Observatree
monitoring tree health

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‘**Host of the month**’ is a series of information sheets and blogs that highlight a tree host and their associated priority pests and diseases that are best seen and recorded in that month. For April we’re looking at oak (*Quercus* species) and acute oak decline.

Oak trees are deeply connected to the history of Britain; the Magna Carter was written in oak gall ink, King Charles II reputedly hid in an Oak tree following the Battle of Worcester (as a result The Royal Oak is one of the top three pub names in the England, incidentally Charles II’s birthday is commemorated by Oak Apple Day on May 29th), and ‘Heart of Oak’ is the official anthem of the Royal Navy. Oak has also been one of the most important broadleaf timber trees grown in Britain, particularly for use in buildings like Salisbury cathedral, and ship building. Henry VIII’s warship, Mary Rose is estimated to have used timber from 600 mature oak trees sourced from across southern England,

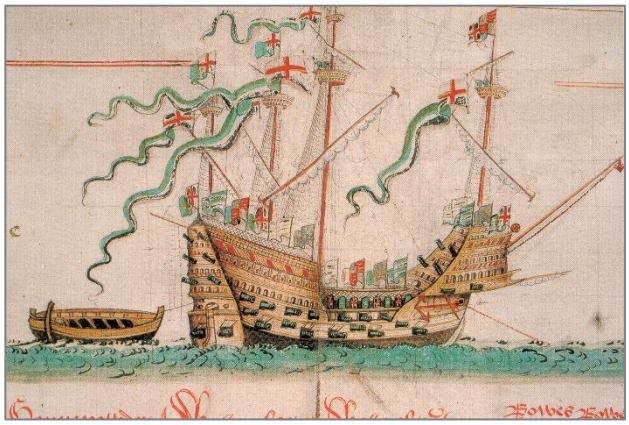

Figure 1*:* The Mary Rose depicted in the Anthony Roll *(Photo by Gerry Bye, original The Anthony Roll of Henry VIII's Navy: Pepys Library 2991 and British Library Additional MS 22047*

Britain has two native species; pedunculate oak (*Quercus robur* L.) and sessile oak (*Q. petraea* (Matt.) Liebl.) as well as the hybrid between the two (*Q.* x *rosacea* Bechst.). Other oak species have been introduced over the years, the most often seen are Turkey oak (*Q. cerris*), holm oak (*Q. ilex*) and red oak (*Q. rubra*). All belong to the Fagaceae family along with beech (*Fagus sylvatica*) and sweet chestnut (*Castanea sativa*), characterised by catkin-like male flowers and nuts contained in a cup-like structure. Oaks are the most numerous Genus in the family with around 600 species currently described.

Separating the two native species isn’t always easy and they hybridise readily, the hybrids being unhelpfully variable. There is no single defining character, instead a range of characters must be considered together. In winter and early spring you are limited to bud characters (fig. 3), leaf litter and cupules with attached peduncles (flower or fruit stalks). The table below gives some of the key differences of the four most commonly seen oaks.

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	Pedunculate	Sessile	Turkey	Red
Winter buds	Reddish-brown, <20 scales, few-no hairs (x10 lens)	Pale grey-brown, >20 scales, usually hairy (x10 lens)	Grey, minutely hairy (x20 lens). Many wispy stipules	Dark reddish brown, acute, off-white hairs.
Leaf base	With auricles (ear-like lobes)	Cuneate (wedge shaped)	Cuneate	Narrow to broad cuneate
Hairs on leaf underside	Hairless or a few simple hairs only	Large and small star-shaped (stellate) hairs amongst simple hairs (x10-20 hand lens)	Many stellate hairs, mainly on the underside. Leaves often feel slightly rough.	Pale brown tufts in in the angle between raised veins (axillary hairs).
Petiole (leaf stalk)	0-1 cm	1.5-2 cm	1-2 cm	1-4 cm
Peduncle (cupule stalk) mature length	3-10 cm	0 – 2 cm	N/R	N/R
Cupule	Scaly	Scaly	'Mossy'	Scaly, shallower cup than the others.

