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Studies on the Cretan flora 3. Additions to the flora of Karpathos

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Synopsis. Floristic notes are provided for 47 taxa, of which 42 were recorded by the authors in April 1992 as new to the South Aegean island of Karpathos. These were first published in *Flora of the Cretan area: annotated checklist & atlas* (Turland, Chilton & Press, 1993), but without comprehensive details of collections or observations, which are instead provided here. Of the 42 taxa, 36 are new to the whole Karpathos island group (Karpathos, Kasos, Saria and adjacent islets). Of these, *Ranunculus cupreus* Boiss. & Heldr. was previously considered endemic to Crete, *Bellevalia trifoliata* (Ten.) Kunth is confirmed as present in the Cretan area (the above islands together with Crete itself), *Scilla bifolia* L. is new to the Cretan area, and *Asyneuma giganteum* (Boiss.) Bornm. is new to Europe (previously known only from the East Aegean islands). Details are also provided confirming the occurrence of five taxa which were formerly known in the Karpathos island group only from old (pre-1930) records.

INTRODUCTION

The island of Karpathos lies in the South Aegean region some 75 km to the north-east of Crete. At 48 km long and up to 12 km wide (305 km^2), it is the largest component of the Karpathos island group (Fig. 1), which also includes Kasos (18 km × 6 km) and Saria (9 km × 6 km). This archipelago, together with Crete and its satellite islands, comprise the floristic territory of the Cretan area ('Cr') as defined in *Flora Europaea* (Tutin et al., 1964–1980) and the *Med-Checklist* (Greuter, Burdet & Long, 1984–1989).

Karpathos lies on a north-south axis and reaches 1215 m on the calcareous mass of Mount Kalilimni, which is located more or less in the centre of the island. On the eastern side, at *c.* 700 m, is the upland plain of Lastos, much of which was formerly under cultivation, while on the western side are vertical cliffs and steep rocky slopes above woods of *Pinus brutia* Ten. The area north of Kalilimni consists of a steep-sided ridge with several summits over 500 m, more pinewoods (largely burnt) and extensive exposure of schistose rock. In the northernmost part of Karpathos are located the villages of Avlona, Diafani and Olimbos, which lacked vehicular access until 1975, and where traditional cultivation of cereals on narrow hillside terraces is still practised. The region south of Kalilimni is less precipitous topographically and contains a large proportion of the island's cultivated land. On the eastern coast is Pigadia, the principal population centre (also known as Karpathos). The southernmost part of the island is low-lying and more or less flat, with some cultivated fields, but mainly large expanses of very dry, exposed calcareous phrygana.

Flora of the Cretan area: annotated checklist & atlas (Turland, Chilton & Press, 1993) was published as a first product of the European Plant Information Centre (EPIC) at The Natural History Museum. In this checklist, the total number of native vascular plant species recorded from the island group is given as 905, of which 10 (1.11%) are endemic and 32 (3.54%) endemic to the Cretan area. There are also 26 introduced species.

Of the taxa dealt with in the present paper, 42 were recorded as additions to the flora of Karpathos in Turland et al. (1993), as a result of a field trip to the island by the present authors in April 1992. Comprehensive details of collections or observations were not included in the checklist because of its concise format, and are instead provided here. During the field trip, the present authors also confirmed the occurrence of five taxa which were formerly known in the Karpathos island group only from old (pre-1930) records. They too are listed here together with full details.

Taxonomy and nomenclature follow *Flora of the Cretan area*. Page references to the text and distribution maps contained in that work are provided for each taxon, using the acronym '*FCA*'. The sequence of localities of collections or observations runs from north to south. Transliteration of Greek place names follows Turland (1992), which in turn follows official Greek usage. The aim is to provide the closest possible phonetic equivalent to the Greek pronunciation without resorting to unwieldy letter combinations. In order to avoid repetitiveness in citing the records, the collectors '*Chilton & Turland*' are abbreviated to '*C. & T.*' and 'observation' to 'obs.' All collections have been lodged at The Natural History Museum (BM).

FLORISTIC NOTES

Pteridophyta

Aspleniaceae

Asplenium ruta-muraria L. subsp. **ruta-muraria** (new to the Karpathos island group – *FCA*: 31, 200)

