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The genus *Persicaria* (Polygonaceae) in Turkey with a new taxon record

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Abstract

Polygonaceae family mainly introduces itself with its stipules called ochrea. In Flora of Turkey, this family is indicated by eight genera that include *Atraphaxis*, *Pteropyrum*, *Calligonum*, *Rheum*, *Oxyria*, *Polygonum*, *Rumex*, *Emex*.

This article emphasizes that the genus *Polygonum* and *Persicaria* are utterly different from each other. Full names and distributions of the species of *Persicaria* in Turkey are given in detail. A new *Persicaria* taxon is also reported from Turkey. A diagnostic key for *Persicaria* has been created for the first time. The taxonomic status of the *Persicaria leblebicii* which was recently given as a new species, has been discussed.

Keywords

A new record, *Polygonum*, *Persicaria*, Polygonaceae, Turkey.

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INTRODUCTION

The Polygonaceae family is a large family including 43 genera and up to 1,100 species worldwide (Brandbyge, 1993). This family mainly introduces itself with its stipules called ochrea.

In Flora of Turkey, the family is represented by eight genera including *Atraphaxis* L., *Pteropyrum* Jaub. & Spach, *Calligonum* L., *Rheum* L., *Oxyria* Hill., *Polygonum* L., *Rumex* L., *Emex* Neck. ex Campd. (Davis, 1967). The checklist published by Keskin (2012) has exactly accepted the classification in Flora of Turkey, but reported numerous species. *Reynoutria* Houtt. has been published as a new genus for in Turkey (Karaer *et al.*, 2020). In the article, the authors gave a new diagnostic key for the genus in Flora of Turkey. Leblebici (1990) has extensively studied the genus *Polygonum* and published a detailed list of species classified under the genus. Keskin (2009) introduced the new species of *Polygonum istanbulicum* M. Keskin and again published a list of the current species of *Polygonum*. Brandbyge (1993) examined the Polygonaceae family in two subfamilies and seven Tribus. This classification is summarized in table 1.

Table 1: Classification of Polygonaceae by Brandbyge (1993).

Scitienfitical Names	Descriptions
I. Subfam. Erigonuideae Meisner	Shrubs, perennial or annual herbs; leaves without well-defined stipules. Branching often sympodial, inflorescences cymose and specialized with an involucre composed of several to one single bract.
1. Tribe Eriogoneae Benth.	Involucres tubular or reduced to a series of 3 to many involucral bracts (15 genera).
2. Tribe Pteroslegieae Torr. & Gray	Involucre reduced to a single highly modified bisaccate, inflated, and reticulated bract, which encloses the mature achene (2 genera).
II. Subfam. Polygonoideae Jaretzky emend. Haraldson	Trees, shrubs, woody lianas, perennial or annual herbs; leaves with stipular sheats (ocreae), monopodial branching, inflorescences racemose with cymose partial inflorescences.
1. Tribe Triplareae Meisner	Trees or shrubs, often dioecious; perianth segments in two whorls of three; outer tepals often enlarged in fruit (5 genera).
2. Tribe Cocrolobeae Dumortier emend. Haraldson	Trees, shrubs, lianas, climbing or twining vines; perianth pentamerous often accrescent in fruit (5 genera).
3. Tribe Rumiceae Dumortier	Herbs, perennial or annual; perianth segments in two whorls of three (or two whorls of two) (4 genera).
4. Tribe Polygoneae emend. Haraldson	Shrubs, perennial or annual herbs; perianth pentamerous; outer tepals often winged, keeled or angular, smaller or larger than inner (8 genera).
5. Tribe Persicarieae Dumortier	Herbs, perennial or annual; perianth pentamerous: outer tepals rarely winged, keeled or angular, often smaller than inner or absent (3 genera).

As shown in Table 1, *Polygonum* and *Persicaria* are two different genera examined under different Tribus. Because there are fundamental differences in between the two genera, the classification suggested by Brandbyge is accepted.

MATERIALS AND METHODS

Examined materials were collected from the Anatolian part of Istanbul in the field trips by Mustafa Keskin during the Phd thesis (Systematical, Morphological, Chronological, Palynological, and Sociological Features of Polygonaceae Members of İstanbul Province). The collected specimen resembels *Persicaria lapathifolia* at the first glance but has been detected to be different from *Persicaria lapathifolia* mainly due to leaf features. According to the Flora of Turkey, identification was not possible. Investigation was carried out in numerous herbaria (E, EGE, ISTE, ISTF, ISTO, MUFE, ANK, GAZI, HUB, NGBB, VANF) and related articles Davis, 1967; Keskin 2009 and 2012; Leblebici, 1990; Webb and Chater, 1964; Snogerup and Snogerup, 1997; Rechinger and Schiman-Czeika, 1968; Komarov, 1936; Tan and Baytop, 1995) were carried out.

All collected specimens are housed in the Marmara University Faculty of Arts and Sciences Herbarium (MUFE).

