A Taxonomic Revision of Genus *Polygonum* L. *sensu lato* (Polygonaceae) for Flora of Iran

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**Authors’ contributions**

This work was carried out in collaboration between both authors. Author SH designed the study and wrote the draft of the manuscript. Author SPG managed the literature searches. Both authors read and approved the final manuscript.

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**ABSTRACT**

The genus *Polygonum* L. *sensu lato* is revised based on articles, herbarium documents and field observations. In this article, a brief revision of this genus in Iran is presented. It was first described by Rechinger and Schiman-Czeika [1] for flora Iranica and has included up to 53 species. The last revision of this genus has been made by Mozaffarian [2], and the genus *Polygonum* L. *sensu lato* is divided into 3 genera (*Polygonum* L. *sensu stricto*, *Bistorta* Adans. and *Persicaria* Mill.). But in present study, according to our field observations and herbarium materials, the genus *Polygonum* L. *sensu lato* has to be separated into 5 different genera including *Aconogonon* (Meisn.) Rchb., *Bistorta* (L.) Scop., *Fallopia* Adans., *Persicaria* (L.) Mill., and *Polygonum* L. *sensu stricto*. The number of species for *Polygonum* L. *sensu lato* has been reduced to 25 species. For these 5 genera, new identification keys have been created.

**Keywords:** Aconogonon; Bistorta; Fallopia; Flora of Iran; Persicaria; Polygonum.

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1. INTRODUCTION

*Polygonum* L. *sensu lato* comprises annual and perennial weedy plants with a complex taxonomic situation [3]. The last arrangement of genus *Polygonum* L. *sensu lato* has been made in Iran by Mozaffarian [2], which included 45 species. According to revision by Mozaffarian [2], *Polygonum* L. *sensu lato* is separated to 3 genera including *Bistorta* Adans., *Persicaria* Mill., and *Polygonum* L. *sensu stricto*. This separation is done based on their inflorescence character. All the species with not branched stems and generally basal leaves, and terminal spike-like inflorescence have been transferred to the genus *Bistorta* Adans. Also, species with generally branched stems, cauline leaves, and terminal or axillary spike-like inflorescence have to be members of the genus *Persicaria* Mill. The aim of this article is to revise the taxonomy of the genus *Polygonum* L. *sensu lato* for flora of Iran.

2. MATERIALS AND METHODS

During our investigations, new specimens were collected from fields and rangelands in different regions of Iran (East and West Azerbaijan, Karaj, Gilan, Kermanshah, and Hamadan provinces). Plant species collected were catalogued and pressed for later identification by flora Iranica [1] and Turkey [4]. Also for determination and separation of these species based on anatomical and morphological characters, we reviewed papers and herbarium materials of Vienna herbarium (Naturhistorisches Museum Wien Botanische Abteilung), herbarium of Agricultural faculty of Tehran and Tabriz University, and herbarium of Research Institute and Natural Resources.

3. RESULTS

Dichotomous key for detection of 4 genera from the genus *Polygonum* L. *sensu lato*.

1- Outer perianth segments winged or keeled
2- Outer perianth segments not winged or keeled

1- Flower base stalk-like; outer perianth segments winged (keeled in *Fallopia convolvulus*); leaf blade base sagittate, hastate, cordate, truncate, or ovate; ochrea papery, not 2-lobed distally
2- Flower base not stalk-like; outer perianth segments keeled; leaf blade base tapered (ovate); ochrea generally translucent, 2-lobed distally
3- Leaves generally basal; inflorescence terminal, spike-like; stems not branched
3- Leaves cauline; inflorescence terminal, axillary, spike-like or not; stems generally branched

4- Ochrea generally translucent, glabrous, 2-lobed, fibrous in age
4- Ochrea opaque, glabrous to scabrous, not 2-lobed

5- Inflorescence raceme- or panicle-like; perianth segments fused ± 1/4; stamens 8
5- Inflorescence ± head-, spike-, or panicle-like; perianth segments fused 1/4–2/3; stamens 5–8

**Aconogonon:**

*Aconogonon alpinum*
*Syn.: Polygonum alpinum*

**Bistorta:**

*Bistorta major*
*Syn.: Polygonum bistorta*

Dichotomous key for detection of *Fallopia* species:

