

DAVE GOULSON

The Garden Jungle

or

Gardening to Save the Planet

VINTAGE

For Gaia, Goddess of the Earth

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Plants in Profusion

To make mulberry muffins

Ingredients: 110g butter, 250g plain flour, 250g caster sugar, 2 eggs, 125ml milk, 2 tsp baking powder, ½ tsp salt, 250g mulberries

- 1. Grow mulberry tree. It may take ten years or more to fruit, since they are slow-growing trees. If you are in a hurry, buy a house with an established one in the garden.*
- 2. Preheat oven to 180°C. Grease a muffin tin. Mix baking powder, flour and salt.*
- 3. Cream butter and sugar until light and fluffy. Add eggs and beat. Add milk and flour mixture, beat. Stir in mulberries.*
- 4. Fill muffin tin 2/3 full. Cook for 25 minutes.*

These are absolutely delicious, gooey, moist muffins. Definitely worth the ten-year wait.

For millennia we humans lived as hunter-gatherers in small bands, knowing nothing of the world beyond our tribal territory, dealing only with what we could see and touch and taste. We harvested berries and nuts, caught fish and game, and later grew crops. For us, the Earth was flat. We did not know or worry about global

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issues such as overpopulation, pollution or changing climate, and we probably did not try to plan years ahead. Perhaps as a result, our brains do not seem to be well suited to grasping big-picture issues, to understanding and reacting to ponderous global changes that may take decades or centuries to have their effect. Certainly our track record in planning ahead for the long-term well-being of our planet leaves much to be desired.

Even now in the twenty-first century, when our understanding of the universe is vastly increased, the big issues that face us seem beyond our personal scope, unmanageable and intractable. Anything I might do to prevent climate change, stop the felling of rainforests, or prevent the hunting of rhinos for the supposedly medicinal properties of their horns seems trivial and ineffective. As a conservationist, it is all too easy to feel helpless and despondent. Much of my personal inspiration to battle on has always come from the small-scale victories I can achieve in my own garden, for that is a little corner of Earth that I *can* control, that is small enough for my brain to comprehend, and where I can make things right. After a sometimes tedious day in my office at the university, perhaps spent firefighting the never-ending email onslaught as most of us seem to do in place of actually doing anything useful, I gain huge inspiration and enjoyment from going into my garden and getting my hands into the soil. I plant seeds and nurture them as they grow, watering, mulching, weeding, harvesting, composting, and working with the cycle of the seasons. This is the scale on which I work best, when I can see and feel the effects of my actions. For me, saving the planet starts with looking after my own patch.

Since leaving my family home at nineteen I have had six successive gardens over thirty-odd years, starting with a pocket-handkerchief rectangle behind an excruciatingly ugly concrete ex-council house in Didcot, and eventually graduating to my current slightly unkempt but delightful two-acre garden in the Weald of East Sussex. Each one has

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been very different, in terms of soil, aspect and the plants I inherited, but in all I have tried to gently steer the garden to support the most wildlife possible, learning as I went. In particular, I have tried to encourage bees and other pollinators by providing them with a banquet of flowers and, wherever I can, some quiet places to nest or breed or hole up for the winter.

Wildlife gardening is easy. Plants grow themselves, and bees and butterflies will find them when they flower. Herbivores will appear, slugs, snails, weevils, leaf beetles and caterpillars, and in turn predators will arrive to eat them. Dig a pond and a huge range of plants, insects and amphibians will miraculously and spontaneously turn up, somehow sniffing out the unclaimed water from miles away. Successful wildlife gardening is as much about what you don't do as what you do. This is not to say that a wildlife garden has to be untidy. Many imagine a wildlife garden as an unruly tangle of brambles, nettles and dandelions, and it is true that a *laissez-faire* garden like this will certainly attract a lot of wildlife, but it is also perfectly possible to have a tidy and beautiful garden that is teeming with life (though tidiness does of course tend to require a little more work). Tidy or unkempt, a tiny courtyard or verdant rolling acres, your garden is probably already home to hundreds, maybe thousands, of wild species.

