SUPPLEMENTATION TO THE REVISION OF EUROPEAN SPECIES OF THE ANT SUBGENUS *CHTHONOLASIUS* RUSZSKY, 1913

(HYMENOPTERA: FORMICIDAE)

**INTRODUCTION**

In a revision of the European of ant subgenus *Chthonolasius* (Seifert, 1988) I have demonstrated the existence of 11 morpho-ecological entities: 10 good species plus one entity which is either a well-defined subspecies or a parapatric species. Weak points of that revision were the low number of investigated specimens from the Mediterraneans and an incomplete consideration of synonymies. The investigations of material seen after the finishing of the manuscript confirmed the general conception of these 11 entities. However, one further good species *Lasius viehmeyeri* Emery, 1922 from Greece has to be added and a replacement name for the invalid name *Lasius affinis* (Schenck, 1852) has to be published. Further, this paper wants to give supplementary notes on types and synonymies.

**ACKNOWLEDGEMENTS**

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search for material of the Schenck collection at Senckenberg Museum
Frankfurt and loan of specimens.

INVESTIGATION METHODS AND TERMINOLOGY

The investigation methods are explained elsewhere (SEIFERT,
1988) and I repeat here only the character terminology:

AW - maximum alitrunck width before the tegulae

GHL - length of longest hair on dorsal face of first gaster
tergite.

HL - maximum head length measured from midpoint of
occipital border of anterior clypeal border; the head
has to be tilted carefully until maximum length is in
measuring plane.

HTMAX - maximum diameter of hind tibia at midpoint; to
measure the real cuticular surface, transmitted-light
was used.

HTMIN - minimum diameter of hind tibia at midpoint; transmitt-
ed-light was used.

HW - maximum measurable head width; this is the outer
distance of eyes (in males and queen) or the maximum
width of head capsule (in workers normally across or
slightly behind the eyes).

nHHT - numbers of standing hairs projecting more than 11 μm
from cuticular surface of hind tibia extensor profile,
except the hairs on distal apex which are always
present.

F2 - median line length of second funiculus segment in
dorsal visual position (looking at the plane of scape).

IF2 - ratio F2/maximum width of second funiculus seg-
ment; the width is measured in dorsal view and
transmitted-light conditions.
PDF - average pubescence distance in front of midocellus; the number of pubescence hairs crossing a straight, transversal measuring line of 250-500 μm is counted and the average distance between two hairs is calculated.

PDG - average pubescence distance on dorsum of first tergite obtained as in PDF.

SL - maximum straight line length of scape excluding articular bulb.

SMAX - maximum diameter of scape at midpoint; transmitted-light was used to measure real cuticular surface.

SMIN - minimum diameter of scape at midpoint measured as in SMAX.

Redescription of Lasius viehmeyeri Emery, 1922

In the collection of MCSNG still exists one queen of Carlo Emery's type material found at Erymanthos/Greece. I have labelled this specimen as lectotype, det. Seifert 1989. The pin carriers the original labels «Morea sept. Erymth. H. Vlasis, 800-1000 m, VIII.1901. Holtz » and «L. umbratus var. viehmeyeri, Type Emery ».

Description of the lectotype queen:

