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## ***Asperula* (sect. *Cynanchicae*) *brachyphylla*, spec. nova (*Rubiaceae*) from the Island of Evvia (Greece)**

By

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With 3 Figures

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### Summary

TRIGAS P. & IATROU G. 2003. *Asperula* (sect. *Cynanchicae*) *brachyphylla*, spec. nova (*Rubiaceae*) from the island of Evvia (Greece). – *Phyton* (Horn, Austria) 43 (1): 29–37, 3 figures. – English with German summary.

*Asperula brachyphylla* TRIGAS & IATROU, from the island of Evvia (W Aegean, Greece) is described as a species new to science. It belongs to *Asperula* sect. *Cynanchicae* and is related to the Greek endemic species *A. abbreviata* and *A. pinifolia* and the Anatolian *A. nitida*. Main characteristics are the short, glaucous-pruinose and densely hispid leaves. The new species is apparently a narrow endemic, restricted to rock crevices and rocky slopes in the summit area of Mt. Ochi (Profitis Ilias) and the neighboring Gioudas peak, in the southern part of the island of Evvia.

### Zusammenfassung

TRIGAS P. & IATROU G. 2003. *Asperula* (sect. *Cynanchicae*) *brachyphylla*, spec. nova (*Rubiaceae*) von der Insel Euböa (Griechenland). – *Phyton* (Horn, Austria) 43 (1): 29–37, 3 Abbildungen. – Englisch mit deutscher Zusammenfassung.

*Asperula brachyphylla* TRIGAS & IATROU von der Insel Euböa (W Ägäis, Griechenland) wird als neue Art beschrieben. Sie gehört zu *Asperula* sect. *Cynanchicae* und ist mit den griechischen Endemiten *A. abbreviata* und *A. pinifolia* sowie mit der orientalischen *A. nitida* verwandt. Wichtige Merkmale sind die kurzen, blaugrün bereiften und borstig behaarten Blätter. Der im Süden der Insel engräumig ver-

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breitete Endemit ist bisher nur vom Gipfelbereich des Ochi-Gebirges (Profitis Ilias) sowie vom benachbarten Gioudas-Gipfel bekannt, wo die Art in Felsspalten und an felsigen Hängen wächst.

### Introduction

*Asperula* is a rather heterogeneous genus, centered in the Mediterranean area and SW Asia, with about 100 – 150 species in the present circumscription (EHRENDORFER & SCHÖNBECK-TEMESY 1982). The taxonomically difficult sect. *Cynanchicae* is well represented in Greece with a total of 21 species.

Five *Asperula* taxa were known until now from the island of Evvia, all of them belonging to sect. *Cynanchicae*. Three of them (*A. suffruticosa* BOISS. & HELDR., *A. ophiolithica* EHREND., *A. lutea* SIBTH. & SM. subsp. *euboea* EHREND.) are considered as endemic to the island. The other two, *A. rigidula* HALÁCSY and *A. aristata* L. fil. subsp. *longiflora* (WALDST. & KIT.) HAYEK, have a wider distribution; the first is a lowland taxon of E Sterea Ellas and Evvia (SCHÖNBECK-TEMESY & EHRENDORFER, 1991) and the latter has a wider distribution in S Europe (EHRENDORFER & KRENDL 1976).

During a visit to Mt. Ochi, together with Prof. Arne STRID, Dr. Kit TAN and Mr. Gert VOLD from Copenhagen University in the summer of 1997, an *Asperula* of sect. *Cynanchicae* was collected, which differed from all other *Asperula* species known from the island, and initially was reported as *A. abbreviata* (HALÁCSY) RECH. fil. (TRIGAS & IATROU 2000), which however is endemic to the islands of Naxos and Amorgos.

Further collections and detailed morphological studies showed that the taxon concerned is quite distinct from *A. abbreviata* and also differs from other similar taxa of mainland Greece, especially from *A. pinifolia* (BOISS.) HELDR. ex EHREND. & SCHÖNB.-TEMESY. The Anatolian *A. nitida* SM. s.l., which also has many similarities with *A. brachyphylla*, is clearly distinguished from it.

