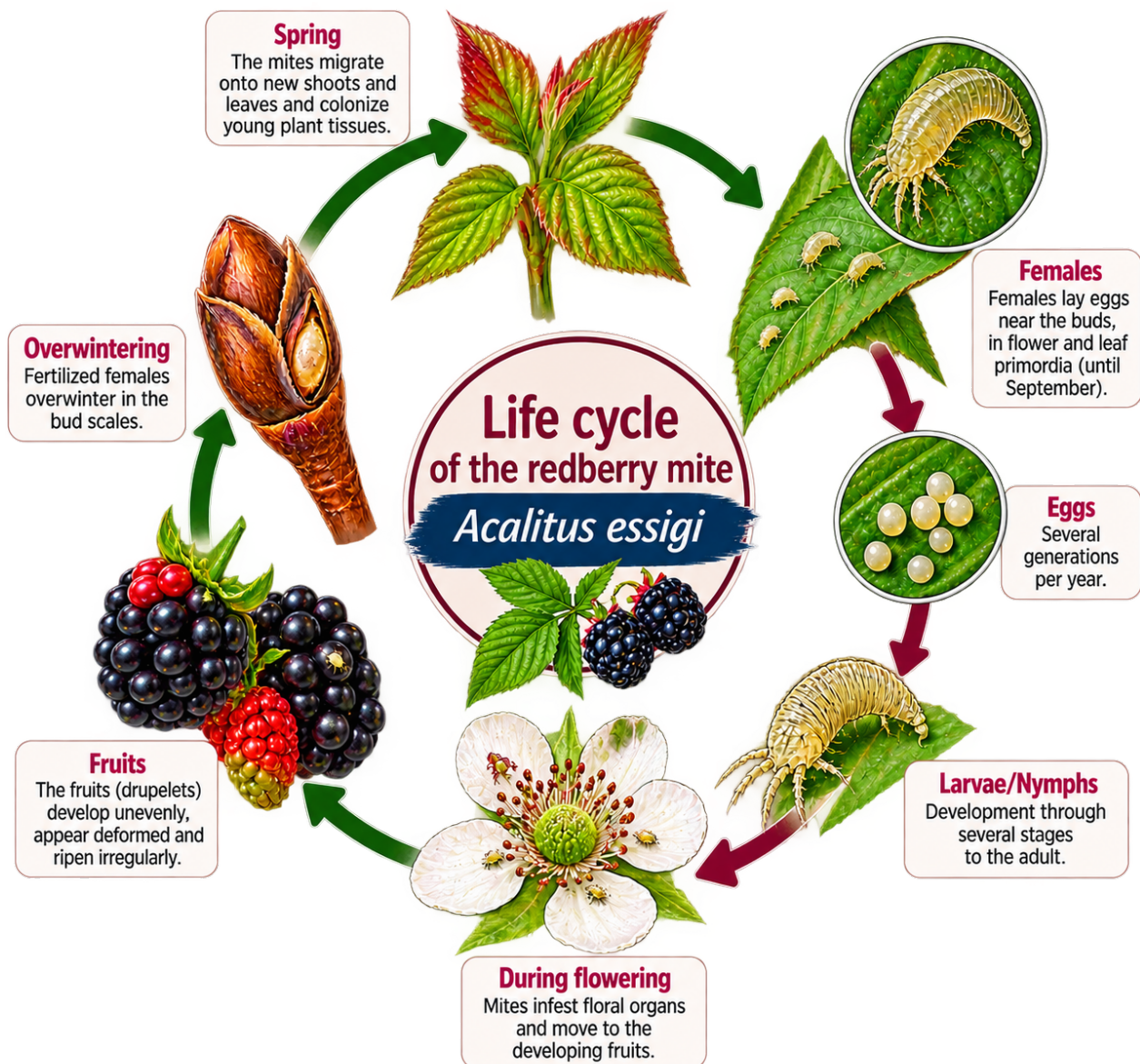


Redberry mite

Acalitus essigi (Hassan, 1928)

European overview of distribution, biology, reproduction, overwintering, damage potential, diagnosis and management

Focus: *Rubus* spp., particularly cultivated and wild blackberries



1. Profile

Acalitus essigi is a tiny eriophyid mite in the family Eriophyidae. It is specialized on *Rubus* and is particularly associated with the so-called “redberry disease”, or blackberry ripening disorder. The mite is microscopic and therefore difficult to detect long before fruit symptoms become visible.

