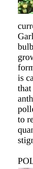
WILDFLOWERS

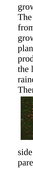
REPRODUCTION



Plants reproduce either by fragments of the parent plant forming a new plant or by the dispersal of pollen grains. Several kinds of plant break off pieces to grow independently. Pondweeds spread as currents take pieces of the plant downstream to grow. Garlic and celandine have flower heads that hold green bulbils that drop from the parent plant to find a place to grow in the earth below. Dust like yellow pollen is formed in the anther of seed producing plants. The pollen is carried either on the wind or on the body of an insect that has fed on the plant. Wind pollinating plants have anthers and stigmas that dangle outside the flower, the pollen grains are smooth and rounded and small enough to remain airborne. Male plants need to produce huge quantities of pollen to be blown from its anther to find the stigma of a female plant, for germination to begin.

POLLINATION

Insect pollinated plants have flowers that are designed to be seen by the infra red eyesight of the bees and insects that feed on it, and have smelling to attract nighttime pollinating moths. The pollen grains are larger than wind dispersed pollen and are rough surface that will stick to the bodies of the insect. Once a plant has been pollinated it will germinate, each pollen grain producing pollen tubes. The tubes grow through the tissues of the stigma towards the flowers ovaries. The stigma providers the energy for the tubed growth. One the pollen reaches the cells inside the ovary, the male gamete is released and fuses with an egg cell, which develops into an embryo which develops into a seed. Fertilisation only occurs if the pollen and the stigma are from the same species of plant.



Seeds have have a thick, resistant outer layer, inside is a reserve of nutrients which will feed the growth of the seedling.

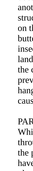
Seeds develop either as individual seeds or in fruit which may contain several seeds. They may have wings that will carry the seed away from the parent plant, or, like the poppy, be dispersed in a small explosion. Seeds can be carried in the water or in the fur of passing animals or eaten by birds, who digest the berries and disperse the seed in their droppings.

VEGETATIVE REPRODUCTION

Not all plants need pollination to reproduce. Some produce shooting roots, with buds attached to the roots, which will grow some distance from the parent. The creeping thistle pushes out stems spreading from the parent plant. Blackthorn and the burnet rose produce suckers that extend from the parent along the ground to root. Grasses and sedges spread underground by sending out rhizomes, which turn upwards at their end to push new shoots above the ground. The English stonecrop has fleshy brittle leaves in autumn. The pear has its own water store and can push tiny roots into the ground to grow into new plants.

The bluebell grows from bulb and can bud off new bulbs from the main bulb to produce new shoots. Crown garlic grows bulbils among its flowers that will fall to grow new plants. Mosses and liverworts reproduce without producing flowers. Cells, called gemmae are produced on the leaves, each able to form a new plant. A single raindrop can scatter dozens of gemmae

There are advantages to vegetative reproduction. The



reproductive organ is part of the parent plant and so shares its nutrients. Many plants growing from rhizomes and corms grow and flower early, setting seed before other species. The down side is that there is no variation in the new plants from the parent, preventing adaptation to new environments.

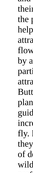
FLOWER DIVERSITY

Flowers have many shapes, sizes and colours. They are composed of the same four structures, sepals, petals, stamens and pistils. The green sepals make up the outer ring of the flower

and their role is to protect the flower while in bud. The petals are the colourful structures designed to attract insects to feed and carry the flowers pollen. Wind pollinated plants have fewer petals. The stamens, the male part of the flower, are made up of anthers bome on the tips of filaments. The anthers produce the pollen holding the male cells. The pistil is the female part of the flower, consists of the stigma, the style and the ovary. The stigma collects the pollen grains and which will lead to germination, producing a pollen tube which grows into the style, transferring the germinated pollen to the ovary. The basis structures are the same for all flowers, although petals can have radically different shapes, from the symmetrical flowers of a buttercup to complex flowers of a snapdragon.

Pollination is the process of carrying pollen from the anther to the stigma. In self pollinating plants pollen grows down from the stigma through the style and fertilises a flower on the same plant. Cross pollination occurs when pollen moves from one plant to another. Cross pollination produces a more robust plant, fusing the genetic characteristics of two plants, than self pollinating plants. Pollen is carried either by insects or on the wind. Wind pollinated plants produce much more seeds than insect pollinated as the chances of pollen arriving on the right plant are random.

Wind pollinated flowers usually have large dangling anthers, without petals or sepals with the stamens protruding on the outside of the flower for the pollen to be more easily swept by the wind.