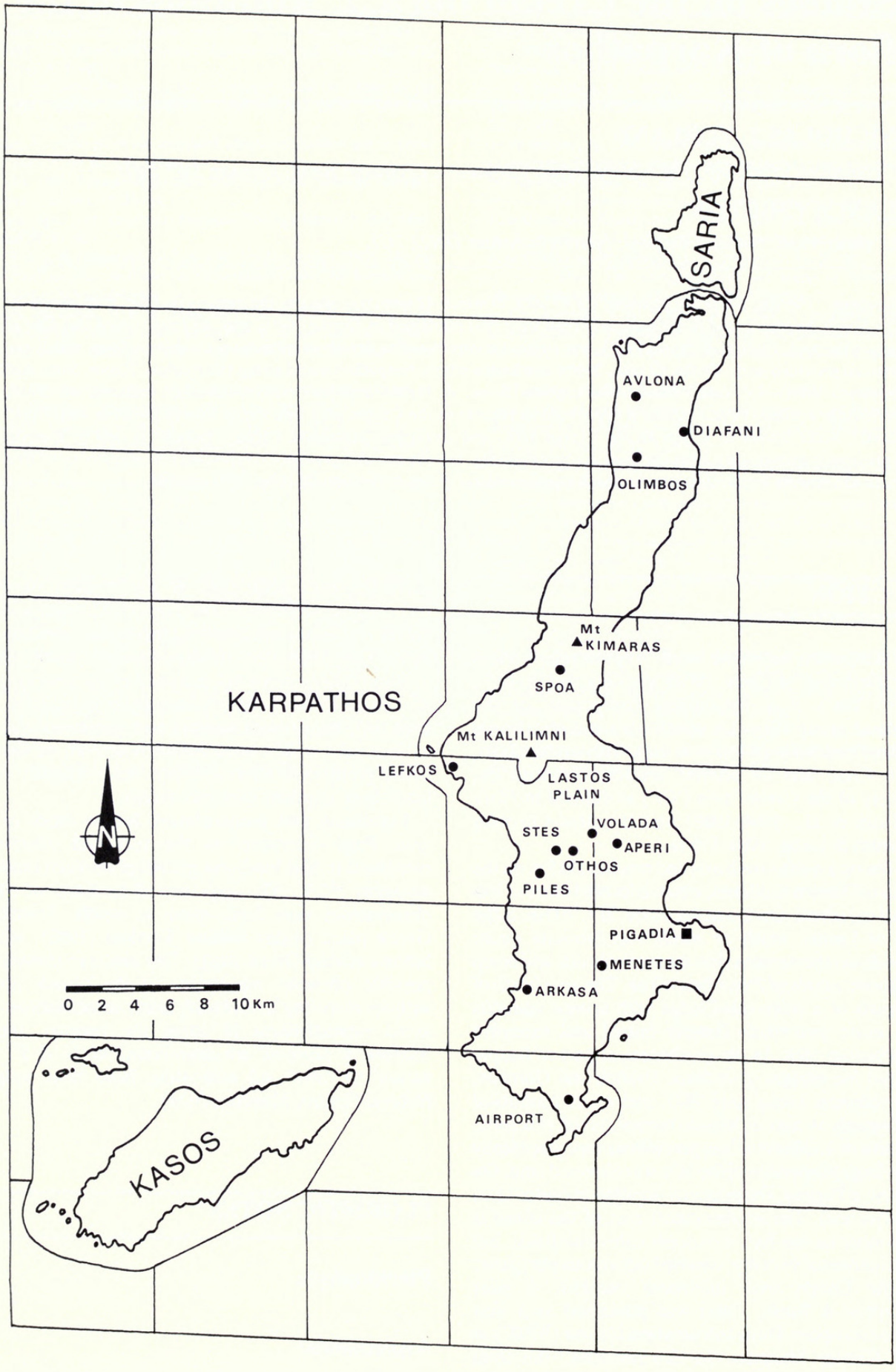

Fig. 1 The Karpathos island group, showing localities mentioned in the text, and the mapping grid used by Turland et al. (1993). The basic, unadjusted square size is 8.25 km × 8.25 km.

W. of summit of Mt Kalilimni, 1150 m, crevices of W.-facing calcareous cliff, 9 April 1992, *C. & T.* 307 (living material, no longer extant).

This small north temperate fern also occurs in the three main mountain massifs of Crete (Lefka Ori, Psiloritis and Dikti).

Spermatophyta

Angiospermae

Dicotyledones

Apocynaceae

Vinca major L. subsp. **major** (new to the Karpathos island group – *FCA*: 36, 206)

Aperi village, 300 m, side of road, 7 April 1992, *C. & T.* obs.; 2 km NNW of Piles, 250 m, abandoned cultivated ground, 6 April 1992, *C. & T.* obs.

This evergreen subshrub is cultivated for ornament in Crete and occasionally becomes naturalized. It occurs as a native plant in western and central parts of the Mediterranean region.

Araliaceae

Hedera helix L. (new to the Karpathos island group – *FCA*: 37, 206)

Piles village, 300 m, wall at side of road, 6 April 1992, *C. & T.* obs.

Hedera helix is widespread in Crete as subsp. *helix* (with blackish fruits) and is a native plant in woodland and on cliffs. The species also occurs on walls in Cretan towns and villages, where it may sometimes be planted, either as subsp. *helix* or subsp. *poëtarum* Nyman (with orange-yellow fruits). In Karpathos it was observed only at the cited locality – a man-made habitat – which suggests that its native status on the island is doubtful. In the absence of fruits, the plants could not be identified to subspecific rank. Outside the Cretan area the species is distributed in temperate parts of Europe and Asia.

Boraginaceae

Lithospermum sibthorpianum Griseb. (confirmation for the Karpathos island group – *FCA*: 40)

Buglossoides arvensis subsp. *sibthorpiana* (Griseb.) R. Fern.

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, among cereal crop on cultivated terrace, 8 April 1992, *C. & T.* 291; SE side of summit of Mt Kalilimni, 1150 m, soil-patch in calcareous phrygana, 9 April 1992, *C. & T.* 304; E. slope of Mt Kalilimni, 900 m, small open area in dry stream-bed surrounded by garigue of *Phlomis floccosa* D. Don and *Sarcopoterium spinosum* (L.) Spach, 5 April 1992, *C. & T.* 247; 1.5 km E. of Lastos plain, 700 m, bare soil at side of track, 9 April 1992, *C. & T.* obs.

