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Pyrus ghahremanii spec. nova and *P. giffanica* spec. nova *(Rosaceae-Maloideae)* from Iran

By

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With 9 Figures

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Summary

ZAMANI A., ATTAR F. & JOHARCHI M. R. 2009. *Pyrus ghahremanii* spec. nova and *P. giffanica* spec. nova (*Rosaceae-Maloideae*) from Iran. – Phyton (Horn, Austria) 49(1): 105–115, with 9 figures.

In this paper, two new species namely *Pyrus ghahremanii* ATTAR & ZAMANI and *P. giffanica* ZAMANI & ATTAR belonging to *Pyrus* sect. *Pashia* KOEHNE and sect. *Xeropyrenia* FEDOROV respectively, are described from Iran. The complete description of these species is provided on the basis of both flower and fruit materials of the same individuals, a morphological comparison of the species with their most closely related species, information on phenology and ecology, a distribution map, drawings of their fruits and flowers and finally photographs of their diagnostic characters are given. The main characteristics of *P. ghahremanii* are pyriform fruits on thick pedicels, of *P. giffanica* the leaves pilose only on the lower side and the appressed sepals of the fruit.

Zusammenfassung

ZAMANI A., ATTAR F. & JOHARCHI M. R. 2009. *Pyrus ghahremanii* spec. nova and *P. giffanica* spec. nova (*Rosaceae-Maloideae*) from Iran. [*Pyrus ghahremanii* spec. nova und *P. giffanica* spec. nova (*Rosaceae-Maloideae*) aus Persien]. – Phyton (Horn, Austria) 49(1): 105–115, mit 9 Abbildungen.

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Zwei neue *Pyrus*-Arten aus dem Iran, *P. ghahremanii* ATTAR & ZAMANI and *P. giffanica* ZAMANI & ATTAR aus *Pyrus* sect. *Pashia* KOEHNE bzw. sect. *Xeropyrenia* FEDOROV werden beschrieben. Die Beschreibungen wurden auf der Basis von blühendem und fruchtenden Material von denselben Individuen, des morphologischen Vergleichs mit den nächstverwandten Arten, Informationen über Phänologie, Ökologie und Verbreitung, Zeichnungen der Blüten und Früchte, sowie Photos wesentlicher Merkmale durchgeführt. Wesentliche Merkmale gegenüber den nächsten Verwandten sind bei *P. ghahremanii* die birnenförmigen Früchte auf dicken Stielen und bei *P. giffanica* die nur unterseits behaarten Blätter sowie die der Frucht angedrückten Kelchblätter.

1. Introduction

The genus *Pyrus* L. of family *Rosaceae*, subfamily *Maloideae* (SCHÖNBECK-TEMESY 1969), consists of 38 species (BROWICZ 1993) and is distributed in temperate areas of northern Eurasia and northwestern Africa (BROWICZ 1993). Ten (SCHÖNBECK-TEMESY 1969) to twelve (KHATAMSAZ 1992) species of *Pyrus* occur in Iran, which according to e. g. characters of fruits and leaves are subdivided into four sections, i. e. sect. *Pashia* KOEHNE, sect. *Pyrus*, sect. *Xeropyrenia* FEDOROV and sect. *Argyromalon* FEDOROV. Their main distribution ranges from Alborz (N. Iran) to Zagros Mts. (N.W. to S. Iran) in habitats such as dense forests, open forests, dry slopes or shrub thickets. Generally, *Pyrus* is a morphologically difficult genus and its species are often the product of easy hybrid formation within the genus (BROWICZ 1993, RUBTSOV 1944). During an investigation of several species of *Pyrus* in Iran, *P. ghahremanii* and *P. giffanica* were recognized as new species.

2. Material and Methods

About 500 fresh specimens and 500 photographs from different localities in both fruit and flower (samples deposited in TUH, acronyms according to HOLMGREN & al. 1990), were identified with the respective keys (CUIZHI & SPONGBERG 2003, KHATAMSAZ 1992, MALEEV 1971, SCHÖNBECK-TEMESY 1969). Herbarium samples of FUMH, the herbarium of research center of agricultural and natural resources of Kurdistan, and also photographs taken from specimens in W, were investigated. For characterization of the species, illustrations of species, both drawings and photographs are provided representing taxonomically separating characters.

