THE IPSWICH & EAST SUFFOLK BEEKEEPERS' ASSOCIATION

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Newsletter for September – December 2024

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Opinions expressed in this Newsletter are not necessarily those either of the Editor or of the Association.

The Suffolk Beekeepers' Association is an Area Association of The British Beekeepers' Association. http://www.bbka.org.uk/

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The Yellow-legged Hornet

We are heading in to peak Asian hornet activity time, if you have traps to use as bait stations, now is the time to have them out. If you want more Trappit bait, Richard Allen, our Secretary, has some available at cost price of £2.50 per 250ml. Instructions and advice from the National Bee Unit: https://www.nationalbeeunit.com/assets/PDFs/3_Resources_for_beekeepers/Fact_Sheets/Fact_01_Asian_Hornet_Monitoring.pdf.

The following is from Sarah Bunker's book: *The Yellow-Legged Asian Hornet – a handbook*; 2nd edition.
Autumn trapping attempts to catch males and gynes (new queens) when they are newly on the wing. We do not know exactly when this will be in the UK but in Jersey gynes start appearing in late September. Depending how fast winter comes, traps could be taken down in late November or early December.
If traps using pheromones become available, autumn will become the main trapping time.

Any trap that is neglected becomes a killing trap if insects cannot escape, killing non-target species, the by-catch. It is important to note that just because a trap has some exit holes, it doesn't mean non-target species are able to escape through them. They may not be able to find the holes, or recognise them as escapes or be able to pull themselves through.

Originally designed as a drowning kill trap, the Véto-Pharma trap it is used in Jersey as a monitoring trap with a mini wick-pot inside, or, with the entrance cones removed, as a bait station. In Guernsey they use them with the barest amount of bait soaked into a sponge and two sets of 6mm exit holes around the top of the side walls and just above the sponge.

The essential take-home message is that non-target insects MUST be released, at the very least, EVERY DAY.

P.S. West Suffolk BKA has Gard'Apis traps for sale @ £18.00. These allow non-target insects to escape.

We need a new Newsletter Editor – could this be you?

Barry Crabtree did an excellent job as Editor for, I think, six years – for which he has our very grateful thanks - but he thought that was long enough and resigned. Following that, one possibility would be for the Association to run without a newsletter. As the newsletter is a good way of publicising future events, airing questions and a platform for information and amusement, I don't want that to happen unless there really is no other option. If anyone 'out there' feels they could be our next editor, please tell me or Richard, our Secretary. You would have a free hand to include whatever bee-related stuff that takes your fancy. If you think that might be hard to find, Northern Bee Books offers BEES – the beekeeping editors' exchange scheme – so you could use the best of what other local association newsletters print. Please don't be put off by the high standard Barry maintained; you would receive whatever help you needed from other members and would, I am sure, grow into the job.
In the meantime, I will be Acting Editor. *Jeremy*

