

Hesperis turkmendaghensis (sect. *Hesperis*) (Cruciferae/Brassicaceae), a new species from the Central Anatolia region, Turkey

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Hesperis turkmendaghensis A.Duran & A.Ocak **sp. nov.** (Cruciferae) is described and illustrated from Anatolia, Turkey. The species grows under mixed forest, open forest and shady slopes in Türkmen Dağı (B3 Eskişehir) in Central Anatolia. It is closely related to *H. matronalis* L. ssp. *matronalis*, an endemic confined to Central Anatolia. Diagnostic morphological characters are discussed. Notes are also presented on its ecology, biogeography and conservation status. In addition, the pollen characteristics and seed coat surface of *H. turkmendaghensis* and *H. matronalis* are examined by SEM. © 2005 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2005, 147, 239–247.

ADDITIONAL KEYWORDS: Matthioleae – taxonomy.

INTRODUCTION

The genus *Hesperis* L. (Brassicaceae) is distributed in the warm climate belt of Eurasia in south and central Europe, south-west Asia, Caucasia, Russia and mountainous regions of Western China and Mongolia. This genus has almost 55 species throughout the world (Tzvelev, 1959; Dvořák, 1980; Duran, Ünal & Pınar, 2003). Most species in Anatolia are confined to rather restricted areas of distribution. On the other hand, those occurring in moist areas are more widespread, especially in the Euro-Siberian phytogeographical region.

The genus *Hesperis* is represented with many taxa at the junction of the Irano-Turanian, Mediterranean and Euro-Siberian phytogeographical regions. The region where these three phytogeographical regions meet is Anatolia. Towards the outer boundaries of each phytogeographical region *Hesperis* is represented by fewer taxa. The number of *Hesperis* taxa in different floras also supports this view. *Hesperis* is represented with 14 species in Europe (Ball, 1964), 11

species in Iran (Dvořák, 1968), nine species in Romania (Săvulescu, 1955), five species in Iraq (Dvořák, 1980), three species in Italy (Pignatti, 1982), one species in Palestine (Zohary, 1966) and 26 species in Turkey (Duran *et al.*, 2003).

Dvořák carried out morphological, cytological and palynological studies on some *Hesperis* species (Dvořák, 1965, 1966a, b, 1973a, b). He also described numerous new *Hesperis* taxa, and carried out the revisions of the genus *Hesperis* in the *Flora of Iraq* and *Flora Iranica* (Dvořák, 1968, 1980).

The genus *Hesperis* was revised by Cullen (1965) for the *Flora of Turkey*. Six new species have since been described from Turkey, as well as four newly recorded from Turkey (Davis, Mill & Tan, 1988). In addition, three imperfectly known taxa were recorded in the *Flora of Turkey* (Cullen, 1965). In this paper, *H. turkmendaghensis* is described as a new species.

The second author (A. O.) collected some interesting *Hesperis* specimens with flowers and fruit on botanical trips to Türkmen Dağı (Eskişehir province) in the 2002 and 2003 growing seasons. The specimens were not referable to any known *Hesperis* species. Studying the specific descriptions of *Hesperis* in Ball (1964), Busch (1939), Cullen (1965), Davis *et al.* (1988),

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Dvořák (1968, 1980), Halácsy (1900), Hayek (1927), Pignatti (1982), Săvulescu (1955), Tan & Iatrou (2001), Tzvelev (1959) and Zohary (1966) as well as comparison with specimens in the herbaria ADO, AEF, ANK, BM, E, EGE, GAZI, HUB, ISTF, K, KNYA, P and WU, showed that the specimens represent a species new to science. The specimens of *H. turkmendaghensis* were examined and compared with specimens of the related species *H. matronalis* in Turkey. Examined representative specimens of *H. matronalis* from 34 localities are cited in the Appendix.

DESCRIPTION

HESPERIS TURKMENDAGHENSIS A. DURAN & A. OCAK SP. NOV. (FIG. 1)

(Sect. *Hesperis*)

Type: Turkey. B3 Eskişehir: Türkmen Dağı, Efsunbaba tepesi, 1650 m, 01.vi.2003, *A.Ocak* 3482 (holotype: KNYA, isotypes: ANK, E, GAZI, HUB, Osmangazi University Herb.).

