

Additional revisionary actions and corrections in the *Turanana endymion* species-group (Lycaenidae)

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Abstract. The separation of *Turanana taygtica micrasiatica* ssp. n. from *Turanana taygetica endymionoides* Coutsis, 2005 is effected on the basis of their having constant external differences between them and of their being geographically isolated from one another. The sympatric occurrence of *Turanana endymion endymion* (Freyer, 1850) and *Turanana endymion ahasveros* (Bytinski-Saltz & Brandt, 1937) in Iran is discussed.

Key words. Lycaenidae, *Turanana endymion*, *T. taygetica*, taxonomy, typification, new subspecies, Greece, Turkey, Iran, Israel.

Introduction

In the revision of the *Turanana endymion* (Freyer, 1850) species-group (Coutsis 2005) the following were effected: the separation at species level of *T. taygetica* (Rebel, 1902) from *T. endymion*; the re-description of *T. endymion endymion*, *T. endymion ahasveros* (Bytinski-Saltz & Brandt, 1937) and *T. taygetica taygetica*; the description of *T. taygetica endymionoides* ssp. n., as well as the tentative placement of Turkish *T. taygetica* under ssp. *endymionoides*; and lastly the necessary typifications for all the above mentioned species-group taxa.

Later on (Coutsis 2006), a correction was carried out in respect of the true identity of *Turanana* material from Kopetdagh, Turkmenistan, originally wrongly assumed to be *T. endymion ahasveros*, and eventually correctly identified as *T. dushak* Dubatolov, 1989.

The recent obtainment of a large number of *T. taygetica* from Turkey, as well as of a few fresh individuals of *T. endymion* from Iran, led to a better and more detailed comparison between, and understanding of the various *T. endymion* species-group taxa, while at the same time it revealed the need for carrying out further revisionary actions within this species-group, as well as of making a few necessary corrections to the original revision (Coutsis 2005).

Abbreviations

ZMAN	Zöologisch Museum, Universiteit van Amsterdam
RMNH	Naturalis, National Museum of Natural History, Leiden
TL	type locality
FW	forewing
HW	hindwing
v	vein
s	space

A comparison between Turkish and Mt. Helmós *Turanana taygetica*

The original placement of both Turkish and Mt. Helmós *T. taygetica* under one ssp., i.e. *endymionoides*, was done because of insufficient comparative material from Turkey, because of the lack of material from a good many geographically intermediate areas between Greece and central Asia Minor that might have conceivably revealed the existence of an external character cline, and because of the occasional external character overlap between the Turkish and the Mt. Helmós populations.

The extensive material of Turkish *T. taygetica* now at hand suggests that the overlap in external characters is not present in a collective way, but rather involves the single character of the width of the upperside blackish marginal border of the wings.

Furthermore, the rather pronounced external differences between the geographically extremely close nominotypical *T. taygetica* and topotypical ssp. *endymionoides* (Coutsis 2005), suggests that it is highly improbable that a character cline should exist between the geographically distant and disjunct Mt. Helmós and Turkish *T. taygetica*.

The main external differences now known to exist between Turkish and Mt. Helmós *T. taygetica* are as follows:

In Turkish *T. taygetica* the hindwing upperside blackish marginal border may have a maximum width of up to about 2.0 mm (in Mt. Helmós *T. taygetica* this width never surpasses 1.3–1.4 mm), the forewing upperside blackish marginal border always invades the post-discal area of the wing basad from its apex (in Mt. Helmós *T. taygetica* this is never the case), the wings on their upperside have the veins more extensively lined in black, and the orange sub-marginal spotting on hindwing underside is as a rule more extensive.

For all the reasons mentioned above, as well as because of the geographic isolation between Greek and Turkish populations of *T. taygetica*, it is now deemed appropriate to separate Turkish *T. taygetica* from the Greek ssp. *endymionoides* and to describe it as a good ssp. in its own right.

Turanana taygetica micrasiatica ssp. n.

