

BLOOMSBURY



Concise

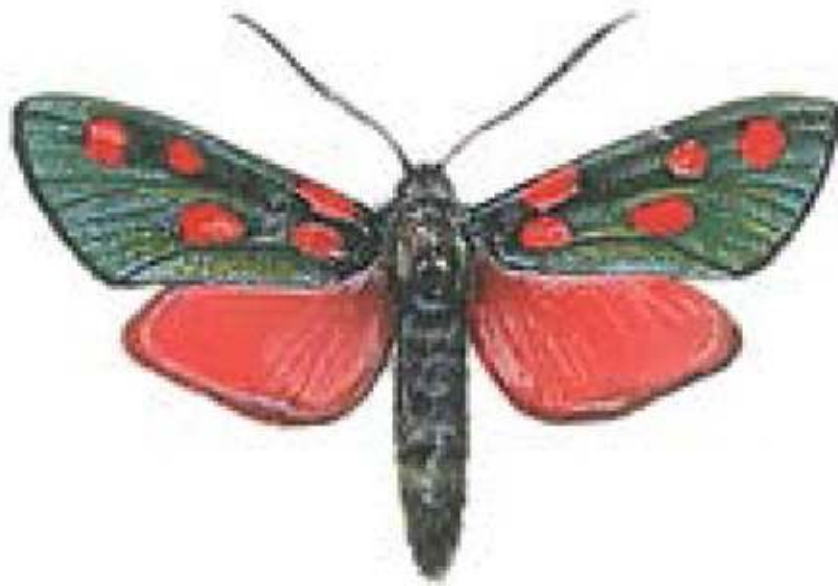
Butterfly  
& Moth  
Guide



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There are 47 individual Wildlife Trusts covering the whole of the UK and the Isle of Man and Alderney. Together The Wildlife Trusts are the largest UK voluntary organization dedicated to protecting wildlife and wild places everywhere – at land and sea. They are supported by 791,000 members, 150,000 of whom belong to their junior branch, Wildlife Watch. Every year The Wildlife Trusts work with thousands of schools, and their nature reserves and visitor centres receive millions of visitors.

The Wildlife Trusts work in partnership with hundreds of landowners and businesses across the UK in towns, cities and the wider countryside. Building on their existing network of 2,250 nature reserves, The Wildlife Trusts' recovery plan for the UK's wildlife and fragmented habitats, known as A Living Landscape, is being achieved through restoring, recreating and reconnecting large areas of wildlife habitat. As well as protecting wildlife this is helping to safeguard the ecosystems that we depend on for services like clean air and water.

The Wildlife Trusts are also working to protect the UK's marine environment. They are involved with many marine conservation projects around the UK, often surveying and collecting vital data on the state of our seas. Every year they run National Marine Week in August – a two-week celebration of our seas with hundreds of events taking place around the UK.

All 47 Wildlife Trusts are members of the Royal Society of Wildlife Trusts (Registered charity number 207238). To find your local Wildlife Trust visit [wildlifetrusts.org](http://wildlifetrusts.org)

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# Introduction

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Butterflies are the most obvious of insects and probably the most popular. They are seen during the day, mostly in the warmer months from spring through summer to autumn. Many moths are nocturnal and are often seen when they enter the house or come to a lighted window. There are, however, some day-flying species that are so colourful people think they are butterflies.

## Main Characteristics of Butterflies & Moths

Butterflies and moths belong to a huge order of insects, known as the Lepidoptera, which has over 165,000 species worldwide, with 2,300 in the British Isles. Moths are much more numerous than butterflies, and of the British species of Lepidoptera only about 70 are butterflies. Butterflies and moths are distinguished from other insects by being densely covered with tiny powdery scales ('Lepidoptera' is derived from the Greek 'scaly wings'). Sizes vary from species that are so tiny that magnifying glass is needed to see them, to some tropical species that are the size of small birds.

## Body Structure

Butterflies and moths have bodies that are in three parts:

- The head carries the eyes, antennae and mouthparts.
- The thorax has three segments. The first segment carries the front legs, the second the forewings and the middle pair of legs, and the third the hindwings and the third pair of legs.
- The third segment of the body is the abdomen, which has no legs, but does have sexual and digestive functions.

## The Senses

Vision is through two large compound eyes and a pair of *ocelli*, or simple eyes. The *antennae* are found between the eyes. They are complex sense organs that can pick up chemical and tactile messages. Butterflies have antennae that are more uniform than those of moths, which are very varied.

## Feeding

The vast majority of butterflies and moths feed on nectar and other liquids. They lack jaws, which have evolved into tongues. The tongue or *proboscis* is long and slender enough to probe flowers. When not in use it is coiled up and cannot be seen. The larvae or caterpillars feed on plants, though some members of the Lycaenidae also feed on ant grubs.

## The Role of Colour in the Wings

The wings of butterflies and moths may be very strikingly coloured and patterned, or quite dull when they serve a protective role. The bright metallic colours, particularly purples and blues, are due to the structure of the *scales*, and if they are damaged the colours fade.

The bright colours must play a role in communication between individuals. Males also have specialized *scent glands* in the wings. The pheromones that they produce help to attract females over distance, and also help to differentiate between the sexes of species in which males and females look alike.

The wings of some species may have roughly circular markings that look like eyes. It is thought that these distract predatory birds from the body of the insect. It may survive if a bird pecks a chunk

from the wing, whereas a peck to the body will almost inevitably be fatal.

A protective mechanism employed by moths is **flash colouring**, where the forewings are well camouflaged, but the underwing is brightly coloured. When the moth is disturbed the bright yellow of the large yellow underwing will confuse a bird, because the moment the moth comes to rest the yellow disappears.

The upperside of a butterfly's wings may be brightly coloured, but the underside, which is the area visible when the insect is at rest, may be extremely well camouflaged, so that the resting animal looks like a dead leaf.

## Temperature Control

Wings help to warm butterflies to the temperature that they need to fly. Their bodies need to reach about 30°C before they can take off. The dark-coloured areas of the wings absorb the most heat, even on cool days when there is some sunshine. To achieve this temperature butterflies sunbathe with their wings open. Nocturnal moths reach the required body temperature by shivering their wings.