Diagnosis: Affinis *H. matronalis* sed herba perennis (non biennes vel perennes), caules glanduliferi tantum, vel dense glanduliferi et pauce simplices pili inferne (non simplices, bifurcati et interdum pauce glanduliferi et trifidi pili), folia basalia subintegra vel minute denticulata (non plerumque denticulata ad serrata), siliquae distincte torulosae, plerumque dense glanduliferae pili, vel dense glanduliferae et raro pauce asperatae simplices pili (non plerumque glabrae vel asperatae) differt.

Description: Perennial herb. ROOTS thickened, 4–8 mm diam. STEM ± erect, 75–135 cm tall, rarely purplish below, solitary or 2–6, mostly branched with flowering part, terete, smooth, 3–12 mm diam. below, with only glandular hairs, or densely glandular and a few short and long simple hairs below, densely glandular and sparsely short simple and bifurcate mixed hairs above; long simple hairs *c.* 4 mm. LEAVES crowded in lower and middle parts of stem; basal leaves oblong to lanceolate, or oblanceolate, 8–18 × (1–) 1.5–4 cm (incl. petiole), subentire or irregularly minutely denticulate, rarely remotely and patently toothed below. PETIOLE (2–) 3–8 cm long, lamina of radical leaves attenuated into petiole at base, ± obtuse, all with main midrib conspicuous, with indumentum of glandular, simple and bifurcate hairs, or densely bifurcate and sparsely simple hairs; cauline leaves same size in middle part of stem, or decreasing size towards inflorescence, indumentum similar to basal leaves; middle cauline leaves oblong to lanceolate, often short petiolate, mostly attenuated into petiole, subentire, minutely denticulate, subacute or acute; upper cauline leaves lanceolate, rarely ovate, very shortly petiolate or ± sessile,

sometimes semiamplexicaul, subentire, denticulate to serrate, acute to acuminate. INFLORESCENCE a raceme, branches ascending to erect, 25–65 × 15–35 cm, all flowers ebracteate. PEDICELS ascending to erect, slender, 4–8 mm long at anthesis, elongating to 20 mm long at most in fruit, with glandular, bifurcate and rarely a few simple hairs. SEPALS partly greenish, inner sepal oblong-obovate, outer sepal oblong-ovate to elliptic, deciduous, with 5–8 veins, 6–7 × *c.* 2 mm, glandular and bifurcate, or only glandular hairs, and long simple and bifurcate hairs on tips, with pinkish membranous margins, inner sepals strongly saccate. PETALS obovate to spatulate, 15–18 × 4–5 mm, purplish-violet, veins rather conspicuous; limb ± obovate, tapering gradually into the claw, 7–8 mm, rounded, obtuse, horizontal to ascending; claw 7–9 × *c.* 1.5 mm, claw exerted from sepal. Outer filaments not dilated at base, 2.8–3.5 mm long, inner filaments dilated at base, 5–6 mm long, mostly whitish, rarely slightly pinkish; anthers all fertile, ± linear, 2.5–3 mm long, yellowish or greenish, basifixed. STIGMA with two obtuse, decurrent carpoid lobes. OVARY hairy. Fruiting pedicels slightly thickened, 0.6–0.7 mm diam. SILIQUAE 40–85 × 1.3–1.8 mm, ± terete, dehiscent, clearly torulose, straight or rarely slightly curved, ascending to erect, densely glandular hairs, or densely glandular and rarely a few asperous simple hairs, greenish; valves slightly broader than septum; septum mostly entirely membranous, or membranous in seed place, remaining semimembranous, with visible median veins. SEEDS brown, 2–3 × 1.3–1.6 mm (4–) 13–24 in number.

Fl. 5–6, under mixed forest, roadside in forest and shady slopes, 1500–1700 m.

Paratype: Turkey. B3 Eskişehir: Türkmen Dağı, Efsunbaba tepesi, 1550 m, 14.viii.2002, *A.Ocak* 3367 (KNYA, GAZI, Osmangazi University Herb.).

Distribution and suggested conservation status: Endemic to Central Anatolia (Eskişehir province), Irano-Turanian element. The specimens are collected in B3 Eskişehir where the species seems to be very rare and local (Fig. 2), and from an area of *c.* 3 acres. The population is not in good condition and approximately 300 specimens grow in the small area. Therefore, it should be graded as Critically Endangered (CR) (IUCN, 2001).