This annual species was given for Karpathos by Greuter et al. (1983: 49, as *Lithospermum arvense* L.) purely on the basis of an old record from Mount Kalilimni cited by Rechinger (1943*a*: 455, as *Lithospermum arvense* var. *sibthorpianum* (Griseb.) Halácsy). *L. sibthorpianum* is related to *L. arvense* and *L. incrassatum* Heldr. ex Guss. (*Buglossoides arvensis* subsp. *gasparrinii* (Heldr. ex Guss.) R. Fern.) These two species are unknown in the Karpathos island group, although they do occur in Crete together with *L. sibthorpianum*.

Cactaceae

Opuntia ficus-barbarica A. Berger (new to the Karpathos island group – *FCA*: 41, 212)

O. ficus-indica sensu *Flora Europaea*

Road entrance to Olimbos village, 350 m, field-margins, 7 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; 1.5 km W. of Menetes, 350 m, near side of road, 10 April 1992, *C. & T.* obs.

Opuntia ficus-barbarica was introduced to the Mediterranean region from tropical America. It is planted in Crete and also naturalized in cultivated and waste areas, usually near human habitation.

Campanulaceae

Asyneuma giganteum (Boiss.) Bornm. (new to Europe – *FCA*: 42, 213)

W. of summit of Mt Kalilimni, 1150 m, crevices of W.-facing calcareous cliff, 9 April 1992, *C. & T.* 311 (living material, in hort. Turland).

Asyneuma giganteum is a monocarpic chasmophyte which occupies a very isolated taxonomic position within the genus (Damboldt, 1978: 71). Its discovery in Karpathos extends the known distribution into Europe, the previously known populations being on the East Aegean islands of Rodos (Damboldt, loc. cit.) and Halki (Carlström, 1987: 97, 223). The population on Mount Kalilimni appears to be extremely small and localized: up to 10 plants were found on one cliff only, all of them diminutive (up to 5 cm high), with only a few leaves and no fertile parts present, or indeed any dead remains of those of the previous growing season. The single plant collected has subsequently grown well in cultivation in Britain. By autumn 1992, it had produced a rosette of numerous leaves and, although still sterile, was clearly identifiable with a fertile specimen collected in Rodos (In monte Prophet Elias (Monte Profeta) prope Salakos, in saxosis calc. 'Turka', *c.* 600 m, 2 July 1935, *Rechinger* 8508 (BM!)).

Two other taxa have a similar bi-regional endemic distribution spanning the phytogeographical divide between Europe and Asia: *Astragalus austro-aegaeus* Rech. f. (Leguminosae) is known only from Kasos, Karpathos and Rodos, while *Ophrys umbilicata* subsp. *rhodia* H. Baumann & Künkele (Orchidaceae) is known only from Karpathos and Rodos.

Caryophyllaceae

Cerastium brachypetalum Pers. (new to the Karpathos island group – *FCA*: 45, 218)

Lastos plain, 700 m, fallow field, 5 April 1992, *C. & T.* 241.

This small annual species occurs in the higher mountains of Crete, where two subspecies are known: the endemic subsp. *doerfleri* (Halácsy ex Hayek) P.D.Sell & Whitehead, apparently restricted to Mount Kedros, and the more widespread subsp. *roeseri* (Boiss. & Heldr.) Nyman. Unfortunately it was not possible to identify the Karpathos collection to subspecific rank and it is recorded, for the time being, as the species sensu lato. *Cerastium brachypetalum* is widely distributed in western, central and southern Europe where several subspecies have been recognised.

Sagina apetala Ard. (new to Karpathos – *FCA*: 49, 223)

1 km NW of Pigadia, sea-level, damp bare sandy mud at edge of *Phragmites* bed, 11 April 1992, *C. & T.* 339.

This is another diminutive annual with a widespread European distribution which includes Crete. The species was first recorded from the Karpathos island group by Greuter et al. (1983: 50), from Kasos.

Sagina maritima Don (new to Karpathos – *FCA*: 49, 223)

0.5 km W. of Pigadia, 5 m, damp bare sandy ground by track, 4 April 1992, *C. & T.* 226.

Sagina maritima is morphologically similar to the preceding species, but differs in having leaves muticous or very shortly mucronate, rather than distinctly aristate. It occurs along the coasts of most of Europe, including Crete. In common with *Sagina apetala*, it was first recorded from the Karpathos island group by Greuter et al. (1983: 50), from Kasos.

Stellaria media (L.) Vill. (confirmation for the Karpathos island group – *FCA*: 53, 228)

Diafani village, sea-level, 8 April 1992, *C. & T.* obs.; road entrance to Olimbos village, 350 m, 7 April 1992, *C. & T.* obs.; 1.5 km SW of Spoa, 300 m, foot of NW-facing calcareous cliff, 7 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; immediately NW of Piles, 300 m, bare stony ground of dry stream-bed by road, 6 April 1992, *C. & T.* 260; immediately W. of Menetes, by church, 350 m, grassy area, 10 April 1992, *C. & T.* obs.; Menetes village, 350 m, 10 April 1992, *C. & T.* obs.

