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The Micropterigidae of Switzerland, with a key to their identification (Lepidoptera)

Steven Whitebread, Maispracherstrasse 51, CH-4312 Magden, Switzerland.

Summary

The Palaearctic genus *Micropterix*, the only European representative of the family Micropterigidae, comprises about 65 species. Switzerland has a fairly rich *Micropterix* fauna, with 13 species. A key to all Swiss species, based on external characters, is presented. Five species are figured in colour. All available records are presented in the form of distribution maps. One species is reported from Switzerland for the first time.

The Palaearctic genus *Micropterix* is the only representative of the family in Europe. About 65 species are known, of which 13 have so far been recorded from Switzerland. They are day-flying moths, flying usually only in sunshine and many species can be found in numbers sitting on flowers, feeding on the pollen. The larvae feed on vegetable matter on or below the surface of the soil and are therefore for the majority of species unknown. Their wingspan ranges from about 6 to 11 mm. Many species are shining purple or violet with golden fasciae and spots.

I have studied the Swiss *Micropterix* material in most private and museum collections in Switzerland and that in the Natural History Museum, London (BMNH). Data is still quite sparse, but nevertheless gives an idea as to the distribution and phenology of the species. However, before I could undertake this study, I had to solve a number of identification problems. Fortunately, John Heath, former Vice-President of SEL, was able to help me before his untimely death in 1987, and I dedicate this article to him.

John Heath devoted much of the last 30 years of his life to revising the genus *Micropterix*. He was able to solve most of the taxonomical problems and described 25 new species. Unfortunately, however, he died before he could publish a monograph on the genus, although a check list was published posthumously (Heath, 1987), as also was his autobibliography (Heath, 1988). His findings therefore remain distributed among a number of publications in many different journals. These were mostly devoted to descriptions of new

species. Existing taxa were not generally treated fully, the North African species being an exception, and for some the genitalia have never been figured. For this reason, many lepidopterists still have difficulty in identifying species of this genus. At this point I would like to stress that, even though I might sound rather critical of John HEATH's work, there is no doubt as to the immense value of his contribution to the knowledge of these moths.

An important point to mention is the way John HEATH chose to illustrate adults and genitalia. He always drew the **pale** golden bands on the forewings **darker** than the violet or purple ground colour, which makes interpretation of the figures very difficult. Also, the male genitalia are always figured unconventionally, with the valvae pointing upwards, and the degree of variation in the adults and genitalia was not usually mentioned. This confused situation has for instance recently led to the description of two new species, which are almost certainly only synonyms of known species.

List of the Swiss *Micropterix* species

The main reference work to Swiss microlepidoptera is still that of J. MÜLLER-RUTZ, in VORBRODT & MÜLLER-RUTZ (1914), and the numbers in that work are quoted here (or page number for *M. paykullella*, which was first mentioned in a footnote). For species recorded for the first time in Switzerland subsequent to the original work, the supplement and page number are quoted where it was first mentioned. Eight supplements to this work have been published so far, although the first two were published at the end of each of the two original volumes.

	M.-R. No./ Suppl. : Page	Species
1	2931	*Micropterix aruncella* (SCOPOLI, 1763) + f. *seppella* (FABRICIUS, 1777)
2	2932	*Micropterix calthella* (LINNAEUS, 1761)
3	5 : 533	*Micropterix isobasella* STAUDINGER, 1870 + f. *weberi* MÜLLER-RUTZ, 1927
4	8 : 108	*Micropterix mansuetella* ZELLER, 1844
5	2926	*Micropterix tunbergella* (FABRICIUS, 1787)
6	2927	*Micropterix aureoviridella* HÖFNER, 1898
7	p. 603	*Micropterix paykullella* (FABRICIUS, 1794) (= *rosarum* MÜLLER-RUTZ, 1927)
8	—	*Micropterix aglaella* DUPONCHEL, [1840]
9	7 : 406	*Micropterix aureatella* (SCOPOLI, 1763)
10	2928	*Micropterix allionella* (FABRICIUS, 1794) + *f. junctella* WEBER, 1945 (= *aureatella* sensu MÜLLER-RUTZ, 1914)
11	2930	*Micropterix rothenbachii* FREY, 1856 (= *australis* HEATH, 1981)
12	2929	*Micropterix schaefferi* HEATH, 1975 (= *ammanella* sensu MÜLLER-RUTZ, 1914 partim)
13	2929	*Micropterix osthelderi* HEATH, 1975 (= *ammanella* sensu MÜLLER-RUTZ, 1914 partim)

The systematics of the Micropterigidae have not yet been worked out. The order of species in this list is based on my own observations of affinities, taking wing pattern and genitalic characters into account.