In many of absolute measurements clearly larger than the upper extremes of all other European species, particularly HW (1931 μm against 1807 μm in the largest umbratus queen) and HTMAX (388 against 310 μm in the largest meridionalis or longiceps queen). Scape flattening extreme, comparable to jensi. Flattening of hind tibia extreme, HTMAX/HTMIN as large as in upper extremes of jensi or longiceps. Second funicular segment as much elongated as in upper extremes of jensi. Head, alitrunk and gaster with a dilute subdecumbent pubescence and with clearly shining surfaces (but somewhat less brilliant than in rabaudi). Pilosity on tibiae very sparse: hind tibiae on proximal part of extensor profile each with 4 suberect to erect hair the longest of which projects 46 μm from cuticular surface (Fig. 2). Dorsal surface of scape with subdecumbent pubescence projecting 15-20 μm from cuticular surface and with 1-2 weak erect hairs projecting up to 30 μm (Fig. 1).
As a consequence, scape and tibiae appear more smooth than in other *Chthonolasius* taxa with flat appendages (*rabaudi, meridionalis, jensi, longiceps*). Petiolar scale in caudal view with straight or slightly convex sides, converging a little towards dorsal crest that is notably emarginated (Fig. 3). Erect hairs on whole dorsal surface of gaster tergites sparse and as short as in *mixtus* but on dorsal face of first tergite 100-125 μm long. Genae each with 5-10 rather short, standing hairs which project at the most 45 μm from cuticular surface. Mesonotum with many erected hairs of 70-108 μm length. Length of longest hair on scutellum 158 μm. Morphological data:

HL 1591 μm, HW 1931 μm, SL 1424 μm, SMAX 181 μm, SMIN 84 μm, SMAX/SMIN 2.17, F2 194 μm, IP2 2.08, AW 1558 μm, PDF 12.9 μm, PDG 13.5 μm, GHL 125 μm, HMAX 388 μm, HMAX/HMIN 2.94, aHHT 4, HL/HW 0.824, SL/HL 0.895, SL/HW 0.737, overall length from mandibular tip to acidopore 8900 μm, maximum petiole width 704 μm.

**Comments**

Taxonomic judgements from single specimens are often very problematic but it seems to be, in this case, no risk to regard *viehmeyeri* as good species because its character combination is outstanding and the specimen shows no signs of morphological malformations or abnormalities. The *Lasius viehmeyeri* queen is not to confuse with any other European species: It is a combination of extremely flattened scape and hind tibia, strongly elongated second funiculus segment, extremely large body size, very weak tibial and scape pilosity and notably emarginated petiolar scape. A little similar is the *rabaudi* queen but the *viehmeyeri* lectotype is much larger (HW 1931 against 1720 μm in the largest *rabaudi* queen), the standing hairs on whole body are much shorter in *viehmeyeri*, the appendage pilosity is much less developed, the flattening of hind tibia is stronger and the scape length indices are below the range of *rabaudi* (lower extremes in *rabaudi* 0.925 for SL/HL and 0.812 for SL/HW).

From the detailed description of A. Stärcke, it is most probable that his *Lasius viehmeyeri* var. *dalmatica* STÄRCKE, 1937 from the Dinaric Alps belongs indeed to *viehmeyeri*. In Stärcke’s description of the *dalmatica* queen we find no contradictions to the above description of the *viehmeyeri* lectotype in statements on pubescence, pilosity, cuticular surface, petiolar scale, body shape and measurements. Stär-
not to see the Emery material and suspected that he possibly was going to produce a synonym (STÄRCKE 1937), gives for *dalmatica*: HTMAX 369 μm, maximum petiole width 730 μm, SL 1405 μm.

The worker and the male of *Lasius viehmeyeri* are unknown.

Lectotype Fixation for *Lasius distinguendus* Emery, 1916

The date of publication of Emery’s original description was February 1916. He gave no date of collecting and reported as collecting site simply “Bologna.” According to the present knowledge (SEIFERT 1988), only queens guarantee a safe distinction of *Lasius distinguendus* from related species. I could examine a total of 9 queens from the original material of Emery. 4 queens were labelled with “Bologna,
1916, Emery », 2 queens with « Borgo Panigale, Estate 1914 » and three others with « Bologna, 1912, Emery ». The queens of 1916 can not be regarded as types because they must have been collected after the date of publication (the first young queens are found in the nests June). As a consequence, I have selected as lectotype a queen with a label « Bologna, 1912, Emery » and labelled it as « Lasius distinguendus Emery, 1916; Lectotype (det. Seifert 1989) ». This lectotype is stored in MCSNG.