3. Pyrus ghahremanii ATTAR & ZAMANI, spec. nova

Diagnosis: *P. boissieriana* BUHSE affinis sed differt foliorum lamina elliptico-ovata (nec orbiculato-ovata), apice cuspidato-acuminata (nec rotundato-emarginata), margine serrulata (nec serrata); pedicellis usque ad 2.5 cm (nec usque ad 4 cm), pedicellis fructiferis crassis (nec tenuibus),

superne incrassato (nec non incrassato); fructibus pyriformis (nec saepe globosis).

Holotypus: Iran, Mazandaran: ca. 20 km after Gachsar to Chalous (36° 07' N, 51° 19' E); ATTAR & ZAMANI; 23.7.2007; TUH 37300 (green fruit). – Paratypes: Iran, Mazandaran: ca. 20 km from Gachsar to Chalous (36° 07' N, 51° 19' E); ATTAR & ZAMANI; 14.10.2007; TUH 37602 (mature fruit). – Iran, Mazandaran: ca. 20 km after Gachsar to Chalous (36° 07' N, 51° 19' E); ZAMANI & FATEMI; 24.4.2008; TUH 38141 (flower).

Icones: h. l. Fig. 2, 3, 4, 5.

Description: Tree to 5 m height, ± unarmed; Branches grey-blackish; Buds broadly ovate, 5 × 4 mm, pilose in margin of scales; Lenticels sparse, white; Stipules linear, membranous, up to 1.5 cm length, sparsely pilose in both surfaces. Petiole 1.5–3 cm, sparsely pilose when young, soon glabrescent. Leaves lustrous green, drying blackish specifically in flower; elliptic-ovate, 3–5 × 1.5–3 cm; acute, cuspidate to acuminate; rounded, oblique to broadly cuneate; ciliate and serrulate, teeth terminating into a deciduous callous; both surfaces glabrous. Inflorescence corymbose, 8–15-flowered, 3–6 in fruit; bracts deciduous, membranous, soon brownish, linear, up to 1.5 cm length; pedicels sparsely pilose when young, soon glabrescent. Flowers up to 2 cm in diam.; sepals short triangular, 2–4 mm length; acute; upper surface densely brown-tomentose, lower surface ı glabrous; petals orbicular, 1–1.1 × 1–1.2 cm; rounded or emarginate at apex; with very short claw; styles 3–4, 5–6 mm length; tomentose at base; stigma clavate; stamens 15–20; in two rings, outer ring longer (4 mm) than inner one (3 mm), with an obscure thickening at base, specifically in the outer ring. Pome pyriform, 1.5–2 cm in diam., brown, with pale dots on fruit, most sepals deciduous in fruit; Pedicel 1.5–2.5 cm, thick and stiff, with a remarkable thickening below fruit.

Phenology: Flowering late April to early May, mature fruit late August to late September.

Affinities: This species which is a member of *Pyrus* sect. *Pashia*, is the morphologically closest relative of *P. boissieriana*, however, some important separating characters could be named between the two species (Table 1).

Distribution and Ecology: *P. ghahremanii* is associated together with trees and shrubs such as *Mespilus germanica, Rosa* and *Prunus* in central Alborz (N. Iran, Fig. 1) in more or less dense and humid Hyrcanian forests (Fig. 5). The first individual of the species was collected from the above-mentioned locality. Since this area is very widespread and consisting of dense forests with partially impassable regions, it is to expect that other individuals could be reported from this area (i. e. the Hyrcanian forest).

