First records of the ivy scale *Aspidiotus hedericola* Leonardi, 1920 in Luxembourg (Hemiptera, Coccomorpha, Diaspididae)

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Abstract. The typically Mediterranean scale insect species *Aspidiotus hedericola* Leonardi, 1920 (Hemiptera, Coccomorpha, Diaspididae) is reported for the first time from Luxembourg. Specimens were found at six sites, infesting one of its host plants, the common ivy (*Hedera helix*). It is the second species of the genus *Aspidiotus* observed in the country, and its records increase the number of known scale insect species in Luxembourg to 48. Around one-third must be considered as introduced plant pests. Due to the still limited research into the biodiversity of scale insects in Luxembourg, and the ongoing trade of plant materials, many more species of scale insects remain to be discovered.

Keywords. Checklist, globalization, plant pest, climate change, new species.

1. Introduction

Scale insects are sap-sucking insects belonging to the infraorder Coccomorpha within the order Hemiptera. Together with the infraorders Psyllomorpha (psyllids), Aphidomorpha (aphids) and Aleyrodomorpha (whiteflies), they make up the suborder Sternorrhyncha (García Morales et al. 2016, Williams & Hodgson 2014). Scale insects represent an evolutionarily ancient group of morphologically and ecologically highly diverse holometabolous insects with a sedentary lifestyle. They are often characterized by their tight host plant associations. Individual species are therefore often linked to only a few host plants and are unable to survive for extended periods away from them. Many scale insect species are serious pests of agricultural crops, fruit trees, woody ornamentals, forest trees and indoor plants (Kosztarab & Kozár 1988). International trade and transportation of plant material is one of the most common ways in which scale insects are spreading. These insects are also among the most successful invaders of new areas (Rabitsch 2009), and many have become cosmopolitan due to human mediated dispersal (Malumphy 2009, Pellizzari & Germain 2010). Pellizzari & German (2010) further mention that non-native scale insects in Europe comprise about 30% of the total scale insect fauna, and these belong mainly to three families: Coccidae Fallén, 1814 (soft scales), Diaspididae Tagioni-Tozzetti, 1868 (armored scales) and Pseudococcidae Cockerell, 1905 (mealybugs).

In Luxembourg, 47 species are known, of which almost one-third must be regarded as non-native plant pests (Pellizari & Germain 2010, Gertsson 2016, Gertsson & Schneider 2020). Prominent examples include the cottony cushion scale *Icerya purchasi* Maskell, 1879 from Australia on citrus, the cottony camellia scale *Pulvinaria camelicola* Signoret, 1873 and the bamboo scale *Kuwanaspis pseudoleucaspis* (Kuwana, 1902) from Asia on ornamental shrubs and bamboo, respectively, and the obscure (glasshouse) mealybug *Pseudococcus viburni* (Signoret, 1875) from North America on *Viburnum* spp. plants. In our climate, several introduced species are only able to survive within

greenhouses, and as such, have been predominantly found at such locations in the country (Gertsson & Schneider 2020).

The scale insect genus *Aspidiotus* Bouché, 1833 within the hyperdiverse armored scale family Diaspididae shows a cosmopolitan distribution and currently encompasses 105 recognized species (García Morales et al. 2016). To date, among the sixteen Diaspididae species listed for Luxembourg, *Aspidiotus nerii* Bouché, 1833 is the sole *Aspidiotus* species. However, for this species a comparatively long-term occurrence record in Luxembourg exists, with evidence of its presence on various plant species and at multiple localities (Kraus 1891, Koltz 1893, Feltgen 1894, 1900, Sunnen 1907, Ferrant 1910, 1916, Gertsson & Schneider 2020). *Aspidiotus nerii* can only survive under glass in more cold areas (Gertsson & Schneider 2020). Here we report the first records of a second *Aspidiotus* species for Luxembourg – the ivy scale *Aspidiotus hedericola* Leonardi, 1920.

2. Material and methods

2.1. Sampling site and additional records

Adult females of *A. hedericola* were collected by C.-A. Gertsson on the 22.09. and 26.12.2025 from leaves of common ivy (*Hedera helix*) in the municipal park of Luxembourg-City, N49.61242, E6.121965 (Fig. 1). On the leaves the scale of the adult female is flat, circular, with the insect itself (exuvium) centrally located. The shield is translucent-white and the insect itself shows a yellowish coloration (Fig. 2). Individuals were predominantly infesting the upper side of the leaves. The sampling site was re-visited by A. Weigand on 17.02.2026 to collect further specimens for imaging. Besides these collected and slide-mounted specimens, five additional observations of *A. hedericola* can be confirmed, which all are based on images:

13.09.2024, Luxembourg-Grund, N49.61004, E6.13519 by Thierry Helminger via the iNaturalist platform. Observed on *H. helix*. Identified by B. Normark (Fig. 3).

