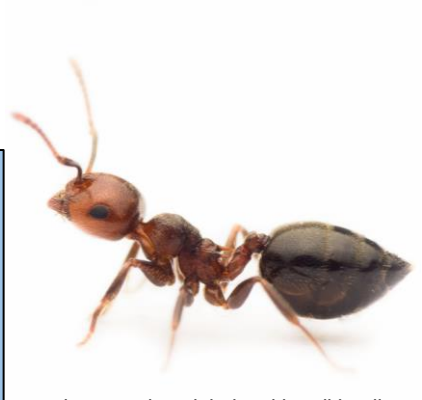
RISK ASSESSMENT SUMMARY SHEET

Updated: October 2020

Cork ant (*Crematogaster scutellaris*)

- Also known as the acrobat ant. Slightly larger than native black ant, with distinctive red head and abdominal waving behaviour.
- Native to Mediterranean.
- Established indoors in 2 GB locations, probably introduced as contaminants of imported goods.
- Unlikely to be able to establish outdoors in GB, but could be a nuisance in buildings.

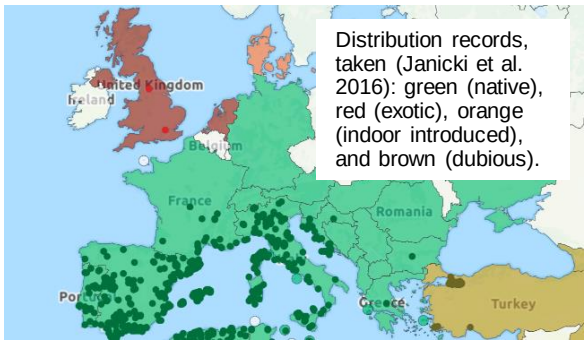


Photograph: Michal Kukl, Wikipedia

History in GB

Two separate populations discovered in buildings (north London and the west Midlands) in 2017. Further surveys found healthy colonies (>1000 workers) at both sites in May 2018. These are the only known populations, although incidental records exist from before the 1970s (associated with warehouses for imported natural cork).

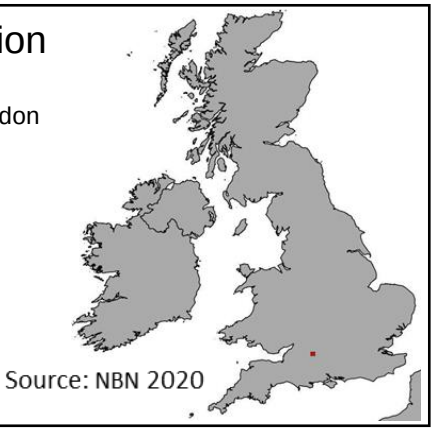
Native Distribution



Distribution records, taken (Janicki et al. 2016): green (native), red (exotic), orange (indoor introduced), and brown (dubious).

GB Distribution

Present indoors in 2 locations (north London and west Midlands.



Source: NBN 2020

Impacts

Environmental (minor, high confidence)

- Unlikely to establish outdoors in GB and so environmental impacts are unlikely.
- Biodiversity impacts have been recorded elsewhere in the world.

Economic (minor, high confidence)

- Few negative economic impacts.

Social (minor, high confidence)

- A highly aggressive ant that quickly mobilises quickly when disturbed and releases pheromones to attract large numbers of nest mates.
- Could have negative impacts on people living near to nests.

Introduction pathway

Probably introduced with imported timber from Spain or Portugal. Also, possible contaminant of mobile homes.

Spread pathway

Natural (slow, high confidence). Can spread by nuptial flights, but these are unlikely to occur in GB.

Human (slow, high confidence). Could be spread with raw wood materials.

Summary

	Response	Confidence
Entry	MODERATELY LIKELY	HIGH
Establishment	UNLIKELY	HIGH
Spread	SLOW	HIGH
Impact	MINOR	HIGH
Overall risk	LOW	HIGH

GB Non-native Species Rapid Risk Assessment (NRRA)

Rapid Risk Assessment of: *Crematogaster scutellaris* Olivier (Mediterranean acrobat ant)
Author: Adam John Mears Devenish, Imperial College London

Version: Draft 1 (July 2018), NNRAP 1 (Sep 2018), Draft 2 (Oct 2018), Peer review (April 2019), Draft 3 (July 2020)
Signed off by NNRAP: March 2019
Approved by Programme Board: September 2020
Placed on NNSS website: October 2020

Introduction:
The rapid risk assessment is used to assess invasive non-native species more rapidly than the larger GB Non-native Risk Assessment. The principles remain the same, relying on scientific knowledge of the species, expert judgement and peer review. For some species the rapid assessment alone will be sufficient, others may go on to be assessed under the larger scheme if requested by the Non-native Species Programme Board.