Key to the identification of Swiss *Micropterix* species

The male genitalia of all species are fairly characteristic and should present no identification problems if intra-specific variation and varying mounting techniques are taken into account. The genitalia of many specimens can be inspected in situ. However, the female genitalia are hardly sclerotized, and have therefore been neglected by taxonomists ; only the chitinous plates on the 8th segment may be of limited use. For this reason, I have found it necessary to construct a key to the identification of adults based on wing pattern. Critical to the identification of some central European species is the colour of the basal fascia, which can be dull- or shining (pale) golden. Badly worn or poorly set specimens can be difficult to identify correctly. The nomenclature used in the key is explained in Fig. 1.

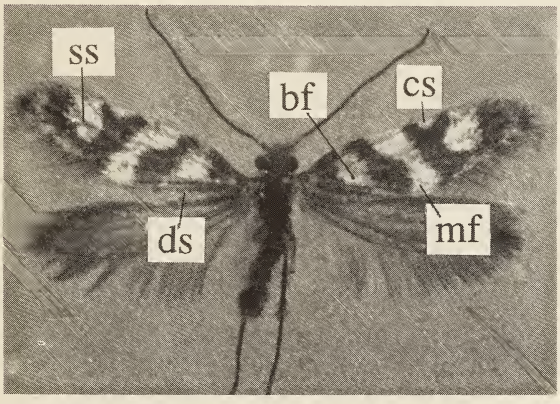


Fig. 1. *Micropterix schaefferi*, male. ds - dorsal streak ; bf - basal fascia ; mf - median fascia ; cs - costal spot ; ss - subapical spot.

1 Forewings unicolorous, or at most marked purple at base **2**
– Forewings not unicolorous **4**
2 Forewings golden, marked purple at base **3**
– Forewings bronze (greenish-golden), not marked purple at base (at most a few scales on edge of costa) ..... *isobasella*
3 Forewing narrow, with purple basal spot on costa ..... *aruncella* ♀
– Forewing broad, purple spot extends across whole of base ..... *calthella*
4 Forewing golden with 2 usually complete narrow silvery white fasciae ..... *aruncella* ♂
– Forewing markings not silvery white **5**

5 Forewing bronze with 2 very faint reddish golden fasciae, head golden yellow ..... *isobasella* f. *weberi*
– Forewing reddish-purple or violet with golden markings **6**
6 Forewing reddish-purple with indistinct dull golden markings **7**
– Forewing reddish-purple or violet with bright golden markings **8**
7 Head black, golden markings largely absent in apical third of forewing ..... *mansuetella*
– Head golden-yellow, golden markings present in apical third of forewing ..... *tunbergella*
8 Basal fascia of forewing bright golden from costa to dorsum, dorsal streak absent (Figs 4-6) **9**
– Basal fascia of forewing wholly or partly dull golden (Figs 2,3) **12**
9 Fasciae narrow, straight, parallel, costal spot usually absent, subapical spot sometimes reaching costa, bright golden (Fig. 6) ..... *aureatella*
– Fasciae broad, one small costal spot and one median subapical spot, sometimes connected **10**
10 Fasciae more or less straight, parallel, spots separate, median spot reaching costa but not dorsum (Fig. 5) ..... *allionella*
– Median fascia more or less angled towards dorsum **11**
11 Subapical and costal spots not reaching dorsum, often connected, enclosing a small spot of ground colour on costa (Fig. 4) ..... *rothenbachii* ♀
– Spots not usually connected, subapical spot triangular, usually reaching costa and dorsum ..... *rothenbachii* ♂
12 Basal fascia wholly dull golden (Fig. 2) **13**
– Basal fascia partly bright golden towards costa (Fig. 3) **15**
13 Median fascia slightly curved, costal spot present (Fig. 2) ..... *osthelderi*
– Median fascia straight, costal spot absent **14**
14 Basal and median fasciae not parallel, median fascia and subapical spot narrow ..... *paykullella*
– Basal and median fasciae parallel, subapical spot large, roundish, sometimes touching costa and dorsum ..... *aglaella*
15 Median fascia slightly curved, broader towards costa ; costal and subapical spot present (Figs 1,3) ..... *schaefferi*
– Median fascia straight, narrow ; costal spot absent ..... *aureoviridella*

