

Table 1. Biometrical data of gynes of four related *Myrmica* species (minimum and maximum values, in mm or indices).
Biometrische gegevens van vrouwtjes van vier verwante Myrmica-soorten (minimum- en maximumwaarden, in mm of indices).

	<i>M. schencki</i> ^a	<i>M. schenckioides</i> ^b	<i>M. karavajevi</i> ^c	<i>M. lemasnei</i> ^d	<i>M. myrmicoxena</i> ^e
head length (mm) ¹	1.24- 1.35	1.27	0.78-0.89	0.88-0.90	1.02-1.05
head width (mm) ²	1.30-1.44	1.30	-	-	-
head width (mm) ³	-	1.17	0.73-0.84	0.82-0.85	0.94-0.97
alitrunk (mm) ⁴	-	1.98	1.16-1.44	1.40-1.44	1.52-1.58
HW/frons ⁵	4.34 - 5.29	4.56	-	-	-
frons/HW ⁶	-	0.24	0.42-0.49	0.45-0.49	0.45-0.46
frons index ⁷	1.44 - 1.71	1.67	1.03-1.07	1.03-1.05	1.16-1.21
scape/HL ⁸	0.72 - 0.78	0.75	0.83-0.92	0.86-0.90	0.65-0.66
postpetiole/HW ⁹	0.41 - 0.48	0.48	-	-	-
postpetiole/HW ¹⁰	-	0.53	0.55-0.62	0.56-0.60	0.56-0.57

^a n = 23 (Seifert 1988), ^b n = 1, ^c n = 31 (Radchenko & Elmes 2003), ^d n = 3 (Radchenko & Elmes 2003), ^e n = 6 (Radchenko & Elmes 2003),

¹ head length in dorsal view, measured in a straight line from the anterior point of median clypeal margin to mid-point of occipital margin,

² maximum head width including eyes,

³ maximum head width in dorsal view behind eyes,

⁴ diagonal length of alitrunk seen in profile from anteriodorsal point of alitrunk to posterior margin of metapleural lobes,

⁵ maximum head width including eyes/minimum frons width between frontal lobes,

⁶ maximum head width in dorsal view behind eyes/minimum frons width between frontal lobes,

⁷ maximum width between external borders of frontal lobes/minimum frons width between frontal lobes,

⁸ maximum straight-line length of antennal scape seen in profile/head length in dorsal view, measured in straight line from anterior point of median clypeal margin to mid-point of occipital margin,

⁹ maximum width of postpetiole from above/maximum head width including eyes,

¹⁰ maximum width of postpetiole from above/maximum head width in dorsal view behind eyes.

the antennal scape is much longer than the scape width instead of much shorter (figure 7), and it does not have a ventral process at the postpetiole node. Other *Myrmica*'s from both groups do not have that either.

The most closely resembling European socially parasitic ants (*M. lemasnei*, *M. karavajevi* and *M. myrmicoxena*) are smaller and have a slightly broader postpetiolar node, but none of the socially parasitic *Myrmica* species has such a narrow frons as *M. schenckioides*.

Socially parasitic species

Many socially parasitic ants have a ventral process at the postpetiole node, like *Formicoxenus nitidulus* (Nylander), *Harpaxogenus sublaevis* (Nylander) and some socially parasitic *Myrmica*'s. There are two other characteristics for socially parasitic *Myrmica*'s: the gynes are smaller than non-parasitic *Myrmica* queens, and seven out of ten obligate socially parasitic *Myrmica*'s have relatively short propodeal spines (*M. myrmicoxena*, *M. karavajevi*, *M. bibikoffi* Kutter, *M. hirsuta* Elmes, *M. lemasnei*, *M. erepatrix* Bolton and *M. microrubra* Seifert). *Myrmica schenckioides* has all these features and it seems obvious that it is socially parasitic.

Of the fourteen Palaearctic socially parasitic *Myrmica* species, six have a distinct process at the ventral side of the postpetiolus, like *M. schenckioides*. These six species are all workerless. The species of which workers are known do not have such a process. Possibly, this adapted postpetiolus contains pheromone-producing glands; the pheromone may play a role in the social interaction between parasite and workers of the host species. This could implicate that *M. schenckioides* is workerless as well.

In *Myrmica* colonies, little gynes (so called microgynes) can occur in high numbers. Socially parasitic *Myrmica*'s are quite likely derived from these highly polygynous microgyne-

like ancestors (Elmes 1978, Buschinger 1986). This would mean that socially parasitic species look like their host. Because *M. schenckioides* strongly resembles *M. schencki*, it is plausible to suppose that *M. schenckioides* is a social parasite of *M. schencki*. Two closely resembling socially parasitic ants, *M. karavajevi* and *M. myrmicoxena*, have *M. lobicornis* as host. This species is a close relative of *M. schencki*, but is probably not a possible host for *M. schenckioides*. *M. lobicornis* was recently discovered in The Netherlands (Boer 2003) and must be considered as rare. It probably does not occur in the part of The Netherlands where we found *M. schenckioides*, considering of its habitat preferences.

Habitat and accompanying species

The Beekhuizerzand is a drift sand area (with pine forest) in the Pleistocene part of The Netherlands. It is currently a nature reserve belonging to Harderwijk and occupies about 500 hectares. Fixed drift sand areas can form a habitat of the supposed host species, *M. schencki*. The total area seeming suitable habitat for this species is about 200 hectares. Nature restoration management and military exercises with tanks prevent natural succession to forest.

The studied roadside verge of highway A28, where *M. schenckioides* was found, lies at the edge of the drift sand area. Open vegetation of the nature reserve is connected with the vegetation in the roadside verge. In the roadside verge *Cladina portentosa*, several mosses, *Calluna vulgaris* and *Deschampsia flexuosa* are dominant. Bare sand is scarce and several young trees (*Pinus silvestris* and *Quercus robur*) are present. Natural succession will probably change the ant community in this roadside verge in the years to come.

In six pitfalls in the roadside verge we found 22 accompanying ant species, including seven *Myrmica* species. Most abundant in the pitfalls were *M. speciosus* Bondroit, *Tapin-*