ABSTRACT: Myrmica schencki Em. and M. rubra (L.), common Palaearctic ant species, collect fallen male Scots pine (Pinus sylvestris L.) inflorescence during the pine blossom time, take it to their nests and then gather it on rubbish piles close to nest-entrances. Dissection of M. schencki workers revealed the presence of numerous pollen grains in their crops and midguts proving at least periodical pollenivory of these ants. So far, only some Neotropical ants of the genus Cephalotes Latr. have been known to eat pollen.

KEY WORDS: ants, Myrmica schencki, Myrmica rubra, foraging, pollen-eating.

Pollinivory seems to be very rare in ants despite the pantophagy of the majority of ant species and the undeniable nutrient-richness of pollen. There are very few reports on pollen-eating ants, all dealing with Neotropical species of the genus Cephalotes Latr. (=Zacryptocerus Wheel., Cryptocerus Latr.) (subfamily Myrmicinae), which feed on wind-dispersed pollen settled on leaves (Creighton 1963, 1967, Creighton and Nutting 1965, Baroni Urbani and de Andrade 1997). These ants are characterised by special anatomical and physiological features of their digestive tract, highly adapted to the efficient storage and regurgitation of undigested pollen grains for their nestmates, as well as to spitting indigestible pollen cell walls (Roche and Wheeler 1997, Baroni Urbani and de Andrade 1997, de Andrade and Baroni Urbani 1999). The present paper brings, most probably, the first report of at least occasional pollen-eating in Palaearctic ant species, namely Myrmica schencki Em. and M. rubra (L.).

The observations were carried out in a complex of sand dunes overgrown with pine forest and an adjacent area near the village of Tvärminne on the Hanko Peninsula, southern Finland in mid June 2007. It was the period of maturation of Scots pine (Pinus sylvestris L.) inflorescence. About 30 ant species occurred there, including at least six species of the genus Myrmica Latr. (M. rubra (L.), M. ruginodis Nyl., M. rugulosa Nyl., M. sabuleti Mein., M. lobicornis Nyl., and M. schencki Em. (Gallé 1991).

The nest holes of each M. schencki colony found there and those of some of the local M. rubra colonies were either surrounded by piles of male pine inflorescence or such piles adjoined the nest holes. With no particular effort to search, a total of 15 Myrmica nests with such piles were found: 11 of M. schencki and four of M. rubra. The piles of...
Fig. 1–4. Rubbish dumps consisting of male pine inflorescence at nests of _M. schencki_ (in 1 and 3, the nest entrance is marked with an arrow, in 2 the entrance is pointed out by the tip of a knife; length of the knife blade is 10 cm, and in 4 the entrance is well visible. (Photos by W. Czechowski).
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pine inflorescence, 10 to 16 cm in diameter in their compact parts (generally bigger in M. schencki than in M. rubra), were visible from a distance as yellow patches well standing out against the ground (moss or litter). Zones of more dispersed pine inflorescence stretched out within a radius of a further 20–30 cm, but their concentration was still incomparably higher there than in the rest of the area (Figs 1–4).

These accumulations of identical plant elements, rather untypical of North- and Central-European ant species, resembled rubbish dumps consisting of remnants of seeds typically associated with specialised granivorous ant species (so called harvester ants), e.g. ones of the genus Messor For. Thus these rubbish dump-like piles around M. schencki and M. rubra nests suggested that ants intensely pick up fallen male pine inflorescence during pine blossom time probably for the pollen that it contains, then eat pollen out of it, and throw empty inflorescence away.

Observation of one of the M. schencki colonies revealed the origin of these peculiar piles indeed. The foragers collected fallen male pine inflorescence, carried it to the nest, and dragged it inside. The latter was a hard task because of the narrow collar-like nest entrances characteristic of M. schencki (see Czechowski 2008). At the same time, particles of inflorescence were, no less laboriously, removed by ants from the nest and left “right on the doorstep”. Two of the M. schencki nests observed were situated within a territory of Formica polyctena Först. In their cases, layers of pine inflorescence removed from the nests covered concentrations of insect remnants, so called ‘ant cemeteries’, consisting mainly of F. polyctena corpses. Such around-nest rubbish dumps are seen in M. schencki colonies, which have dumping areas of the wood ants in their range, and are signs of myrmecophagous scavengery of this species (Czechowski 2008).

Dissections of workers taken from one of the nests of M. schencki fully confirmed that ants indeed consumed pollen. Altogether 18 M. schencki individuals were dissected, and 16 (89%) of them contained pollen in their crops and midguts (Fig. 5). A grain of pine pollen bears two air-sacks which cannot be seen on pollen from the ant gaster (Fig. 6). It is possible that the ants deprive them be-
fore they swallow a grain or air-sacs were destroyed in the ants’ alimentary canal.

Interestingly, only these two Myrmica species out of several ones which occurred there (see above) were noticed to exploit this food resource, although M. ruginodis were much more abundant in those habitats than M. schencki and M. rubra (see Gallé 1991).

M. schencki is a thermophilic oligotope of dry grasslands and forests, while M. rubra is a hygrophilous eurytope occupying very diverse habitats, most typically moist and wet meadows (in the study area it occurred only locally; see Gallé 1991). Both species, besides their predatory and scavenging behaviour, are known to exploit food sources of plant origin – either indirectly (honey dew) or directly (floral and extrafloral nectaries) – to a larger extent than most of the other European Myrmica species. For more details of biology of these species see e.g. Collingwood (1979), Elmes and Abbott (1981), Nielsen (1981), Seifert (1988, 2007), Czechowski et al. (2002). The pollen-eating described in the present paper completes the picture of phytophagy or, more precisely, mellitophagy of these two ant species.

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