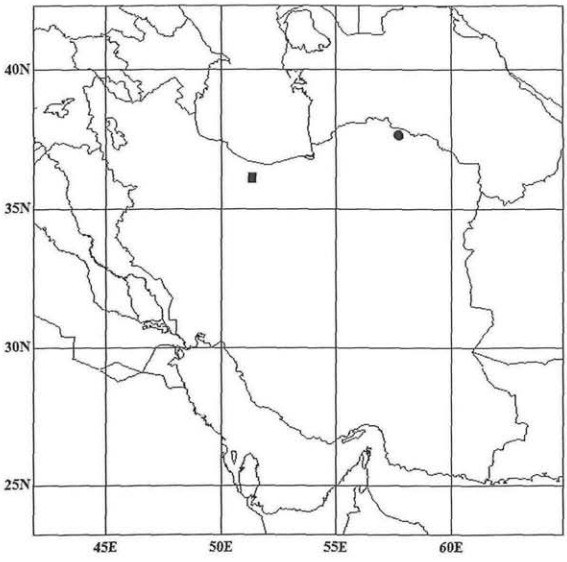

Fig. 1. Distribution *Pyrus ghahremanii* (square) and *P. giffanica* (circle) in Iran.

Fig. 2. Drawings of *Pyrus ghahremanii*, twig, petal and longitudinal section of a flower. – Scale bars: 2 cm (twig) and 1 cm (flower).

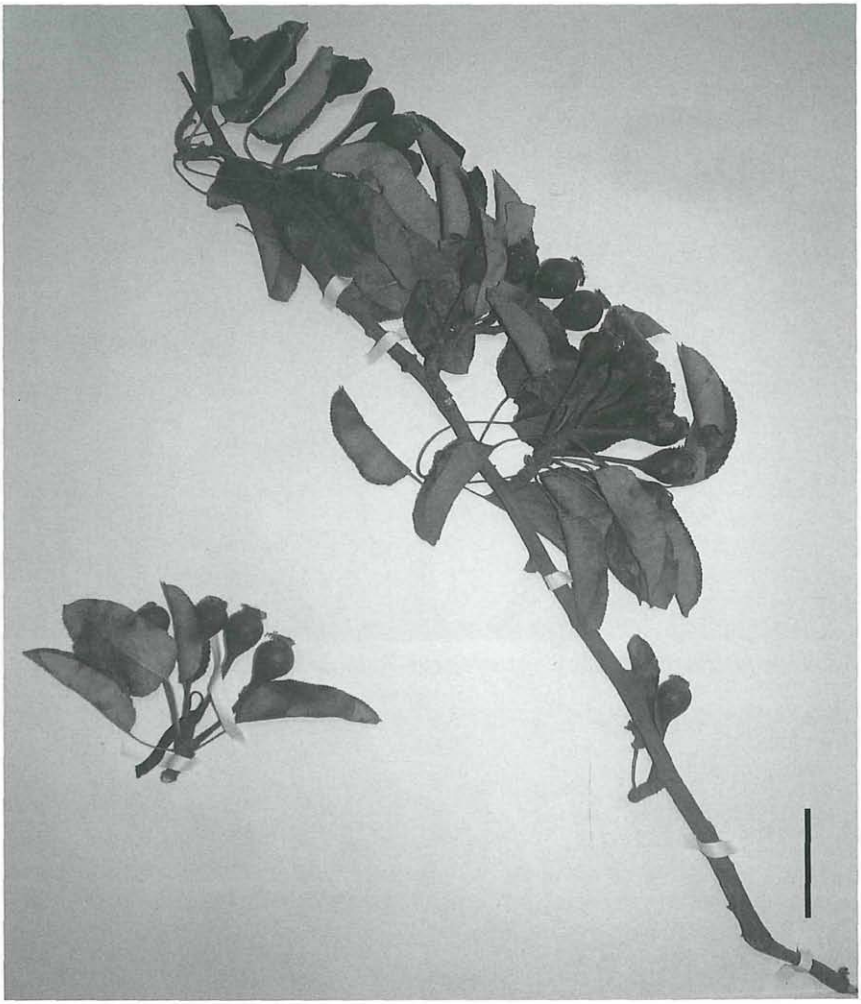

Fig. 3. Type specimen (holotype) of *Pyrus ghahremanii* in TUH. – Scale bar: 4 cm. – Phot. A. ZAMANI.