Ecology: Flowering in May and June, fruiting: June and July. *Hesperis turkmendaghensis* grows under mixed forest, roadside in forest and shady slopes with *Pinus nigra* Arn., *P. sylvestris* L., *Fagus orientalis* Lipsky, *Populus tremula* L., *Quercus cerris* L., *Rubus sanctus* Schreb., *Potentilla argentea* L., *Veronica*



Figure 1. *Hesperis turkmendaghensis* A. Duran & A. Ocak sp. nov. A, B, habit. C, pedicel and silique. D, petals.

serpyllifolia L., *Helichrysum graveolens* (Bieb.) Sweet, *Campanula tokurii* A.Ocak (local endemic), *Astragalus stereocalyx* Bornm. (endemic), *Saponaria chlorifolia* Kunze (endemic), *Consolida aconiti* (L.) Lindl. (endemic), *Pilosella echioides* (Lumn.) Schultz Sch. & F.W.Schultz, *Tanacetum* sp., 1500–1700 m altitude, hemicryptophyte.

Seed coat characteristics: The seed coats of *H. turkmendaghensis* and *H. matronalis* were studied by SEM, and they have different seed coat surfaces. The seeds of *H. turkmendaghensis* are, on average, 2–

3 mm long and 1.3–1.6 mm wide. The seed surface ornamentation is reticulate-verrucate (Figs 3, 4). The reticulum wall is thick (12.5 μm) and undulations traversing the interspaces. The reticulum wall is rectangular in shape. The wart is situated close to the wall (specimen no. A.Ocak 3367). The seed of *H. matronalis* ssp. *matronalis* are, on average, 1.6–3.7 mm long and 1–1.4 mm wide. The seed surface ornamentation is reticulate-verrucate (Figs 5, 6). The reticulum wall is thin (5 μm) and undulations traversing the interspaces. The reticulum wall is polygonal in shape. The wart is situated in the middle of the lumen



Figure 2. Distribution map of *Hesperis turkmenaghensis* (*), *H. matronalis* (▲), *H. verroiana* (□), *H. pseudonivea* (○), *H. hirsutissima* (■), *H. rechingeri* (△), *H. theophrasti* (★) and *H. siliquo-glandulosa* (◆).

(specimen no. A.Duran 5007). Although the reticulum wall of *H. turkmenaghensis* is rectangular and thick (12.5 µm), it is polygonal and thin (5 µm) in *H. matronalis*. The wart is situated in the middle of the lumen in *H. matronalis*, but it is situated close to the wall in *H. turkmenaghensis* (1 µm) (Figs 4, 6). In addition, the seed coats of *H. matronalis* ssp. *adzharica* were studied by SEM. *H. matronalis* ssp. *matronalis* and *H. matronalis* ssp. *adzharica* are very similar in their seed coats surfaces characteristics (Figs 7, 8).

Pollen characteristics: The pollen of *H. turkmenaghensis* and *H. matronalis* ssp. *matronalis* was studied by SEM. *H. turkmenaghensis* and *H. matronalis* are very similar in their pollen characteristics. (Table 1, Figs 9–12). In addition, the pollen of *H. matronalis* ssp. *adzharica* was studied by SEM. *H. matronalis* ssp. *matronalis* and *H. matronalis* ssp. *adzharica* are very similar in their pollen characteristics (Figs 13, 14).