Scientific name	<i>Acalitus essigi</i> (Hassan, 1928)
Family	Eriophyidae – eriophyid mites
Host plants	Primarily <i>Rubus</i> spp.; cultivated and wild blackberries
Body size	Depending on the source, about 0.10–0.20 mm; very small, whitish to yellowish-translucent, spindle-/worm-shaped mite
Overwintering	Primarily in/on bud scales and inside buds; additionally in leaf axils, bark/cane crevices and fruit mummies
Main damage	Drupelets remain green, red or reddish-green, firm and fail to ripen normally
Significance	Usually of minor importance on foliage, but potentially substantial fruit-quality and yield losses in blackberries

2. Taxonomy and nomenclature

Accepted name: *Acalitus essigi* (Hassan, 1928). In older literature, the synonyms *Eriophyes essigi*, *Aceria essigi* and *Phytoptus essigi* are also found. The species belongs to the Eriophyidae within the eriophyid mites (Eriophyoidea). As is typical of eriophyids, it has only two pairs of legs.

Important note on the name: Despite the German common name “Brombeergallmilbe” (blackberry gall mite), the species does not necessarily produce conspicuous plant galls like many other eriophyid mites. The characteristic problem is instead the disruption of development and ripening of individual drupelets of the blackberry.

3. Occurrence and distribution in Europe

Overall picture: The available taxonomic and plant-protection literature describes *Acalitus essigi* as widespread in Europe. The EPPO database lists the species under the code ACEIES; GBIF summarizes the known distribution as “widespread in Europe”. The European distribution is therefore considerably broader than individual national records may suggest.

Documented European records/references:

- United Kingdom: historical records from England; known since the 1930s as the cause of “red berry disease”. Later British studies confirmed the species on *Rubus fruticosus* agg.
- Germany: repeatedly described as a blackberry pest, including in German plant-protection and horticultural sources and historical biological studies.
- Austria and Switzerland: listed in European literature as countries with records.
- Poland: first recorded in 1983/84 near Skierniewice; the species was found there on damaged blackberry plants.

- France: current French plant-protection information lists *A. essigi* as a European pest of *Rubus* and describes its development in inflorescences and fruits.
- Spain: current Spanish cultivation guidance describes *A. essigi* as a common pest of blackberry crops and attributes the characteristic ripening damage to the mite.
- Other European countries: The broader European distribution reported by GBIF/EPPO shows that the species is not restricted to the countries listed above. For many countries, however, easily accessible, up-to-date primary records are lacking.

Assessment of the data: “Widespread in Europe” does not mean that equally current and detailed documentation exists for every European country. For tiny, concealed eriophyid mites, records also depend strongly on the sampling method and on targeted searching.

3.1 Country overview – currently documented literature evidence

Country/region	Evidence	Assessment
United Kingdom	historical + current	Well documented; known in England since the 20th century as a blackberry pest.
Germany	multiple records	Plant-protection advice and technical literature describe <i>A. essigi</i> as a relevant blackberry pest.
Austria	literature record	Historically listed in European literature as an affected country.
Switzerland	literature record	Historically listed as an affected country.
Poland	first record 1983/84	Record on Thornless Evergreen near Skierniewice; biology additionally studied there.
France	technical information	<i>A. essigi</i> is listed as a European <i>Rubus</i> pest.
Spain	technical information	Cultivation guidance describes <i>A. essigi</i> as a common blackberry pest.
Rest of Europe	broader distribution	GBIF/EPPO: widespread in Europe; current country-level data are uneven.

4. Host plants

The main hosts are species and cultivars of the genus *Rubus*. Cultivated and wild blackberries are particularly affected. The species can colonize a range of *Rubus* species; published records include, among others, the *Rubus fruticosus* aggregate and other blackberry species.

Raspberry: Several plant-protection sources do not regard *A. essigi* as an economically important pest of raspberry. Therefore, an observation on *Rubus* should not automatically be interpreted as *A. essigi* infestation of raspberry.