## The Life Cycle

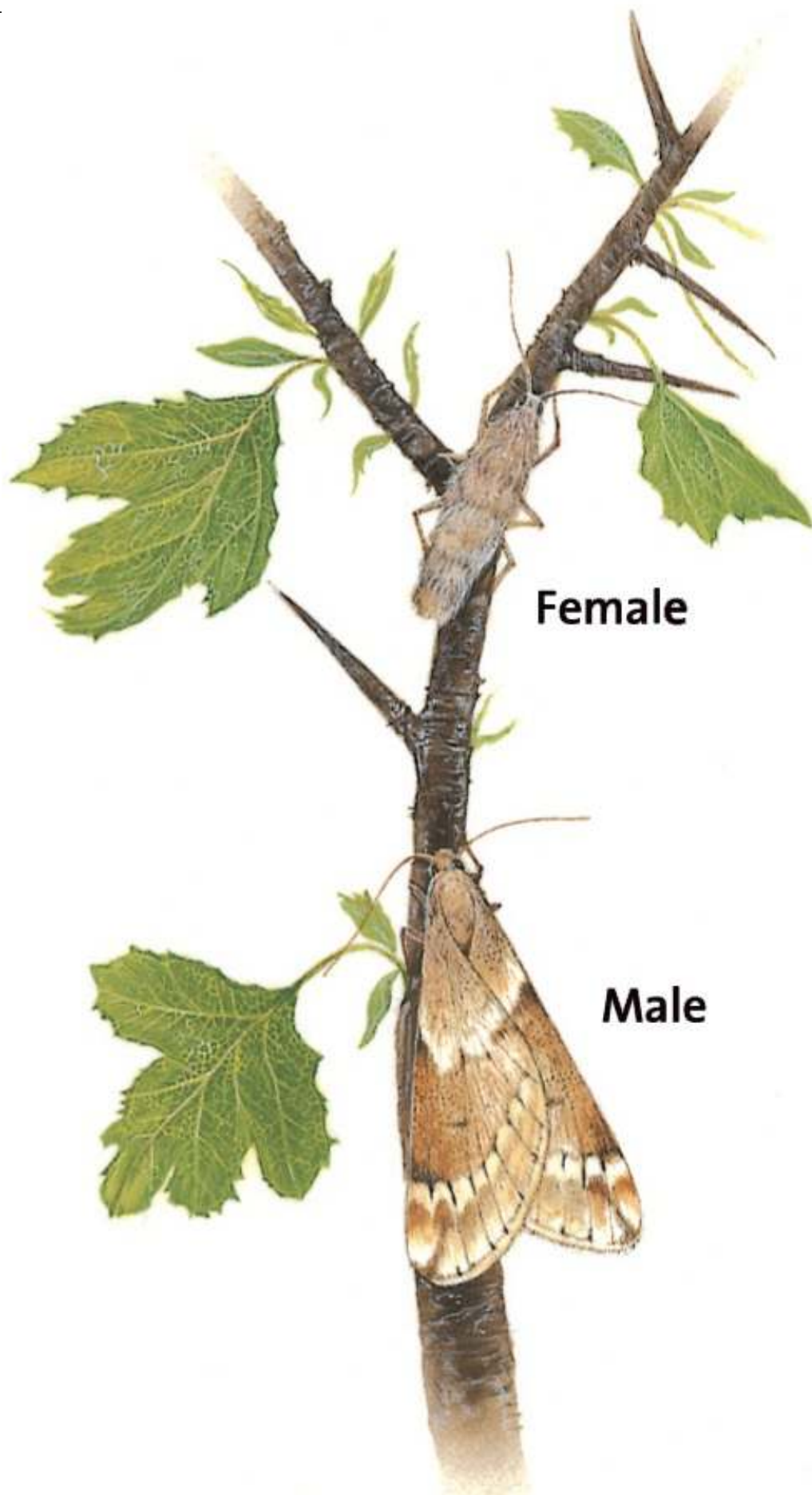
The life cycle of all insects includes a number of stages. These vary between species in terms of the timing, but each cycle is timed to provide the maximum opportunity for the larvae to feed. All butterflies and moths pass through four very different stages, during which they metamorphose completely.

- The first stage is an **egg**. The female lays an egg, in most cases on the plant on which the caterpillar will feed. The eggs are tiny and usually overlooked by the human eye.
- From the eggs hatch the **larvae** or **caterpillars**. These look nothing like the adult insect. They are worm-like with biting jaws, and in addition to the three pairs of legs on the thorax have stumpy legs on the abdomen. Caterpillars moult four or five times during their life. Before the final moult the caterpillar, which has become large and fat, seeks a place of safety, often burrowing beneath the soil or protected within a silken cocoon that the larva spins, or hanging from its food plant. The caterpillars of some species – the hawkmoths for example – are large and spectacular.
- The final moult is the metamorphosis between caterpillar and **chrysalis** or **pupa**. The pupa has a harder outer skin than the larva and barely moves at all. However, inside, its tissues liquefy and develop into the adult insect. The time for this to happen varies. In some species in warm weather it may be as short as a week, while in many it may take two to three weeks and in some several months because it is in this stage that the species spends the winter. The longevity of butterflies and moths varies between species and broods. Many species produce one brood a year, but others may produce more. The first butterfly to appear in early spring in Britain is the Brimstone, which hibernates as an adult. Males emerge first and patrol their territories. The greenish-white females appear a couple of weeks later.

## Wingless Moths

The females of some moth species, such as the March Moth (*Alsophila aescularia*), do not have wings and are flightless. They can be seen crawling up tree trunks, on which they lay their eggs, at night in

March–April; males can also be found on the wing at this time. March Moths are quite common in Britain, and their larvae feed on a range of deciduous trees, including oaks, hawthorns and fruit trees.



**Female**

**Male**

Eggs are laid in May and June, the larvae are seen in June and July, and the adults emerge in August. Sometimes among double-brooded species, some of the second brood will reach adulthood before

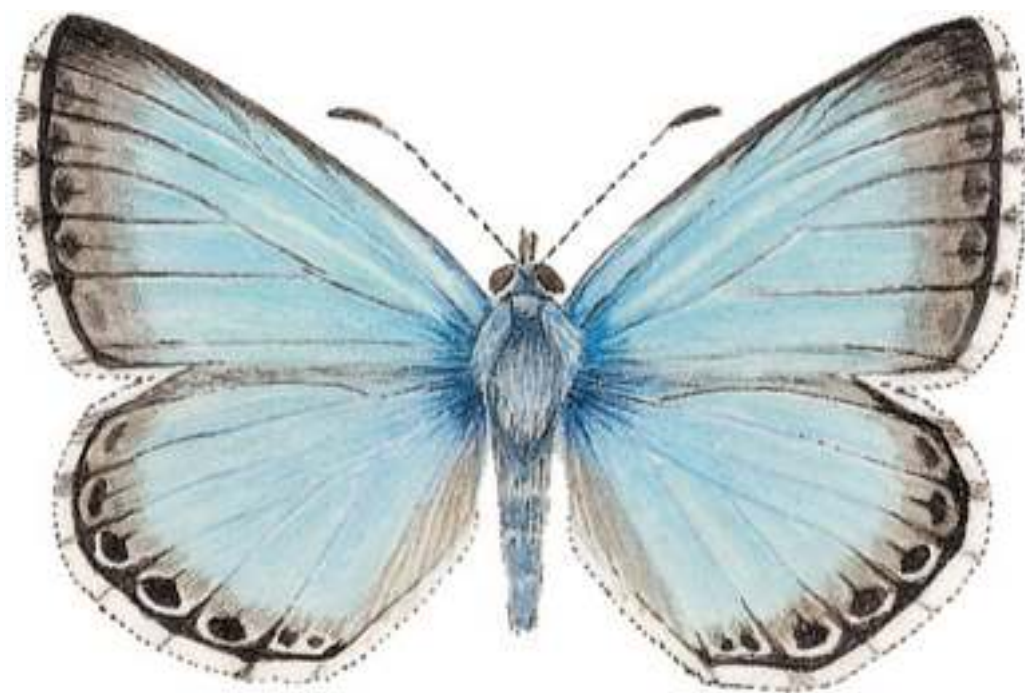


winter and hibernate, while others will spend the winter as larvae or pupae.

Moths and butterflies are both seen seasonally. A common garden butterfly is the Peacock, especially if there is a bed of nettles on which the caterpillars might feed. The first Peacocks are seen as the weather warms in March and they emerge from hibernation to breed. After May they seem to disappear – this is because the adults have bred and the new generation is developing from eggs to larvae to pupae, emerging as butterflies from July to September. On sunny autumn days they can be seen feeding on the nectar or juices of rotting windfall fruits, before hibernating throughout the winter. You might come across one in a corner of a garden shed or even in your home (if you do, do not disturb it or put it outside in freezing weather).

## **BUTTERFLIES**

Butterflies can be distinguished from moths mainly by the different shape of their antennae, which are usually thin and slender, and club shaped at the ends. At rest butterflies tend to hold their wings vertically above the body, so that the underside is visible, while moths usually rest with their wings spread out or folded over the body, with the upperside visible.