Just how much wildlife can be found in a garden has been quantified in depth only once in the whole world so far as I know, in suburban Leicester. My PhD supervisor was a chain-smoking, charming old reprobate named Denis Owen, an expert on tropical butterflies who was once married to Jennifer Owen, a lady who was to go on to become one of the great heroines of wildlife gardening. Jennifer spent a good few years of her life, from the 1970s to 2010, cataloguing the diversity of creatures found in her small garden. It was, by all accounts, an ordinary garden, though she did not use any pesticides. There were flower beds, a small lawn, a tree or

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two and a vegetable patch, in a total area of 0.07 hectares. In this little garden in Leicester she ran a moth trap to attract nocturnal insects, dug in pitfall traps to catch those insects that scurry along the ground, and constructed a Malaise trap¹ to catch flying insects. She also meticulously catalogued the plant life, and any birds or mammals that came through. Over an obsessive thirty-five-year period she identified no less than 2,673 different species, comprising 474 types of plants, 1,997 insect species, 138 other invertebrates (spiders, centipedes, slugs, etc.) and 64 vertebrates (mostly birds).² Even more impressive, for most of this period Jennifer was battling multiple sclerosis and now, sadly, much of her garden has had to be paved over to enable access for her wheelchair and for vehicles. Nonetheless, she says that there is still quite a bit of wildlife to be found.

The foundations of a wildlife garden are, of course, the plants; they are the bottom of the food chain, the footings on which everything else is built. The microscopic green chloroplasts in plant leaves capture the energy emitted from a ball of burning hydrogen some 100 million miles away in space. They store it in bonds between atoms, chemical energy, initially as sugars which are then converted to complex carbohydrates, mainly starch and cellulose. The energy stored in the leaves, stems and roots of plants is then transferred to the caterpillars and slugs that eat their leaves, to the aphids that suck their sap, and to the bees and butterflies that drink the sugary nectar in flowers. These creatures in turn might be eaten

¹ A tent-like structure invented by the Swedish biologist and intrepid explorer René Malaise, which intercepts any small flying insects and encourages them to throw themselves into a bottle of alcohol. There are worse ways to go.

² Jennifer Owen has published a delightful account of the creatures she found over the years in *Wildlife of a Garden: A Thirty-Year Study*.

by thrushes, blue tits, shrews or flycatchers, which themselves provide food for sparrowhawks or owls. Everything, from the gentle croaking of a toad in the garden pond to the frenetic hovering of a kestrel overhead, is ultimately fuelled by light coming from that distant sun. It seems like a preposterously unlikely and precarious system if you think too much about it.

Each creature that feeds upon plants tends to have its own preferences for a certain plant species, and often for particular parts of the plant. The holly leaf miner spends its entire development – which takes just less than one year – burrowing under the cuticle of a holly leaf. It creates a distinctive brown blister before eventually emerging as a minuscule yellowish fly in late spring. It is never found on any other plant species, or in any other part of a holly tree. The caterpillars of the orange-tip butterfly prefer to eat the seed pods of lady's smock, and will eat those of garlic or hedge mustard at a push, but turn their noses up at most other cabbage-family plants and wouldn't dream of eating anything else. There are 284 different types of insects that feed on one part or another of an oak tree: gall wasps, scale insects, aphids, moth and butterfly caterpillars, froghoppers, weevils, long-horn beetles and many more. Each insect tends to specialise in feeding on a particular part of the plant, at a particular time of year, and so the energy resources captured by the tree are divided up by a horde of tiny creatures. Caterpillars of the purple hairstreak butterfly burrow into buds high in the canopy in spring, while those of the green oak tortrix moth live within tubes they roll from the older leaves, gluing them together with silk. Meanwhile, grubs of the acorn weevil quietly tunnel away inside acorns. In this way the insects largely avoid competing with one another, each occupying their own small niche.

