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Research article

The genus of *Rumex* (Polygonaceae) in Istanbul and the new check-list of Polygonaceae in Türkiye

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Abstract

Rumex is an important genus of the Polygonaceae family. It is represented in Türkiye by 28 species (but two are suspicious) and seven hybrids. There are nine *Rumex* species in Istanbul. *Rumex bucephalophorus* is a rare dune plant and is known from only two places. In contrast, the *R. crispus* species, in particular, has been collected from most areas. All distributions of investigated species are recorded on the maps. In addition, all Polygonaceae members in Türkiye are listed in light of new developments.

Keywords: Check-list; Istanbul; key; Polygonaceae; *Rumex*

1. Introduction

Rumex is a genus belonging to taxonomically problematic Polygonaceae family that is with included about 160 species (Rechinger, 1984).

Identifying of *Rumex* species in the early stages of flowering is difficult, easiest when the nutlets are nearly ripe. Still, it becomes slightly more difficult again as the inflorescences dry and the ripe nutlets are shed (Holyoak, 1998). Ripe fruit is essential for a precise diagnosis. The best fruiting time interval is from March to June. Numerous stems often arise from a robust and thick rootstock, and some species have long rhizomes (perennials) or their rootstock (annuals).

The Polygonaceae family is studied in The Flora of Türkiye and The East Aegean Islands vol. 2 (Coode and Jullen, 1967). Later, there were various additions in vol.10 (Davis et al., 1988) and vol.11 (Ozhatay, 2000). There are 28 species and seven hybrids in Türkiye (Table 1).

There are no systematic publications on *Rumex* in Türkiye. Publications are especially relevant to the genera *Polygonum* and *Persicaria* (Keskin, 2009; Kilic, 2014; Kocyigit et al., 2015; Keskin and Severoglu, 2020; 2021a, 2021b, 2022; Keskin et al.,

2021; 2022). Also, a new species, *Rheum telianum* Ilcim, was described (Ilcim and Karahan, 2020), and *Reynoutria* was added as a new genus for Türkiye (Karaer et al., 2020).

Table 1

The development of the Polygonaceae family to the present day in Türkiye.

Cins Adı	The Flora of Türkiye and The East Aegean Islands			Keskin, 2012
	Volume 2	Volume 10	Volume 11	
<i>Atraphaxis</i>	4 species	-	-	4 species
<i>Pteropyrum</i>	1 species	-	-	1 species
<i>Calligonum</i>	1 species	-	-	1 species
<i>Rheum</i>	1 species	-	-	1 species
<i>Oxyria</i>	1 species	-	-	1 species
<i>Polygonum</i>	27 species	6 species	4 species	40 species
	23 species	2 species		28 species
<i>Rumex</i>	and	and	2 species	and
	5 hybrids	2 hybrids		7 hybrids
<i>Emex</i>	1	-	-	1 species
<i>Fagopyrum</i>	-	-	-	1 species
<i>Fallopia</i>	-	-	-	1 species

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2. Materials and methods

The work is based on field surveys (2019-2022) along various Istanbul districts. The samples were collected and deposited at the herbaria MUFE and NGBB (acronyms, according to Thiers 2022). Moreover, specimens from the Herbaria E, ANK, ISTE, ISTF, ISTO, MUFE, and NGBB were studied, and relevant literature on the genus concerning Türkiye and the neighbouring countries was analysed (Halacsy, 1904; Rechinger, 1964; Snogerup and Snogerup, 1997).

When preparing the maps, only the samples examined in the herbariums and the species collected were considered.

2.1. Study area

Istanbul is a big city between the European and Asian sides of the Bosphorus. A semi-arid Mediterranean climate is dominant in the area, with a local oceanic climate (Altay et al., 2020). Istanbul's property lies in Europe and Asia, between the Marmara and the Black Sea, and in two phytogeographical regions (Euro-Siberian and Mediterranean). Istanbul is a part of the Euro-Siberian region represented by the Euxine sub-region, while the Mediterranean region belongs to the East Mediterranean province (Davis, 1971; Altay et al., 2020).

Such a position manifests in miscellaneous flora and vegetation (Altay et al., 2020). Regarding the flora, Istanbul has a vibrant flora with a total of 2.218 taxa reported by Baytop (2009).

