

Melitaea britomartis Assmann, with Special Regard to its Occurrence in Hungary

By L. Issekutz & L. Kovács, Budapest

Of all palaeartic Lepidoptera maybe none caused as much trouble to investigators as the *athalia*-group of the genus *Melitaea*. The external features of the species belonging here resemble each other to such extent that even a skilful worker falls victim to errors.¹

There are three species in the *athalia*-group of *Melitaea*, occurring also in Hungary, concerning the identification of which problems now and anon appear in literature: *athalia* Rott., *parthenie* Bkh. (*aurelia* Nick.), and *britomartis* Assm. Though, since some decades, it is an indubitable fact that we have to deal here with three distinct species, eminently differing in the anatomical structure of their copulatory organs, the question could not reach a satisfactory settling, even to day. Besides false determinations in sundry collections, even authors happen to take notice of two distinct species only, *athalia* and *aurelia* (*parthenie* to day), relegating *britomartis* to this latter, mostly as a variety or form,² notwithstanding the fact that the investigations of the Russian author, Sushkin, have finally cleared up this question in 1913. Sushkin made slides of the male copulatory organs of all three species, publishing his results both in writing and drawings. The correctness of his statements were justified by later researches.

If we raise the question why this result was not universally accepted by lepidopterists, we can offer several answers. Urbahn indicates, very correctly, one of the causes; when he says that the big summarizing works serving mostly for the orientation of the lepidopterists, namely, Spuler's and Seitz's, were issued directly before the clarification of the problem, thereby representing and spreading the older and obsolete point of view. Another cause of the survival of the antiquated notion is the belief of some lepidopterists, that Lepidoptera can, in every case, be unerringly determined by external macroscopic characters alone. Enlarged knowledge has, however, taught workers that to correctly separate specimens of nearly related species with similar external features, also microscopic characters must be taken into consideration. Such species are *Melitaea athalia* Rott., *parthenie* Bkh., (*aurelia* Nick.) and *britomartis* Assm.

With regard to the *athalia*-group, no original research was carried on in Hungary as yet. Our literature recognizes of the species belonging here *athalia* and *aurelia* (now *parthenie*) only, till 1866. Mann, Viennese lepidopterist, mentions first in 1867 that he caught *britomartis* in Hungary, with the result that our collectors began to pay attention to this butterfly. Some of them earnestly believed to have caught it, as witnessed by their insects relegated under the name *britomartis*. It could be established later that never a Hungarian *britomartis* was, left to us from the Hungarian collectors of the XIX century, the oldest specimen dating back to 1908. The *britomartis* of our elders was generally a darker form of *athalia*, rather frequent in our surrounding mountains. We cannot say that they did not try to conscientiously clarify what *britomartis* was really like. This is borne out by the fact that the proprietors of the larger collections acquired butterflies believed to be *britomartis* from abroad: they did not, however, get far by this method as, in what they received, there were to be found in equal portions, *athalia*, *parthenie*, indeed, sometimes *britomartis*, too.

¹ So, for instance, Hormuzaki was engaged for some decades in this problem, yet Urbahn found lately several errors in his determinations.

² Bergmann, in his work »Gross-Schmetterlinge Mitteleuropas«, speaks even now of *aurelia* f. *britomartis*, in 1952!

At the time, when our collectors began to busy themselves with the problem of the occurrence of *britomartis* in Hungary, an important change in the taxonomical valuation of this species took place. Its discoverer, A s s m a n n, judging correctly, described it as a distinct species in 1847, and his contemporaries joined in his view. S t a u d i n g e r, however, relegated it as a variety to *aurelia* (now *parthenie*) in the second edition of his well-known Catalogue of Lepidoptera, in 1871. With regard to the fact that his opinion carried much weight in the taxonomic evaluation of palaearctic lepidoptera, *britomartis* was regarded as a variety of *aurelia* also in Hungary. So it was mentioned by the Fauna Regni Hungariae in 1896, and by L. A b a f i - A i g n e r in his work »Magyarország lepkéi«. A b a f i - A i g n e r knew, in all probability, the work of H o r m u z a k i on the *athalia*-group, as he presents var. *dycinnoides* Horm. under the title *aurelia*, both in the above mentioned work as in his »Magyarország pillangói«. In every case, he does not mention that H o r m u z a k i was not convinced on the rightness of S t a u d i n g e r's sentiments with regard to the *athalia*-group, indeed, that he tended to recognize *britomartis* as a distinct species, — but on the other hand he proved to have interpreted rightly the characters of the *britomartis* of A s s m a n n.

The first, indubitably Hungarian, *britomartis* specimens were caught by A. S c h m i d t, the erstwhile Keeper of the Lepidoptera Collection of the Hungarian Natural History Museum in the Mts Bakony, and by A. K i s s, teacher in Sárospaták, in Sárospaták, in the summer of 1908. These did not attract much attention which is to be explained, besides the mix-up about the right interpretation, by the fact that the majority of *britomartis* of the Central Mountains resembles *parthenie* (flying at the same places) to a perplexing degree. We met with specimens in greater numbers from the end of the 'twenties only, from the time when intensiver collecting was carried on also in the Central Mountains. As a result, *britomartis* was found in more and more localities, but no momentum appeared either in the 'twenties or in the 'thirties which should have facilitated their identification. The collected *britomartis* were still believed to be *parthenie* not only in regard to determination but also in keeping only fresh specimens, throwing away other individuals as a well-known and common butterfly.

The solving of the problem of the Hungarian occurrence of *britomartis* was the result of a collecting in a place formerly not much frequented. One of the authors caught about one and a half dozen *Melitaea* species of a more colored underside than the Central Mountainous form of *parthenie*, which it rather resembled, on the side of Mt. Nagykevély, looking on Budakalász, in 1943. Regarding the differences, these insects had to be separated from *parthenie*, with an endeavour to secure further material. As a result of the investigations carried on in this district, a teeming *Melitaea* population was successfully discovered in a relatively small area on the Szentendre side of the Kőhegy, a few kilometres distance from the former collecting place, in 1946. In the material collected here, — consisting indubitably of the same species, — there were found some specimens resembling the Budakalász ones. Though we had now ample material at our disposal to continue researches, the case was further assisted by a possibility to examine the material of the Natural History Museum. In this material we came to know the *britomartis* of the Kaposvár area, displaying much more the »dycinnoid« characters mentioned by A s s m a n n than those found in the Central Mountains. This is the cause why the collectors residing in Kaposvár held the majority of them to be *diamina* (*dycinna*).

Examined material and methods

After having found, on the ground of the external features, the Hungarian inhabitation of *britomartis* an indubitable fact, it was yet left to support our conclusions by the examination of the copulatory organs. The first aim of our researches into the structure of the genital armature was to be able to precisely separate the *britomartis* of the Central Mountains from *parthenie* (in this aspect we had not troubles with the Kaposvár material). The borderline questions with regard to *athalia* were not complicated, the special features of our Hungarian specimens rather well distinguish them from the other two species. They are characteristically large and rounded, with many other important differences also in minor points. The single spots of the first row are extensive on the forewings, sometimes almost touching, the black color intruding only as a fine separating line amongst the neighbouring spots. The spots of the third row (sensu A s s m a n n) on the underside of the hindwings are large, rather rounded, the yellow of the light spots are of a quite dissimilar tone than those of the two other species. Contrarily, among *britomartis* and *parthenie* specimens of the Central Mountains, some happen to resemble each other in aspect of color and pattern to such extent that they do not strike out against the respective series even when changed-up. The character given in respect to the color of the palpus (russet hairs in the palpus of *parthenie*, with no such hairs in *britomartis*)

is generally of good service, but not valid in every case. In the case of such intermediate specimens we have always relied on genitalic examinations.

For the base of our detailed examinations we have selected the paper of Verity on the *athalia* group of the genus *Melitaea*. This work took into account not only every other paper published hitherto in this regard, but summed up its material systematically and very comprehensively, illuminating its theme by numerous figures. So, for instance, also the differences in the copulatory organs of the three species. Of course, we have referred to every relevant item of literature, primarily to the original descriptions of the *britomartis* races. For our detailed examinations we had use of five Hungarian collections. In aspect of collecting localities, the material of the Hungarian Natural History Museum is the richest, having not only inland material but foreign, too. The other collections, taken into account, were those of Fabricius, Gergely, Issekutz, and L. Kovács, preserving *britomartis* material from our country.

Copulatory organs

For the sake of comparison, slides were made of all three species. On the examination of the preparations, we rest content that they give sure and faultless fundamentals for the separation of the three species, in regard also of the Hungarian material. The Uncus of *athalia* is always longer and more slender than even the longest *britomartis* uncus, though also other details prove unquestionably the distinctness of the two species. So, the Tegumen of *athalia*, of a trapezoid shape, is always lower with a well observable protrusion on both its sides, whilst the tegumen of *britomartis* is high, with a wavy, unprotruding margin. In the same way, constant differences are displayed in the Processus Posterior; namely, that of *athalia* ends in long, sharp thorns, while the extreme thorn of *britomartis* broadens, carrying two or more variously shaped teeth. An unmistakable difference can be seen in the shape of the Valva and the Aedoeagus, too. The tegumen of *parthenie* is always broad and low, its uncus is absent, hence no other details are necessary for its separation from *britomartis*. In the possession of the slides, the *britomartis* and *parthenie* specimens from the Central Mountains could be separated without remains.

Of Hungarian *britomartis* specimens, 34 male slides were made. Four specimens are from the Southern Transdanubium, eleven others from other Transdanubial localities, and nineteen from the eastern parts of the Central Mountains. The *britomartis* preparations generally corresponded in every character to the data found in literature. In the course of the detailed examinations, we have, first of all, established the fact that of the two *britomartis* race-groups erected by Verity the Hungarian specimens, as every other European *britomartis*, belong to the second one, in which the valvae are round, the processus posterior is less broad, the tegumen is longer, more trapezoidal, the uncus narrow. Some individual differences may be found in the male organs, but these are so slight that they do not alter the general picture.

Minute examinations of the slighter deviations show, however, that there exist differences which could not be held any more as individual aberrations, since they occurred constantly and unconditionally in connection with certain definite collecting localities. These locally determined and constant differences of the copulatory organs occur, as will be seen later, in connection with locally peculiar external characters, wherefore they deserve a more detailed treatment. Local specialities in the sexual organs could be established partly in the shape of the uncus, partly in the shape of the processus posterior.

1. *Uncus*: We meet with two forms in the Hungarian material:
 - a. a pointed, thorn-like uncus, resembling somewhat *athalia*, but not so long;
 - b. a broad, blunt, spine-like uncus.

These two uncus forms appear in sharply delineated areas. To type *a.* belong only specimens caught at and around Kaposvár (Fig. VIII/11), every other Hungarian specimen must be relegated to type *b.* (Fig. VIII/13). The difference can be expressed also numerically. The upper value of the length of the uncus does not alter, 190 mikron in Hungarian specimens. The difference manifests itself strongly in the breadth of the base of the uncus. The basal breadth of the measured specimens varies between 100—138 mikrons in the insects of the central Mountains, while this value is between 60—85 mikrons in the Kaposvár specimens, so, that even the upper and lower values stand rather far apart. This difference in the uncus, in its highly localized aspect, seems to indicate a racial difference in itself.

2. In the Hungarian material we find two forms of the *processus posterior* (terminal apophysis in *Verity*):

- a. broad, or very broad and, at the same time, short *processus posterior*. Its shape resembles to a certain grade that of *parthenie*; (Fig. VIII/13)
- b. a narrow, slender *processus posterior* (Fig. VIII/14).

These two forms of the *processus posterior* show also a certain localization, but in quite another aspect than in the case of the uncus. The slender *processus posterior* appears only in one place in Hungary: on the plateau of the Mts. Bükk, at a 800—900 meters altitude, almost imbedded in the other *processus posterior* form. Here also, the difference can be numerically given. While the length of the *processus posterior* in specimens from other places in Hungary is 275—340 mikrons, its breadth varying between 175—206 mikrons, in the specimens of the Bükk plateau, the length oscillates between 340—375 mikrons, the breadth between 170—205 mikrons. The difference occurs therefore in the length of the *processus posterior*, since the lower value of the Bükk plateau specimens is identical with the upper value of specimens from other collecting localities.

The peculiarities of the uncus and *processus posterior* were examined also on the foreign specimens at our disposal. We had specimens from abroad from the following localities: 1. Hochschwab (Styria)?, coll. *B a r t h a*, one specimen, both uncus and *processus posterior* resembles type *b*; 2. Silesia, coll. *F r i - v a l d s z k y*, one specimen. Here, uncus belongs to type *b*, while *processus posterior* is intermediate between types *a* and *b*; 3. Lwow (SSSR), one specimen, in which uncus belongs to type *b*, *processus posterior* to type *a*; 4. Borosjenő (Ineu, Roumania), leg. *D i ó s z e g h y*, four specimens, of which uncus belong to type *b*, while *processus posterior* resembles in two specimens type *a* and the other two type *b* (Fig. VIII/15). This relates, however, only to shape, as the *processus posteriors* are, according to the measurements, large and well developed in all four specimens. 5. Sliven (Bulgaria), leg. *B a r t h a*, three specimens. Here, both uncus and *processus posterior* resemble type *b*, that is, the rates of the *processus posteriors* are like those of the Bükk specimens, but their values are greater (Fig. VIII/16). 6. Mts. Saján (ssp. *seminigra* Seitz), one specimen. *Processus posterior* is also long, resembling the Sliven specimens, both in shape and measurements.

Table 1.

Collecting localities	Number of examined specimens	Uncus			shape	Processus posterior measurements μ	Remarks		
		measurements μ		length (l)				breadth (b)	l/b*
		length (l)	basal breadth (b)						
Kaposvár	4	170—190	60—85	2—2,2	broad	310—327	190—206	1,5—1,6	
Other Transdanubial, and Central Mountains	25	138—190	100—138	1,3—1,7	broad, spiny	275—340	175—190	1,3—1,8	very broad pr. p. Szt. Endre, 1 specimen l/b = 1,14; Márianosztra 1 spec. l/b = 1,12; slender pr. p.; Sümeg, 1 spec. l/b = 1,8
Bükk Plateau	5	138—190	100—138	1,3—1,7	slender	340—375	170—205	1,8—2,2	1 spec. from the base of Mts. Bükk: very broad uncus l/b = 1; broad pr. p. l/b = 1,3
Borosjenő	4	155—190	86—138	1,3—1,8	varying	340—375	190—240	1,3—1,8	Pr. p. much developed: broad and long. Decidedly slender in two specimens: l/b = 1,7—1,8
Sliven (Bulgaria)	3	120—170	100—155	0,8—1,5	slender	360—380	190—225	1,7—2,	Pr. p. very developed = long and broad

* = This is a ratio between length and breadth (l/b); if this number, in the case of the Uncus, reaches or is higher than »2«: the uncus is slender, of a thorny character, is between the values »1,3—1,8«: the uncus is broad, of a spiny character is under »1,3«: the uncus is very broad; Processus posterior, reaches or is higher than »1,7«: the proc. p. is slender, is between the values »1,3—1,7«: the proc. p. is broad, is under »1,3«: the proc. p. is very broad.

The numerically expressable characteristics of the uncus and the processus posteriors are tabulated.

Since we have found no data with regard to the measurements of the uncus and processus posterior in literature, and, as we had only a meagre material from abroad at our disposal, we were unable at the present to try and give a general picture of the distribution of above characteristics. The narrow and pointed uncus occurs in one place only in Hungary, in the southernmost population. This uncus type is probably rare, for Verity ought to have paid attention to a deviation of this dimensions, mentioning it if occurring regularly.

The variation of the measurements and shapes of processus posterior show a rather disturbed picture. The slender processus posterior in Hungary occurs in a somewhat eastern area as a constant populational character. Two other places, more far east, are Borosjenő and Sliven, where it occurs mixed in the one and probably exclusively in the other. On the other hand, the Hochschwab data seems to indicate that this form of the processus posterior is to be met with also westwards of Hungary. All in all, it would be a profitable task to look further into the characteristics of the male copulatory organs based on a material richer than ours.

Systematical part.

Now, as far as the external characters of the Hungarian *britomartis* are concerned, we have already mentioned them above. We have stated that the specimens of the Central Mountains could be separated with complete precision from *parthenie* only by taking into consideration the genital armature, while the Kaposvár specimens were generally held by the local collectors to be *diamina*. These facts shed light not only on the fact that our *britomartis* is not a uniform insect as regards its external characters but that the most important ones of the external features appear also locally to be well demarcated. We have already touched upon, how, with respect to *athalia*, the three members of the *athalia*-group can be distinguished. It remains now to extend this to the differences of *britomartis* and *parthenie*. Literature gives some of the differentiating characters. Such are: 1. Differences in the color of the labial palpi (the hairs toward the tip are russet in *parthenie*, black in *britomartis*), 2. the brown ground of *parthenie* is toned to yellow russet in *britomartis*; 3. the underside of the hindwing is more mottled in *britomartis* than in *parthenie*, resembling *diamina*, 4. the spots of the first row on the forewings are approximately of the same size in *britomartis*, 5. on the ventral side of the abdomen, the black lines are disconnected in *parthenie* but united into continuous streaks, in *britomartis*. — Authorities agree, however, also in the fact that these features are not constant, with exceptions popping up all the time. We should like to add another character to the above ones, not met with in literature, yet which holds good for 90 percent of the Hungarian specimens. This character is to be seen on the underside of the forewings, observable in the shape and ratio of the spots intruding inwards from the margin. Among these, we have found some differences in the shape of the spots 4 and 5, and their ratio to spot 6, counted all from the apex. In *parthenie* spots 4 and 5 are rounder, 5 being longer than 4. Consequently spots 4, 5, 6 gradually increase in size like the pipes of an organ. Spots 4 and 5 of *britomartis* are equal, generally very small, spot 6 extending far towards the base of the wing. Spots 4 and 5 of *britomartis* end in a small

line, proximal to base. In *athalia*, the situation of spots 4 and 5, as related to 6, similar to *britomartis* but their base, resting on the margin, is more broad, generally arched, though we have met with specimens in which these ended sharply. The situation and shapes of these spots are given in figs. VIII/7—9.

Assmann, in his description of *britomartis*, laid special stress on the characters resembling *diamina*, which evidently occur rather strongly marked in the Silesian race. These characters are almost absent in our *britomartis*, with the exception of the specimens from the Southern Transdanubium. In the other specimens, from all other parts of the country, the underside of the hindwings are more or less uniformly colored and, in our estimation, they are individually aberrant specimens only, in which the characters resembling *diamina* present themselves, yet these also not together but one or two of them and in no extreme way. This is the cause why these specimens resemble *parthenie*. Of course, individual aberrations are numerous, but one may find localized, populational deviations, too. Paying attention to all points of view, the following chief groups can be distinguished:

1. Southern Transdanubial group,

Kaposvár and environment (Töröcske).

Alar expanse of males 29—33 mm, females 32—36 mm (one specimen exceptionally 28 mm). Margin of forewings obliquely inwards, rounded in tornus. Ground color of males of a russet tint with a yellowish shade, moderately bright. Females more dull, stronger yellowish. A characteristic feature of the forewings is that the spots of the first brown row are broad, elliptical, not round, approaching more (by their extension) the premarginal, that is, the second row of spots (Fig. VIII/10). The underside is rather mottled, displaying sometimes characters resembling the nominate form of *britomartis*. The spots in the areas between the streaks on the underside of the hindwings have a strong tendency to whiten, the same as the spots in the area between the third row and the margin. The single waves of the undulating black line dividing the third streak intrude deeply between the veins basally, and are of a distinct mitre shape (Fig. VIII/3). The part of the third row basally of the dividing line is only rarely brown in its whole length, usually only the first two spots under the costa are of a light brown color, the others are yellowish-brown, indeed, sometimes yellow. In the triangular spot, the dividing line is occasionally absent, but its two parts are even then bicolorous; the inner yellow (and not orange), the outer white. The black lines on the underside of the hindwings are fine and sharp. The characteristic black spots of *diamina* are absent from the marginal part of the third streak, with at least their marginal area embraced by the «capillary» lines (Verity), usually of a darker yellow shade.

This group, in certain characters, resembles the nominate form, — in others, ssp. *melathalia* Rocci, described from Northern Italy; but identical with none. It deviates from the first in that the *diamina*-like characters are present only in portions, and in the shape of the first row of spots. From the second, that is has no melanistic tendencies, its margin is not vertical, having some *diamina*-like characters. If we take yet the particularly narrow shape of the uncus (which in *melathalia* Rocci, according to Fig. 317, Table 13 of Verity's book, cited above, is broad), it becomes inevitable that we have to do here with a distinct geographical variation, to be named hereafter

M. britomartis ssp. **kaposensis** ssp. n.

Holotype 1 ♂ : Kaposvár 20. VI. 1942, leg. N a t t á n, in the collection of L. K o v á c s .
 Allotype : 1 ♀ Kaposvár 20. VI., coll. H á m o r i, in the Collection of the Hungarian Natural
 History Museum. Paratypes : 24 ♂ 14 ♀ : 1. in the collection of the Museum : Kaposvár
 4 ♂ 2 ♀ 6. VII., 2 ♀ 10. VII., 1 ♂ 1 ♀ 15. VII., 2 ♂ 17. VII., 2 ♀ 23. VII., coll. H á m o r i ;
 Töröcske : 2 ♀ 6. VII., 2 ♂ 10. VII., 1 ♂ 12. VII., coll. H á m o r i. — 2. In the collection of
 I. G e r g e l y : Kaposvár 10 ♂ 1 ♀ 16—23. VI. 1942., coll. H á m o r i. — 3. In the collection
 of L. K o v á c s ; Kaposvár : 2 ♀ 1. and 4. VII. 1941., 5 ♂ 2 ♀ 20. VI. 1942., 1 ♀ 23. VI. 1942.,
 leg. N a t t á n.

2 a Central Mountains group

Much more variable than the former, with numerous local forms. In spite of this, it can be yet unequivocally characterized on the ground of its external features. Margin of forewings vertical, broken in tornus with a sudden transition into dorsum. Ground color less vivid, dull, russet-brown, not bright. Spots of first row between black streaks of a slight extension, spots usually rounded, sometimes quite small, as also some spots of second row have slightly rounded corners (Fig. VIII/12). Ground color and black network is in balance on wing surface. Their undersides much less motley in their total impression, and some spots in inter-streak areas not white but pale yellow, resembling parthenie flying in same localities. Single intravenul wavelets of black undulating line dividing third streak do not intrude basally as much. They are more flattened than in former race (Fig. VIII/6). Consequently, spots marginally of third row smaller, sometimes as small as in parthenie. Inner part of third streak uniformly brownish in its total length, shade of brown, however, varied according to specimen and collecting locality. Triangular spot uniform yellow, regardless of presence or absence of dividing line ; its distal part lightens in aberrant specimens only. Intracapillar area only exceptionally darker than ground color. Black lines on underside of hindwings diluted, dull, with black scales around them, too. Accordingly, *diamina*-like features not characteristic to Central Mountains group, wherefore it is not identical with nominate form. — It deviates, also, from ssp. *aureliaeformis* Vrty. described from Northern Italy, since it is much more darker, its wings not elongated. It is indubitable therefore that the group inhabiting the Hungarian Central Mountains represents a distinct geographical variety.

Many local forms could be separated inside this group which, though identical in all essential features, are unlike each other, occasionally in a striking way, in certain characters. The question must be raised, however, how they should be regarded taxonomically. According to our views, they cannot be considered, with one exception, as races. This is supported by the almost complete conformity of the essential features and the sexual organ but chiefly by the fact that some of them live near each other, the localities of their occurrences being only a few kilometres apart.

The typical representative of this essentially uniform, though in local forms rich, race of the Central Mountains, is the population on the Kőhegy above Szentendre ; displaying the best observable features characteristic to the race. With regard to size and shape of wings, it agrees with the average form of the Central Mountains ; the spots of the first row on the forewings are moderately rounded, the dappling of the undersides also correspondings to the main.

The specimens from other collecting localities, among the paratypes, are identical in essentials with the Szentendre specimens.

We nominate the britomartis variety of the Hungarian Central Mountains

M. britomartis ssp. **centroposita** ssp. n.

Holotype: 1 ♂ Szentendre (Kőhegy) 2. VI. 1946., leg. L. Kovács, in the collection of L. Kovács. Allotype: 1 ♀ Szentendre (Kőhegy), 2. VI. 1946. leg. Kovács, in the collection of L. Kovács. Paratypes: 87 ♂ 20 ♀: 1. In the collection of the Hungarian Natural History Museum: Káld 1 ♂ 28. VI. 1952. leg. Kaszab; Sümeg 1 ♂ 20. VI—10. VII. 1949. leg. Barkóczy; Pápatészér 1 ♂ 1 ♀, leg. A. Schmidt; Fenyőfő 1 ♂ 3 ♀ 23. VI. 1908., leg. A. Schmidt; Szépalma 1 ♂ 1 ♀ 2. VII. 1908., leg. A. Schmidt; Bánhida 1 ♂ leg. I. Gáál; Dobogókő 1 ♂ 25. VI. 1941., leg. Pillich, 1 ♀ 11. VII. 1951., leg. L. Kovács; Budaörs 1 ♀ 19. VI. 1924., leg. Parlay; Felsőpetény 1 ♂ 30. VI. leg. ?; Márianosztra 1 ♂ 13. VI. 1948., leg. I. Gáál; Sárospatak 1 ♂ 1 ♀ 9. VII. 1908., 1 ♂ 1 ♀ 16. VII. 1908. 25. VI. 1909., 1 ♂ 16. VII. 1909., 2 ♂ (no date), leg. A. Kiss. — 2. In the collection of E. Fabricius: Szár 1 ♂ 23. VI. 1940; Pomáz 10 ♂ 2. VI. 1940., leg. Fabricius. — 3. In the collection of I. Gergely: Szár 1 ♂ 12. VI. 1941., leg. Majthényi, and 3 ♂ 1 ♀ 12. VI. 1942., leg. Gergely; Dunaalmás 1 ♂ 20. VI. 1942., leg. Gergely; Dobogókő 2 ♂ 13. VI. 1937. and 2 ♂ 18. VI. 1939., leg. Gergely; Szentendre 1 ♂ 29. VI. 1943., leg. Gergely; Budaörs 1 ♂ 10. VII. 1945., leg. Gergely; Törökbálint 1 ♂ 6. VII. 1913., leg. Jablonkay; Zebegény 1 ♂ 9. VI. 1942., leg. Gergely. — 4. In the collection of L. Issekutz: Űzsa 1 ♂ 22—23. VI. 1952., leg. Issekutz; Pomáz 1 ♂ 25. VI. 1941., leg. Vargha and 1 ♂ 29. VI. 1943., leg. Issekutz; Budakeszi 1 ♂ 8. VI. 1947, leg. Issekutz; Budaörs 1 ♂ 27. VI. 1943., and 1 ♀ 10. VI. 1945., leg. Issekutz; Isaszeg 1 ♂ 20. VI. 1920., leg. Issekutz, Diósjenő 1 ♂ 18. VI. 1938., leg. Vargha. — 5. In the collection of L. Kovács: Szár 1 ♂ 23. VI. 1940., leg. Fabricius; Esztergom 1 ♂ 27. VI. 1940. and 1 ♀ 29. VI. 1942. leg. Vida; Szentendre 31 ♂ 2. VI. 1946., 1 ♀ 10. VI. 1946., 1 ♂ 26. V. 1946., 1 ♀ 13. VI. 1942. 1 ♀ 16. VI. 1942. (e. l.), leg. L. Kovács; Pomáz 1 ♀ 29. VI. 1944. and 2 ♀ 2. VII. 1944., leg. L. Kovács; Budakeszi 1 ♂ 8. VI. 1947., leg. L. Kovács; Budaörs 1 ♂ 19. VI. 1942., and 1 ♀ 24. VI. 1942., leg. Kovács; Isaszeg 1 ♂ 4. VI. 1942., leg. Vida; Börzsöny 1 ♂ leg. Vajda; Mátra 2 ♂ 4. VII. 1940., and 1 ♀ 12. VII. 1940., leg. Vajda; Kékes 2 ♂ 14. VII. 1943., leg. Vajda.

The local forms of this race, worthy of designation with a special name are the followings:

Forma **kalászensis** f. n. The *britomartis* inhabiting the eastern side of Mt. Nagykevély, north of Budapest, is exceedingly pale, the basally proximal part of the third row on the upper side of the hindwing dark brown. Holotype: 1 ♂ Budakalász 20. VI. 1943., leg. L. Kovács, in the collection of L. Kovács; paratypes also there, 2 ♂ 13. VI. 1943. and 12 ♂ 20. VI. 1943., leg. L. Kovács, in the collection of L. Kovács.

Forma **verőcensis** f. n. The *britomartis* flying around Nógrádverőce, in the southern slopes of Mts. Börzsöny, have a very strongly developed black pattern, though not approaching the criteria of *dyctinnoides* as described by Hormuzaki. Holotype: 1 ♂ Nógrádverőce, 23. VI. 1939., leg. J. Wágner, in the collection of L. Issekutz, paratypes: same place 1 ♂ 25. VI. 1939. leg. ?, in the Collection of the Museum, 3 ♂ 23. VI. 1939., leg. J. Wágner, in the collection of L. Issekutz, 1 ♂ 25. VI. 1939, leg. Fabricius, in the collection of Fabricius, 1 ♂ 25. VI. 1939., leg. Fabricius, in the collection of L. Kovács.

Forma **naszáleensis** f. n. The *britomartis* occurring on Mt. Naszál, near Vác, have a more strongly rounded forewing. They are colored relatively more

lively, the black network very regular, the spots of the first row on the forewing very round, small. Such specimens were caught also on the Galyatető, Mts. Mátra. Holotype: 1 ♂ Vác (Naszál) 5. VII. 1926., leg. U h r y k, in the Collection of the Hungarian Natural History Museum. Paratypes: 2 ♂ from the same place, 4. VI. 1925., leg. P a r l a y, in the Collection of the Museum; Mátra (Galyatető) 3 ♂ 28. VI. 1925., leg. P a r l a y, 4 ♂ 20. VI. 1927. and 1 ♂ 21. VI. 1927., leg. U h r y k, in the Collection of the Museum; 1 ♂ from the same place, 18. VI. 1925., in the collection of L. K o v á c s.

Forma **szadaënsis** f. n. The *britomartis* collected on the low southern slopes of the Mts. Cserhát, around Szada, have a ground color tending to yellow. The black elements of the pattern are also rather well developed, strikingly extended in the base of the hindwings. Holotype: 1 ♂ Szada VI. 1909., paratypes 3 ♂ from the same locality and date, leg. A. S c h m i d t, all in the Collection of the Hungarian Natural History Museum.

Forma **matica** f. n. The *britomartis* flying around Mátraháza in the Mts. Mátra, at a 600 meters altitude, have slightly elongated forewings, not so round as usual in this group. Their color is somewhat brighter. Holotype 1 ♂ Mátraháza VII. 1944., leg. F a b r i c i u s, in the collection of E. F a b r i c i u s; paratypes of the same locality 1 ♂ VI. 1942. and 2 ♂ VII. 1944., leg. F a b r i c i u s, in the collection of E. F a b r i c i u s; 3 ♂ from the same place 16. VI. 1934., leg. G e r g e l y, in the collection of I. G e r g e l y.

It is worthy of mention yet that, eastwards to the Mts. Mátra, strikingly small specimens occur flying together with normally sized individuals. Their color is also pale. The brown filling in the basally proximal spots of the third streak on the underside of the hindwings is rather strong.

2 b. The population of the Bükk plateau.

We have left out of the Central Mountains' group the *britomartis* specimens collected on the plateau of the Mts. Bükk. This is explained, as formerly discussed, by the long and slender form of the processus posterior on the valva of the male genitalia. There appear, however, peculiarities in external characters, too, justifying their separation. Alar expanse of males 29—33 mm, in the two females at our disposal 30 mm. Shape of forewings rather pointed in apex, flattening slightly in tornus, with convex margin. Ground color pale, of a bright reddish brown. Color of black pattern a vivid black on forewing. Underside of wings conforms in design with former group, yet lighter and shiny. Females stand nearer to males both in color and pattern, and, in which they deviate from other females of the Central Mountains, they are just as bright. We name this special race of the Mts. Bükk **M. britomartis** ssp. **confulgens** ssp. n.

Holotype: 1 ♂ Bükk plateau (around Mt. Bálvány), 11—14. VII. 1950., leg. I s s e k u t z, in the collection of L. I s s e k u t z; allotype 1 ♀, same place, 15—18. VII. 1952., leg. I s s e k u t z, in the collection of L. I s s e k u t z; paratypes 25 ♂ (1950) and 1 ♀ (1952), same place, of which 22 ♂ and 1 ♀ in the collection of L. I s s e k u t z, and 3 ♀ in the collection of L. K o v á c s.

We had at our disposal sufficient *britomartis* material from abroad from two localities only, allowing to establish their particular characters. These will be set forth below, to complete the systematical part. This is the more desirable as we have already made reference to them, though we have not met with their description in the relevant literature.

1. The Borosjenő group

(Ineu, Roumania, some kilometres to the SW from Mts. Codru).

Forewing broken at tornus, margin slightly convex under apex, wings broad. Ground color more yellowish, moderately bright. Black pattern on wing surface reduced, ground color expressed more clearly. Spots of first row high, almost touching, broad, approaching spots of second row. Spots of hindwing also more strongly expressed than in former races. Underside of hindwings rather light, less mottled in its total impression. Some specimens seem to build a transition to following group. Sexual organs, as we have already mentioned, refer also to this transition. We introduce the Borosjenő population, to commemorate its collector, as

***M. britomartis* ssp. *diószeghyi* ssp. n.**

Holotype 1 ♂ Borosjenő 20. VI. 1911., leg. *Diószeghy*, in the Collection of the Hungarian Natural History Museum. Paratypes: 3 ♂ from the same place 20. VI. 1911. and 2 ♂ 3. VI. 1913., leg. *Diószeghy*, in the Collection of the Museum.

2. The Sliven (Bulgaria) group

(on the southern side of the Eastern Balcan Mountains, 400 m a. s. l.).

Forewings broad, margin convex, suddenly breaking in tornus, wherefore the animals seem unusually large, though alar expanse of males is between 29—33 mm also here. Ground color yellowish rather than bright. Base of hindwings tend to melanism. On two specimens black places well developed, allowing to speak of melanism in one individual. Yellow of undersides livid, their pattern resembling specimens from Hungarian Central Mountains. Distal part of undulating dividing-line in third streak generally rather dark. The Sliven *britomartis* represent, in the aspect of their shape, color and the peculiarities of the male copulatory organs, an indubitably distinct geographical variety, to be named hereafter, to commemorate its collector, ***M. britomartis* ssp. *barthae* ssp. n.**

Holotype: 1 ♂ Sliven (Bulgaria) 400 m, 13—15. VI. 1936., leg. *Bartha*, paratypes 4 ♂, with the same data. All in the Collection of the Hungarian Natural History Museum.

Distribution, biotops, flight.

The distribution of *M. britomartis* in Hungary extends almost to the western border, reaching from then on to the east as far as the Central Mountains stretch. From the southern part of the country, we know it from the neighbourhood of Kaposvár, every other data originate from the northern regions of Hungary. The southern Kaposvár group builds, according to our data up to date, an island, divided by the Middle-Somogy hills and the Balaton from the nearest Transdanubial Northern populations. *Britomartis* occurs in the Transdanubium and around the Capital city in preponderantly low lying places. It was collected around Káld at 175 m level. Another collecting locality under 200 meters is the environment of Szada. In the other Transdanubial localities and around Budapest, it flies at 2—400 meters altitude. It was caught on the higher parts of the Central Mountains in still higher altitudes, 600 meters on the Dobogókő, 8—900 m in the Mts. Mátra (Galyatető), and the plateau of Mts. Bükk. There are large and continuous areas where it was never found: the plain regions of the Great Plains, and its continuation in the Transdanubium: also a low

territory. According to the known data, the centers of its occurrence lie in the Budapest hills, the Mts. Dunazúg, the Mts. Börzsöny, and the SW feet of Mts. Cserhát. This may also be explained by the fact that the best exploited regions of the country lie around the Capital, yet it is also true that it occurs in really big numbers in some places around Budapest.

In this connection, we have to raise the question of the most favourable habitats of *britomartis*. Our own observations testify that this species dislikes completely open spaces and strongly insolated points. We have always collected it in the glades of woods or fields planted with shrubs and saplings, and once in a clearing. Its preference to fresh forest clearings is supported by the data of N. N a t t á n of Kaposvár. According to him, *britomartis* appears quite suddenly in clearings one or two years old, increases in numbers gradually for a while, and when the trees grow to such heights that they shadow the ground, it vanishes again to reappear in other, fresh clearings. The inclination of the places where we have collected it at lower altitudes is usually Eastern-Northeastern, therefore of a moderate insolation even when the sun stands high. At higher altitudes, on the Bükk plateau, it occurs in larger numbers even in flat areas, yet mainly on northernly inclined places also here. Some of the collecting places are completely dry, disproving its alleged preference to moisture: we have to conclude rather that it avoids strong sunlight. We have not yet found its caterpillars even by methodical search, and only one specimen had successfully hatched from a caterpillar brought home with other larvae indistinctively. This caterpillar was collected in the forenoon.

Trustworthy data on the flight of *britomartis* cover the period of 26 May to 23 July. It is sooner on the wing in warm years, and disappears generally sooner, too, not extending to July. Flight begins later in cold summers, stretching to later dates. So, for instance, in the cold and rainy summer of 1944, fresh females could be found around Budapest yet in the first days of July. At higher altitudes, approximately above 500 meters the date-lines shift to later times. The phenological data of the Kaposvár populations fall to surprisingly late dates as compared with the ones of the Central Mountains (20. June—23. July) i then those of the Mts. Sátor (25. June—18. July), too.

Zoogeographical Problems.

M. britomartis was collected, related to the enormous area where it had hitherto been found, in relatively few places. This holds good not only to its Eastern but also to its occurrence in Europe. The meagre number of collecting localities is indubitably in connection with its difficult separation from the two related species. This is supported by the fact that, even before the problem of its occurrence in Hungary was solved, it had already been caught in about 30 localities. We feel sure that it will yet be found in the course of further exploitations in many other places in this country, but still more so in other regions where this question was paid less attention to. With regard to its general distribution, a striking picture takes form even from the data of the present days. If the collecting localities found in literature and in this paper were to be put on a map, it would become apparent at once that the majority could be found almost on the same latitudes in Europe as in Asia. The area of occurrence of the Asian populations lie between latitudes 47 and 53, whilst all trustworthy European data refer to points between latitudes 46 and 53. We know

only of four points more southern than these: two in Italy, one in Southern Moldova (Tecuci), between latitudes 45—46, and the Bulgarian one between latitudes 42—43. If we take into consideration therefore that *britomartis* inhabits in Europe the preponderantly Middle-European climate zone, with only isolated populations in the South (these also in the vicinity of Pleistocene glacial centres: the Alps, and Mts. Balcan), the question of the whereabouts of its glacial refuges will spontaneously emerge. It is believed of our high mountain animals that they found shelter during the period of glaciation in regions of a milder climate in the South, returning gradually to the mountainous districts with the coming of the warmer period. If this were applied as an analogy to *britomartis*, it had then to draw back even more southwards to have had found a refuge conforming to its present distribution. This supposition, at least in the light of our recent data, rests on a shaky ground, as this species has never been found even on high mountains in expressedly southern areas.

The problem could be explained away otherwise, too, by the recently very fashionable assumption that, after the lapse of the glacial periods, it had immigrated to Europe from Eastern Asia, from the ancient Angara continent. We may believe, from our part, in justifiable cases, that certain species really did immigrate from the east to populate formerly glaciated territories and their environments, but we do not hold this explanation absolutely necessary in every case. Not especially so in the case of *britomartis*. One glance on a map showing the annual isotherms suffices to recognize the fact that certain *britomartis* populations live in territories north to the zero grade isotherm in Eastern Asia, wherefore they can endure relatively low temperatures. The annual main temperature was not so low during the glaciation of Hungary. A. Kéz published in his paper in 1938 the results of his investigation in this regard. He came to the conclusion, after having carefully deliberated on the most diverse factors, that the annual main temperature during the glacial periods in our country oscillated between grades 0- +3. If this were so, we can safely suppose that species able to live in colder climatal zones could survive also in Hungary. On the ground of above circumstances, we relegate *britomartis* among these species. On our opinion, the strongerly isolated southern slopes of the Hungarian Central Mountains offered suitable shelter to numerous lepidoptera during the cold glacial climate. We have already mentioned that *britomartis* avoids areas of strong insolation, so, for instance, the southern slopes. In this fact we see an adaptation to changed climatal circumstances. This adaptation happened partly through the change of the biotop: the departure from the southern slopes (active adaptation), partly from becoming gradually adapted to higher yet not extremely warm climates on the new colder biotops (passive adaptation).

The data given above, in the systematical part, indicate, however, that the *britomartis* populations, living now in Hungary did not spread from a single refuge after the glaciation. The *britomartis* population of Kaposvár displays considerable diversities both in its external characters and in the peculiarities of the male genital armature, — being also territorially isolated among and from the other Hungarian *britomartis* races. Furthermore, the Kaposvár specimens differ from the ones of the Transsylvanian Border Mountains, separated by the extensive area of the Great Plains. From the fact that *britomartis* has never been found even in the marshy areas of the Great Plains, one may conclude that *britomartis* is not indigenous there, since the same swamps are the

refugies in the recent days of many alpine and mountainous forms. So, *Melitaea diamina* Lang, or *Argynnis selene* Schiff, of a similar distribution, can still be found around Bátorliget; indeed, two *Argynnis ino* Schiff. specimens were caught at Izsák (sole Hungarian data).

Nor do the populations inhabiting the Central Mountains seem to be of identical origin. Among them, the *britomartis* found on the plateau of the Mts. Bükk constitute a distinct group characterized, besides the external features, by the special shape of the processus posterior. As it was discussed in the previous paragraphs, we have met with this form of the processus posterior only in specimens from abroad, in the Transsylvanian Border Mountains, and more southernly, in the southern feet of the Balcan Mountains. Indubitably, the Mts. Bükk are isolated from the Transsylvanian Mountains by the NE extension of the Great Plains. The question is, therefore, whether there be other data which may allude to the zoogeographical connection of the Mts. Bükk with the Transsylvanian Mountains in the geological past. Recent lepidoptero-logical investigations do show that such data exist. *Pieris manni* Mayer became known, aside from its single Hungarian area of occurrence in the Mts. Bükk, also from Borosjenő, further away from the region of the lower Danube. A similar element seem to be a dark form of *Thyris fenestrella* Scop., collected, nearest to the Mts. Bükk, around Herkulesfürdő. It is worthy of mention in this connection with *manni* that Diószeghy collected this species also in the Mts. Retyezát, at an altitude of 1000—1900 a. s. l., proving that it can adapt itself to low temperatures.

If we correlate these facts, we cannot leave the proposal out of consideration that a zoogeographical region existed composed of the main links of the Mts. Balcan, the Lower Danube, the Transsylvanian Mountains, ending with the Mts. Bükk. The remainder of this former zoogeographical region could be, among others, the *britomartis* population of to day, characterized by the slender processus posterior, of the Bükk plateau. If we take into account further, that the geographical connection of the Mts. Bükk and the Transsylvanian Border Mountains broke up already at the beginning of the Tertiary, we have to maintain the said faunal elements of the Mts. Bükk to be of a very old origin, indeed.

We have no information as yet whether the western group of the Central Mountains *britomartis* was in connection with the other group in the geological past, that is, whether it became separated from it. Indubitably, both had to live isolated from each other during a very long time. To day, the *britomartis* group of the western regions of the Central Mountains seem to be of the highest vitality. These have the most numerous populations, they are found in rather wide altitudinal levels (175—900 m), besides, they have the most extensive distribution. Their spreading power is revealed by the fact that they have almost reached the western border, and in the east, they have passed over the Mts. Bükk.

Unfortunately, we are unable, in the absence of fossils, to shed light on the time of origin of our lepidopterous fauna. In our deductions, we are wholly dependent on the indications of the recent fauna. The fact, however, that glaciation had not exterminated every animal life in Hungary and the neighbouring areas, is sufficiently proven by mollusk fossils. L. S ó s, in his work on the shell fauna of Hungary, sets forth species inhabiting continuously our faunal territory since the Tertiary, and, lately, J. V á g v ö l g y i completed this picture with valuable new data. With regard to Arthropoda, G. K o l o s -

váry was the first to take the standpoint, in his researches on the recent Arachnoid fauna, on the ancient habitation of some spiders in Hungary; and, more recently, Z. Kaszab and V. Székessy made, employing similar methods, important statements on the ancient origin of certain beetle species, as relicts of the Tertiary. When we subjected to inquiry the distribution of some members of our lepidopterous fauna, in search of explanation of the singularities in their spreading, we had also found — among the proffered possibilities — the most natural interpretation of the problem in the supposition of continuous habitation since the Tertiary. It must be emphasized that the climatal aspects of the case could not form any obstacles for a considerable amount of Lepidoptera.

To put this theory on more secure foundations — since we are dealing with primary consuments: and, as concerns food, with specialized insect species, — the exploitation of the lessons from the glacia flora of the southern slopes of the Central Mountains are necessary. The question must also be devotedly looked into what areas of the Central Mountains were continuously exposed over the surface of the ancient inland sea to enable us to more precisely demarcate the refugial points of the Central Mountains, where britomartis and our other species of seemingly Tertiary origin could continuously have survived.

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sulla modalità di schisura e le forme di variazione della cosiddetta *Mel. athalia* Rott. (Mem. soc. ent. ital., 10, 1931, p. 10—34). — 27. R o c c i, U.: Osservazioni su alcuni gruppi specifici del Gen. *Melitaea* F. (Mem. soc. ent. ital., 11, 1932, p. 202—211). — 28. R o c c i, U.: Osservazioni su »*Aurelia* Nick.« e »*britomartis* Assm.« (o. *aureliaeformis* Ver.) del gen. *Melitaea* F. (Mem. soc. ent. ital., 11, 1932, p. 30—40). — 29. R o c c i, U.: La struttura e la variabilità delle armature maschili in alcuni gruppi specifici del gen. *Melitaea* F. (Mem. soc. ent. ital., 11, 1933, p. 123—161). — 30. S e i t z, A.: Die Gross-Schmetterlinge der Erde (Abt. I., 1. Stuttgart, 1909, p. C + 379, und Suppl., Stuttgart, 1932, p. VII + 392). — 31. S h e l d o n, W. G.: The male Ancillary Appendages of European species of the *Athalia* Group of the Genus *Melitaea* (Entomologist Record, 28, 1916, p. 261—264). — 32. S p u l e r, A.: Die Schmetterlinge Europas (I, Stuttgart, 1908, p. C + CXXVII + 385). — 33. S t a u d i n g e r, O.: Lepidopteren des Kentei-Gebirges (Iris, 5, 1892, p. 300—393, spec. 327—328). — 34. S t a u d i n g e r, O.: Die Macrolepidopteren des Amurgebiets (Mém. Lep. Romanoff, 6, St. Petersburg, 1892, p. 83—653, spec. 186—187). — 35. S u s c h k i n, F.: Zur anatomischen Begründung einiger paläarktischer Arten der Gattung *Melitaea* F. (Ztschr. für wiss. Insektenbiologie, 9, 1913, p. 169—175, 285—289, 321—325). — 36. U r b a h n, E.: Die Unterschiede der Jugendstände und Falter von *M. athalia* Rott., *britomartis* Assm., u. *parthenie* Borkh. = *aurelia* Nick. in Deutschland (Ztschr. der Wiener Ent. Ges., 37, 1952, p. 105—121). — 37. U r b a h n, E.: Artberechtigung u. Typenuntersuchungen von *Melitaea veronicae* Dorf. (Ztschr. der Wiener Ent. Ges., 38, 1953, p. 87—94). — 38. U r b a h n, E.: Was versteht man unter *Mel. dictynnoides* Horm.? (Ztschr. der Wiener Ent. Ges., 38, 1953, p. 149—152). — 39. V e r i t y, R.: Revision of the *Athalia* Group of the genus *Melitaea* F. (Trans. ent. Soc., London, 89, 1940, p. 591—702).

Explanation of tables

Table VII.

Fig. 1. *Melitaea britomartis* ssp. *kaposensis* ssp. n., ♂, Kaposvár, 20. VI. 1942, leg. M. N a t - t á n (holotype). — 2. *M. britomartis* ssp. *kaposensis* ssp. n., ♀, Kaposvár, 10. VII., coll. H á m o r i (paratype). — 3. *M. britomartis* ssp. *centroposita* f. *kalászensis* f. nova, ♂, Budakalász, 20. VI. 1943, leg. L. K o v á c s (holotype). — 4. Underside of fig. 1., ♂, Kaposvár. — 5. Underside of fig. 1., ♀, Kaposvár. — 6. Underside of fig. 3., ♂, Budakalász. — 7. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Szentendre, 2. VI. 1946, leg. L. K o v á c s (holotype). — 8. *M. britomartis* ssp. *centroposita* ssp. n., ♀, Pomáz, 29. VI. 1944, leg. K o v á c s (paratype). — 9. *M. britomartis* ssp. *centroposita* f. *veröcensis* f. n., ♂, Nógrádverőce, 25. VI. 1939, leg. F a b r i c i u s (paratype). — 10. Underside of fig. 7., Szentendre, ♂. — 11. Underside of fig. 8., ♀, Pomáz. — 12. *M. britomartis* ssp. *centroposita* f. *naszálensis* f. n., ♂, Mts. Mátra (Galyatető), 20. VI. 1927, leg. U h r y k i (paratype). — 13. *M. britomartis* ssp. *confulgens* ssp. n., ♂, Mts. Bükk (Bálvány), 900 m., 11—14. VI. 1950, leg. I s s e k u t z (holotype). — 14. *M. britomartis* ssp. *confulgens* ssp. n., ♀, Mts. Bükk (Bálvány), 900 m., 15—18. VII. 1952, leg. I s s e k u t z (allotype). — 15. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Szár, 12. VI. 1941, leg. M a j t h é n y i (paratype). — 16. Underside of fig. 13., ♂, Mts. Bükk (Bálvány). — 17. Underside of fig. 14., ♀, Mts. Bükk (Bálvány). — 18. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Sárospatak, leg. Á. K i s s (paratype).

Table VIII.

Fig. 1. *M. britomartis* ssp. *diószeghyi* ssp. n., ♂, Borosjenő (Ineu), 3. VI. 1913, leg. D i ó s z e g h y (paratype). — 2. *M. britomartis* ssp. *barthae* ssp. n., ♂, Sliven (Bulgaria), 13—15. VII. 1936, leg. B a r t h a (holotype). — 3. *M. britomartis* ssp. *kaposensis* ssp. n., ♂, Kaposvár, a portion of the underside of the hindwing. — 4. Underside of fig. 1., ♂, Borosjenő (Ineu). — 5. Underside of fig. 2., ♂, Sliven (Bulgaria). — 6. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Szentendre, a part of the underside of the hindwing. — 7. *M. parthenie*, ♂, Mátraszentimre, a part of the underside of the forewing. — 8. *M. britomartis*, ♂, Szentendre, a part of the underside of the forewing. — 9. *M. athalia*, ♂, Mts. Bükk (Bálvány), a part of the underside of the forewing. — 10. *M. britomartis* ssp. *kaposensis* ssp. n., ♂, Kaposvár, a part of the forewing. — 11. *M. britomartis* ssp. *kaposensis* ssp. n., ♂, Kaposvár, a part of the male genitalia (Gen. Prep. M: 8). — 12. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Isaszeg, a part of the forewing. — 13. *M. britomartis* ssp. *centroposita* ssp. n., ♂, Szada, a part of the male genitalia (Gen. Prep. M: 92). — 14. *M. britomartis* ssp. *confulgens*, ssp. n., ♂, Mts. Bükk (Bálvány), a part of the male genitalia (Gen. Prep. M: 78). — 15. *M. britomartis* ssp. *diószeghyi* ssp. n., ♂, Borosjenő (Ineu), a part of the male genitalia (Gen. Prep. M: 53). — 16. *M. britomartis* ssp. *barthae* ssp. n., ♂, Sliven (Bulgaria), a part of the male genitalia (Gen. Prep. M: 63).

A *Melitaea britomartis* Assm., különös tekintettel hazai előfordulására

Írta: Issekutz László és Kovács Lajos,
Budapest

Szerzők a *Melitaea*-nem *athalia* (Rott.) csoportjába tartozó *M. britomartis* Assm. hazai elterjedésének a vizsgálatából indulnak ki, de a rendelkezésükre álló külföldi anyagot is figyelembe vették. Vizsgálataik alapján arra az eredményre jutnak, hogy nálunk a szóbanforgó fajt három földrajzi változat képviseli. A külföldi anyag alapján is ismertetnek két új földrajzi változatot, az egyiket az erdélyi szegélyhegységéből, a másikat Bulgáriából. A továbbiakban a *britomartis* ethológiájára vonatkozó adatokat ismertetnek. Befejezésül a faj általános elterjedését teszik vizsgálat tárgyává. Az erre vonatkozó adatok mérlegelése alapján annak a felfogásuknak adnak kifejezést, hogy a *britomartis* a magyarországi faunának ősi, feltehetőleg a harmadkor óta folyamatosan itt élő tagja.





