

## An annotated review of fossil records of Lower Lepidoptera\*

Andrzej W. SKALSKI

*Museum and Pedagogical University, Czestochowa, Poland*

The term "Lower Lepidoptera" or "Primitive Lepidoptera" is used by several authors in current classification of the order in a broad or narrow sense. In this paper the "Lower Lepidoptera" are understood as all Homoneura and monotrystian Heteroneura.

To date, the oldest evidence of the Lepidoptera is known from the Lower Jurassic (WHALLEY, 1985). Some older fossils of the Triassic age were erroneously referred to the Lepidoptera. Their systematic status is discussed by SKALSKI (1979), WILLMANN (1984), WHALLEY (1986) and KOZLOV (1988).

The extinct oldest lepidopterous family <sup>1</sup>Eolepidopterigidae distributed from the Upper Jurassic to the Lower Cretaceous contains four genera: <sup>1</sup>Undopterix SKALSKI, <sup>1</sup>Eolepidopterix RASNITSYN, <sup>1</sup>Daiopterix SKALSKI, and <sup>1</sup>Palaeolepidopterix KOZLOV. Probably <sup>1</sup>Archaeolepis WHALLEY, from the Lower Jurassic also belongs to this family. Amongst all suborders of Lepidoptera, the suborder <sup>1</sup>Eolepidopterigina shows greatest similarity to the Aglossata.

There is good evidence of Zeugloptera, Dacnonypha, Exoporia, Nepticuloidea and Incurvarioidea, from the Cretaceous, but the systematic status of the forms referred to the families Micropterigidae, Lophocoronidae, Mnesarchaeidae and Nepticulidae remains unclear. Only evidence of the family Incurvariidae in the Cretaceous is well documented.

In the Tertiary the representatives of the following families have been found: Micropterigidae, Eriocraniidae, Hepialidae, Nepticulidae, Incurvariidae, Adelidae, and probably Heliozelidae. They are represented both by extinct and contemporary genera. Some leaf-mines of the Nepticulidae from late Tertiary are indistinguishable from present day living species.

All known fossil taxa of the Lower Lepidoptera including undescribed author's materials are listed in Table 1, and their distribution in geological time is shown in Figure 1.

---

\* Contribution to the First International Workshop on Lower Lepidoptera: Sugadaira Montane Research Center, University of Tsukuba, Nagano, Japan, July 29-Aug. 1, 1989.