3. Results and discussion

Rumex species detected in Istanbul, according to Flora of Türkiye vol. 2 (Cullen, 1968), are *R. acetosella* L., *R. bucephalophorus* L., *R. conglomeratus* L., *R. crispus* L., *R. pulcher* L., *R. obtusifolius* L. subsp. *subalpinus* (Schur) Celak, *R. sanguineus* L., *R. tuberosus* L. at the end of this study, all these species were confirmed, and *R. cristatus* DC. species were added to the Istanbul flora.

The findings about the species and identification key are listed below.

3.1. Identification key of *Rumex* in Istanbul

1. Plants dioic; leaves with wide auricles to the sides at the base 2
 - _ Plants monoic; leaves without auricles at base 3
 2. Roots tuberous; the inner tepals have a tubercle in the middle; fruiting tepals much wider than achenes *tuberosus*
 - _ Roots simple, rhizomatous; the inner tepals without a tubercle; fruiting tepals not enlargement *acetosella*
3. Fruiting pedicels thick, at most as long as tepals *pulcher*
 - _ Fruiting pedicels thin, longer than tepals 4
 4. Dune plants; flowers 1-2; pedicels completely swollen *bucephalophorus*
 - _ Land plants; flowers more than 2; pedicels not swollen

5. Tubercles large, up to tepal segments; inner tepal at fruit time forward noticeably elongated veinless part 5
 - _ Tubercles narrower than tepals; inner tepal not elongated forward, but webbed veins usually everywhere 6
 6. Tubercle 1, almost spherical, white or reddish; pedicels longer than tepals *sanguineus*
 - _ Tubercles 3; length longer than width, usually dark-dirty white or rarely red; pedicel at most less long than from tepal *conglomeratus*
7. Tubercle 1; pedicels swollen at the tip, 2-times longer than tepals *obtusifolius* subsp. *subalpinus*
 - _ Tubercle 3; pedicels no swollen, at most little longer than tepals 9
 8. Petiole deeply channelled; fruiting tepal 4-5 mm, circular in outlines *crispus*
 - _ Petiole terete; fruiting tepal 6-8 mm, length longer than width *cristatus*

3.2. *Rumex* species in Istanbul

3.2.1. *Rumex acetosella* L., *Sp. Pl.* 1: 338 (1753). (Fig. 1&2)

It is perhaps the most well-known species with its unique structure and leaves in the *Rumex* genus. Especially the leaves have a slightly bitter and sour taste. However, its morphology is very variable. The size range is very different. Naturally, many researchers consider these differences as different taxa; therefore, it cannot be said that all taxa are valid. One must admit that this species is highly polymorphic. Scientifically, it would inevitably be more correct to accept this species broadly: *Rumex acetocella* s.l. It probably grows in all districts of Istanbul.

3.2.2. *Rumex bucephalophorus* L., *Sp. Pl.* 1: 336 (1753). (Fig. 1&2)

It is a type of *Rumex* with a unique appearance. It is typical with clublike pedicels, which are especially thin on the underside but prominently swollen towards the top. Although all of the Istanbul populations are observed in the dunes, they exist outside the dune area, albeit very little. Therefore, it is possible to say that the population is well developed in the environment where it grows, but the dunes are often open to destruction. For this reason, there is often a decrease in their population. It is usually branched from the base, and the branches bend to the sides and show an upward curling structure. Some specimens are single-bodied and grow in a form that can be considered upright. The body is primarily red. The morphology of this species is variable. Many taxa related to the main species have been identified, but it is impossible to say that there are definite boundaries between them. For this reason, it would be more accurate to examine this species broadly: *Rumex bucephalophorus* s.l.

3.2.3. *Rumex conglomeratus* Murray, *Prod. Gotting.* 52 (1770). (Fig. 1&2).

It is a cosmopolitan species in Türkiye. It stands out as a species with a high ability to adapt to both ruderal environments and natural areas. It is a medium-sized species, less than one meter in length. The base leaves dry quickly while the fruit is in the ripening stage. Flower boards are usually in crowded clumps. The ends of the fruiting tepals are elongated tongue-in-

cheek forward with typically veinless. Each tepal has a prominent tubercle. It is related to the *R. sanguineus* species. It is easily distinguished from it by the fact that the fruity tepals are 3-tuberculate (not 1-piece). Therefore, diagnoses based on non-fruited samples are always a candidate to be wrong. It probably grows in all districts of Istanbul.

