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THE BUZZ

Newsletter of the British Bee Veterinary Association

Welcome!

CHRIS PALGRAVE, EDITOR

Welcome to a busy fifth issue of The Buzz! This month, our President, John Hill, shines a light on the unsung pollinating heroes, the solitary bees. John Carr, brings us up to speed on the recent incursion of Varroa into Australia. We also find out about the fascinating work of a professional Honey Sommelier from award-winning author and beekeeper, Sarah Wyndham Lewis.

Margaret Anne Adams introduces us to how and why bees collect pollen and what they do with it when they get back to the hive. With the help of Ann Chilcott, we review her new book 'Pollen grains and honeydew' on the Bee Bookshelf. Liz Childerley gives us with a brief introduction to BIBBA and its important work in protecting and promoting our native honey bee. Mark Johnston highlights an exciting opportunity for us all to become responsible citizen-scientists by carrying out 10 minute 'FIT counts' of insects visiting a particular patch of flowers. Finally, we meet one of the solitary bees, Hylaeus pectoralis, and discuss the value and versatility of borage in our plant file.

DATE FOR YOUR DIARY: the Honey Bee Veterinary Consortium (HBVC) is holding its 5th Annual Conference on 26-28th August 2022 at Michigan State University, USA. Lectures are being streamed live and will also be available on-demand for a period of two months after the event.

This issue:

Solitary bees - the unsung pollinating heroes

JOHN HILL, BBVA PRESIDENT

In the UK, there are about 230 species of what are known as 'solitary bees'. We also have 23 species of bumblebee and only one honey bee, Apis mellifera. Honey bees make up approximately 55% of the pollinating force with solitary bees, bumblebees, moths and flies contributing the rest.

While honey bees receive almost all the publicity, there is this other workforce working diligently. The mason and carpenter bees are far more efficient at pollination than the honeybees because they don't need to gather pollen for a collective colony. The solitary bees cover 6 families (Colletidae, Andrenidae, Halictidae, Melittidae, Megachilidae and Apidae) and many genera. Some are similar in size to the honey bee while many are much smaller and of varying morphology; they could be easily missed or be mistaken for a fly species.

The life cycle is simple. Males and females emerge from hibernation around May and mate. The females seek a suitable nesting site which could be a burrow in an earth mound or a gall on a reed. If burrowing, she often excavates a short tunnel in an earth bank and then lays an egg at the end. She will then gather a food larder including pollen for protein and a nectar paste for energy. She will then seal the tunnel and fly off. The egg hatches to a larva and consumes the larder. The larva goes through a number of moults and pupates. The pupa remains in the burrow over winter and completes its development by the spring, when it leaves the burrow to go to find a mate. Some males, such as the common red mason bee, Osmia bicornis, will guard a territory and see off any other males. Some males are so keen that they will sit at a tunnel entrance and ambush the female when she emerges. Many are mining bees either which make burrows on slopes or cliff face. Others use cavities in ground. Three or more of the Osmia species like to use snail shells.

This simple life cycle means that the mother has no contact with the offspring once the nest is complete. Variations occur with some species where the female may wall off a "cell" and start another in the same burrow. There can be several cells in the same burrow. Sometimes another female will make a branch burrow off the main burrow and so there can be a network of tunnels. Some species will tend to nest in the same area so there are aggregations of the same bee, sometimes in very large numbers. This is not forming hives but a species wanting safety in numbers. The offspring still have to look after themselves One could argue that these aggregations are a step towards eusociality, as seen in honey bees.

Out of the 230 solitary bees there are 50 species that are in effect parasites of other bees' nests. These bees wait until a female has laid her egg and left provisions, she will then go in eat the egg and lay her own so as her larva will have a ready made larder and shelter.

There are 20,000 species of bee worldwide and very little is known of the natural history of most. Many solitary bees are in serious decline due to habitat loss and agrochemicals. Little is known of what diseases they encounter. The problem is we do not see his decline and so it is necessary for us to take an holistic approach and try and improve the environment for them by providing nest sites, flowers for food and stop using insecticides.