We also need a new Speaker Finder

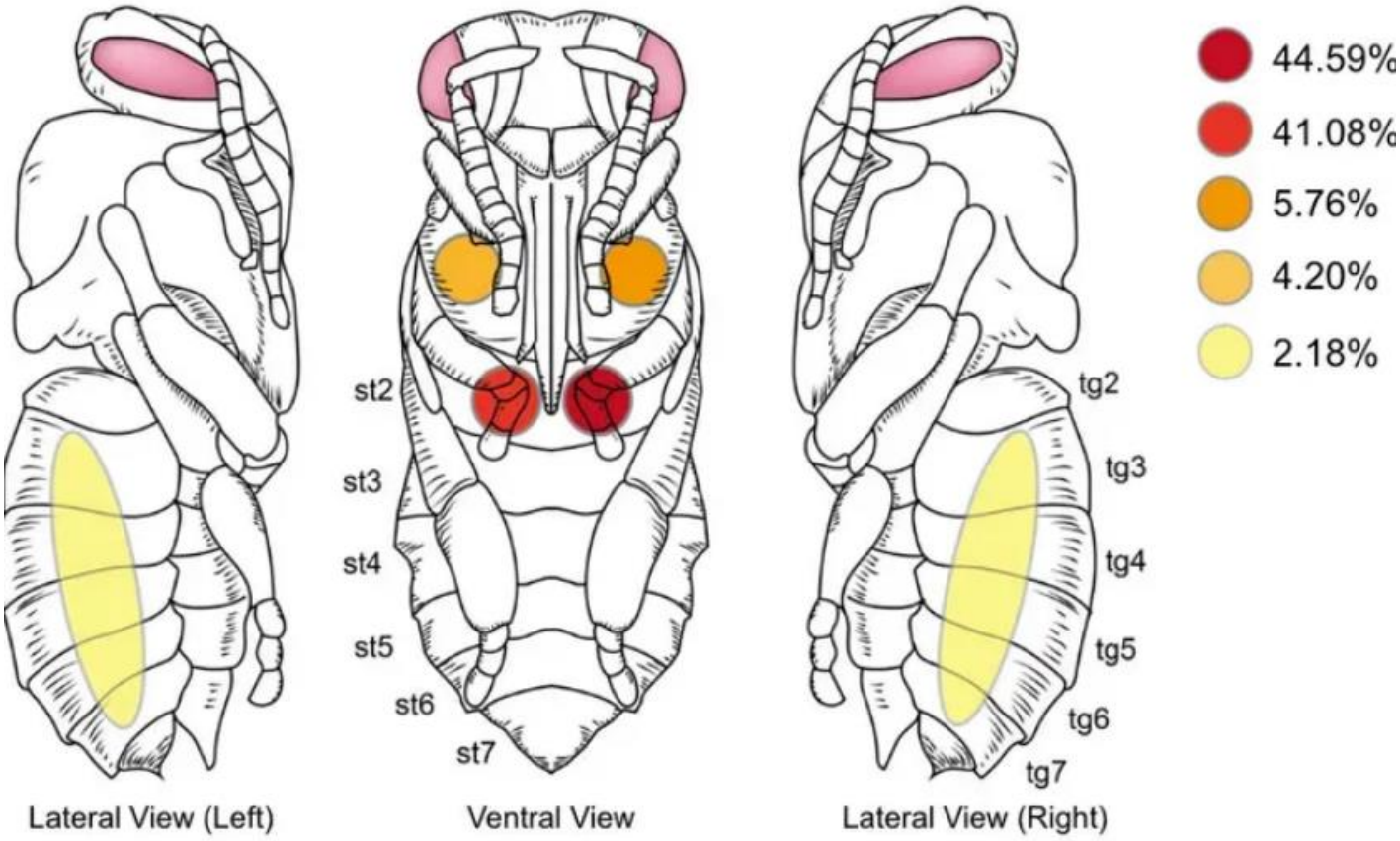
Tim Wilmshurst has also been doing an excellent job but also wishes to retire at the end of the year – a date that is fast approaching. Again, is there someone 'out there' who will take on the job? In consultation, you would be free to invite good interesting speakers from all parts of the UK. Naturally, the Association pays speakers' expenses. Either Richard or I would be delighted to hear from you. Jeremy

Varroa sometimes eats fat-body **AND**, at other times, sucks haemolymph!

Originally, we heard that Varroa sucked bees' haemolymph (hemolymph in American). Samuel Ramsey's work postulated that, no, it was fat-body. In bees, the fat-body is, broadly, analogous to the human liver; it acts as a major organ for nutrient storage, energy metabolism and detoxification of things like pesticides. In the adult bee it is located in a sheet underneath the abdominal cuticle. This explains why the feeding locations identified by Ramsey *et al*., (2019) were used to provide supportive evidence of the diet of *Varroa* His study largely used *adult* bees, and the conclusions were then extrapolated to *all* stages of the life cycle of the mite, resulting in the definitive "*not hemolymph*" in the title of his paper.

They photographed 1285 pupae parasitised by *Varroa* and identified the location of the feeding site (visually, after staining with a dye). 90% of all feeding sites were on the abdomen, and 85% were located on the sternite (the ventral shield) of the second abdominal segment.

This site is probably favoured as the cuticle here is thinner, and is directly over a large haemolymph-containing cavity. The fluorescent dyes used showed the mites were feeding on haemolymph tissue, *not* on fat body tissue.