Material. Holotype ♂ (Figs. 2, 3), **Turkey**, Isparta province, 15 km S of Akşehir, Sultandağları, 1800 m, st. 323, 4.vii.1986 (gen. prep. no. 3931), W. O. De Prins leg., ZMAN. – Paratypes: 2♀ (Figs. 7, 8) Afyon province, 8 km SW of Dereçine, Sultandağları, 2200 m, 19/20.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN. 7♂ Isparta province, 15 km S of Akşehir, Sultandağları, 1800 m, st. 323, 4.vii.1986, W. O. De Prins leg., ZMAN. 4♂ Isparta province, 15 km S of Akşehir, Sultandağları, 1500 m, 12/21.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN. 1♂ Konya province, Akşehir, Sultandağları, 1100 m, 17/26.vii.1980, H. v. Oorschot leg., ZMAN. 1♂ Afyon province, 20 km SE of Çay, Sultandağları, 2000 m, 14.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN. 1♂ Afyon province, 8 km SW of Dereçine, Sultandağları, 2200 m, 19/20.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN (figured in Hesselbarth et al. 1995: pl. 97, fig. 58). – Additional specimens: 3♂ Konya province, Akşehir, Sultandağları, 1100 m, 17/26.vii.1980, Fam. H. v. Oorschot leg., ZMAN; 3♂ Konya province, 22 km SE of Akşehir, Sultandağları, 1600–1900 m, 29.vii.1995, H. A Coene & J. H. H. Felten leg., ZMAN; 2♂ Konya province, 6 km S of Çankaturan, 23 km SSE of Akşehir, Sultandağları, 1700 m, 20.vii.1995, H. A Coene & J. H. H. Felten leg., ZMAN; 1♂ Konya province, Akşehir, Sultandağları, 1100 m, 13/20.vii.1981, st. 0100, H. & T. v. Oorschot & H. v. d. Brink leg., ZMAN; 2♂ Konya province, 15 km S of Akşehir, Sultandağları, 1500 m, 16./19.vii.1980, H. v. Oorschot leg., ZMAN; 4♂ Afyon province, 10 km S of Çay, Sultandağları, 1300 m, 18/25.vii.1980, H. v. Oorschot leg., ZMAN; 1♂ Afyon province, 8 km SW of Dereçine, Sultandağları, 1700–2200 m, 19/20.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN; 2♂ Afyon province, 8 km SW of Dereçine, Sultandağları, 2200 m, 19/20.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN; 13♂ Isparta province, 15 km S of Akşehir, Sultandağları,