RESULTS AND DISCUSSION

A New Record for Turkey; *Persicaria lapathifolia* (L.) Delarbre Fl. Auvergne ed. 2: 519 (1800). subsp. *brittingeri* (Opiz) Soják Preslia 46: 153 (1974). Figure 1, Map 4

Syn.: *Polygonum brittingeri* Opiz, Naturalientausch viii. 74. (1824).

Type: Dnus Britinger, legit prope Liuz in Australia, 1823.

Annual, 40-100 cm, branched from the base; reddish; low striate; loosely hairy. Ochrea 10-nerved, 15-22 mm, especially at the upper part of stem ciliate and hairy. Petiols 5-12 mm, hairy. Leaves broadly ovate-lanceolate, 25-50 x 10-22 mm; lanate at the bottom at least when young, green at upper but sparsely hairy; hirsute-ciliate at edge; blackish mauve spots present. Peduncles 5-25 mm, yellow glands present and hirsute. Inflorescences congested spike, 10-35 mm. Pedicels short and included in ochrea. Perianth pinkish 2-2,5 mm, covered with yellowish glands, veins present. Fruiting perianth enlarged, stillus exceeding tepals. Style 2. Stamens 5-6. Achenes shiny, sunken, 2 mm.

The locality of the examined taxon: İstanbul: Bostancı coast, near scaffolding, rocky openings, 1 m, 17.xi.2019, M.Keskin 7889!.

İstanbul: Tuzla, Akfırat, Against the Formula-1 race ground, meadows and old humid areas, 25.vi.2020, M.Keskin 8019!.

This taxon is distinguished by its type and form of pubescence making it different from the main taxon. Probably, its distribution is more than that is known.

Figure 1: *Persicaria lapathifolia*: subsp. *lapathifolia* (left), from İstanbul, M.Keskin 8004, and subsp. *britingeri* (right), from İstanbul, M.Keskin 7889.

The Examined Specimen for *Persicaria lapathifolia* subsp. *lapathifolia* from İstanbul

İstanbul: Büyükçekmece, Güzelceköy, in field, 11.ix.1970, A.Baytop, G.Ertem, N.Özocak, F.Öktem (ISTE 18479!).

İstanbul: Çatalca, Between Dursunköy and Boyalık, roadside, 90 m, 15.viii.2002, İ.Genç 1469 (ISTE 82277!).

İstanbul: Çatalca, Karaman stream, 28.vii.1967, A.Baytop, G.Atila (ISTE 11599!).

İstanbul: Çekmeköy, entrance to the village of Hüseyinli, 7 m, N 41º 07' 07,5" ve 29º 17, 58,8", 11.vii.2020, M.Keskin 8032!

İstanbul: Küçükçekmece, Levazım-Maliye school, Special Education Center and Rest camp, 18.viii.1986, K.Ergezen (ISTE 57213!).

İstanbul: Maltepe, Başıbüyük district, the forest of Süreyyapaşa Hospital, wet area, 1.xii.2019, M.Keskin 7897!.

İstanbul: Maltepe, Büyükbakkalköy, 26. viii.1950, T.Baytop (ISTE 3782!).

İstanbul: Pendik, Akfırat beldesi, Formula-1 race area, creek circumference, 26.xii.2004, M.Keskin 3625!.

İstanbul: Pendik, Aydos mountain, 17.viii.1950, A.Berk, T.Baytop (ISTE 3783!).

İstanbul: Sancaktepe, Paşaköy, D 020 motorway, roadside, highway, wide roadside opening and green spaces, E 41.025342 ve B 29.27239, 25.vi.2020, M.Keskin 8004!.

İstanbul: Sarıyer, Garipçe, Bird watching, N 41º 11’ 38,7’’ ve E 29º 04’ 34,4’’, in-forest, 18.ix.2016, M.Keskin 6505!, N.Özhatay, E.Özhatay.

İstanbul: Sarıyer, Kemerburgaz-Bahçeköy, 3.ix.1952, A.Berk, T.Baytop (ISTE 3133a!).

İstanbul: Şile, in-center, 24.viii.1952, A.Berk, T.Baytop (ISTE 3134!).

İstanbul: Şile, in-center, wet area,11.viii.1972, H.Argöksel (ISTE 23076!).

İstanbul: Şile, Ömerli creek, 24.viii.1952, A.Berk, T.Baytop (ISTE 3132!).

The New List of *Persicaria* species in Turkey

In Turkey Flora, twelve taxa have been reported to *Persicaria* so far. These taxa are listed below, and distribution maps specify where the taxa are present in Turkey. The distributions reported here are given to the land trips of the first author according to the samples diagnosed in different herbariums.

1. *P. amphibia* (L.) Delarbre, Fl. Auvergne ed. 2: 519 (1800) (Map 1) .
2. *P. decipiens* (R.Br.) K.L.Wilson, Telopea 3(2): 178 (1988) (Map 5) .
3. *P. hydropiper* (L.) Delarbre, Fl. Auvergne (Delarbre) ed. 2: 518(1800) (Map 3)
4. *P. lapathifolia* (L.) Delarbre Fl. Auvergne ed. 2: 519 (1800).
   subsp. *lapathifolia* (Map 4).
   subsp. *brittingeri* (Opiz) Soják Preslia 46: 153 (1974) (Map 4)
5. *P.leblebicii* (Yıld.) Raus, Willdenowia 44(2): 293 (2014) (Map 2).

