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Sisyrinchium micranthum (Iridaceae), a New Alien Record from Türkiye

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ABSTRACT

Sisyrinchium is one of the largest genera in the Iridaceae family, including over 200 taxa. It is native to regions ranging from the Hawaiian Islands through temperate and subtropical areas of the Americas, extending down to the Falkland Islands. *S. angustifolium* Mill. is only recorded from Artvin, Kemalpaşa (Türkiye) from this genus. A newly allien species, *S. micranthum* Cav., has been reported as a new taxon for the Flora of Turkey from the eastern black sea region of Türkiye. *S. micranthum* is morphologically distinguished from *S. angustifolium* by urceolate-campanulate perianth, broadly acuminate tepal, 0.7–2 mm wide of node, 2–10 cm first internode, broadly acuminate petal apex and size of the capsule. Diagnostic characters, description and photographs are given in the manuscript. The distribution and habitat in Türkiye of the new record is determined. Taxonomic and conservation status of this species are evaluated.

Keywords: Allien, Iridaceae, morphology, *Sisyrinchium,* Türkiye.

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Introduction

The Iridaceae family includes 69 accepted genera [1]. *Sisyrinchium* L., a genus within the Iridaceae family, encompasses a diverse range of species, taxonomically making it the most complex genus in this family. The estimated number of species in *Sisyrinchium* is thought to range from approximately 60 to 212, depending on the taxonomist [1-3]. The genus is distributed across all biomes but occurs mainly in the South and Southeastern regions, particularly in the Atlantic Forest and Pampa (Fig 1) [4] with biome delimitation according to [5]. In Brazil, 71 species and 9 subspecies are currently recognized [4]. Only one species (*S. angustifolium*) was determined from Türkiye [6]. Most *Sisyrinchium* species are native to the America, with several becoming invasive weeds globally [7-9].

These plants are perennial herbs featuring bulbs or corms. Their leaves are typically clustered at the base of the stem, compressed laterally, mostly linear, basal sheathing and arranged equitant manner. Recent discoveries of new *Sisyrinchium* taxa have highlighted the need for comprehensive taxonomic studies to understand the genus' diversity fully. *Sisyrinchium* needs additional research to address subgeneric classifications, precisely identify taxa, and clarify synonyms for ambiguous taxa [10-13]. Based on earlier taxonomic research, the genus *Sisyrinchium* has been classified into two subgenera: *Sisyrinchium* and *Echthronema* [2,11,14].

S. micranthum Cav. is native to South America and Mexico [15,16]. It is introduced to Alabama, Albania, Arkansas, Azores, Canary Is., China Southeast, Dominican Republic, East Himalaya, Fiji, Florida, Galápagos, Georgia, Hawaii, India, Iran, Italy, Japan, Korea, Louisiana, Madagascar, Malaya, Mauritius, Mississippi, New Caledonia, New South Wales, Norfolk, North Carolina, Puerto Rico, Queensland, Réunion, Samoa, Sardegna, South Australia, South Carolina, Spain, Tasmania, Texas, Tibet, Tubuai [1,17-19] (Fig. 1).

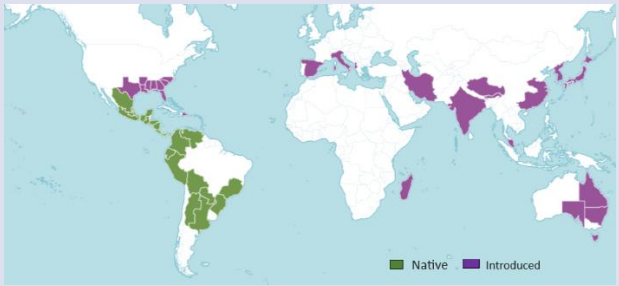


Figure 1. Worldwide distribution map of *S. micranthum* (IPNI, 2024).

This study presents a detailed examination of new record of *S. micranthum* based on voucher specimens, original characterization and contemporary literature [10, 15, 17] To facilitate comparison, images of *S. angustifolium* and an depiction of *S. micranthum* are provided.

Materials and Methods

Sisyrinchium specimens were collected from Karadeniz Center, Ortahisar (Trabzon), Fındıklı (Rize), Kemalpaşa (Artvin) Türkiye in May-October 2024 (Fig. 2). Plant material for this study was collected exclusively from three sites located around of the eastern black region, Türkiye. The collected materials were critically studied. Five specimens were measured for the morphological analyses.