5. Identification features

- Adults are approximately 0.10–0.20 mm long; some sources give about 115–130 µm for adults.
- Body spindle-shaped/worm-like, whitish to pale yellow or translucent.
- Only two anterior pairs of legs – typical of Eriophyidae.

- Practically impossible to identify reliably with the naked eye; diagnosis requires at least about 20× magnification, preferably stereomicroscopy or suitable extraction methods.
- Diagnosis based on the damage symptoms is considerably easier than direct visual identification of the mite.

6. Biology and annual life cycle

Acalitus essigi lives mainly in protected microhabitats on the blackberry plant. During the year, the species uses different structures: buds, leaf axils, leaf/bract areas, flowers and finally the spaces between the drupelets.

Stage	Typical period*	Location	Significance
Winter	Autumn to bud break	Buds/bud scales; leaf axils; cane crevices; fruit mummies	Survival; population greatly reduced
Early spring	approx. March–April (Central Europe)	Expanding buds and young shoots	Migration from overwintering sites; build-up of spring population
Pre-flowering/flowering	Spring	Leaf undersides, petiole/axil areas, flower buds, sepals	Reproduction and movement toward fruit
Fruit development	Early summer–summer	Fruit receptacle and spaces between drupelets	Main damage phase; disruption of ripening of individual drupelets
Late summer	Summer–early autumn	Fruit, buds and protected cane tissues	Population may peak; symptoms become apparent
Autumn	After harvest/leaf fall	Return to protected structures	Preparation for overwintering

* *Timing varies with climate and cultivar; the dates are intended as a Central European guide.*

7. Reproduction and population dynamics

The species can reproduce very rapidly during the season. German technical information gives about 8–10 overlapping generations per year under favorable conditions. At the same time, more recent literature indicates that quantitative data on the exact egg-to-egg duration or generation time under different conditions are limited. Therefore, 8–10 generations should be regarded as a practical guideline rather than a universally constant figure.

Oviposition: Eggs are laid in protected areas of young plant tissues; studies have also documented eggs in overwintering buds. In spring, the expanding shoots are colonized. Populations can become highly concentrated within protected microhabitats.

Population structure: A detailed study on European blackberry showed a strongly aggregated distribution. On primocanes, mites were particularly common in the lower fifth; in spring, colonization of young shoots occurred mainly from overwintering sites in the lower third of the previous year's canes. This indicates relatively limited active dispersal over longer distances.

8. Overwintering

Overwintering is particularly important for management. The mites do not remain exposed on the plant but use protected structures.

- under or between bud scales and deep inside buds
- in leaf axils and protected areas on canes
- in bark/cane crevices
- in unharvested, dried fruit mummies
- partly also in living fruits or young shoots

Winter mortality: The population declines markedly during autumn and winter. However, studies show that buds in particular serve as important protected overwintering sites and sources for spring colonization. One study observed slowly reproducing colonies in buds during winter.

9. Damage symptoms and damage potential

Characteristic symptoms: Individual blackberry drupelets remain green, red or reddish-green while other drupelets of the same aggregate fruit ripen normally to black. Affected drupelets often remain firm, dry and poor in flavor.

- Delayed ripening or failure to develop the normal black coloration
- red or reddish-green, firm drupelets within otherwise ripe blackberries
- Fruits may shrivel, dry out and become inedible or unmarketable
- under heavy infestation, a very large proportion of the fruit crop may be affected
- Leaf damage is generally of much lower economic importance; under heavy infestation, small pale spots may occur on leaves

Economic importance: The economic relevance lies primarily in fruit quality rather than in general weakening of the plant. In commercial production, the damage can nevertheless be considerable because even a small proportion of incompletely ripened drupelets reduces marketability and visual quality. Late-ripening blackberry cultivars may be particularly problematic.

Regarding the magnitude of yield losses: Sources outside Europe describe substantial losses under heavy infestation; figures such as 10–50% should not, however, be treated as a general European standard value. Actual damage depends strongly on cultivar, infestation pressure, weather, crop management and the timing of control measures.

9.1 How does the ripening disorder develop?

The mites remain well protected at the fruit receptacle and between the drupelets, where they feed on developing fruit tissues. Sources also describe the release of substances/toxins during feeding that interfere with normal ripening of affected drupelets. The result is the characteristic “redberry” symptom.

