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## A new species of the genus *Melitaea* FABRICIUS, 1807 from Iran

(Lepidoptera, Nymphalidae)

by

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**Summary:** A new species *Melitaea jitka* spec. nov. from a montane steppe locality of SW Iran is described. This taxon stands morphologically between two related species: *Melitaea perseae* KOLLAR, 1850 and *Melitaea casta* KOLLAR, 1848. The new species is very variable. It differs from both mentioned related species by a specific morphological feature of the pattern, a characteristic clouded surface of the underside of the hindwings and by a profound sexual dimorphism. Significant differences of male copulatory organs between *M. jitka* and closely related species are also noticeable. At the type locality, the species occurs together with its closest relative *M. perseae*, and also with *Melitaea gina* HIGGINS, 1941, and *Melitaea trivia* DENIS & SCHIFFERMÜLLER, 1775.

**Zusammenfassung:** *Melitaea jitka* spec. nov. wird als neue Art beschrieben. Sie stammt aus den bergigen Steppen im südwestlichen Iran. Dieses Taxon steht morphologisch zwischen *Melitaea perseae* KOLLAR, 1850 und *Melitaea casta* KOLLAR, 1848. Es unterscheidet sich von beiden Arten durch die spezifischen Merkmale der Flügelzeichnung, durch die charakteristische Nebeligkeit der Hinterflügelunterseite bei beiden Geschlechtern, durch den markanten sexuellen Dimorphismus und durch die unterschiedlichen Merkmale des männlichen Genitals. Die neue Art ist sehr variabel. Sie fliegt am Typenfundort zusammen mit den verwandten Arten *M. perseae*, *Melitaea gina* HIGGINS, 1941 und *Melitaea trivia* DENIS & SCHIFFERMÜLLER.

### Introduction

During an entomological expedition to SW Iran in June 1999 the second author found a sizable population of butterflies belonging to the *Melitaea didyma* ESPER, 1779-group. The specimens are morphologically and superficially quite different from two other related species *Melitaea perseae* KOLLAR, 1850 and *Melitaea casta* KOLLAR, 1848, so that we decided to describe them as a new species:

### *Melitaea jitka* spec. nov.

We named this taxon in honour of the girlfriend of the second author.

### Material

Holotype ♂: SW Iran, Buyer Ahmed-Kuhgiluyeh prov., Yasuj reg., Dinar Mts. 2600–2700 m, 16.–17.VI.1999, leg. MAJOR, in coll. Nat. Mus. Prague (colour plate V, figs. 1, 3).

Paratypes: 15 ♂♂, 16 ♀♀ of typical form, and 6 ♂♂ f. *perseides* f. nov., 3 ♂♂ f. *castoides* f. nov., 2 ♀♀ f. *decolorata* f. nov., 2 ♀♀ f. *ochracea* f. nov. leg. MAJOR and in coll. MAJOR, D. WEISS and

Nat. Mus. Prague; 9 ♂♂ and 19 ♀♀ of typical form, leg. et coll. BIEBER, 6 ♂♂, 4 ♀♀ of typical form, and 2 ♀♀ f. *ochracea* f. nov., 2 ♀♀ f. *decolorata* f. nov. leg. et coll. J. KLÍR, same data as holotype (colour plate V, figs, 2, 4; colour plate VI).