1 - What is the principal reason for performing the Risk Assessment? (Include any other reasons as comments)

Response: The acrobat ant (*Crematogaster scutellaris*) is a non-native ant with a distinctive red head and abdominal waving behaviour, that is slightly larger than the native black garden ant. It is native to the Mediterranean region, extending northwards as far as southern Germany. It nests in tree trunks, stumps and buildings.

This assessment is being undertaken following the discovering of two separate populations in buildings in north London and the west Midlands by pest controllers in 2017. Further surveys found healthy colonies (>1000 workers) at both sites in May 2018, which were reported to the Non-native Species Secretariat in July 2018. These are the only known populations in Great Britain, although incidental records of this species exist from before the 1970s (associated with warehouses for imported natural cork).

It is not yet clear how these populations were introduced (but likely related to imported goods). The acrobat ant nests in buildings, mainly among roof timbers, where it could be a potential nuisance. It is unlikely to be able to establish in the wild in Great Britain, given it is a mainly Mediterranean species. Biodiversity impacts (displacing native ant species) have been documented elsewhere in the world, but it is not yet clear how likely these are to occur in the Great Britain.

2 - What is the Risk Assessment Area?

Response: Great Britain.

3 - What is the name of the organism (scientific and accepted common; include common synonyms and notes on taxonomic complexity if relevant)?

Response: *Crematogaster scutellaris* (Olivier 1792) is an ant species (Formicidae) within the

Myrmicinae subfamily, commonly referred to as the Cork ant, Red Scorpio ant or Mediterranean acrobat ant. According to Bolton (2018) there are three valid subspecies (*C. scutellaris alii*; *C. scutellaris nigra*; *C. scutellaris tenuispina*) and eight junior synonyms (*Crematogaster haematocephala*; *C. rediana*; *C. rubriceps*; *C. ruficeps*; *C. scutellaris corsica*; *C. scutellaris degener*; *C. scutellaris grouvelli*; *C. scutellaris lichtensteini*).

4 - Is the organism known to be invasive anywhere in the world?

Response: No

5 - What is the current distribution status of the organism with respect to the Risk Assessment Area?

Response: This species is commonly found in countries located around the western half of the Mediterranean Basin, including: Italy, Austria, France, Iberian Peninsula, as well as several other countries in Northern Africa (See Fig. 1).

Figure 1: *Crematogaster scutellaris* distribution records, taken from antmaps.org (Janicki et al. 2016). Colour corresponds to record status: green (native), red (exotic), orange (indoor introduced), and brown (dubious).

6 - Are there conditions present in the Risk Assessment Area that would enable the organism to survive and reproduce? Comment on any special conditions required by the species?

Response: *Crematogaster scutellaris* is commonly found in both natural and human-managed ecosystems. This species is an arboreal specialist, naturally living in tree trunks and dead logs (Bernard 1968; Baroni Urbani 1971). There are no records of any *permanent* populations of *C. scutellaris* in Great Britain. However, Collingwood (1964) recorded incidents of *C. scutellaris* making *temporary* nests around warehouses and cork factories in England. This earlier introduction has been linked to cork imports from Southern Europe (Collingwood 1964).

7 - Does the known geographical distribution of the organism include ecoclimatic zones comparable with those of the Risk Assessment Area or sufficiently similar for the organism to survive and thrive?

Response: No. While this species native range includes European countries with both Mediterranean and Temperate climates (e.g. France). It is predominantly found (recorded) in regions close to the Mediterranean Basin (See Fig. 1). It is therefore likely that temperature plays a large role in its ability to survive and thrive. Cold winters associated with temperate climates such as Great Britain, are therefore likely to be a limiting factor in *C. scutellaris* establishment.

8 - Has the organism established viable (reproducing) populations anywhere outside of its native range (answer N/A if you have answered 'yes' to question 4)?

Response: No.

9 - Can the organism spread rapidly by natural means or by human assistance?

Response: This species reproduces sexually and has winged females that can disperse relatively long distances during nuptial flights; however, this species is also prone to jump-dispersal through human-mediated transport of wood materials, such as cork (Collingwood 1964; Frizzi et al. 2015).

10 - Could the organism itself, or acting as a vector, cause economic, environmental or social harm in the Risk Assessment Area?