Important: Not every red or poorly ripening blackberry is automatically caused by *A. essigi*. Physiological ripening disorders, sun/UV damage and other causes can produce similar

symptoms. In unclear cases, reliable diagnosis should therefore be based on microscopic examination.

10. Diagnosis and monitoring

Examination of overwintering buds is particularly useful for reliable monitoring. An Australian study showed that *A. essigi* can be detected more readily in overwintering buds than in fruit. Direct examination of fruit is possible, but difficult because of the mites' tiny size and their protected position between the drupelets.

Method	Advantage	Limitation
Symptom monitoring	Quick and easy in the field	Does not reliably distinguish other ripening disorders
20× hand lens	Simple field detection	Mites are tiny and difficult to find in protected sites
Stereomicroscopy	Much better direct diagnosis	Material must be specifically collected from buds/fruits
Winter bud examination	Good time for detecting infestation and assessing risk	Time-consuming; experience required
Fruit extraction	Can provide quantitative assessment	Method-dependent; not all mites are recovered equally well

11. Factors favoring infestation and damage

- high initial infestation pressure carried over from previous seasons
- remaining fruit mummies as possible overwintering and refuge sites
- dense, poorly ventilated stands with many protected microhabitats
- warm, dry weather periods may favor population development; the precise effect varies by region and year
- late-ripening or particularly susceptible cultivars may show greater economic impact
- infestation may go unnoticed because the mites live concealed and are microscopic long before fruit symptoms appear

12. Management and prevention

The most important principle is to reduce overwintering sources and detect infestations as early as possible.

Timing	Measure
After harvest	Remove spent fruiting canes; do not leave infested or dried fruits on the plants.
Winter	Consistently prune out heavily infested or old canes and remove them from the crop.
Before bud break	Where infestation occurred in the previous season, specifically inspect overwintering buds and the bud-break zone.
Spring	Monitor early, before mites move into flowers and young fruit.
Cultivar choice	In commercial production, consider regional experience with cultivar susceptibility.

Crop management	Good air circulation and open, easily monitored plantings support monitoring.
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Plant protection: Authorizations and conditions of use are national and may change over time. For Germany, current plant-protection databases list indications against eriophyid mites on blackberry/raspberry or cane fruit. Before application, always check the currently valid authorization, crop, indication, application rate, pre-harvest interval and restrictions. Active ingredients mentioned in older literature are not to be understood as current recommendations.

Beneficial organisms: Predatory mites can affect *A. essigi*. Unnecessarily broad-spectrum plant protection should therefore be avoided, particularly where preservation of beneficial-mite populations is desired.

13. European perspective

The European picture is relatively clear: *A. essigi* is not a blackberry pest restricted to a single region, but a widespread Rubus-associated eriophyid mite. Historical records from the United Kingdom, Germany, Austria, Switzerland and Poland, together with current technical information from France and Spain, show that the species occurs across different European climatic regions.

At the same time, the data are uneven. For many countries there are no easily accessible, current publications on population density or economic damage. The absence of a recent report therefore does not mean that the species is absent.

Of particular relevance to Central Europe: The species occurs on both cultivated and wild blackberries. Wild stands may therefore act as reservoirs from which nearby cultivated areas can be colonized. Because active dispersal within the plant may be relatively limited, infested plant material, canes and fruit mummies, as well as the proximity of suitable hosts, are likely to play an important role.

14. Differentiation from other causes

Cause	Typical appearance	Differentiation
<i>Acalitus essigi</i>	Drupelets remain red/green and firm; uneven ripening	Mites detectable in buds/fruit receptacle
Physiological ripening disorder	Ripening may be uneven	No mite detection; course may be weather-dependent
UV/sun stress	Discoloration or ripening disorders	No typical concentration of mites in buds/fruit
Other eriophyid mites	Leaf/fruit symptoms depending on species	Reliable species identification requires microscopy

15. Conclusion

Acalitus essigi is a tiny but economically relevant blackberry mite. Its particular importance results from spending most of its life in protected plant structures, making it difficult to see. The most conspicuous symptom appears only when the fruit ripens: individual drupelets remain red or green and firm while the rest of the blackberry ripens normally.