The examination of 3 type queens of Formicina umbrata v. nuda Bondroit 1917 (stored in coll. of I.R. Sc. N.B. Bruxelles) showed clearly the synonymy with L. distinguendus Emery, 1917. It should be emphasized that all the Emery and Bondroit specimens and all further queen material I have examined after the finishing of my revision confirmed the general validity of the distinguendus diagnosis stated by Seifert (1988) and there remains no doubt that it is a good morphospecies different from L. umbratus Nylander.

There are few queen examples from Central and East Germany with a somewhat doubtful identity but their interpretation as lower pilosity extremes of umbratus seems reasonable.

In my revision is suggested that workers of Lasius distinguendus and balcanicus could be separated in a number of cases by morphometry of nest samples. In the Emery collection there are two workers accompanied with distinguendus queens under the same label (« Borgo Panigale ») which show characters typical for balcanicus (longer scape, flatter appendages). If these workers were really from the same nest as the queens, they completely disproved my earlier suggestion that SL/HL, HTMAX/HTMIN and SMAX/SMIN could be used in many nest samples for separation of balcanicus and distinguendus workers. So I can not tell just a single objective criterion for separation of workers while the distinction of the two species’ queens has proved as very easy in each case.

Lasius mixtoumbratus Forel, 1974 can not be interpreted

The original paper of Forel from 1874 contains no figure, no statements on collecting date and locality, and the short verbal description is absolutely insufficient to permit a taxonomic interpretation in such a difficult ant group. From the MHNG collection I got a loan of 3 queens and 6 workers labelled apparently by Forel himself with « Burghölzli, 23 V 91, L. mixto-umbratus For., Coll. Forel, Typus ». The collecting date definitely shows that this series can not be
recognized as type material since it was collected 17 years after the first description. The absence of types and the useless original description make it clear that the name *Lasius mixtoustratus* Forel, 1874 can not be referred safely to any species and its use should be avoided. On the other hand, it would be unreasonable to apply for an opinion of the International Commission on Zoological Nomenclature to give the Burghölzli series the status of neotypes; there is not to defend any stability of the name *mixtoustratus* which was used very rarely during the last 100 years and was forgotten in the last 50 years. The correct name for Forels Burghölzli series must be *Lasius sabularum* (Bondroit, 1918) - a species which is widely distributed in Central Europe and of which we have a confirmed type queen.

*Lasius citrinus* Emery, 1922 - a replacement name for the invalid taxon *Lasius affinis* (Schenck, 1852)

I was informed by Barry Bolton/BMNH London that the name *Formica affinis* Schenck, 1852 was preoccupied by *Formica affinis* Leach, 1825 (Formicidae: incertae sedis) and *Formica affinis* Le Guillou, 1841 (now *Polyrhachis affinis* (Le G., 1841). The international Code of Zoological Nomenclature requires the replacement of the name *Lasius affinis* (Schenck) by the first available junior synonym. Such formal taxonomic acts are disputed if they refer to a long-established, widely used name that has been transferred to another genus soon after its introduction and which has been « virtually » no homonym for several generations of myrmecologists. *Formica affinis* (Schenck, 1852) was removed from *Formica* by Mayr already in 1861 and did not reappear under *Formica* in the myrmecological literature of the last 120 years. As a consequence, it seems that the replacement of *Lasius affinis* by a forgotten name could produce irritations among a majority of myrmecologists. However, in case of *Lasius affinis*, I have no practical objections to follow the International Code because the « *Lasius affinis* » conception of the last 120 years is already confused and de facto invalidated by the many false subjective interpretations of species. So we have many « *Lasius affinis* » which are in reality *Lasius distinguendus* Emery or *Lasius balcanicus* Seifert.