This taxon is the species sensu stricto (i.e. subsp. *media* sensu *Flora Europaea*), which is distributed throughout Europe. The species was given for Karpathos by Greuter et al. (1983: 51) purely on the basis of an old record from Volada cited by Rechinger (1943*a*: 148). Jalas & Suominen, in *Atlas Florae Europaeae* (1983: 72, map 820), map *Stellaria media* sensu lato from Karpathos (i.e. including *S. cupaniana* (Jord. & Fourr.) Bég., *S. neglecta* Weihe and *S. pallida* (Dumort) Piré), using a symbol indicating the existence of a post-1930 record, but they do not provide a separate map for the species sensu stricto.

Chenopodiaceae

Beta vulgaris subsp. **maritima** (L.) Arcang. (new to the Karpathos island group – *FCA*: 54, 230)

Diafani, sea-level, cliff immediately above seashore, 8 April 1992, *C. & T.* obs.; coast WSW of Piles, 5 m, margin of abandoned field above beach, 7 April 1992, *C. & T.* 272.

At the cited localities, the plants appeared to be referable to the native subsp. *maritima*, rather than subsp. *vulgaris*, which occurs as a casual escape from cultivation in both Crete and Karpathos. Subsp. *maritima* occurs along the coasts of western and southern Europe (including Crete), Asia and North Africa, as well as on saline soils inland.

Compositae (Asteraceae)

Bellis sylvestris Cirillo (new to the Karpathos island group – *FCA*: 59, 237)

Lower E. slopes of Mt Kalilimni above Lastos plain, 750 m, garigue, 5 April 1992, *C. & T.* obs.; along track from Lastos plain to E. coast, 700 m, garigue, 9 April 1992, *C. & T.* obs.; upper end of Volada village, 470 m, garigue, 5 April 1992, *C. & T.* obs.; W. of Othos, on road to Stes, 450 m, phrygana, 6 April 1992, *C. & T.* 249; immediately W. of Menetes, by church, 350 m, grassy area, 10 April 1992, *C. & T.* obs.

Numerous flowering individuals of this perennial southern European species were observed in Karpathos – enough to suggest that spring is at least part of its main flowering period there. In Crete, the species seems to flower mainly in the autumn, and only rarely in spring.

Centaurea calcitrapa L. subsp. **calcitrapa** (new to the Karpathos island group – *FCA*: 61, 240)

0.5 km SE of Olimbos, 350 m, bare ground at side of road, 7 April 1992, *C. & T.* obs.

This biennial plant occurs as a native in southern-central Europe and the Mediterranean region, and is naturalized elsewhere in western and central Europe. It is found in Crete, where it usually grows in weedy habitats similar to the Karpathos locality.

Rhagadiolus edulis Gaertn. (new to the Karpathos island group – *FCA*: 71, 253)

Valley 4 km N. of Mt Kimaras, between semi-deserted village and gorge, 100 m, grove of *Pinus brutia* Ten. on valley-floor, growing with *Aristolochia cretica* Lam., *Cyclamen creticum* (Dörfl.) Hildebr., *Scaligeria napiformis* (Spreng.) Grande and *Theligonum cynocrambe* L., 8 April 1992, *C. & T.* 298; 1 km SE of Lastos plain, 650 m, rocky ground sheltered by a shrub on margin of abandoned field, 9 April 1992, *C. & T.* 301; 1 km SE of Menetes, 280 m, foot of E.-facing calcareous cliff, 10 April 1992, *C. & T.* obs.

Rhagadiolus edulis has not always been separated from *R. stellatus* (L.) Gaertn. sensu lato, which is distributed from southern Europe eastwards to Iran and was already known to occur in Kasos and Karpathos (Rechinger, 1943*a*: 676; Greuter et al., 1983: 54). *R. edulis* was not given for the Karpathos island group by Rechinger (op. cit.: 677), and was not treated

separately by Greuter et al. (loc. cit.) It is characterized by its lyrately divided leaves and glabrous phyllaries and is probably only worthy of separation at varietal rank, if at all. Turland et al. (1993) do not treat it separately, except in their distribution maps. *R. stellatus* sensu stricto, with dentate to incised leaves and pubescent or minutely setulose phyllaries, also occurs in Karpathos, and both taxa occur more or less sympatrically in Crete. *R. edulis* has a tendency to grow in more humid habitats than *R. stellatus* in the Cretan area.

Tyrimnus leucographus (L.) Cass. (new to the Karpathos island group – *FCA*: 73, 257)

0.25 km SW of Avlona, 300 m, cultivated terraces on calcareous substratum, 8 April 1992, *C. & T.* obs.; immediately N. of Olimbos, 300 m, field, 8 April 1992, *C. & T.* obs.; E. side of Mt Kimaras, on Spoa-Olimbos road, 350 m, rocky ground at side of road, 7 April 1992, *C. & T.* 276.

Old records of this Mediterranean species from Kasos and Karpathos (Rechinger, 1943*a*: 655) were considered erroneous and were referred to *Carduus argentatus* L. by Greuter et al. (1983: 52). The latter species was also observed by the authors on the terraces at Avlona.

Crassulaceae

Crassula alata (Viv.) A. Berger (new to the Karpathos island group – *FCA*: 76, 259)

Beach 1 km NW of Pigadia, sea-level, sandy ground at top of beach, 11 April 1992, *C. & T.* 335 – det. J.R. Akeroyd.