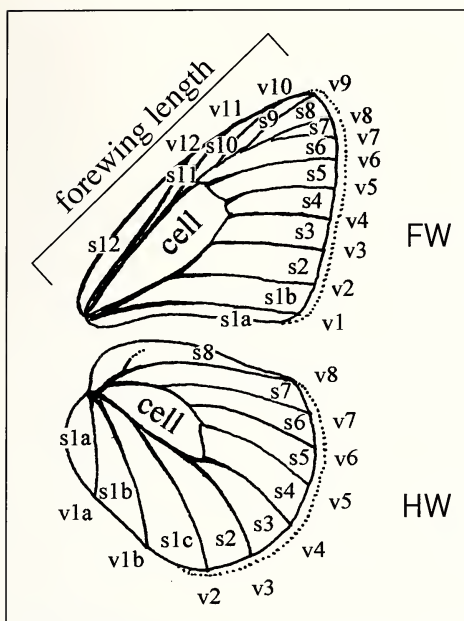


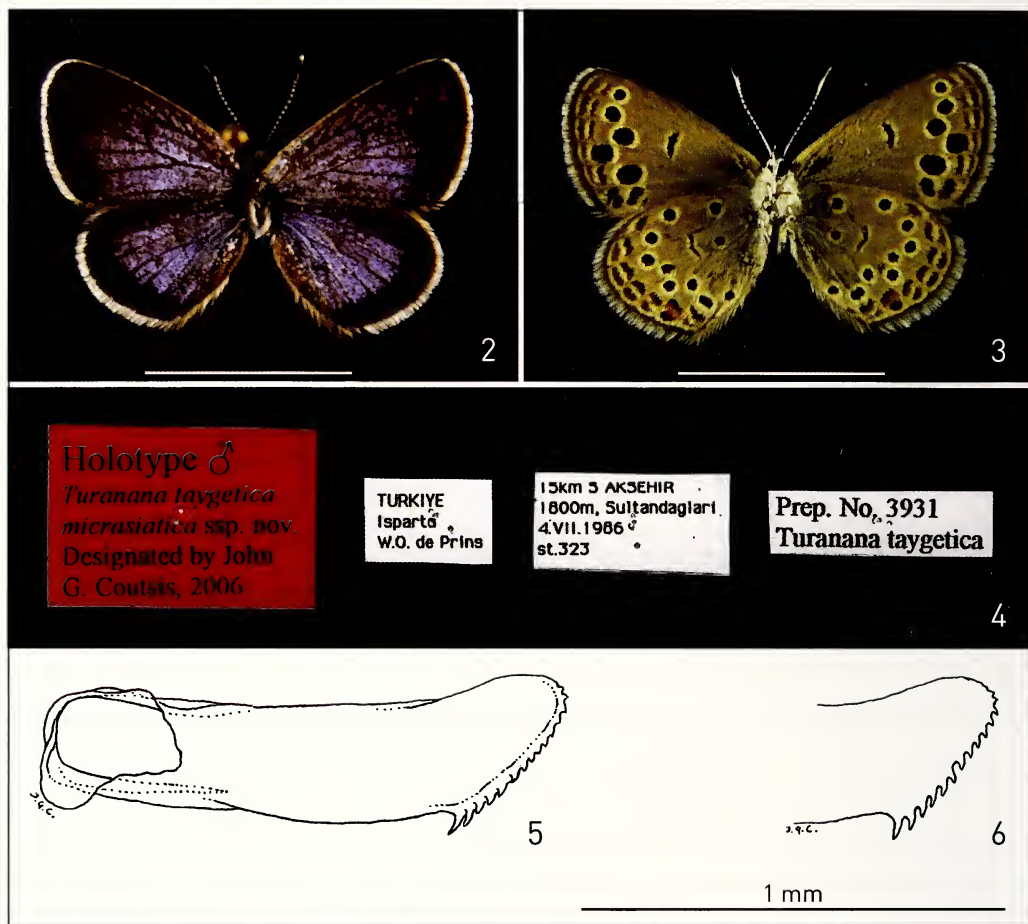
Fig. 1. Diagram of the wings of a butterfly, defining 'forewing length', and showing the cell, the veins and the inter-venal spaces of the fore- and hindwing.

1500 m, 12./21.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN; 1♂ Afyon province, 15 km SE of Çay, Sultandağları, 1400–1600 m, 14./18.vii.1981, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN; 2♂ Isparta province, 15 km S of Akşehir, Sultandağları, 1800 m, st. 323, 4.vii.1986, W. O. De Prins leg., ZMAN; 2♂ Isparta province, 10 km NE of Gelendost, Sultandağları, 1000 m, 15.vii.1980, H. v. Oorschot leg., ZMAN; 2♂ Karaman province, Sertavul Geçidi, 1500 m, 1.viii.1995, H. A. Coene & J. H. H. Felten leg., ZMAN; 1♂ Antalya province, İrmasan Geçidi, 12 km N of Akseki, 1500–1900 m, 24./27.vii.1981, H. Coene, J. Lucas & H. v. Oorschot leg., ZMAN; 1♂ Asia Minor, Taurus, coll. Snellen RMNH; 1♂ Anatolien, Ak-Chehir, 1900 m, Korb, ZMAN, 1♀ Konya province, Akşehir, Sultandağları, 1100 m, 17./26.vii.1980, H. v. Oorschot leg., ZMAN; 1♀ Isparta province, 15 km S of Akşehir, Sultandağları, 1500 m, H. & Th. v. Oorschot & H. v. d. Brink leg., ZMAN; 1♀ Asia Minor, Taurus, Lederer leg., coll. Snellen RMNH.