Schenck’s description of *Formica affinis* is unusually detailed in terms of his time and in Senckenberg Museum Frankfurt exist two queens and two worker specimens ex coll. Schenck (all without collecting data or type labels) which characters are in very good agreement with the description of *Lasius affinis* (Schenck, 1852), sensu
Seifert, 1988. So we have a good notion which species is meant the more it has an outstanding character combination and can be identified in single workers. After *L. viehmeyeri*, the species is the rarest *Chthonolasius* in European ant collections and I have found only one name among 26 *Chthonolasius* taxa I know from Europe which can serve as replacement name: *Lasius bircornis* var. *citrina* Emery, 1922 of which exists a lectotype in the collection of MCSNG. This worker specimen is labelled « Monte Gargano, 1907, legit. M. Hilf, coll. O. Leonhard » and « lectotype, designated by E.O. Wilson ». All characters of this specimen are typical for the species *Lasius affinis* sensu Seifert (1988). So I can state the following list of synonymies on the basis of investigated specimens (without having seen their specimens, I can not say which species Mayr, the early Emery, Forel, Bondroit, Baroni Urbani and Kutter determined as *Lasius affinis*):

*Lasius citrinus* Emery, 1922 stat nov.

*Lasius bicornis* var. *citrina*, Emery, 1922

*Formica affinis* Schenck, 1852:62. Junior primary homonym of

*Formica affinis* Leach, 1825 [Formicidae, incertae sedis], and of

*Formica affinis* [Le Guillou, 1841 [now Polyrhachis affinis (Le Guillou, 1841)].

*Lasius affinis* (Schenck) sensu Van Boven, 1955

*Lasius affinis* (Schenck) sensu Collingwood, 1963

*Lasius affinis* (Schenck) sensu Seifert, 1988

The following table gives data of the *Lasius citrinus* lectotype and West Palearctic population data of *citrinus*, *balcanicus* and *distinguendus* workers.

<table>
<thead>
<tr>
<th></th>
<th>citrinus lectotype</th>
<th>citrinus (n = 33)</th>
<th>balcanicus (n = 35)</th>
<th>distinguendus (n = 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL</td>
<td>1236</td>
<td>1211.5 ± 50.1</td>
<td>1068.5 ± 55.2</td>
<td>1062.4 ± 62.4</td>
</tr>
<tr>
<td>SMAX</td>
<td>107</td>
<td>107.8 ± 5.75</td>
<td>97.7 ± 8.29</td>
<td>93.4 ± 8.86</td>
</tr>
<tr>
<td>GHL</td>
<td>117</td>
<td>116.4 ± 7.25</td>
<td>105.7 ± 8.3</td>
<td>105.9 ± 7.94</td>
</tr>
<tr>
<td>PDG</td>
<td>5.7</td>
<td>6.10 ± 1.01</td>
<td>11.52 ± 3.11</td>
<td>11.64 ± 2.88</td>
</tr>
<tr>
<td>PDF</td>
<td>8.2</td>
<td>7.72 ± 1.43</td>
<td>10.50 ± 1.97</td>
<td>9.91 ± 1.90</td>
</tr>
<tr>
<td>IL/HW</td>
<td>1.036</td>
<td>1.035 ± 0.0167</td>
<td>1.045 ± 0.0161</td>
<td>1.047 ± 0.0186</td>
</tr>
<tr>
<td>SL/HL</td>
<td>0.856</td>
<td>0.847 ± 0.0145</td>
<td>0.879 ± 0.0141</td>
<td>0.873 ± 0.0186</td>
</tr>
<tr>
<td>SMAX/SMIN</td>
<td>1.384</td>
<td>1.461 ± 0.0859</td>
<td>1.471 ± 0.0688</td>
<td>1.382 ± 0.0967</td>
</tr>
<tr>
<td>nHHT</td>
<td>0</td>
<td>0.12 ± 0.28</td>
<td>6.68 ± 1.79</td>
<td>4.56 ± 2.84</td>
</tr>
<tr>
<td>nGen</td>
<td>0</td>
<td>0.66 ± 1.05</td>
<td>10.26 ± 2.96</td>
<td>7.21 ± 3.16</td>
</tr>
</tbody>
</table>

(nGen = number standing hairs on genae in front of eye which project, in dorsal view of head, more than 11 μm from cuticular surface; the value is the arithmetic mean of both genae).
These data show that even single *citrinus* workers can be separated from *balcanicus*/*distinguendus* using the character combination nHHT--nGen-PDG. The *citrinus* worker's body size is frequently above the upper extremes of these species and its appendages appear much more smooth due to more appressed pubescence and the lacking standing pilosity (Seifert, 1988).