For practical management, three points are crucial: first, monitor buds and young shoots in spring; second, consistently remove infested fruit mummies and old infested canes; and third, diagnose infestations early, before flowering. For a reliable European-wide assessment, it should be kept in mind that although the species is considered widespread, current quantitative infestation data vary greatly by region.

16. Selected sources and literature

EPPO Global Database – *Acalitus essigi* (ACEIES)

<https://gd.eppo.int/taxon/ACEIES>

Taxonomy, synonyms and EPPO classification.

GBIF – *Acalitus essigi*

<https://www.gbif.org/species/119404614>

Distribution described as “widespread in Europe” and British records.

Fauna Europaea / PESI – *Acalitus essigi*

[https://www.eu-](https://www.eu-nomen.eu/portal/taxon.php?GUID=urn%3Aisid%3Afaunaeur.org%3Ataxname%3A94454)

[nomen.eu/portal/taxon.php?GUID=urn%3Aisid%3Afaunaeur.org%3Ataxname%3A94454](https://www.eu-nomen.eu/portal/taxon.php?GUID=urn%3Aisid%3Afaunaeur.org%3Ataxname%3A94454)

Accepted taxon name and European taxon record.

Davies, J. T., Allen, G. R. & Williams, M. A. (2001). Intraplant distribution of *Acalitus essigi* on blackberries.

<https://pubmed.ncbi.nlm.nih.gov/12171272/>

Important study on microhabitats, aggregation, overwintering and spring dispersal.

Łabanowski, G. S., Łabanowska, B. H. & Suski, Z. W. – New species of mites in the fauna of Poland.

https://agro.icm.edu.pl/agro/element/bwmeta1.element.agro-3e0f474b-ceb4-47a2-b218-9b2b64e2a0da/c/Zeszyt_Probl_Poste_Nau_Rol_r.1990_t.373_s.9-17.PDF

First Polish record and early biological observations.

University of California IPM – Redberry Mite

<https://ipm.ucanr.edu/agriculture/caneberries/redberry-mite/>

Biology, overwintering, host plants and symptoms.

RHS – Red berry mite

<https://www.rhs.org.uk/biodiversity/red-berry-mite>

Practical information on activity period, symptoms and management.

Chamber of Agriculture North Rhine-Westphalia – Blackberry gall mite

<https://www.landwirtschaftskammer.de/presse/aa-2016-10-02.htm>

German practical information on overwintering, symptoms and pruning measures.

Weihenstephan-Triesdorf University of Applied Sciences – Blackberry gall mite

https://www.hswt.de/fileadmin/Redaktion/Hochschule/Organisation/Zentrale_Einrichtungen/Weihenstephaner_Gaerten/Pflanzenschutz/Brombeergallmilbe.pdf

Morphology, host plants and damage.

Schleswig-Holstein / Plant Protection – Pest information

<https://www.schleswig-holstein.de/DE/fachinhalte/W/wald/Downloads/SchaderregerInfoblaetter.pdf>
Biology, overwintering and damage potential.

Hortipendium – Blackberry gall mite

<https://www.hortipendium.de/Brombeergallmilbe>
Practice-oriented summary of the annual cycle and 8–10 generations.

INRAE Ephytia – Plant Protection Encyclopedia

<https://ephytia.inrae.fr/fr/C/20297/Hypp-encyclopedia-des-plantes>
French classification of *A. essigi* as a *Rubus* pest.

PSInfo – Plant-protection indications in Germany

<https://obstbau.pflanzenschutz-information.de/Suche?anwendungsbereich=&kultur=Rubus+fruticosus&schaedling=Acalitus&typ=integriert>
Current German authorization/indication overview; always check the current authorization before application.

Sampling, extraction and incidence of redberry mites (2020)

<https://pubmed.ncbi.nlm.nih.gov/32500392/>
Sampling/extraction methods and infestation relationships on wild and cultivated blackberries.

Use note

This compilation is a scientifically oriented literature review and not individualized plant-protection advice. For plant-protection measures, only applications currently authorized in the relevant country and their official instructions are legally applicable. Active ingredients or control trials mentioned in historical literature are not current recommendations.