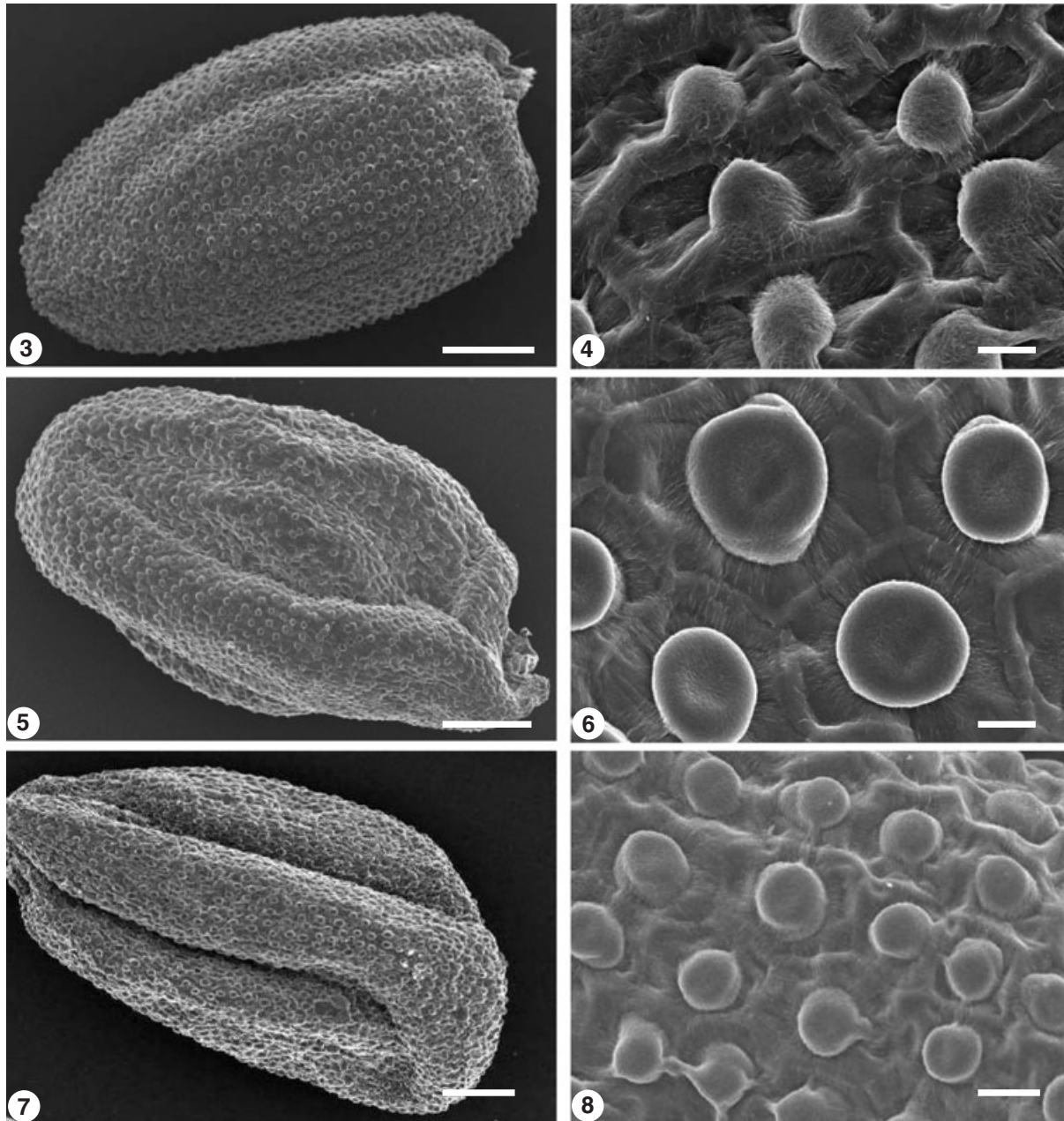
DISCUSSION AND CONCLUSION

Hesperis turkmenaghensis is included in the section *Hesperis* that contains a number of taxa that are generally not very difficult to identify, but whose status is often unclear. Most of them differ from each other in only one to two characters, which in other groups are often considered to be of doubtful taxonomic value (Ball, 1964). In the section *Hesperis*, there are eight *Hesperis* species of which six are endemic to Turkey. Eleven taxa from different genera, namely *Consolida* (DC.) S.F.Gray, *Aethionema* R.Br., *Alyssum* L., *Anthe-*

mis L., *Achillea* L., *Sideritis* L., *Salvia* L. and *Campanula* L., have been recently described from Eskişehir province in Turkey (Güner *et al.*, 2000; Ocak, 2003). Moreover, six new species from the genus *Hesperis* have been described from Anatolia (Davis *et al.*, 1988). The area is one of the floristically interesting areas of Turkey.

