

Unveiling a longstanding misinterpretation: revisiting phylogenetic and morphological evidence from *Arabis verna* (L.) W.T.Aiton, supports the description of a monospecific taxon, *Pseudoarabis* A.R. Khosravi & A. Eslami-Farouji *gen. nov.*

Ahmad Reza Khosravi^{1,*}, Özlem Çetin², Atena Eslami-Farouji^{1,*}

1) Department of Biology, College of Science, Shiraz University, Shiraz, Iran
2) Department of Biotechnology, Faculty of Science, Selçuk University, Konya, Türkiye

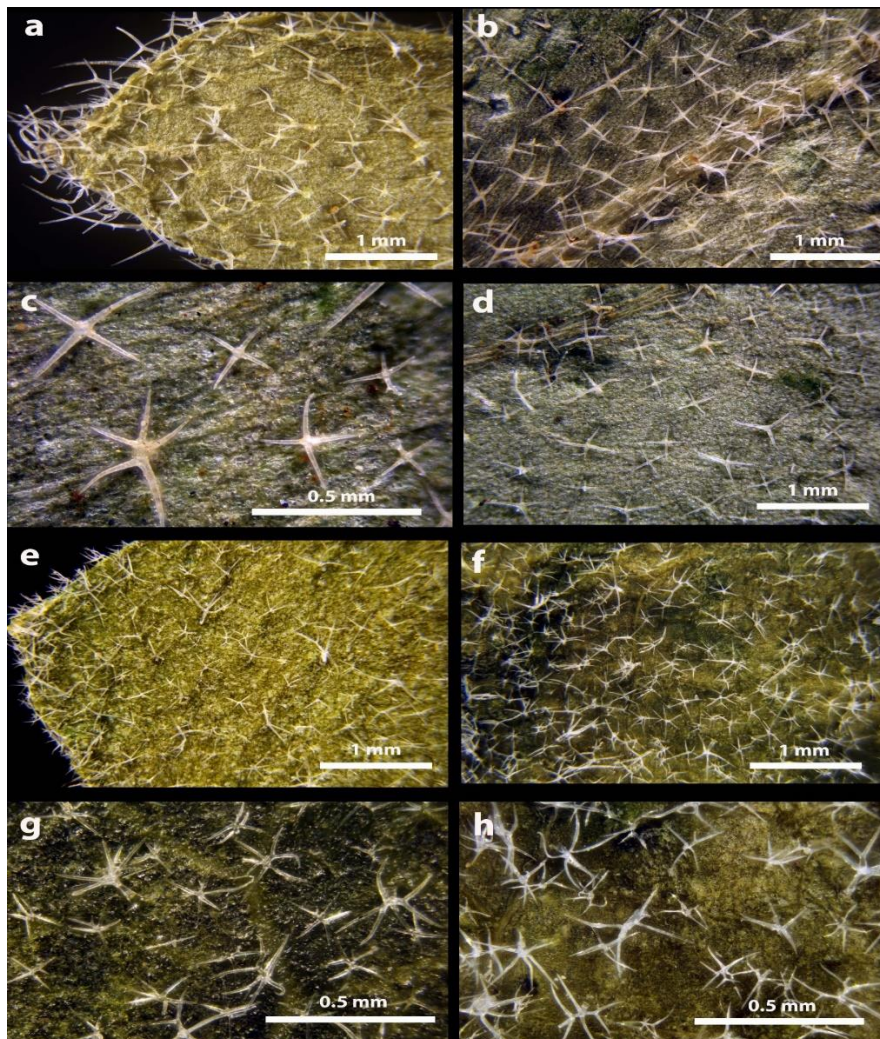


Figure S1: Trichome types of the leaves of the *Pseudoarabis* and *Aubrieta* genera using a light microscope. **a-d:** *Pseudoarabis verna comb. nov.* and **e-h:** *Aubrieta parviflora*.