A few insects are much less fussy, grazing on the leaves of a range of plants. Known as woolly bears, the caterpillars of the garden tiger moth can eat dandelions, docks, nettles and more or less

anything else they bump into. But insects such as these are the exception. Most herbivorous insects eat just one type of plant, or a few closely related ones, and will starve to death rather than try anything else. You might wonder why they are so specific, so adamant about their dietary choice. The answer is thought to be that plants have evolved defences against these herbivores. Some of the defences are physical – tough leaves, spines, bristles and so on – but most are chemical. Over the millennia, plants have evolved a vast diversity of toxins with which they infuse their tissues, intended to repel or poison the creatures that would eat them. Cabbages produce sulphur-rich glucosinolates, the chemicals responsible for the distinctive pungent school-dinner aroma of boiled cabbage, mustard, horseradish and Brussels sprouts. The glucosinolates are not themselves very toxic, but are stored inside the plant cells in little parcels; if the leaf is chewed or crushed by a nibbling caterpillar, or for that matter by the munching of a sheep, the parcels rupture and enzymes within the cell quickly turn the glucosinolates into toxic mustard oils. Most insects cannot cope with these chemicals, and so avoid eating cabbages and their kin. When cabbages first evolved glucosinolates, one imagines they had it pretty easy for a few millennia; but eventually a few insects found ways to overcome their defence. For example, the orange-tip, the large and small white butterflies, and the cabbage stem flea beetle have all evolved chemical means to convert the glucosinolates into harmless compounds rather than mustard oils. Some insects, such as the American harlequin bug and the turnip sawfly, store the glucosinolates in their own tissues to make themselves unpalatable to predators.

Similar sequences of events are thought to have played themselves out over and over again through the 400-million-year evolutionary history of life on land. Any plant that evolves a new chemical defence making them unpalatable has a huge advantage over its tastier competitors, and is likely to multiply and spread.

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This then provides a large untapped resource, and it is only a matter of time before by chance a herbivore arises with a mutation allowing it to handle the new toxin. It may be able to break down the chemical, or sequester it in its own tissues. Some toxins act by blocking important biochemical pathways, and insects may overcome this by evolving an alternative pathway to achieve the same thing. Whatever the mechanism, descendants of this herbivore can then thrive and multiply, coming to specialise on this particular plant, since it provides plenty of food and there is no competition. Often the adult insect comes to use the odour of the very plant defences that were intended to deter them as a cue to help it identify where to lay its eggs. The result is an endless arms race, with plants under evolutionary pressure to develop new defences, and insect herbivores following them through the evolutionary landscape, devising solutions to the problems posed by the plants. Since every plant species tends to have different toxins, it pays for their herbivores to specialise; it is difficult to be a jack of all trades, and better to be a master of one. It is these evolutionary games, resulting in tight relationships between herbivorous insects and their preferred food plants, which are thought to have driven the evolution of quite a large chunk of life on Earth. As plants evolve to avoid the nibbling of their herbivores new species eventually evolve, and as the herbivores adapt to track them they too change and become new species. Every plant species ends up with its own collection of specialist herbivores, each of which has its own array of specialist predators and parasites. Some species of rainforest tree have been found to support over 700 species of beetle alone, and there are more than 100,000 species of tree found in our remaining tropical forests, so it is easy to see that plant diversity underpins the fabulous richness of life.

Humans make much use of the diversity of plant defence chemicals; although intended as toxins, in small quantities they

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have many desirable properties. Some we use as flavourings in cooking; it is largely the plant defence compounds in herbs that give them their flavour. For centuries, the only medicines we had were herbal ones; digitalis is one such example, a heart drug extracted from foxgloves which is lethal at higher doses. Many modern medicinal drugs are based upon plant extracts, and new ones are constantly being discovered. We also use chemicals from plants as natural insecticides, some of which, such as pyrethrum (extracted from chrysanthemums), are allowed in organic farming. Citronella extracted from lemongrass deters mosquitoes. Recreational drugs such as nicotine, cannabis, caffeine and opium (along with quinine, used to treat malaria) are all natural alkaloids produced by plants to deter herbivores. There is no doubt that there are numerous new and useful chemical compounds yet to be discovered in the many tropical plants that have not yet been studied; one of the many reasons why we would be wise to stop destroying tropical forests and the treasure trove of useful chemicals they undoubtedly contain.

You may wonder why I have drifted so far from the garden, but of course there is something to be learned for the gardener here. The plants we choose to grow have a huge impact on the insects which will come to live on them or visit them, and this influences the food that will be available for birds, bats, shrews, and predatory insects such as dragonflies. Everything starts with the plants.