Fig. 4. *Pyrus ghahremanii* fruit. Insert: leaf. – Phot. A. ZAMANI.

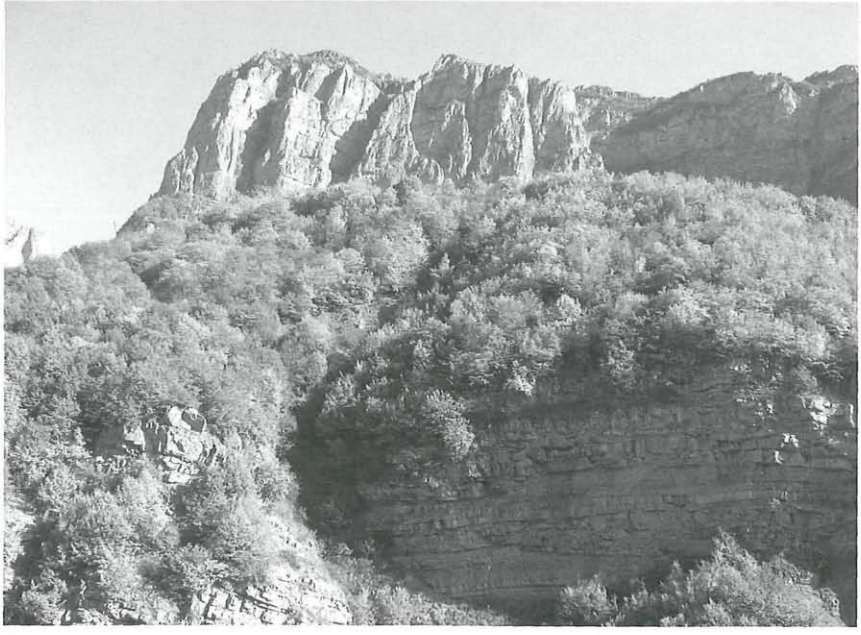

Fig. 5. Habitat of *Pyrus ghahremanii* at the type locality. – Phot. A. ZAMANI.

Eponymy: The epithet was chosen in honour of the late Professor Ahmad GHAHREMAN (1938–2008); father of botany in Iran, founder of TUH and author of the 26-volumed Illustrated Flora of Iran.

Table 1. Important differences between *Pyrus ghahremanii* and *P. boissieriana*.

Character	*P. ghahremanii*	*P. boissieriana*
Leaf shape	elliptic-ovate	orbicular
Leaf apex	cuspidate-acuminate	rounded-emarginate
Leaf margin	serrulate	serrate
Pedicel length	up to 2.5 cm	up to 4 cm
Pedicel thickness	remarkably thick	slender
Pome shape	*pyriform*	*globose (less often pyriform)*
Pedicel thickening	+	–

4. *Pyrus giffanica* ZAMANI & ATTAR, spec. nova

Diagnosis: *P. korshinskyi* LITV. affinis sed differt ramis spinosis (nec inermibus); foliorum lamina elliptico-ovata (nec late usque anguste lanceolata vel lingulata), 3.5–4.5 × 1.5–3 cm (nec 5–10 × 2–4 cm), utrinque ± glabra (nec utrinque subtomentosa); inflorescentia c. 3-5-flora (nec multiflora); calycis laciniae triangulari-lineares (nec triangulares usque triangulari-oblongae),in fructu appressae (nec erectae).

Holotypus: Iran, Northern Khorassan: Bojnord, loop road of Giffan village, Qazi village (37° 33' N, 57° 27' E); ZAMANI, ZANGOOEI & RAEI NIAKI; 11.9.2007; TUH 37586 (fruit). – Paratypus: Iran, Northern Khorassan: Bojnord, loop road of Giffan village, Qazi village (37° 33' N, 57° 27' E); ATTAR, ZAMANI & MALAKI; 16.4.2008; TUH 37952 (flower).

Icones: h. l. Fig. 6, 7, 8, 9.