Response:
There are no records of any significant economic, environmental or social impacts associated with this species. As with other ant species, *C. scutellaris* tends coccid scale insects for honeydew (Schatz and Hossaert-McKey 2003) and this could potentially impact agricultural and horticultural industries due to inhibition of plant growth and development

While *C. scutellaris* is more commonly found nesting in trees, there are records this species can build nests within the structure of buildings (Barrettine Environmental Health 2017). Furthermore, *C. scutellaris* is characterised as a highly aggressive ant species that mobilises

quickly when disturbed (Marlier et al. 2004). This aggressive behaviour could potentially negatively influence native fauna in the direct vicinity of the nest, as well as pose some negative impacts on human populations (i.e. through stings). While reports are generally very rare, there have been isolated cases of anaphylactic shock in young children that have been stung (Monti et al. 2011).

Entry Summary

Estimate the overall likelihood of entry into the Risk Assessment Area for this organism (comment on key issues that lead to this conclusion).

Response: *moderately likely*
Confidence: *high*

Comments (include list of entry pathways in your comments):
This species has previously been reported in Great Britain as an exotic organism (Collingwood 1964). Given that Great Britain imports cork and wood products from countries such as Portugal and Spain, it is therefore likely that the propagule pressure associated with *C. scutellaris* will continue. *Crematogaster scutellaris* has also been reported as present in insulation material used in mobile homes (Seifert et al. 2018). A review of the current intercept records and/or sampling using pitfall/baiting at the point of entry would potentially provide a good estimate of external propagule pressure.

Establishment Summary

Estimate the overall likelihood of establishment (comment on key issues that lead to this conclusion).

Response: *unlikely*
Confidence: *high*

Comments (state where in GB this species could establish in your comments, include map if possible):
While there have been previous records of this species in Great Britain (Collingwood 1964; Bees, Wasps & Ants Recording Society 2018), none of these were of any *permanent* establish populations. To date, most of the identified colonies have been found in or around buildings, particularly warehouses and cork factories in England (Collingwood 1964). At this moment in time, there is no evidence to suggest that this species can establish any *permanent* outside populations within Great Britain, instead it is more likely to be found indoors or in and around urban areas.

As with other potentially invasive ant species, the main limiting factor is thought to be temperature. It is therefore unlikely that this ant species would thrive, especially outside of gardens/greenhouses or residential areas. Although this may change under different future climatic conditions (Bertelsmeier et al. 2016). If we are to look for evidence of establishment outside populations it would be best to focus on warmer areas of Great Britain, such as South-West England/Wales, where winters are milder. By contrast, given the recent discovery of a relatively large (>1000 worker colonies) indoors in May 2018, it would suggest that this species can potentially thrive indoors, like some populations found in the Netherlands (Boer et al. 2019). However, while this suggests these indoor populations can survive overwinter, there does not appear to be many records (publicly available). This would suggest that these events are still relatively rare, even in Netherlands which is likely to have a higher propagule pressure (due to their proximity to native populations) than Great Britain. It is therefore unlikely, that species will become widely established indoors in Great Britain.

Spread Summary

Estimate overall potential for spread (comment on key issues that lead to this conclusion).

Overall response: *slow*
Confidence: *high*

Sub scores:

Natural spread only:
Response: *slow*
Confidence**:** *high*

Human facilitated spread only:
Response: *slow*
Confidence**:** *high*

Comments (in your comments list the spread pathways and discuss how much of the total habitat that the species could occupy has already been occupied): There are relatively few published sources on either the natural or human facilitated dispersal ability of this species. As with other ant species, C. *scutellaris* reproduces sexually forming both monogynous (single queen) and polygynous (multiple queens) colonies (Frizzi et al. 2015). Therefore, while there is potential for the winged queens to fly during nuptial flights, they require both the correct environmental cues to trigger the swarming behaviour, as well as nearby colonies that are producing winged males to mate with. Failure to achieve this would mean that it is likely they would either not attempt to swarm and/or the ant queens would remain infertile. While the temperatures in Great Britain may be enough to trigger swarming [estimated at. 23.41°C±2.82 (Seifert et al. 2018)], it is unlikely that two colonies would be in close enough proximity for mating to occur (Crisanto Gomez Pers. Comm.).

As with other arboreal ant species, *C. scutellaris* nests in tree cavities, particularly in cork and olive trees (Santini et al. 2011). Human mediated transport is therefore likely to occur during the transporting process of the raw wood materials; however, *C. scutellaris* readily defends its nest which means it can be easily identified by the naked eye (body size: 2.8-4.4 mm) through its abdominal (gaster) waving behaviour (See Fig. 2).

Figure 2: *Crematogaster scutellaris* defensive behaviour seen through the waving of its abdomen (Photo taken from myrmecoformis.fr).