Our knowledge on biology of *Lasius citrinus* is poor. It typically nests in hollow trees, rotten logs or stumps at summery wood stands. The reports for occurrence of *citrinus* in treeless xerohermous grasslands or steppes refer surely in most cases to either *distinguendus* or *balcanicus*. Alates occur on average earlier than in many other *Chthonolasius* species even in the northern parts of its distributional range which indicates that elder sexual larvae, pupae or even imagines hibernate. Sure data are: May 2, 13; June 2, 7, 11, 17; July 7, 8, 17, 21; August 18. Van Boven (1955) reports a large nest area with a numerous population and as inner nest structure a brown-yellow carton nest. A dealate queen with a *Lasius brunneus* worker attached on its antenna (Rüppurr near Karlsruhe, June 11 1951, stored in Naturkundemuseum Karlsruhe) and the preferred nest sites indicate that *brunneus* is a probable host species.

*Lasius citrinus* is more rarely collected than *bicornis* and I give here the *citrinus* sites of which I have checked specimens:

**Belgium:**

**Germany:**
3. Nassau (most probable site but not label), coll. Schenck
4. Rottleben/Bad Frankenhausen, leg. Pisarski 2. VI.1964
5. Rüppurr near Karlsruhe, 11.VI.1951
6. Karlsruhe, 17.VI.1955

**Spain:**

**Italy:**
8. Monte Gargano, leg. M. Hilf 1907

**Yugoslavia:**

**Bulgaria:**
11. 30 km N of Karnobat, leg. Krampl 8.VII.1981

**S Russia:**
12. Tatyanovka/Donetz River, 18.VIII.1938
13. Svyatogorsk near Donetsk, 7.VI.1939
15. Ubinskaya/Kuban River, 22.IX.1953
Azerbaijdzhan: 17. Alazapin/Talysh Mountains, leg. Arnoldi July 1929

Commented synonynic list of European *Chthonolasius* species

1. *Lasius citrinus* Emery, 1922; good species, lectotype seen
   *Formica affinis* Schenck, 1852; invalid preoccupied name, original material investigated
   *Lasius umbratus* (Nylander) sensu Wilson, 1955, partim; material seen

2. *Lasius balcanicus* Seifert, 1988; good species, types seen;
   species often named as *Lasius affinis*
   *Lasius affinis* (Schenck) sensu Stärcke, 1937; synonymy clear from detailed description and investigation of original material

3. *Lasius bicornis* ( Förster, 1850); good species, identity clear from description
   *Formica incisa* Schenck, 1852; synonymy can be assumed from description, two worker specimens ex coll. Schenck were studied
   *Lasius bicornis* subsp. oertzeni Forel, 1910; lectotype studied, no subspecies
   *Formicina microgyna* Bondroit, 1918; synonymy clear from description of the queen
   *Lasius bicornis* var. neapolitana Emery, 1922; type studied: in all characters a typical *bicornis* queen

4. *Lasius distinguendus* Emery, 1916; good species, types seen
   *Lasius bicornis distinguendus* var. *hybrida* Emery, 1916; original material seen
   *Formicina umbrata* var. nuda Bondroit, 1917; type queen seen
   *Lasius umbratus distinguendus* var. *cereomicans* Stärcke, 1937; synonymy with *distinguendus* very probable from description
   *Lasius hybridus* (Emery) sensu Arnoldi and Dlussky, 1978; material seen
   *Lasius umbratus* (Nylander) sensu Wilson, 1955, partim; material seen