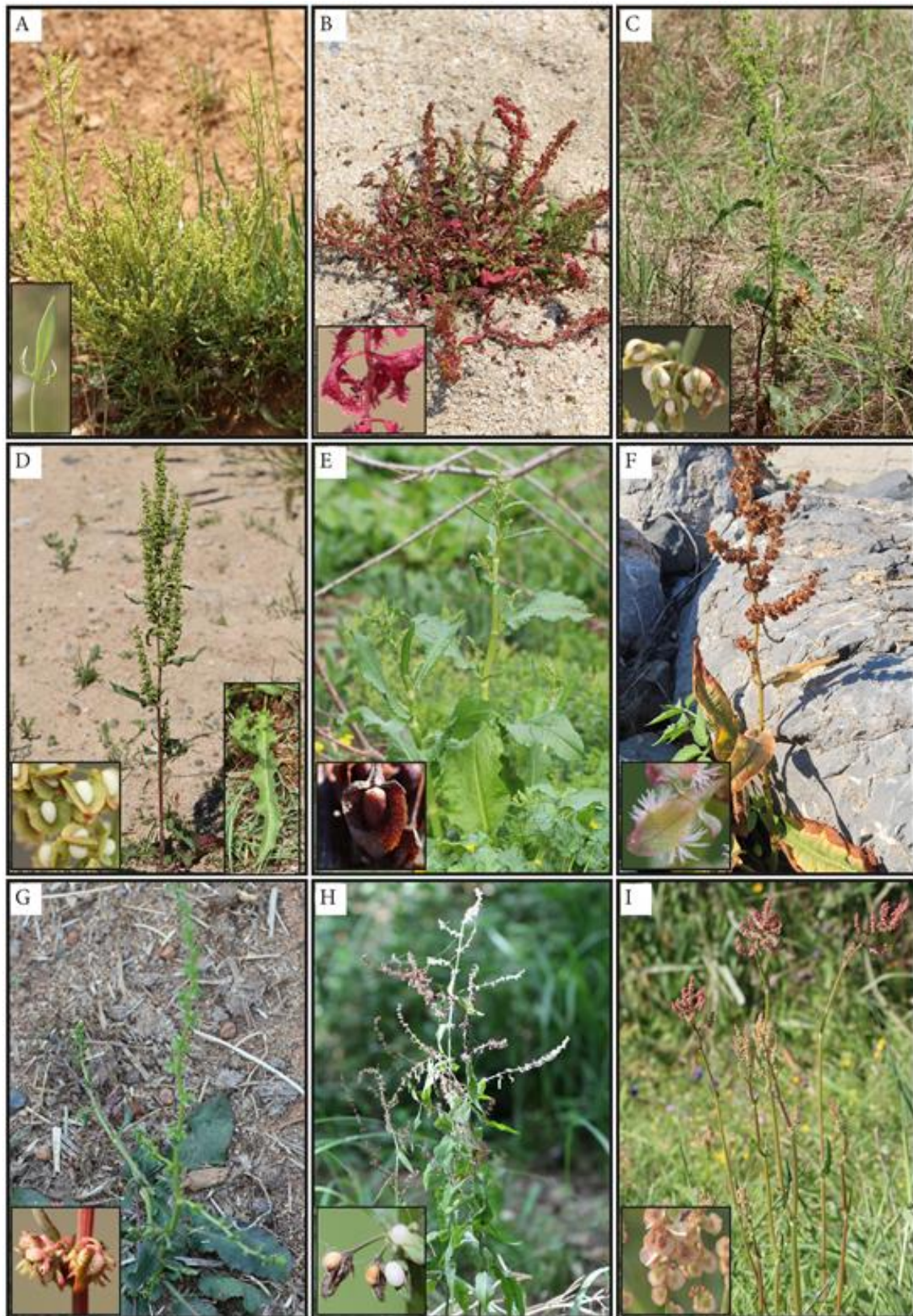


Fig. 1. *Rumex* species of Istanbul: **A.** *R. acetosella*, **B.** *R. bucephalophorus*, **C.** *R. conglomeratus*, **D.** *R. crispus*, **E.** *R. cristatus*, **F.** *R. obtusifolius* subsp. *subalpinus*, **G.** *R. pulcher*, **H.** *R. sanguineus*, **I.** *R. tuberosus*