Varroa destructor identified in New South Wales, Australia

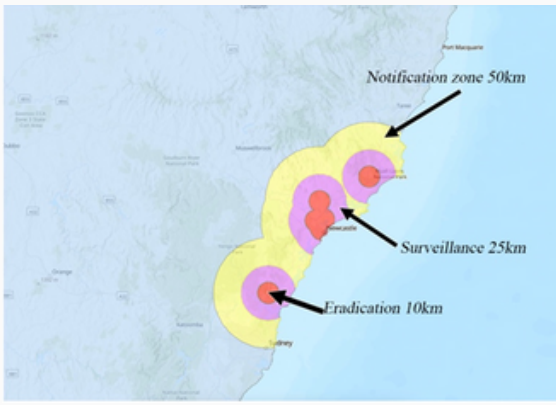
JOHN CARR, APIAM ANIMAL HEALTH, TOWNSVILLE, QUEENSLAND. BBVA MEMBER

Since the western honey bee, Apis mellifera, was introduced to Australia in the 1820s, their bees have remained free of parasitic Varroa sp mites. However, on the 22nd June 2022, Varroa destructor was found in 2 sentinel hives in Newcastle port, New South Wales. On further investigation, it was also identified in managed hives about 3 km away. While this was not the first incursion of Varroa sp into Australia, the situation is extremely concerning. Previous incursions have been Varroa jacobsini from the eastern honey bee, Apis cerana. Classically, these incursions come from ships from Papa New Guinea. It was quickly eliminated, but the surveillance period of 3 years was intensive.

Unfortunately, on this occasion, the highly pathogenic Varroa destructor mite has been identified and is now out in the community. This indicates that the parasite has been there for a few months at least. The authorities and bee industry are working flat-out to understand the epidemiology of this incursion.

As of the 30th June 2022 this was the map of the incident:

THE JUNE 2022 INCURSION OF VARROA DESTRUCTOR TO AUSTRALIA

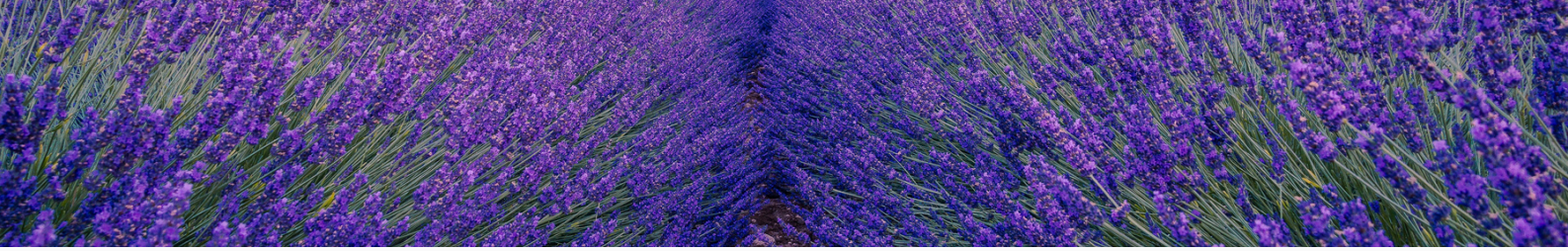


DETAIL OF THE RESPONSE WITH THE EXCLUSION, SURVEILLANCE AND NOTIFICATION ZONES ON THE 30/6/22

Varroa are being identified by sugar testing, although I am concerned that the investigation is not happening quickly enough. At the time of writing, bees are still alive in the exclusion zone some 7 days after identification. There is little point in beekeepers being allowed to check their hives with sugar testing inside this zone; instead beehives should be sealed on the first evening and the hive killed as soon as possible. The dead bees can be easily examined later. There are many feral hives in this area and the authorities need to resolve the managed hives quickly and then worry about the hundreds of feral hives.

