



Insect fauna on and around
Zelkova abelicea



Zelkova abelicea

Zelkova abelicea (Lam.) Boiss. (family: Ulmaceae) is a relict (species that at an earlier time was abundant in a large area but now occurs in only one or a few small areas), long-lived deciduous tree species, **endemic** to the island of Crete.

It grows between 800 and 1800 m a.s.l. in all mountain massifs of Crete (Lefka Ori, Kedros, Psiloritis, Dikti and Thripti); usually mixed with maple, oak and occasionally cypress trees.

All populations are significantly **threatened** by **intensive pastoralism** (overgrazing and browsing of mainly goat and sheep livestock). Over 95% of all individuals across the island exhibit a stunted, dwarfed, shrub-like form, while only few individuals develop into fully shaped, regularly fruiting trees. Soil erosion, water stress, fire as well as climate change represent additional threat factors.

The species holds a very strong patrimonial value, as traditional shepherd walking sticks (katsounes) are preferentially made with its hard, light and durable wood. Pruning of plants and illegal collection of wood hinders the growth and development of fruiting trees.

Given the level of threat, *Z. abelicea* has been included as **Endangered** (EN) in the IUCN Red List of Threatened Species and is **protected** by the **Greek legislation**.

This leaflet outlines the findings of the insect fauna found on and around *Z. abelicea* and was investigated within the framework of the project entitled: "**Conservation of *Zelkova abelicea* in Crete**".

The insect component

Z. abelicea provides a specific microhabitat and is a shelter for many other living organisms such as insects, spiders, acarica, bryophytes, lichens and birds. Some of these organisms feed on *Z. abelicea* or use the trees for their development, reproduction or to predate on other organisms.

A wide variety of insects are found living on or around *Z. abelicea* or use the tree for part or all of their life cycle. For example, the elm leaf beetle *Xanthogaleruca luteola* (Coleoptera, Chrysomelidae) feeds on newly emerged leaves of *Z. abelicea* and other Ulmaceae species.

Several wasp (Hymenoptera) and moth (Lepidoptera) species lay their eggs on the leaves of *Z. abelicea*. This is also the case of a gall-midge species (Diptera, Cecidomyiidae) that lays its eggs within the flowers of *Z. abelicea* which will be modified and reassigned into specialized growth and feeding structures called galls.

Some insects found on *Z. abelicea* are natural enemies of other insects that may eat or damage the trees. For example, some wasp (Hymenoptera) species will parasitize the larvae of other insects that feed on plant tissues such as leaves or fruit.

Ground predator insects are also attracted to *Z. abelicea* and will eat any insect that falls off of the trees or that are found in the surrounding vegetation.

A particular group of insects found on *Z. abelicea* are invasive or alien species, which are not native from Greece and when present in large numbers may pose threat to the trees. This is the case for example of the Japanese elm aphid *Tinocallis takatchihoensis* (Hemiptera, Aphidoidea).

An annotated, though not exhaustive, list of these insects is presented below.

Xanthogaleruca luteola

(Coleoptera, Chrysomelidae) the elm leaf beetle. The larvae and adults eat leaves of *Z. abelicea*. The adults also lay their eggs on the leaves of *Z. abelicea*. This is the first report of this species for Crete.

Photo credit: F. Samaritakis t



Neophilaenus campestris

(Hemiptera, Aphrophoridae) a spittlebug found on the leaves of *Z. abelicea*.

Photo credit: F. Samaritakis t





Eulophid wasps

Hymenoptera. These wasps are parasitoids of the eggs of the elm leaf beetle (*Xanthogaleruca luteola*)

Photo credit: forestpests.org



Tetraneura ulmi

The elm sack gall aphid (Hemiptera, Aphidae) produces galls on the upper surface of leaves of *Z. abelicea*. Winged aphids emerge from the galls in June or July and colonize the roots of grasses (Poaceae) before returning to the tree.

Photo credit: E. Kechagiadakis, L. Fazan, P. Gotsiou

Lepidoptera sp.

The pupa of an unidentified moth (Lepidoptera) species was found hanging at the apex of a *Z. abelicea* leaf.