This minute annual species is currently known in Europe only from the Aegean region (Crete, Karpathos and the Kiklades). Otherwise, it occurs in North Africa and south-western Asia. It was first recorded from Crete by Greuter & Raus (1981: 276), and has not always been distinguished there from the very similar *Crassula tillaea* Lest.-Garl. (Greuter, Matthäs & Risse, 1984: 275–276).

Cruciferae (Brassicaceae)

Eruca sativa Mill. (new to the Karpathos island group – *FCA*: 82, 268)

E. vesicaria subsp. *sativa* (Mill.) Thell.

1.5 km NE of Lefkos, 100 m, 6 April 1992, *C. & T.* obs.; 0.5 km SW of Volada, 500 m, 6 April 1992, *C. & T.* obs.; 2.25 km NNW of Piles, 250 m, 6 April 1992, *C. & T.* obs.; Pigadia town, 15 m, 4 April 1992, *C. & T.* obs.

Eruca sativa is an annual species widely distributed in the Mediterranean region. It occurs in Crete, where it grows in weed communities on cultivated ground.

Teesdalia coronopifolia (J. P. Bergeret) Thell. (new to the Karpathos island group – *FCA*: 86, 272)

Lastos plain, 700 m, fallow field, 5 April 1992, *C. & T.* 240.

This mainly southern European and North African annual is also known from western Crete, where it has been recorded under similar ecological conditions at an altitude of 1050 m on the Omalos plain in the Lefka Ori massif (Rechinger, 1943*b*: 79).

Dipsacaceae

Knautia integrifolia (L.) Bertol. (new to the Karpathos island group – *FCA*: 86, 273)

Along track from Lastos plain to E. coast, 700 m, 9 April 1992, *C. & T.* obs.; immediately NE of Stes, 450 m, weed community in olive grove, 6 April 1992, *C. & T.* obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, *C. & T.* obs.

Knautia integrifolia is an annual species represented in Crete by subsp. *mimica* (Borbás) Greuter, which otherwise occurs in Albania and Greece, and on the East Aegean island of Rodos by subsp. *urvillei* (Coult.) Greuter, which otherwise occurs from Turkey-in-Europe to Palestine. The precise identity of the populations in Karpathos has yet to be ascertained; they could belong to either of these taxa, or possibly to subsp. *integrifolia*, which is distributed mainly in the western and central Mediterranean region, extending eastwards to Bulgaria and Greece.

Euphorbiaceae

Euphorbia helioscopia L. (new to Karpathos – *FCA*: 89, 277)

0.25 km SW of Avlona, 300 m, cultivated terraces, 8 April 1992, *C. & T.* obs.; ravine immediately SW of Diafani, 50 m, 8 April 1992, *C. & T.* obs.; 5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, *C. & T.* obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, *C. & T.* obs.; 1.5 km N. of Airport, 20 m, margin of fallow field, 10 April 1992, *C. & T. 324.*

This annual species occurs almost throughout Europe (including Crete), North Africa and Asia, and is widely introduced elsewhere. The species was first recorded from the Karpathos island group by Greuter et al. (1983: 57), from Kasos.

Geraniaceae

Erodium moschatum (L.) L'Hér. (new to the Karpathos island group – *FCA*: 92, 281)

Olimbos village, 350 m, 7 April 1992, *C. & T.* obs.; gorge 4.5 km N. of Mt Kimaras, 100 m, 8 April 1992, *C. & T.* obs.; semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, 8 April 1992, *C. & T.* obs.; 1.5 km SW of Spoa, 300 m, foot of NW-facing calcareous cliff, 7 April 1992, *C. & T.* obs.; immediately NE of Stes, 450 m, 6 April 1992, *C. & T.* obs.; Pigadia town, 15 m, 4 April 1992, *C. & T.* obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, *C. & T.* obs.

Erodium moschatum is an annual or biennial species widely distributed in Europe (including Crete), North Africa and Asia, and introduced elsewhere.

Geranium tuberosum L. subsp. **tuberosum** (new to the Karpathos island group – *FCA*: 93, 282)

Immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, *C. & T.* 253.

This tuberous perennial plant is distributed in southern Europe, North Africa and south-western Asia. It occurs in Crete, where it is characteristic of areas in which traditional methods of cultivation are still practised. The plants typically grow in cultivated and fallow fields, as for example in the fields of the Lasithi plain in the Dikti massif in eastern Crete.

Guttiferae (Hypericaceae)

Hypericum perforatum L. (new to the Karpathos island group – *FCA*: 94, 284)

0.25 km SW of Avlona, 300 m, growing through calcareous rocks of dry-stone wall, 8 April 1992, *C. & T.* 285; 0.5 km E. of Pigadia, 11 April 1992, *C. & T.* obs.; between Menetes and Arkasa, growing through calcareous rocks of dry-stone wall, 10 April 1992, *C. & T.* obs.

Hypericum perforatum occurs almost throughout Europe (including Crete), as well as in North Africa and Asia. The plants seen in Karpathos were sterile, but they can nevertheless be referred to this species with confidence.

Labiatae (Lamiaceae)

Melissa officinalis subsp. **altissima** (Sm.) Arcang. (confirmation for the Karpathos island group – *FCA*: 96, 286)

Immediately NE of Stes, 450 m, heap of stones in partly cultivated area, 6 April 1992, *C. & T.* obs.; 2 km NNW of Piles, 250 m, near stream, 6 April 1992, *C. & T.* obs.