In this area we are fortunate that there are no Apis cerana and that native Australian bees are not hosts for Varroa destructor. However, the battle and war is only just starting and must be won. Australia is one month away from the annual Almond pollination jamboree! The British Bee Vet Association is on the ground providing information to the general public.

For up to date information on the unfolding situation, please visit: https://www.dpi.nsw.gov.au/varroa



What does a Honey Sommelier do - and why?

SARAH WYNDHAM LEWIS, PROFESSIONAL HONEY SOMMELIER, AUTHOR, CO-FOUNDER BERMONDSEY STREET BEES

Honeybees have been on earth for more than 80 million years. Honey was mankind's original luxury food and, for a long time, only source of sweetness. Naturally sterile, with a wide range of antibacterial, antiviral, and anti-inflammatory properties, it was also vital medicinally. Unsurprisingly, it became an important trading item, as well as being held sacred within virtually every organised religion in history. From the Mayans to Mithras, from Ancient Egypt and Greece to Judaism, Christianity and Islam, honey has always been seen as a "gift from the gods".

It's desperately sad then, that modern times see honey named alongside wine and olive oil as the world's top three most adulterated foods. Much of what is sold, especially in supermarkets, is priced below the lowest possible cost of production of real honey, suggesting adulteration with far cheaper syrups. A significant majority of world honey, especially at the lower price points, is 'blended' (always check the label for this tell-tale). Behind this apparently innocent word lurks a sad tale of slave labour, hi-tech fraud on a global scale and aggressive factory processing which fatally damages delicate nutritional and flavour components.

Which is where my work as a professional Honey Sommelier, comes in. I work exclusively within the hospitality industry and, just like a Wine Sommelier, my work is concerned with authenticity, terroir, and flavour. Honey is intensely local in origin. The bees fly out around 2.5 miles from their hives, so the pollens and nectars they collect come only from flora in that range. These plants have unique nectars and are also the product of environmental factors such as weather and soil minerality. All of these qualities are found in the nectars that the bees transform into their honey stores.

Unlike the aggressive sweetness and uniform colour and texture of the processed products, real honeys range in colour between black and creamy-white, with an array of gleaming gold, red/tawny/green and countless other subtle tones. The natural texture can range from thin to thick, from crunchy to gelatinous. And, even more surprising, not all honey is predominantly sweet; it can be bitter, sour, spicy or tart. It can smell floral, mushroomy, acrid or animal. These are the really exciting elements in my work; seeking out and enumerating the unique qualities in a honey, tracing its roots back to the land, the beekeepers and the bees that produced it.

In my role as a professional Honey Sommelier, I'm employed to train and work with leading chefs, bartenders and local honey producers all over the world. I see myself as a Brand Ambassador for the bees and the honey, privileged to be able to introduce people to astonishing stories of nature, history, culture and flavour……and, hopefully, changing their understanding of honey forever.

FIT Counts: Citizen science opportunity for us to support UK pollinators

MARK JOHNSTON, BBVA

The importance of our pollinators is very clear. The good news is that we can all play a part in knowing what the real situation is regarding bees, butterflies and other pollinators in our gardens and green spaces, by using a free app (launched at this year's Chelsea Flower Show).

The new FIT Counts app will help track pollinator numbers and movements, providing crucial data that the government can use to support pollinators in their natural environment.

It forms part of Defra's new "Pollinator Action Plan (2021-2024)", which aims to improve nature recovery and reverse declines in these species.

Flower-Insect Timed (FIT) Counts, are organised by the UK Pollinator Monitoring Scheme (UKPoMS), and supported by the UK Centre for Ecology & Hydrology. They ask us to spend just 10 minutes a day collecting data on the number of insects that visit particular patches of flowers, including dandelion, buttercup and lavender.

The information will be used to help the government and conservationists understand where pollinators are declining or how populations are shifting in response to climate change and therefore guiding what can be done to correct the damage that we seem to be inflicting on our wildlife.

The great news is that whilst we are carrying out a wonderful mindful activity for our own wellbeing we can also be contributing to the wellbeing of our pollinators!