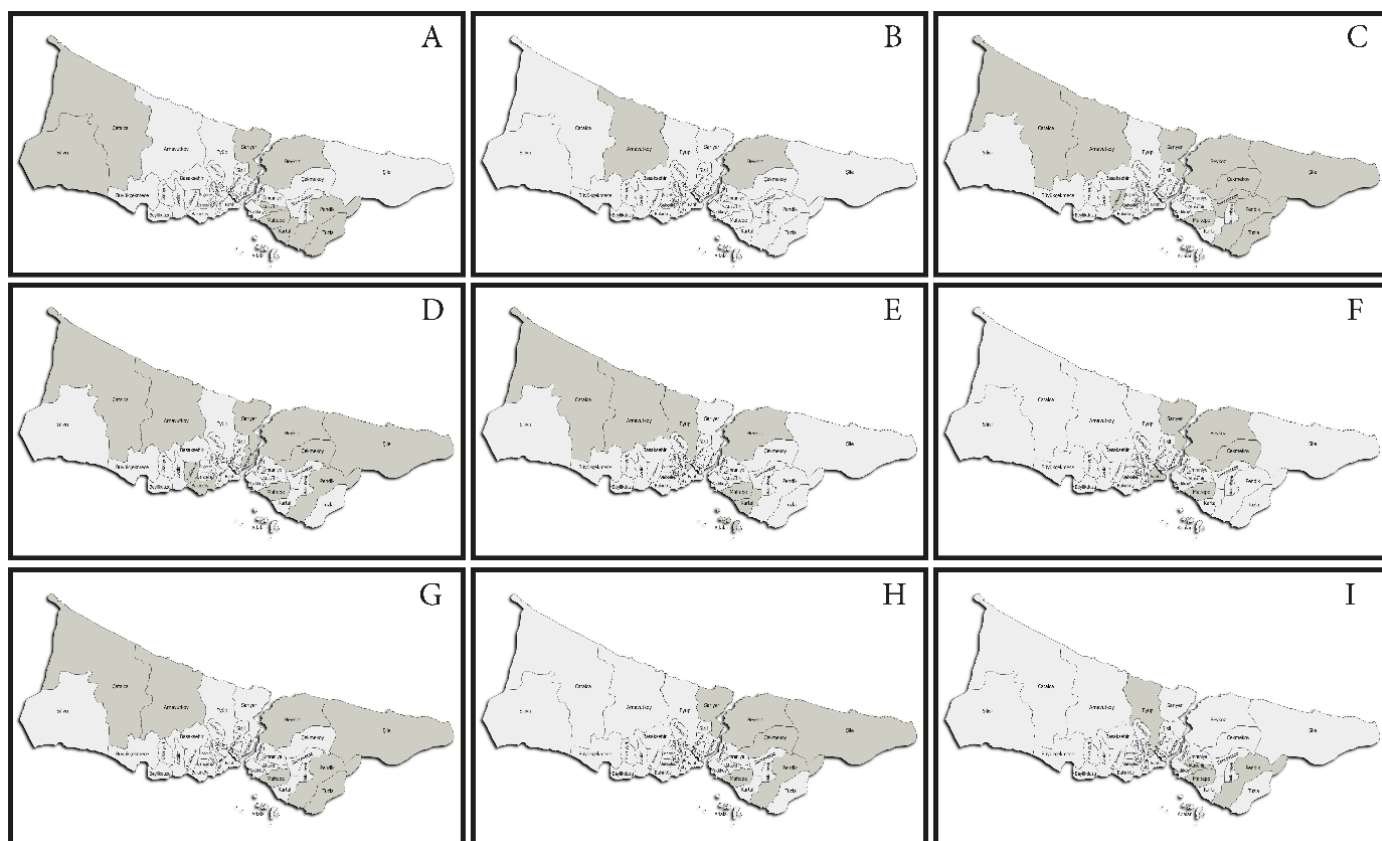


Fig. 2. Distributions maps of *Rumex* species in Istanbul: **A.** *R. acetosella*, **B.** *R. bucephalophorus*, **C.** *R. conglomeratus*, **D.** *R. crispus*, **E.** *R. cristatus*, **F.** *R. obtusifolius* subsp. *subalpinus*, **G.** *R. pulcher*, **H.** *R. sanguineus*, **I.** *R. tuberosus*.

3.2.4. *Rumex crispus* L., *Sp. Pl.* 1: 335 (1753). (Fig. 1&2).

It is one of Istanbul's most common *Rumex* species with long base leaves and wide channeled stems. It can be found in many different habitats. We can explain the fact that it has such variable characteristics with its broad ecological willingness. In addition, the leaves of this species are often collected for cooking purposes. Therefore, it probably grows in all districts of Istanbul.

