

**Witches' Brooms in Damson *Prunus insititia* trees in the Vale of Evesham.**

Gary Farmer and Terry Knight



01. Damson brooms in old hedge at Hipton Hill 14.11.18.

The Vale of Evesham and surrounding area (the Vale) is synonymous with fruit growing, particularly Plums *Prunus domestica* and to a lesser extent Damsons *Prunus insititia*/*Prunus domestica* subsp. *insititia*. Damsons were grown commercially in the Vale, the majority going to Evesham to be made into jam but this trade petered out after the Second World War, continuing to decline through the 1960's in the face of cheap imports and reduction of available labour for harvesting etc. The plum and damson orchards that dominated the area through the 20<sup>th</sup> century have in the most part been lost; grubbed out to grow other crops, cleared for housing or declined due to neglect, leaving a scattering of old orchards and a few new commercial plots. One feature of the Vale which survives as a reminder of the fruit growing heyday is the large number of Damson trees in old hedgerows. These are particularly noticeable during the winter when the leaves have fallen as almost all these old Damson trees bear dense twiggy growths known as witches' brooms (01 & 02). The amount of infestation on a tree varies greatly, from a single small hand-sized tuft to a dense covering of globular growths as large as footballs, obscuring the rest of the tree.

We needed to be sure that the trees in question were Damson so Terry Knight studied 26 affected trees from different locations and situations. The trees bore occasional spines and the twigs were densely covered in very short hairs (x10 lens) with the leaf stalks having fairly sparse longer hairs. Some ripe fruit was collected from a few of these trees in early September in order to identify the taxon. Three fruits were collected for examination from each of the 26 trees and a typical ripe fruit is shown in 03. These were bluish-black in colour with a bloom and had a pleasant taste, with the flesh of the fruit initially adhered to the stone but generally became free on ripening.

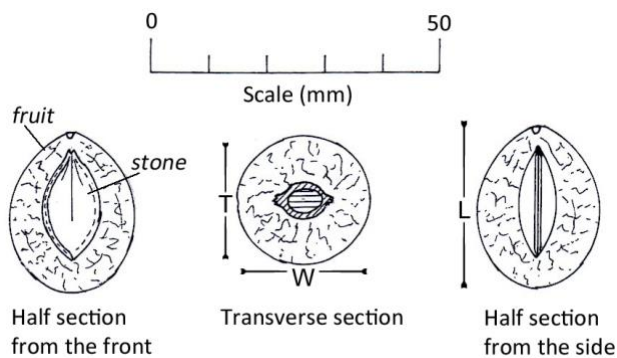


02. Typical witches brooms on damsons Hipton Hill 19.10.18.



03. Typical Damson fruit & stone.





04. Typical Damson fruit. Terry Knight.

An analysis of the 78 fruits gave 95% confidence limits on the size and shape of the fruits and stones and measurements were recorded as Length (L), Width (W) and Thickness (T) (04) for each fruit and stone.

Measurements (mm) of individual fruits ranged from (L- 21, W- 18, T- 17) to (L- 31, W- 26, T- 25)

This worked out as percentages from (L - 100, W - 85.7, T - 81) to (L - 100, W - 83.9, T - 80.6)

Measurements (mm) of individual stones ranged from (L- 16, W- 10, T- 6) to (L- 21, W- 12, T- 8)

This worked out as percentages from (L- 100, W- 92.3, T- 88.5) to (L- 100, W- 83.3, T- 76.7)

These findings suggest that the taxon was broadly *Prunus domestica* ssp. *insititia* (Damson, Bullace).

The witches' brooms of birch trees are a common sight in many areas and are a gall most commonly caused by the fungus *Taphrina betulina* which is well documented (e.g. Chinery 2011). Finding any reference to the brooms of Damsons however, proved to be more difficult. The gall known as Pocket Plum, a distortion of Blackthorn *Prunus spinosa* fruits or Sloes is caused by the fungus *Taphrina pruni* and there are several other *Taphrina* gall-causers noted in the New Naturalist books on Plant Galls (Redfern 2011) and Fungi (Spooner & Roberts 2005) but none are credited with causing the brooms in Damsons. Eventually after searching the Internet, a page was found on the site *Plant Parasites of Europe* which mentions witches' brooms on *Prunus domestica* subsp. *Insititia* (*Prunus insititia*) and credits the growths to the fungus *Taphrina insititiae* (Sadebeck) Johanson, 1886. It describes the galls as "an abnormal thickening of the twigs and the development of dense witches' brooms." We had surely found the gall causer of the Vale's Damson trees. The website does state though that the galls lead to sterility, but we have not necessarily found this to be the case, with some fruit being produced by even the most heavily infected trees (05). In 2018 when the main survey took place, the amount of fruit did not seem to bear any relationship to the proportion of brooms on a tree.