Table 1. Fossil Lower Lepidoptera

---

Suborder?
† Archaeolepidae
† <i>Archaeolepis mane</i> WHALLEY, 1985, LJu, off.
† Eolepidopterigina
† Eolepidopterigidae (= † Undopterigidae)
† <i>Undopterix sukatshevae</i> SKALSKI, 1979, LCr, off.
† <i>Eolepidopterix jurassica</i> RASNITSYN, 1983, UJu, off.
† <i>Daiopterix rasnitsyni</i> SKALSKI, 1984, UJu/LCr, off.
† <i>D. olgae</i> KOZLOV, 1989, UJu/LCr, off.
† <i>Palaeolepidopterix aurea</i> KOZLOV, 1989, UJu/LCr, off.
Gen. sp. (undescribed), UJu/LCr, off.
Zeugloptera
Micropterigidae
<i>Micropterix</i> † <i>pervetus</i> COCKERELL, 1919, ?Mi, BuAm.
<i>M.</i> † <i>proavitella</i> REBEL, 1935, UEO, BaAm.
<i>M.</i> † <i>anglica</i> JARZEMBOWSKI, 1980, Pa, off.
<i>M.</i> sp. (some undescribed specimens), UEO, BaAm.
† <i>Parasabatinka aftimacrai</i> WHALLEY, 1978, LCr, LeAm.
† <i>Palaeosabatinka zherichini</i> KOZLOV, 1988, Cr, off.
Gen. sp. from <i>Sabatinka</i> group (some undescribed species), ?OI or ?Mi, SaAm.
† <i>Auliepterix mirabilis</i> KOZLOV, 1989, UJu/LCr, off.
† <i>A. minima</i> KOZLOV, 1989, UJu/LCr, off.
Other evidences of fossil Zeugloptera :
Scales in French amber (KÖHNE <i>et al.</i> 1973, SCHLÜTER 1974, 1978), UCr.
Scales and microtrichia on wing membrane in alimentary canal of fossil bats (RICHTER, STORCH 1980), Mi.
Dacnonypha
Eriocraniidae
† <i>Electrocrania immensipalpa</i> KUZNETZOV, 1941, UEO, BaAm.
† <i>Eriocranites hercynicus</i> KERNBACH, 1967, Pl, off.
<i>Eriocraniella</i> sp. (OPLER 1973), Mi, off.
?Lophocoronidae
Gen. sp. undescribed (SKALSKI 1976, 1979), UCr, SiAm.
Mnesarchaeoidea
?Mnesarchaeidae
Gen. sp. undescribed (SKALSKI 1976, 1979), UCr, SiAm.
Hepialoidea
Hepialidae
† <i>Prohepialus incertus</i> PITON, 1940, Mi, off.
† <i>P.</i> sp. (JARZEMBOWSKI 1980, ROBINSON 1977), Pa, off.
† <i>Protohepialis incertus</i> PIERCE, 1945, Mi, off.
Nepticuloidea

---

## Nepticulidae

## Imagines:

- † *Stigmellites baltica* KOZLOV, 1988, UEo, BaAm.  
*Ectoedemia* sp. undescribed (SKALSKI 1976), UEo, BaAm.  
*Niepeltia* sp. undescribed, ?Q, African copal

## Leaf-mines:

- Stigmella ulmivora* FOLOGNE, 1860, Mi, off.  
*S.* sp. cf. *variella* BRAUN (OPLER 1973, 1974)  
*S.* sp. referred many fossil mines (CRANE and JARZEMBOWSKI 1980, KUROKO 1987, LEWIS 1969, OPLER 1974), Pa-Mi, off.  
† *Stigmellites araliae* FRIČ, 1882, Mi off.  
† *S. pliotityrella* KERNBACH, 1967, Pl, off.  
† *S. heringi* KERNBACH, 1967, Pl, off.  
† *S. messelensis* STRAUS, 1976, Pl, off.  
† *S. carpini-orientalis* STRAUS, 1977, Pl, off.  
† *S. zelkovae* STRAUS, 1977, Pl, off.  
† *S. kzyldzharica* KOZLOV, 1988, LCr, off  
† *S. serpentina* KOZLOV, 1988, LCr off.  
† *S. samsonovi* KOZLOV, 1988, LCr, off.  
† *S. sharovi* KOZLOV, 1988, LCr, off.  
† *S. tyshchenkoi* KOZLOV, 1988, LCr, off.  
† *S.* sp. referred many fossil mines

## Incurvarioidea

## Incurvariidae

- † *Incurvarites alienella* REBEL, 1934, UEo, BaAm.  
† Gen. sp. undescribed (SKALSKI 1979), UCr, SiAm.  
† *Prophalonia gigas* REBEL, 1936, (SKALSKI 1973, 1976), UEo, BaAm.  
† *P. acutilarsella*, (SKALSKI 1973, 1976), UEo, BaAm.  
*Incurvaria* sp. leaf-mine, Pl, off.  
Other evidence: Scales (WHALLEY 1977, 1978), LCr, LeAm.

## Adelidae

- † *Adelites electrella* REBEL, 1934, UEo, BaAm.  
† *A. serraticornella* REBEL, 1936, UEo, BaAm.  
† *A. purpurescens* REBEL, 1936, UEo, AaAm.  
*Adela kuznetzovi* KOZLOV, 1987, UEo, BaAm.  
*A. similis* KOZLOV, 1987, UEo, BaAm.  
Gen. sp. some undescribed specimens, UEo, BaAm.