The morphological study and description of the new species are based on material collected from the three known populations of Mt. Ochi. To ascertain that the new species does not fall into the morphological variation of other *Asperula* species of the Greek mountains, all the relevant specimens kept at the Herbarium of the University of Patras (UPA) and the Herbarium of Goulandris Natural History Museum (ATH) were examined. In addition, the authors made collections of related taxa, to cover the gaps of the collections of herbarium specimens.

*Asperula brachyphylla* TRIGAS & IATROU, spec. nova

Holotype: [Greece, West Aegean] Nom. Evvias, Ep. Karistias, Mt. Ochi, summit area (Profitis Ilias), rock crevices and rocky ground. Alt.

1200–1300 m, Lat. 38° 03' N, Long. 24° 28' E, 19. 06. 1997, P. TRIGAS & G. IATROU 2044 (UPA!).

Additional specimens: [Greece, West Aegean] Nom. Evvias, Ep. Karistias, Mt. Ochi, summit area (Profitis Ilias), rock crevices and rocky ground. Alt. 1200–1300 m, Lat. 38° 03' N, Long. 24° 28' E, 17. 07. 1997, P. TRIGAS & G. IATROU 2123 (UPA!); [Greece, West Aegean] Nom. Evvias, Ep. Karistias, Mt. Ochi, Gioudas peak, rock crevices. Alt. 1150–1250 m, Lat. 38° 03' N, Long. 24° 28' E, 15. 06. 1998, P. TRIGAS & G. IATROU 2853 (UPA!).

Diagnosis: Planta perennis, dense pulvinata, glauco-pruinosa. Caules (2-) 3–12 (–16) cm longis, infra medium adscendentes vel prostrati, cum ramis adscendentibus vel erectis, dense hispidis vel glabris superiore. Folia linearia, suberecta, rigida, 3.5–9 mm longa et 0.4–0.8 mm lata, dense hispida, acuminata vel aristata, apice hyalino 0.3–0.6 mm longo. Bracteae glabrae vel hirsutae, late triangulatae ad lanceolatae, acuminatae vel aristatae, apice hyalino usque ad 0.7 mm longo. Corolla 3.5–5 mm longa, hebes lutea ad purpurea, hypocrateriformis ad anguste infundibuliformis, extus dense hirsuta vel subglabra. Ovarium papillosum. Mericarpia 1.3–2 mm longa, papillosa, glabra vel ± hirsuta.

Description: Densely pulvinate, glaucous-pruinose perennial with a woody rootstock. Stems (2-) 3–12 (–16) cm long, quadrangular, with projecting ridges, ascending or prostrate below, with erect or ascending branches, densely hispid (hairs up to 0.5 mm long) to glabrous at the upper part. Leaves in whorls of 4, linear, 3.5–9.0 × 0.4–0.8 mm, somewhat connate at base, rigid, ± straight, densely hispid (hairs 0.1–0.3 mm long), acuminate to aristate, with an often hairy hyaline apex 0.3–0.5 (–0.6) mm long; margins revolute; midrib prominent beneath, comprising 1/4–1/3 of leaf width. Lower leaves smaller, 1.5–5.0 mm long, linear to narrowly ovate. Inflorescence usually unbranched, rarely with few very short lateral branches, compactly spicate, with (1-) 2–3 (–4) clusters, each of 2–7 flowers. Bracts glabrous or hairy, longer than fruits, broadly triangular to lanceolate, acuminate to aristate (hyaline apex up to 0.7 mm long), with hyaline margins, connate at base; bracteoles free, glabrous or hairy, lanceolate to broadly ovate, with hyaline margins and hyaline apex up to 0.7 mm long. Flowers sessile. Corolla 3.5–5.0 mm long, purplish-pink outside and creamy white to dull yellow inside or creamy white to dull yellow throughout, hypocrateriform to narrowly infundibuliform, densely hispid to subglabrous outside, glabrous inside; tube 3–4 times as long as lobes; lobes oblong with obtuse, short appendages. Anthers 1.0–1.3 mm long, oblong-ellipsoid, blackish, included to slightly exerted from corolla tube. Style 1.8–2.2 mm long, bifid from the base; stigmas subglobose. Mericarps 1.3–2.0 mm, blackish, papillose, rarely shortly hispid. Flowering period: June to mid-July.