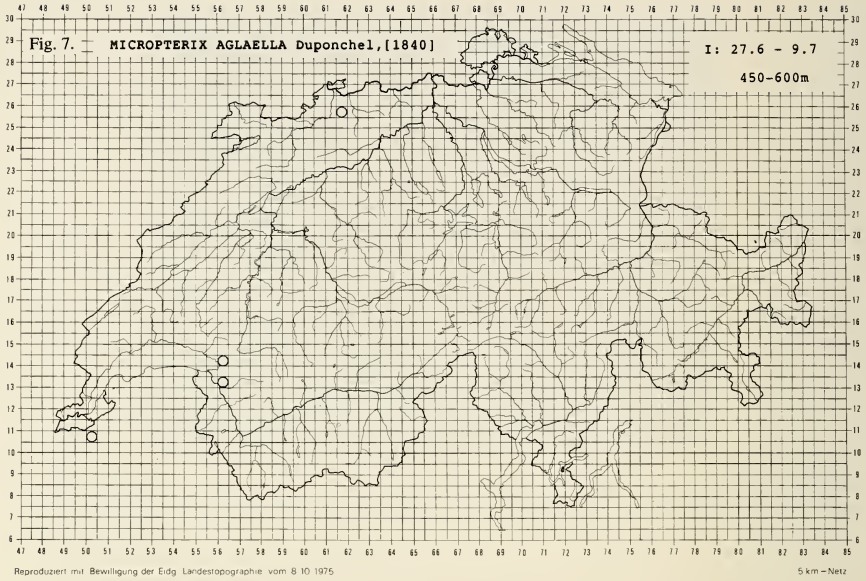
Distribution and phenology

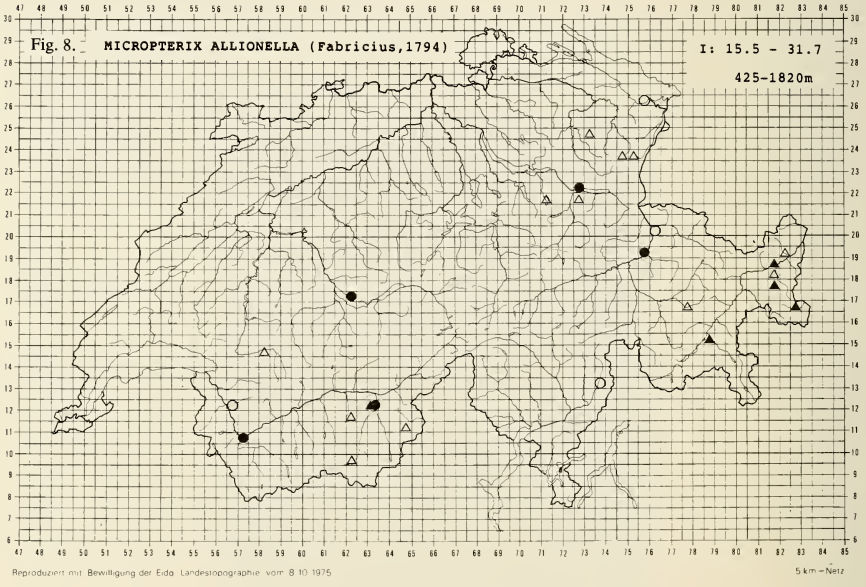
All the data collected were placed in a card index. Distribution maps were prepared based on a 5 km grid (Figs 7-19). The extreme dates and altitudes between which the adults have been taken is given at the top right of the maps. A few records from regions bordering Switzerland are also given and are commented on below.

It is not suggested that the maps show the complete distributions for each species. The data are far too incomplete for that. They are much more intended to summarise the state of our knowledge and to spur microlepidopterists to seek out the species in areas from which they have not yet been recorded. Nevertheless, certain trends can be seen. For instance, the fact that *M. allionella* has not yet been recorded from the Jura cantons or in S. Ticino, strongly suggests that it does not occur there. On the other hand, *M. rothenbachii* predominantly occurs in these two regions.

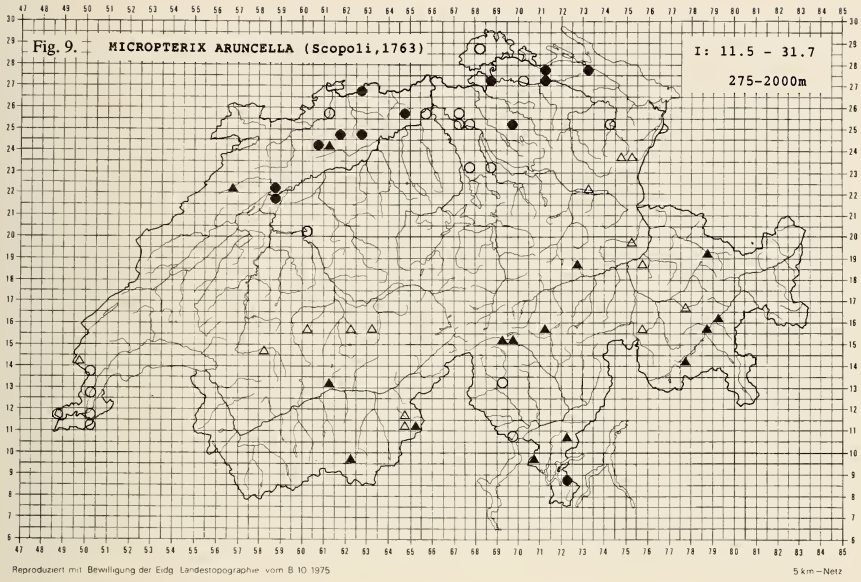
Figs 2-3. Females of *M. osthelderi* (2, top) and *M. schaefferi* (3, bottom), showing the difference in the shade of gold at the base of the wings.