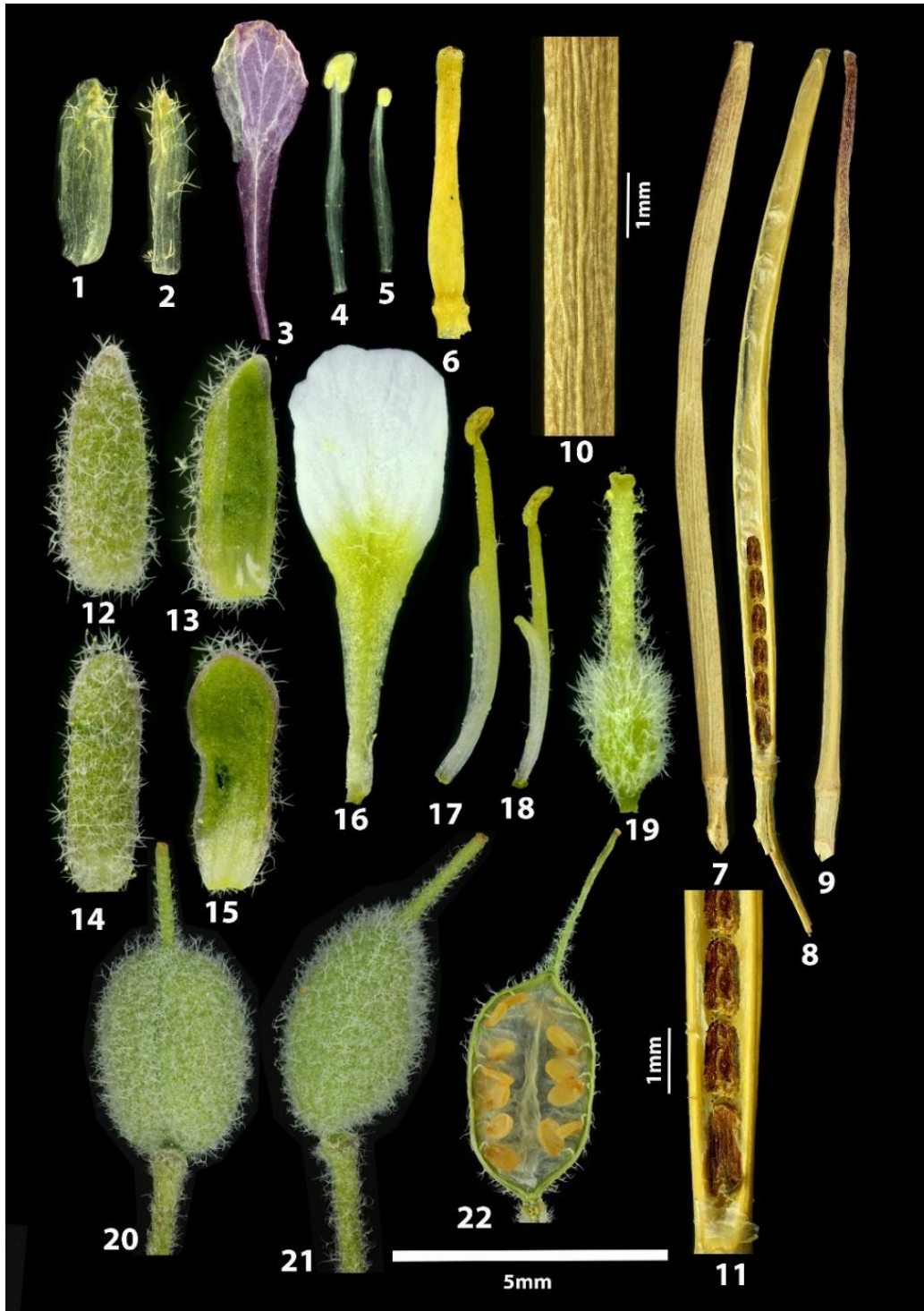


Figure S2: Morphological characteristics of *Pseudoarabis* and its close relative, *Aubrieta*. **1-11) *Pseudoarabis verna*:** **1:** outer sepal, **2:** inner sepal, **3:** petal, **4:** long stamen, **5:** short stamen, **6:** gynoecium, **7:** fruit valve (anterior view), **8:** a fruit with one valve removed, **9:** fruit (lateral view), **10:** fruit, part of valve, **11:** parts of fruit, **12-22) *Aubrieta parviflora*:** **12-13:** outer sepal, **14-15:** inner sepal, **16:** petal, **17:** long stamen, **18:** short stamen, **19:** gynoecium, **20-21:** fruit (anterior and lateral views, respectively), **22:** fruit with seed.

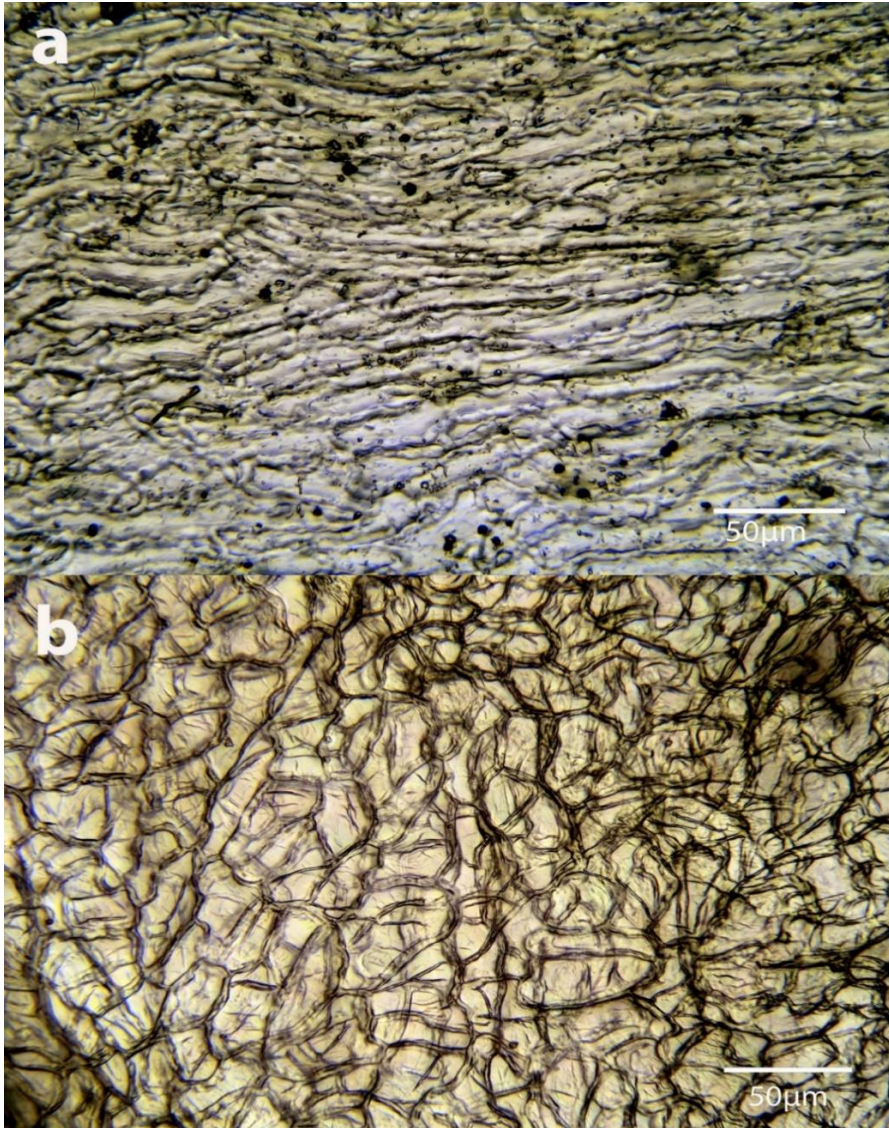


Figure S3: Septum surface of representatives of the *Pseudoarabis* and *Aubrieta* genera using a light microscope. **a)** *Pseudoarabis verna*, **b)** *Aubrieta parviflora*.