The glandular hairs have never been on the siliquae of the group *Hesperis matronalis*. The hair characters are reliable diagnostic features in the section *Hesperis*. Some species in the section *Hesperis*; *H. verroiana* F.Dvořák, *H. rechingeri* F.Dvořák, *H. siliquo-glandulosa* (Rohlena) F.Dvořák, *H. theophrasti* Borbás, *H. pseudonivea* Tzvelev and *H. hirsutissima* (N.Busch) Tzvelev, are similar to *H. turkmenaghensis* in having glandular hairs on the siliquae. The siliquae of the other taxa are either without glandular hairs or glabrous (Tzvelev, 1959; Ball, 1964; Dvořák, 1966c, d).

Hesperis turkmenaghensis is closely related to *H. matronalis*, which is very widespread in south and central Europe, the Balkan Peninsula, Estonia, Transcaucasia, Russia, Ukraine, Crimea, Georgia, Azerbaijan, Turkestan, West Siberia and Turkey (Fig. 2) (Duran *et al.*, 2003). It mainly differs from *H. matronalis* ssp. *matronalis* because it has siliquae with densely glandular hairs, clearly torulose, and the valve is slightly broader than the septum (not glabrous or asperulous, terete or slightly asperulous, with the valve slightly narrower than the septum). In addition, it differs from *H. matronalis* ssp. *matronalis* because it has stems and flowering parts bearing mostly glandular hairs (not simple, bifurcate and sometimes a few



Figures 3–8. SEMs of the seed coat. Figs 3, 4. *Hesperis turkmendaghensis*. 3, general shape. Scale bar = 500 μm . 4, seed coat surface. Scale bar = 20 μm . Figs 5, 6. *H. matronalis* ssp. *matronalis*. 5, general shape. Scale bar = 500 μm . 6, seed coat surface. Scale bar = 20 μm . Figs 7, 8. *H. matronalis* ssp. *adzharica*. 7, general shape. Scale bar = 500 μm . 8, seed coat surface. Scale bar = 50 μm .

glandular and trifid hairs, or only simple hairs), basal leaves subentire or minutely denticulate (not generally serrate to denticulate, and mostly irregularly and patently toothed at below), ovary with hairs (not mostly glabrous or asperous) (Table 2).

H. matronalis ssp. *adzharica* (Tzvelev) Cullen is separated by weak diagnostic characters from *H. matronalis* ssp. *matronalis*. Most features of this

taxon are the same as in *H. matronalis* ssp. *matronalis*. *H. turkmendaghensis* is similar to *H. matronalis* ssp. *adzharica*, which occurs in Georgia and Turkey (Duran *et al.*, 2003). It differs from *H. matronalis* ssp. *adzharica* because it has siliquae with densely glandular hairs (not mostly glabrous). In addition, it differs from *H. matronalis* ssp. *adzharica* because it has below and middle cauline leaves subentire or irregu-

Table 1. Pollen morphology of *Hesperis turkmenaghensis* and *H. matronalis* ssp. *matronalis* (values in μm)

Taxa	Polar axis	Equatorial axis	Pollen shape	Intine thickness	Exine thickness	Ornamentation			
						Shape	Muri width	Lumina width	Aperture type
<i>H. turkmenaghensis</i>	23	15.3	prolate-spheroidal	0.5	1.6	reticulate	0.4	1.2	tricolpate
<i>H. matronalis</i> ssp. <i>matronalis</i>	22.3	14.1	prolate-spheroidal	0.3	1.4	reticulate	0.5	1.5	tricolpate 95% tetracolpate 5%