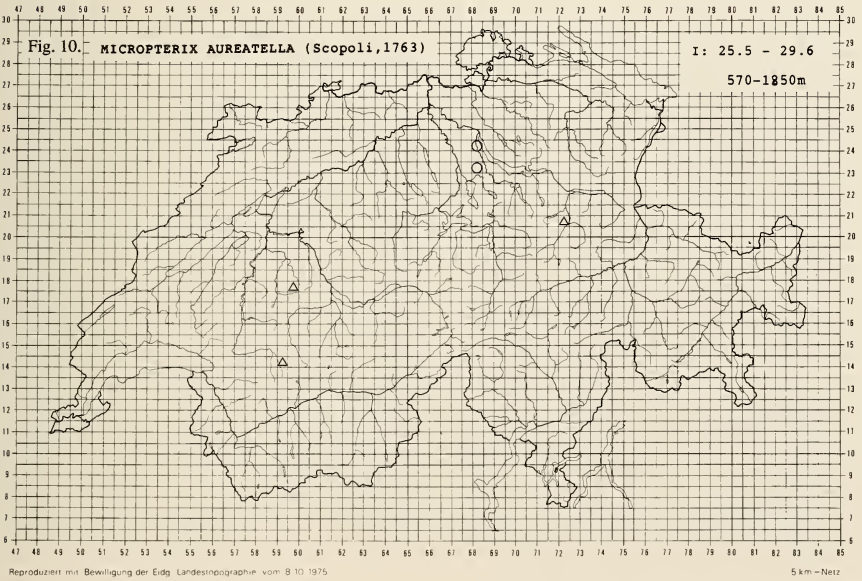
Figs 4-6. Females of *M. rothenbachii* (4, top), *M. allionella* (5, centre) and *M. aureatella* (6, bottom).