### **Hesperiidae/Skippers**

Regarded as the most primitive of butterflies, the skippers share the characteristics of both butterflies and moths. They are small and lively, with broad hairy bodies. Their eyes are widely separated and there is a bristle at the base of each antenna that is not found in other butterflies. The orange-chestn skippers (subfamily Hesperinae) sit in a characteristic pose with the forewings and hindwings held at different angles. Skipper larvae live in a shelter made from silk among their foodplants.

### **Papilionidae/Swallowtails**

This family of spectacular insects contains the largest butterflies in the world, including the apollo, festoons, swallowtails and birdwings of Australasia and the Far East. In Britain the family is represented by just one species, the Swallowtail, although the Scarce Swallowtail may occasionally visit British shores. Swallowtail larvae are brightly coloured and have a forked organ – called the osmeterium – behind the head that emits a pungent smell if the larva is disturbed.

## **Pieridae/Whites & Yellows**

Butterflies in this family have predominantly white or yellow wings with black markings. They include the garden whites, brimstones, orange tips and clouded yellows, and their colours usually derive from the pigments in their larval foodplants. Their larvae are long, slender and blunt at either end, and often have a decorated lateral line.

## **Lycaenidae/Hairstreaks, Coppers & Blues**

About a third of the world's butterflies belong to this family. All species are relatively small and active. They have small slug-like caterpillars, and many have an intimate relationship with ants whereby the ants attend the larvae, cleaning them, in return obtaining a sugary secretion from them. The *hairstreaks* have zigzag markings on the underside, and usually short tails. The *coppers* are characterized by their fiery copper colour, although a few are mostly dark brown and some are suffused with purple. Both sexes in the *blues* may be brown; in some the female only is brown.

## **Riodinidae/Metalmarks**

This family is regarded as a subfamily of the Lycaenidae by some authorities. It contains some magnificent and diverse butterflies, the most spectacular of which occur in Central America. The single European species – the Duke of Burgundy – is one of the least striking members of the family.

## **Nymphalidae/Emperors, Vanessids & Fritillaries**

This large family contains some of the biggest and gaudiest butterflies in the world, in Europe including the Peacock, Red Admiral and Purple Emperor, as well as the somewhat less spectacular fritillaries. A characteristic of adults of these butterflies is that the first pair of legs is vestigial, and only the remaining two pairs of legs are functional.

## **Danaidae**

This family is considered by some to be a subfamily of the Nymphalidae. Only one member, the spectacular North American Monarch, occurs as a migrant in Britain. It dwarfs every other species found in Britain, and is one of the world's great migratory butterflies. Poisons from milkweeds, the foodplants of the striking black, yellow and white larva, protect it from predators.

## **Satyridae/Browns**

The majority of butterflies in this family, which contains nearly a third of European butterflies, are brown or yellowish-orange; the exception is the Marbled White, which is more like members of the Pieridae. Butterflies in this group include browns, graylings, ringlets, woods and walls. They are medium or small in size, with small eyespots at the outer margins of the wings. The larvae typically taper towards the tail, and are often striped from head to tail, with colouration that matches the grass on which they feed.

## **MOTHS**

Moths tend to have hairier and stouter bodies than butterflies, and larger scales on the wings, which makes them look more fluffy and dense. Most are nocturnal or diurnal, although there are exceptions to this generalization. Nocturnal moths are usually dull coloured with obscuring patterns that help camouflage them when they are at rest during the day.



### **Micropterigidae**

This family of very small moths is believed to be the most primitive of the Lepidoptera. The adults usually fly during the day, and have functional mandibles (rare in the Lepidoptera), which they use to feed on pollen.

### **Tortricidae/Leaf Rollers**

Commonly known as tortrix moths, members of this family typically rest with the wings folded back, producing a somewhat rounded profile. There are more than 6,300 species worldwide.

### **Pyralidae/Pyralid Moths**

Moths in this family generally rest with their wings in a triangular shape and put the first pair of long legs in front, the two antennae at the top and pointed backwards. They are small in size and have relatively long legs that extend beyond the hindwings when resting. There are more than 25,000 species of Pyralidae worldwide.

### **Pterophoridae/Plume Moths**

The plume moths have unusually modified wings. The forewings usually consist of two curved spars with bedraggled bristles trailing behind, while the hindwings have three spars. At rest the wings are extended laterally and narrowly rolled up, and the moths may resemble a piece of dried grass, enabling them to avoid predators.

### **Hepialidae/Swift Moths**

This family of more than 500 species worldwide is considered to be very primitive, with structural differences to other moths including very short antennae and the lack of a functional proboscis. The forewings and hindwings are similar in size, and are folded along the body when at rest.

### **Cossidae/Leopard & Goat Moths**

These are generally large and sturdy moths that fold their wings along the body when at rest. They tend to be grey in colour, and may mimic twigs, bark or leaves. Most larvae are tree borers, and in some species they take up to three years to mature. There are about 700 species worldwide.

## **Zygaenidae/Forester & Burnet Moths**

The majority of the 1,000 or so species of Zygaenidae are tropical, but the family is also reasonably well represented in temperate regions. The Zygaenidae are typically day flying, with a slow and fluttering flight. They often have prominent red or yellow spots, the bright colours acting as a warning to predators that they are distasteful, containing hydrogen cyanide in all stages of their life cycle. This is manufactured by the moths themselves, rather than being obtained from a foodplant as is common in the case among many Lepidoptera.

## **Sesiidae/Clearwing Moths**

In these moths the wings have hardly any of the scales usually present in moths and butterflies, leaving them transparent. Their bodies are often striped with yellow, and they resemble wasps or hornets, probably as a defence against predation. There are 1,370 species, most of them in the tropics.

## **Lasiocampidae/Eggar Moths**

Members of this family are large bodied with broad wings. They are either diurnal or nocturnal. Females are generally larger and slower than males, but the sexes are similar in other ways. Eggar moths are typically brown or grey, and have hairy legs and bodies. There are more than 2,000 species worldwide.

## **Saturniidae/Emperor Moths**

This family includes large moths such as giant silkmoths, emperor moths and royal moths. It has members in the tropics with wingspans of up to 30cm, making them the largest insects on Earth today. All saturniids have large and heavy bodies with hair-like scales, lobed wings, small heads and reduced mouthparts. They are sometimes brightly coloured and may have translucent eyespots on their wings. Males generally have broader antennae than females. There are up to 1,300 species worldwide, one of which, the Emperor Moth, occurs in Britain.

## **Endromidae**

The Kentish Glory is the only representative of this family. It is an attractive day-flying species that lives in birch forests throughout Europe and is scarce in Britain.

## **Thyatiridae/Lutestring Moths**

This family comprises some 200 species, with 10 occurring on the Continent and 9 in Britain. It is named for the fine lines that cross the wings of some species. The wings of these moths are held tentatively, close to the body, when at rest. The thorax often has prominent tufts.

## **Geometridae/Geometer Moths**

This is a very large moth family of at least 20,000 species, more than 300 of which appear in Britain alone. Many have slender abdomens and broad wings, which are usually held flat with the hindwings visible. The majority fly at night, and the antennae of the male are often feathered. The moths are well camouflaged, with wavy wing patterns, and tend to blend in with the background. Their family name derives from geometer ('earth-measurer'), referring to the method of locomotion of the larvae. The larva will clasp its point of attachment with its front legs and draw up its hind end, employing a 'looping' gait, creating the impression that it is measuring its journey.

## **Sphingidae/Hawkmoths**

Comprising about 1,050 species, the hawkmoth family is best represented in the tropics. The moths are moderate to large, and can employ rapid and sustained flight. Some, like the Hummingbird Hawkmoth, hover in midair while feeding on flower nectar and may be mistaken for hummingbirds. Most species are crepuscular or nocturnal, but some fly during the day. At rest the wings are generally laid flat over the body and swept back into an arrowhead shape. Hawkmoths are relatively long-lived, living for up to 30 days. The larvae of most species have a 'horn' at the rear end.