Impact Summary

Estimate overall severity of impact (comment on key issues that lead to this conclusion)

Overall response: *minor*
Confidence: *high*

Sub-scores

Environmental impacts:
Response: *minor*
Confidence**:** *high*

Economic impacts:
Response: *minor*
Confidence: *high*

Social impacts:
Response: *minor*
Confidence: *high*

Comments (include list of impacts in your comments):
Impacts of *C. scutellaris* are likely to be contingent on overall population size. Furthermore, many of the economic and social impacts reported are not limited to this ant species, and

indeed could be said of many of the native Great Britain ant species as well.

Environmental: Studies of *C. scutellaris* in its native range indicates that it is one of the most highly ranked competitors in Mediterranean ant assemblages (Cammell et al. 1996; Way et al. 1997; Santini et al 2007; Ottonetti et al. 2008; Frizzi et al 2015). It therefore could have some negative impacts on both the native ant and arthropod communities.

Economic: Impacts are likely to be linked to eradication costs and negative impacts on agriculture/horticulture (e.g. mutualisms with scale insects) (Schatz and Hossaert-McKey 2003).

Social: *C. scutellaris* is characterised as a highly aggressive ant species that mobilises quickly when disturbed (Marlier et al. 2004). When disturbed they display a abdominal waving behaviour, which releases both venom and alarm pheromones, triggering the recruitment of a large numbers of nest mates (Pasteels et al. 1989). Upon contact this species actively sting and bite intruders. This could have negative impacts on people living near *C. scutellaris* nests, especially with young children that may be at risk of anaphylactic shock (Monti et al. 2011).

Climate Change

What is the likelihood that the risk posed by this species will increase as a result of climate change?

Response: *low*
Confidence: *medium*

Comments (include aspects of species biology likely to be affected by climate change (e.g. ability to establish, key impacts that might change and timescale over which significant change may occur):
Invasion forecasts have suggested that an increase in ambient temperatures would improve climatic suitability for several invasive ant species (Bertelsmeier et al. 2016). Unfortunately, there is no studies to date that look at the temperature requirements of *C. scutellaris*. It is however unlikely that under climate change that *C. scutellaris* will have an improved chance of establishing within Great Britain. in the foreseeable future. Especially as its population is restricted to the warmer regions of Southern Europe, and therefore temperatures would likely need to rise substantially for the population to become established in the Great Britain.

Conclusion

Estimate the overall risk (comment on the key issues that lead to this conclusion).

Response: *low*
Confidence: *high*

Comments: Given the patchy records of this species, and the fact that there is no evidence

that this species can produce long-term viable and stable population in the Great Britain, means that the likelihood of invasion remains relatively low. Furthermore, the fact that *C. scutellaris* is significantly different in appearance to all native. ant species in Great Britain (due to the behaviour shown in Fig. 2) and preference for selected substrates (i.e. tree trunks and dead logs) would make it more readily identifiable. Taken altogether, this means it is unlikely that this species would become widely established, even indoors. However, with increased ambient temperatures (as a result of climate change), it is likely that the incidents of *C. scutellaris* colonies interceptions might rise. Which if left unchecked might lead to these populations becoming more widely introduced, and even established in Great Britain, especially indoors.

Management options (summary):

1 - Has the species been managed elsewhere? If so, how effective has management been?

Response: Given that *C. scutellaris* poses minimal nuisance to people means that outside of cork plantations there appears to be little, to no recorded evidence of effective control methods. While *C. scutellaris* nest building may depreciate the cork stock and hinder the extraction process, it appears to be a relatively minor pest in the cork industry and therefore there are no recorded pest management strategies (Soria et al. 1994; Verdinelli et al. 2012; Tiberi et al. 2016).

2 - List the available control / eradication options for this organism and indicate their efficacy.

Response: There is currently a wide array of insecticides available as 'ant baits' in both granular and liquid forms. For example. Imidacloprid gel baits have been shown to be an effective insecticide treatment (Kleinlogel and Felke, 2012); however, beyond this there are no recordeds of appropriate pest management plans for this species.

3 - List the available pathway management options (to reduce spread) for this organism and indicate their efficacy.

Response: Propagule pressure from outside Great Britain. is likely to remain low, but it is likely to potentially increase with global warming. Enhanced vigilance in and around ports of entry are advisable and relatively inexpensive. It is likely that the main pathway for this species would be from the transport of raw and unprocessed wood materials, such as cork. Therefore, care should be taken to inspect these materials at their point of entry, as these precautions could limit their potential for introduction.

4 - How quickly would management need to be implemented in order to work?

Response: If the management objective is eradication (rather than control), upon identification of a population, rapid application of an appropriate poison ant bait is required. Training needed for eradication and management would need to focus on identification and differentiation of the different ant species, as well as bait application training to optimise results and safety precautions.

References

Provide here a list of the references cited in the course of completing assessment

List:

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