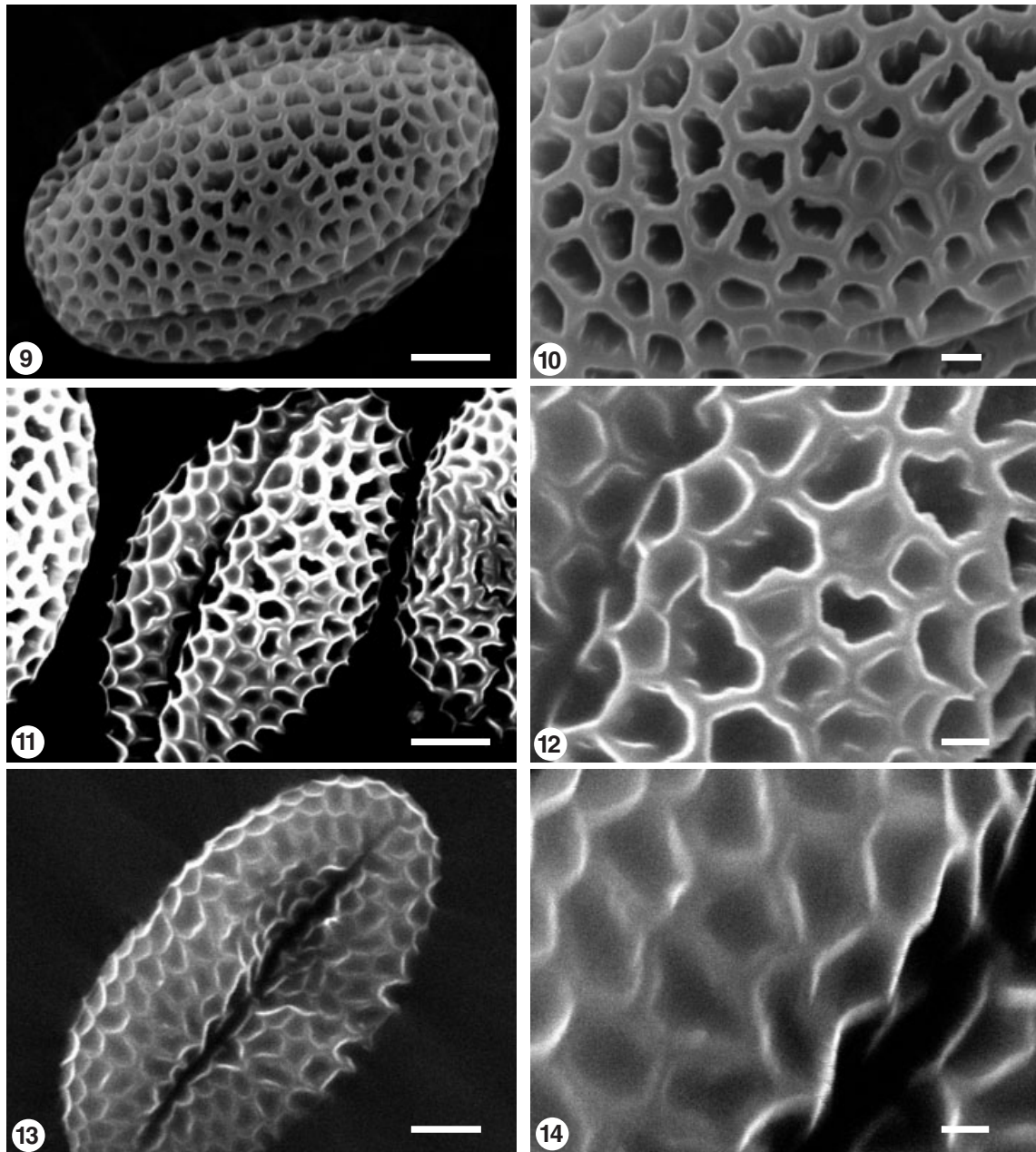
larly minutely denticulate (not entire or subentire, very thin and delicate), stems and flowering parts bearing mostly glandular hairs (not mostly simple, bifurcate and sometimes a few glandular and trifid hairs), ovary with hairs (not generally glabrous).

H. turkmenaghensis is very similar to *H. verroiana* in siliquae characters. *H. verroiana* is restricted to Greece (Macedonia), but its stems are 75–135 cm long, only glandular, or densely glandular on a few simple hairs (not *c.* 20 cm, densely branched with bifurcate-dichotomous and stalked glandular hairs), basal and lower leaves 3–8 cm, attenuated into petiole at base, or subentire, minutely denticulate, \pm obtuse (not short petiolate, lyrate, coarsely dentate, acute) and basal leaves glandular, simple and bifurcate hairs (not bifurcate).