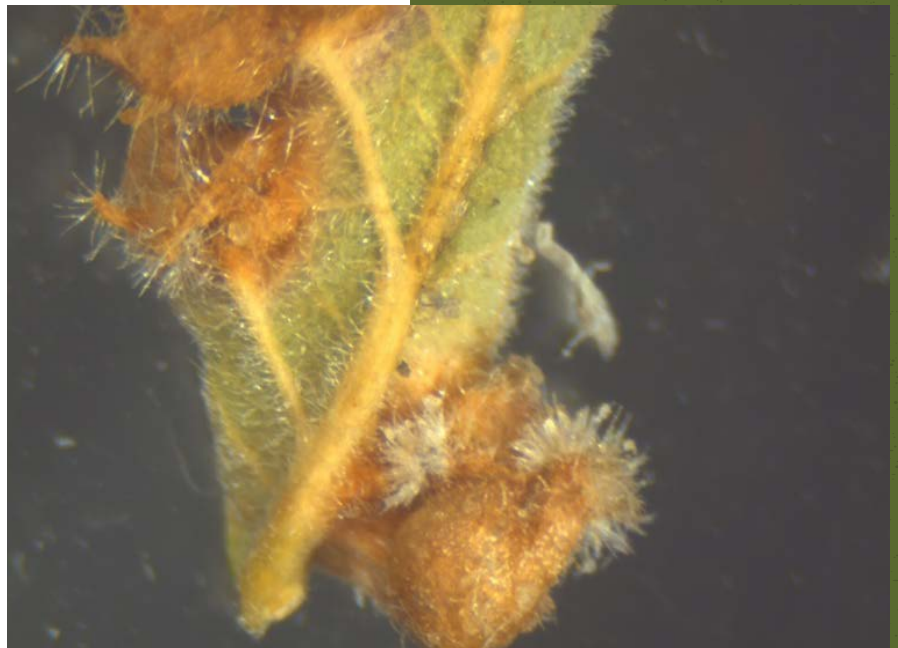
Photo credit: F. Samaritakis

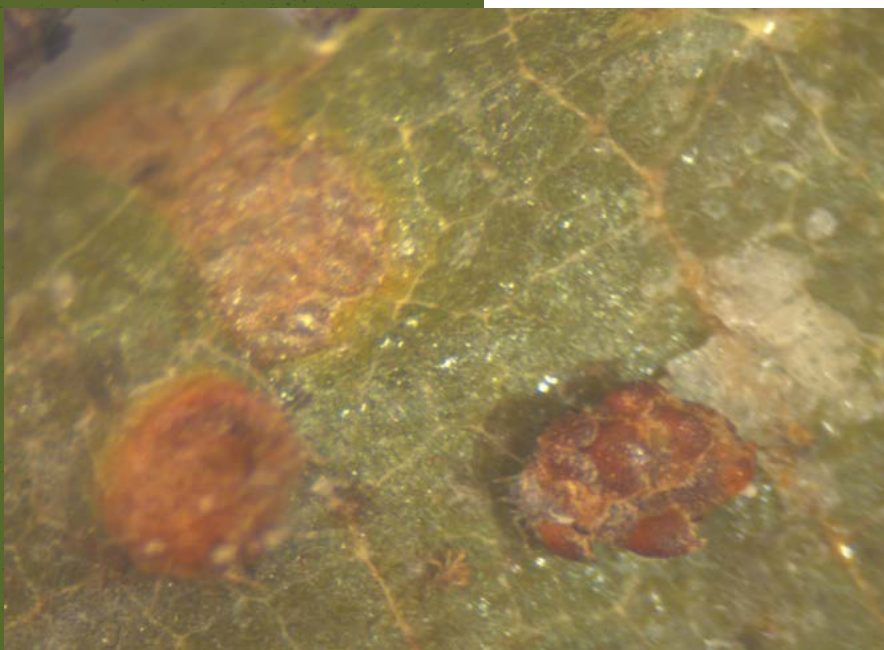


Unidentified leaf gall

An unidentified gall was found on the lateral veins of leaves of *Z. abelicea*. This structure is maybe formed by an Eriophyid mite (Acaria, Eriophyidae).

Photo credit: P.V. Petrakis





Unidentified leaf gall

Another unidentified leaf gall was found on the leaves of *Z. abelicea* and could possibly be formed by a gall wasp (Hymenoptera, Cynipidae).

Photo credit: P. V. Petrakis



Zicrona caerulea

Eggs and second instar nymphs of the blue shieldbug (Hemiptera, Pentatomidae) were found on leaves of *Z. abelicea*. The two skins (=exuvia) on the upper part of the leaf blade, belong to the first instar. This species is a predator of several beetle species and moth caterpillars.

Photo credit: F. Samaritakis



Unidentified gall midge

The larvae of an unidentified gall midge (Diptera, Cecidomyiidae) were found in galls on the flowers of *Z. abelicea*.

Photo credit: L. Fazan

Ground beetles found under *Z. abelicea* trees

These insects are predators of other insects found under *Z. abelicea* trees. - Photos credit: P. V. Petrakis



Cymindis lineata
(Coleoptera, Carabidae)



Perileptus areolatus
(Coleoptera, Carabidae)



Carabus banonii
(Coleoptera, Carabidae)



Harpalus sp.
(Coleoptera, Carabidae)



Unidentified *Carabidae* larva
(Coleoptera, Carabidae)



Cf. Platyderus graecus
(Coleoptera, Carabidae)



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