### **Notodontidae/Prominent & Kitten Moths**

Species in this family are usually heavy bodied and long winged, and their wings are held folded across the back when at rest. They are generally grey or brown, and many species have a tuft of hair on the trailing edge of the forewing, which protrudes upwards when at rest, hence their common name 'prominents'. The common names of some species, such as 'Puss Moth', refer to their hairiness. The family comprises more than 2,500 species, 27 of which have been recorded in Britain.

### **Lymantriidae/Tussock Moths**

Moths in this family of about 2,700 species worldwide are usually muted brown and grey in colour with some species being white, and tend to be very hairy. Their wings are generally held tent-wise when at rest, with the legs prominently displayed. Some females are flightless, and some have reduced wings. The larvae are hairy and frequently have tufts of hair that breaks off easily, forming a means of defence throughout their life cycle.

### **Arctiidae/Footman Moths, Tiger Moths, Ermines & Allies**

This family comprises about 11,000 species worldwide, with 32 having been recorded in Britain. It includes brightly coloured tiger moths, as well as rather duller footmen, and lichen and wasp moths. Many species have hairy caterpillars, or 'woolly bears'. Many also retain distasteful or toxic chemicals that the larvae or adults acquire from foodplants, and advertise their defences with bright colouration, scents or ultrasonic vibrations. Tiger moths hold their wings tent-wise when they are at rest, but most footmen lay them flat, with a considerable amount of overlap.

### **Thaumetopoeidae/Processionary Moths**

The larvae of this small family of moths move in columns when searching for food, resembling a procession, hence the common name of the family. The adults are stout and furry, have feathery antennae and hold their wings close to their body at rest. Only two of about a hundred species worldwide have been recorded in Britain. These are the Pine Processionary and the oak Processionary, the larvae of both of which may cause skin irritation in humans and can cause extensive defoliation of trees. Neither species is currently resident on mainland Britain, except as individuals, but they are expanding their range northwards, probably due to global warming. The oak Processionary is resident on Jersey, where it was first recorded in 1984. Populations in southern Europe are controlled by natural predators that do not exist in northern Europe.

### **Noctuidae/Noctuid Moths**

This is the largest of the moth families, with just over 400 species on the British list and about 21,000 species worldwide. Most British noctuids are medium-sized brown moths with a stout build and forewings considerably longer than they are deep, and most fly mainly at night. When at rest, the majority of noctuids hold their wings tent-wise over their body, with the trailing edges of the forewings brought together or slightly overlapping.

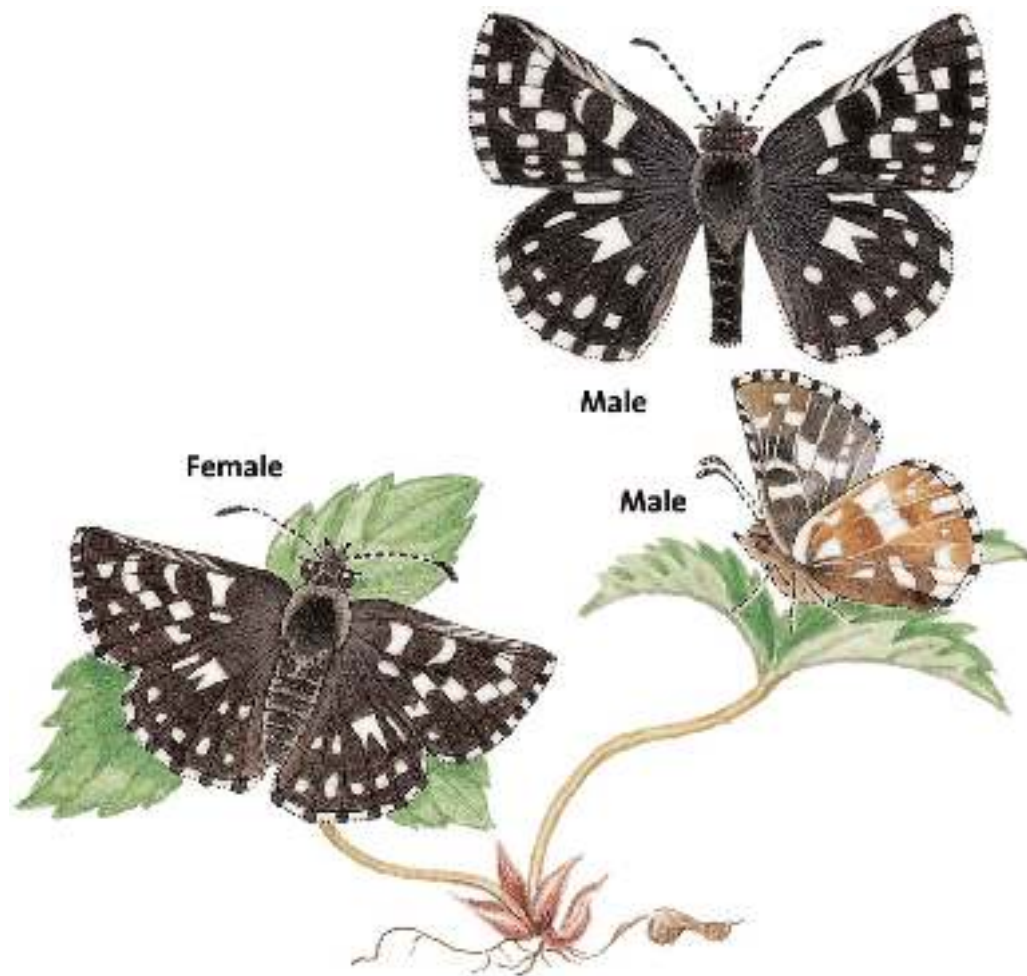
The 152 species in this book include all butterfly species and many of the most common moths currently found in Britain (including rarities like the Scarce Swallowtail and Monarch), and give an at-a-glance introduction to the butterflies and moths you are likely to see in the field. Measurements provided indicate the average size of a forewing; ranges are given for species that are particularly variable in size.

# BUTTERFLIES

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## Grizzled Skipper

*Pyrgus malvae*



### SIZE AND DESCRIPTION

Forewing 12mm. Smaller than most skippers and with more white markings on a brown background. Sexes are similar, although male has more angular wings than female. Larva is green suffused with pale brown on the back, which is striped with darker olive-brown.