H. pseudonivea differs in being a biennial herb, stem with long simple hairs below and short glandular hairs above, and petals white with limb rather wide. *H. pseudonivea* is distributed in West Siberia and Kazakhstan and is more closely related to *H. sibirica* L. (Tzvelev, 1959). *H. hirsutissima* differs in having stems 50–70 cm, with long simple hairs below and short glandular and bifurcate-dichotomous hairs above, all leaves entire or slightly dentate, petals white, siliquae shortly glandular or subglabrous. *H. hirsutissima* is distributed in Armenia and Azerbaijan and is related to *H. matronalis* (Tzvelev, 1959).

H. rechingeri differs in being biennial, stem unbranched, densely long glandular hairs below, and adpressed simple and bifurcate hairs above, middle cauline leaves subcordate, subamplexicaul, all leaves with densely glandular hairs, and adpressed bifurcate, dichotomous eglandular hairs only in basal part, sepals 9–10 mm. This species only occurs in Greece (Macedonia), and it is related to *H. theophrasti* (Dvořák, 1966c, d). *H. theophrasti* is also similar to *H. turkmenaghensis*, from which it mainly differs in its stem clad with long unbranched hairs, lower leaves dentate, upper leaves semiamplexicaul, \pm serrate, petals purple or pinkish, siliquae densely glandular and sparsely simple and bifurcate hairs. This species is distributed in central and northern Greece, southern Serbia and Montenegro, south-west Bulgaria, Albania, and is related to *H. turkmenaghensis* and *H. sylvestris* Crantz (Ball, 1964; Dvořák, 1966c, d).

H. siliquo-glandulosa is readily distinguished from *H. turkmenaghensis*, by its 70–80 cm stems, basal leaves lyrate, acute and dentate, cauline leaves shortly petiolate, acuminate, contracted at the base, all leaves glandular, simple eglandular hairs, bifurcate hairs in the basal part, pedicels *c.* 18 mm, sepals 8–10 mm long, petals 23–27 \times 10–11 mm, siliquae with simple and glandular hairs. This species is only distributed in Montenegro (near Kotor), and it is related to *H. turkmenaghensis*, *H. sylvestris*, *H. theophrasti*,



Figures 9–14. SEMs of pollen grains. Figs 9, 10. *Hesperis turkmendaghensis*. 9, polar view. Scale bar = 5 μm . 10, wall detail. Scale bar = 1 μm . Figs 11, 12. *H. matronalis* ssp. *matronalis*. 11, polar view. Scale bar = 5 μm . 12, wall detail. Scale bar = 1 μm . Figs 13, 14. *H. matronalis* ssp. *adzharica*. 13, polar view. Scale bar = 5 μm . 14, wall detail. Scale bar = 1 μm .

H. steveniana DC. and *H. matronalis* (Dvořák, 1966c, d; Duran, Menemen & Hamzaoglu, 2002). Diagnostic characters of *H. turkmendaghensis* with the related species *H. matronalis* are provided in Table 2. The distributions of eight species are shown in Figure 2.

The first *Hesperis* specimens were collected from Anatolia by Tournefort in 1701 and this species is currently known as *H. bicuspidata*, which was collected

by Tournefort as *H. orientalis* from north-east Anatolia (P!) (Fournier, 1866; Burt, 2001). *H. bicuspidata* mainly differs from *H. turkmendaghensis* by having leaves mostly crowded at base, entire and canescent, stems and leaves with densely bifurcate-stellate hairs, siliquae glabrous or rarely asperous.

Chromosome counting of *Hesperis turkmendaghensis* has not been carried out, but in sect. *Hesperis*, the

Table 2. Diagnostic characters of *Hesperis turkmenaghensis* with the related *H. matronalis*

Diagnostic characters	<i>H. turkmenaghensis</i>	<i>H. matronalis</i> ssp. <i>matronalis</i>
Life form	perennial always	biennial or perennial
Stems and flowering parts	mostly glandular and sometimes a few simple hairs below	simple and bifurcate and sometimes a few glandular and trifid hairs, or only simple hairs below
Basal leaves	subentire or minutely denticulate	generally serrate to denticulate, mostly irregularly and patently toothed at below
Pedicele	glandular, bifurcate and rarely a few simple hairs	simple and bifurcate, or simple, bifurcate and glandular, or bifurcate and trifid, or only bifurcate, or subglabrous
Petals	15–18 × 4–5 mm, limb 7–8 mm long	14–25 × 4–8 mm, limb 7–13.5 mm long
Ovary	hairy	glabrous or asperulous
Siliquae	clearly torulose, mostly densely glandular hairs, with visible median veins	terete or slightly torulose, mostly glabrous or asperous, with barely visible median veins
Valve	slightly broader than septum	slightly narrower than septum
Septum	mostly entirely membranous,	semimembraneous or membranous in seed location, remaining spongy
Reticulum wall of seed coat	rectangular, thick (12.5 µm)	polygonal, thin (5 µm)
Position of the wart	close to the wall	in the middle of the lumen