## ?Heliozelidae

- † Gen. sp. undescribed (SKALSKI 1976), UEo, BaAm.

---

L, lower; U, upper; Ju, Jurassic; Cr, Cretaceous; Pa, Palaeogene; Eo, Eocene; OI, Oligocene; Mi, Miocene; Pl, Pliocene; Q, Quaternary; BaAm, Baltic amber; BuAm, Burmese amber; LeAm, Lebanese amber; SaAm, Saxonian amber; SiAm, Siberian amber; off, offprint on rock; †, fossil taxon.

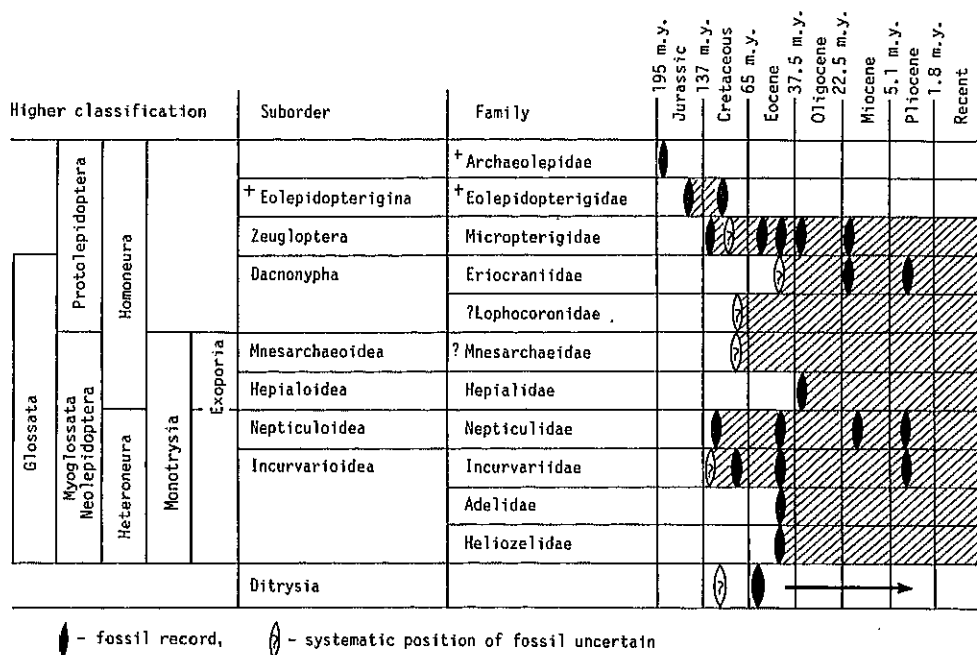


Fig. 1. Distribution of Lower Lepidoptera in geological time.

## References

- KOZLOV, M. V. 1988. Paleontology of the Lepidoptera and problems of the phylogeny of the order Papilionida. In "Melovoi biocenoticeskij krizis i evoljucija nasekomych", Nauka, Moskva. (in Russian).
- SKALSKI, A. W. 1979. Records of oldest Lepidoptera. *Nota Lepidopterol.*, 2: 61-66.
- WHALLEY, P. E. S. 1985. The systematics and palaeogeography of the Lower Jurassic insects of Dorset, England. *Bull. Brit. Mus., Nat. Hist., Geol.*, 39: 107-189.
- . 1986. A review of the current fossil evidence of Lepidoptera in the Mesozoic. *Biol. J. Linn. Soc.*, 28: 253-271.
- WILLMANN, R. 1984. Zur systematischen Stellung mesozoischer und tertiärer Mecopteren einschliesslich *Eoses triassica* TINDALE. angeblich Lepidoptera, Insecta, Holometabola. *Paläontol. Z.*, 58: 231-246.