Developing bee pupae undergo metamorphosis, during which everything is mixed up and rearranged or, as Han *et al*., (2024) more scientifically say: ... the fat body of the metamorphosing pupae is diffuse in the hemolymph-filled body cavity during the re-modelling and formation of adult tissues. Han *et al*., (2024) set out specifically to determine whether *foundress* mites and their progeny feed on fat body or haemolymph tissue.

You will have heard of the microbiome of honey bees - and of humans. Just as the microbiome is a catalogue of bacteria - both the species and abundance in a particular environment - the ***proteome*** is a catalogue of the abundance and identity of *proteins* in a particular location. The proteome is measured by fragmenting all the proteins present into short pieces and then identifying and quantifying the billions of fragments generated using mass spectrometry. It's a clever, expensive and exquisitely sensitive method. The cost precludes its use by many (often poorly-funded) honey bee research laboratories, and the sensitivity means that contamination of

one form or another can be an issue. Controls and comparisons are essential.

To cut a long story short, Han and colleagues compared the *honey bee proteins* within the proteome of *Varroa* in both reproductive and dispersal phases of the life cycle. They compared these with the *known* proteome of honey bee haemolymph, and also investigated the presence and abundance of vitellogenin (a fat body protein). As the proteome of the honey bee fat body has not been determined, the presence of vitellogenin was used as a surrogate marker for *all* the proteins specific for the fat body. Although ~58% of honey bee proteins were found in *both* reproductive- and dispersal-phase mites, 42% were *unique* to one or the other. Analysis of the latter clearly showed that foundress (reproductive) mites and phoretic (dispersing) mites have a different diet, with the foundresses feeding on haemolymph and the phoretic mites feeding on the fat body.

I am grateful to Prof David Evans, *The Apiarist*, for his excellent report of this research.
He added that those unfamiliar with *Tropilaelaps* - another parasitic mite of honey bees - should perhaps do a bit more reading as it is becoming more widely distributed, and has recently been identified in Europe for the first time (Brandorf *et al*., 2024).

Coming to an apiary near you ..

Wherstead Teaching Apiary

Those who teach there will be meeting on 25th September to discuss how we might improve teaching and learning next summer. If you have ideas or suggestions, please send them to Helen Thorne hthorne57@gmail.com before that date.

In particular, we would like to encourage those who have been keeping bees for a year or longer to take the BBKA's Basic – it really isn't difficult – just a chat with an experienced beekeeper – and a 98% pass-rate!
How can we get those eligible to apply?

New Members

We welcome the many new members who have joined us this year: Nicholas and Ruth Baby, Don Baxter, Robert Beevers, Chris Cage, Jamie Clarkson, Kevin Corrigan, Chris Davies, Michal Fisher, Joy French, Michele Gibson, Loraine Goddard, Terence Gray, Alicia Herbert, Liam Jennings, Stuart Kellett, Matthew Keys, Garry Leay, Chris Lewis, Supamon Lockett, David Parrott, Richard Pursey, Cavan Rhodes, Jim Rose, Emma Royall, Nuno Silva, Stefan Tchorzewski, Yvonne Turner, Helen Wallace, Oscar Withers, Harry Wood and Alison Zammit.

Bees in a bad mood to-day?

