

**Are their native Holarctic *Lasius* and *Serviformica* ant species in the USA, other than exotic ones?  
With a key of the North American *Lasius* s.str. and *Chthonolasius* subgenera.**

A brief statement

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Abstract:

1. There is no evidence for the presence of native Holarctic *Lasius* and *Serviformica*-species in North America. It concerns in particular: *Formica fusca*, *Lasius flavus*, *Lasius umbratus* and *Lasius alienus*.
2. Up to now as *Lasius umbratus* identified North American specimens are not identical with the (Palearctic) *Lasius umbratus*. The North American species can relate to *Lasius aphidicola*, but given the unclear status of this taxon it is here called provisionally *L. (Chthonolasius) sp. USA01*.
3. The Nearctic workers and images on AntWeb I saw from ants identified as *L. flavus*, were not identical with this species.
4. Up to now as *Lasius alienus* identified North American specimens, are not identical with the (Palearctic) type of *L. alienus*. The North American species is probably identical to *L. americanus* (revived from synonymy). It is not impossible that this is a complex of species.
5. *Lasius niger* is a Nearctic species, and perhaps Holarctic, it depends on which status this species include: native or exotic.
6. *Lasius (Lasius) sp. USA01* and *Lasius (Lasius) sp. USA02* are undescribed species, or there may be a previously described species or subspecies, or variety, which will be raised to species level.

The list of *Lasius* species living in the US counts 31 species, four of them are also known as Palearctic species. Evidently there is no consensus about 'native' and 'exotic'. In the list of native North American species of Wittenborn & Jeschke (2011) *Lasius niger* and *L. umbratus* are considered to be native species, while *L. alienus*, *L. flavus* and *L. neoniger* should be exotic ones. However *L. neoniger* is only living in North America. In the list of exotic species in the South Eastern USA (MacGown, 2014), none of these species are mentioned, while the website AntWiki shows that the distribution of *L. alienus* is over nearly all USA states, with the note: *Lasius alienus* has the widest distribution of all the members of the genus, also *L. flavus* is wide spread over the USA, just like *L. niger* and *L. umbratus*. In addition, all of these species considered to be general. It is therefore questionable whether this species can be considered exotic. The only *Serviformica* (possibly even *Formica*) species which has both Palearctic distributions as occurs in the USA is *Formica fusca*. Also this species is scattered everywhere across the USA. Incidentally, Wittenborn & Jeschke, (2011) don't mention *F. fusca* as a North America species. Whether it is an exotic species or not, let's rest here. Another question arises: are the above five species (*L. niger*, *L. alienus*, *L. flavus*, *L. umbratus* and *F. fusca*) found in the USA, identical to the same five in Europe? Images of these species on Antweb and AntWiki are showing namely differences.

***Formica fusca* Linnaeus, 1758**

I saw two specimens identified as *F. fusca*.

The setosity of the thorax was 0 – tens of setae, the inside of the femora 1,2 and 3 has some setae and the density pubescence on 1<sup>st</sup> gastral tergite is distinctly denser in contrast to sparser pubescence of the 2<sup>nd</sup> and 3<sup>rd</sup> tergites (the last characteristic also mentioned in Coover, 2005).

The European *F. fusca* has at maximum 4 short setae on the pronotum, none setae on the inside of the femura and the density pubescence is equal on all three gastral tergites.

### The subgenera *Cautolasius*, *Chthonolasius* and *Lasius* s.str. of the genus *Lasius* in the USA (March 2016)

subgenus	Number of species in USA (Wilson, 1955)	Number of species in USA (AntWiki, 2016) 9.826.675 km <sup>2</sup>	Number of species in The Netherlands 41.543 km <sup>2</sup> (Boer, 2016)
<i>Lasius</i>	<i>sitkaensis</i> <i>niger</i> <i>alienus</i> <i>neoniger</i> <i>crypticus</i> <i>sitensis</i>	<i>pallitarsis</i> (= <i>sitkaensis</i> ) <i>niger</i> <i>alienus</i> <i>neoniger</i> <i>crypticus</i> <i>sitensis</i> <i>xerophilus</i>	<i>brunneus</i> <i>niger</i> <i>alienus</i> <i>emarginatus</i> <i>psammophilus</i> <i>neglectus</i> <i>platythorax</i>
<i>Cautolasius</i>	<i>flavus</i> <i>fallax</i> <i>nearcticus</i>	<i>flavus</i> <i>fallax</i> <i>nearcticus</i>	<i>flavus</i>
<i>Chthonolasius</i>	<i>umbratus</i> <i>speculiventris</i> <i>vestitus</i> <i>subumbratus</i> <i>minutus</i> <i>humilis</i>	<i>umbratus</i> <i>speculiventris</i> <i>vestitus</i> <i>subumbratus</i> <i>minutus</i> <i>humilis</i> <i>atopus</i> <i>nevadensis</i>	<i>umbratus</i> <i>meridionalis</i> <i>bicornis</i> <i>citrinus</i> * <i>distinguendus</i> * <i>jensi</i> <i>mixtus</i> * <i>sabularum</i> *