This brings me to one of the biggest debates in wildlife gardening: native versus non-native. The majority of plants grown in most gardens are not native: for example, in a study of sixty urban gardens in Sheffield conducted by Ken Thompson and colleagues from Sheffield University, one-third of plant species recorded were native UK species, the remaining two-thirds being aliens, mainly from Europe and Asia. When compared with derelict land or semi-natural habitats, gardens contained many more plant species

overall. Ken's team repeatedly placed one-metre-square quadrats³ in these different habitats and found that the number of plant species found per quadrat was broadly similar across habitats, but that in the semi-natural areas the cumulative number of species found in successive quadrats tended to plateau after about 120, whereas in gardens it continued to rise. In total, more than twice as many plant species were found in gardens compared to semi-natural areas.

Of course this isn't surprising, for keen gardeners are constantly adding new and interesting plants, impulse buys from the garden centre or seed catalogue, or gifts from friends. It is hard to resist, for these days there is a near-endless and bewildering selection of tempting cultivars of all manner of plants from across the globe. More than 70,000 varieties of 14,000 different plant species can be bought in the UK. If you wish to encourage wildlife, which ones should you go for? Are there some general rules of thumb? In particular, are native wild flowers better than exotic aliens?

Ken Thompson's studies of Sheffield gardens suggest that insect diversity is not noticeably richer in gardens with more native plant species. The best predictor was just the number of different plant species and the volume of vegetation; gardens with lots of plants and more shrubs and trees tended to have more insects. On the other hand, the gardens tended to be rather similar in the proportion of natives. Ken didn't have any gardens that were exclusively planted with natives, or exclusively with exotics, so unless there was a really profound effect of small changes in the proportions of native versus non-native plants on insects he would have been unlikely to detect any pattern. What is really needed is an experiment in which a mix of gardens are created from scratch, some with only

³ Wire rectangles much used by plant ecologists to study plant abundance and diversity, for example by repeatedly counting the number of plant species within randomly placed quadrats.

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natives, some with only exotics, and some with a mix of the two. Perhaps it could be done on a new housing estate where all the gardens are starting from new. It would be great fun to do, but I can't imagine anyone funding such a study any time soon. In the meantime, perhaps the best evidence we have so far is from a study done by Andrew Salisbury and colleagues at the Royal Horticultural Society's gardens at Wisley. They set up small experimental plots with native plants, or close relatives of native plants, or exotics from the southern hemisphere, and they recorded the pollinator visits to the flowers. Overall, natives or their close relatives attracted more bees and other insects than their exotic counterparts. This is not hugely surprising. Some exotic plants have evolved to attract pollinators that do not occur at Wisley, such as hummingbirds, and they hide their nectar at the end of a deep tube where only these long-beaked birds can reach it. These plants aren't likely to get very many visitors (though some of our more enterprising bumblebees might learn to steal the nectar by biting a hole in the side of the flower). On the other hand, most flowers are not so specialised, and bees and butterflies in the UK are not so different compared to those found in Chile or South Africa. A flower that is pollinated by butterflies in Australia is very likely to prove attractive to British butterflies. Plants do not usually protect their nectar with poisonous compounds in the way they do their leaves, since they 'want' pollinators to visit, so there is no need for pollinators to specialise on particular host plants in the way that herbivorous insects do.⁴

⁴ This is a bit of an oversimplification. Some plants do add traces of bioactive compounds to their nectar. For example, citrus nectar contains caffeine, which bees seem to like, and which makes them whizz backwards and forwards to and from the citrus orchards with the renewed vigour one might expect after a morning cappuccino. Oddly,

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I have seen buff-tailed bumblebees in Tasmania, where they were introduced in the 1990s, feeding on clovers from Europe, on lupins from California and on native Tasmanian eucalyptus; sweet nectar tastes just as good no matter where it comes from.