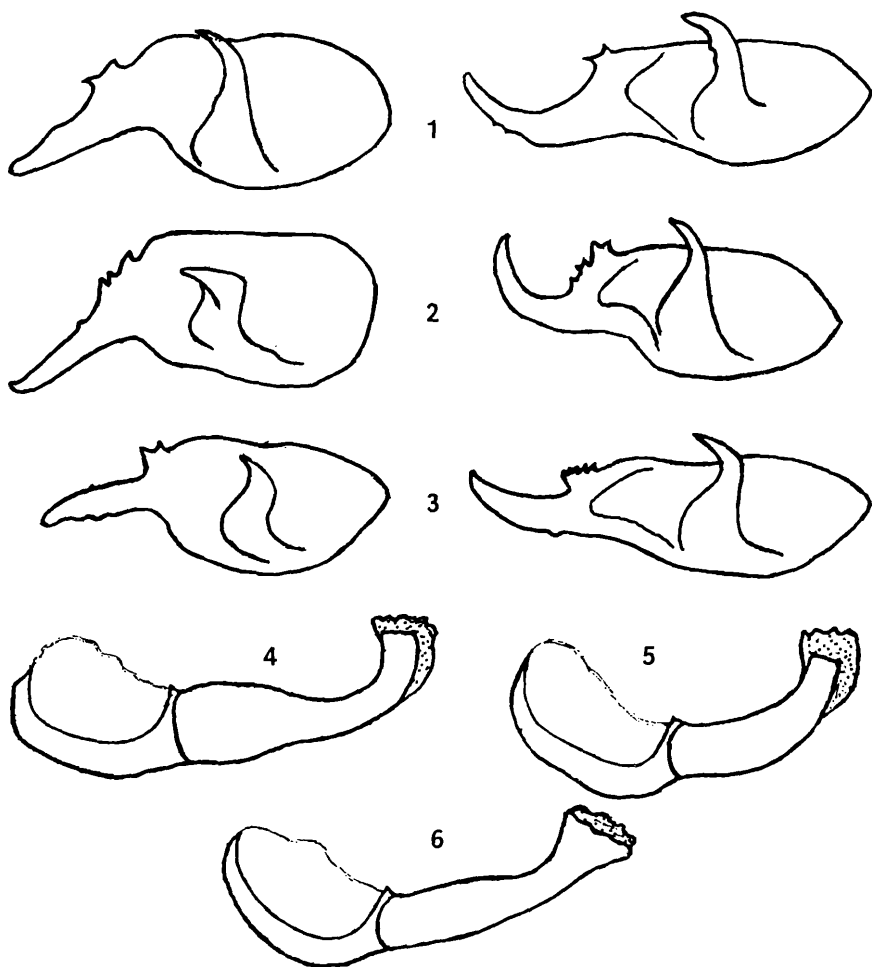
### Description

Male: Forewing length 18–20 mm, wingspan 33–35 mm. The forewing apex is rounded as in *M. casta*. The superficial character of the upperside marking resembles *M. perseae*, but the underside is similar to *M. casta*. The ground colour of the dorsal wing surface of *M. jitka* is pale beige-orange, and not clear yellow-orange or orange as in *M. perseae*. The black marking is greatly reduced and the black spots are very small and sparse, so that the whole pattern is less marked than that of *M. perseae*.

There is no conjunction of the spots, as in *M. casta*. The intensity of the basal black shade is variable. The black border line is extremely narrow. The marking of the hindwing underside does not show through the dorsal wing surface of the hindwings as in *M. perseae*. The upper-side marking of the discal field on both wings is nearly obliterated. The discal spot is absent. The subcostal oval spots are usually well developed. The underside of the forewing is decorated by clear white nuclei. This feature is typical for *M. gina*, but rare in *M. perseae*. The ground colour of the hindwing upperside is the same as that of the forewing apex. Its shade is cream-beige to yellowish cream just like in *M. casta*, and not cream-white like in *M. perseae*. The spots of the marginal series are very small. There are nebulous orange submarginal fascia on the upper side of the hindwings. These fascia are formed by the bordered series of very narrow, wiry grey-black lunules. The basal orange band is completely broken. The whole ventral wing surface of the hindwing is nebulously covered by a pale yellowish tint.

Female: Forewing length 21–25 mm, wingspan 33–44 mm. All female specimens are extremely variable. The upperside somewhat resembles females of *M. gina* and *Melitaea perseae afghana* HEYDEMANN, 1954. The upperside ground colour varies from pale ochre-yellow to an ochre-orange tint. The forewings are more ochre-yellow coloured. There are some females with a uniform ochre-orange coloration resembling females of *M. gina*. The veins of typical specimens are dark ochre-orange dusted. The black marking of the females is much more complete than that of the males. The pattern, especially on the forewings, is highly extended and denser. The discal spot is well developed. There are three distinct discoidal lunules in the discal cell. The subcostal oval spots are large. The lunar submarginal spots forming a series on hindwings are strongly enlarged as in *M. gina*. Occasionally, a second series of sharpless gray lunar spots parallels the first series. The marginal line and the series of contiguous spots are bright and mutually connected.