### HABITAT AND DISTRIBUTION

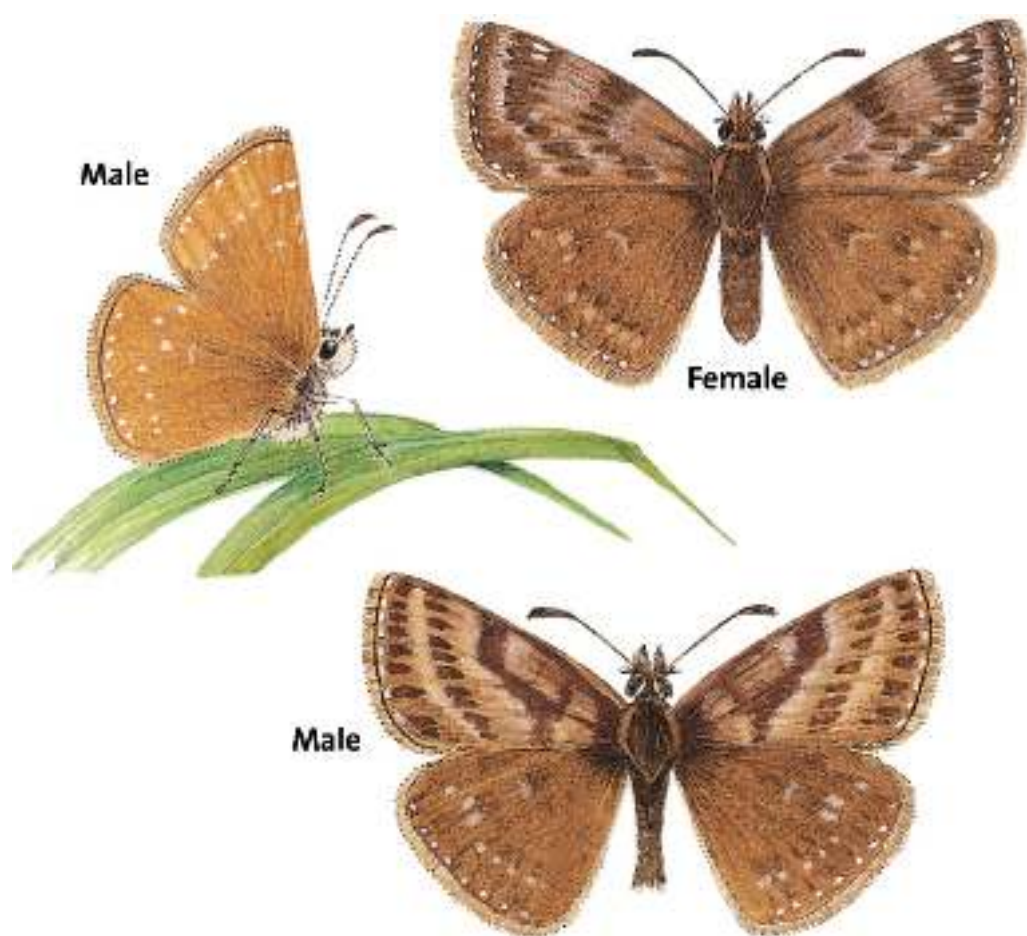
Open country, on grassy banks and at edges of woodland, from the lowlands to 1,800m. Europe except northern Britain and northern Scandinavia.

### FOOD AND HABITS

Flies April–August, in 1–2 broods. Larvae feed on Rock-rose, Wild Strawberry, Bramble and cinquefoils.

# Dingy Skipper

## *Erynnis tages*



Male

Female

Male

### SIZE AND DESCRIPTION

Forewing 14mm. Upperside is brown with tiny white spots near the margin of the forewing and hindwing. Underside is paler. Female is similar to male. Larva is green with a dark green line down its back, and a black head.

### HABITAT AND DISTRIBUTION

Usually banks of wild flowers on lime soils at up to 1,800m. Southern and central Europe, including England, Wales and southern Scandinavia.

### FOOD AND HABITS

Flies May–June, in 1–2 broods. Larvae feed on Bird's-foot Trefoil, Scorpion Vetch and other vetches.



# Chequered Skipper

## *Caterocephalus palaemon*

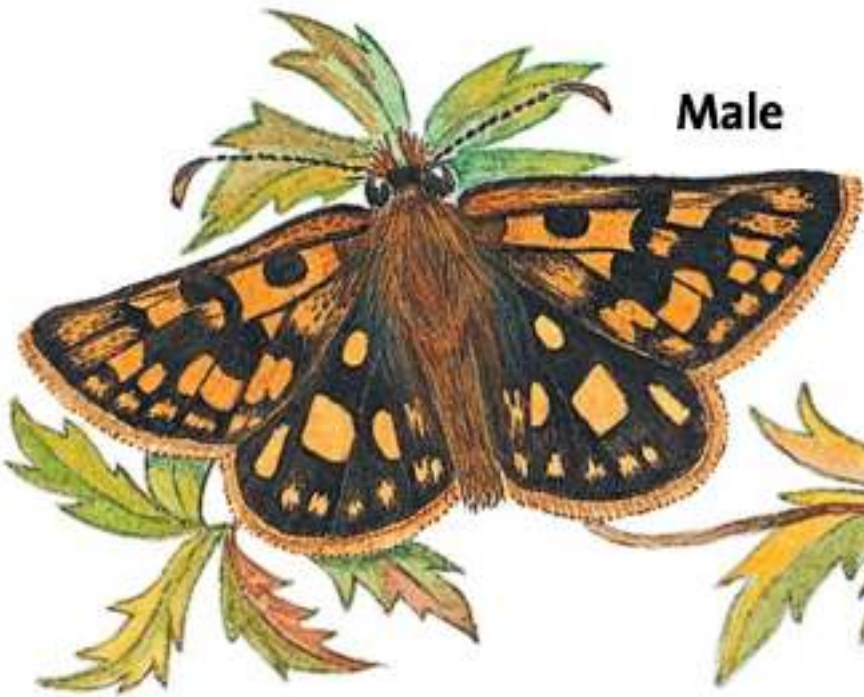


Female

Female



Male



### SIZE AND DESCRIPTION

Forewing 14mm. Upperside is dark brown with yellow patches. Underside is brownish with yellow scales and pale yellow spots on the hindwing. Female has more rounded wings and larger, more open markings than male. Larva is green with dark green and white lines, and a large green head.

### HABITAT AND DISTRIBUTION

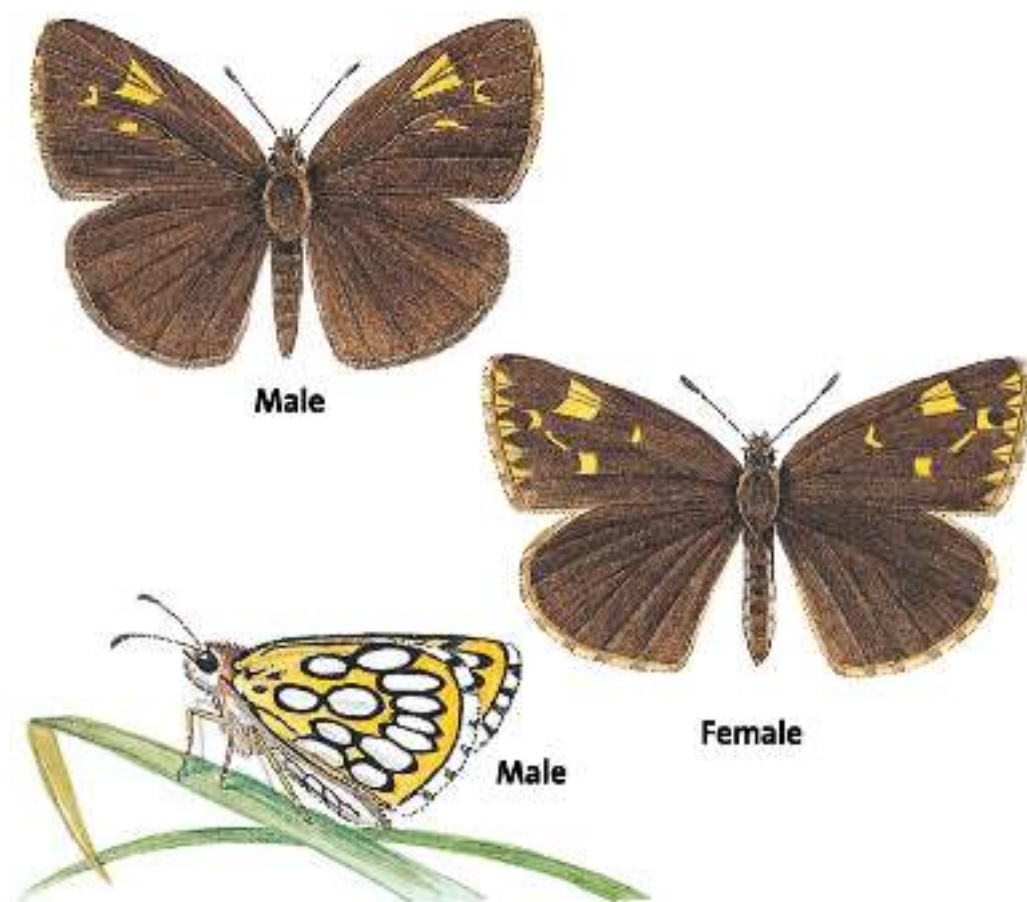
Light woodland, rides and clearings from sea level to more than 1,000m in Alps. Most of France, western Scotland, central Europe and northern Scandinavia.