Since most plants have pretty vague and flexible associations with groups of pollinators, something will usually pollinate them no matter where they are planted, and similarly most pollinators are pretty adaptable as to where they gather their food. Hence if your goal is simply to encourage as many pollinators as you can into your garden, then there is probably no need to get too hung up on the origins of the plant. Some non-natives are absolutely wonderful. For example, blue tansy (*Phacelia tanacetifolia*) originates in south-western USA and Mexico, but as a bumblebee plant for a UK garden it has few rivals; bees go mad for it. Giant hyssop (*Agastache foeniculum*), also from North America, will give blue tansy a run for its money (though I find it tends to die in the winter on my wet Sussex clay). Most of us would find it rather limiting if we only grew native plants, but there are of course many lovely natives that also deserve space in the garden. No garden should be without foxgloves, with their majestic spires of purple hooded flowers, and their willingness to grow in sun or shade. Viper's bugloss is also wonderful, and easy to grow if you have a sunny, well-drained spot. Its violet, blue and red flowers drip nectar and are adored by bees of many types. Marjoram and thyme will infuse your garden with the scents of summer meadows, while attracting swarms of buzzing bees, butterflies and hoverflies.

rhododendron nectar contains grayanotoxins at sufficient concentration that it can actually kill some bee species, yet honey bees somehow manage to make honey from it and this honey can induce hallucinations or death in humans if consumed in excess.

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There is a popular misconception that native flowers are ‘weeds’, but of course a weed is just a plant growing where the gardener doesn’t want it to be. In any case, all flowers are native to somewhere, so there is no fundamental difference between natives and non-natives, weeds and non-weeds. Hence you can remove all the weeds in your garden in a heartbeat, simply by rebranding them as wild flowers. That said, some flowers – including both native and exotics – are prone to self-seeding rather more than you might want. Dandelions provide a great splash of colour in April and May and are very popular with some of our early-spring solitary bees, but their seeds will spread if you have bare patches of soil nearby for them to colonise. My lawn is full of them and I leave them to flower but then pay the small price in having to hoe their many seedlings from the flower beds later in the year. To a sufficiently liberal-minded gardener there is no such thing as a weed, but I’m afraid I have not quite yet ascended to that Zen-like state of acceptance, and so my hoe gets regular use. Rather than attempting to impose my will by brute force, though, I try to gently steer my garden, making a bit of space around the plants I want to encourage, nipping out and pushing back those I want to discourage. Unless you have only a very small garden and/or a lot of time on your hands, aiming for complete control is likely to end only in blistered hands, disappointment and frustration.

From an environmental perspective, the most dangerous weeds are not our native plants but the exotic flowers we grow. Of all the thousands of plant species that we have imported to make our gardens more beautiful, a handful have become major invasive weeds, running amok in our countryside. *Rhododendron ponticum*, Japanese knotweed, Himalayan balsam and giant hogweed are perhaps among the best known and most serious of these pests, forming dense stands that can smother our native vegetation. All were once seemingly harmless garden flowers, imported and carefully tended for their

exotic blooms and attractive foliage. From a practical point of view, the best a gardener can do is make sure that these invasive pests don't get a foothold in our own back yard, and use it as a springboard for invasion of your neighbourhood. Of course, the risk that any exotic plant we grow might one day become invasive provides a further argument in favour of growing native plants where possible.

Pollinators may not particularly care where a plant is from, but many herbivorous insects do. As we have seen, plants infuse their leaves with defensive chemicals, and in their native range there are likely to be herbivores that have adapted to overcome these defences. When transported to a UK garden, these native insects are usually left behind. As a result, exotic plants tend to have few herbivores, other than generalists such as slugs and rabbits. You might see this as an advantage, for they are thus more likely to remain unblemished in your garden, but if you want to maximise garden wildlife then you shouldn't mind too much if there are a few aphids, plant hoppers or caterpillars munching away in the herbaceous border. Grow native mulleins (*Verbascum*), and you might be lucky enough to get the beautiful yellow-and-black-spotted caterpillars of the mullein moth. Grow champions, and you will very likely see champion moth caterpillars eating their seeds. Plant meadow cranesbill, and you just might get geranium weevils. These insects are themselves prey for other insects, birds, bats and amphibians, all part of the complex web of life. To me it seems intuitive that planting natives is better than planting non-natives, but I don't see any need to be obsessive about it.