Animals fall into prolonged bad moods over minor slights in the same way as humans, scientists have found. Birds, rats, fish – and everything in between – can be far less pragmatically minded than previously thought - according to a study that promises to transform the understanding of animal psychology. Researchers have long assumed that an animal's emotional state was dependent on achieving its life goals – keeping safe, finding food and reproducing. Now, however, a new analysis has found that it could be just as likely that a "gloomy" animal was suffering from what amounts to a lengthy strop provoked by an unrelated factor. The reverse is also true.
The team at Queen's University Belfast gave the example of starlings with more comfortable nests than their neighbours appearing more upbeat. They also pointed to honey bees having a more pessimistic reaction to pheromones if they have previously received a fright. *[Or perhaps disease, bad weather, a shortage of food or clumsy handling by their beekeeper.]*
The scientists drew on a theory of "contests" between animals – interactions where two or more organisms are competing for the same core advantage. While the significance of any small advantage may be small, the outcome can affect the animal's mood long term. Andrew Crump, lead author of the paper, said: "Human emotion influences unrelated cognition and behaviour, For example, people rate their overall satisfaction higher on sunny days than rainy ones. We have found that animals' emotions also influence unrelated cognition and behaviour. For example, animals that won a contest experienced a more positive mood and expected fewer predators in their environment."
"Similarly, animals that lost a contest experienced negative emotions and took less part in future contests. These carry-over effects may lead to mal adaptive behaviour. Stimuli or events that elicit emotional responses might influence virtually any decision – potentially with life-or-death consequences. For example, are rustling leaves a predator or the wind? Anxious animals will probably interpret the rustling as a predator and run away. Emotions in animals can be measured empirically through changes to cognition, how much energy and drive a creature shows and nervous system activity.
Dr Gareth Arnott, the principal investigator, said that currently, animal behaviour researchers typically do not consider animal emotions in their work. "The results of this study show that this may need to be considered as the role of animals' emotion is crucial in relation to understanding their subsequent behaviour."
The study appears in the journal *Proceedings of the Royal Society B.*

Book review: **"The Dark Side of the Hive: The Evolution of the Imperfect Honeybee"**

by Robin Moritz & Robin Crewe; OUP, 2020. £44.00

The authors' proposition is that while honey bees have been described as exceptionally clever, well-organized, mutualistic, collaborative, busy, efficient—in short, a perfect society - it also has a considerable dark side. They write about the life history of the honey bee, *Apis mellifera*, highlighting conflict rather than harmony, failure rather than success from the perspective of the individual worker in the colony. When one looks carefully, the honey bee colony is far from being perfect. As with any complex social system, honey bee societies are prone to error, robbery, cheating, and social parasitism. Nevertheless, the hive gets by remarkably well in spite of many seemingly odd biological features. The perfection that is perceived to exist in the honeybee's social organization is the function of a focus on the colony as a whole rather than exploring the idiosyncrasies of its individual members. *The Dark Side of the Hive* thus focuses on the role of the individual rather than that of the collective. Moritz and Crewe dissect the various careers that individual male and female honey bees can take and their role in colony organization. Competition between individuals using both physical and chemical force drives colonial organization. This book deals with individual mistakes, maladaptations and evolutionary dead-ends that are also part of the bees' lives. The book details these dark sides of the colony and spans the full range of biological disciplines ranging from genomics to systems biology. *What a pity that the publishers made such a hash of reproducing the photographs. Nevertheless, this is my sort of book and I much enjoyed reading the I&ES Library copy. Thank you, Gillian!*

Honey bees as model animals for other insects

Studying honey bee biology improves bee knowledge and care. It can also, however, provide an important insight into the physiology of other insect species. In one such example, a novel study from the Australian National University, honeybees were used to investigate the rewarding properties of cocaine and the paradox it seems to pose.

Cocaine, or *Benzoylmethylecgonine*, is a natural alkaloid found in the leaves of the Coca plant, native to Western South America. In evolutionary terms, it has developed and persisted in these plants as a natural insecticide that helps to prevent herbivory. For mammals, however, rather than acting as a deterrent, cocaine has quite the opposite effect. Despite its toxicity and potentially fatal effects, it acts as a strong stimulant, interacting with the mammalian reward system and making it highly addictive. That such a compound evolved as a deterrent to one group of animals (insects), while being highly rewarding to another (humans and other mammals) has been much debated over the years as the 'paradox of drug reward' (Sullivan et al., 2008). One theory suggests that cocaine interacts differently with insects and mammals and so insects never experience the same 'rewarding' effects. Understandably, trying to assess whether a caterpillar finds a coca leaf rewarding is difficult. Aside from the obvious, how does one separate the 'rewarding' influence of a nutritional food item from the 'rewarding' influence of a non-essential chemical interaction with the brain? Honey bees provide a useful model towards deciphering this conundrum.