### FOOD AND HABITS

Flies May–June. Larvae feed on grasses.

# Large Chequered Skipper

*Heteropterus morpheus*



## SIZE AND DESCRIPTION

Forewing 12mm. Dark brown with yellow markings. Sexes are similar, but female has more pronounced markings on the forewing than male, and chequered fringes. Larva is pale green.

## HABITAT AND DISTRIBUTION

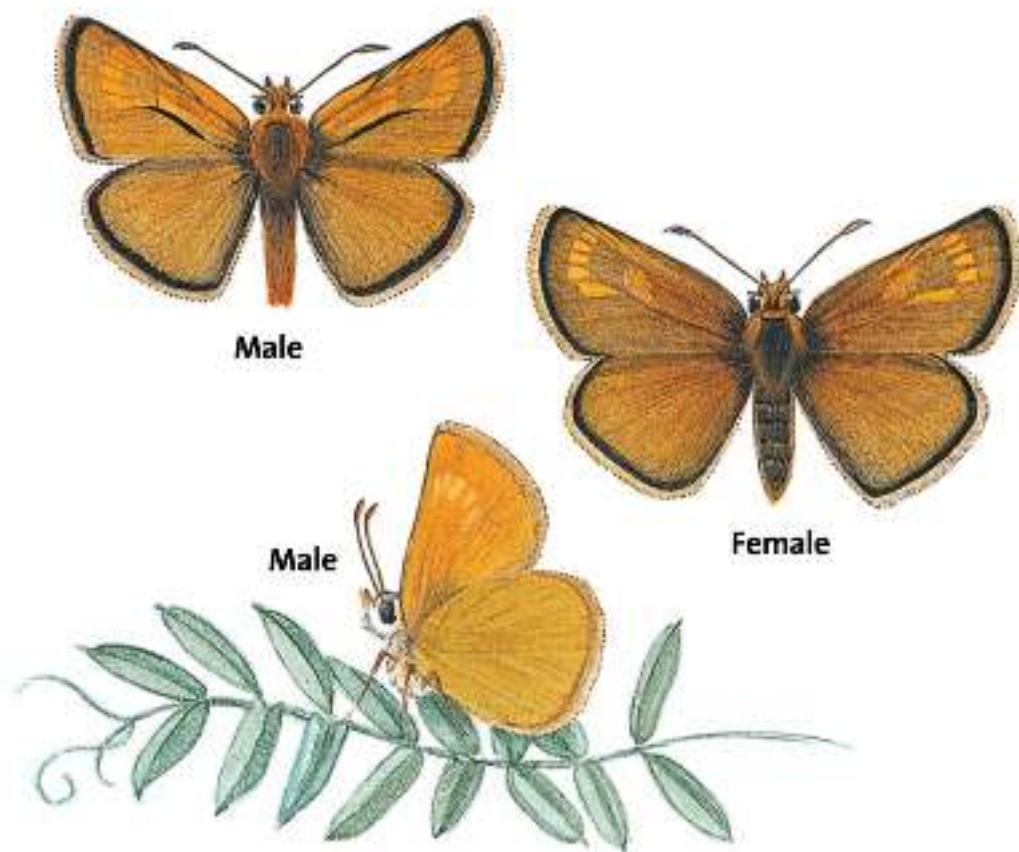
Damp grasslands and woodland clearings. Mainly eastern Europe, but also northern Spain and western France. In Britain, believed to have been accidentally introduced to Jersey during the Second World War, but not seen on the island since 1996.

## FOOD AND HABITS

Flies June–July. Larvae feed on grasses and reeds.

# Lulworth Skipper

## *Thymelicus action*



### SIZE AND DESCRIPTION

Forewing 12mm. Sexes are dissimilar and variable. Female is larger than male, with a ring of pale orange spots on the forewing. Male has a prominent black streak on forewing. Underside is dull orange in both sexes. Larva is green with a pale-bordered dark green line at the centre of the back, and pale greenish-yellow lines on either side.

### HABITAT AND DISTRIBUTION

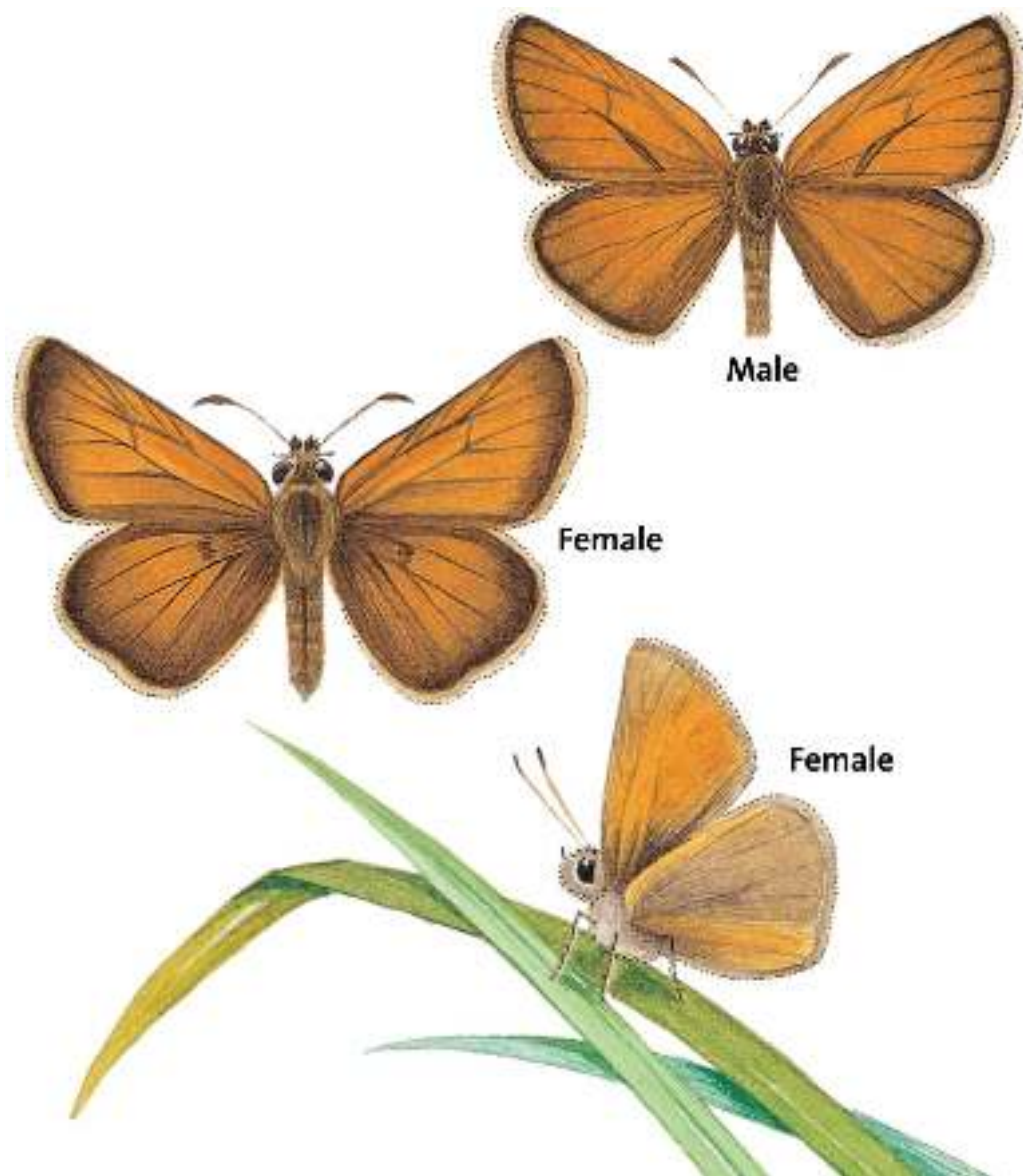
Slopes of long grass, cliff tops and mountainsides. Most of Europe apart from north-east and Scandinavia; in Britain mainly along Dorset coast.