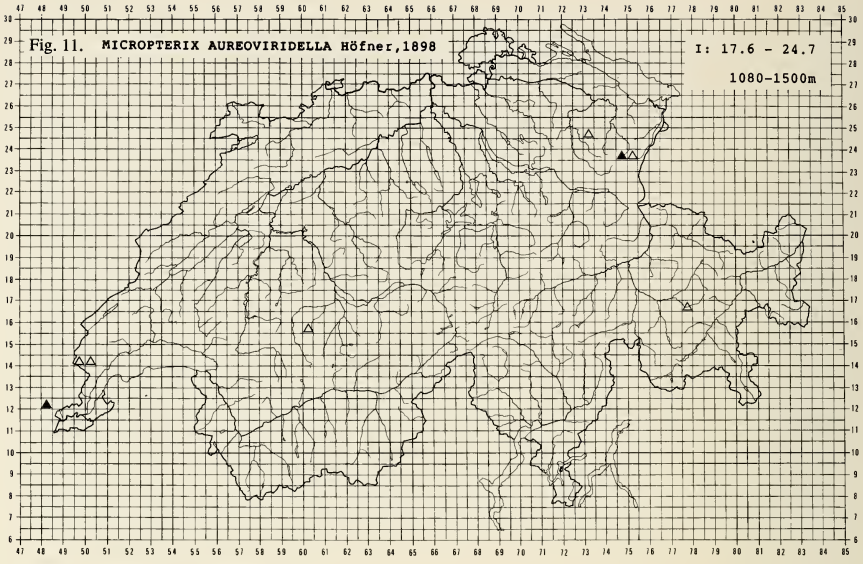


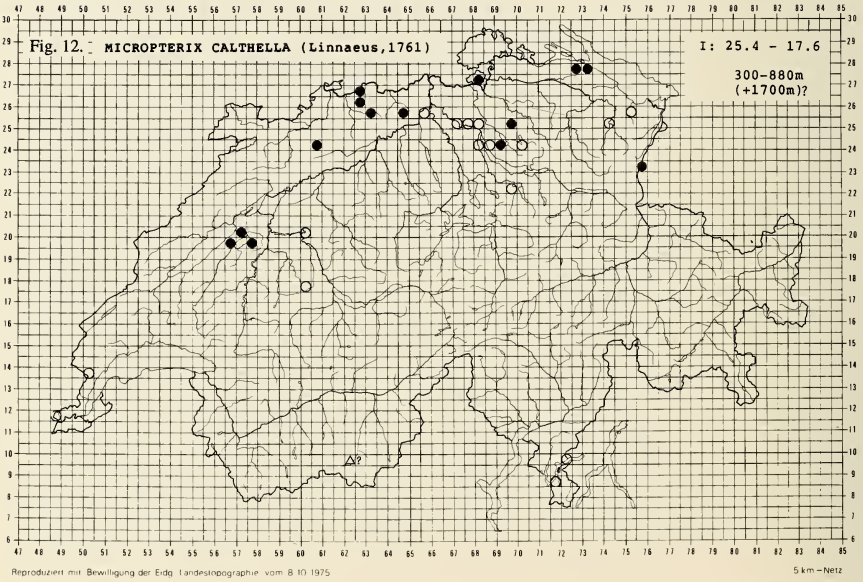


Figs 7-20. Distribution maps of *Micropterix* species recorded from Switzerland. Records are separated according to their date (filled symbols : post 1970 ; open symbols : pre 1970) and their altitude (circles : below 1000 m.a.s.l. ; triangles : above 1000 m.a.s.l.). The dates and altitude between which the adults have been taken are given at the top right. Fig. 20 shows all of the available *Micropterix* records.