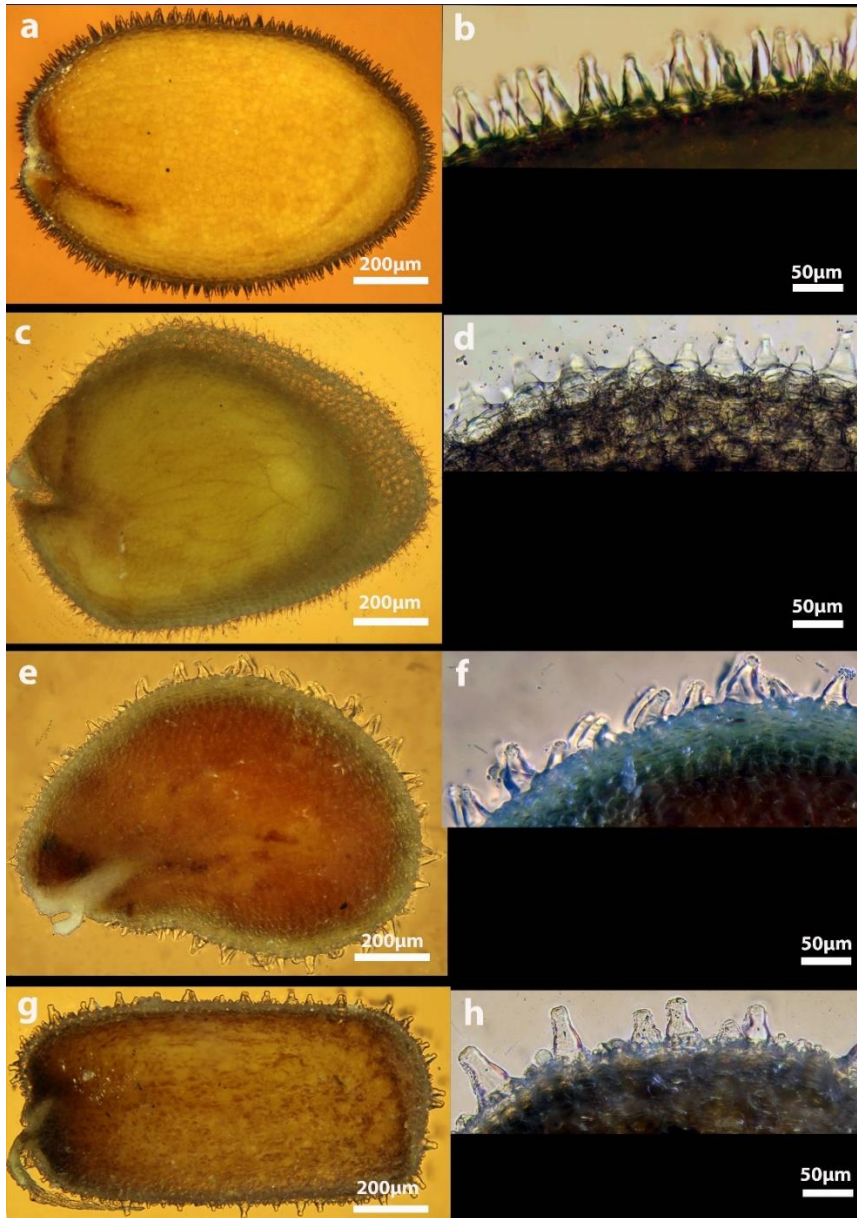


Figure S4: Seed mucilage shape and seed surface micromorphology of *Arabis*, *Aubrieta*, *Pseudoarabis*, and *Hafezia* genera using light and scanning electron microscopes. **a-b:** *Arabis nova*, **c-d:** *A. caucasica*, **e-f:** *Aubrieta parviflora*, **g-h:** *Pseudoarabis verna*.