Table adapted from the BSBI Plant Crib.

Figure 2: *Q.robur* leaf base with auricles and short petiole (left) and *Q. petraea* cuneate leaf base with longer petiole (right).

Figure 3: Clockwise from top left - *Q. robur, Q. petraea, Q. rubra, Q. cerris*

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Figure 4: *Q. robur* cupule with long peduncle (left), *Q. petraea* cupule with very short peduncle (middle), and the 'mossy' cupule of *Q. cerris* (right).

For more guidance on the identification of the native oaks and the hybrid the Botanical Society of Britain and Ireland Plant Crib is a useful guide. A more detailed key on all oak species can be found at the Ghent University website along with some excellent photos.

Priority disease - Acute oak decline (AOD)

AOD is a complex condition affecting oaks over 50 years old and is caused by a combination of bacteria, the oak jewel beetle (*Agrilus biguttatus*) and environmental stress such as drought. The bacteria *Brenneria goodwinii*, *Gibbsiella quercinecans*, *Rahnella victoriana* and *Lonsdalea brittanica* work together as part of a pathobiome (a community of host-associated microbes associated with reduced health in the host) which becomes more pathogenic in the presence of the oak jewel beetle larvae. Although tree death can occur 5-6 years after symptoms first appear it is not a foregone conclusion; bleed sites on around 40% of trees affected by AOD callus over and the trees appear to recover.

Of the species commonly seen in Britain and Ireland pedunculate and sessile oak are the most commonly affected but Turkey and red oaks have also presented with symptoms. As of March 2026 most cases have been found in south-eastern, central and eastern England, the Welsh Borders and south-east Wales. It hasn't yet been reported in Scotland or Northern Ireland.

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Identification

The most visible indicator for AOD is the presence of multiple vertical cracks in the bark and associated bleeds of dark fluid which can appear anywhere along the whole length of the trunk (fig. 5). Individual bleed points are not linked and can occur around the entire girth of the tree or restricted to one or two sides. The activity of bleeds appears to be seasonal and they can dry up, sometimes callusing over completely.

Figure 5: Moderate stem symptoms (left) and severe stem symptoms (right) ©Crown copyright. Forest Research

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Figure 6: Characteristic D-shaped exit holes (left) in Oak bark made by mature oak jewel beetles (right) ©Crown copyright. Forest Research

There is also a strong association with the D-shaped exit holes of the oak jewel beetle (fig. 6) which are often seen in close proximity to the bleeds. Canopy dieback is common where stem bleeds are frequent, disrupting water and nutrient movement in the tree.

Lookalikes (fig. 7)

Bacterial wetwood, also known as slime flux, is usually associated with a single watery bleed patch from a large vertical crack in the trunk. The bleeds may have a yeasty smell.

Phytophthora cambivora and ***P. cinnomomi*** are both both found on Oaks and these give rise to large lesions which are not associated with bark cracks and there are usually fewer bleeds present.

Honey fungus (*Armillaria species*) can also cause stem bleeds on Oaks but they are usually in a distinct patch which starts at the base of the trunk. The patch often has bleeds between most of the bark plates and progresses up the trunk forming a triangular 'capital A' shape. Like bacterial wetwood bleeds those caused by Honey fungus may have a brewing type smell but it's more alcoholic than yeasty.

Figure 7*:* (Left to right) Bacterial wetwood, *Phytophthora cinnamomi* on *Q. cerris*, and Honey fungus (*Armillaria sp.)* symptoms. ©Crown copyright. Forest Research

Oaks in Britain are hosts for a number of other pests and diseases, some already present (e.g. Oak processionary moth) and potential future pests (e.g. Oak lace bug).

Reporting

AOD, OPM and Oak lace bug are Observatree priorities so please report suspected sightings via TreeAlert.

For more information and resources for the pests and diseases of oak please check the Observatree website.

Matt Parratt, Forest Research, March 2026