When honey bees locate a particularly 'fruitful' food source, they pass information about this source to their sisters. If those sisters are to use the information efficiently, there are three important pieces of knowledge they must gain: direction of food from the hive, distance of food from the hive and its reward value. This final piece - the ability to transmit a subjective assessment of reward value - is rare in the insect world and is the reason the researchers chose honey bees for their study.

To assess the rewarding properties of cocaine exposure, the researchers set up a sucrose feeder ten metres from an observation hive and trained a number of bees to collect sucrose from this feeder. Individual bees were paint-marked and observed collecting sucrose, then subsequently returning to the hive to carry out their dances. While at the feeder, some bees were treated with cocaine, in which a small droplet of pre-determined concentration was applied to the thorax. The cocaine was dissolved in dimethylformamide (DMF), a solvent that is absorbed by the bee cuticle, allowing the cocaine to reach the honey bee brain. Control bees were treated with the DMF alone with no added cocaine. The dances of the treated and non-treated bees returning to the hive were filmed and analysed.

Researchers found that the cocaine-treated bees danced for significantly longer than the controls. This extended dancing implies that, following cocaine-treatment, bees found sucrose more rewarding and transmitted this information to their sisters. It is worth noting that cocaine is a powerful stimulant and so there was concern that the dancing was a heightened motor output, resulting from the chemical stimulant input. However, the researchers highlighted that the bees did not exhibit any 'locomotor hyperactivity or motor malfunction' as a result of cocaine exposure (Barron et al., 2009). This finding reinforces the idea that the increased rate and likelihood of dancing resulted from the bees' increased reward perception of the sugar solution following cocaine exposure.

The findings suggest that insects do experience the rewarding effects of cocaine. The study also obtained another interesting result. The team trained bees in a 'two-odour discriminant learning task' after receiving chronic oral cocaine treatment for 6 days. The study found that while bee

learning was not severely influenced by chronic cocaine treatment, the bees did demonstrate a significantly diminished learning ability with removal of the cocaine-laced diet. The bees appeared to demonstrate 'withdrawal symptoms' after prolonged cocaine exposure - similar to how human cocaine addicts react to withdrawal. This finding demonstrates that honey bees could potentially provide a useful model in the future to study the mechanisms of drug addiction and reward.

Summary

Honey bees are the most valuable pollinators, contributing billions (£) to agriculture in pollination services every year. Their value, however, extends far beyond what we gain from their work in the field. For research purposes, they offer an important tool to explore the realms of physiology - from how the taste system works - to pessimistic cognitive biases and understanding the effects of cocaine as an insecticide (just a couple of examples from the vast honeybee literature!). Honey bees are small and numerous with relatively simple behaviours, which make them an ideal model animal for physiological study. Combined with their impressive memory, aptitude for learning and excellent collaboration and communication skills, the study of honey bees will continue to provide illuminating insights into our world. The knowledge we gain from these small insects is likely to have far-reaching, inter-species impacts in many novel areas.

From a talk by Dr Nicola Simcock, University of Oxford, to the Central Association of Bee-Keepers

Bumble bees - the big lifters of the insect world

"They can carry 60, 70 or 80 percent of their body weight flying, which would be a huge load for us just walking around," said researcher Susan Gagliardi, a research associate in the College of Biological Sciences at the University of California, Davis. "We were curious to see how they do it and how much it costs them to carry food and supplies back to the hive." Gagliardi and Stacey Combes, associate professor in the Department of Neurobiology, Physiology and Behavior, measured the energy expended by bumble bees flying in a specially designed chamber (an emptied snowglobe). They attached small pieces of solder wire to the bees to adjust their weight.

"We have the bees in a little chamber and we measure the carbon dioxide they produce. They are mostly burning sugar so you can tell directly how much sugar they are using as they are flying," Gagliardi said.

They also used high-speed video to examine wing beats and movements.

Bumble bees fly in a very different way to aircraft. While air flows smoothly over an aircraft wing or rotor blade, bees move their wings at a high angle to the air generating vortices that curl round the wing. This produces much more lift than smooth airflow, but it is unstable as the vortices quickly break down. Bees are able to sustain flight by moving their wings very rapidly.