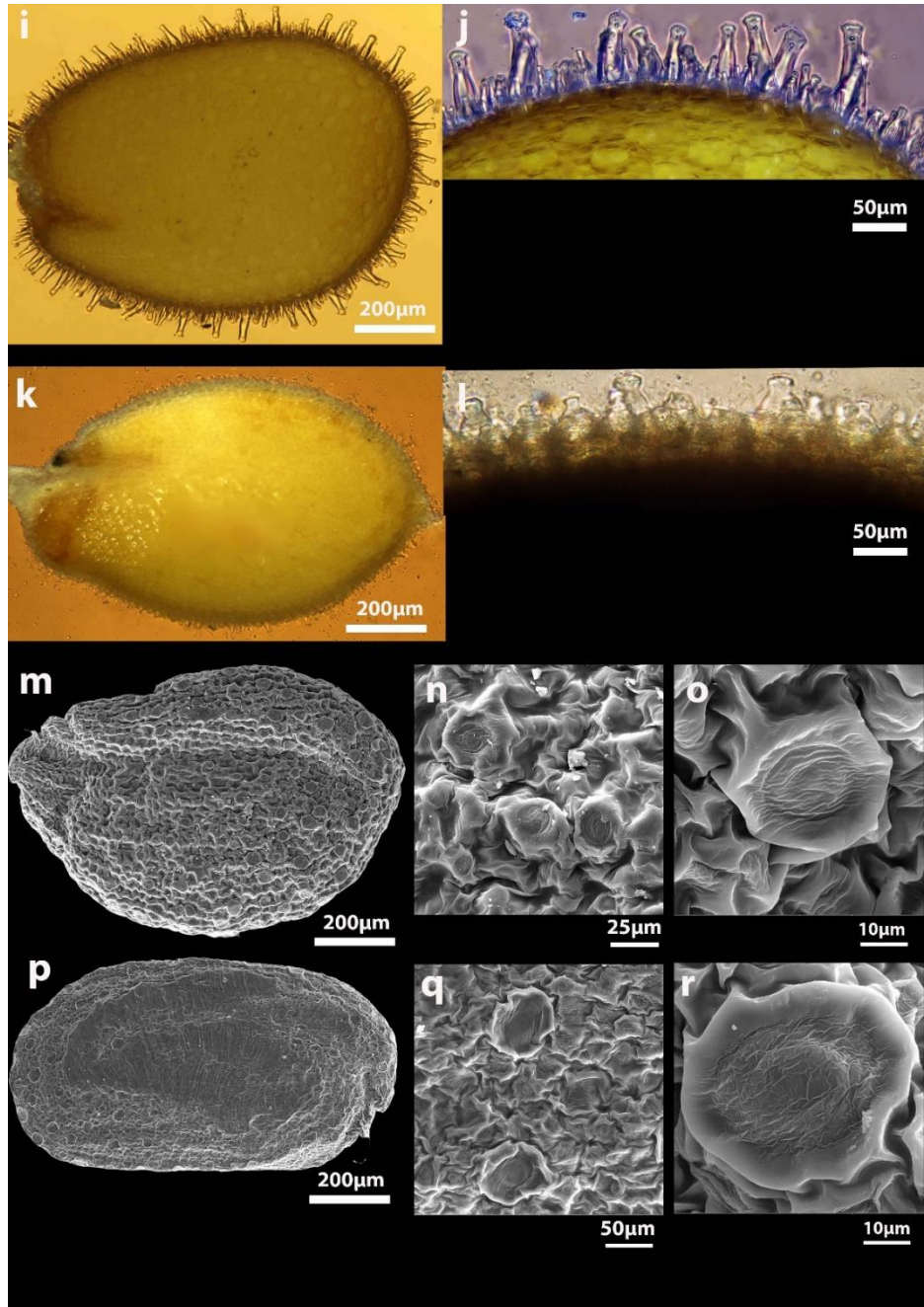


Figure S5: Seed mucilage shape and seed surface micromorphology of *Arabis*, *Aubrieta*, *Pseudoarabis*, and *Hafezia* genera using light and scanning electron microscopes. **i-j:** *Hafezia aucheri*, **k-l:** *Arabis sagittata*, **m-o:** *Aubrieta parviflora*, **p-r:** *Pseudoarabis verna*.

Supplementary Tables

Table S1: Voucher specimens of the examined taxa used in morphological analyses regarding the introduction of the new genus, *Pseudoarabis*.

Pseudoarabis verna (L.) A.R. Khosravi & A. Eslami-Farouji: Türkiye: Prov. Aydın, Çine-Yatağan, 300 m, *Quercus coccifera* maquis, on metamorphic rock. Annual, Fls. Violet. 1956.03.23, Davis, O. Polunin 25213; Türkiye: Antalya, Demre, Sahilkılınçlı, 05.04.2019, Ö.Çetin 2254 & Ö.Güner (GAZI Herbarium); Türkiye: Mersin, Gülnar, 1956.04.14, 1000 m, Davis, O. Polunin 26055.

Aubrieta parviflora Boiss.: PERSIA: Fars: Gorge 23-24 km from Firuzabad to Farashband, 1974.04.03, P.H. Davis & M.H. Bokhari, 56381 (HSHU!); Fars: E-6, 70 km from Shiraz, on old road to Kazerun, 2500 m, M.H. Bokhari, 1226 (HSHU!); Tehran: N of Tehran, 1989.06.05, A.R. Khosravi, 64 (HSHU!); Fars: 5 km north of Sivand, Tang-e Khoshk, Kouh-e Tome karam, 1861m, 2013.03.29, Z. Moussavi, 88 (HSHU!); Fars: Shiraz, Kuh-e Derak (29°38'35.73"N-52°27'6.19"E), 1671m, 2021.03.10, A.R. Khosravi, 60230 (HSHU!); Fars: Shiraz, Park-e Bamu, Kuh-e Gowd-e Lubia, 1924 m, 2011.05.18, A.R. Khosravi, & A. Assadi, 48516 (HSHU!); Fars: Rostam, Babameydan, Kuh-e Zardeh Shehneh, 30°19'28"N-51°32'15.78"E, 1369 m, A. Gorjian, 2012.05.04, 126 (HSHU!); Fars: 17 km after Dasht-e Arjan to Kazerun, on old road, 2450 m, A.R. Khosravi, A. Hatami & H. Safaei, 1997.06.27, 24820 (HSHU!); Fars: 25 km West of Firuzabad, Khergheh (Emamzadeh Dawood), 28°53'36.96"N-52°22'35.40"E, 1500 m, E. Bahrani Fard, 2013.03.18, 62 (HSHU!); Fars: 25 km West of Firuzabad, Khergheh (Emamzadeh Dawood), 28°53'42.36"N-52°22'58.44"E, 1679 m, E. Bahrani Fard, 2013.04.26, 229 (HSHU!); Fars: 40 km SW of Abadeh, before Khosrow & Shirin, D. Lotfi Azad, 1993.05.05, 16080 (HSHU!); Fars: 5 km north of Sivand, Tang-e Khoshk, Kouh-e Shekaf, 1884 m, Z. Moussavi, 2014.04.24, 357 (HSHU!); Fars: 5 km north of Sivand, Tang-e Khoshk, Kouh-e Tom karam, 1861 m, Z. Moussavi, 2013.03.29, 88 (HSHU!); Fars: Arsanjan, Tang Eshkan, Kuh-e Khom, 2446 m, M. Zare, 2012.04.26, 174 (HSHU!); Fars: Bavanat, Sarchuhan, Golpa village, 2559 m, J. Hashemi, 2005.05.14, 28582 (HSHU!); Fars: E6 (Times Atlas) Gorge 23-24 km from Firuzabad to Farashband, 2500 m, P.H. Davis & M.H. Bokhari, 1974.04.03, 56381 (HSHU!); Fars: Mamassani, Dosmanziari, Tasak, 2596 m, A. Assadi, 2011.04.26, 634 (HSHU!); Fars: River gorge 12 km from Firuzabad to Kavar, 1450 m, P.H. Davis & M.H. Bokhari, 1974.04.03, 56372 (HSHU!); Fars: S of Shiraz, Kuh-e Sabzpushan, 2100 m, M. Arabzadeh, 1992.04.23, 11770 (HSHU!); Fars: Sepidan, 2110 m, M.S. Tadayyon, 1992.07.03, 13773 (HSHU!); Fars: Shiraz, Kuh-e Derak, 29°38'35.73"N-52°27'6.19"E, 1671 m, A.R. Khosravi, 2021.03.10, 58792 (HSHU!); Fars: S of Shiraz, Eslamlu village, 29°29'15.88"N-52°29'16.6"E, 1537 m, Z. Najafi Ghareghani, 2006.04.02, 30058 (HSHU!); Kermanshah: 30 km NE of Kermanshah, Bistun, J. Maleki Samangani, 1994.03.27, 18976 (HSHU!); Kermanshah: Bistun, J. Maleki Samangani, 1994.03.26, 30058 (HSHU!); Lorestan: Kuh-e Sefidkuh, 34°11'40.26"N-47°07'50.52"E, 2061 m, A. Eslami-Farouji, 2016.05.20, 113 (HSHU!); Tehran: Tehran, Darband, H. Moazzeni, 2005.07.17, 28910 (HSHU!); Tehran: N of Tehran, A.R. Khosravi, 1989.06.05, 64 (HSHU!).