3.2.5. *Rumex cristatus* DC., *Cat. Pl. Horti Monsp.* 139 (1813). (Fig. 1&2).

It is a new record for Istanbul. Although it is a new record, this species has been found in Istanbul's Anatolian and Thrace parts. In addition, various herbarium specimens were examined. A number of publications in the literature emphasize that it has a wide morphological variation. Therefore, more detailed studies should be done on this species in our country. In this way, the boundaries between interpretations can be well defined, and in this case, new taxa can be specified if necessary. It forms a small group of individuals in the living environment. It generally prefers a rich soil structure.

3.2.6. *Rumex obtusifolius* L. subsp. *subalpinus* (Schur) Rech. f. in *Beih. Bot. Centralbl.* 49(2): 61 (1932). (Fig. 1&2).

It is a polymorphic species. In Türkiye, only subsp. *subalpinus* taxon is recorded. Its long and drooping pedicels are distinctive. In addition, the triangular outline of the fruit and only one tubercle on it is a unique feature. This species is collected for cooking. In addition, this type is a forgotten value

because the yellow color obtained from its roots was often used in old Turkish carpets and kilims (Eyupoglu et al., 1983; Ugur, 1988).

3.2.7. *Rumex pulcher* L., *Sp. Pl.* 1: 336 (1753). (Fig. 1&2).

It is a cosmopolitan species with a unique stance. Pedicels thickened and curved downwards at the fruiting time are very typical. Similarly, the basal leaves' violin-like (pandurate) structure is an excellent distinguishing character. Fruit structure has very variable characteristics. For this reason, many related taxa have been defined. Therefore, this situation reveals a highly controversial problem from a systematic point of view. Similar differences can be seen when examining the population.

For this reason, we think a classification based only on the size of fruit teeth is wrong. Therefore, it would be more accurate to examine this species in a broader sense: *Rumex pulcher* s.l. It probably grows in all districts of Istanbul.

3.2.8. *Rumex sanguineus* L., *Sp. Pl.* 1: 334 (1753). (Fig. 1&2).

Table 2

A comparison of *Rumex sanguineus* and *Rumex conglomeratus* species.

	<i>Rumex sanguineus</i>	<i>Rumex conglomeratus</i>
Stem	40-100 cm	30-80 cm
Ochrea	5-10 cm	1-3 cm
Petioles	4-5 cm	3-6 cm
Tubercles	1-piece, shorter than tepals	3-piece, as long as tepals
Pedicels	Longer than fruiting tepal	As long as fruiting tepals
Achenes	1-1.5 mm	1.5-2 mm

It is related to the *R. conglomeratus* species and is one of

the most complex species to collect (Table 2). It is distinguished by having a single tubercle in the fruit, red veins on the base leaves, long ocrea, and height. The literature has reported that this species is difficult to find and is most likely an invasive species (Chase, 1926). Considering that it is known from only four provinces in Türkiye, it can easily be said that all records here are invasive.

3.2.9. *Rumex tuberosus* L., *Sp. Pl., ed. 2. 1: 481 (1762). (Fig. 1&2).*

It is a typical species with prominent tubers in its underground structure and lanceolate leaves. However, it also has many different forms and shapes. Therefore, other subspecies have been defined. A few of these subspecies can be found in Istanbul (Cullen, 1967). However, the characters used to distinguish them are not very precise.

For this reason, it was concluded that these subspecies are only the morphological differences shown by the species, and it is supposed that it is correct to examine them in a broad sense: *R. tuberosus* s.l. Similarly, this species has been studied by Uotila (2017) in a way we accept. This species primarily inhabits open meadows and forest margins. It is susceptible to environmental factors. In other searches made at the same gathering time in areas where collections were made before, either they could not be found, or the number of individuals was deficient.

4. A new checklist of Polygonaceae in Türkiye

I. *Atraphaxis*

1. *A. angustifolia* Jaub. & Spach, Illustr. Pl. Or. 2: 15 (1844-6).
2. *A. billardieri* Jaub. & Spach, Illustr. Pl. Or. 2: 15 (1844-6) var. *billardieri*
3. *A. billardieri* Jaub. & Spach var. *tournefortii* (Jaub. & Spach) Cullen, Notes Roy. Bot. Gard. Edinburgh 27: 215 (1967).
4. *A. grandiflora* Willd., Sp. Pl. 2: 440 (1799). end.
5. *A. spinosa* L., Sp. Pl. 333 (1753).