Two modes of flight

Because bumble bees fuel flight from the nectar they are carrying, they should get lighter as they fly and use less energy. To their surprise, Combes and Gagliardi found that the bees could actually use less energy per unit load when they were more heavily laden. "They get more economical in flying the more heavily loaded they are, which doesn't make any sense in terms of energetics," Combes said.

Looking closely, the researchers found that bumble bees have two different ways to cope with increasing loads. They always increase stroke amplitude (how far the wings flap) when they are more heavily loaded, but this isn't enough to support the extra weight on its own. To make up the difference, bees can increase wingbeat frequency, which generates more lift and increases energetic cost.

But bees also have an alternative, subtly different flying mode that allows them to carry heavier loads while expending less energy than when they increase flapping frequency.

It's not yet clear exactly what this "economy mode" involves, Combes said, although it may involve a change in how the wing rotates to reverse direction between strokes. But it is something the bees can choose to do, or not.

"It turns out to be a behavioural choice they are making in terms of how they support the load," When bees are lightly loaded or rested, they are more likely to increase wingbeat frequency. When they are more heavily loaded, they switch

to the mysterious economy mode, producing enough force to support the load with only a small increase, or even a decrease, in flapping frequency.

Economy and stability

If the bees can save energy while flying, why don't they use this economy mode all the time? It's not clear, but it may be that high wingbeat frequency has performance advantages, for example in maintaining stability in turbulent air or avoiding obstacles.

The work has prompted a shift in how Combes sees insects, she said: "When I started in this field there was a tendency to see them as little machines, we thought they'll flap their wings one way when carrying zero load, another way when they're carrying 50 percent load and every bee will do it the same way every time," she said. "This has given us an appreciation that it's a behaviour, they choose what to do. Even the same bee on a different day will pick a new way to flap its wings."

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The British Beekeepers' Association Annual Delegate Meeting, 11 Jan 2025 at 09:30

This was addressed to our County Secretary:

The British Beekeepers' Association is planning the 2025 Annual Delegate Meeting (ADM), and warmly invites your association *[i.e., The Suffolk BKA]* to send your delegate. The ADM will be a hybrid meeting, both in person at Stoneleigh Park, Warwickshire, and simultaneously on the Zoom online platform. Your first step is to nominate the delegate from your association; please complete and return the Delegate Nomination Form by Friday 18 October 2024 (see link below). Prior to the ADM, we will provide full details of how to participate.

We are seeking nominations for Trustees of the BBKA. In 2025 there will be four Trustee vacancies for three-year terms, to be voted on at the ADM. Information about being a Trustee is available on the BBKA web site, and we encourage you to consider and propose candidates. Nominations to become Trustee are due by Friday 18 October.

Similarly, there are opportunities to join the BBKA Exam Board, which oversees examinations and their delivery. There are three vacancies for three-year terms and one vacancy for a one-year term. You will find information and guidance for candidates on the BBKA web site and voting takes place at the ADM. Once again, nominations are due by Friday 18 October.

In addition, if you have a Proposition for the BBKA ADM, then please complete the Proposition Form to be reviewed by the Standing Orders & Governance Committee. Propositions are also due by Friday 18 October.

Delegate, Trustee, and Exam Board nomination forms, the ADM Proposition Form, plus guidance and policy documents, are all available on the BBKA website https://www.bbka.org.uk/bbka-compliance.

To remind you again, please ensure that your nominations and propositions arrive at the BBKA Office (post or by email) by 4.00pm Friday 18 October 2024 – and of course, earlier is always better! Please note that timings are prescribed by the BBKA Constitution.

Naturally, if you have any questions, please contact me by email mailto:gen.manager@bbka.org.uk and I will always be very happy to help.