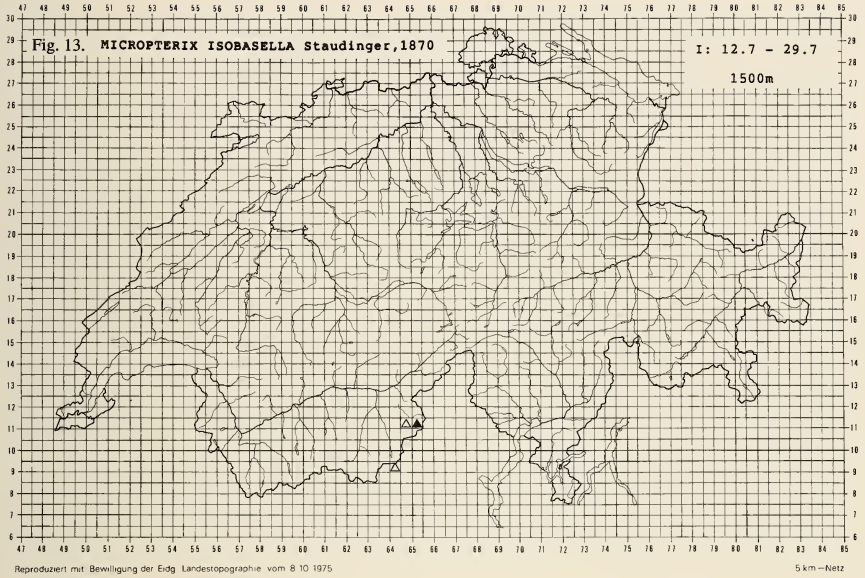


Fig. 13. **MICROPTERIX ISOBASELLA Staudinger,1870**

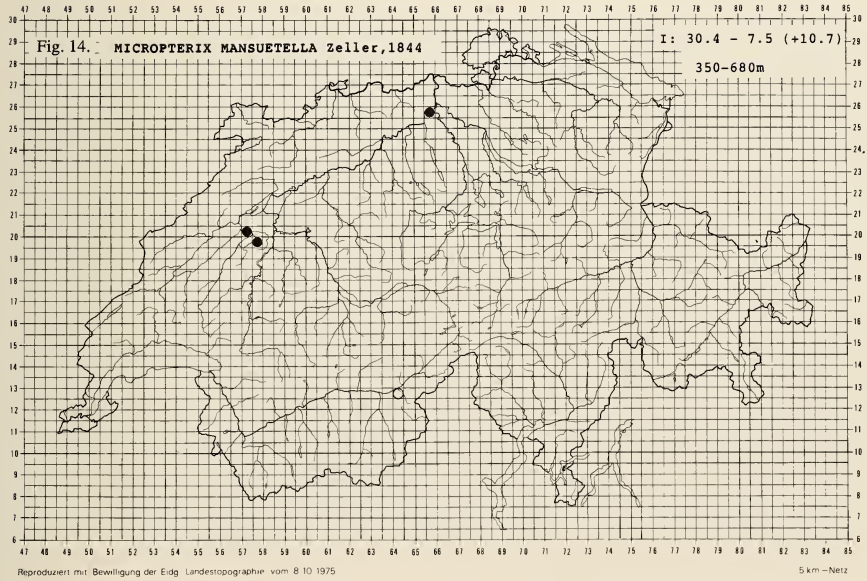


Fig. 14. **MICROPTERIX MANSUETELLA Zeller,1844**

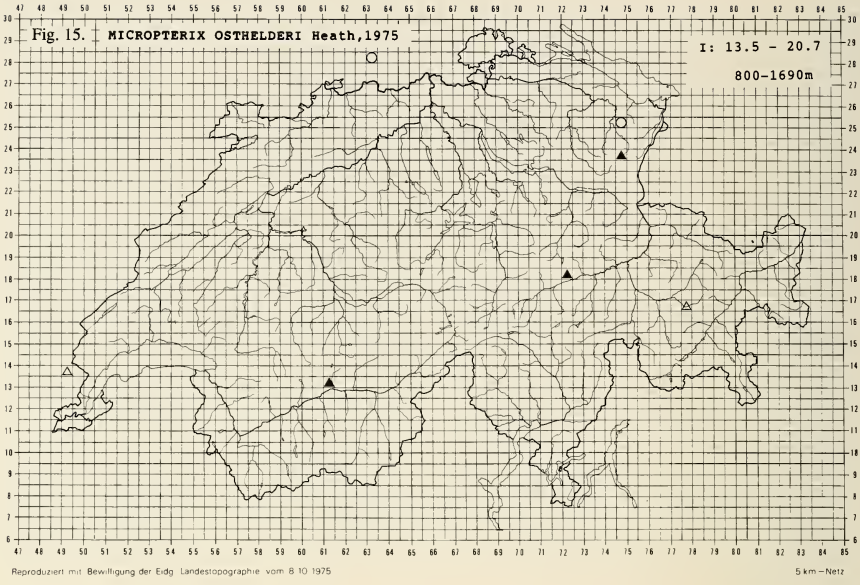


Fig. 15. MICROPTERIX OSTHELDERI Heath, 1975

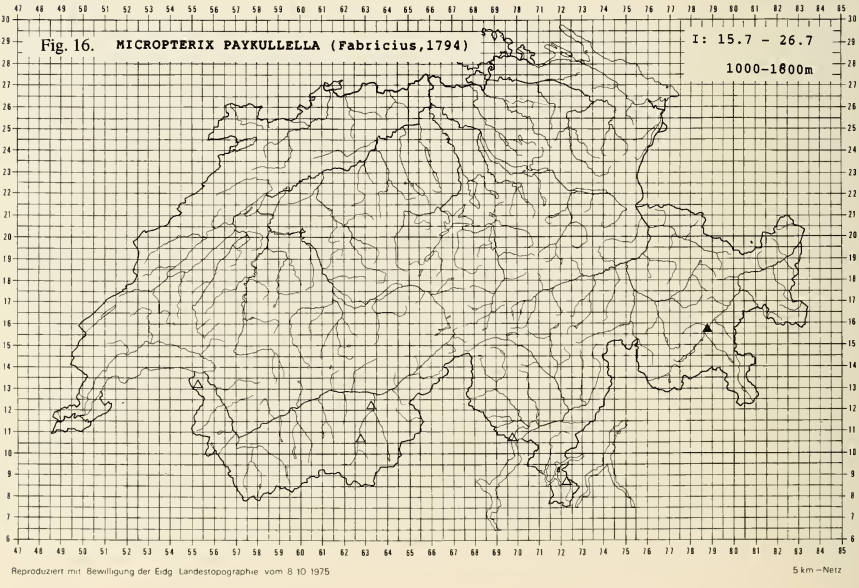


Fig. 16. MICROPTERIX PAYKULLELLA (Fabricius, 1794)