II. *Bistorta*

6. *B. officinalis* L., Sp. Pl. 360 (1753).
7. *B. carnea* (K.Koch) Kom., Fl. URSS 5: 682 (1936).

III. *Calligonum*

8. *C. polygonoides* L., Sp. Pl. 530 (1753).

IV. *Emex*

9. *E. spinosa* (L.) Campd., Monogr. des Rumex 58 (1819).

V. *Fagopyrum*

10. *Fa. esculentum* Moench, Methodus 290 (1794).

VI. *Fallopia*

11. *F. aubertii* (L.Henry) Holub, Folia Geobot. Phytotax. 6 (2): 176 (1971).
12. *F. convolvulus* (L.) Á.Löve, Taxon 19: 200 (1970).
13. *F. dumetorum* (L.) Holub, Folia Geobot. Phytotax. 6: 176 (1971).

VII. *Koenigia*

14. *K. alpina* (All.) T.M.Schust. & Reveal, Taxon 64 (6): 1200 (2015).

VIII. *Oxyria*

15. *O. digyna* (L.) Hill, Hort. Kew. 158 (1768).

IX. *Persicaria*

16. *Pe. amphibia* (L.) Delarbre, Fl. Auvergne ed. 2: 519

(1800).

17. *Pe. decipiens* (R.Br.) K.L.Wilson, Telopea 3(2): 178 (1988).
18. *Pe. hydropiper* (L.) Delarbre, Fl. Auvergne (Delarbre) ed. 2: 518 (1800).
19. *Pe. hydropiperoides* Small, Fl. S.E. U.S. 378, 1330 (1903).
20. *Pe. lapathifolia* (L.) Delarbre Fl. Auvergne ed. 2: 519 (1800) subsp. *lapathifolia*
21. *Pe. lapathifolia* (L.) Delarbre subsp. *brittingeri* (Opiz) Soják Preslia 46: 153 (1974).
22. *Pe. lapathifolia* (L.) Delarbre subsp. *nodosa* (Pers.) Á.Löve, Rit Landbú. Atvinnud. Háskólans, B 3: 109 (1948).
23. *Pe. leblebicii* (Yıld.) Raus, Willdenowia 44(2): 293 (2014). end.
24. *Pe. maculosa* Gray, Nat. Arr. Brit. Pl. ii. 269 (1821).
25. *Pe. minor* (Hudson) Opiz, Seznam Rostlin Kvetney Cesk, 72 (1852).
26. *Pe. nepalensis* (Meisn.) H. Gross, Bot. Jahrb. Syst. 49: 277 (1913).
27. *Pe. orientalis* (L.) Spach, Hist. Nat. Vég. (Spach) 10: 537 (1841).
28. *Pe. perfoliata* (L.) H.Gross, Bot. Jahrb. Syst. 49(2): 275 (1913).
29. *Pe. thunbergii* (Siebold & Zucc.) H.Gross, Bot. Jahrb. Syst. 49(2): 275 (1913).

X. *Polygonum*

30. *Po. afyonicum* Leblebici & Gemici, N. Roy. Bot. Gard. Edin. 42(2): 321(1985). end.
31. *Po. arenarium* Waldst. & Kit., Descr. Icon. Pl. Hung. 1: 69 (1801).
32. *Po. arenastrum* Boreau, Fl. Centre France, ed. 3, 2: 559 (1857).
33. *Po. argyrocoleon* Steud. & Kunze, Linnea 20: 17 (1847).
34. *Po. aviculare* L., Sp. Pl. 362 (1753).
35. *Po. bellardii* All., Fl. Pedem. ii. 205. t. 90. f. 2 (1785).
36. *Po. buxiforme* Small, Bull. Torrey Bot. Club 33: 56 (1906).
37. *Po. cappadocicum* Boiss. & Balansa, Diagn. Pl. Orient. ser. 2, 4: 78 (1859). end.
38. *Po. cognatum* Meisn. Monogr. Polyg. 91 (1826).
39. *Po. ekimianum* Leblebici, H.Duman & Aytaç, Willdenowia: 23 (1-2): 163 (1993). end.
40. *Po. equisetiforme* Sibth. & Sm., Fl. Graec. Prodr. 1: 266 (1809).
41. *Po. istanbulicum* M.Keskin, Nordic J. Bot. 27 (1): 11 (2009). end.
42. *Po. karacae* Ziel. & Borat., Willdenowia 21 (1-2): 173 (1991). end.
43. *Po. longipes* Halácsy & Charrel, Oesterr. Bot. Z. 40: 164 (1890).
44. *Po. maritimum* L., Sp. Pl. 1: 361 (1753).
45. *Po. melihae* Gemici & Kit Tan, Nordic J. of Botany 32(5): 540 (2013). end.
46. *Po. mersinicum* M. Keskin, Ann. Bot. Fenn. 59(1): 318 (2022). end.
47. *Po. mesembrium* Chrtek, Preslia 32: 367 (1960).
48. *Po. urnigera* M.Keskin, Phytotaxa 538 (2): 114 (2022). end.
49. *Po. neglectum* Besser, Enum. Pl. 45 (1821).
50. *Po. paronychioides* C.A.Mey., Bull. Soc. Imp.