Perhaps more critical than whether a plant is native or not is choosing the best variety. Plant breeders have spent several centuries developing the 70,000 varieties of flowers that are on sale via plant and seed catalogues or garden centres. They have bred them for unusual colours; for example, tulip breeders spent

nearly 500 years attempting but never quite succeeding to perfect a black tulip (the variety 'Paul Scherer' is pretty close but look carefully and you will see that it is really very dark purple). They have bred them for bigger flowers, longer blooming periods, extra sets of petals, and for anything else that caught their fancy and which might appeal to purchasers. Sadly, plant breeders never gave much thought to pollinators in this whole process; bees were not their target audience. Yet of course bees and other pollinators were very much the target audience of the wild flowers from which our garden cultivars evolved. Flowers and bees have been co-evolving for 120 million years or so, and the wild flowers that we see today are thus finely honed and often highly intricate mechanisms for achieving efficient pollination. When we start messing about with flowers, altering them for our own ends, we are very likely to impair their function. Rapid artificial selection for any particular trait will often have unintended consequences, so that many of the colourful bedding plants one might buy lack scent, or nectar, or are sterile hybrids that lack pollen, or have flower structures that are inaccessible to pollinators. In my own garden, I inherited a pair of dwarf cherry trees that are a 'double' variety. A normal cherry flower has five petals, arranged as a shallow dish surrounding the anthers that produce pollen, and with nectaries in the centre, providing both food and drink for passing insects. The flowers of my double varieties have, instead, a jumbled ball of twenty petals and no anthers. With all those extra petals they look quite pretty from a distance, but with no anthers they have no pollen, and bees cannot get to the nectaries, so they are of no interest to insects. I have a standard cherry growing nearby which in late April hums with insect life, while the two double cherries are silent. They offend me, for they are a travesty, mutants whose link with the natural process of pollination has been broken. My chainsaw trigger finger has been

twitching for several years, but I cannot quite bring myself to cut them down, for a tree is a tree after all, and the world doesn't have enough of them.

Double flowers aren't new. They are naturally occurring mutants that would ordinarily be swiftly selected out from the population, for not attracting pollinators is obviously a huge disadvantage in the wild. Double-flowered roses were described by the Greek philosopher Theophrastus in 286 BC, and they have been cultivated ever since, using cuttings to generate new plants. Most garden roses, including the classic 'hybrid tea' roses that one might give or receive on St Valentine's Day, are double varieties. A queen bee would not be impressed if a drone presented her with one of these. Fortunately, garden centres normally also sell single-flowered roses that are more similar to their wild ancestors and which are great for pollinators.

Many other ornamental plants are commonly sold as double varieties, carnations, camellias, peonies and *Aquilegia* among them. My local Waitrose is currently selling double hollyhocks; the single varieties are great for bees, but these are useless. I want to go into the store and remonstrate with the staff, but I realise that this would be unreasonable and pointless, and that they would probably throw me out and revoke my free-coffee privileges, so I have restrained myself so far. It is a free country after all, and if people want to grow such abominations then good luck to them, but they should at least be aware of what they are doing.

Even among garden flower varieties that do not carry major mutations such as double flowers, there is much variation in their attractiveness to pollinators. The Internet, books and magazines are replete with advice as to the best plants to grow to attract insects. The Royal Horticultural Society published one such list, a very long one including 198 plant genera. The RHS also provides a 'Perfect for Pollinators' logo which can be put

on plant labels by garden centres to flag up to customers which plants are on this list. Natural England, the government agency responsible for looking after our natural environment, has also published a list. Not to be outdone, I've put one on my university website. But how good are these lists? Ken Thompson has described the Natural England list as looking 'very much as if it was put together late on Friday afternoon'. Mihail Garbuzov, a PhD student supervised by my colleague Francis Ratnieks at Sussex University, has published a comparison of fifteen such lists, and he highlights a number of common weaknesses. Firstly, the lists are surprisingly inconsistent, with no plants found on every list and a majority of plants found on only one or two lists. This suggests that they may not be entirely reliable, and is certainly likely to cause confusion in any budding wildlife gardener diligent enough to dig out several lists and compare them. Secondly, none of the lists appear to be based on scientific evidence. Ideally, one would plant all of the different varieties in replicate patches alongside one another, and then count how many insect visitors each received through the year. Since different plants thrive in different soils and microclimates, one really ought to repeat this at multiple locations across the country. With 70,000 plant varieties to choose from this would be quite some experiment, and so as with the native versus non-native experiment, it is unlikely that anyone will ever do this. Of course, smaller-scale experiments would still be valuable, and Mihail has been attempting some of his own.