Melissa officinalis was given for Karpathos by Greuter et al. (1983: 58) purely on the basis of an old record from Othos cited by Rechinger (1943*a*: 522). Subsp. *altissima* occurs in southern Europe (including Crete), North Africa and south-western Asia.

Rosmarinus officinalis L. (new to the Karpathos island group – *FCA*: 99, 289)

0.5 km W. of Volada, by track to Lastos plain, 500 m, one plant at top of bank by track, *C. & T.* obs.; near Piles, 6 April 1992, *C. & T.* obs.

This largely Mediterranean shrub is occasionally cultivated for ornament or culinary use in both Crete and Karpathos, and it is very likely that the few plants seen at the cited localities are deliberately planted individuals rather than native or naturalized. The native status of the species in Crete is similarly doubtful.

Stachys arvensis (L.) L. (new to the Karpathos island group – *FCA*: 100, 292)

2 km SE of Aperi, 250 m, 5 April 1992, *C. & T.* obs.

Stachys arvensis is found in Europe, Africa, south-western Asia and America. It occurs in Crete, where it grows among rocks and in stony places.

Leguminosae (Fabaceae)

Lathyrus annuus L. (new to the Karpathos island group – *FCA*: 106, 299)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, among cereal crop on cultivated terrace, 8 April 1992, *C. & T.* 292; immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, *C. & T.* 251; 1 km NW of Pigadia, sea-level, annual community on damp ground at edge of *Phragmites* bed, growing with *Bromus* spp., *Hordeum leporinum* Link, *Medicago* spp. and *Vicia villosa* subsp. *varia* (Host) Corb., 11 April 1992, *C. & T.* 338.

This annual species is distributed from the Mediterranean region eastwards to central Asia. It occurs in Crete, where its usual habitats are much the same as those in Karpathos.

Lens culinaris Medik. (confirmation for the Karpathos island group – *FCA*: 107)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, *C. & T.* obs.; 1 km NE of Lefkos, 40 m, fallow field, 6 April 1992, *C. & T.* 264.

Lens culinaris is an annual species widely cultivated in Europe, Asia and elsewhere for its edible seeds. The plant was given as cultivated in Karpathos by Greuter et al. (1983: 60) purely on the basis of an old record cited by Ciferri (1944: 61, as *Ervum lens* L.) The plants at both localities cited here are probably no more than relics of cultivation, although those at Lefkos may have become locally naturalized, since the field appeared to have been lying fallow for some years.

Vicia faba L. (new to the Karpathos island group – *FCA*: 115)

Lastos plain, 700 m, fields, 5 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, *C. & T.* obs.; 1.5 km N. of Airport, 20 m, fields, 10 April 1992, *C. & T.* obs.

Vicia faba is cultivated for its edible seeds in both Crete and Karpathos. In Crete, the species also occurs as a casual relic or escape from cultivation, and the records from Karpathos most probably represent such occurrences.

Malvaceae

Lavatera cretica L. (new to the Karpathos island group – *FCA*: 118, 317)

Road entrance to Olimbos village, 350 m, 7 April 1992, *C. & T.* obs.; Pigadia town, 15 m, waste area, 11 April 1992, *C. & T.* 343.

This annual or biennial species is distributed from western Europe through the Mediterranean region to Arabia. It occurs in Crete, where it is most often found in cultivated and waste areas.

Plantaginaceae

Plantago amplexicaulis Cav. subsp. **amplexicaulis** (new to the Karpathos island group – *FCA*: 124, 323)

E. edge of Pigadia town, 20 m, waste area at side of road, 11 April 1992, *C. & T.* 344.

This annual plant is found in southern Spain, southern Italy, the South Aegean region (including eastern Crete), North Africa and Cyprus.

Ranunculaceae

Ranunculus cupreus Boiss. & Heldr. (new to the Karpathos island group – *FCA*: 132, 334)

Summit area of Mt Kalilimni, 1200 m, soil-pockets in calcareous rocky slope, 9 April 1992, *C. & T.* 306; E. side of Mt Kalilimni, 1000 m, crevices and soil-pockets in calcareous rock-face exposed to N., 5 April 1992, *C. & T.* 244.

Ranunculus cupreus is a tuberous perennial species which, prior to its discovery on Mount Kalilimni in Karpathos, was considered endemic to Crete, where it occurs sporadically from sea-level up to 2200 m. The plants are frequent on Kalilimni above *c.* 1000 m. The basal leaves are hairy and the undersides of the honey-leaves sometimes copper-tinted – both diagnostic features of *R. cupreus*, and relevant in distinguishing this species from *R. subhomophyllus* (Halácsy) Vierh., which has also been recorded from Mount Kalilimni (Rechinger, 1943*a*: 190; Strid, 1986: 220). It seems probable that *R. cupreus* in Karpathos has previously been misidentified as *R. subhomophyllus*: the authors observed large numbers of plants of the former but none of the latter during their field trip. Indeed, the accuracy of all records of *R. subhomophyllus* from Karpathos should not be taken for granted. The same could be said of records from Mount Afendis Kavousi in eastern Crete (Rechinger, 1943*b*: 74; Strid, loc. cit.): this mountain is the type locality of *R. cupreus*, which still occurs there in large numbers (clearly agreeing with the Kalilimni material), whereas *R. subhomophyllus* has not yet been found there by either of the authors.