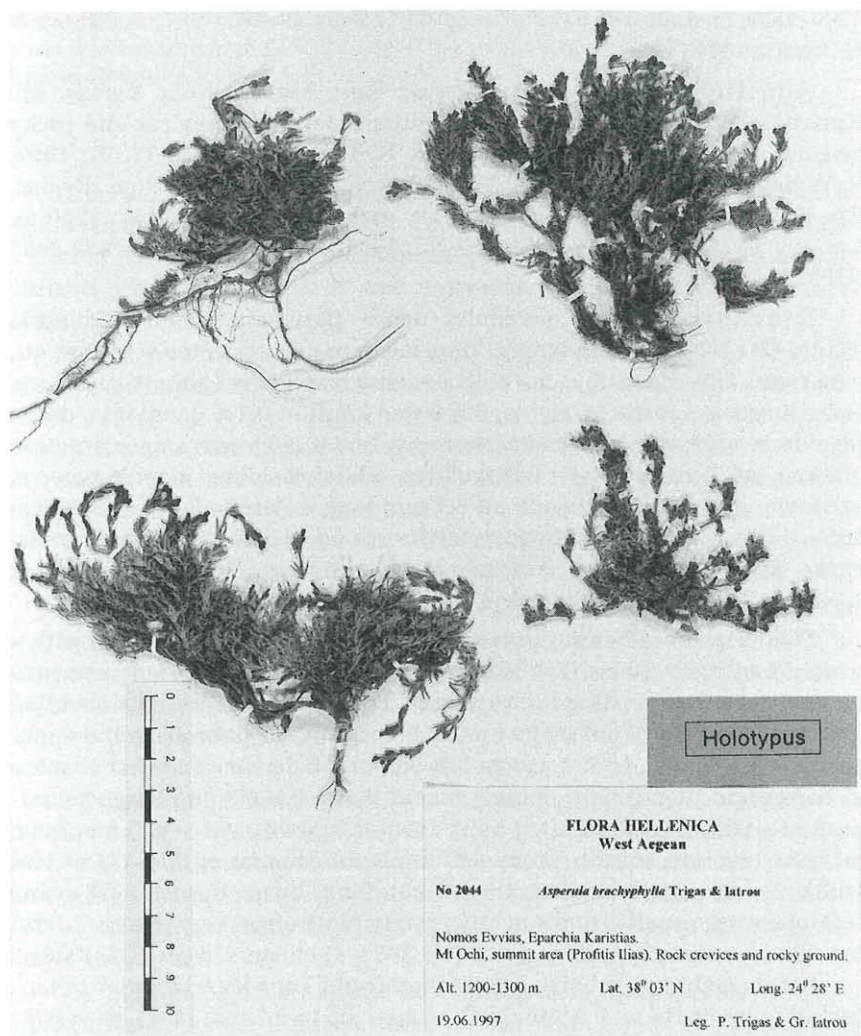


Fig. 1. *Asperula brachyphylla*: Holotypus.

### Distribution and Ecology

*A. brachyphylla* is restricted to an altitude of 1100 to 1300 m, on the summit area of Mt. Ochi (Profitis Ilias) and the neighboring Gioudas peak, in the southern part of the island of Evvia. The geological units of the area consist of muscovite epidotite chlorite quartz schist and micaeous marbles with chloritic partings. The soil acidity (pH) varies between 4 and 6.



Fig. 2. *Asperula brachyphylla*: Habit. Mt. Ochi, summit area (Profitis Ilias), 19. 06. 1997

The largest population comprising of a few hundred individuals has been discovered on the northern steep slopes of Gioudas peak. On the southern and eastern slopes of Profitis Ilias, two more populations each of 50–60 individuals were found.

The new species is a typical chasmophyte and grows in rock crevices (Fig. 2) accompanied by other botanically interesting taxa such as *Thymus longicaulis* C. PRESL subsp. *chaubardii* (REICHENB. fil.) JALAS, *Hypericum olympicum* L., *Cerastium runemarkii* MOESCHL & RECH. fil., *Anthoxanthum odoratum* L., *Festuca jeanpertia* (ST-YVES) MARKGRAF, *Hieracium sartorianum* BOISS. & HELDR., *Mycelis muralis* (L.) DUMORT, *Aubrieta deltoidea* (L.) DC., *Trifolium uniflorum* L., *Galium melanantherum* BOISS., *Dactylis glomerata* L. subsp. *hispanica* (ROTH) NYMAN, *Leontodon graecus* BOISS. & HELDR., *Solidago virgaurea* L. subsp. *virgaurea*, *Arenaria filicaulis* FENZL subsp. *graeca* (BOISS.) MC NEILL, *Anthemis cretica* L. subsp. *cretica* etc.