The ground colour of the forewing upperside resembles the dorsal wing surface. The apex is cream-white coloured and the colour penetrates into the tornal area. The black marking is strongly developed with large subcostal spots, which may contain clear white nuclei. The ground colour of the ventral hindwing surface is monotonous and the colour has the same shade as the forewing apex. The pattern is reduced, less marked and almost nebulous in most specimens. The basal area contains a system of small broken lines. The orange submarginal fascia are bordered by a series of more or less developed black narrow lunules. Orange parts are scarcely marked. In the medial area, there is a series of wiry lunar spots. This series is often unmarked, and usually incomplete. Specimens with hind wing underside totally unmarked are very rare.



Figs. 1-6: Male genitalia of the related species. Bilateral view of claspers (figs. 1-3 - lateral view on the left, ventral view on the right). Aedeagus (figs. 4-6 - lateral view). Fig. 1: *Melitaea jitka* spec. nov.; fig. 2: *Melitaea perseae* (same data as holotype of *M. jitka* spec. nov.); fig. 3: *Melitaea casta* (data see colour plate V); fig. 4: *Melitaea jitka* spec. nov.; fig. 5: *Melitaea perseae* (same data as holotype of *M. jitka* spec. nov.); fig. 6: *Melitaea casta* (data see colour plate V).

#### Variability

There is a limited number of males with orange ground colour and enlarged markings on the upperside of both wings. This form is superficially similar to *M. perseae*, so we name it *f. perseides* f. nov. (colour plate VII, figs. 1, 2).

There are also some male specimens with strongly reduced pattern. The orange submarginal fascia on the upperside nearly disappear in the pale ground colour, making the overall appearance of these specimens very similar to *M. casta*. Thus, we name these as f. *castoides* f. nov. (colour plate VII, figs. 3, 4).

The next male form of *M. jitka* is f. *unicolora* (comb. nov., stat. nov., D. WEISS, 1990). It was originally described from a single specimen as an individual or temperature form of *M. persea* with the note, that it could represent a new species of the genus *Melitaea*. This form is probably very rare. The upperside pattern is completely absent and the hindwing underside is similar to f. *castoides* f. nov.

Females of *M. jitka* are extremely variable. There are some specimens with a very pale cream-yellow ochre colour of the dorsal surface. These we name as f. *decolorata* f. nov. (colour plate VII, figs. 7, 8).

The next form is f. *ochracea* f. nov. (colour plate VII, figs. 5, 6). The ochre orange coloration of the upperside of both wings resembles *M. gina*.

#### Male genitalia

We have examined the male genitalia of six specimens of *M. jitka*. They are somewhat variable and generally close to those of *M. didyma* ESPER, 1779 and other related species of the *M. didyma* group. Nevertheless the genitalia of *M. jitka* stand morphologically between *M. persea* and *M. casta* (figs. 1–6). The posterior process of *M. jitka* is somewhat wider compared to *M. persea*. It is less curved and somewhat shorter with only one to two spines. The second spine (if at all developed) is usually shorter. The aedeagus is slightly extended in the medial area as in *M. casta*, but it is narrower and more curved in the apex.

#### Ecology and biocenose

The type locality of *M. jitka* spec. nov. lies in the Yasuj region near the town of Meymand. The habitat is situated on the northern slopes of the Dinar Mts. at 2600–2700 m. The biotope is an arid stony steppe. The basal geological formation is crystallinicum, represented mainly by gneisses and micaschist. The foot of the mountains is formed by limestone. Both formations come in contact at the locality, which is a protected Natural Reserve with an original vegetation. *M. jitka* appears to be a very local species. Specimens were observed only on a total area of about 100 m × 200 m. They do not depart from their biotope, which gradually blends through a steppe forest into an oak forest. The biotope is mostly covered by vegetation. The dominant plants are grasses mixed with various plants, e. g. *Scabiosa*, *Carduus*, *Ferrula*, *Eryngium*, *Knautia*, as well as bushes of *Crataegus*, *Caragala*, *Astragalus*, and other xerotherm steppe plants. Specimens of *M. jitka* fly low above the ground by placid gliding flight like *M. didyma*. They perch on the ground or low vegetation. They also visit flowers, especially Compositae.