Resedaceae

Reseda luteola L. (confirmation for the Karpathos island group – *FCA*: 134, 336)

2.5 km N. of Mt Kimaras, 200 m, hard bare ground on track, 8 April 1992, *C. & T.* 296; 2 km NW of Pigadia, 10 m, roadside bank, 4 April 1992, *C. & T.* obs.

This biennial species was given for Karpathos by Greuter et al. (1983: 66) purely on the basis of an old record from the Olimbos area cited by Rechinger (1943*a*: 245). It occurs in Europe (including Crete) and North Africa eastwards to central Asia.

Scrophulariaceae

Linaria chalepensis (L.) Mill. (new to the Karpathos island group – *FCA*: 142, 348)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, *C. & T.* obs.

Linaria chalepensis is an annual species found in the Mediterranean region and south-western Asia. It occurs in Crete, where it grows as a weed of cultivated areas.

Scrophularia peregrina L. (new to Karpathos – *FCA*: 143, 349)

Gorge 4.5 km N. of Mt Kimaras, 100 m, 8 April 1992, *C. & T.* obs.; semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, 8 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; immediately NW of Piles, 300 m, heap of soil and stones by dry stream-bed by road, 6 April 1992, *C. & T.* 259; 0.5 km E. of Pigadia, 11 April 1992, *C. & T.* obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, *C. & T.* obs.

This annual species is found mainly in the Mediterranean region, including Crete, where it grows in rocky places and weed communities mainly in the west of the island. In the Karpathos island group, it is known from an old record from Kasos cited by Rechinger (1943*a*: 477), and was recorded as new to Saria by Greuter et al. (1983: 68). It appears to have been hitherto overlooked in Karpathos, however, in spite of its moderately frequent occurrence there.

Umbelliferae (Apiaceae)

Smyrnium olusatrum L. (new to the Karpathos island group – *FCA*: 153, 363)

Aperi village, 300 m, dry-stone wall at side of road, 7 April 1992, *C. & T.* 267; Piles village, 300 m, 6 April 1992, *C. & T.* obs.; Menetes village, 350 m, 10 April 1992, *C. & T.* obs.

Smyrnium olusatrum is a biennial species distributed mainly in the Mediterranean region. It occurs in Crete, where it is often found in or around villages.

Monocotyledones

Agavaceae

Agave americana L. (new to the Karpathos island group – *FCA*: 157, 368)

Diafani village, 8 April 1992, *C. & T.* obs.

This large succulent perennial was introduced to the Mediterranean region from Mexico. It is cultivated in Crete and is possibly also naturalized on roadsides and near villages. The exact status of the population at Diafani is uncertain.

Cyperaceae

Carex illegitima Ces. (new to the Karpathos island group – *FCA*: 160, 372)

2.5 km N. of Mt Kimaras, 200 m, steep slope of stream gully in area of burnt *Pinus brutia* woodland, forming clumps amongst regenerating vegetation of *Arbutus unedo* L., *Pistacia lentiscus* L. and *Cistus* on schistose substratum, 8 April 1992, *C. & T.* 295; along track from Lastos plain to E. coast, 700 m, in field layer of very open *Pinus brutia* woodland, 9 April 1992, *C. & T.* obs.

This mainly eastern Mediterranean sedge was considered doubtfully present in the Cretan area until recorded by Turland (1992: 163) from the lower western slopes of Mount Afendis Kavousi in eastern Crete where, as in Karpathos, it grows in *Pinus brutia* woodland.

Gramineae (Poaceae)

Bromus diandrus Roth (new to the Karpathos island group – *FCA*: 165, 378)

Immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, *C. & T.* 250; 1 km NW of Pigadia, sea-level, annual community on damp ground at edge of *Phragmites* bed, 11 April 1992, *C. & T.* obs.; Pigadia town, 15 m, 4 April 1992, *C. & T.* obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, *C. & T.* obs.

Bromus diandrus is an annual grass found in southern Europe, North Africa and south-western Asia. It occurs in Crete, growing in a variety of disturbed habitats.

Bromus hordeaceus subsp. **divaricatus** (Bonnier & Layens) Kerguélen (new to the Karpathos island group – *FCA*: 166, 379)

B. hordeaceus subsp. *molliformis* (Lloyd ex Godr.) Maire & Weiller

1.5 km N. of airport, 20 m, fallow field, 10 April 1992, *C. & T.* 323 – det. M.H. Martin (University of Bristol).

This annual Mediterranean grass also occurs in Crete, where it grows in marshes, damp grassland and sandy alluvial soils, as well as fallow fields.

Hordeum spontaneum K. Koch (new to the Karpathos island group – *FCA*: 171, 385)

Immediately W. of Menetes, by church, 350 m, 10 April 1992, *C. & T.* obs.; immediately E. of Menetes, 340 m, waste ground at side of road, 10 April 1992, *C. & T.* 317; 1.5 km N. of Airport, 20 m, side of road, 10 April 1992, *C. & T.* obs.

Greuter, Matthäs & Risse (1985: 36) suggested that this annual grass is 'actively spreading as a roadside weed in Greece and on many Greek islands'. The same authors (loc. cit.) considered it to be fairly recently introduced to Crete, and now naturalized there. Elsewhere, it is known from Libya, Egypt and south-western and central Asia.

