

Eocene Achilidae (Hemiptera: Fulgoromorpha) from European deposits

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Achilidae Stål, 1866

- one of the smaller families of planthoppers (Hemiptera: Fulgoromorpha)
- distributed worldwide, mainly in tropical and subtropical zone
- enclosing over 160 genera and about 550 species
- three subfamilies: Achilixinae Muir, 1923, Bebaiotinae Emeljanov, 1991 and Achilinae Stål, 1866 (with 11 recent and two extinct tribes)
- immatures are fungus feeders
- adults feed on woody plants, polyphagous
- appearing in fossil record in the early Cretaceous

Phanerozoic	Cenozoic	Series / Epoch	Stage / Age	numerical age (Ma)
Phanerozoic	Cenozoic	N Miocene	Aquitainian	23.03
			Chatthian	28.1
		Oligocene	Rupelian	33.9
			Priabonian	37.8
			Bartonian	41.2
		Eocene	Lutetian	47.8
			Ypresian	56.0
			Thanetian	59.2
		Paleocene	Selandian	61.6
			Danian	66.0
			M K K2	Maastrichtian



The first Achilidae fossils were described by Germar and Berendt (1856), however placed together with other not related taxa in the family Cixiidae Latreille, 1807, all under the genus *Cixius* Latreille, 1807. All these taxa come from the Baltic amber.

More species from the Eocene of Europe were subsequently add by Cockerell (1910, 1922), Usinger (1939), Emeljanov (1991), Szwedo & Stroński (2001), Szwedo (2006), Lefebvre *et al.* (2007) and Emeljanov & Shcherbakov (2009).

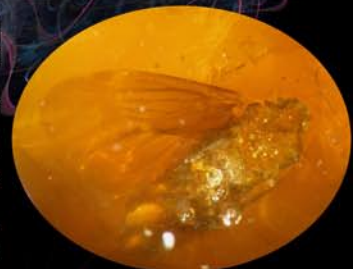
These taxa are placed in the subfamily Achilinae, within the tribes: Achilini Stål, 1866, and Achillini Cockerell, 1922, Ptychoptilini Emeljanov, 1990 and Waghildini Szwedo, 2006 (the two latter extinct). Surprisingly, vast majority of the fossils from the Baltic amber are to be placed in the Achilini. This tribe, in modern fauna, is represented by three subtribes: Elidipterina Fennah, 1950, Achilina Stål, 1866 and Cixidiina Emeljanov, 1992.

Two Achilidae specimens are reported from Fur Formation in Denmark, aged 56-54.5 Ma. These are imprints of tegmina, alas weakly preserved.

Single Achilidae specimen is found among the inclusions of the Lowermost Eocene amber of Oise, aged 53 Ma. It is representing another tribe - Plectoderini Fennah, 1950 - the richest and the most speciose tribe of modern Achilidae.

Vast majority of species (and dozens of new specimens under study) are reported from Baltic amber, from the Gulf of Gdańsk deposit; however, more specimens were found in the deposit of Rovno in Ukraine, and along coasts of Denmark, contemporaneous to amber from Baltic area.

The last record of Achilidae in the European Eocene deposits comes from Bouldnor Formation of Isle of Wight, UK, aged ca. 34 Ma. Interestingly, only single species is known so far, and any additional specimens were found.



MNHN PA3171. Plectoderini; Oise amber

List of valid species names

Achilini
Angustachilus longirostris Lefebvre, Bourgoin et Nel, 2007
'Cixidia' reticulata Germar et Berendt, 1856

Paratesum rasnitsyni Emeljanov et Shcherbakov, 2009
Proteptera kaweckii Usinger, 1939
Protomenocria notata Emeljanov et Shcherbakov, 2009
Psycheona variegata Emeljanov et Shcherbakov, 2009
Psycheona striata Emeljanov et Shcherbakov, 2009
Psycheona variegata Emeljanov et Shcherbakov, 2009

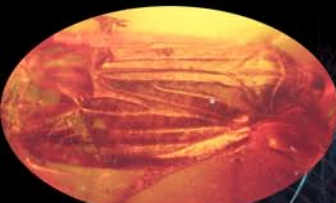
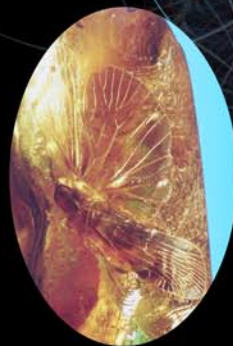
Achillini
Hooleyia indecisa Cockerell, 1922

Ptychoptilini
Ptychogroenia reducta Szwedo et Stroński, 2001
Ptychoptilum major Emeljanov, 1990
Ptychoptilum minor Emeljanov, 1990

Waghildini
Waghilde baltica Szwedo, 2006



Waghilde baltica; MNHN-LP-R 63856, Coll. Jacek Serafin AUF 061US; Baltic amber



Ptychoptilum major; Coll. Carsten Gröhn, Baltic amber



Ptychoptilini; Coll. Christel and Hans-Werner Hoffeins, Baltic amber



Hooleyia indecisa; NHM IN24364; Bembridge Marls



References: Cockerell, T.D.A. (1910) *Entomologist* 43, 153-155; Cockerell, T.D.A. (1922). *Annals and Magazine of Natural History*, (9), 10, 157-161; Emeljanov, A.F. (1990) *Vestnik Zoologii* 4, 6-10; Emeljanov, A.F. & Shcherbakov, D.E. (2009) *Paleontological Journal* 43 (9), 1008-1018; Germar, E.F. & Berendt, G.C. (1856) *Die im Bernstein befindlichen organischen Reste der Vorwelt*, 2(1), 1-40; Lefebvre, F., Bourgoin, T. & Nel, A. (2007) *Annales de la Société Entomologique de France* 43 (1), 37-43; Szwedo, J. (2006) *Annales Zoologici* 56 (1), 167-174; Szwedo, J. & Stroński, A. (2001) *Annales Zoologici* 51 (1), 95-101; Usinger, R.L. (1939) *Psyche* 46, 65-67.