Description. Holotype (Figs. 2, 3). Forewing length 10.9 mm. Upperside ground-colour blue; blackish marginal borders averaging 1.8 mm in width; blackish border on forewing invading post-discal area basad from apex; wing veins thinly lined in black; apex of cell on both forewing and hindwing

marked by a fine, black stria, shaped like shallow crescent, which is weakly-defined in the former, and narrower, shorter and barely visible in the latter; fringes pure white. Underside ground-colour light grey-brown, giving impression of 'dirty and rough' texture; basal area of hindwing with faint, shiny, whitish-blue dusting; post-discal black spots on forewing large and surrounded by off-white rings; post-discal spot in s3 conspicuously displaced distad; apex of cell on forewing with fine, well-defined black-brown stria shaped like shallow crescent; both wings with double row of well-defined black-brown sub-marginal markings, the darkest (almost black) and most conspicuous being situated nearest wing margin in s2 of hindwing; space between outer and inner row of dark sub-marginal markings of hindwing filled with macroscopically conspicuous orange scaling in s1c, s2 and s3, and microscopically discernible orange dusting also in s1b and s4; post-discal black spots on hind-wing likewise surrounded by off-white rings, but smaller than their forewing counterparts; apex of cell on hindwing underside with black-brown stria shaped like shallow crescent as in forewing, but narrower and shorter than its forewing counterpart; single black spot enclosed by off-white ring also present in cell of hindwing, just basad from and slightly diagonally to dark stria of cellular apex; fringes pure white. Valva (Figs. 5, 6) 1.23 mm in length, with 14 terminal spikes present, that extend all along the valval distal margin, reaching its apex; most proximal spike decidedly the longest.

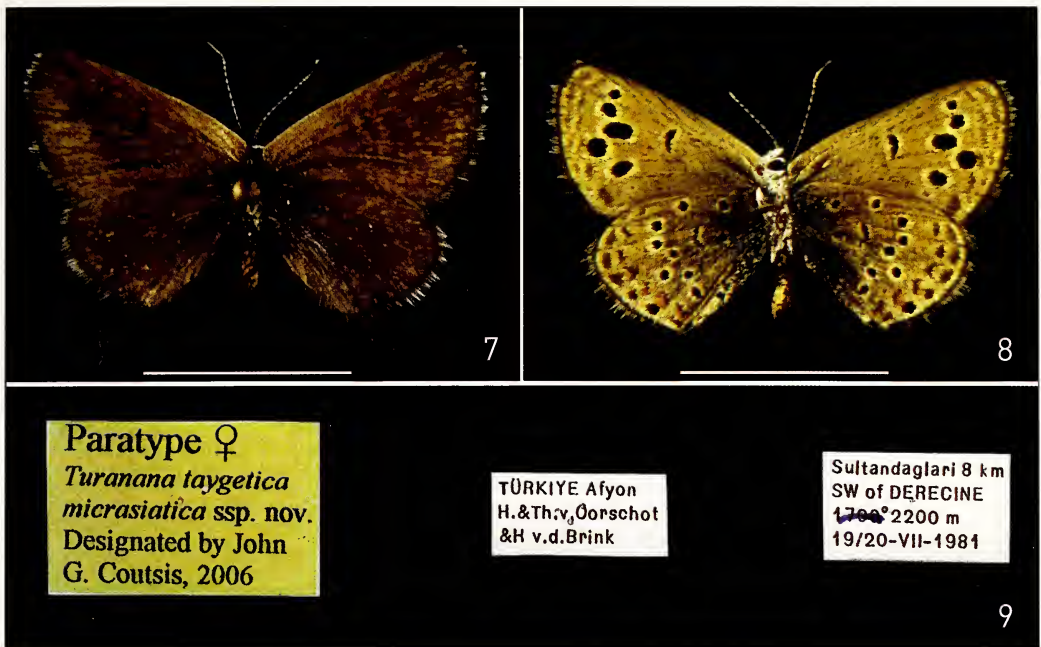
♀ paratype (Figs. 7, 8). (Due to the unavailability of fresh material, the description that follows is that of a worn specimen, and cannot be considered as being accurate in all details. The specimen chosen is from Sultandağları, a locality where only *taygetica*