Our Native Honey Bee

Bee Improvement & Bee Breeders Association (BIBBA)

LIZ CHILDERLEY, BIBBA TRUSTEE & PUBLICITY OFFICER

Did you know that we have a 'native' honeybee, indigenous to our shores, and perfectly adapted to withstand our very British climate, over millions of years? BIBBA (Bee Improvement and Bee Breeders Association) is a household name within the beekeeping community and has existed since 1964 to support and promote the sustainable conservation, restoration, study, selection, and improvement of honey bees that are native to the British Isles and Ireland (often referred to as the European dark bee or Apis mellifera mellifera).

BIBBA has recently launched an UK-wide initiative to help sustain the genetic stability of Apis mellifera mellifera in the British Isles which is known as 'The National Bee Improvement Programme' (or NatBIP), which is receiving support from many beekeepers. BIBBA aims to reduce the need for imported honey bees by encouraging beekeepers to breed their own locally-adapted queens and improve their stock.

To find out more go to bibba.com for more information and advice.

EUROPEAN DARK (HONEY) BEES, APIS MELLIFERA MELLIFERA
PHOTO CREDIT: JO WIDDICOMBE

"Native type bees will not necessarily serve us well if we neglect them, if we subject them to indiscriminate cross-mating with imported types, or if we impose unsuitable styles of management on them. It is up to us to observe them, to manage them properly, and above all to maintain, select and improve them by selective breeding, for our own benefit and that of generations to come."

BEOWOLF A. COOPER (1917-1982)
BIBBA FOUNDER

How a honey bee colony acquires pollen

MARGARET ANNE ADAMS, AUTHOR 'POLLEN GRAINS & HONEYDEW'

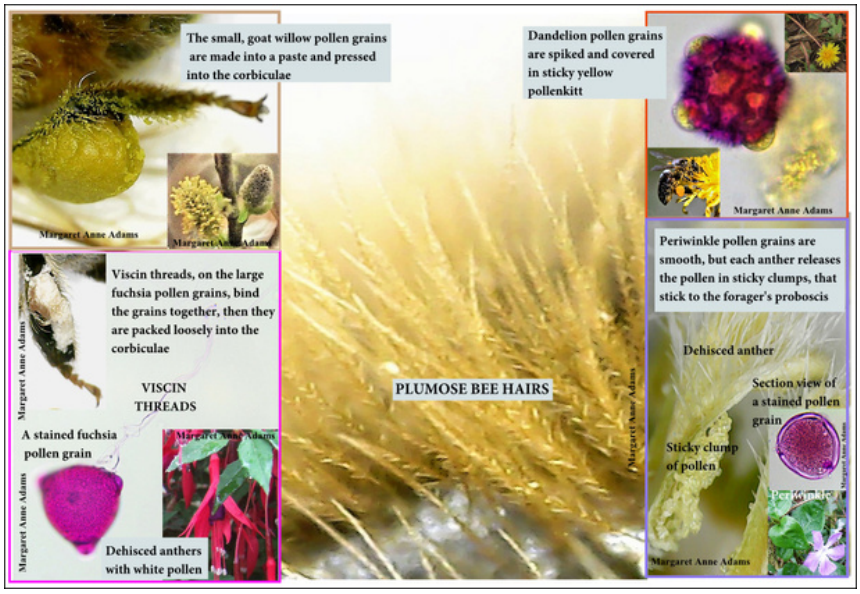
Honey bees need to gather a wide variety of pollens, to assemble the amino acids, lipids, minerals, vitamins and sterols required for colony development. Fresh pollen must be stored as 'beebread' by the bees. No artificial food can fulfil the same functions as beebread, so beekeepers must site their hives where there are plants that can provide the necessary range and abundance of pollens, from early spring through to late Autumn.

Honey bees evolved from wasps. During the transition from wasps (who chop up insects with their mandibles to feed their larvae) to honey bees (who feed their larvae, queen and sexually immature drones with variously processed pollens), they developed an array of grooming tools on their exoskeleton. These are needed because honey bees have also developed a covering of plumose hairs, which trap pollen when they visit flowers with dehisced anthers.