At the type locality *Melitaea persea*, *gina*, *trivia*, and *cinxia*, LINNAEUS, 1758 fly together with *M. jitka* spec. nov.

At the collecting time *M. persea* was past the peak of its flight and very worn. It appears, that at the type locality the flight period of *M. jitka* starts in early June. Specimens collected 16. and 17. June are mostly shabby, especially males. A second brood in late July is quite possible.

### Acknowledgements

The authors would like to thank their colleagues Ing. JIŘÍ KLÍR and LUBOŠ BIEBER for valuable information concerning the type locality, and to Ing. PAVEL ŠKALA for technical help with this manuscript.

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### Explanation of colour plate V (p. 391):

Fig. 1: *Melitaea jitka* spec. nov., holotype ♂, wingspan 32 mm.

Fig. 2: *Melitaea jitka* spec. nov., paratype ♀, wingspan 43 mm

Fig. 3: *Melitaea jitka* spec. nov., holotype ♂ (underside).

Fig. 4: *Melitaea jitka* spec. nov., paratype ♀ (underside).

Fig. 5: *Melitaea casta*, ♂, SW Iran, prov. Fars, Zagros Mts. Dasht Arzhan 2500 m, 8.–10.VI. 1999, leg. MAJOR; wingspan 30 mm.

Fig. 6: *Melitaea casta*, underside of specimen of fig. 5.

Fig. 7: *Melitaea casta*, ♀, SW Iran, prov. Fars, Zagros Mts. Dasht Arzhan 2500 m, 8.–10.VI. 1999, leg. MAJOR; wingspan 32 mm.

Fig. 8: *Melitaea casta*, underside of specimen of fig. 7.

Fig. 9: *Melitaea gina*, ♂, same data as holotype of *M. jitka* spec. nov.; wingspan 33 mm.

Fig. 10: *Melitaea gina*, underside of specimen of fig. 9.

Fig. 11: *Melitaea gina*, ♀, same data as holotype of *M. jitka* spec. nov.; wingspan 40 mm.

Fig. 12: *Melitaea gina*, underside of specimen of fig. 11.

1	5	9
2	6	10
3	7	11
4	8	12

Explanation of colour plate VI (p. 393):

*Melitaea jitka* spec. nov., series of paratypes.

Explanation of colour plate VII (p. 395):

Figs. 1–8: The forms of *Melitaea jitka* spec. nov.

Fig. 1: ♂, f. *perseides* f. nov.; wingspan 31 mm.

Fig. 2: ♂, f. *perseides* f. nov., underside of the same specimen.

Fig. 3: ♂, f. *castoides* f. nov.; wingspan 33 mm.

Fig. 4: ♂, f. *castoides* f. nov., underside of the same specimen.

Fig. 5: ♀, f. *ochracea* f. nov.; wingspan 37 mm.

Fig. 6: ♀, f. *ochracea* f. nov., underside of the same specimen.

Fig. 7: ♀, f. *decolorata* f. nov.; wingspan 37 mm.

Fig. 8: ♀, f. *decolorata* f. nov., underside of the same specimen.

Figs. 9–16: *Melitaea perseia*.

Fig. 9: ♂, same data as *M. jitka* spec. nov.; wingspan 35 mm.

Fig. 10: underside of the specimen of fig. 9.

Fig. 11: ♂, Iran, Elborz Mts., Tehran prov., Kendevar Valley, Nesa,

2500 m, 3.VI.1999. leg. MAJOR; wingspan 35 mm.

Fig. 12: underside of the specimen of fig. 11.

Fig. 13: ♂, Turkey, Birecik 700 m, 6.V.1994, leg. MAJOR; wingspan 32 mm.

Fig. 14: underside of the specimen of fig. 13.

Fig. 15: ♀, Turkey, Hakkari, Zap Tal, 5.VII.1984 leg. HUBER; wingspan 35 mm.