### FOOD AND HABITS

Flies May–July. Larvae feed on grasses.

# Small Skipper

## *Thymelicus flavus*



Male

Female

Female

### SIZE AND DESCRIPTION

Forewing 14mm. Bright orange wings. Body is stout and rather moth-like. Tends to hold its wings flat when at rest. Has a swift darting flight.

### HABITAT AND DISTRIBUTION

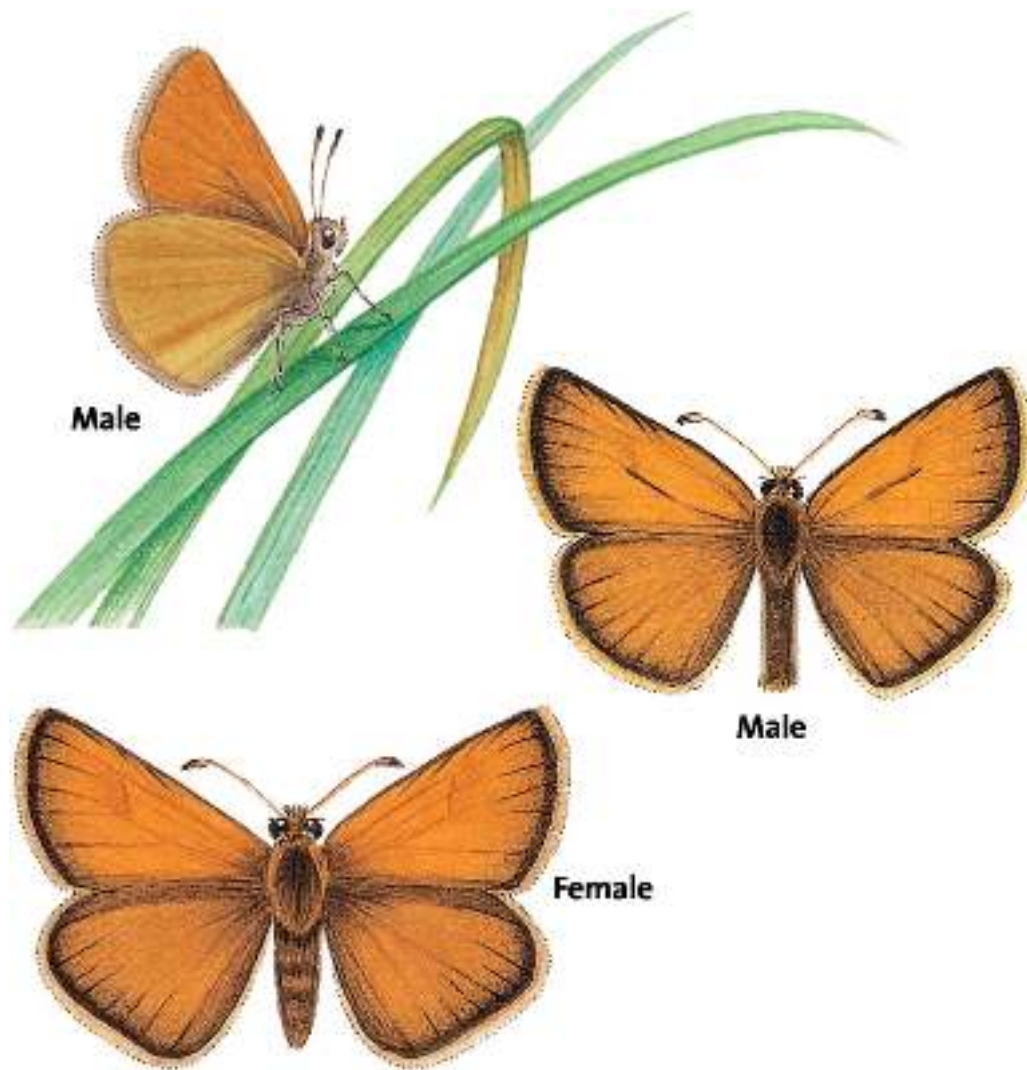
Grassy places. England, Wales and mainland Europe south from Denmark.

### FOOD AND HABITS

Flies May–August. Small green larvae feed briefly on grasses, but go into hibernation shortly after hatching.

# Essex Skipper

## *Thymelicus lineola*



### SIZE AND DESCRIPTION

Forewing 12mm. Very similar to Small Skipper (*T. flavus*), except for the black spots on the undersides of the antennae, and generally smaller. Male can be distinguished from female by the sex brand on his forewings.

### HABITAT AND DISTRIBUTION

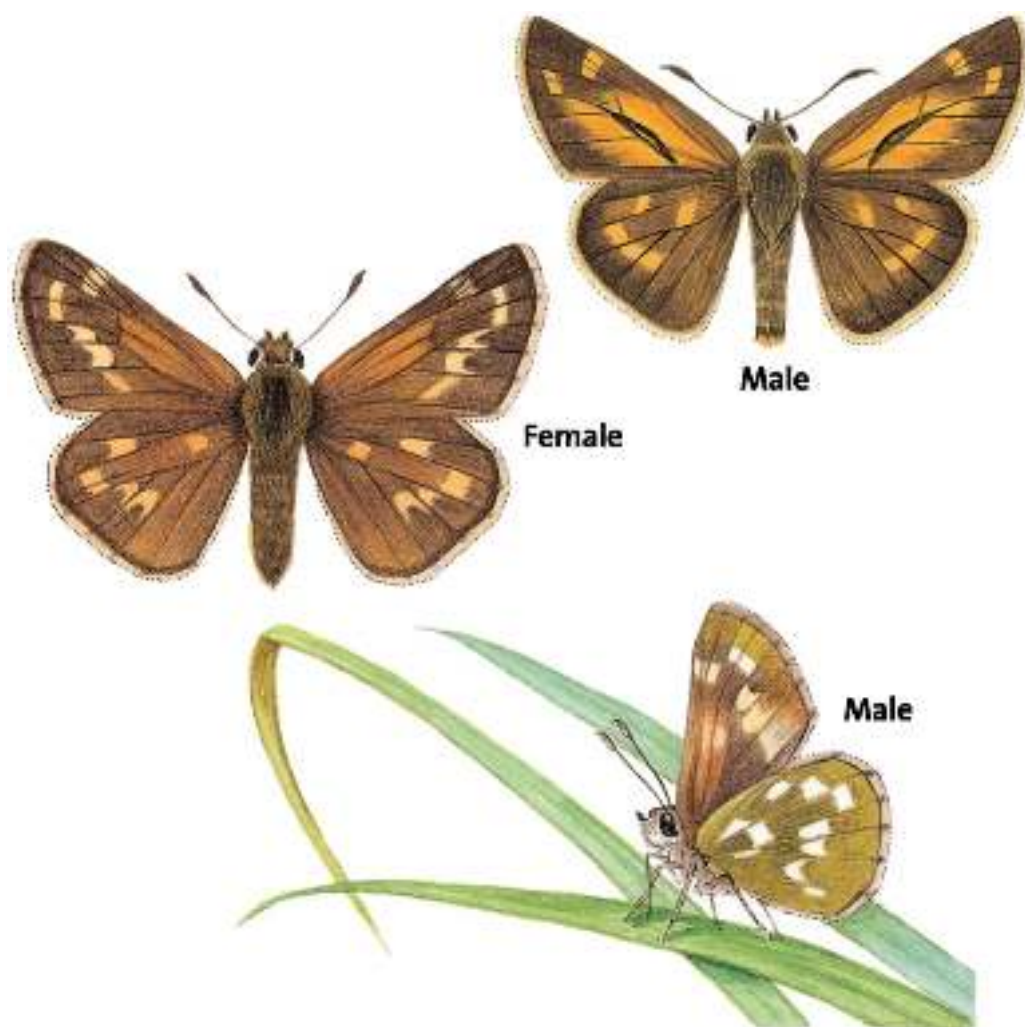
Grassy places. Throughout Europe except northern Britain and northern Scandinavia.