These tools not only facilitate cross pollination of flowers but allow a forager bee covered in pollen, to brush the hairs on her compound eyes, to wipe her antennae, to groom most other parts of her body and to load the pollen, (moistened with enzyme-containing saliva, nectar and/or honey from her crop), into corbiculae ('baskets') on her hind legs, to take back to the hive.

On returning to the hive, the pollen forager bee knocks both loads into a cell, near the brood; a house bee breaks up the loads, spreads the pollen into a layer and adds more saliva to inhibit germination, A thin layer of honey is spread on the top as a preservative. The pollen then undergoes lactic acid fermentation, comparable to silage or cheese making. The fermentation is due to bacteria such as Lactobacillus, and to beneficial fungi from the plant environment, that the foragers bring in with their pollen loads. The four main fungi are Aspergillus, Penicillium, Cladosporium, and Rhizopus which help protect the colony against microbial diseases. During the lactic acid fermentation, the pH of the bee bread is reduced to about 4, which helps the exine of the pollen grains to open, enabling the contents to be ingested by young bees and worker larvae. In cross section, a cell of this 'beebread' is seen as multicoloured layers of different pollens, yet in surface view, the inside of the cell is the colour of the last pollen loads knocked in by a forager.

Simultaneously, entomophilous flowers have developed strategies for attracting bees, guiding then and providing them with a nectar reward so that bees will cross pollinate them. Over and above these strategies, the exine, which is made of a hard substance called sporopollenin, comes in a variety of forms, to make sure that pollen gets trapped in the forager's hairs, while she seeks her nectar reward. In early spring, honey bees also collect anemophilous pollens such as goat willow. The tableau shows four examples, from our own garden, displayed on a background of plumose hairs on the thorax of a forager.



Hylaeus pectoralis (reed yellow-face bee)

JOHN HILL, BBVA PRESIDENT

Of the 270 species of bee in the UK, only one is the honeybee. In this issue, we are going to meet one of the 230 species of solitary bee, Hylaeus pectoralis, from the Colletidae family.

This primitive solitary bee has a typical life cycle. It is small, approx. 6-7 mm long, and found in marshy areas. In early summer, the males and females mate. The female then seeks to nest in the disused cigar-shaped gall of the reed gall fly (Lipara lucens), made from dead leaves on the flowering stem of the common reed (Phragmites australis). She builds one cell at a time and lines it with a mucous membrane (weatherproofing). The cell is generously provisioned with a paste of nectar and pollen. An egg is laid and the cell is sealed up. Further cells are built, between 5-8 on the same gall. Once completed the female bee dies. The eggs hatch in a few weeks and the larvae feed on the provided larder. By the autumn they are fully grown and remain dormant until next Spring. The larvae pupate in their cells and emerge as fully adult insects in about May or June when they leave the nest. Mating then occurs and the process repeats itself. The males die after mating and the females start another nest in a disused gall.

HYLAEUS PECTORALIS
(THE REED YELLOW-FACE BEE)

"The solitary Bee,
Whose buzzing was
the only sound of
life, Flew there on
restless wing,
Seeking in vain one
blossom where to
fix."

ROBERT SOUTHEY
(1774-1843)

Plant File: Borage (Borago officinalis)

CHRIS PALGRAVE

The vivid blue constellations of star-shaped flowers suspended on their hairy stems bring the Mediterranean sky to our northern European gardens and make borage one of our most visually-striking herbs. Borage is also a generous producer of nectar and firm favourite of honey bees and many other insects. It results in a very pale, delicate honey.

There are two schools of thought regarding the origin of its name. One suggests that Borago is derived from the Latin 'borra' for rough hair, short wool or shaggy coat (reflecting the hairy stems). The other considers it to have come through the Latin 'burrago', but originating from the Arabic abu buraq 'father of sweat' (standard Arabic abu araq), referring to the medicinal property of borage leaves to cause sweating.