Figs. 2–6. *Turanana taygetica micrasiatica* ssp. n., holotype ♂. 2. Upperside. 3. Underside. 4. Data labels. 5, 6. Right valva. 5. View of mesal wall of valva. 6. Flat view of distal part of mesal wall of valva.

flies, thus excluding the possibility of a misidentification due to a mix-up with *endymion*). Forewing length 10.8 mm. Upperside ground-colour dark brown; blue basal scaling not evident macroscopically, but scattered blue scales in evidence when viewed microscopically; outer margin of wings thinly lined black-brown; black-brown stria at apex of cell clearly evident on forewing, less so on hind-wing; remnants of fringes pure white. Underside as in male, but ground-colour slightly browner.

Variation. This is expressed in the males by their overall size (forewing length from about 9.0 mm to about 12.5 mm), by the width and degree of definition of the upperside blackish marginal border, by the extent or absence of black spotting within this border, by the degree of definition of the black stria at the apex of the cell on the hindwing, and by the degree of intrusion of the blackish marginal border into the post-discal area of the forewing, basad from its apex. On the underside it is expressed primarily by the extent of sub-marginal orange scaling and of the basal, shiny, whitish-blue dusting on the hindwing, as well as by the distance from the wing's outer margin of the hindwing



Figs. 7–9. *Turanana taygetica micrasiatica* ssp. n., paratype ♀. 7. Upperside. 8. Underside. 9. Data labels.

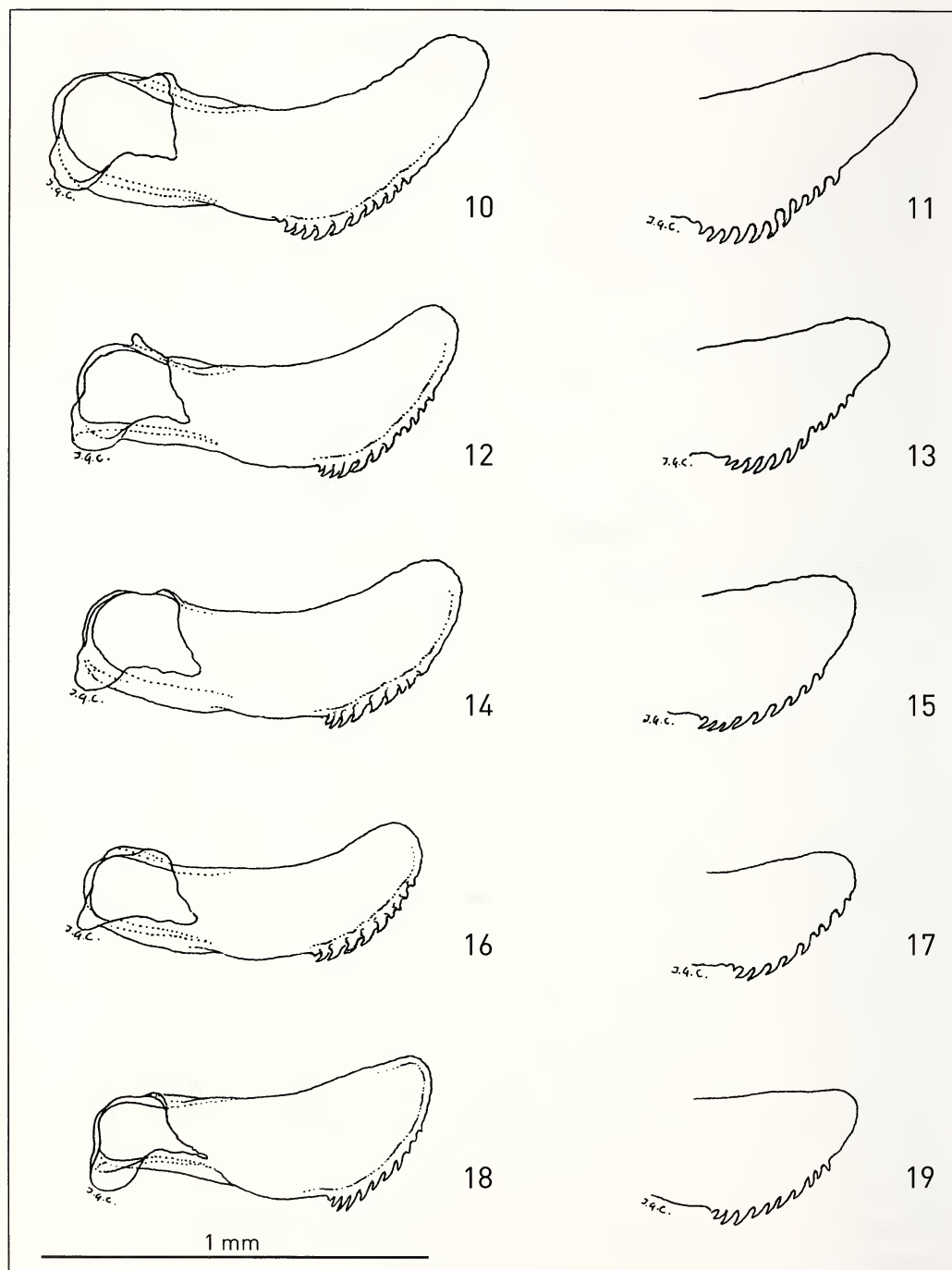
post-discal row of black spots. Variation in the females cannot be defined due to lack of sufficient material.