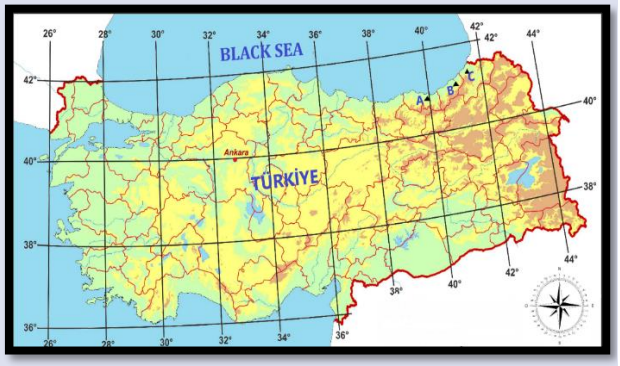


Figure 2.Collected locations of *Sisyrinchium micranthum* samples from Türkiye; A-Trabzon, B- Rize, C-Artvin

Morphological characteristics of *S. micranthum* were determined by examining of these collected specimens and by comparing them to data from previous studies [6, 14, 20] and herbarium materials at ARTH (Artvin Çoruh University Herbarium). All collected specimens have been deposited at ARTH. Population and habitat data are based on field observations.

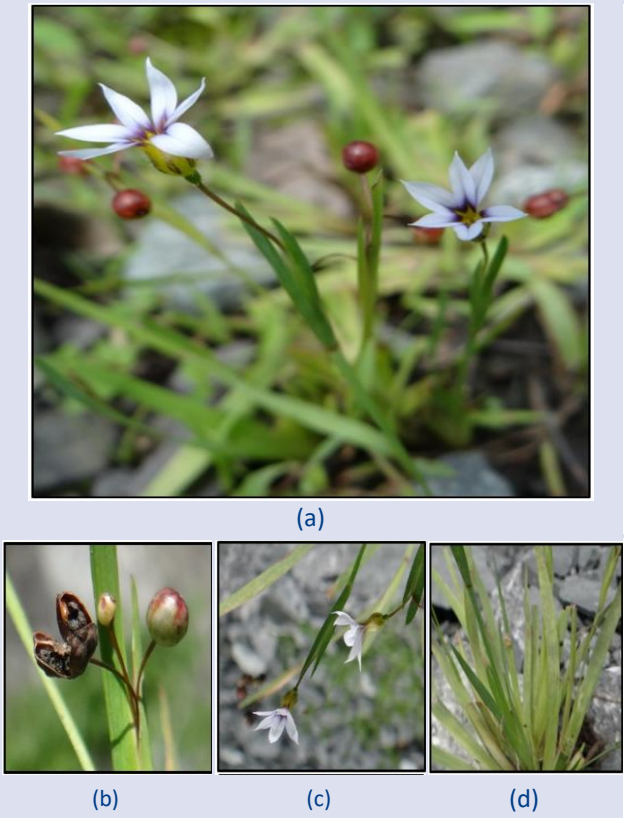
Results and Discussions

Sisyrinchium micranthum Cav., Diss. 6: 144, tab. 191, 1788. (Fig. 3, 4).