Fig. 16: underside of the specimen of fig. 15.

1	3	5
2	4	6
7	9	11
8	10	12
13	15	
14	16	

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## Colour plate V

WEISS, D. & V. MAJOR: A new species of the genus *Melitaea* FABRICIUS, 1807 from Iran (Lepidoptera, Nymphalidae). - *Atalanta* 31 (1/2): 123-128.

Fig. 1: *Melitaea jitka* spec. nov., holotype ♂, wingspan 32 mm.

Fig. 2: *Melitaea jitka* spec. nov., paratype ♀, wingspan 43 mm.

Fig. 3: *Melitaea jitka* spec. nov., holotype ♂ (underside).

Fig. 4: *Melitaea jitka* spec. nov., paratype ♀ (underside).

Fig. 5: *Melitaea casta*, ♂, SW Iran, prov. Fars, Zagros Mts. Dasht Arzhan 2500 m, 8.-10.VI. 1999, leg. MAJOR; wingspan 30 mm.

Fig. 6: *Melitaea casta*, underside of specimen of fig. 5.

Fig. 7: *Melitaea casta*, ♀, SW Iran, prov. Fars, Zagros Mts. Dasht Arzhan 2500 m, 8.-10.VI. 1999, leg. MAJOR; wingspan 32 mm.

Fig. 8: *Melitaea casta*, underside of specimen of fig. 7.

Fig. 9: *Melitaea gina*, ♂, same data as holotype of *M. jitka* spec. nov.; wingspan 33 mm.

Fig. 10: *Melitaea gina*, underside of specimen of fig. 9.

Fig. 11: *Melitaea gina*, ♀, same data as holotype of *M. jitka* spec. nov.; wingspan 40 mm.

Fig. 12: *Melitaea gina*, underside of specimen of fig. 11.

1	5	9
2	6	10
3	7	11
4	8	12

Colour plate V





Colour plate VI

WEISS, D. & V. MAJOR: A new species of the genus *Melitaea* FABRICIUS, 1807 from Iran (Lepidoptera, Nymphalidae). – *Atalanta* **31** (1/2): 123–128.

*Melitaea jitka* spec. nov., series of paratypes.

### Colour plate VI



Colour plate VII

WEISS, D. & V. MAJOR: A new species of the genus *Melitaea* FABRICIUS, 1807 from Iran (Lepidoptera, Nymphalidae). – *Atalanta* 31 (1/2): 123–128.

Figs. 1–8: The forms of *Melitaea jitka* spec. nov.

Fig. 1: ♂, f. *perseides* f. nov.; wingspan 31 mm.

Fig. 2: ♂, f. *perseides* f. nov., underside of the same specimen.

Fig. 3: ♂, f. *castoides* f. nov.; wingspan 33 mm.

Fig. 4: ♂, f. *castoides* f. nov., underside of the same specimen.

Fig. 5: ♀, f. *ochracea* f. nov.; wingspan 37 mm.

Fig. 6: ♀, f. *ochracea* f. nov., underside of the same specimen.

Fig. 7: ♀, f. *decolorata* f. nov.; wingspan 37 mm.

Fig. 8: ♀, f. *decolorata* f. nov., underside of the same specimen.

Figs. 9–16: *Melitaea perseae*.

Fig. 9: ♂, same data as *M. jitka* spec. nov.; wingspan 35 mm.

Fig. 10: underside of the specimen of fig. 9.

Fig. 11: ♂, Iran, Elborz Mts., Tehran prov., Kendevan Valley, Nesa, 2500 m, 3.VI.1999. leg. MAJOR; wingspan 35 mm.

Fig. 12: underside of the specimen of fig. 11.

Fig. 13: ♂, Turkey, Birecik 700 m, 6.V.1994, leg. MAJOR; wingspan 32 mm.

Fig. 14: underside of the specimen of fig. 13.

Fig. 15: ♀, Turkey, Hakkari, Zap Tal, 5.VII.1984 leg. HUBER; wingspan 35 mm.

Fig. 16: underside of the specimen of fig. 15.

1	3	5
2	4	6
7	9	11
8	10	12
13	15	
14	16	

Colour plate VII



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