Male genitalia. Identical to those of nominotypical *T. taygetica* and of ssp. *endymionoides* (Coutsis 2005); right and left valvae roughly symmetrical to one another; number of valval terminal spikes varying from 11 to 25, even within a single locality, and always spreading the whole length of valval distal margin irrespective of their number; length of valva from about 1.03 mm to about 1.23 mm, proportionate to overall size of the butterfly.

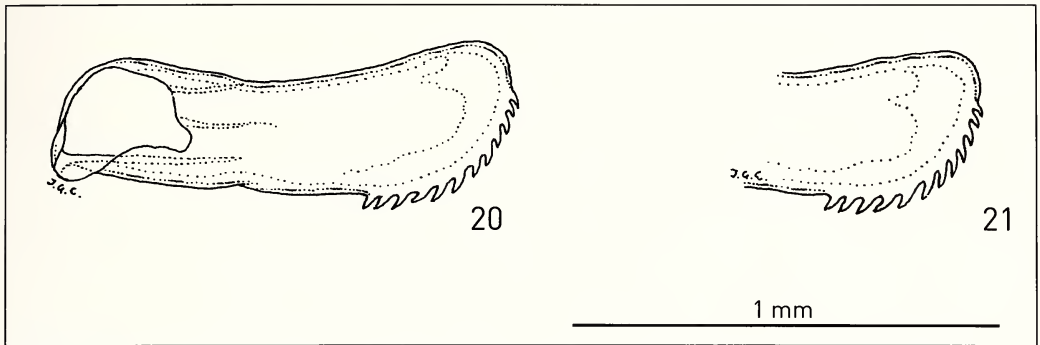
Distribution. *Turanana taygetica micrasiatica* has only been found so far in the southern part of central Asia Minor, as well as in part of the western half of Asia Minor, and namely in the Turkish provinces of Isparta, Afyon, Konya, Antalya, Kayseri, Niğde and Karaman. In one particular site, on Bolkardağları, Niğde province, it has been recorded as syntopic and synchronous with *T. endymion endymion* (Coutsis 2005). On Sultandagları it appears to be the sole *Turanana* taxon or ssp. present there.