Hafezia aucheri (Boiss.) A.R. Khosravi & A. Eslami-Farouji: PERSIA: Fars: Park-e Bamu, Kuh-e Sufia, 29°41'42.70"N-52°39'39.70"E, 2017 m, 2011.05.05, A.R. Khosravi, & A. Assadi, 47663 (HSHU!); Fars: Shiraz, Pardis-e Eram, 29°39'19.87"N-52°30'9.18"E, 1632 m, A.R. Khosravi, 2023.04.24, 59547 (HSHU!); Fars: Shiraz, Pardis-e Eram 29°39'19.87"N-52°30'9.18"E, 1653 m, A.R. Khosravi & A. Eslami-Farouji, 2023.03.09, 59718 (HSHU!); Fars: Shiraz, Park-e Bamu, South slope of Kuh-e Bamu, 29°41'26.30"N-52°34'27.90"E, 1906 m, A.R. Khosravi & M. Dehghani, 43895 (HSHU!); Fars: 5 km north of Sivand, Tang-e Khoshk, Tol-e Sangabi, 1786 m, Z. Moussavi, 2013.03.30, 98 (HSHU!); Fars: Firuzabad, 1330 m, K. Najafi, 1992.05.08, 12132 (HSHU!); Fars: Shiraz, Kuh payeh, 1798 m, A.R. Khosravi, 2007.03.24, 33896 (HSHU!); Fars: Shiraz, Park-e Babakuhi, A. Hatami, 1500 m, 1993.03.10, 14219 (HSHU!); Kohgiluyeh & Boirahmad: Below Sisakht, on road to Yasuj, 1900 m, P.H. Davis, & M.H. Bokhari, 1974.04.08, 56453 (HSHU!); Kohgiluyeh & Boirahmad: Yasuj, Mahmudabad, M.J. Setudeh, 1994.04.06, 19441 (HSHU!); Kohgiluyeh & Boirahmad: Below Sisakht, on road to Yasuj, 1974.04.08, 1900 m, P.H. Davis & M.H. Bokhari, 56453 (HSHU!); Fars: Firuzabad, 1992.05.08, 1330 m, K. Najafi, 12132 (HSHU!); Fars: Shiraz, Park-e Babakuhi, 1500 m, 1993.03.10, A. Hatami, 14219 (HSHU!); Kohgiluyeh & Boirahmad: Yasuj,

Mahmudabad, 1994.04.06, M.J. Setudeh19441 (HSHU!), Fars, Shiraz, Pardis-e Eram (29°39'19.87"N-52°30'9.18"E), 1632 m, 2023.03.09, A.R. Khosravi, & A. Eslami-Farouji, 59547 (HSHU!).

Hafezia parvula (Dufour ex DC.) A.R. Khosravi & A. Eslami-Farouji: Hab. in schistosis c. Targuist, 1000 m, 1929.04.26, Univ. Mohammed 5-A, 12087, Institut Scientifique, Herbar National RAB; Castille: Ameyugo, Talus et Garigues, LY0079877, 1906.04.20, Herbiers Universite de Lyon; Maroc: Djebel Kerker, 600-850 m (Beni Bu Yahi), F. Sennen et Hno. Mauricio, 1934.04.22, 81155, 840611, 48428; Z. Spanje: oost van Ronda pas in de weg van Ronda naar Coin, 800 m, Bloemkroon Wit, 1984.04.18, L3767928; Merindad de Ubierna (BU): Desfiladero de Ubierna. Laderas pedregosas, soleadas, al pie de un rouedo calizo, 900-920 m, B. Fz de Betono et J. A. Alejandro, 1988.04.24, Z-000113708. Spain, Prov. Burgos, Ameyugo, sunny slope of the mountain, west of the town, 2006.04.16, 5 80-650 m, J. A. Alejandro & M.J. Escalante, 1122 (AHIM!)., Morocco, Prov. oujda: Mts. of Beni Snassen, 6 km E of Tizi Oulal on the Street 5303, holm oak forest; limestone rubble; 2°14' W- 34°51' N, 1993.04.11, 1070 m, D. Podlech, 51465. 1122 (MA!), Spain, Prov. Burgos, Santa Ol alla de Bureba (BU): On a sunny slope at the foot of a limestone rock. Holm oak forest environment. Limestone. 930-940 m, 1988.05.07, Juan Antonio Alejandro Sáenz (MA!)., Spain, Prov. Álava, Elciego (VI): Las Lombas. In dismantled kermes oak forests. Disturbed gravelly soils. 500 m, 1988.03.26, Juan Antonio Alejandro Sáenz (MA!), Spain, Prov. Burgos, Las Lavas Valley (BU): Between Robledo-Temiño and Tobes and Ranedo. At the base of dolomitic rocks. Heated environments, from 920 to 950 m. 1988.05.01, M. L. Gil Zíñiga & J. A. Alejandro (MA!).

Arabis caucasica Willd.: PERSIA: Tehran: N of Tehran, 1989.06.05, A.R. Khosravi, 65 (HSHU!); Ardebil: Meshkinshah, Kuh-e Sabalan (38°12'34.50"N-47°51'43.84"E), 3200 m, 1994.07.29, H. Baharvand, 22205 (HSHU!); Gilan: Langrud, Leila Kuh, 81 m, 2006.05.31, M.R. Dashtpeyma, 32391 (HSHU!), Esfahan: 8 km after Vanak to Semirom, 2587 m, S. Heidarian, 37943 (HSHU!), Fars: Sepidan, Abshar-e Margun, 30°29'32.39"N-51°53'45.28"E, 2008.05.19, 2316 m, E. Rusta (HSHU!).

Arabis nova Vill.: PERSIA: Fars: 5 km from Masiri to Basht, 700 m, 1974.03.20, P.H. Davis & M.H. Bokhari, 55648 (HSHU!); Tehran: N of Tehran, 1989.06.05, A.R. Khosravi, 56 (HSHU!); Lorestan: 70 km from Andimeshk to Khorramabad, Kuh-e Shah Ahmad, 1991.04.02, H. Baharvand, 16 (HSHU!); Yazd: Taft, Kuh-e Sefid, 1991.04.16, K. Salehi, 47 (HSHU!); Qazvin: road of Lowshan to Ghazvin, 36°32'6.70"N-49°30'56.50"E, 2009.04.24, 574 m, A.R. Khosravi, 42740 (HSHU!).