While many languages have recognisable variations on the word borage e.g. bourrache (French), Borrestsch (German), borragone (Italian), borraja (Spanish), in other languages the name reflects the delicate cucumber-like flavour of its leaves e.g. komkommerkruid (Dutch), ogórecznik (Polish), gurkört (Swedish), Gurkenkraut (German).

Although most commonly associated with the drink 'Pimms' in the UK, borage is a versatile herb with many culinary uses. It can be infused as a herbal tea, included in sandwiches and salads, steamed like spinach, used in pasta fillings, soup and stews, and is an important component of the famous grüne Soße (green sauce) of Frankfurt.

Borage trivia...

Borage has long been associated with its ability to refresh, lift the spirit and give courage. It was added to the final stirrup (parting) cup offered to those fighting in the Crusades and was embroidered of scarves given to them. John Gerard's Herball (1597) mentions an ancient Latin saying: 'Ego Borago, gaudia semper ago (I, Borage, bring always joy)'. He also reports that 'borage leaves and flowers when put into wine make men and women glad and merry, driving away all sadness, dullness and melancholy'. Pliny the Elder also considered it an anti-depressant. Borage is associated with a range of other properties, including its traditional use as an anti-inflammatory, diuretic and expectorant.

VIVID BLUE STARFLOWERS OF BORAGE MOUNTED ON HAIRY STEMS

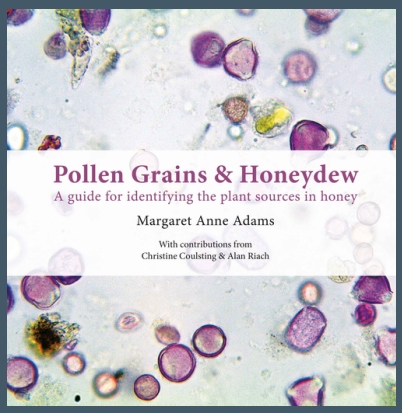
The bee bookshelf: Pollen Grains & Honeydew

CHRIS PALGRAVE AND ANN CHILCOTT

Pollen Grains & Honeydew (Northern Bee Books, 2021) was born out of the Scottish Beekeepers Association Facebook page, where Margaret Anne Adams captivated followers by posting photographs of pollens she had identified. Over several years, she analysed honey samples sent in by followers and this book contains a photographic record of these findings with illustrations, detailed annotations, and clear written descriptions.

Adams' book is both a comprehensive reference guide and instructional manual, covering how to collect pollen from different sources (flowers, pollen loads and honey samples) and make your own slides, enabling you to identify plant sources and build up your own library of local forage. Contributions from Christine Coulsting and Alan Riach cover the process of identifying 'mystery' pollens not present in your existing library as well as calculating the proportion of different pollens in a honey sample to determine the contribution made by various flower types.

This beautifully-produced book is a phenomenal achievement and a labour of love. It will be of great interest to the curious beekeeper as well as naturalists, environmentalists, botanists and many others interested in the biodiversity of our environment. It will no doubt play a central role in future beekeeping microscopy courses and is an essential addition to beekeeping association libraries. Pollen Grains & Honeydew is available from Northern Bee Books (£28.95).



The British Bee Veterinary Association

The British Bee Veterinary Association (BBVA) was launched in 2015 in response to an increased demand for bee knowledge and expertise within the veterinary profession. We host multiple educational events each year and attend a number of veterinary conferences. The BBVA also runs the very successful Bee-Friendly Practice Scheme.

For more information on membership or becoming a Bee-Friendly Practice, please visit: www.britishbeevets.com. All previous issues of The Buzz are available on the BBVA website.

Editor: Chris Palgrave

Chris is a beekeeper and veterinary surgeon living with his family in the Exe Valley in Devon. He is a member of Exeter Beekeepers and writes regularly for the veterinary and beekeeping press, including a monthly column in BeeCraft magazine. Please send any comments, suggestions or contributions to buzz@britishbeevets.com.