Description: Tree to 5 m height with irregular crown; branches armed, specifically in lower parts, grey, young branchlets dark brown; buds ovoid, large, 7 × 3 mm, pilose at margin of scales; stipules membranous, linear, upper surface pilose, lower surface ± glabrous. Petiole 2–6 cm, pilose when young, soon glabrescent; leaves 3.5–4.5 × 1.5–3 cm, elliptic to ovate, acute to acuminate; rounded or oblique at base; margin ciliate, soon glabrescent, serrate; upper surface nitid, glabrous, lower surface pallid, sparsely tomentose when young, specifically along main veins. Inflorescence a few-flowered (3–5) corymb; pedicel sparsely pilose when young, soon glabrescent. Flowers 1.5–2 cm in diam.; hypanthium cupular, sparsely tomentose; sepals 5 (in this sample there are remarkable flowers with up to 7 sepals which is an abnormal state), long triangular to linear, 4–6 mm, acute, densely brown-tomentose at upper surface, tomentose at lower surface; petals 9 × 7 mm, round to broadly elliptic, rounded at apex, with short claw; styles 5 (also 6 was observed), longer than stamens (up to

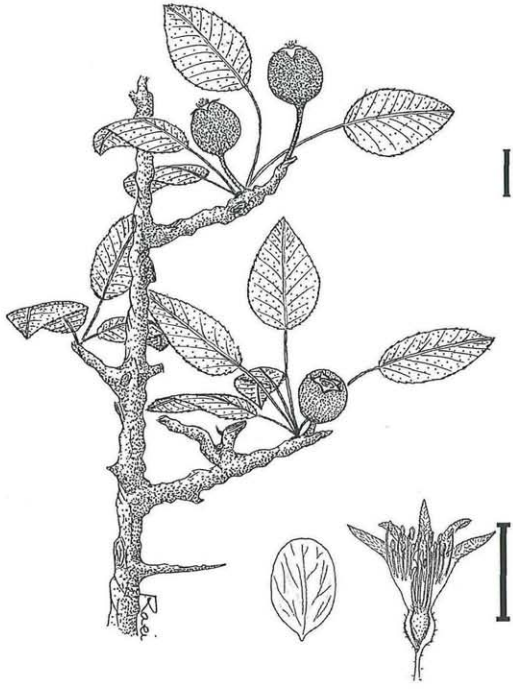

Fig. 6. Drawings of *Pyrus giffanica*, twig, petal and longitudinal section of a flower. – Scale bars: 2 cm (twig) and 1 cm (flower).

8 mm), tomentose at base; stigma clavate; stamens 20–25, filament with an obscure thickening at base, in two rings, outer ring longer (5 mm) than inner ring (4 mm). Pome globose, 2.5 × 2.5 cm, green-yellowish, succulent, with numerous grit cells; sepals persistent, appressed to fruit; ovary 5-loculed, 2 ovules per locule; pedicels in fruit 2–2.5 cm, with a very obscure thickening just below fruit. (Fig. 6, 8)

Phenology: Flowering early to middle April, mature fruit late August to September.

Affinities: This species of Pyrus sect. Xeropyrenia is the closest relative of *P. korshinskyi* distributed in N.W., E. and N.E. Afghanistan (SCHÖNBECK-TEMESY 1969). The main differences between the two species are summarized in Table 2 (MALEEV 1971).

Distribution and Ecology: Unlike other species of *Pyrus* sect. *Xeropyrenia*, which are distributed in N.W. to S. Iran, *P. giffanica* is distributed in N.E. Iran (Fig. 1) in dry valleys comprising scrublands of *Berberis (B. integerrima)* (Fig. 9). According to field observations, only one individual of this species was found at the bottom of the valley; however,

Fig. 7. Type specimen (holotype) of *Pyrus giffanica* in TUH. – Scale bar: 4 cm. – Phot. A. ZAMANI.

Fig. 8. *Pyrus giffanica* fruit. Insert: leaf. – Phot. A. ZAMANI.