Species marked with \* were synonym to *L. umbratus* by Wilson (1955)

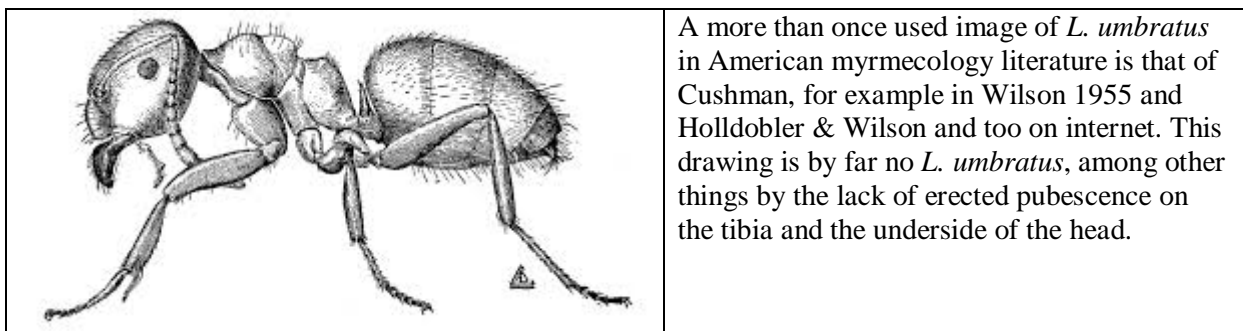
It is curious that in The Netherlands are living as much *Lasius* s.str.- and *Chthonolasius*-species now as in the USA, while the surface of the USA is almost 240 times greater. This is partly explained by differences in meticulous pubescence, which Wilson (1955) declared as variation within species, while the differences in Europe leads to new described species or (after Wilson) to revive some out of synonymy (the species with an \* in the table). I am firmly convinced that the number of species in the USA is considerably greater than it is today. Some species had to be reviving from synonymy, while other species had to be splitted in one or more species.

#### *Lasius umbratus* Nylander, 1846

The key published by Wilson (1955) is still in use for identifying specimen of the *Lasius* species. In the case *L. umbratus*, Wilson did not use an important character in which *Chthonolasius* species are distinguished in Europe (in the first place), namely the pilosity of the scape and tibia. First he used the crest of the worker petiole seen in frontal view. Seifert (1988) shows that this can be used as additional character, but because of the large variation the shape of the petiole cannot be the most important one. Wilson used also the length of the longest hairs of the posterior half of the first gastric tergite: < 0.50 x maximum width of the hind tibia at its midlength (= *L. umbratus*) and > 0.60 in *L. minutus*, *L. subumbratus* and *L. vestitus*. It would be clearer to start with the pilosity on the scape and tibia. More serious was the mistake made by Creighton (1950). He mentions in his key that *L. umbratus* has few or no erect pubescence hairs on antennal scapes and tibiae (in contrary of the abundant erect

pubescence in the types). Therefore, the use of Creightons key had leads to misidentifications. A more than once used image of *L. umbratus* in American myrmecology literature is that of Cushman, for example in Wilson 1955 and Hölldobler & Wilson (1990) and too on internet. This drawing is by far no *L. umbratus*, among other things by the lack of erected pubescence on the tibia and the underside of the head. So, there are lot of examples that the North American *L. umbratus* is misidentified (as for example in Wilson, 1955; in Cole, 1956; Ellison et al., 2012).