Arabis sagittata (Bertol.) DC.: PERSIA: North Khorasan: Central parts of Golestan National park, Almeh valley, Darreh Palang, 1999.04.23, 1600 m, H. Akhiani, 13406 (HSHU!), Mazandaran: Chalus road, 2009.06.26, 2201 m, A.R. Khosravi & K. Kavousi, 43638 (HSHU!).

Draba rimarum (Rech.f.) A.R. Khosravi & A. Eslami-Farouji: PERSIA: Mazandaran: Pol-e Sefid, Ashak (35°59'36.7"N-53°13'18.90"E), 2265 m, 2009.06.25, A.R. Kosravi & K. Kavousi, 24985 (HSHU!).

Table S2: Voucher specimens of the examined taxa used in phylogenetic analyses regarding the introduction of the new genus, *Pseudoarabis*.

Chalcone synthase: *Pseudoturritis turrita*: LN623711.1; *Pseudoarabis verna*: JQ919890.1; *Aubrieta parviflora*: LK937252.1; *Aubrieta canescens*: LK937222.1; *Aubrieta deltoidea*: AF174529.1; *Hafezia aucheri*: LK937203.1, LK937201.1, JQ919881.1; LK937202.1; *Arabis procurrens*: AF112105.1; *Arabis christianii*: LK937225.1; *Arabis hirsuta*: AF112096.1; *Arabis collina*: LK937227.1; *Arabis nova*: LK937244.1; *Arabis auriculata*: LK937216.1; *Arabis nordmanniana*: LK937243.1; *Arabis alpina*: AF112084.1; *Arabis purpurea*: LK937253.1; *Arabis montbretiana*: JQ919886.1; ; *Draba hispanica*: JQ919894.1; *Draba nemorosa*: KU525030.1; *Draba aizoides*: JQ919893.1.

Alcohol dehydrogenase: *Pseudoturritis turrita*: KC814712.1; *Pseudorabis verna*: KC814704.1; *Aubrieta canescens*: KC814705.1; *Arabis procurrens*: AF110454.1; *Arabis stelleri*: AB015498.1; *Arabis hirsuta*: KC814701.1; *Arabis collina*: KC814707.1; *Arabis alpina*: AF110429.1; *Arabis purpurea*: KC814703.1; *Arabis montbretiana*: KC814708.1; *Arabis nordmanniana*: KC814702.1; *Arabis auriculata*: KC814700.1; *Arabis nova*: KC814709.1; *Hafezia aucheri*: KC814699.1; *Draba hispanica*: KC814711.1; *Draba nemorosa*: KU525032.1; *Draba aizoides*: KC814710.1.

ITS: *Pseudoturritis turrita*: JQ919845.1; *Pseudoarabis verna*: KF547397.1; *Aubrieta parviflora*: DQ357518.1; *Aubrieta glabrescens*: KC412291.1; *Aubrieta gracilis*: KU513569.1; *Aubrieta deltoidea*: LC089991.1; *Aubrieta columnae*: KF547210.1, KF547212; *Aubrieta libanotica*: KJ540407.1; *Aubrieta erubescens*: KC412290.1; *Aubrieta scardica*: KF547219.1; *Aubrieta thessala*: KF547227.1; *Aubrieta canescens*: KU513562.1; *Aubrieta pinardii*: KF547202.1; *Aubrieta scyria*: KF547146.1; *Aubrieta olympica*: KU513572.1; *Draba nuda*:

GU2025513.1; *Draba nemorosa*: DQ467361.1; *Draba rimarum*: FJ187866.1; *Draba hispanica*: DQ467449.1; *Draba pulchella*: KC412310.1; *Draba aizoides*: AF120721.1; *Draba bruniifolia*: DQ467286.1; *Draba verna*: KX166171.1; *Hafezia parvula*: HQ646618.1, FJ407224.1; *Hafezia aucheri*: FJ187881.1, HM046191.1; *Arabis caucasica*: MG234697.1; *Arabis purpurea*: JN189758.1; *Arabis alpina*: KU321355.1; *Arabis montbretiana*: KF547279.1; *Arabis graellsiiiformis*: HQ646648.1; *Arabis nordmanniana*: FJ187924.1; *Arabis christianii*: GU182044.1; *Arabis nova*: JQ919839.1; *Arabis auriculata*: KF547244.1; *Arabis bryoides*: KF547247.1; *Arabis procurrens*: FJ187880.1; *Arabis modesta*: FJ187970.1; *Arabis carduchorum*: KF547309.1; *Arabis collina*: KF547250.1; *Arabis serpyllifolia*: KC412279.1; *Arabis pterosperma*: GU182048.1; *Arabis hirsuta*: MT881090.1; *Arabis stelleri*: KF547392.1; *Arabis sagittata*: MN166463.1;

trnL-F: *Pseudoturritis turrita*: JQ919867.1; *Draba nuda*: GU202635.1; *Draba nemorosa*: DQ467040.1; *Draba pulchella*: DQ467146.1; *Draba bruniifolia*: DQ466985.1; *Draba hispanica*: DQ467077.1; *Draba aizoides*: DQ466991.1; *Draba rimarum*: FJ188012.1; *Hafezia parvula*: HQ646677.1, *Hafezia aucheri*: FJ188027.1; *Aubrieta canescens*: KC412341.1; *Aubrieta deltoidea*: KF547486.1; *Aubrieta glabrescens*: KF547491.1; *Aubrieta olympica*: OM803192.1; *Aubrieta thessala*: KF547494.1; *Aubrieta parviflora*: OM803190.1; *Aubrieta pinardii*: KF547474.1; *Aubrieta scardica*: KF547490.1; *Aubrieta canescens*: KU513584.1; *Aubrieta libanotica*: KF547467.1; *Aubrieta gracilis*: KC412347.1; *Aubrieta erubescens*: KC412345.1; *Aubrieta columnae*: KF547481.1; *Aubrieta scyria*: KF547419.1; *Pseudoarabis verna*: FJ188036.1; *Arabis caucasica*: GU181974.1; *Arabis alpina*: JF705252.1; *Arabis purpurea*: KF547412.1; *Arabis montbretiana*: FJ188011.1; *Arabis graellsiiiformis*: HQ646708.1; *Arabis nordmanniana*: FJ407242.1; *Arabis christianii*: FJ188120.1; *Arabis nova*: FJ407267.1; *Arabis auriculata*: GU182023.1; *Arabis bryoides*: KC412320.1; *Arabis procurrens*: FJ188030.1; *Arabis modesta*: GU182008.1; *Arabis carduchorum*: FJ407235.1; *Arabis collina*: KF547466.1; *Arabis serpyllifolia*: KF547650.1; *Arabis pterosperma*: KF547411.1; *Arabis hirsuta*: KF547629.1; *Arabis stelleri*: KF547661.1; *Arabis sagittata*: KF547566.1.