Dissusion about *P. leblebicii* lalest taxonomic status:

This species have been published by Yildirimli (2011) and then was transferred to *Persicaria* by Raus (2014). The original article is supported by four photos. Although the first one was stated to belong to the living state of the plant, it belongs to the *P. lapathifolia*. The other three photos belong to the herbarium sample. The author distinguished it from *P. hydropiper* and *P. minor*. However, when the description and photos of the plant are examined, it is understood that the new species is primarily matched to *P. minor*. The only difference that can be seen is the achenes types, but when the literature information is examined, it is understood that there is a similar type of achenes in the *P. minor*. Small (1895) explained in his monograph on the North American *Polygonum*, which describes the achenes structure of this species as follows: "achenes lenticular, nearly 2 mm long broadly oblong conspicuously biconvex or triquetrous and narrowly ovoid-oblong, black, smooth and shining". The feature is also mentioned with detailed drawings. *P. hydropiper* and *P. minor* can quickly become hybridized because they have similar morphological properties. For this reason, it is thought that the *P. leblebicii* may be either *Persicaria* × *ambigua* (Meisn.) B.Bock hybrid or *Persicaria minor* (Hudson) Opiz. The definitive diagnosis can be determined by examining the type of sample.

6. *P. maculosa* Gray, Nat. Arr. Brit. Pl. ii. 269 (1821) (Map 2).
7. *P. minor* (Hudson) Opiz, Seznam Rostlin Kvetney Cesk, 72 (1852) (Map 1).
8. *P. nepalensis* (Meisn.) H. Gross, Bot. Jahrb. Syst. 49: 277 (1913) (Map 5).
9. *P. orientalis* (L.) Spach, Hist. Nat. Vég. (Spach) 10: 537 (1841) (Map 3).

10. *P. perfoliata* (L.) H.Gross, Bot. Jahrb. Syst. 49(2): 275 (1913) (Map 6).

11. *P. thunbergii* (Siebold & Zucc.) H.Gross, Bot. Jahrb. Syst. 49(2): 275 (1913). (Map 6).

Idendification key of Turkish species

1. Perennials, up to 6 m tall; strongly rooting from nodes; usually in water, aquatic, rarely terrestrial or rarely subterrestrial; stamens longer than tepal *P. amphibia*

1. Annuals or perennials with at most 2.5 m tall; usually strict; rarely slightly rooting at the base (*P. thunbergii* and *P. decipiens*); terrestrial; stamens shorter than tepal or equal

2. Barbed plants

3. Stems more and recurved barbed; fruit metallic blue, spheroidal; not rooting at nodes *P. perfoliata*

3. Stems loosely barbed; fruit not metallic colour, trigonous; rooting at nodes *P. thunbergii*

2. No barbed plants

4. Inflorescences congested, capitate

5. Plants strict with 100-250 cm long; ochrea foliaceous flange at upper *P. orientale*

5. Plants slightly strict or somewhat recurved after middle; ochrea not foliaceous flange

6. Ochrea long ciliate, as long as tube; peduncles and leaves non glands *P. maculosa*

6. Ochrea short ciliate, shorter than the tube; peduncles and leaves yellow amber glands

7. Nods area whitish glandular trichomes; inflorescens capitate; nuts biconvex or trigonous *P. nepalensis*

7. Nods area glabrous or a few hairy; inflorescens oblong spike; nuts biconvex with subken in middle *P. lapathifolia*

a.Leaves lanate at the bottom at least when young; little longer than the width subsp. *britingeri*

b.Leaves glabrous or loosely hairy; longer than the width subsp. *lapathifolia*

4. Inflorescences loosely spike, easily seen its axis

8. Perennial plants with rhizomes or roots from nodes; tepals glabrous *P. decipiens*

8. Annuals; tepal glandular

9. Leaves oblong-lanceolate to ovate-lanceolate; stamen 4-6 *P. hydropiper*

9. Leaves linear or linear-lanceolate; stamen 6-8

10. Achenes lenticular, biconvex *P. minor*

10. Achenes trigonous *P. leblebicii*

Map 1. The Distribution map of *Persicaria amphibia* ● and *minör* ●

Map 2. The Distribution map of *Persicaria maculosa* ● and *leblebicii* ●

Map 3. The Distribution map of *Persicaria hydropiper* ● and *orientalis* ●

Map 4. The Distribution map of *Persicaria lapathifolia* subsp.*lapathifolia* ● and *britingeri* ●

Map 5. The Distribution map of *Persicaria decipiens* ● and *nepalensis* ●

Map 6. The Distribution map of *Persicaria perfoliata* ● and *thunbergii* ●

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