I have found no evidence of the existence of *L. umbratus* is North America. The specimen identified as *L. umbratus* resembles *Lasius aphidicola* (Walsh, 1862). However, the description of Walsh is very inadequate (Wheeler, 1910), it may not bear the name of a species description, while types are missing, and so Walsh his *L. aphidicola* doesn't deserve a species status. Emery (1893) used the name *L. umbratus mixtus* var. *aphidicola*. This he does to the North American "*umbratus*" more right, because it looks more like the short and sparse pubescence of the Palearctic *L. mixtus*. The name *L. umbratus mixtus* var. *aphidicola* is however an unavailable name. Creighton (1950) called this species *Lasius umbratus aphidicola*, but his characterization of this subspecies is far from usable. I provisionally book this species *L. (Chthonolasius) sp. USA01*.



### ***Lasius flavus* Fabricius, 1782 and the subgenus *Cautolasius***

The Nearctic workers and images on AntWeb I saw from ants identified as *L. flavus*, were not identical with this species. The workers of *L. flavus* are differed in size, more different than in the *Chthonolasius* species. It is not only the size, but too the ommatidia number. The greater the more ommatidia. The *L. flavus* specimen I saw, had smaller eyes (less ommatidia) less than is to be expected on the basis of the ratio between the head size and the eye size, as defined by Seifert (2007) for *Lasius flavus*. The specimen I have seen are no *L. fallax*, perhaps *L. nearcticus*, but I do not rule out that there are other *Cautolasius* species, such as could be inferred from the data of Wilson (1955), data showing that the 'flavus' workers from western North America have another scape index than the 'flavus' workers from the eastern United States.

### ***Lasius alienus* Foerster, 1850**

The Nearctic workers I examined and images on AntWeb I saw from ants identified as *L. alienus*, were not identical with this species. The Palaeartic *L. alienus* is splitted in three species: *L. alienus*, *L. psammophilus* and *L. paralienus* (Seifert, 1992). If we compare the North American *L. alienus* with the Palaeartic three, than she is most corresponding with *L. paralienus*. But the Nearctic workers are more hairy.

The variety *americanus* was originally described by Emery (1893) as a variety of *L. niger*: "*Lasius niger* var. *americanus* Emery, 1893: smaller and more brightly coloured". Wheeler (1917) concluded it should be attached to the European subspecies *alienus* since erect hairs are missing on the legs and scapes and the body is sparsely haired. On the basis of the analysis of Gregg (1945), these varieties are raised to specific rank: *L. americanus* Emery (Wilson, 1955 declared this species as synonym to *L.*

*alienus*). The question is however: Is *L. americanus* the same as the North American *L. alienus*? Gregg's *L. americanus* had no erected pilosity on scapes and tibia (like *L. crypticus* and the Palearctic *L. alienus*), while the North American *L. alienus* has here a few (mostly two) (see Wilson, 1955).

### ***Lasius niger* Linnaeus, 1758**

The only true *L. niger* I have seen from North America, came from Halifax, that means that I could not find differences between these specimen and the European *L. niger*. Is ever proved that *L. niger* is an exotic species in the Nearctic?

### ***Lasius (Lasius) sp USA01***

This, probably undescribed species, resembles the Palearctic species *Lasius platythorax*.

### ***Lasius (Lasius) sp USA02***

This, probably undescribed species, resembles none of the described Nearctic *Lasius (Lasius)* species (see key).

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### Key of the Nearctic *Chthonolasius* species

- 1a Scape in repose passing occipital corners by a distance less than the length inclusive the first and second funiculus segments together.... 2
- 1b Scape in repose passing occipital corners by a distance of greater than one-third their length (about of the length of the scape and the first, second and third funiculus segments together). Entire body surface highly shining and shagreened (Cole, 1958). Scape and tibia with erected hairs..... *L. atopus*
- 2a Scape and tibia with at least decumbent pubescence, number of erected hairs on head > 30 ...3
- 2b Scape and tibia with appressed pubescence, sides of head in full face view without erected hairs ... 7
- 3a Scape (and tibia) with abundant (sub)erected, more than 0,4 x cross-section of the scape ... 4
- 3b Scape and tibia with (sub)decumbent short hairs, less than 0,3 x cross-section of the scape ... 6
- 4a Second and third gastral tergite with pubescence, dull ... 5
- 4b Second and third gastral tergite without pubescence, shiny... *L. speculiventris*
- 5a Space between the pubescence hairs at the top of the 1st gastral tergite about equal to their thickness ... *L. vestitus*,
- 5b Space between the pubescence hairs at the top of the 1st gastral tergite more than 4 times their thickness ... *L. nevadensis*
- 6a Hairs on the gaster are between 2/3 and 4/5 the maximum width of the hind tibia (Ellison et al., 2012) ... *L. subumbratus*
- 6b Hairs on the gaster are as long as or longer than the maximum width of the hind tibia (Ellison et al., 2012)... *L. minutus*
- 7a Head seen in full face view: occiput with 15 – 20 erected hairs, top of propodeum with 10 - 15 erected hairs ... 8
- 7b Head seen in full face view: occiput with < 8 erected hairs, top of propodeum with < 5 erected hairs ... *L. humilis*
- 8a Space between the pubescence hairs at the 2<sup>nd</sup> and 3<sup>rd</sup> gastral tergite mainly at least as ¾ x their length ... *L. (Chthonolasius) sp. USA02*
- 8b *L. (Chthonolasius) sp. USA01 (→ L. aphidicola ??)*