Table S3: List of indels (insertion/deletion) found within genetic markers (ITS, *trnL-F*, alcohol dehydrogenase, and chalcone synthase) in the clade *Aubrieta* and related clades. Indel positions, nucleotide sequences, and clade-specific distributions are listed, which provide informative variation within each clade.

Alcohol dehydrogenase (12 indels)	
Outgroup	Insertion: Bases 24-34/ 52-60/ 464-466 GTCAACGTGG/ TTCTGCTT/ AAA
Draba Clade	Insertion: Bases 1744-1746 TAC
Hafezia Clade	Deletion: Bases 1749-1757/ ATGAGAAAAA
Main Arabis Clade	Deletion: Bases 705-706 TG
Alpina & Arabis nordmanniana clade	Insertion: Bases 1467-1470/ ATCT Deletion: Bases 1534-1558 TGTGGATCTT--TGAACCTAATAC
Alpina clade	Deletion: Bases 382-389 C--TTTTT Insertion: Bases 1481-1494 TTCGACATTCTTG
Aubrieta Clade	Insertion: Bases 86-88/ Insertion: Bases 1525-1527/ GTT/ CTG or CTA
Chalcone synthase	
---	---
ITS (4 indels)	
Aubrieta Clade	Deletion: Bases 115-123/ 128-141
Hafezia Clade	Deletion: Bases 116-136
<i>Arabis stelleri</i> & <i>A. sagittata</i>	Deletion: Bases 126-133
trnL-F (6 indels)	
Hafezia Clade	Deletion: Bases 37-45
Aubrieta Clade	Insertion: Bases 156-158 TCT/TGT Insertion: Bases 377-385 TTAATTGAC

Draba Clade	Deletion: Bases 156-158 TCT/TGT Insertion: Bases 159-160 AA
Main Arabis clade	Insertion: Bases 413-419 GTAAAAT/TTAAAAT

Table S4: List of the single-nucleotide polymorphisms, and clade-specific distributions within the molecular markers, including ITS, *trnL-F*, alcohol dehydrogenase, and chalcone synthase, among the clade Aubrieta and related clades.

Alcohol dehydrogenase	
Outgroup	42-bp (C→T), 95-bp (G→A), 97-bp (T→G), 121-bp (A→G), 126-bp (A/C/G→T), 213-bp (A→T), 335-bp (A/C→T), 379-bp (A→C), 447-bp (T→A), 469-bp (G→A), 709-bp (- →G), 734-bp (T→A), 737-bp (A→T), 756-bp (G→C), 757-bp (C→A), 770-bp (T→C), 776-bp (A→G), 854-bp (C→T), 871-bp (G/A→T), 995-bp (T→G), 1149-bp (G→T), 1255-bp (T→G), 1268-bp (T→C), 1457-bp (T→C), 1564-bp (T→C), 1652-bp (G/C→T), 1823-bp (A/-/T→G)
Arabis alpina & Arabis nordmanniana Clades	773-bp (T/G→A), 941-bp (G/C/A→T), 1469-bp (- /G→C), 1495-bp (- /C→T), 1530-bp (A→T), 1709-bp (C→T)
Arabis alpina & Arabis auriculata Clades	211-bp (G→A)
Aubrieta, Hafezia clade & Draba Clades	79-bp (A→T), 821-bp (A/T/G→C), 950-bp (T→C), 1169-bp (T→C), 1267-bp (T→G)
Aubrieta & Hafezia Clades	767-bp (T→C), 1088-bp (A/T→G), 1139-bp (T→C)
Main Arabis Clade	40-bp (T/- →C), 41-bp (T/- →C), 409-bp (A→C), 808-bp (G→C), 1753-bp (-/A/G→T)
Arabis auriculata Clade	1511-bp (C→G), 1773-bp (T/- →C)
Arabis nordmanniana Clade	224-bp (G→T), 444-bp (C→T), 453-bp (A→G), 971-bp (T→G), 1227-bp (T→G), 1250-bp (T→C), 1298-bp (T→A), 1329-bp (T→C), 1385-bp (A/G→T), 1397-bp (T/G→A), 1622-bp (C→T), 1691-bp (C→T), 1759-bp (G→T), 1918-bp (-/G→A)
Arabis alpina Clade	190-bp (T/C→A), 217-bp (A→C), 229-bp (G→A), 372-bp (A→T), 378-bp (C→T), 395-bp (A/T→C), 408-bp (T→C), 848-bp (C/T→A), 1196-bp (C→A), 1297-bp (A/- →G), 1394-bp (A/G→T), 1774-bp (-/T→A)
Aubrieta Clade	83-bp (G→A), 92-bp (C/- →A), 115-bp (T/- →C), 247-bp (T→C), 377-bp (T-C), 388-bp (T→A), 471-bp (A/T→C), 707-bp (T→A), 711-bp (T→C), 800-bp (A/T→C), 932-bp (T→G), 938-bp (A/T→G), 1248-bp (T→G), 1249-bp (C→A), 1576-bp (T→C), 1636-bp (C→G), 1791-bp (A/G→C), 1903-bp (-/T→C), 1924-bp (-/G→A)
<i>Pseudoarabis verna</i>	7-bp (T→A), 232-bp (T/G→A), 327-bp (T/C→A), 830-bp (A→G), 890-bp (A→G), 893-bp (G→C), 911-bp (G/C→A), 1115-bp (T→C), 1421-bp (A→T), 1572-bp (-/T →A), 1394-bp (A/G→T), 1781-bp (-/C→A), 1784-bp (A/-/G→T), 1785-bp (-/A→T), 1811-bp (C→G), 1824-bp (T/C→A), 1867-bp (T→G), 1874-bp (G→T)
Hafezia Clade	208-bp (G→A), 393-bp (T/C/- →A), 719-bp (T/G/A→C), 989-bp (G→A), 1145-bp (A→G), 1198-bp (A→G), 1342-bp (A→G), 1403-bp (A/G→T), 1476-bp (C→T), 1601-bp (T/G→A), 1803-bp (A/-→C), 1927-bp (-/T→C)
Draba Clade	136-bp (A→T), 797-bp (T→C), 1367-bp (G→A), 1729-bp (A→T), 1925-bp (G →A)
<i>Arabis purpurea</i> & <i>A. alpina</i>	165-bp (A/T→G)
<i>Aubrieta</i>	398-bp (G/T→C), 974-bp (T→C), 1046-bp (G→T)
<i>Arabis hirsuta</i> & <i>A. stelleri</i>	1504-bp (→C), 1523-bp (A→G), 1751-bp (G→C), 1827-bp (T→G)
Chalcone synthase	
Outgroup	396-bp (C/T→A), 701-bp (C→T), 779-bp (T→G)
Hafezia & Draba Clades	274-bp (A/C/G→T)
Arabis nordmanniana Clade	262-bp (A→G)
Arabis alpina Clade	305-bp (A→C), 821-bp (T/C/G→A)
Aubrieta Clade	755-bp (T/C→A)
Hafezia Clade	283-bp (G/T→A), 295-bp (C/G/A→T), 340-bp (C→T), 463-bp (T→A), 464-bp (C→T), 484-bp (A/G→T), 487-bp (A/T→G), 495-bp (-/A/G→C), 529-bp (-/T→A), 533-bp (T→A), 728-bp (A/C→T)
Draba Clade	337-bp (C→T), 434-bp (A/T→C), 434-bp (A/T→C), 479-bp (-/A/T→G), 484-bp (A/T→G), 551-bp (G/C→A), 596-bp (G/A→T)