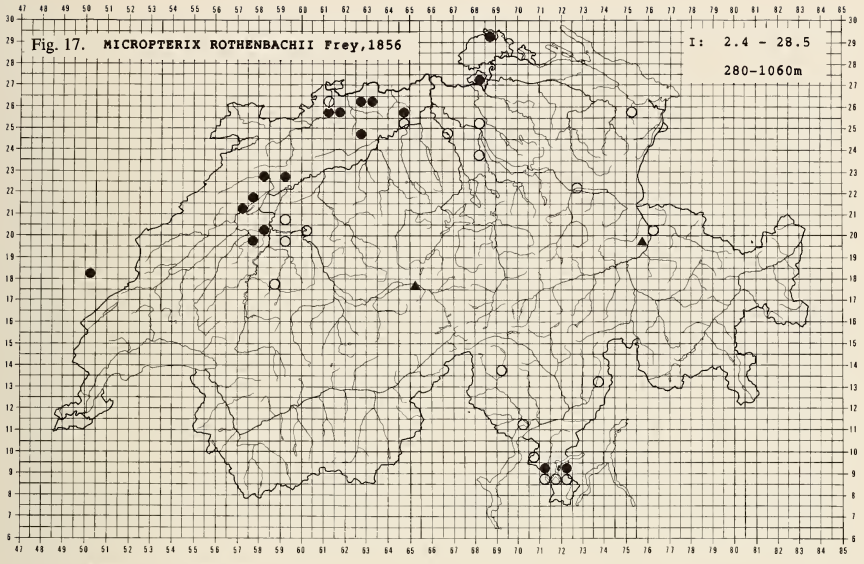


Fig. 17. MICROPTERIX ROTHENBACHII Frey,1856

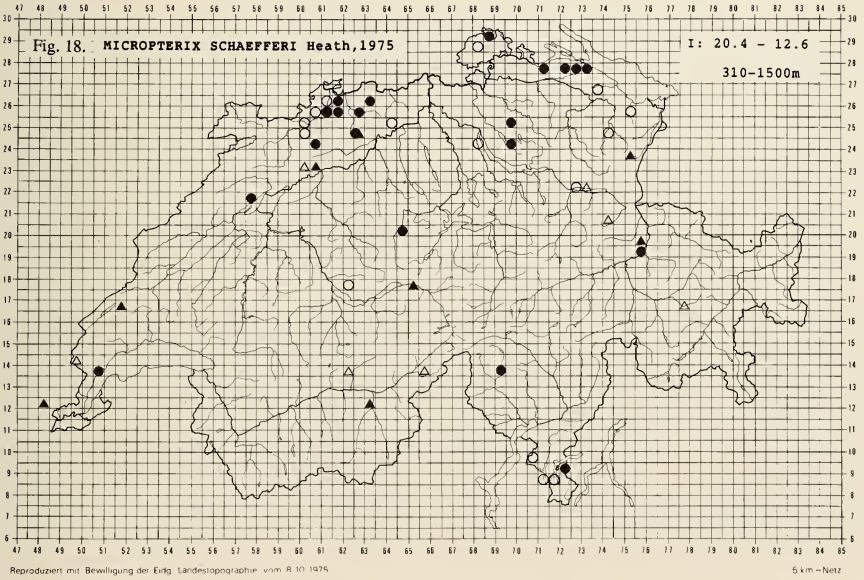
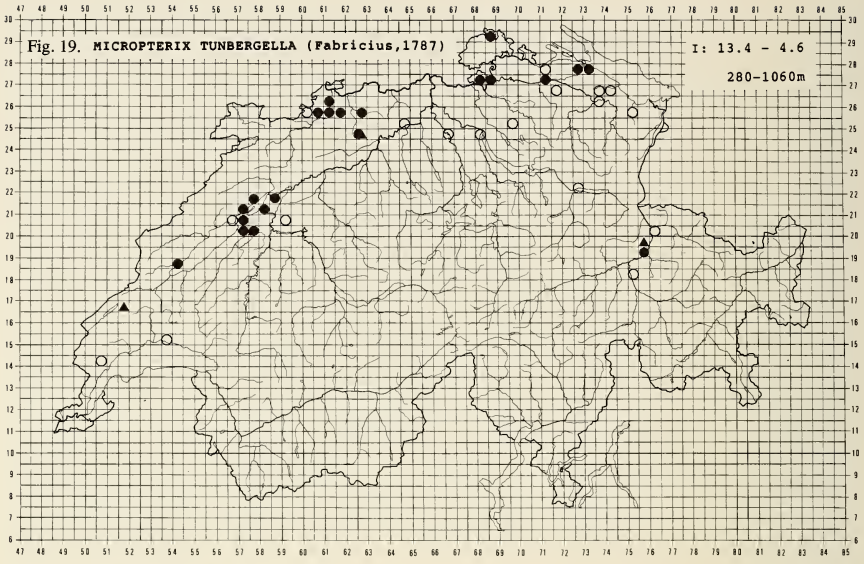
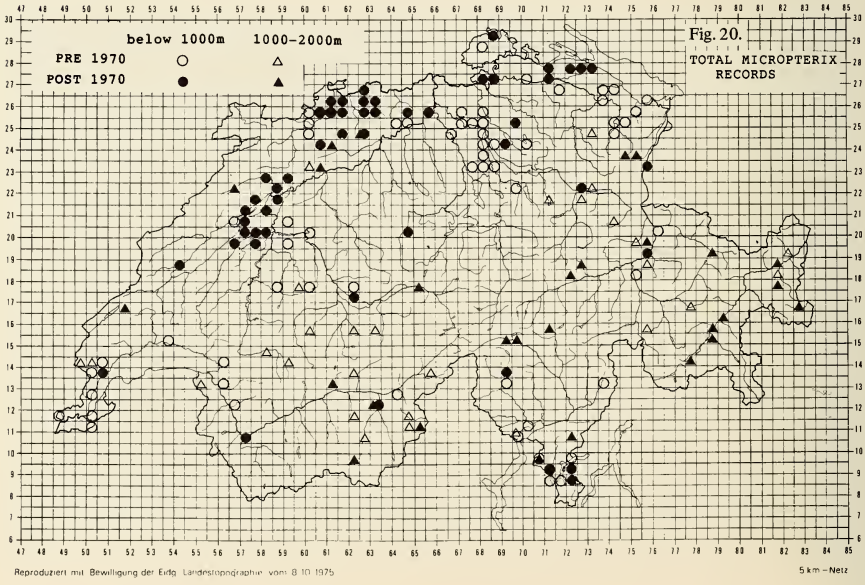


