

Invasive Ant Threat



INFORMATION SHEET Number 16 • *Myrmica rubra* (Linnaeus)

Risk: Medium

Myrmica rubra (Linnaeus)

Taxonomic Category

Family:	Formicidae
Subfamily:	Myrmicinae
Tribe:	Myrmicini
Genus:	<i>Myrmica</i>
Species:	<i>rubra</i>

Common name(s): European fire ants (www56)

Original name: *Formica rubra* Linnaeus

Synonyms or changes in combination or taxonomy: *Myrmica laevinodis* Nylander, *Myrmica laevinodis* var. *bruesi* Weber, *Myrmica rubra* r. *champlaini* Forel, *Myrmica longiscapus* Curtis, *Myrmica rubra laevinodis* Nylander

Current subspecies nominal plus *europaea*, *khamensis*, *neolaevinodis*.

Although Japanese specimens differ morphologically from European *M. rubra* material, the name *Myrmica rubra* is applied to them for the present (www15).

General Description (worker)

Identification

Size: monomorphic. Total length of workers about 4 to 5.5 mm (www1)

Colour: body colour yellow to yellowish brown and in the field workers are clearly yellowish (Japan) or reddish brown (North America)

Surface sculpture: head and mesosoma are heavily sculptured, the gaster is smooth and shining (www8), unraised rugae occur on the posterodorsal portion of the mesonotum (www1).

General description of genus: body cuticle thick and with an armoured appearance; usually the cuticle strongly sculptured. Psammophore absent. Clypeus with longitudinal rugulae interrupted by posterior border of clypeus and not continuous with rugulae of rest of head. Antenna 12-segmented; scape often curved or bent at base; funniculus enlarged apically forming an indistinct 3- or 4-segment club. Promesonotal suture absent. Metanotal impression weak to distinct. Propodeum with spines. Petiole with a short anterior peduncle and an anteroventral tooth or process. Tibial spurs on mid and hind legs finely pectinate.

Sources: www1; www8; www13

There are several native species of *Myrmica* in New England, and distinguishing them from *M. rubra* is difficult (www8).

Behavioural and Biological Characteristics

Feeding and foraging

Unlike other species of *Myrmica*, *rubra* is very aggressive and freely inflicts a painful sting (www13; Saaristo 1995). *Myrmica* are generalist scavengers and predators (www13). Workers also feed on honeydew of Homoptera and exudates of plants (www13) and tend aphids (Saaristo 1995). Workers forage around the clock from early June through September on Mount Desert Island, Maine (Grodén et al. www57). Throughout the fall months (September through early November) there was a significant sigmoidal relationship between temperature and foraging. Foraging activity increased with temperature from about 6°C to 13–14°C (Grodén et al. www57). Above these temperatures, foraging did not appear to increase in response to air temperature (Grodén et al. www57). In Maine establishment of *M. rubra* has resulted in a significant decrease in richness of native ant species and other invertebrates (Drummond & Garnas www57).

Venom

The ants sometimes nest in lawns and gardens and readily sting humans, pets and livestock (www56; www46). Schmidt (www57) compared the sting of *Pogonomyrmex* and *M. rubra*. *Myrmica rubra* stings produce mini-versions of the reactions to *Pogonomyrmex* which typically hurt for 4–8 hours, produces a deep pain that feels like the “tearing of muscles or tendons”, and comes in waves. The venom also produces localized sweating at the sting site, erection of the hairs around the sting site, and a pain or tenderness in axillary or groin lymph nodes. *Pogonomyrmex* venom is the most lethal known arthropod venom, with an LD50 in mice of about 190 micrograms/kg. The lethality of *M. rubra* venom is unknown, but is also likely to be high.

Colony characteristics

Normally polygynous with some 1000 workers, but may develop large polydomous colonies covering up to 2 m² and consisting of 100s of queens and over 10,000 workers (Saaristo 1995). Unrelated queens have been found cohabiting (Pearson 1983). Densities of *M. rubra* nests can be as high as 4 per m², with more than 5200 workers and 39 queens per nest (Drummond & Garnas www57). Artificial nesting substrates set out in Maine were readily used and were repeatedly vacated and recolonised, suggesting colony movement is high, or that *M. rubra*'s large polydomous colonies are able to relocate nests in response to shifting optimal conditions for brood production on a short temporal scale (Garnas et al. www57). In Poland, mating swarms were present from August until mid-October (Woyciechowski 1992).

Dispersal

The primary means of spread is via colony budding (www56). Dispersal is also assisted by human activity, particularly with movement of infested potted plants, mulch and fill (www56). The first infestation in Maine to become established more than 20 miles from the coast resulted from the planting of shrubs purchased from a nursery in an infested coastal community and has persisted through four winters.

Habitats occupied

In Finland it is frequently found in gardens and agricultural meadows and can be extremely abundant (Saaristo 1995). It is rare inside larger forests (Saaristo 1995). Similarly in its introduced range in the US, the ant favors disturbed open grassy areas, forest edges, and residential landscapes (www8). In Japan this species is rare and nests in the soil of grasslands in lowland areas (www15).