Because the lists are largely based on the personal experiences of the authors, some of whom may not necessarily have great knowledge of the subject (and may sometimes simply be lazily recycling earlier lists), some of the plants included are simply wrong. For example, one list contained petunias, which are scarcely if ever visited by insects, and seem a very odd choice for a shortlist of the

best plants for pollinators. Other very attractive plants were missing from most lists; for example, Mihail's field trials have found some types of *Dablia* such as 'Bishop of Llandaff' and 'Bishop of York' to be great bumblebee plants (something which I have since tried in my own garden and can enthusiastically confirm), but *Dablia* was not mentioned on most of the lists. Giant hyssop was rarely included, despite being hugely attractive to bees. There is a danger that gardeners might infer that plants not on such lists must be poor for pollinators, but this is not necessarily the case.

One final weakness of these lists is that they usually do not specify a particular variety of plant, often using only a common name such as lavender or a genus such as *Allium*. Lavender includes forty-seven species within the genus *Lavandula*, with some of them represented by a dozen or more different varieties available for gardens, including dwarf plants, ones with white flowers instead of the usual mauve, varieties with variegated foliage and so on. The genus *Allium* contains perhaps 800 different wild species, plus hundreds of garden cultivars, and includes chives and onions, so it is a pretty vague recommendation. Which ones are best? Again, planting them side by side is really the only way to find out. Mihail has done this with thirteen different common lavender varieties representing three different species, and found that there were striking differences between them. Overall, he found that Dutch lavender, *Lavandula x intermedia* (confusingly, a cross between English lavender, *Lavandula angustifolia*, and Portuguese lavender, *Lavandula latifolia*, with no clear link to the Netherlands), is four times better than the more commonly planted English lavender, as measured by the numbers of insects counted per square metre of plant. Even within Dutch lavenders there was more than a twofold difference between the best and worst variety, with 'Gros Bleu' the best of all, and 'Old English' performing worst. While it is broadly true to say that lavender is good for pollinators, it is much more helpful to be

specific as to exactly which lavender to grow, and most lists do not include this.

At this point you might be forgiven for feeling a bit bewildered. Who would have thought that choosing plants for your garden could be such a complicated business? Few people are going to have the time and enthusiasm to research which plants and varieties are best in great detail. To make life a little easier, I've included a short list of tried and tested favourites in the back of this book; these haven't all been tested in a proper experiment, but are based on a mixture of Mihail's work, repeated recommendations from others, and my own informal trials; I can say with certainty that they all attract lots of insects in my garden.

An alternative approach to reading lists is to simply go to your local garden centre in spring or summer and let the insects tell you what to buy. Garden centres predominantly stock plants that are in full flower and hence look enticing to potential customers, and also to potential pollinators. Go on a quiet day, ideally avoiding the weekend crowds, and stand still for a moment. Scan across the neat rows of alphabetically arranged herbaceous plants, and you will very likely see movement: bees, butterflies and hoverflies moving among the flowers they prefer, and avoiding the rubbish ones. Given such a wide selection, you can be pretty sure that any plant being visited by more than one insect or getting repeat visits is pretty good. This is much more reliable than going by logos with pictures of bees on them. If you have the money, simply buy the plants the bees are visiting. On the other hand, if you are poor but blessed with patience, take note of the variety and then buy some seeds to grow at home. That way, you can be sure that your plants are free of pesticides and with luck you will end up with so many seedlings that you can share them with your friends and neighbours.

There is really no need to get too hung up on which plants are best for your garden. Any plant is better than decking or paving

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slabs, and the more plants you have, and the more variety, the better. Include a few of the ones that are really good for pollinators, and perhaps a few native wild flowers and flowering shrubs, and your garden will soon be abuzz with insect life. Persuade your neighbours to grow some too, and soon your neighbourhood could become a sanctuary for these small but vital creatures.