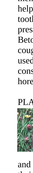
Insect pollinated flowers have anthers which hold the pollen deep onside the flower. The insect must enter into the flowers body to to reach the nectar, collecting the pollen on its body as it does so, transferring the pollen from one flower to another. Bees, wasps, butterflies and moths have special structures on their bodies to collect pollen, plover baskets on the legs of bees, and the long coiled tongue of the butterflies. The flowers colour and scent attract the insects. Some, like the birds-foot trefoil have developed a landing platform for bees to sit as they feed. Plants like the crocus protect pollen by closing their petals at night preventing damage from dew and dampness. The bluebell hangs its flowers so that water will flow away without causing damage.

PARASITIC PLANTS

While most plants draw their nutrients needed for growth through photosynthetic, where sunlight is converted by the plant's chlorophyll into sugar, some plants do not have chlorophyll and so cannot photosynthesise. These plants draw their nutrients from organic matter in the ground around them or from the living plants that grow near them. Some of these plants wind their thread like stems around the body of their neighbouring plant, small suckers penetrating the host plant's stem and extracting nutrients. It is in the interest of the parasitic plant to keep the host alive, tempering the amount of nutrient it extracts. Most parasitic plants take the nutrient from the routes of nearby plants to which they attach themselves with small suckers. Flowering shoots push above ground in spring with small whitish scales. As the plant does not need to photosynthesise it does not need green leaves. Many parasitic plants need a specific plant to feed from. Broomrape is entirely parasitic, greater broomrape feeds of the roots of broom and gorse, lesser broomrape from clover, tall broomrape from greater knapweed. If seeds of the parasitic plant d not come into contact with its specific host, it will not grow. To counter this they will produce huge numbers of seeds, usually very small, that can be carried by the wind over long distanced, increasing its chances of finding its specific host plant. As these plants do not need sunlight, they grow well under the shade. The parasitic bird's nest orchid is a common woodland plant.

MEDICAL PLANTS

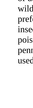
Active chemicals in some plants have given those plants medical uses. The white foliage and bark of the willow has been used to treat fever and as a painkiller. Salicin is the chemical in willow that had this effect. It is found in white flowers of the meadowsweet and the pink flowers of the dropwort. They are also have antiseptic properties. The active ingredient in aspirin, salicylic acid, is related to salicin. Opium poppy, which is rare in the UK, acts as a painkiller, the principal component in morphine and codeine. Feverfew is a delicate daisy like plant, with a strong scent as it contains camphor. It is used as a cure for migraines. Some plants act on the central nervous system, causing drowsiness and helping to reduce pain. Valerian, with its clusters of pink flowers, is a powerful depressant, used to rest hysteria, hypochondria, epilepsy and insomnia. The lady's slipper orchid has the same sedating properties. The stem of the bright blue flowering borage is a stimulant, and able to ease bronchitis, pneumonia and skin inflammation. Vervain helps to overcome fevers and colds, mustard plants act as a stimulant, peppermint used to treat coughs colds. Foxglove is the source of the drug digitalin, used to treat heart problems.



MINTS

The tiny glands that cover the plant produce oils that are used in medicine. Each mint has a special aroma, peppermint, lavender, origanum. Steam is passed over the herb to extract the oils. These oils have antiseptic and anaesthetic properties, menthol from peppermint, thymol from thyme. Balm oil helps with headache, thyme and peppermint with toothache. Mint teas are used as tonics, reducing blood pressure (motherwort and hyssop), and as a sedative. Betony helps reduce tiredness, thyme to treat whooping cough, balm tea cools fevers. Tea made from bugle is used medically as a mild narcotic, used to treat consumption. Syrups made from thyme, hyssop and white horehound soothe coughs and breathing disorders.

PLANT ARoMA



Many plants have their own distinctive aroma, stimulated by the combination of chemicals in each plant, known as essential oils. This essential oils in plants like the mint sit on the leaves, in thyme and lavender evaporate slowly around the plant, spreading their aroma, in damsons the aroma is released only when the plant is crushed. Aromatic oils released by the plants help to keep them cool, but are also directed towards attracting insects to visit and pollinate the plant. The flowers aroma travels over distance and can be picked up by an insect before it can see the flowers. This is particularly important for night flowering plants who attract moths with the powerful and sweet scent. Butterflies, moths and beetles can detect the scent of a plant like the honeysuckle from over a kilometre away, guiding themselves to the flower by following the increase in the concentration of the smell the closer they fly. Plants have differing scents depending on the insects they want to attract. Hogweed and lords and ladies smell of decaying flesh to attract flies, violets, bluebells and wild roses give out a sweet smell to attract insects who prefer sugary nectar. Plants can also use scent to warn insects away, sap feeding aphids, who will avoid the poisonous chemicals of plants such as wormwood and pennyroyal. The chemical from the plant pyrethrum is used in commercial insecticides.