Derivatio nominis. The name being given is derived from the latinized version of the Greek term 'Mikrá Asía', meaning Asia Minor, and its derivative 'Mikrasiatikí', meaning 'from Asia Minor'.

Diagnosis. *T. taygetica micrasiatica* may be distinguished from both nominotypical *T. taygetica* as well as from ssp. *endymionoides* by the fact that the forewing upperside blackish border always invades the post-discal area of the wing basad from its apex; it may also be distinguished from nominotypical *taygetica* by the darker upperside and underside ground-colours, by the wider, darker and more sharply defined upperside



Figs. 10–19. Right valva of *Turanana endymion* species-group taxa. **10, 12, 14, 16, 18.** View of mesal wall of valva. **11, 13, 15, 17, 19.** Flat view of distal part of mesal wall of valva. **10, 11.** *T. endymion ahasveros* from Iran, Tehran province, Resteh Ye Alborz, Ab Ali, 2500 m, 28.vii.1974, Blom leg., RMNH, specimen no. 3927. **12–21.** *T. endymion endymion*. **12, 13.** Turkey, Van province, 8–32 km N of Çatak, 1500–2200 m, 13.–19.vii.1990, Riemis & v. d. Poorten leg., ZMAN, specimen no. 3929. **14–19.** Iran, Mazandaran province, Khosh-Yeylaq, 2000–2500 m, Blom leg. 14.–17. 15./21.vi.1973, ZMAN. **14, 15.** Specimen no. 3925. **16, 17.** Specimen no. 3926. **18, 19.** Gorgan, 28.vi.–2.vii.1971, RMNH, specimen no. 3944.



Figs. 20–21. Right valva of *Turanana endymion endymion*, Israel, Hermon, 2000 m, 23.vi.1973, Benyamini leg., coll. Coutsis, specimen no. 3828. **20.** View of mesal wall of valva. **21.** Flat view of distal part of mesal wall of valva.

blackish borders, by the fact that the underside black post-discal spots are as a rule placed more basad, and by the orange sub-marginal scaling on hindwing, which is substituted by yellowish-beige in nominotypical *taygetica*. From nominotypical *T. endymion* it differs only in the male genitalia, there being no apparent external character differences between the two. From *T. endymion ahasveros* it differs both structurally as well as by external characters, in the latter case much in the way as does nominotypical *T. endymion* differ from *T. ahasveros* (Coutsis 2005). It is also worth noting that *T. endymionoides* appears to be closer externally to the geographically distant *micrasiatica* than it does to the geographically proximate nominotypical *T. taygetica*.

***T. endymion* species-group taxa from Iran and Israel**

In Coutsis (2005) it is mentioned that specimens from Mazandaran province, Iran, though externally similar to *T. endymion ahasveros*, possess genitalia that are identical to those of nominotypical *endymion*. These specimens were referred to as '*endymion ?ahasveros*'. The assumed external similarity between *T. ahasveros* and *T. ?ahasveros* was based on a misjudgment caused by the worn condition of the Mazandaran material and the faded ground-colour of the relevant specimens.

A single recently acquired male specimen from Iran, Tehran province, Resteh Ye Alborz, Ab-Ali, 2500m, 28.vii.1974, W. L. Blom leg. agrees with *T. endymion ahasveros* both in external characters, as well as in genitalia (Figs. 10, 11), these being identical to those of *T. ahasveros* figured in Coutsis (2005). Two recently acquired male specimens in fresh condition, both from Mazandaran province, Khosh-Yelaq, 2000–2500 m, 15./21.vi.1973, W. L. Blom leg., as well as one recently acquired male, likewise in fresh condition, from Mazandaran province, Khosh-Yelaq, Mt.Gorgan, 2000–2600m, 28.vi.–2.vii.1971, W. L. Blom leg., were found to possess nominotypical *T. endymion*-like genitalia (Figs. 14–19), agreeing fully with those of *T. ?ahasveros* in Coutsis (2005), and to exhibit external characters that appear closer to those of nominotypical *T. endymion*, than to those of *ahasveros* (darker blue uppersides, darker undersides and purer orange underside spotting).