05. Damson fruit on witches' broom Hipton Hill 07.09.18.

Most of the affected Damson trees are found in old hedgerows but there are still a few remnant orchards including a particularly nice example adjacent to the Avon at Evesham Country Park (06 & 07) and approximately 40 trees adjacent to the Harvington Brook near Harvington. An old mixed Plum and Damson orchard near Chadbury is managed on a semi-commercial basis where the brooms are pruned out of the trees but they always return.



06. Blossom and brooms Evesham Country Park 20.04.18



07. Old Damson orchard Evesham Country Park.

Affected trees were noted by Gary Farmer during 2018 from Evesham westwards to Pershore and north of the Avon into the Lenches, these are shown in Table 1.

**Table 1** A few locations of broom-producing *Prunus* trees as noted by Gary Farmer in 2018.

Location and Grid Reference	Details
Hipton Hill Orchard SP026 482	Many trees in hedgerows around outside of the orchard.
Wood Norton SP00707 47476 to SP01112 47414	Many roadside hedgerow trees
Station Road, Fladbury SO9941 4710	5 or 6 trees along roadside
Fladbury Community Orchard SO991 467	Trees along Public Right of Way
Harvington SP0501 4918	Few roadside trees
Harvington SP04811 48863	Approx. 40 trees adjacent to the Harvington Brook
The Valley at Evesham Country Park SP04837 46644	Over 100 trees adjacent to the River Avon
Chadbury SP024 472	Old mixed Plum and Damson orchard.
Tiddle Widdle island, Wick SO96844 47175	Few trees remaining of an overgrown Damson orchard on small former SSSI island in the river Avon

Between mid-February and the end of April 2018 a more thorough survey was carried out in the south-east of the county by Terry Knight who found roughly 1,450 of these affected trees. The survey area comprised that part of Greater Worcestershire south and east of the River Avon, downstream as far as Evesham, including, among others, the parishes of Cleeve Prior, Pebworth, Broadway, Sedgeberrow and the east part of Ashton under Hill.

Terry also noted affected trees near the river Arrow between Wixford and Arrow, Warwickshire around SP084 553 which were the most northerly recorded brooms on Damson trees during this survey.

A few old orchards that are affected by witches' brooms remain in use in the survey area. Most of these are entirely of Damsons but one sizeable one was a mixture of Damsons and other plums. There are also a few such orchards that are now derelict and abandoned. However, most of the affected trees were found in boundary hedges

where orchards had formerly been. Occasionally isolated trees, or small groups of trees, were seen in hedgerows away from any known former orchards and also some were noted growing in gardens.

The two main areas having affected trees were: the dip slope of Cleeve Hill from Cleeve Prior through the Littletons to Blackminster; and the area between Aldington, Badsey, Wickhamford and Bengeworth. The approximate number of witches' broom trees seen in each parish is given in Table 2.

**Table 2** Approximate number of *Prunus* trees affected by witches' brooms fungus in south-east Worcestershire as surveyed by Terry Knight

Aldington	215
Ashton under Hill (in SP03)	13
Aston Somerville	0
Badsey	198
Bengeworth	181
Bickmarsh	0
Bretforton	100
Broadway	7
Childswickham	24
Church Honeybourne	26
Cleeve Prior	192
Cow Honeybourne	9
Hampton (east of River Isbourne)	52
Hinton on the Green (east of River Isbourne)	19
North & Middle Littleton	179
Offenham	31
Pebworth	21
Sedgeberrow	88
South Littleton	23
Wickhamford	79
SUM	1,457

It is worth noting that only two Birch trees affected by witch's broom were noted during the survey. One was a *Betula pendula* (Silver Birch) at Badsey (SP07304379) located in a planted(?) strip between an estate road and the B4085. The other was an

undetermined *Betula* taxon in a garden at Ashton under Hill (SP 00403763).

**References.**

Plant Parasites of Europe

<https://bladminerders.nl/parasites/fungi/ascomycota/taphrinomycetes/taphrinales/taphrina/taphrina-insititiae/> [Accessed 16.11.18]

Chinnery, M. 2011. *Britain's Plant Galls. A Photographic Guide*. WildGuides Ltd, Hampshire.

Redfern, M. 2011. *Plant Galls*. New Naturalist series, Harper Collins, London.

Spooner, B. & Roberts, P. 2005. *Fungi*. New Naturalist Series, Harper Collins, London.

**Images**

01. Damson brooms in old hedge at Hipton Hill 14.11.18.

02. Typical witches' brooms on damsons Hipton Hill 19.10.18.

03. Typical Damson fruit & stone.

04. Typical Damson fruit. Terry Knight.

05. Damson fruit on witches' broom Hipton Hill 07.09.18.

06. Blossom and brooms Evesham Country Park 20.04.18.

07. Old Damson orchard Evesham Country Park.