- Naturalistes Moscou: 356 (1838).
51. *Po. patulum* Bieb., Fl. Taur.-Cauc. 1: 304 (1808).
 52. *Po. pulchellum* Loisel. Mém. Soc. Linn. Paris 6: 411 (1827).
 53. *Po. polycnemoides* Jaub. & Spach, Ill. Pl. Orient. 2: 30 (1844).
 54. *Po. praelongum* Coode & Cullen, Notes Roy. Bot. Gard. Edinburgh 27: 215 (1967).
 55. *Po. romanum* Jacq., Bserv. Bot. 3: 8, t. 58 (1768).
 56. *Po. rottboellioides* Jaub. & Spach, Ill. Pl. Orient. 2: 32 (1845).
 57. *Po. rurivagum* Jord. ex Boreau, Fl. Centre France, ed. 3, 2: 560 (1857).
 58. *Po. salebrosum* Coode & Cullen, Notes Roy. Bot. Gard. Edinburgh 27: 215 (1967). end.
 59. *Po. salsugineum* M.Bieb., Tabl. Provo Casp. 114 (1798).
 60. *Po. samsunicum* Yıld. & Leblebici, Willdenowia 19(1): 87 (1989). end.
 61. *Po. setosum* Jacq., Obs. 3: 8, t. 57 (1768).
 62. *Po. luzuloides* Jaub. & Spach, Ill. Pl. Orient. 2: 37 (1845).
 63. *Po. sivasicum* Kit Tan & Yıldız, Notes Roy. Bot. Gard. Edinb. 45: 439 (1988). end.
- XI. *Pteropyrum***
64. *Pt. olivierii* Jaub. & Spach, Ill. Pl. Orient. 2: 9 (1846).
- XII. *Reynoutria***
65. *Re. japonica* Houtt., Nat. Hist. (Houttuyn) 2(8): 639, t. 640 (1777).
- XIII. *Rheum***
66. *Rh. ribes* L., Sp. Pl. 1: 372 (1753).
 67. *Rh. telianum* İlçim, Phytotaxa 477(1): 82 (2020). end.
- XIV. *Rumex***
68. *Ru. acetosa* L., Sp. Pl. 1: 337 (1753).
 69. *Ru. acetosella* L., Sp. Pl. 338 (1753).
 70. *Ru. alpestris* Jacq., Enum. Stirp. Vindob. 62 (1762).
 71. *Ru. alpinus* L., Sp. Pl. 1: 334 (1753).
 72. *Ru. amarus* Rech.f., Candollea 12: 108 (1949). end.
 73. *Ru. angustifolius* Campd., Monogr. Rumex 63: 73 (1819). subsp. *angustifolius*
 74. *Ru. angustifolius* Campd. Monogr. Rumex 63: 73 (1819). subsp. *macranthus* (Boiss.) Rech.f., Feddes Rep. 353 (1934).
 75. *Ru. bithynicus* Rech.f., Pl. Syst. Evol. 148: 317 (1985). end.
 76. *Ru. bucephalophorus* L., Sp. Pl. 336 (1753).
 77. *Ru. caucasicus* Rech.f., Repert. Spec. Nov. Regni Veg. 31: 258 (1933).
 78. *Ru. chalepensis* Mill., Gard. Dict. ed. 8, n. 11 (1768).
 79. *Ru. conglomeratus* Murray, Prod. Desig. Stir. Gotting. 52 (1770).
 80. *Ru. crispus* L., Sp. Pl. 335 (1753).
 81. *Ru. cristatus* DC., Cat. Pl. Horti. Monsp. 139 (1813).
 82. *Ru. cyprius* Murb., Acta Univ. Lund. n.s., ii. No. 14, 20 (1907).
 83. *Ru. dentatus* L., Mant. Pl. 2: 226 (1771). subsp. *halacsyi* (Rech.) Rech.f., Beih. Bot. Centr. 49(2): 16 (1932).
 84. *Ru. gracilescens* Rech.f., Phytion (Horn) 8: 143 (1959). end.
 85. *Ru. hydrolapathum* Huds., Fl. Angl., ed. 2, 1: 154 (1778).
 86. *Ru. maritimus* L., Sp. Pl. 335 (1753).
 87. *Ru. nepalensis* Spreng., Syst. Veg. ed. 16, 2: 159 (1825).