Plants of *A. brachyphylla* have also been found in small groups on rocky ground, on the ridge between Profitis Ilias and Gioudas peaks. These plants are smaller in size and almost prostrate, probably affected by the heavy grazing in the area. They are accompanied by mainly perennial taxa, such as *Cerastium candidissimum* CORR., *Scabiosa argentea* L., *Sideritis euboea* HELDR., *Centaurea pichleri* BOISS. subsp. *pichleri*, *Silene multi-*

*caulis* GUSS. subsp. *sporadum* (HALÁCSY) GREUTER & BURDET, *Armeria canescens* (HOST) BOISS., *Cerastium comatum* DESV., *Rosa pulverulenta* M. BIEB., etc.

### Discussion

*Asperula brachyphylla* belongs to *Asperula* sect. *Cynanchicae* (DC.) BOISS., since it has the main characters of this section: Leaves in whorls of 4, with distinct hyaline apex; corolla mainly infundibular; anthers and stigmas included; ovary and fruit ellipsoid-reniform, papillose to tuberculate (SCHÖNBECK-TEMESY & EHRENDORFER 1991). This extremely complex section is represented on the island of Evvia with 6 taxa (incl. *A. brachyphylla*) and many intermediate populations, probably of hybrid origin, especially at the lower altitudes.

*A. brachyphylla* due to the densely pulvinate habit with compact inflorescences, the cauline leaves with hyaline apex 0.3–0.6 mm, the corolla with a tube 2–4 times as long as lobes and the  $\pm$  straight non-flowering shoots, seems to have close affinities to *A. abbreviata* (HALÁCSY) RECH. fil., an endemic species on the islands of Naxos and Amorgos (Fig. 3). These two taxa are well distinguished from each other, with *A. brachyphylla* being glaucous-pruinose, usually densely hispid, and *A. abbreviata* shiny-green, glabrous or sparsely hairy. The leaves of *A. brachyphylla* are shorter (3.5–9.0 mm long), rigid,  $\pm$  straight, densely hispid and the lower leaves are 1.5–5.0 mm long, usually narrowly ovate. The leaves of *A. abbreviata* are much longer (7–15 mm long),  $\pm$  weakly patent-falcate, glabrous or shortly hairy; the lower leaves are similar (Table 1).

The origin of the new species could be retraced further eastern to Asia Minor and Anatolia, through its relationship with the Anatolian *A. nitida* Sm s.l. (see distribution map 104 in Flora of Turkey 7: 896) The low pulvinate habit, the short flowering stems with compact, unbranched inflorescences, the basal leaves shorter and wider than the middle and upper ones and the short and usually hispid corolla are common characters for the two species. *A. brachyphylla*, however, is well distinguished from *A. nitida* by its more densely pulvinate habit, the more hairy branches, the shorter,  $\pm$  straight leaves with shorter awns, the bracts without cilia and the smaller mericarps (Table 1). It seems closer to *A. nitida* subsp. *hirtella* (BOISS.) EHREND., a densely hispidulous plant, always green on drying, with lanceolate-ovate bracts, endemic to W and C Anatolia (EHRENDORFER & SCHÖNBECK-TEMESY 1982).

*A. brachyphylla* can also be considered morphologically related to *A. pinifolia* (BOISS.) HELDR. ex EHREND. & SCHÖNB.-TEMESY, an endemic species of mainland Greece restricted to the mountains of South Pindhos and adjacent Sterea Ellas (SCHÖNBECK-TEMESY & EHRENDORFER 1991) (Fig. 3); the latter species has often been confused with *A. nitida*, in lit-

Table 1: Comparison of *A. brachyphylla* and related species.