Fig. 18. MICROPTERIX SCHAEFFERI Heath,1975





Remarks on individual species

1. *M. isobasella* Stgr.

The type locality for this species is Macugnaga in northern Italy (ref. 64/09). The first Swiss specimens were taken by P. Weber in the Laquintal (VS) 1923-26. Müller-Rutz (1927) described specimens with two red-golden parallel fasciae as f. *weberi.* Weber took more specimens in 1936, and based on this material he raised the taxon to species rank (Weber, 1945). Heath (unpublished) considered these specimens to be simply *isobasella.* After more than 50 years, I was not able to detect the described fasciae on the original material. In 1990, I took a single female in a nearby locality ; this lacked the fasciae. There appears to be no evidence to suggest that *weberi* M.-R. is a separate species. The species could easily have been overlooked elsewhere.

2. *M. aureoviridella* Höfner

This species is known from a number of scattered localities in the Jura and Alps, always above 1000 m. Réal (1987 ; 1988) described a new *Micropterix* species from the Crêt de la Neige, just north of Geneva. I have been able to study material from the same locality collected by E. de Bros. These specimens are quite definitely *aureoviridella.* Having studied the problem, I am convinced that *M. liogierella* Réal, 1987 is a synonym of *M. aureoviridella* Höfner. However, it is beyond the scope of this paper to go into details.

3. *M. aglaella* Dup.

This species has not previously been recorded from Switzerland. The five known specimens have the following data : 'Gempenstrasse, 1.7.13' leg. Paravicini in Natural History Museum, Basel (NHMB) ; 'Aigle - Leysin, 9.vii.32' leg. Müller-Rutz in NHMB (determined by M.-R. as *aureatella*) ; 'Chillon, 27.6.26' leg. Fletcher in BMNH (determined as *ammanella* by Fletcher, 1927). Outside Switzerland, I have seen 3 specimens in the Geneva Museum from Mt. Salève, south of Geneva : 'Le Coin, 27.6.1920, leg. Romieux, det. Viette'.

4. *M. rothenbachii* Frey, *M. aureatella* (Scop.) and *M. allionella* (Fabr.).

These three species have often been confused. Females are illustrated in Figs 4-6.

Heath (1965) wrongly synonymized *M. rothenbachii* Frey with *M. allionella* (Fabr.), which left *'rothenbachii'* without a name. Heath (1981) described it under the name *australis.* However, having rechecked the type of *rothenbachii* Frey in the BMNH (designated as lectotype by Heath in 1959, but never published), I pointed out this error to John Heath just before he died. The correct synonymy with *australis* Heath appeared then in his posthumously published *Micropterix* check list (Heath, 1987).

From the original description of *M. vallebonnella* Réal, 1988, it would seem that this also is a synonym of *rothenbachii.* I have included the locality (ref. 50/18) on the map for that species.

In Switzerland, *aureatella* appears to be restricted to moors, whereas *allionella* occurs in warm mountain valleys, usually along the borders of dry woodland. *M. rothenbachii* is a species of shady deciduous woodland below 1000 m, especially among beech and hornbeam and very often flying together with *M. schaefferi* and *M. tunbergella.*

5. *M. osthelderi* Heath

Apparently a rare species, but widespread. The species appears to be found more often in regions with coniferous woodland. Outside Switzerland, I have records from the Black Forest : 'Hohe Möhr, 800 m, forêt, 10.6.62' 1 female, leg. de Bros ; and near Geneva : 'Le Pailly (Ain, F), 27.v.1928' 1 male, leg. Rehfous, in Natural History Museum Geneva.

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