1- Perennial herby plants; inflorescence a lax panicle; Cultivated plants in Iran
1- Annuals herby plants; inflorescence racemose or spicate; occur as weedy plants

**F. baldschuanicum**
2- Fruiting pedicels 1- 3 mm, shorter than perianth segments; Nut finely granular  
2- Fruiting pedicels 5- 8 mm, as long as or longer than perianth segments; Nut smooth and glossy  

**Dichotomous key for detection of *Polygonum* species:**

| 1- | Perennial herby plants | 2 |
| 2- | Stems long and virgate, up to 20-70 cm, with a hard woody stock | 3 |
| 3- | Basal and lower cauline leaves lanceolate or oblong- ovate, nerved, with cartilaginous- crenulate margins | 4 |
| 4- | Basal and lower cauline leaves lanceolate or narrowly linear, non-cartilaginous margins | |
| 5- | Stems long and virgate, up to 20 cm, with or without a hard woody stock | 6 |
| 6- | Stems branched below the inflorescence; Leaves revolute, linear- lanceolate, more than 5 mm broad; lover ones 30 (-50) × 3 mm; Pedicels as long as perianth segments | 7 |
| 7- | Stems and branches are tick at base; Leaves shorter than ochrea or only lower ones less and more longer | 10 |
| 8- | Stems and branches are woody at base; leaves small, up to 10 mm long; flower bearing branches are prostrate | 11 |
| 9- | Stems and branches are leafless; ochrea long and conspicuous | 12 |
| 10- | Branches spiny | 13 |
| 11- | Leaves shorter than ochrea or only lower ones less and more longer | 14 |
| 12- | The entire plant (except ochrea) papillose; leaves linear; flowers always single | 15 |
| 13- | Internodes abbreviated, less and more up to 5 (- 10) mm; branches short and indurated | 16 |
| 14- | Internodes often longer, branches often long and herbaceous | 17 |
| 15- | Branches thick; leaves ovate; flowers single | 18 |
| 16- | Inflorescence branches leafless | 19 |
| 17- | Nut 4- 5 mm long | 20 |
| 18- | Leaves quickly deciduous; flowers close | 21 |
| 19- | Stems short, 10- 20 cm; flowers small | 22 |
4. DISCUSSION

According to revision by Mozaffarian [2], Polygonum L. sensu lato is separated into 3 genera including Bistorta Adans., Persicaria Mill., and Polygonum L. sensu stricto for flora of Iran. And according to revision by Ter-Voskanyan [5], this genus is divided into Aconogonon (Meisn.) Reichenb., Bistorta (L.) Scop., Fallopia Adans., Persicaria Mill., Polygonum L. s. s., which include 16 species, instead of 20, mentioned in 2nd volume of Flora of Armenia. In this article and in order by other available resources such as different floras and literatures [6,4,7,2,8,12,5], the genus Polygonum L. has been divided into 5 genera including Aconogonon (Meisn.) Rchb. with one species (Aconogonon alpinum instead of Polygonum alpinum), Bistorta (L.) Scop. with one species (Bistorta major instead of Polygonum bistorta), Fallopia Adans. with 3 species (Fallopia baldschuanicum, F. convolvulus, and F. dumetorum instead of Polygonum baldschuanicum, P. convolvulus, and P. dumetorum, respectively), Persicaria (L.) Mill. with 10 species (Persicaria barbata, P. glabra, P. orientalis, P. amphibia, P. maculosa, P. lapathifolia, P. salicifolia, P. Hydropiper, P. miltis, P. minus instead of Polygonum barbata, P. glabra, P. orientalis, P. amphibia, P. maculosa, P. lapathifolia, P. salicifolia, P. Hydropiper, P. miltis, P. minus, respectively), and Polygonum L. sensu stricto with 25 species (Polygonum iranicum, P. hyrcanicum, P. luzuloides, P. setosum, P. alpestre, P.

5. CONCLUSION

The genus Polygonum L. sensu lato has to be separated into 5 different genera including Aconogonon (Meisn.) Rchb., Bistorta (L.) Scop., Fallopia Adans., Persicaria (L.) Mill., and Polygonum L.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES


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