 88. *Ru. obtusifolius* L., Sp. Pl. 335 (1753). subsp. *subalpinus* (Schur) Celak., Prodr. Fl. Böhm. 159 (1873).
 89. *Ru. olympicus* Boiss., Diagn. Pl. Orient. 1, 5: 45 (1844). end.
 90. *Ru. palustris* Sm., Fl. Brit. 1: 394 (1800).
 91. *Ru. patientia* L., Sp. Pl. 333 (1753).
 92. *Ru. ponticus* E.H.L.Krause, Beih. Bot. Centralbl. 24, 2: 15 (1908). end.
 93. *Ru. pulcher* L., Sp. Pl. 336 (1753).
 94. *Ru. sanguineus* L., Sp. Pl. 334 (1753).
 95. *Ru. scutatus* L., Sp. Pl. 337 (1753).
 96. *Ru. thyrsiflorus* Fingerh., Linnaea 4: 380 (1829).
 97. *Ru. tmoleus* Boiss., Diagn. Pl. Orient. 1, 12: 101 (1853). end.
 98. *Ru. tuberosus* L., Sp. Pl. ed. 2, 481 (1762).
 99. *Ru. x autranianus* Freyn & Sint. ex Dinsm., Post. Fl. Syria, Palest. & Sinai, ed. 2: 465 (1933). (*R. nepalensis* x *R. obtusifolius*).
 100. *Ru. x gemlikensis* Rech. f., Pl. Syst. Evol. 148(3-4): 319 (1985). (*R. bithynicus* x *R. pulcher*). end.
 101. *Ru. x muellneri* Rech.f., Verh. Zool.-Bot. Ges. Wien 49: 243 (1889). (*R. nepalensis* x *R. patientia*).
 102. *Ru. x prusianus* Rech.f., Pl. Syst. Evol. 148 (3-4): 319 (1985). (*R. bithynicus* x *R. cristatus*). end.
 103. *Ru. x pseudopatentia* Rech.f., Phytion (Horn) 8: 151 (1959). (*R. gracilescens* x *R. patientia*).
 104. *Ru. x subtrianianus* Freyn & Sint., Bull. Herb. Boiss. 4: 178 (1896). (*R. nepalensis* x *R. obtusifolius*).
 105. *Ru. x subtrilobus* Boiss., Diagn. Pl. Orient. ser. 1, 5: 46 (1844). (*R. cristatus* x *R. nepalensis*).
 106. *Ru. x uludaghensis* Rech.f., Phytion (Horn) 8: 151 (1959). (*R. nepalensis* x *R. olympicus*). end.

There are 106 taxa of Polygonaceae in the flora of Türkiye. Of these, 19 taxa (*Atraphaxis* 1, *Persicaria* 1, *Polygonum* 11 and *Rumex* 6) are endemic. *Persicaria leblebicii* (Yıld.) Raus species is a highly suspicious endemic (Keskin and Severoglu, 2020).

Polygonum is the most difficult to diagnose genus. Its characters are close to each other, so it should be examined carefully. Identified from the province of Istanbul, *Po. urnigera* M.Keskin is our newest species and is the best example (Keskin and Severoglu, 2022). Of the species listed above, 3 (*Polygonum romanum* Jacq., *R. alpestris* Jacq., *R. thyrsiflorus* Fingerh.) is doubtful of being found in Türkiye. Although these species have been reported by Karamanoglu (1974), they have not yet been collected. Therefore, they are possibly wrong-identified.

Rumex is very suitable for hybridization. Three of these hybrids are endemic. It is predicted that the number of hybrids will increase as a result of detailed field studies.

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