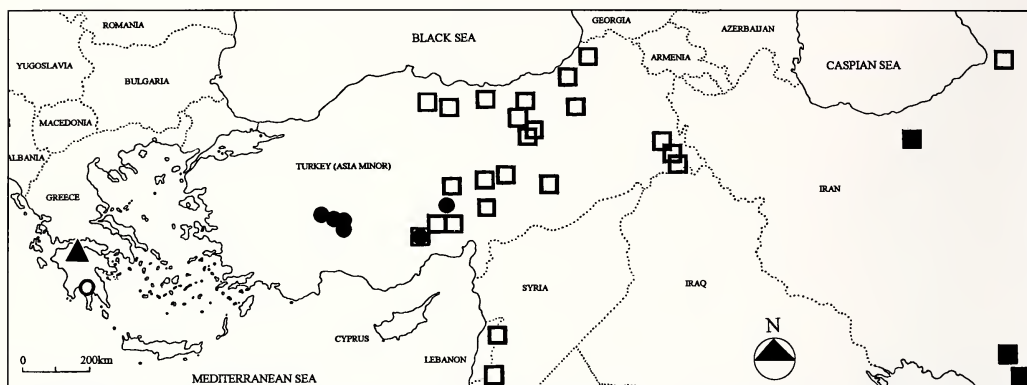


Fig. 22. Map indicating sampling localities of *T. endymion* and *T. taygetica*, based both on Coutsis (2005), as well as on present paper. □ = *T. endymion endymion*. ■ = *T. endymion ahasveros*. ○ = *T. taygetica taygetica*. ● = *T. taygetica micrasiatica*. ▲ = *T. taygetica endymionoides*.

In view of this it can now be said with a degree of certainty that in Iran *T. endymion* is represented by two structurally distinct subspecies, which in the future may conceivably prove to be separate species. The only reason for not adhering at present to this last position is that in Turkey there are rare instances whereby specimens with external characters that are similar to those of nominotypical *endymion* possess genitalia (Figs. 12, 13) that are somewhat reminiscent of those of *T. ahasveros*.

A single specimen from Israel, Hermon, 2000m, 23.vi.1973, D. Benyamini leg., which was found to possess genitalia that are identical to those of nominotypical *T. endymion* (Figs. 20, 21), is presently tentatively placed under this ssp.

Proposed taxonomic arrangements

With all present evidence at hand it is proposed that the following taxonomic arrangements be put to effect within the *Turanana* species-group.

Turanana endymion endymion (Freyer, 1850). TL: Turkey, Amasya province, 10 km SW of Ladik. Distribution: eastern half of Asia Minor, Iran (Mazandaran province), Lebanon and Israel.

Turanana endymion ahasveros (Bytinski-Saltz & Brandt, 1937). TL: Iran, Elburs Mts., Keredj. Distribution: Iran (Tehran & Fars provinces).

Turanana taygetica taygetica (Rebel, 1902). TL: Greece, Pelopónnisos, Mt. Taíyetos. Distribution: Greece, Mt. Taíyetos only.

Turanana taygetica endymionoides Coutsis, 2005. TL: Greece, Pelopónnisos, Mt. Helmós. Distribution: Greece, Mt. Helmós only.

Turanana taygetica micrasiatica ssp. n. TL: Turkey, Isparta province, Sultandağları. Distribution: so far known from south-central Asia Minor, as well as from parts of the western half of Asia Minor.

Corrections

The following corrections should be carried out in Coutsis (2005): p. 258, under heading Description, line 3: 'post-distal' should read 'post-discal'; p. 260, line 4, 'distad' should read 'basad'; p. 260, line 5, '1.26 mm' should read '1.03 mm'; p. 263, line 9, '1.27 mm' should read '1.04 mm'; p. 267, line 12, '1.59 mm' should read '1.28 mm'; p. 270, line 12, '1.48 mm' should read '1.16 mm'. The last four errors were caused by an inadvertent scale calibration mistake; the scale bars that appear in the plates, however, are correct.

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