Sisyrinchium micranthemum Pers. in Syn. Pl. 1: 50 (1805); *Sisyrinchium iridifolium* Kunth in F.W.H.von Humboldt, A.J.A.Bonpland & C.S.Kunth, Nov. Gen. Sp. 1: 324 (1816); *Marica iridifolia* (Kunth) Ker Gawl. in Bot. Reg. 3: t. 229 (1817); *Marica micrantha* (Cav.) Ker Gawl. in Irid. Gen.: 22 (1827); *Sisyrinchium dichroum* Poepp. ex Klatt in C.F.P.von Martius & auct. suc. (eds.), Fl. Bras. 3(1): 537 (1871); *Sisyrinchium fimbriatum* Dombey ex Klatt in C.F.P.von Martius & auct. suc. (eds.), Fl. Bras. 3(1): 537 (1871); *Bermudiana iridifolia* (Kunth) Kuntze in Revis. Gen. Pl. 2: 699 (1891); *Bermudiana micrantha* (Cav.) Kuntze in Revis. Gen. Pl. 2: 700 (1891); *Bermudiana bermudiana* var. *micrantha* (Cav.) Kuntze in Revis. Gen. Pl. 3(3): 307 (1898); *Sisyrinchium rosulatum* E.P.Bicknell in Bull. Torrey Bot. Club 26: 228 (1899); *Sisyrinchium exile* E.P.Bicknell in Bull. Torrey Bot. Club 28: 573 (1901); *Sisyrinchium brownii* Small in Contr. NewYork Bot. Gard. 327: 330 (1931); *S.micranthum f. flavum* Ravenna in Onira 5: 57 (2001); *S.micranthum f. eburneochraceum* Ravenna in Onira 5: 57 (2001); *S.micranthum f. purpureum* Ravenna in Onira 5: 57 (2001); *S.micranthum f. luteum* Ravenna in Onira 5: 58 (2001); *Sisyrinchium micranthum subsp. scudiculare* Ravenna in Onira 5: 57 (2001).

A herbaceous annual plant typically has thin tufts, but it can also be a short-lived rosulate perennial that turns yellowish green when dry. Stems 10–15(–25) cm, compressed, usually 2–3 in a tuft, up to 10 in more vigorous individuals, rarely simple, glabrous, with 1–2 nodes. Leaf blades 15–50(–70) × 1–2.5 mm, linear-lanceolate, glabrous, straight, acuminate, sparsely scabrous on margins. Inflorescences terminal, with 2–5 pedunculated flowers, spathes 15–25(–30) mm long, conspicuously compressed, keeled, glabrous, usually entire, with thin, 0.2- 0.3 mm wide, scarious margins. Perianth urceolate-campanulate basally, spreading in the upper half, tepals 5–10 mm long, acute to aristate, the spreading part pale lavender, tinged purple at the base, urceolate part yellowish to ochroleucous with purple patterns or strips, hairy outside, filaments connate basally, occasionally to 1/2 their length, the ovary ovate, up to 1 mm long, green, patent-hairy.

Capsules 2–3 mm, globose, tan with purplish sutures, pedicels spreading to arcuate. Seeds 0.5–1 mm, ± globose to slightly compressed, black, surface rugulose to finely alveolate.



(a) (b) (c) (d)

Figure 3. *Sisyrinchium micranthum;* a-habit, b- seed capsule, c- flowers, d- leaves

Flowering: Between March and July.

Specimens examined: Türkiye: A7 Trabzon, Pelitli, Merkez, in front of the Trabzon airport, 32 m, 15 July 2024, 40°59’40”N, 39°46’45”E, 0-5 m, OEmin. 22926 (ARTH 17303); A8 Rize, Ardeşen, Fındıklı, beachside, 01 October 2024, 41°16’29”N, 41°08’41”E, 0-9 m, OEmin. 23809 (ARTH 18326); A8 Artvin, Kemalpaşa, Fındıklı, beachside, 03 October 2024, 41°30’09”N, 41°32’02”E, 10-35 m, OEmin. 23810 (ARTH 18327).

Distribution: South America, Mexico Australia, Iran, India, Japan, China.

Ecology: S. micranthum distributed on roadsides at 0-10 m in association *Oxalis corniculata* L., *Plantago major* L. *Trifolium repens* L., *Prunella vulgaris* L., *Duchesnea*

indica (Andrews) Focke, *Hydrocotyle ramiflora* Maxim., *Juncus inflexus* L., *Potentilla erecta* (L.) Räusch.

Conservation status: S. micranthum is known from eastern black sea region. The species' natural habitat is endangered by transportation, human activities, and the development of roads [21].

Sisyrinchium micranthum taxon was collected for the first time from the eastern black sea region of Türkiye and with this study, it was included as a new record in the flora of Türkiye.

