneath. Filaments included; anthers dark brown. — $2n = 18$ (Tutin & al. 1980).

Central part of Ilias. First noted in damp places at roadsides in the town of Pyrgos in 2011, now well established and spreading, 30–100 m. Flowers fragrant, long-flowering from April to October. Native to warm-temperate S America, locally naturalized in SW Europe.

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