### FOOD AND HABITS

Flies May–August. Larvae feed on grasses.

# Silver-spotted Skipper

## *Hesperia comma*



### SIZE AND DESCRIPTION

Forewing 15mm. Similar to Large Skipper (*Ochlodes venatus*), but the underside is spotted with white on a green background, the upperside is darker and less orange, and the pale yellow spotting is more prominent. Larva is dull olive-green with a black collar behind the head, which is large, and black marked with brown.

### HABITAT AND DISTRIBUTION

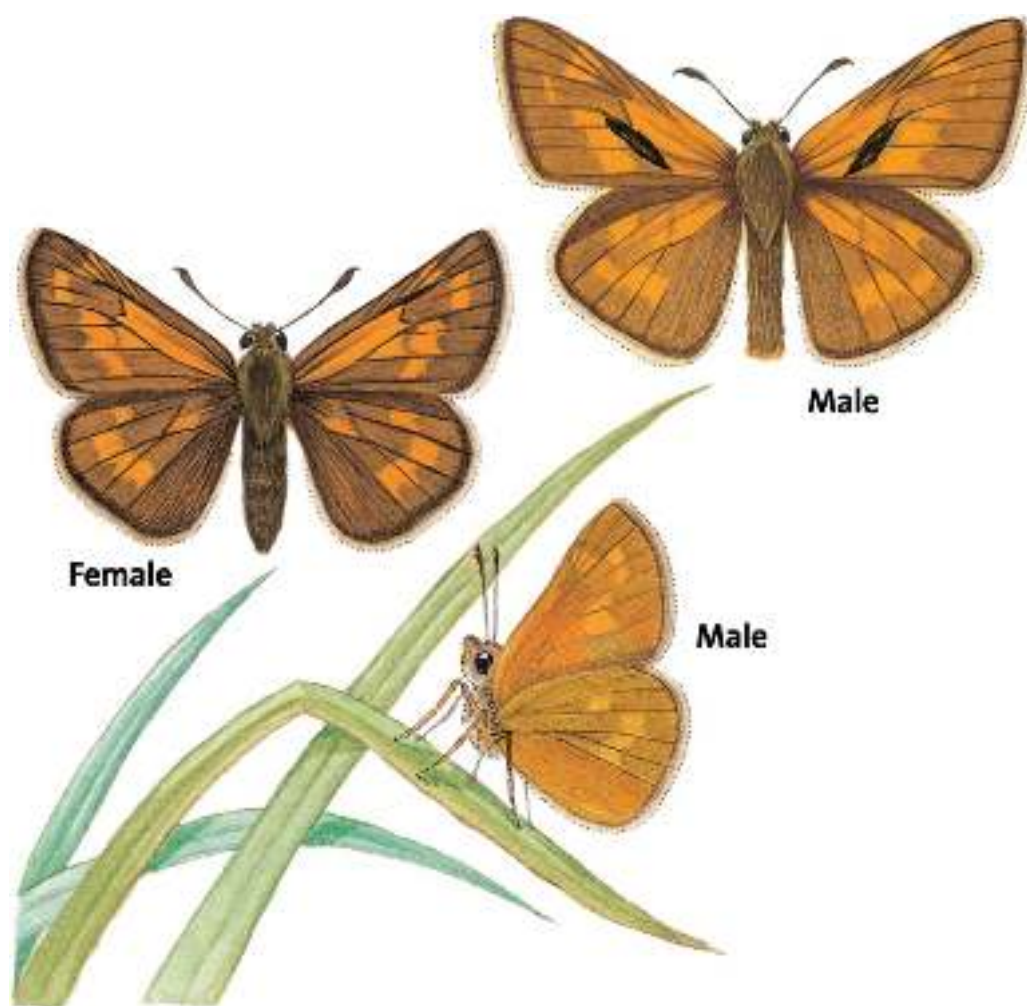
Grassy banks, meadows and cliffs. All of Europe apart from northern Britain and northern Scandinavia.

### FOOD AND HABITS

Flies July–August. Larvae feed on grasses.

# Large Skipper

## *Ochlodes venatus*



Female

Male

Male

### SIZE AND DESCRIPTION

Forewing 16mm. Upperside is orange-brown with dark veins and dark margins. Underside is paler with similar markings. Larva is blue-green with a dark line along its back and a yellow line down the sides.

### HABITAT AND DISTRIBUTION

Meadows, grassy banks and woodland edges, at up to 1,800m. Throughout Europe including Britain (absent in Ireland), to southern Scandinavia.

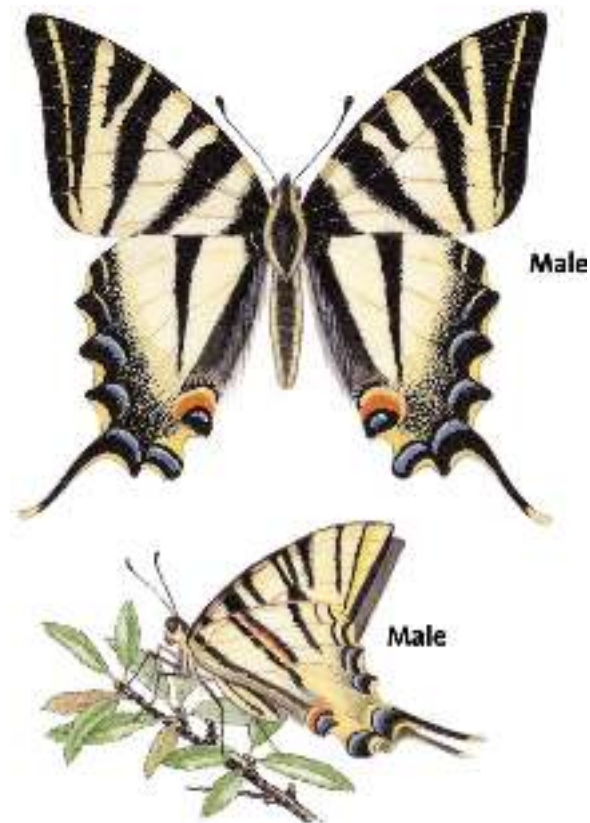
### FOOD AND HABITS

Flies June–August. Only one brood in Britain and other northern areas, 1–3 elsewhere. Larvae feed on grasses such as Cock's-Foot. Overwinters as a larva.

# Scarce Swallowtail

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## *Iphiclides podalirius*



### **SIZE AND DESCRIPTION**

Forewing 40mm in male. Female is a little larger. Sexes are similar – very pale creamy yellow with black markings, and six stripes on the upper forewing. Larva looks like a green slug with faint yellow stripes.

### **HABITAT AND DISTRIBUTION**

Often in fruit orchards at up to 1,800m. Southern and eastern Europe. Vagrants occur in Britain very rarely.

### **FOOD AND HABITS**

Flies March–September. Two broods a year. Larvae feed on Blackthorn and fruit trees.



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