### Key to the Nearctic *Lasius* s.str. species

- 1a Scape and hind tibiae with (sub)erected pubescence ... 2  
1b Scape and hind tibiae with appressed pubescence --- 6
- 2a Long and short dense pubescence on clypeus (fig. below, left) ... 3  
2b Only relative long scattered pubescence on clypeus (Anterior border of the median clypeal lobe describes an even, broad parabolic curve) (fig. below, right) ... 5

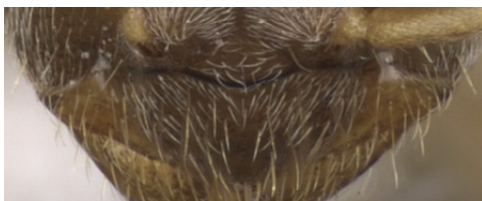


Clypeus of *Lasius niger*



Clypeus of *L. (L.)* sp USA01

- 3a SI (SL/HL) < 0,94. Anterior border of the median clypeal lobe more or less angulate (fig. below, left). ... 4  
3b SI (SL/HL) > 0,94. Anterior border of the median clypeal lobe describes an even, broad parabolic curve (fig. below, right) ... *L. niger*



Clypeus of *Lasius neoniger*



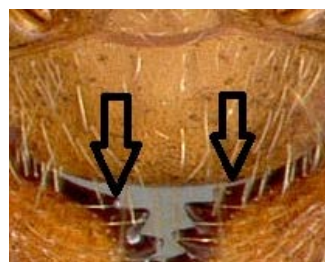
Clypeus of *Lasius pallitarsis*

- 4a Extensor surface of the front tibia has at least 6, usually over 10 pubescence hairs ... *L. xerophilus*  
4b Extensor surface of the front tibia has at maximum 3, usually 0 - 1 pubescence hairs ... *L. neoniger*

- 5a Basal tooth of mandible aligned with rest of the teeth (fig. below, left). Longest setae on pronotum longer than the maximum diameter by the hind tibia. Numerous, relatively long setae at the sides of the head (seen in full face view)... *L. (L.)* sp USA01  
5b Basal tooth of mandible is offset from the others (fig. below, right). Longest setae on pronotum shorter than the maximum diameter by the hind tibia. Few, relatively short setae at the sides of the head (seen in full face view)... *L. pallitarsis*



Basal tooth of mandible of *Lasius (L.)* sp USA01



Basal tooth of mandible of *Lasius pallitarsis*

- 6a None or a few (<10) erect setae at the sides of the head (fig. below, left)... 7  
 6b Numerous (>50), relatively long setae at the sides of the head (fig. below, right) ... *L.(L.)* sp USA02



None or a few (<10) erect setae at the sides of the head of *Lasius americanus*



Numerous setae at the sides of the head of *Lasius (L.)* sp USA02

7a Number of erect pubescence hairs on the hind tibia 0. Number of erect pubescence hairs between the propodeal spiracle and the metapleural gland orifice (one side) > 3. Number of setae at underside of the head > 4 ... 8

7b Number of erect pubescence hairs on (the top of the) hind tibia 1-2. Number of erect pubescence hairs between the propodeal spiracle and the metapleural gland orifice (one side) < 3. Number of setae at underside of the head < 4 ... *L. americanus* (-complex)

8a Number of setae on the dorsum of the pronotum < 10 ... *L. crypticus*

8b Number of setae on the dorsum of the pronotum > 15 ... *L. sitiens*



Dorsum of pronotum and mesonotum of *Lasius crypticus*



Dorsum of pronotum and mesonotum of *Lasius sitiens*