<i>Au. deltoids</i> & <i>Au. canescence</i>	620-bp (C→T), 638-bp (C→T), 856-bp (T→A)
<i>Au. parviflora</i>	755-bp (C/T→A)
<i>Pseudoarabis verna</i>	692-bp (T/G→A)
ITS	
Outgroup	24-bp (A→G), 102-bp (G→A), 213-bp (C→T), 291-bp (T→A), 459-bp (C→T), 464-bp (-→C), 465-bp (-→A), 539-bp (T→A)
Main Arabis Clade	144-bp (T/G→A), 413-bp (C→T)
Arabis auriculata Clade	107-bp (-→C), 125-bp (T→A), 137-bp (T→C), 242-bp (C→T), 422-bp (A/T/G→C), 475-bp (A/T→C), 627-bp (T/C→A)
Arabis nordmanniana Clade	117-bp (A→T), 148-bp (T→A), 154-bp (T→G), 169-bp (C→A), 277-bp (T→G), 469-bp (A→T), 475-bp (C/T→A), 527-bp (T/C→G)
Arabis alpina Clade	149-bp (G→T), 150-bp (C→T), 159-bp (T→C), 426-bp (C→T), 484-bp (A/G→C), 528-bp (A/C→T), 645-bp (C→T), 646-bp (C→T), 649-bp (T/A→G)
Arabis alpina Clade & Arabis nordmanniana Clade	236-bp (C→T)
Aubrieta Clade	4-bp (A→T), 5-bp (A/T→C), 55-bp (T→A), 56-bp (T/G→A), 62-bp (T→G), 103-bp (C→T), 146-bp (C→T), 242-bp (C→T), 251-bp (C/T→G), 252-bp (G→T), 283-bp (A→T), 455-bp (T→A), 476-bp (A/G→T), 545-bp (C→T), 594-bp (T→A), 610-bp (C→T)
Hafezia Clade	82-bp (C→T), 167-bp (A→T), 528-bp (A/T→C)
Draba Clade	139-bp (G→A), 145-bp (T→C), 265-bp (C→T)
<i>Arabis alpina</i> & <i>A. purpurea</i>	251-bp (T/G→C)
<i>Arabis hirsuta</i> & <i>A. pterosperma</i>	628-bp (G→T)
<i>Hafezia aucheri</i>	648-bp (T→C)
<i>Draba rimarum</i> , <i>D. hispanica</i> , <i>D. pulchella</i> , <i>D. aizoides</i> , <i>D. bruniifolia</i>	142-bp (G/A/-→T)
<i>Draba nuda</i> , <i>D. nemorosa</i> , <i>Arabis sagittata</i> & <i>A. stelleri</i>	421-bp (C→T)
<i>Pseudorabis verna</i>	58-bp (C→T), 290-bp (A→T), 608-bp (C→T)
trnL-F	
Outgroup	15-bp (A→C), 37-bp (C→T), 222-bp (A/G→C), 251-bp (T→G), 262-bp (G/T→C), 310-bp (G/A→C), 316-bp (T→G)
Hafezia & Draba Clades	143-bp (C→A)
Hafezia, Main Arabis clade & Draba clades	256-bp (-→T)
Arabis nordmanniana Clade	64-bp (T→G)
Aubrieta Clade	132-bp (C/T→A), 156-bp (-→T), 158-bp (-→T), 268-bp (-/T→A), 313-bp (C→T)
Arabis alpina clade	50-bp (A→T), 64-bp (A/C→T), 80-bp (T/C→G)
Arabis montbretiana Clade, Arabis alpina clade	60-bp (T/G→A)
Hafezia Clade	3-bp (T→C), 183-bp (C→A), 222-bp (A/C→G), 261-bp (T→G), 274-bp (-/T→C), 275-bp (C/A/T→G), 276-bp (G/-/T→G), 297-bp (C→A), 318-bp (C→A), 325-bp (T→G)
Draba Clade	17-bp (A→C), 92-bp (T→C), 109-bp (T/G→A), 146-bp (G→A), 267-bp (-/T→G), 350-bp (T→G), 433-bp (G→A)
Main Arabis Clade	407-bp (T→C), 445-bp (T/-→C)
<i>Arabis alpina</i>	293-bp (A/G→C)
<i>Drab nuda</i>	290-bp (C→G), 293-bp (C/A→G)
<i>Au. parviflora</i>	336-bp (T/C/-→A)
<i>Draba hispanica</i> & <i>D. bruniifolia</i>	307-bp (C→T)
<i>Pseudoarabis verna</i>	258-bp (T→A)