Global distribution (See map)*Native to*

Area spanning from the United Kingdom to central Asia, and from Scandinavia to the Black Sea (www8). Although few records were found Russia and China (see map) it is likely to be widespread in temperate regions.

Introduced to

North-east United States (www8) and Quebec, Canada (Creighton 1950).

History of spread

This ant was first noticed in North America by William Morton Wheeler of Harvard University about 1906, when he found them near Falmouth on Cape Cod (www46). It was probably introduced accidentally from Europe in infested container plants brought for planting in gardens of coastal estates (www56). It has spread from 2 locations in Maine in the 1950s to more than 20 locations along Maine's entire coast as of 2002 (www56).

Interception history at NZ border

There have been no interceptions of this genus at the New Zealand border.

Justification for Inclusion as a Threat

A cold climate species from Europe that has established outside its native range in north-east USA and Canada (Creighton 1950). It is an aggressive species with a painful sting and has become a significant pest in many parts of its introduced range in Maine. Densities of nests can be as high (4/m²) and impacts on people, pets, other ants and the invertebrate community have been demonstrated (www57). It is associated with disturbed habitats and disperses by budding and movement of potted plants (www56).

Mitigating factors

Not present in southern hemisphere and no interceptions of this species have been reported at the New Zealand border. There has probably only been one transfer from its native range.

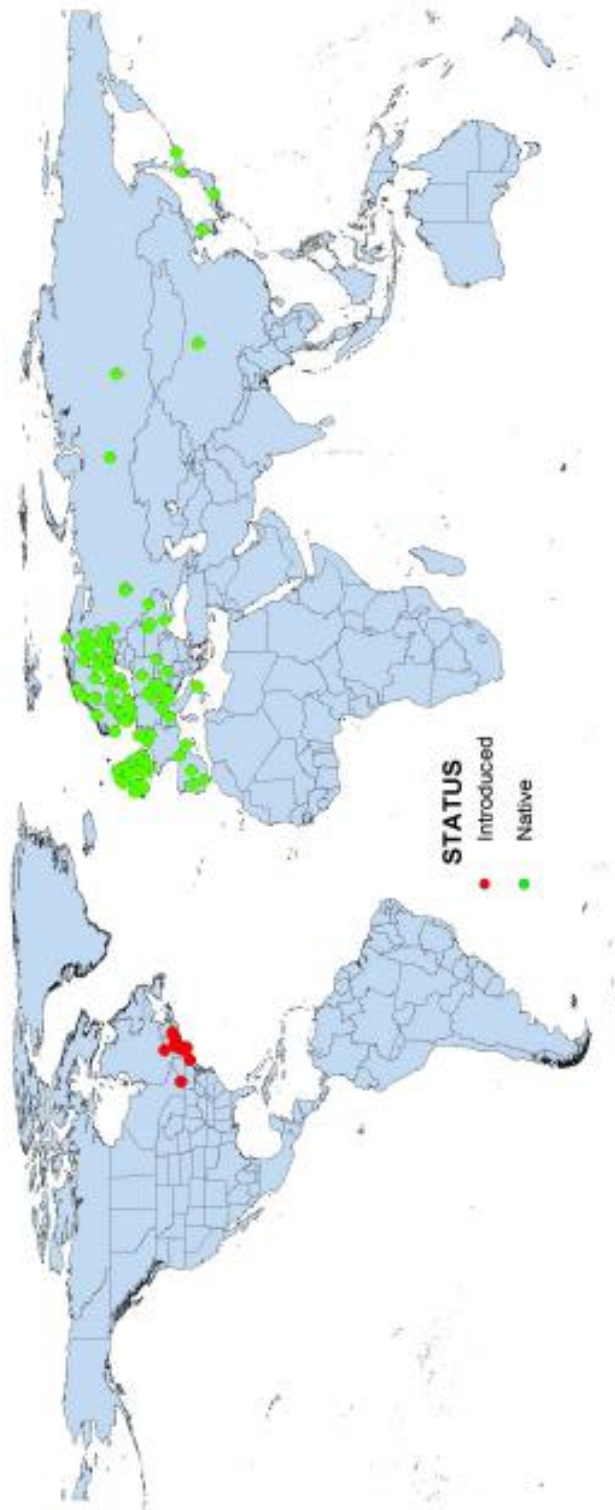
Control Technologies

They have not become pests in the vast majority of their native range (www58), and current research is examining aggression among ants of neighbouring colonies, to determine whether a depression of intra-specific agonistic behaviour is contributing to their success in Maine (www16).

They can be controlled by tracking foragers back to nest and eliminating the colony by direct treatment (www8). Foragers of this sugar-loving ant quickly discover and recruit to vials baited with small pieces of surgical gauze dipped in 30–50% sucrose solution (Grodén et al. www57). Preliminary trials using low concentrations of boric acid (1% and less) in sucrose bait show promise for species control, and foragers will readily pick up baited formulations of both Extinguish®, a baited formulation of methoprene, and Amdro® (www56), so strategies for *Solenopsis invicta* may be effective against this species.

Maculinea butterflies are parasites of *Myrmica* ant nests (Als et al. 2001).

Compiled by Richard Harris & Jo Berry



Global distribution of *Myrmica rubra* (Linnaeus)