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## ***Eriophyes* species (Acari: Eriophyoidea) inhabiting lime trees (*Tilia* spp.: Tiliaceae)—supplementary description and morphological variability related to host plants and female forms**

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### **Abstract**

Three poorly known species of the subfamily Eriophyinae living on *Tilia* spp. (Tiliaceae) are illustrated and supplementary descriptions are provided. Two of them, *Eriophyes exilis* (Nalepa 1892) and *Eriophyes nervalis* (Nalepa 1918), were recorded both in vein angle galls on leaves of *Tilia platyphyllos* Scop. and in erineae on leaves of *Tilia tomentosa* Moench, *Tilia americana* L. ‘Moltkei’, *Tilia americana* var. *heterophylla* (Vent.) Loudon, *Tilia cordata* Mill., *Tilia japonica* (Miq.) Simonk., *Tilia petiolaris* DC. and *Tilia zamoyskiana* Wróbl. The third species, *Eriophyes tiliae* Nalepa 1890, was found in nail galls on leaves of *T. platyphyllos*, *T. americana* and *T. cordata*. All of these *Eriophyes* species showed noticeable morphological differences between protogyne and deutogyne females in terms of the number of dorsal annuli, location of setae *d*, length of setae *e* and *3a*, distance between tubercles *3a* and the length and pattern of the prodorsal shield. Based on a comparative morphological analysis of this original data with that published by A. Nalepa, new synonyms for the following species are proposed: *Eriophyes exilis* (Nalepa) = *Eriophyes leiosoma* Nalepa **syn. nov.**; *Eriophyes nervalis* (Nalepa) = *Eriophyes tiliaceus* Nalepa **syn. nov.**; *Eriophyes tiliae* Nalepa = *Eriophyes rudis* Nalepa **syn. nov.** = *Eriophyes tomentosae* Nalepa **syn. nov.** A key to all studied *Eriophyes* species living on lime trees is included.

**Key words:** basswood, Eriophyidae, taxonomy, redescription, new synonym, key

### **Introduction**

Most eriophyoid mite species are highly host specific: they feed on a single plant host or several species within a single plant genus (Skoracka *et al.* 2010). Currently, eight valid species from the genus *Eriophyes* have been recorded as feeding on *Tilia* spp. (Tiliaceae) in Europe, inducing different types of galls and erineae. Four of them, *Eriophyes tiliae* (Pagenstecher 1857) Nalepa 1890, *Eriophyes tiliae tomentosae* Nalepa 1918, *Eriophyes rudis* Nalepa 1918 and *Eriophyes lateannulata* Schulze 1918, have been recorded as causing nail galls on the leaves of lime trees. Only one species, *Eriophyes exilis* (Nalepa 1892), creates vein angle galls on the leaves of *Tilia platyphyllos* Scop.. Three others, *Eriophyes nervalis* Nalepa 1918, *Eriophyes leiosoma* (Nalepa 1892) and *Eriophyes tiliaceus* Nalepa 1918, are reported as causing erineae on the leaves of *Tilia* spp. (Amrine & Stasny 1994; Amrine & de Lillo (unpublished data 2003; computer database on Eriophyoidea of the world); de Lillo 2012). The eriophyoid species listed above were first described by Nalepa (1892; 1918; 1920) as subspecies of *E. tiliae* (see Table 1). However, a significant problem is that the taxonomy of the eriophyoid species as proposed by Nalepa at the time, was mainly based on variations he observed in the damage symptoms found on different species of lime trees. More importantly, Nalepa (1920) did not differentiate between the two possible female forms, protogynes and deutogynes, which can occur on certain plant hosts. These two female forms may differ from each other so much that they have sometimes been classified not only as different species, but even as separate genera (Keifer *et al.* 1982; Manson 1984). Hence, the probability that too many *Eriophyes* species inhabiting limes trees have been described is high, since Nalepa did not take into account the existence of protogynes and deutogynes.