	<i>A. brachyphylla</i>	<i>A. abbreviata</i>	<i>A. pinifolia</i>	<i>A. nitida</i>
Habit	Densely pulvinate, glaucous-pruinose.	Densely pulvinate, green, ± shiny.	Densely caespitose, green to greyish-green. Leaves in densely crowded whorls giving the plant a brush-like appearance.	± laxly pulvinate.
Stems	Densely hispid (hairs up to 0.5 mm long) to glabrous in the upper part.	Glabrous or with curved hairs up to 0.3 mm long.	Glabrous or very shortly scabrid, rarely entire plant hispid.	Glabrous or ± hispid.
Leaves	3.5–9.0 × 0.4–0.8 mm, rigid, ± erect, densely hispid (hairs 0.1–0.3 mm long), with an often hairy hyaline apex 0.3–0.5 (–0.6) mm long; margins revolute; midrib comprising 1/4–1/3 of leaf width. Lower leaves smaller, 1.5–5 mm long, linear to narrowly ovate.	7–15 × 0.5–0.8 mm, ± soft, ± weakly patent-falcate, glabrous or shortly hairy, with hyaline apex up to 0.8 mm long; midrib comprising 1/4 to more than 3/4 of leaf width; margins distinctly revolute. Lower leaves similar.	(5–) 9–14 × 0.5–0.8 mm, ± shiny, soft, with hyaline apex up to 1 mm long; margins cartilaginous, antrorsely scabridulous, ± flat; midrib comprising 1/4–1/2 of leaf width. Lower leaves similar.	Basal leaves 3–4 (–10) × 0.4–1.0 mm, lanceolate-oblong to oblong, shortly awned; middle and upper 6–12 (–16) × 0.5–1.0 mm, linear, with 0.5–1.0 mm hyaline apex, glabrous or hairy, ± distinctly curved inwards.
Bracts	Glabrous or hairy, broadly triangular to lanceolate, with hyaline apex up to 0.7 mm long and hyaline margins.	Glabrous, lanceolate to narrowly triangular, with hyaline apex up to 0.8 mm long and hyaline margins.	Glabrous, narrowly triangular, aristate, with ± antrorsely scabrid margins.	Lanceolate to lanceolate-ovate, often denticulate, aristate (awns 0.5–1.5 mm), with ciliate margins.
Corolla	3.5–5.0 mm long, purplish-pink outside and creamy white to dull yellow inside, or creamy white to dull yellow throughout, densely hispid to subglabrous.	3.5–4.5 mm long, yellowish to purplish, glabrous or rarely, minutely and sparsely hairy.	6–10 mm long, pink or more rarely yellowish, glabrous, rarely hairy.	3–7 mm long, pink, glabrous to somewhat hispid outside.
Mericarps	1.3–2.0 mm long.	1.5–2.0 mm long.	2.0–2.5 mm long.	2.5–2.7 mm.
Distribution	Evvia	Naxos and Amorgos	South Pindhos and Sterea Ellas	E Aegean islands (Lesvos), W and C Anatolia



Fig. 3. Total geographical distribution of *Asperula brachyphylla*, *A. abbreviata* and *A. pinifolia*.

erature. However, *A. pinifolia* can easily be distinguished from *A. brachyphylla* as it has a more robust habit, glabrous or very shortly scabrid stems, with densely crowded whorls of relatively long (9–14 mm), shining leaves, longer corollas (6–10 mm long) and fruits (2.0–2.5 mm long) (see Table 1).

*A. brachyphylla* seems to be a link of the species chain that connect Anatolia, through the Central Aegean, to continental Greece. Most of the Greek *Asperula* sect. *Cynanchicae* species share pronounced similarities in habit and morphology to several Anatolian taxa. The weak representation of the section in Kriti, Kiklades and the North Aegean, however, has not permitted until now, any sound postulations relating to its migration routes over the Aegean. The discovery of *A. brachyphylla* could be considered as an indication that the Pliocene land-bridge of the Central



Aegean was one of the migration routes for at least a group of species of *Asperula* (sect. *Cynanchicae*).