chromosome numbers of the related species are $2n = 14, 28$ in *H. bicuspidata* Poir., $2n = 14, 24, 28$ in *H. matronalis* ssp. *matronalis*, $2n = 12, 14, 16$, in *H. sylvestris* Crantz ssp. *sylvestris*, $2n = 14$ in *H. velenovskii* (Fritsch) Fritsch, *H. sibirica*, *H. matronalis* ssp. *adzharica* Tzvelev, *H. steveniana* DC., and *H. pycnotricha* (Löve & Löve, 1961; Dvořák, 1964, 1966e, 1973c; Dvořák & Dadakova, 1974; Dvořák & Dadakova, 1976; Duran *et al.*, 2003).

With regard to morphological characters of seed coat surface *H. turkmenaghensis* and *H. matronalis* show noteworthy differences in the reticulate wall shape, thickness and position of the wart.

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- H. matronalis* ssp. *adzharica*: TURKEY. A5 Kastamonu: Tosya-Yağcılar köyü, Karanlık dere, c. 1500 m, 12.vi.1975, *M.Kılınç* 3631 (ANK); Amasya: Akdağ, Eğribük köyü, 1700–1950 m, 16.vii.1984, *M.Koyuncu* 7267 & *F.İzgu* (AEF); A6 Giresun: Tamdere, orman sınırı, 1600 m, 2.vi.2000, taşlı yerler, 40°31.11'N, 38°20.90'E, A.Duran 5546 & *Kandemir* (ADO); A8 Rize: İkizdere-İspir arası, Ovit yaylası, c. 2000 m, 5.viii.2000, taşlı yerler, A.Duran 5574 & *Hamzaoğlu* (ADO); Rize: Çamlı taşlıhemşin, Çat-Elevit arası, 1450 m, 26.vi.1981, *Picea* açıklığı, A.Güner 3869 (HUB, ISTF); Rize: İkizdere, Dijmil (Cimil), 1866, *Balansa* 2032 (P); Kars: Yalnızçam Dağı, between Yalnızçam and Ardanuç, c. 2250 m, 16.vi.1957, rocky volcanic slopes, *D. 29675 & Hedge* (BM, ANK, E); Artvin (Çoruh): Kordevan Dağı (Yalnızçam) near Kutul yayla, 2100 m, 28.vi.1957, *Picea* forest, *D. 30205 & Hedge* (K, E); Artvin: Göktaş (Murgul), Alaca (Tiryal) Dağ, KB yamaç, Damar köyü, Dikenlik mevkii, c. 1570 m, 19.vi.1977, *A.Düzenli* 1022 (ANK); A9 Kars: 10 km from Sarıkamış to Karakurt, 2050 m, 15.vi.1966, waste places-in, *D. 46596* (K); Kars: Karaorgan, c. 1900 m, 13.vi.1957, grassy banks, *D. 29470 & Hedge* (ANK, E, K); Kars: in jugo Laganlug prope lary Komysch, 16.vi.1904, *M.Lorosky* (WU); Artvin: Ardanuç, Kutul yaylası, orman sınırı, 2000–2100 m, 20.viii.1999, nemli yerler, *A.Duran* 5001 (ADO); B9 Ağrı: Suluçam, S.end of Balık G., 2300 m, 23.vii.1966, *D. 47174* (K); C6 Hatay: Amanos: Mont de Dumanlı, 700–1200 m, 1911, *Haradjian* 3704 (K). *Georgia*. Adzharia, jugum Adzharo-Imereticum, Leknara, 1.viii.1914, *E.Kikodze* s.n. (holo. LE, photo. E, KNYA).

APPENDIX

Representative specimens examined: Hesperis matronalis L. ssp. *matronalis*: TURKEY. A1(E) Kırklareli: