ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI
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Data to the Knowledge of Hungarian Macrolepidoptera III. New Taxa from the Subfamily Hadeninae

By L. Kovács, Budapest

The extremely profuse material worked up from the collections of the light-trap network in Hungary results in data multiplely exceeding all previous information, even in an international frame of reference, on our home Macrolepidoptera. Of these collections, we have recorded since 1961 the data of more than one and a half million specimens, in their majority referring to about 750 species. There is hardly any among them whose faunistical, phenological, ecological, or eventually systematical, problems were not further clarified by their help, and at the same time subserving as a safe basis to delineate a fundamental approach to the still obscure quantitative conditions of macrolepidopterous species.

The interest of future researches would indisputably require that this unique mass of data be published as soon as possible, but, for the time being, grave difficulties stand in the way. Publication facilities decrease year by year, aggravating the selection as to priority of the problem to be discussed. In this situation, I have selected species characteristic for our fauna, species of which we have abundant data available to round out incomplete information and to eliminate eventually false notions. This would render inestimable help to research workers, as well as to editors of comprehensive lepidopterological works.

1. The Hyssia-genus, with the description of a new species and a new subspecies

The species *Hyssia cavernosa* Ev., was introduced by E. Eversman, former professor of the University of Kazan, in 1842. The specimens serving for the original description derived from the southwestern foothills of the Ural range (Government of Orenburg), and partly from the environment of Kazan.

According to literature, the area of *H. cavernosa* s. lat. consists of three distinct regions. The first is the southern part of Central Europe (North Italy, Switzerland, Vorarlberg, Lower Austria, Hungary, South and East Slovakia, East Rumania, Poland; the second stretches from Kazan and the southern foothills of the Ural to Turkestan; the third comprises the territory between the Altai Range and the Amur area. From the Alps, only a few localities, rather removed from one another, are cited. From Central-Europe most localities are reported from the Carpathian Basin; east of the environs of Vienna, and south of the Pozsonyszentgyörgy (Sväty Jur) — Aranyosmarót (Zlate Moravce) — Kassa (Kosice) line, respectively the upper reaches of the river Tisza. From Poland Cracow is the only known locality. A number of localities are cited from the southern parts of the Soviet Union, Turkestan, the Amur area, and, following the large-scale collections of Dr. Z. Kaszab, from Mongolia.

Systematical considerations. The study of the material available resulted in the striking discovery that the name *Hyssia cavernosa* Eversmann covers three distinct forms in literature (Fig. 1). Of these, the nominate form and the Mongolian form

stand nearer to one another than the taxon of the Carpathian Basin which essentially differs from both. The most important characteristics of the nominate form are, according to the original description, the rufous thorax, the purplish-tinged for wings, and the very large size of the black spots (stigmatibus...permagnis) in the median field (7). We may add that the yellow dorsal streak is vivid, not suffused by greyish scales, and that the underside of the wings show an overall pale reddish hue.

This description wholly applies to a pair of specimens in our collection bearing the label "Rossia, E. FRIVALDSZKY" (originating to our date, from KINDERMANN's collecting in Eastern Russia), and to another pair labelled "Asia centr., Turkestan, Ili-Gebiet, coll. WAGNER" further there is one pair collected in Uralsk by WAGNER resp. HABERHAUER and two males found at Kuku-Noor coll. SCHAVERDA resp. in Ili-Gebiet coll. WAGNER.

Hyssia cavernosa ssp. **kaszabi** ssp. n. (Fig. 1, right)

The other eastern, Mongolian, form considerably differs from the above features. The alar expanse is bigger, the wings narrower, with more attenuate apices, darker basic colour — the females being black and only the males retaining the purplish shade. The light dorsal streak is wide and a clear ochreous yellow. The spots of the median field are also very large and sharply defined, as also the entire pattern. The male genital apparatus displays but meagre differences against that of the nominate form (Fig. 2, B).

I dedicate the new subspecies to its collector, Dr. Z. KASZAB, Academician, the foremost explorer of the insect fauna of Mongolia.

Holotype male: "Mongolia, Archangaj aimak, Exp. Dr. Z. KASZAB 30. VI. 1964 (nr. 233)", deposited in the Zoological Department of the Hungarian Natural History Museum. Paratypes: "Mongolia, Archangaj aimak, 30 VI. 1964, Nr. 233", 2 ♂, "Bulgan aimak, 2. VII. 1964, Nr. 253", 2♂; "Central aimak, 3. VII. 1964, Nr. 260", 2♂, "4. VII. 1964, Nr. 267", 3 ♂, and "9. VII. 1964, Nr. 286", 2 ♂; "Chentej aimak, 30. VII. 1965, Nr. 333" 2 ♂; "Suchebator aimak, 8. VIII. 1965 Nr. 378", 1 ♂, 5 ♀. All specimens identified as "*Hyssia cavernosa* (EVERSMANN) 1842" by SHELJUZKO (21). All types deposited in the collection of the Hungarian Natural History Museum, Budapest.

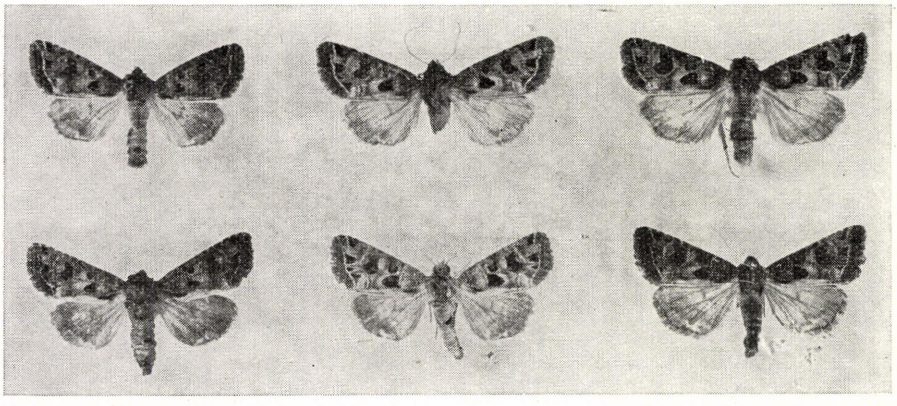


Fig. 1. Left: *Hyssia gozmanyi* sp. n. ♂ and ♀ from Pacsa (light trap), Hungary; in the middle: *Hyssia cavernosa* Ev. ♂ from the Ili area, Turkestan; ♀ from "Russia" (coll. E. FRIDVALDSZKY); right: *Hyssia cavernosa* ssp. *kaszabi* ssp. n. ♂ and ♀ from Mongolia, leg. Z. KASZAB

The localities of the new subspecies are in Central Mongolia, on montane steppe-meadows (above 1500 m); they are moderately humid, the undergrowth dense and luxuriant.

There are in the collection of the Museum also three female specimens originating from the Amur area; they stand rather near to the females from Mongolia, especially with respect to their dark basic colour. The differences of individuals deriving from the Amur were observed already by STAUDINGER (22), and he pointed out their bigger size and darker hue. One would need, however, a more ample material to decide whether they actually belong to ssp. *kaszabi*.

Hyssia gozmanyi sp. n. (Fig. 1, left)

The Hungarian and Lower Austrian form essentially differs from the eastern ones. The fore wings are short, wide, the apices more rounded. The basic colour is a fumous blackish brown, the pattern being only moderately conspicuous. The dorsal stripe of the fore wing is a dingy ochreous yellowish, occasionally entirely suppressed by the greyish scales. The spots of the median field are considerably narrower, the lower portion (pointing terminad) of the reniform is short, as well as the claviform. The underside of the wing is also dark and fumous brown, the reddish scales appear uninterruptedly merely below the costa and are of a much darker shade. The marginal area of the hind wing is strikingly dark.

Even the male genital organ of the Hungarian form (Fig. 2, A) differs to a degree from that of the nominate form (Fig. 2, B). The cucullus is short and forms a rather

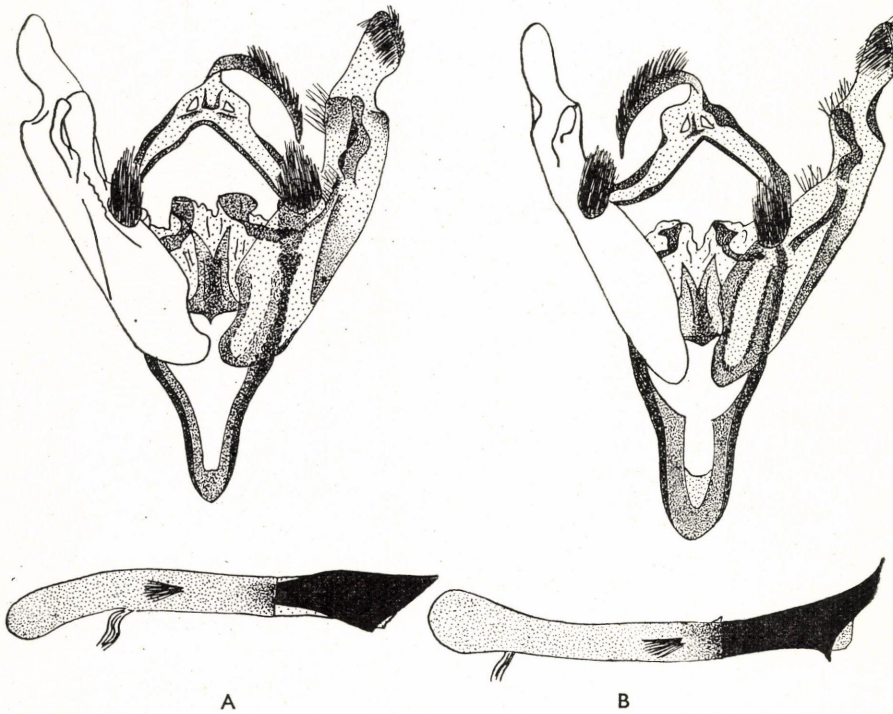


Fig. 2. Male genital organ of A: *Hyssia gozmanyi* sp. n., ventrally, Pacsa, slide 393; B: *Hyssia cavernosa* Ev., ventrally, Ili area, Turkestan, slide 396

projecting shoulder when passing into the valva, the saccus shorter, rounded and the sclerotized, distal margin of the slender aedoeagus is also short at the opening of the vesica. In the nominate form, the cucullus is longer and the shoulder passing into the valva is flatly rounded; the saccus long, attenuate, in the robust aedoeagus the sclerotized distal end is longer than in the Hungarian species. This differences are alone of a specific value.

The distinctness of the two forms are further emphasized by their completely isolated areas, of which that of the western one centers in the northern, and mainly in the northwestern, section of the Carpathian Basin. Its coenological affinities are also peculiar, insofar as the richest populations coexist with species of a montane character. Of the Central European populations, those from Lower Austria and the Carpathian Basin belong to this species, and without doubt also those in the Alps.

I dedicate the new species Dr. L. Gozmány, submitting also a number of data to clarify the problem.

Holotype male: "Tanakajd, 1963. VII. 19., fénycsapda" (=lightrap), deposited in the collection of the author.

Paratypes: I. In the collection of the Hungarian Natural History Museum, Budapest: Győr, 28 May, 1963, 1♂; 15 May, 1964, 1♂; Sopronhorpács, 12 August, 1953, 1 ♂; 6 May, 1959, 1 ♂, 23 May, 1959, 1 ♂; 20 July, 1964, 2 ♂, 27 July, 3 ♂ 2 ♀; Szombathely, 31 July, 1964, 1♂; Tanakajd, 20 (1 ♂), 21 (1 ♀), 23 (3 ♂), 24 (1 ♂) July, 1963; 9 August, 1963, 1 ♂; 26 July, 1964, 1 ♂; Pacsa, 21 (1 ♂), 27 (1 ♂) July, 1964; 19 (1 ♂), 29 (1 ♂) May, 1965; 28 (1♂), 29 July, 1965, 1 ♂, 1 ♀; 31 July, 1 ♀, 4, 14 August, 1965, 1 ♂, 1 ♀; 13 July, 1966, 2 ♂; Csopak, 18 May, 1965, 1 ♂; 29 July, 1965, 1 ♂; Baj, 16 May, 1967, 1 ♂; Fácánkert, 9 August, 1966, 1 ♂; 11 May, 1967, 1 ♂; Kisvaszar, 17 May, 1967, 1 ♂; Velence, 9 August, 1965, 1 ♂; Budakeszi, 11 August, 1965, 1 ♂; Miskolc, 15 May, 1959, 1 ♂; Kisvárda, 16 (1 ♂), 20 (1 ♂) May, 1953; 14 August, 1964, 1 ♂; Makkoshotyka, 1 August, 1964, 1 ♂; all collected by the light-trap network. — Őszhely, 16 August, 1928, 1 ♂; 19 May, 1929, 1 ♂, leg. A. Ruff; Magyaróvár, 28 July, 1948, and 27 August, 1948, one ♂ each, leg. A. Ruff; Pannonhalma, 28 July, 1938, 1 ♀, leg. G. Gaál; Kemenessömjén, 2 ♂, coll. Ulbrich; Pápa, 31 July, 1961, leg. Gy. Lengyel; Csopak, 30 July, 1960, 1 ♀, leg. F. Novák; Vörs, 14 (1 ♂), 20 (1 ♀) May, 1950; 14 July, 1950, 1 ♂, leg. L. Kovács; Fonyód, 30 July, 1951, 1 ♂, leg. S. Pazsicky; Bánhida, 30 July, 1938, 1 ♂; 13 May, 1939, 1 ♂; 23 July, 1940, 1, ♂; 7 June, 1949, 1♂; 20 July, 1949, 1♂; 4 Sept., 1949, 1♂; 4 May, 1950, 1♂; July, 1950, 1 ♂, leg. I. Gaál; Esztergom, 3 August, 1942, 1 ♂; 19 August, 1943, 1 ♂; Szomor, 18 May, 1960, 3♂, leg. S Gyarmati; Pákozd, 17 May, 1950, 1♂; leg. Z. Kaszab; 4 August, 1951, 1 ♂, leg. Gy. Lengyel; Dinnyés, 29 July, 1949, 2 ♂, leg. L. Issekutz; 29 July, 1949, 1 ♂, leg. I. Balogh; 4 August, 1951, 2 ♂, leg. I. Kovács; Törökbálint, 4 May, 1961, 1 ♂, leg. Gy. Lengyel; 1895, 1 ♂, leg. L. Abafi—Aigner; Budapest, 17 March, 1959, 1 ♀ (e. l.), leg. P. Agócsy; Budaörs, 19 May, 1957, 1 ♂ (e. l.); 24 May, 1 ♂ (e. l.), leg. L. Issekutz; Gyöngyös, 19 May, 1962, 1 ♂, leg. P. Agócsy; Kazincbarcika, 20 May, 1960, 1 ♂, leg. Z. Mészáros; Cinkota, 13 July, 1956, 1 ♂, leg. I. Gaál; Tiszaluc, 4—7 August, 1943, 1 ♂, leg. L. Issekutz; Ober-Weiden (N. Ö.), 1926, 1 ♂, (e. l.); 1927, 1 ♂ 1 ♀, (e. l.); 1928, 2 ♂ (e. l.); leg. O. Bubacek; 11 August, 1928, 1 ♂, leg. Kautz; 13 September, 1932, 1 ♂, leg. H. Reisser.

II. In the collection of Dr. L. Kovács: Győr, 29 July, 1959, 1 ♂, 4 August, 1960, 1 ♂, 23 May, 1961, 1 ♂, 22 May, 1963, 1♂; Sopronhorpács, 5 August, 1955, 1♂, 4 June, 1958, 1 ♂, 24 July, 1958, 1 ♂, 7 August, 1958, 1 ♂; 17 (1 ♂), 29 May, (2 ♂), 1959, 8 August, 1959, 1 ♂; Szombathely, 18 May, 1962, 1♂, 4 May, 1963, 1♂; Pacsa, 16 July, 1960, 1 ♂, 8 August, 1961, 1 ♂; Keszthely, 3 August, 1962, 1 ♀; Lengyeltóti, 19 July, 1961, 1 ♂; Martonvásár, 16 May, 1 ♂, 10 August, 1960, 1 ♀; 4 August, 1961, 2 ♂; Fácánkert, 21 April, 1961, 1 ♂; Velence, 5 (1 ♂), 13 (1 ♂) August, 1959, 17 August, 1961, 1 ♂; Baj, 13 (1 ♂), 15 (1 ♀), 17 (1 ♂), 25 (1♂) May, 1960; 5 (1 ♂), 21 (1 ♂ 6 ♀) May, 1961; 19 (1 ♀), 20 (1 ♂) 22 (2 ♂ 1 ♀), 23 (2 ♀), 25 (1 ♂), 29 (1 ♂) July, 1961; 5 August, 1960, 1 ♀; 11 May, 1962, 1 ♂; Toponár, 24 July, 1961, 1 ♂; Budatétény 22 July, 1960, 1 ♂; Budapest, 1 August, 1961, 1 ♂; Miskolc, 2 August, 1960, 1 ♂; 6 May, 1961, 1 ♂ 1 ♀; Makkoshotyka, 7 August, 1962, 1 ♂; Kisvárda, 24 (2 ♂), 28 (1 ♂) July, 1957; 4 (1 ♂), 15 (1 ♂) August, 1957; 2 June 1959, 1 ♂; 22 July, 1960, 2 ♂;

8 August, 1960, 1 ♂; all collected by the light-trap network. — Vörs, 14 (1♂), 20 (1 ♂) May, 1950; 13 August, 1950, 1 ♀, leg. L. KOVÁCS; Esztergom, 15 August, 1943, 1 ♂, leg. L. VIDA; Fehérvárcsurgó, 11 May, 1949, 1 ♂, leg. I. FORSTNER; Pákozd, 24 (1 ♂), 28 (2 ♂) July, 1948, leg. L. KOVÁCS; 29 July, 1949, 2 ♂ 2 ♀, leg. L. GOZMÁNY; Pomáz, 25 July, 1945, 1 ♀, leg. L. KOVÁCS; Ócsa, 19 July, 1947, 1 ♂, leg. L. KOVÁCS.

III. In the collection of L. RÉZBÁNYAI, Budapest: Stájer-házak, Kőszeg, 22 July, 1964, 1 ♂; Somhegy-puszta, Bakonybél, 25 May, 1967, 1 ♂; 2 June, 1 ♂; Balatonszabadi-fürdő, 3 August, 1962, 1 ♀; all collected by light-traps.

IV. In the collection of the Bakony Museum, Veszprém: Somhegy-puszta, Bakonybél, 5 June, 1967, 1 ♀; 30 July, 1 ♂; collected by light-trap.

V. In the collection of the Natural History Museum, Vienna: Wien, May, 1 ♂, leg. HÖFER; Wien (Donau-Auen), 5 August, 1933; 5 May 1934, 2 ♂, leg. R. KITSCHELT; Wien (Umgebung), April, 1932, 1 ♀ (e. l.), leg. R. BERGER; Ober-Weiden (N. Ö.), 5 May, 1927, 1 ♂; 26 May, 1928, 1 ♀; 5 May, 1932, 1 ♂, leg. Dr. SCHAWERDA; 12 May, 1928, 1 ♀, (e. l.), leg. Dr. SCHIMA; 4 August, 1929, 2 ♀, leg. I. PREISSECKER; Bruck a. L. (Spittlberg), 20 July, 1936, 1 ♂, leg. I. PREISECKER; Krakau, 20 May, 1892, 1 ♂ 1 ♀, Coll. PRINZ.

Localities in Hungary. (Map 1.) The new species was most frequently encountered in the northwestern and northern parts of the country. Of the 63 known localities, 14 fall between the western confines of the country and the western slopes of the Mts. Bakony, 7 are situated around the Balaton, 21 lie in the northeastern section of the Transdanubia and the abutting hilly region near Gödöllő, and 10 are located in the Northern Range. Toward the south and the southeast, the number of localities decreases. There are 5 more in the Transdanubia, largely along the line connecting the upper reaches of the river Kapos and the mouth of the Sió. The southern limit of its range is considerably further up in the north in the area between the Danube and the Tisza (Tass and Kecskemét), and the farthest north beyond the Tisza (Mezőtur, Mikepércs, and toward the east in Kállósemjén and Kisvárda).

The new species has hitherto not been collected in our higher mountainous ranges, thus in the Central Mecsek, the higher elevations of the Mts. Bakony, the Mts. Mátra, not above 500 m in the Mts. Bükk, or between the rivers Bodva and Hernád, nor in the Mts. Zemplén (except for their southern confines), in the southern zone of the Transdanubia, the Great Plains, and in the southern and northeastern regions beyond the Tisza.

In Hungary, the first specimen was captured about 10—15 years after the discovery of the species. According to ABAFI—AIGNER, it was R. ANKER who first collected it in Pusztapó near Mezőtúr (1), while I. FRIVALDSZKY relates his own datum from Peszér (9). In the last century, it occurred also in Budapest, but merely one specimen in each of the recorded sites. Though the species is sensitive to light, greater numbers were collected only by the continuously functioning light-traps.

Ecological and cenological characterization of the news species. According to the Central-European literature it has a number of foodplants. The majority of the cited foodplants belong to the far-ranging Compositae, hence no specific preference may influence its distribution.

It seems indubitable, on the other hand, that the species has a certain requirement of moisture, since its most favoured habitats lie in the humid, moderately warm regions of the country, whereas the species is absent from the southern, grassy slopes of the Central Range as well as the extensive, arid, grassy areas of the Great Plains. I had once personally observed its requirement of humidity. In the environs of Pomáz, I found only a single specimen during 2 years of continuous lepidopterological activities, at a site where the seeping waters of a well keep the surrounding ground constantly wet. — However, the species also has a certain demand for heat, because its known localities are the open countryside, the plain and hilly meadows,

where the heating effects of insolation is moderated to some extent only by evaporation. We should yet add that it was not observed at elevations above 400 m.

The conditions of its distribution in Hungary depend primarily on a suitable combination of the ecological factors as defined above. A witnessed by the qualitative data of the light-traps, the situation in this respect is the most favourable in the northwestern parts of the Transdanubia and generally in the northern confines of the country.

Of the 1922 specimens collected by the light-traps, more than 66 per cent derive from the northwestern part of the Transdanubia. An exceeding number, 769 individuals, was caught there by the light-trap at Sopronhorpács, representing 42 per cent of the entire material captured by the traps. Eighteen per cent of the total yield falls on the light-traps functioning in the northeastern section of the Transdanubia, of which the trap at Baj excelled by 192 specimens. Twelve per cent falls yet on the northeastern regions, but the yield of the best trap there, the one at Kisvárda, was merely 97 exemplars. And it is merely 4 per cent of the total which was captured by the traps in the central and southern parts of Hungary, whilst the six traps operating in the south and southeast have not captured a single specimen.

The new species was heretofore habitually regarded as a steppe-species. This should indubitably be ascribed to the early Hungarian data, since the first two specimens known from the region have been collected in the warm Plains, and in the two southernmost known localities of the country. This view can now hardly be defended. It becomes even less tenable if the coenological relationships of our home populations are examined. We have already seen that in the Plains, the true habitat of our steppe-species, the species occurs only sporadically in time and space, and its individual numbers are very low.

Wherever the conditions of its proliferation are the most favourable, thus in the northwestern parts of the Transdanubia, the steppe-species are entirely absent, whereas there live a number of species exhibiting a decidedly montane character within our confines. Such are, for instance, *Eilema depressa* Esp., *Lycophotia porphyrea* Schiff., *Amathes ditrapezium* Schiff., *Cerapteryx graminis* L., *Puengeleria capreolaria* Schiff., and others in Sopronhorpács. In the northeast, the species coexists at Kisvárda with the following species, montane in the above meaning of the term, namely *Eilema depressa* Esp., *Cerapteryx graminis* L., *Bombycia viminalis* F., *Dysstroma citrata* L., *Perizoma albulata* Schiff., etc. Localities, where richer *gozmanyi* populations and one or two steppe-species (eg. *Hadena silenes* Hb), occur together, are to be found only in the northeastern part of the Transdanubia, but this region represents already a transitional area of the two faunal elements in question.

To sum up, one may state that the new species is not a steppe-species, but a Noctuid taxon preferring primarily wet meadows in open tracts of land.

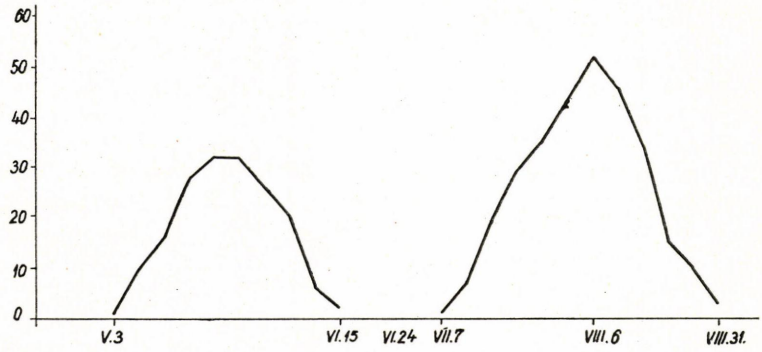
For its distribution in the Carpathian Basin, a plausible explanation might be inferred from the climatic evolvement of the present geological age. The last glacial period was followed by a gradually increasing rise in temperature, simultaneously with a diminishing content of aerial humidity above the ground, as well as the gradual desiccation of the soil. Before this process began, our home populations had indubitably found their conditional requirements more southwards, indeed, the centre of conditions favourable for their proliferation, with respect also to their requirements of heat, had been considerably farther to the south.

Their present range represents therefore an advanced state of a gradual shifting to the north, caused by external circumstances. During this process, the southern populations gradually decreased in individual numbers. This was further aggravated

by the draining of swampy bodies of water and the regulation of river-courses. It is surely owing to these facts that the species has not been encountered in the last 100 years, despite very intense collectings, in Peszér, its erstwhile southernmost locality between the Danube and the Tisza.

Toward the west and the east, however, heavily wooded hilly and mountainous regions stand in the way of its expanse. The rate of advance is here blocked, explaining also the relative overpopulation of its centres in the west and the north. It is to be ascribed to a push with a climatical background, effecting an intensive earlier wandering, that the resulting advance had penetrated (as witnessed by the still living populations) exceptionally deep into the area of the Alps. In all likelihood, this had coincided with the "hazel-period", the warmest interval of the present interglacial.

Phenological data. The activity graph (14) based on the data gathered for an extensive period by the continuously operating light-traps, displays at the first glance that the species has two distinct annual broods (Graph 1.).



Graph 1. Activity curve of *Hyssia gozmanyi* sp. n. (based on light trap data)

The earliest observation of *gozmanyi* n.sp. refers to 3 May, the last individuals of the first generation were captured on 30 June. Subsequent to 13 June, it was not observed on every day. The earliest date of the appearance of the second brood is 7 July. During the period 10 July — 26 August, we have data for every day, and then only one observation each for 28, 30, 31 August. An individual appearing on 26 September, 1966, had probably indicated the commencement of an abortive third generation.

The transitional period between the two broods, during which imagos appeared but sporadically, comprises 26 days, whereas none were as yet observed between 16—23 June and 1—6 July. The second brood predominates in every respect over the first one. Ever since the beginning of the light-trap surveys, the first generation was observed on 175 days, of which most fell between 17—30 May (92 flight days), whereas the second appeared in 291 days, the maximum having been 151 flight days between 28 July—12 August. The spring peak (10 observations) is on 22 May, the summer one (11 observations each) on 5, 6, 8 August.

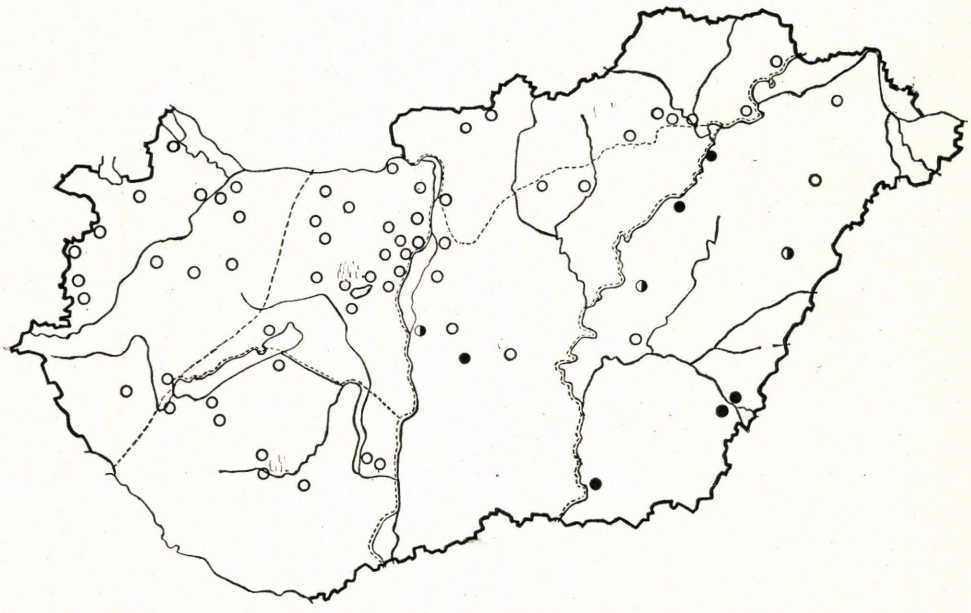
The ratio of individual numbers emphasizes still more the preponderance of the second brood. Of the 1922 specimens caught by the light-traps, 362 represent the first generation, the other 1560 the second brood. Our home populations belong therefore to those bivoltine species for which the conditions of the winter are considerably less favourable than those of the summer (14).

2. **Orthosia porosa** Eversmann, with the description of a new subspecies

When Eversmann described his *cavernosa*, he already had in his hands specimens of the taxon now under discussion, but he as well as others recognized only later that they were confronted in fact by two distinct though superficially similar species. Their separation was made in 1854. The exemplars serving for the description originated from the SW forefoot of the Ural range, the Government of Orenburg (6).

As far as the localities are known at present, they lie in two far-removed areas. The eastern group inhabits the largely triangular territory one of whose shorter (western) sides is the line connecting Uralsk with the mouth of the Volga, the eastern one decurrent also from the Ural to the northern shores of the Issyk-Kul, while the hypotenuse touches the northern coastline of the Black Sea, the Caspian Sea, the Aral Lake and the Issyk-Kul. — The western populations inhabit the Hungarian Plains. As to origin, it is a turano-eremic species, with respect to range, it belongs to the rare Turano-Pannonian taxa, with a disjunct distribution.

Distribution in Hungary (Map 1). The known Hungarian localities are in the central part of the area between the Danube and the Tisza, and beyond the Tisza from the environs of Debrecen to the southern border of the country. The first specimen in Hungary was caught by Dr. F. Kiss, on the window of his house at Nagykapros-puszta near Polgár, Com. Hajdú, 25 July, 1910. Though F. Pillich reported on the discovery in 1913 (17), the important datum was wellnigh forgotten, until, more than 40 years later, two other specimens became known. One of them was captured by Dr. Gy. Éhik at Ágasegyháza, near Kecskemét, on 9 June, 1953, the other by Dr. L. Gozmány, a year later, in the railway station of Ohat-puszta near Egyek,



Map 1. Distribution of *Hyssia gozmanyi* sp. n. (white circles) and of *Orthosia porosa kenderesensis* ssp.n. (black circles) in Hungary; the three black-and-white circles denote the common occurrence of the two species

east of Debrecen. I have published all three data in my list of the Hungarian fauna (13).

The finer delineation of the distribution of *porosa* in Hungary was made possible only by the organisation of the nationwide light-trap network. To this day, 6 light-traps have collected the species, all of them in numerous instances. The first data derive from Tass, Mikepércs, and Hódmezővásárhely in 1959, then from Kenderes in 1960, from Tarhos and Gerla in 1962. Accordingly, two of the known localities lie in the central part of the area between the Danube and the Tisza, the other seven beyond the Tisza. The distances from one another of the localitis is considerable, at least 40 km.

Ecological and coenological references. The main foodplant of *O. porosa* is, according to literature, *Artemisia maritima*. This plant grows in Hungary chiefly on alkali flats, and also in sandy areas. Since both kinds of soil are present in each of the known localities, one might suppose that the range of the species is closely connected with that of the foodplant. This presumption is, however, at variance with the fact that the species was not found in numerous other places where *A. maritima* thrives, indeed, it was caught in one or two specimens or observed in small individual numbers in the majority of even the known localities. There is no doubt therefore that the conditions favourable for its proliferation are rather limited.

By a study of the quantitative data of the continuously operating light-traps, we have attempted to find a clue to the problem. Of our light-traps, the one in Hódmezővásárhely captured one specimen each in two years during the nine years it functioned, the trap at Gerla secured 4 specimens in three years in the course of its six years of operation, the trap at Tarhos collected 7 exemplars in five years during the operational nine, and the one at Mikepércs 12 specimens during five years in the course of its ten functional years. On the other hand, the light-trap at Tass caught 24 specimens in seven years (operating since eight years), therefore almost continuously. The majority of specimens, an exceedingly high number of individuals, was captured by the trap in its first location at Kenderes, namely 865 during five years. After the trap was transferred to a second site, there appeared but 9 specimens in two years of the three functional periods, while a provisionally operating UV trap secured 14 exemplars in 1963. However, the two latter traps were operating in agricultural sites. The total number of *porosa* specimens caught by the light-traps is 944, up to the end of 1967.

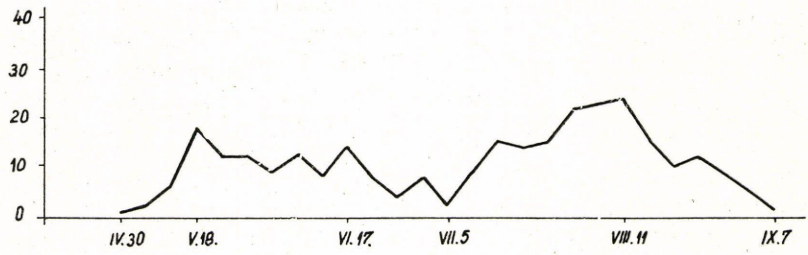
Evidently, if we wish now to gain information on our home conditions most favourable to the breeding of *porosa*, the first site of the trap at Kenderes should first of all be scrutinized. The trap was situated on the side of the Plant Protection Station nearest the market-place. The market was as good as unused for a long time, and it is now entirely overgrown by the plant community *Artemisio-Festucetum pseudovinae*, characteristical of our dry alkaline flats, with the dominant species *Artemisia maritima*. The market passes into an extensive pasture covered by the same plant community. This dry natron field, with its characteristical plant association offers *porosa* the most favourable breeding possibilities available in our home conditions.

The other station where our species appeared yearly is at Tass near the Danube. Though the trap here operates in agricultural conditions, there are vast alkaline fields in the environment, and also in the near neighbourhood, of the village. We probably have the same situation here as in the case of the traps operating at Kenderes in the second site, namely in agricultural surroundings, which also continuously captures *porosa*, although in small numbers. The probability is not precluded that

a part of them feeds on the *A. maritima* plants dispersed in the neighbourhood, but another part of the individuals arrives there in the course of their wanderings, especially in years of gradation when an inclination to expansion can be observed also in other related species (mainly *Mamestra pisi* L.).

In the vicinity of the other light-traps, conditions must surely be less favourable; the primary breeding sites of the species must either be at greater distances from the traps, or the populations comprise but meagre individual numbers everywhere in the surrounding areas, owing to some unfavourable pedological or coenological conditions.

Phenological data. The activity graph, (Graph 2) constructed on the basis of the data produced by the light-traps, reveals that also this species has two annual broods.



Graph 2. Activity curve of *Orthosia porosa kenderesensis* ssp.n. (based on light trap data)

The borderline of the two generations is around 6—7 June, not obliterated even by the summarization of the data of several years. The earliest observation refers to the last days of April, the last one to 7 September (both in 1961). During the period of the first brood, there is at least one daily observation between 14 May—22 June, and similarly between 10 July—3 September for the second brood. By our sporadical data, the transitional period between the two generations is shorter than in the preceding species, comprising merely 17 days. Nor is the second generation predominating over the first one to the same degree as in the case of the preceding taxon. With respect to calendar days, the two generations are nearly equal in time, the first one flying for 56 days (average of ten years), the second for 58 days. However, if the repetition of observations falling on identical calendar days also be taken into account, the rate will discernibly shift to the advantage of the second brood (113: 163). The most favourable days for flight in the spring are between 16 May—14 June, and in the summer 25 July—8 August. The peak of flight is on 18 May, and 29, 31 July (main value 6).

Though at a smaller rate, also the bulk of specimens appears in the period of the second generation, as the rate of the broods in this respect is 245: 699. For one day, most specimens were captured by the trap at Kenderes, 30 ♂ and 1 ♀ on 10 August, 1962. Winter conditions are less detrimental to this species than to the preceding one.

Systematical considerations. Literature as well as the collections of the Hungarian Natural History Museum apply the same specific name to both the eastern form and the one inhabiting the Carpathian Basin. The description of the species and the available specimens indicate, however, that they represent two distinct, well delimitable forms.

According to EVERSMANN's description, the fore wings of the nominate form are violet-brownish. This feature is observable on also our specimens deriving from Uralsk and Sarepta, despite the fact that the basic colour of the formers tend rather to reddish and that of the latters to brownish. One should add that the underside of their wings is also violet- or reddish-brown, and that the arcuate line separating the median and marginal fields is narrow or quite obscure, the same as the discal spot of the hind wings. The outer section of the fringe of the hind wings is white. The alar expanse of males collected in Uralsk is 29—32 mm, that of the two females 33 and 35, respectively, while the expanse of those from Sarepta is 33 and 35, respectively, in the males and 36 mm in the female.

Orthosia porosa kenderesiensis ssp. n.

The wings of the Hungarian specimens are pure blackish grey above, and fumous grey below, without any violet or brownish hue. The pattern of the underside is sharp, the lines behind the margin wide and fumous grey, and the discal spot of the hind wings also large. There is yet another dark line discernible in the marginal zone of the hind wings; occasionally the entire marginal field is suffused by fumous grey and also the outer portion of the fringe is dark, dingy whitish, or grey. The alar expanse is smaller in the average, the majority of the males measuring 24—30 mm (only exceptionally 31—32 mm), that of the females 28—32 mm.

Accordingly, the Hungarian form of *O. porosa* essentially differs in some respects from the nominate form, and is well distinguishable in all cases from the latter one, hence it represents a distinct subspecies. The possibility of this inference, based on considerations relating to faunal genesis, was raised also by Z. VARGA, in his lecture on the "New Systematics".

With respect to its uniquely rich breeding locality in Kenderes, Hungary, I propose to introduce this subspecies by the name *Orthosia porosa kenderesiensis* ssp. n.

Holotype male: "Kenderes, 1964. V. 20, fénycsapda" (= light-trap), deposited in the Hungarian Natural History Museum.

Paratypes: I. In the Lepidopterological Collection of the Hungarian Natural History Museum: Kenderes, 2 August, 1962, 1 ♂; 7 (3 ♂), 8 (2 ♂) August, 1963; 2 Sept., 1963, 1 ♂; 14 (1 ♂), 15 (1 ♂), 16 (2 ♂), 17 (1 ♂), 18 (2 ♂ 1 ♀), 23 (1 ♂), 24 (2 ♂), 25 (2 ♂), 26 (2 ♂), 27 (4 ♂), 28 (1 ♂), 30 (1 ♂), 31 (1 ♂) May, 1964; 1 (2 ♂), 3 (4 ♂), 5 (1 ♂), 6 (1 ♂), 10 (2 ♂), 17 (1 ♂), 25 (1 ♂), June, 1963; 5 (1 ♂), 12 (2 ♂), 14 (1 ♂), 15 (3 ♂), 16 (1 ♂), 17 (7 ♂ 1 ♀), 18 (2 ♂), 19 (2 ♂), 20 (2 ♂), 21 (5 ♂), 22 (6 ♂), 23 (7 ♂), 24 (4 ♂ 1 ♀), 26 (10 ♂), 27 (4 ♂), 29 (1 ♂), 31 (1 ♂), July, 1963; 4 (8 ♂), 5 (9 ♂), 6 (8 ♂) 7 (3 ♂), 8 (4 ♂), 10 (1 ♂), 11 (1 ♂), 14 (1 ♂), 19 (1 ♂), 22 (1 ♂), 24 (1 ♂), 26 (2 ♂) August 1963; 10 (1 ♂), 14 (1 ♂), May, 1966; 7 June, 1966 1 ♂; 16 July, 1967, 1 ♀; Tass, 14 August, 1962, 1 ♀; 16 July, 1964, 1 ♂; 30 June, 1965, 1 ♂; 29 (1 ♂), 31 (1 ♂) July, 1965; 7 (1 ♀), 18 (1 ♂) May, 1966; 13 June, 1966, 1 ♂; Tarhos, 9 August, 1964, 1 ♀; 3 August, 1965, 1 ♂; 8 June, 1966, 1 ♂; 15 May, 1967, 1 ♂ 1 ♀; 10 July, 1967, 1 ♂; 2 August, 1967, 1 ♂; Gerla, 18 May, 1965, 1 ♂; 16 June, 1965, 1 ♀, 4 August, 1965, 1 ♂; all specimens captured by light-traps. — Nagykapros, 25 July, 1910, 1 ♂, leg. F. KISS; Ágasegyháza 9 June, 1953, 1 ♂, leg. GY. ÉHIK; Ohat, 25 June, 1954, 1 ♂, leg. L. GOZMÁNY; Kenderes, 23 June, 1962, 4 ♂, leg. GY. LENGYEL. —

II. In the collection of Dr. L. KOVÁCS, Budapest: Kenderes, 16 (1 ♂), 17 (1 ♂), 20 (1 ♂), 26 (1 ♀) May, 1960; 3 (1 ♂), 6 (1 ♂) June 1960; 2 August, 1960, 1 ♂; 30 April, 1961, 1 ♂; 15 June, 1961, 1 ♂; 10 (1 ♂), 25 (1 ♂), 26 (3 ♂) July, 1961; 3 (2 ♂) 11 (1 ♂), 28 (3 ♂), 29 (1 ♂), 30 (2 ♂) August, 1961; 8 (2 ♂), 22 (1 ♂) May, 1962; 11 June, 1962, 1 ♂; 14 (1 ♂), 16 (1 ♂), 19 (1 ♂ 1 ♀), 20 (1 ♂ 1 ♀), 28 (1 ♀) July, 1962; 9 (1 ♂), 12 (1 ♂) August, 1962; 22 May, 1963, 1 ♂; 10 (1 ♂), 11 (1 ♂), 23 (1 ♂) August, 1962; Tass, 10 July, 1959, 1 ♂; Hódmezővásárhely, 27 July, 1959, 1 ♂; Mikepércs, 4 June, 1958, 1 ♂; 8 (1 ♂), 18 (1 ♂) August, 1958; 14 June, 1959, 1 ♂; 21 May, 1962, 1 ♂; 15 July, 1963, 1 ♂; Tarhos, 22 May, 1962, 1 ♂; 30 June, 1962, 1 ♂; 12 June, 1963, 1 ♂; Gerla, 16 August, 1962, 1 ♂; — all captured by light-traps.

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