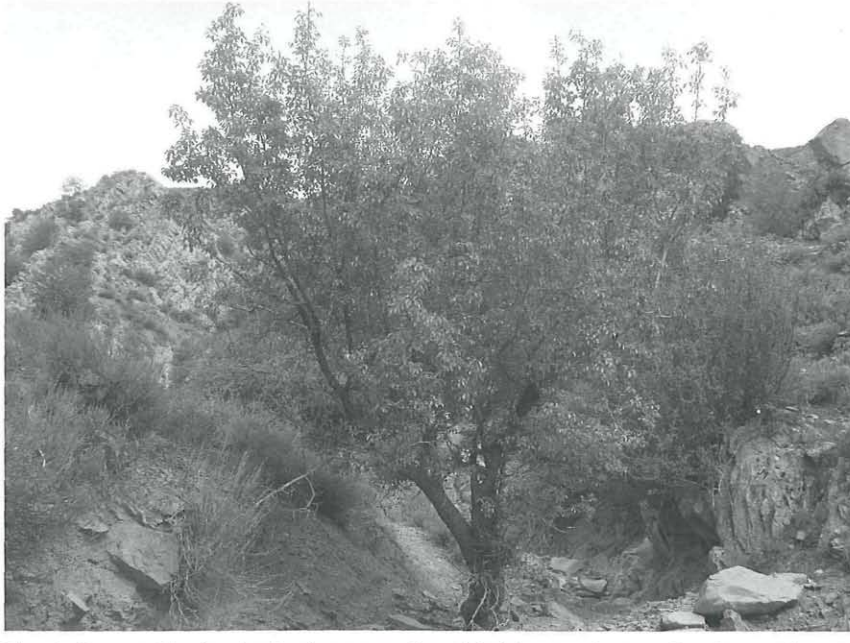

Fig. 9. *Pyrus giffanica* (in the foreground) and habitat at the type locality. – Phot. A. ZAMANI.

given its capability for seed production and the widespread range of the habitat it appears to be likely that more individuals may be found at this locality. The geographically closest species to *P. giffanica* is *P. turcomanica*, which in comparison to the limited distribution of the former species is distributed throughout a more widespread range (N.E. Persia, W. Kopet-Dagh Mts. in Turkmenistan).

Etymology: The epithet was chosen from Giffan, the village near to the location of type sample in N.E. Iran.

Table 2. The main differences between *Pyrus giffanica* and *P. korshinskyi*.

Character	*P. giffanica*	*P. korshinskyi*
Spines	+	–
Indumentum of leaves	sparsely pilose on lower surface	densely tomentose on both surfaces
Leaf shape	elliptic-ovate	elongate-lanceolate
Leaf size	3.5–4.5 × 1.5–3 cm	5–10 × 2–4 cm
Inflorescence	3–5-flowered	many-flowered
Sepal shape	triangular-linear	elongate-lanceolate
Sepals on fruit	appressed	erect

5. Acknowledgements

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6. References

Browicz K. 1993. Conspect and chorology of the genus *Pyrus* L. – Arbor. Kornick. Rocznik. 38: 17–33.

Cuizhi C. & Spongberg S. A. 2003. *Pyrus* L. – Flora of China 9: 173–179.

Holmgren P. K., Holmgren N. H. & Barnett L. C. 1990. Index Herbariorum I: The Herbaria of the World, eighth ed. – Regnum vegetabile 20.

Khatamsaz M. 1992. *Pyrus* L. – Flora of Iran. 6: 181–200. – Research Institute of Forests and Rangelands (In Persian).

Maleev P. V. 1971. *Pyrus* L. - In: Komarov V. L. [ed.], Flora of U.S.S.R. 9: 259–274. – Academy of Science of the U.S.S.R.

Rubtsov G. A. 1944. Geographical distribution of the genus *Pyrus* and trends and factors in its evolution. – The American Naturalist 78: 358-366.

Schönbeck-Temesy E. 1969. *Pyrus* L. – In: RECHINGER K. [ed.], Flora Iranica 66: 27–36. – Graz-Austria.