Imperata cylindrica (L.) Raeusch. (new to the Karpathos island group – *FCA*: 171, 386)

1.5 km SW of Piles, 20 m, wet ditch at side of road, 6 April 1992, *C. & T.* obs.; 1 km NW of Pigadia, sea-level, damp ground at edge of *Phragmites* bed, 11 April 1992, *C. & T.* 340.

This rhizomatous perennial grass is distributed from southern Europe to central Asia, as well as in the Old World tropics and subtropics and Chile. In Crete, it occurs in damp sandy places, ditches and moist grassland near the sea.

Lamarckia aurea (L.) Moench (new to Karpathos – *FCA*: 171, 386)

Semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, fallow cultivation terrace, 8 April 1992, *C. & T.* 300; S. edge of Pigadia town, 25 m, weed community in olive groves, 11 April 1992, *C. & T.* obs.

Lamarckia aurea is an annual grass found from the Mediterranean region (including Crete) eastwards to Pakistan. It was first recorded from the Karpathos island group by Greuter et al. (1983: 72), from Saria.

Iridaceae

Romulea ramiflora Ten. susbp. **ramiflora** (new to Karpathos – *FCA*: 179, 396)

Lastos plain, 700 m, fallow field, growing with *Romulea bulbocodium* (L.) Sebast. & Mauri, 9 April 1992, *C. & T.* 302.

This geophyte is distributed in the Mediterranean region, including Crete, and was first recorded from the Karpathos island group by Greuter et al. (1983: 74), from Kasos.

Liliaceae

Bellevalia trifoliata (Ten.) Kunth (new to the Karpathos island group, and confirmation for the Cretan area – *FCA*: 182, 401)

Lastos plain, 700 m, scrub, 5 April 1992, *C. & T.* obs.; 1 km SE of Lastos plain, 650 m, near margin of abandoned field, 5 April 1992, *C. & T.* 237; area immediately NE of Stes, 450–470 m, several populations in olive groves, margin of scrub and abandoned fields, 6 April 1992, *C. & T.* obs.; immediately W. of Menetes, by church, 350 m, abandoned terraces, 10 April 1992, *C. & T.* obs.

This Mediterranean bulbous species is given as doubtfully present in the Cretan area by Heywood (1980: 45), presumably on the basis of an old record from Crete cited by Rechinger (1943*a*: 728) and doubted by Greuter (1974: 161). The new records from Karpathos confirm the presence of the species in the Cretan area. Furthermore, the authors have recently received confirmation of the occurrence of the species in Crete itself (Apokoronos: S. of Vrises, by road to Hora Sfakion, beneath olive tree in stony field, 10 April 1993, *I. Palmer* colour transparency!).

Greuter (1974: 161) also casts doubt upon old records of *Bellevalia dubia* (Guss.) Rchb. cited by Rechinger (1943*a*:

728) from Kasos. This species has a distribution similar to that of *B. trifoliata* and is likewise given by Heywood (1980: 45) as doubtfully present in the Cretan area. Its occurrence there has recently been confirmed by a record from the Korikos peninsula in north-western Crete (Strasser, 1988: 6, 22), although its presence in Kasos remains doubtful. It is possible that the records from that island are in fact referable to *B. trifoliata*.

Scilla bifolia L. (new to the Cretan area – *FCA*: 185, 406)

W. of summit of Mt Kalilimni, 1100 m, head of valley beneath W.-facing cliffs, among low open scrub of *Acer sempervirens* L., 9 April 1992, *C. & T.* 308; immediately S. of col S. of summit of Mt Kalilimni, 1150 m, in protection of spiny shrub beneath NW-facing calcareous cliffs, 5 April 1992, *C. & T.* 246.

This small bulbous species is widely distributed in central and southern Europe and south-western Asia. It occurs throughout most of Greece and on several of the Aegean islands (Andersson, 1991: 695). However, before its discovery in Karpathos, it was known in the South Aegean region only on the island of Rodos, where it has been recorded at altitudes of 1000–1200 m on Mount Attaviros south-south-east of Embonas by Carlström (1987: 119, 260), as *Scilla* '*longistyla*' Speta, a mis-print of *S. longistylosa* Speta, which is included within *S. bifolia* by Mordak (1984: 216). The plants occur in large numbers at the first cited locality on Kalilimni, and it is intriguing that this conspicuous and attractive species has been overlooked there for so long. In the high mountains of Crete (Lefka Ori, Kedros, Psiloritis, Dikti and Afendis Kavousi massifs) *Scilla bifolia* is unknown, even under ecological conditions analogous to the Kalilimni locality. Instead, there occurs the endemic *Scilla nana* (Schult. & Schult. f.) Speta (= *Chionodoxa nana* (Schult. & Schult. f.) Boiss. & Heldr., including *C. cretica* Boiss. & Heldr. and *S. albescens* Speta).

Typhaceae

Typha domingensis (Pers.) Steud. (new to the Karpathos island group – *FCA*: 195, 416)

2.5 km N. of Mt Kimaras, 200 m, wet stream-bed in area of burnt *Pinus brutia* woodland, 8 April 1992, *C. & T.* obs.

Typha domingensis is a hygrophilous species distributed in the Mediterranean region, Asia, tropical Africa and tropical America. It occurs in Crete, growing in watery places mainly in the west of the island.

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