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### Recensio

JÄGER Ekehart J. & WERNER Klaus (Eds.) 2002. *Rothmaler, Exkursionsflora von Deutschland*, Band 4, Gefäßpflanzen: Kritischer Band, 9. Auflage. – 8°, 948 Seiten, 1202 Abbildungen; geb. – Spektrum Akademischer Verlag, Heidelberg, Berlin. – € 39,95. – ISBN 3-8274-0917-9.

Rothmalers Exkursionsflora bzw. deren Kritischen Band (4. Band der Reihe) im Detail vorzustellen, ist wohl müßig, denn der Band hat seit der 1. Auflage 1963 (8. Aufl. 1990, Nachdruck 1994) einen hohen Bekanntheitsgrad erreicht. Die bei Band 2 (Gefäßpflanzen: Grundband) noch im G. Fischer-Verlag begonnene Umgestaltung des äußeren Erscheinungsbildes der Flora [vgl. *Phyton* 38 (1): 193–194, 1998] wird nun mit dem Kritischen Band fortgesetzt. Schon in früheren Auflagen wurde der Band von einer reinen Ergänzung zum Grundband zu einer selbständig zu benutzenden Flora weiterentwickelt. Dem wird nun weiter Rechnung getragen, indem in der neuen Kritischen Flora der allgemeine Teil um Kapitel über Systematik und Nomenklatur (p. 9–15), über die wichtigsten morphologischen Termini (p. 16–42) und Biologie (Wuchsform, Blüten-, Ausbreitungs- und Keimungsbiologie; p. 43–50) erweitert wurde. Für die Neuaufgabe wurden nicht nur die Neuerungen in der Kenntnis der Taxa berücksichtigt und die Schlüssel verbessert, sondern das ganze Werk überarbeitet. Die Aufzählung der Neuerungen im Vorwort (p. 5) nimmt fast eine Seite ein; davon seien nur die Neubearbeitung und Erweiterung der Verbreitungsangaben und die Neuaufnahmen von detaillierten Wuchsformangaben, Hinweisen auf Bestäubung und Ausbreitung sowie die Aufnahme der Zeigerwerte nach ELLENBERG erwähnt. Die Schlüssel kritischer Formenkreise wie *Rubus*, *Alchemilla*, *Prunus* etc. machen einen guten Eindruck, allerdings hatte der Rezensent nicht die Zeit, sie zu testen.

Insgesamt entstand ein handliches, geschlossenes, im Text sehr übersichtlich gestaltetes, auch optisch ansprechendes und nicht überladenes Werk. Es ist sehr sorgfältig durchgearbeitet (selbst Hinweise auf die durch Furanocumarine bei *Ruta*, *Dictamnus* und *Heracleum* ausgelöste „Lichtkrankheit“ sind enthalten) und kann gewiß auch in den Nachbarländern mit Gewinn benutzt werden. Der Druck ist sehr sauber und besser lesbar als in der vorhergehenden Auflage. Wenn man diese Flora nicht ständig benützt, wird man zwar an den vielen Formeln und Abkürzungen für Verbreitung etc. etwas beißen, aber diese sind zum größten Teil auf Buchdeckel-Innenseiten und Vorsatz leicht zugänglich, im übrigen in den entsprechenden Einleitungskapiteln zu finden. Besonders angenehm im Vergleich zu anderen Floren sind in den Schlüsseln die Abbildungshinweise über die Seitenzahl, sodaß jede erläuternde Figur problemlos und sehr rasch zu finden ist; weiters die Angabe der Autornamen zu den wissenschaftlichen Pflanzennamen. Der Rezensent stimmt den Kritikern von Autornamen gerne dahingehend zu, daß deren Angabe in vielen Fällen nicht nötig oder gar sinnlos sein kann; im Rothmaler kann der Benutzer der Flora jedoch selbst entscheiden, ob er die Autorbezeichnung für nötig erachtet; im Falle des Bedarfs hat er sie zur Verfügung und braucht nicht erst in einem weiteren Werk [womöglich mit anderer taxonomischer Einstufung, vergeblich] danach zu suchen.

Wo ließe sich nach den vielen Auflagen noch etwas verändern? Der Rezensent würde sich freuen, wenn die Titel auf Deckel und Titelblatt vereinheitlicht würden, das korrekte Zitieren würde dadurch leichter. P. 18: Windepflanzen: Windesprosse als Schrauben zu betrachten und im

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