Figure 4. Tepal apex forms; a-*S. micranthum*, b- *S. angustifolium*

A key to distinguish *Sisyrinchium micranthum* from *S. angustifolium,* which has been previously recorded in the flora of Türkiyey, has been established. [6,22]

Distinguish Key to the species of genus Sisyrinchium in Türkiye (Fig. 5-7)

1 Perianth stellate-rotate, widely spreading from base; tepals abruptly acuminate, cristate, 5–10 mm, pale blue; filaments connate ± entirely; capsule ca. 4-7 mm……..*S. angustifolium*

2 Perianth urceolate-campanulate basally; tepals broadly acuminate, 7.5–12.5 mm, pale lavender in the spreading part; filaments connate to 1/2 of their length; capsule ca. 2-3 mm……*S. micranthum*

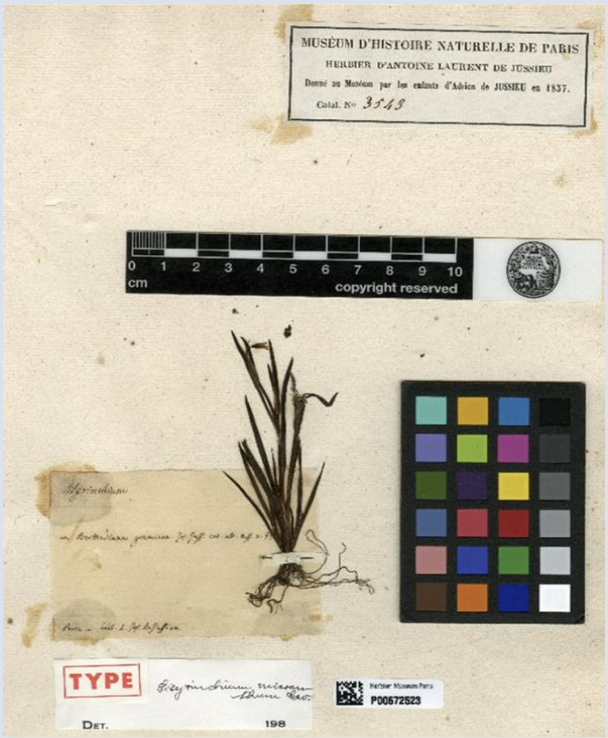


Figure 5. Type specimens of *S. micranthum* in National Museum (France).

Figure 6. Herbarium specimens of *S. micranthum* (ARTH 17303)

Sisyrinchium micranthum are new record and a newly naturalized species for the Türkiye flora and an alien species and it is thought that it probably entered our country via Georgia and grows in the Eastern Black Sea region, as it can easily expand its distribution area.

Fiure 7. Herbarium specimens of S. *angustifolium* (ARTH 16705)

Table 1. Distinctive characters of *S. angustifolium* and *S. micranthum*

	S.angustifolium	***S. micranthum***
Habit	Up to 45 cm	15 cm
Leaves	3-5 mm broad	1-3 mm broad
Stems	1-2 nodes, 2.3-5 mm wide, first internode 10-30 cm, usually longer than leaves	1-2(-3) nodes, 0.7-2 mm wide, first internode 2-10 cm, usually shorter than leaves
Flowers	1-4	2-5
Perianth	stellate-rotate	urceolate-campanulate basally
PetalApex	abruptly acuminate, cristate, acuminate to acute	acute, rarely aristate, broadly acuminate, occasionally erose
Tepal	pale blue to violet, occasionally white, bases yellow; outer tepals 7.7-12.5 mm	maroon or pink to lavender-rose with purple stripes, or yellow with rosy purple bases; outer tepals 5-11mm
Filaments	usually more or less adnate to the tube, connate ± entirely, stipitate-glandular basally	connate basally, occasionally to 1/2 their length
Capsules	4 -7 mm long, ± globose	2-4 mm, globose, tan with purplish sutures
Seeds	0.5-1.2 mm, globose to obconic, lacking obvious depression, rugulose	0.5-1 mm, ± globose to slightly compressed, black, surface rugulose to finely alveolate

Conclusions

Sisyrinchium micranthum is distributed near roadsides on the eastern blacksea region of Türkiye. Once the flowering period is over, there may be difficulties in species identification as they resemble Poaceae species. It can be damaged by human and transportation activities on the beach and roadside. Its populations need to be observed and monitored in order to continue its existence and their habitats. This species, like the species of the genus *Iris, Crocus* and *Gladiolus* in the Iridaceae family, possesses decorative and aesthetic features. For this reason, it is recommended to cultivate and exhibition it in botanical gardens. Since its natural habitats are under threat, this approach will also ensure its conservation.

Conflicts of interest

There are no conflicts of interest in this work.

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