With best wishes

Leigh Sidaway

General Manager, The British Beekeepers' Association

Any member interested in becoming Suffolk's ADM rep, a BBKA Trustee or joining the BBKA Exam Board should get in touch with the Suffolk BKA Secretary, Helen Davies: secretary@suffolkbeekeepers.co.uk

Masthead colour

A mnemonic for marking queen bees: "Will you rear good bees?" makes the internationally recognised (but optional) colour code easy to remember. So, in years ending in a 1 or a 6, it is white, 2 & 7 yellow, 3 & 8 red, 4 & 9 green and 5 & 0, blue. Hence the masthead colour for this newsletter. Some prefer to use white or yellow because they are easier to see than the other standard colours. I prefer pink to red and the lighter versions of blue and green. All these are available via the internet.

I'm delighted to see that Thorne's has reduced their price for Posca markers from £6 to £4.

An Introduction to Beekeeping – the I&ES BKA Course for absolute beginners in beekeeping

This starts on Monday 3rd March 2025 and we are now taking enrolments. See: https://www.suffolkbeekeepers.co.uk/2025%20Course%20enrolment%20form.pdf.

If you know someone who might be interested, please ask them to get in touch. Unless the course is fully booked, we would take enrolments up to the end of February - but the earlier they are, the better.

Cambridge BKA Talks by Zoom

The first this autumn is on 11th September at 7pm when Jane Medwell, Master Beekeeper, will talk about preparing bees for winter.

See: https://buytickets.at/cambridgeshirebeekeepersassociation1/1376039

Meetings Notes

Café Flex monthly meetings

The first winter bee chat & breakfast at Café Flex IP10 0BF will be on14 Sep from 10 to 12. Please contact Sal Thurlow asap if you'd like to go along: salthurlow@gmail.com.

Felixstowe bee group

The first winter meeting of the Felixstowe bee group will take place on Thursday 19th September at Kirton Sports Pavilion at 7.30pm. Location is Back Road, Kirton, Ipswich IP10 0PR. All welcome, charge of £2 per head for room hire & refreshments (if it is the same as last year…)

Nynke Blömer

Nynke is a researcher at the University of Cambridge where she is working towards a PhD in Zoology. Her research focuses on how honeybees and bumblebees share landscapes, and how to detect potential competition for resources and its effects between the two species. She has been a beekeeper since the age of 16 when she began helping in her small family apiary in the Netherlands and now runs the student beekeeping society at St Johns College. She is also on the committee of the Cambridgeshire Beekeepers' Association. Every month she writes the News in Brief column of the BBKA News and in her spare time she works with an association focussing on pollinator education and youth engagement.

Michael-Thomas Ramsey

I am a Chartered Scientist and Fellow of the Royal Entomological Society. I am also a Certified Pollinator Steward with the Pollinator Partnership. I have a PhD in BioPhysics from Nottingham Trent University, where I researched the use of transducer technology to study the ethology of honeybee colonies. I did a couple of Post Docs then at NTU studying brood cycle assessments and swarm prediction. From there I was head-hunted into industry to oversee the Bee Ecotoxicology work, which examines the impact of chemical products on honeybees, and now I work for a company called APIS (Applied Insect Science Ltd) leading the Terrestrial Ecotoxiology work, which studies the potential environmental effects of biologicals, agrochemicals, pharmaceuticals, and chemicals in the non-aquatic environment, including bees, non-target arthropods and plants. I am also a beekeeper in Peterborough, working closely with the Peterborough Environmental City Trust to deliver projects that promote pollinators and habitat creation across the city.

Calendar

Unless otherwise specified, Ipswich & ES BKA meetings are held in the Scout Hall, Kesgrave IP5 1JF from 7:30pm.

Members of the six Associations which form the Suffolk Beekeepers' Association are welcome to attend any or all these meetings.
If you do not belong to that particular local association, please introduce yourself to the secretary.
There will be other meetings but details were not available at the time we went to press.

Date	Event	Ten Minute Tips
4 Sep	Auction & Forum	None
2 Oct	Nynke Blömer: Bumble bees' interaction with honey bees	Helen Thorne: Beekeeping with Women in Uganda: update
24-26 Oct	National Honey Show, Sandown Park	
6 Nov	Michael-Thomas Ramsey: Pesticides and Bee Toxicology	Barry Crabtree: Mini nucs
4 Dec	Jeremy Quinlan: Wax, Candles & Christmas cheer! Dallinghoo Village Hall IP13 0JX.	