5. *Lasius jensi* Seifert, 1982; good species, types seen
   *Lasius meridionalis* (Bondroit) sensu Pisarski, 1975, partim; material seen
Lasius rabaudi (Bondroit) sensu Arnoldi and Dlussky, 1978, partim; material seen

6. Lasius jensi longiceps Seifert, 1988; type seen, unclear whether parapatric species or well-defined subspecies

7. Lasius meridionalis (Bondroit, 1919; good species, type queen seen

Lasius meridionalis (Bondroit) sensu Stärcke, 1937; the identity of Stärcke’s Material is clear from his detailed descriptions

Lasius rabaudi (Bondroit) sensu Wilson, 1955, partim; material seen

Lasius rabaudi (Bondroit) sensu Collingwood, 1963; synonymy clear from description and geographic origin of material

Lasius rabaudi (Bondroit) sensu Kutter, 1977, partim; material seen

Lasius rabaudi (Bondroit) sensu Arnoldi and Dlusky, 1978, partim; material seen

8. Lasius mixtus (Nylander, 1846); good species; identity clear from detailed description of type (Stärcke, 1937) and type locality

Lasius umbratus (Nylander) sensu Wilson, 1955, partim; material seen

9. Lasius rabaudi (Bondroit, 1917); good species, type queen seen

10. Lasius sabularum (Bondroit, 1918); good species, type queen seen

Lasius umbratus (Nylander) sensu Wilson, 1955, partim; material seen

11. Lasius umbratus (Nylander, 1846); good species, identity clear from detailed description of type (Stärcke, 1937) and type locality

Formicina belgarum Bondroit, 1918; type queen seen

Lasius umbratus var. hirtiscapus Stärcke, 1937; synonymy concluded from Stärcke’s detailed description

12. Lasius viehmeyeri Emery, 1922; good species, type queen seen

Lasius viehmeyeri var. dalmatica Stärcke, 1937; synonymy can be concluded from Stärcke’s detailed description

Lasius umbratus (Nylander) sensu Wilson, 1955, partim; material seen
Incertae sedis

_Lasius mixtoumbratus_ FOREL, 1874; insufficient description, no types available

_Lasius umbratus_ var. _exactus_ RUZSKY, 1902; types not got, description insufficient

_Lasius affinoumbratus_ DONISTHORPE, 1927; concluded from type locality it must be a synonym of either _mixtus_, _sabularum_ or _meridionalis_

_Chteronolasus_ [!] _affinis_ var. _nyaradi_ RÖSZLER, 1943; insufficient description, types not available

Synonyms of _Lasius flavus_ (FABRICIUS, 1871)

_Lasius umbratus ibericus_ SANTSCHI, 1925; type seen

_Lasius umbratus ibericus_ var. _sancho_ SANTSCHI, 1925; types seen

REFERENCES


SUMMARY

A redescription of Lasius viehmeyeri Emery, 1922 is given showing that it is a good species with outstanding characters. Lasius citrinus Emery, 1922 is redescribed and published as replacement name for the invalid name Lasius affinis (Schenck, 1852) which is a junior primary homonym. 17 proved sites of Lasius citrinus are reported for Europe and Caucasus. A lectotype of Lasius distinguendus Emery, 1916 is fixed. The taxon Lasius mixtoumbratus Forel., 1874 can not be interpreted because types are not available. A commented synonymic list of 26 taxa referred to Chthonolasius is given for the territory of Europe.

RIASSUNTO

Viene descritta la specie L. viehmeyeri Emery, 1922 dimostrando che è una specie valida, L. citrinus Emery, 1922 e ridescritto e pubblicato per rimpiazzare il nome non valido di L. affinis (Schenck, 1852) che è più recente ononimo primario. Sono segnalate 17 località per l'Europa ed il Caucaso dove è stato trovato L. citrinus. È stabilito il lecotipo di L. distinguendus Emery, 1916. Il taxon L. mixtoumbratus Forel, 1874 non può essere interpretato per la mancanza di tipi. È fornita una lista sinonimica di 26 taxa di Chthonolasius d'Europa.