

Ants, Plants and Elaiosomes

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We know that many ant species have close relationships with plants. In the UK some collect plant material to build their nests e.g. Southern Wood Ants *Formica rufa*; many rely on plants to support aphids from which they obtain honeydew e.g. Yellow Meadow Ants *Lasius flavus* which feed from aphids underground on grass roots; some species need trees to provide a nesting area e.g. Jet Black Ants *Lasius fuliginosus* which need a hollow tree or dead stump. Perhaps one of the easiest relationships to study is ants' use of extra-floral nectaries to obtain food e.g. from Bracken *Pteridium aquilinum* and *Vicia* species including Broad Beans *V. faba*. The plants may themselves gain from the relationship e.g. ants may deter or remove invertebrate herbivores or they may occasionally pollinate flowers.

We also know that ants may disperse seeds from the parent plant (called myrmecochory) and some European ant species are granivorous, feeding solely on seeds. *Tetramorium caespitum* is apparently the only UK species which collects and stores seeds and feeds them directly to its young.

Some plant species produce seeds which contain small fleshy outgrowths or elaiosomes (from the Greek, *elaion* = oil & *soma* = body), which are particularly attractive to ants. These elaiosomes are rich in lipids, amino acids and other nutrients and cannot be dislodged so each whole seed is carried back to the nest where only the elaiosome is fed to the ant larvae. The seeds are then dumped with the nest waste, so burying them in an organic mix perfect for germination, thus aiding dispersal.

I was interested to see this for myself after I had read that the seeds of Greater Celandine *Chelidonium majus* have elaiosomes. I had been looking out for Greater Celandine plants (01) whilst searching for the tiny ladybird *Clitostethus arcuatus* which we had found feeding on whitefly on this plant. I had noted these plants growing along the lane near where I lived at that time; isolated plants were found at intervals along the hedgerow.



01. Greater Celandine. Rosemary Winnall.

I collected some ripe fruits and was interested to see the conspicuous elaiosome on each seed (02). So, I decided to see what happened when I placed these seeds on open ground on a heathy, sunny bank in my garden where I knew ants moved around and where it was easy to watch and photograph them. I soon spotted some *Myrmica* ants heading along the slope and they came straight to the seeds, picking them up (03) and then carrying them back along the way they had come, presumably to their nest. I took several movies which provided a good record of this behaviour. The still photos were less successful as the ants were moving so very quickly. I collected two ants for identification and the species was confirmed as *Myrmica sabuleti*.



02. Greater Celandine seeds with elaiosomes. Rosemary Winnall.



03. *Myrmica sabuleti* with Greater Celandine seeds, note the elaiosome. Rosemary Winnall.

Many other plants have seeds with elaiosomes, including violets *Viola* sp., Dog's Mercury *Mercurialis perennis*, Wood Anemone *Anemonoides nemorosa*, Common Cow-wheat *Melampyrum pratense*, White Dead-nettle *Lamium album* Red Dead-nettle *L. purpureum*, Primrose *Primula vulgaris*. I shall be interested to check these out when I am able.

Thinking further into plant and insect associations, ants may help to determine the distribution of insects such as fritillary butterflies which lay their eggs on violets, and by distributing the seeds of Cow-wheat, the ants are influencing the distribution of the Cow-wheat Shieldbug *Adomerus biguttatus*. Food for thought!

References

Jones R. 2022. *Ants: The Ultimate Social Insects*. Bloomsbury Publishing.
 Skinner G. J and Allen G. W. 1996. *Ants: Naturalists Handbooks* 24. Richmond, Slough.
 Lebas C., Galkowski C., Blatrix R., Wegnez P. 2019. *Ants of Britain and Europe, A Photographic Guide*. Bloomsbury Publishing
 Winnall, R. 2012. Ants and extra-floral nectaries. *Worcestershire Record* 32:18-19.
 Available at:
https://www.wbrc.org.uk/WORCRECD/32/Winnall_Rosemary--Ants_and_Extra-floral_.html [Accessed 24.12.24].

Images

01. Greater Celandine. Rosemary Winnall.
 02. Greater Celandine seeds with obvious elaiosomes. Rosemary Winnall.