08.08.2025, Bissen, rue de la Chapelle, N49.79127, E6.06185 by L. Burton. Observed on *H. helix*. Identified by N. Schneider & C.-A. Gertsson (Fig. 4).

13.10.2025, Luxembourg-Bonnevoie, rue de l'Égalité, N49.60861, E6.14444 by C. Reckinger. Observed on *H. helix*. Identified by N. Schneider (Fig. 5).

23.01.2026, Luxembourg-Bonnevoie, rue Nicolas Martha/rue Tony Dutreux, N49.59776, E6.14762 by N. Schneider. Observed on *H. helix*. Identified by N. Schneider & C.-A. Gertsson.

23.01.2026, Luxembourg-Bonnevoie, rue Tony Dutreux, N49.59833, E6.14916 by N. Schneider. Observed on *H. helix*. Identified by N. Schneider & C.-A. Gertsson.



Fig. 1. Habitat of *Aspidiotus hedericola* in the municipal city park of Luxembourg-City. Photo: C.-A. Gertsson (26.12.2025).

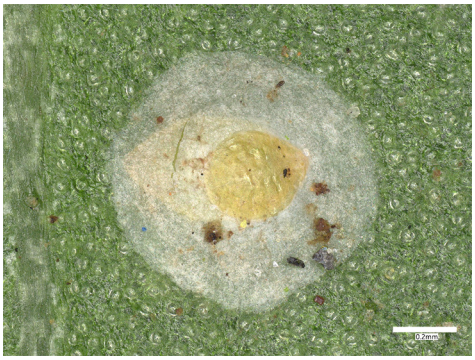


Fig. 2. Adult female of *Aspidiotus hedericola* on common ivy (17.02.2026, Luxembourg-City municipal park). Photo: A. Weigand. Scale bar: 0.2 mm.



Fig. 3. Large population of *Aspidiotus hedericola* on common ivy (13.09.2024, Luxembourg-Grund). Photo: T. Helminger via iNaturalist.

2.2. Specimen preparation and identification

The initially collected specimens from the sampling site were preserved in 80% ethanol for subsequent identification in the laboratory. The preparation involved maceration and mounting on microscopic slides using Euparal, following the established protocol of Gertsson & Schneider (2020). Morphological observations were performed using an Olympus 22LED microscope with object micrometer. The taxonomic keys of Ferris (1946) and Moghaddam & Nematian (2020) were used for specimen identification. Specimens collected on the 17.02.2026 from the sampling site were investigated and photographed with a Keyence VHX-7100 digital microscope (Fig. 2).

Aspidiotus hedericola is morphologically very similar to the closely related *A. nerii* Bouché, 1833 (Yellow palm scale insect), but the macrocanals of *A. hedericola* are much longer (Gill 1997). Samples are deposited in the microscopic slide collection of the Museé national d'histoire naturelle Luxembourg (MNHNL123427-123432).

3. Results

Aspidiotus hedericola was recorded from six sites in Luxembourg – five in Luxembourg-City, one in the town of Bissen. All records were made from common ivy (*H. helix*). Specimens from one population (municipal park in Luxembourg-City) were collected and morphologically examined, while the five other records were made based on



Fig. 4. Adult females of *Aspidiotus hedericola* on common ivy (08.08.2025, Bissen). Photo: L. Burton.



Fig. 5. Large population of *Aspidiotus hedericola* on common ivy (13.10.2025, Luxembourg-Bonnevoie). Photo: C. Reckinger.

identified photographs. The slide-mounted adult female has a broad pear shape, about 0.8 mm. The pygidium (the last posterior segment) has three well-developed lobes. The median lobes have strong notches. The ventral side of the pygidium has four groups of perivulvar pores (Ferris 1946) (Fig. 6). Some of the collected Ivy scale specimens from the municipal park of Luxembourg-City were parasitized. These parasites were most likely first instar larvae of a chalcidoid wasp (Fig. 7).

With the current finding, the number of scale insects in Luxembourg increases to 48. The checklist on the Global Biodiversity Information Facility (GBIF) platform has been updated accordingly (Gertsson et al. 2026).



Fig. 7. Larva of a chalcidoid wasp parasitizing an adult female of *Aspidiotus hedericola*. Photo: C.-A. Gertsson.

4. Discussion

Aspidiotus hedericola is a typical Mediterranean species, but its current distribution extends its classical more Southern European range. Including the findings from Luxembourg, the species is reported from 19 Palearctic countries: Austria, Bulgaria, Croatia, Cyprus, Denmark, France, Germany, Greece, Iran, Israel, Italy, Lebanon, Luxembourg, Malta, Serbia, Spain, Sweden, The Netherlands and Turkey (García Morales et al. 2016, GBIF 2026). Thereby, several first records in more northern European countries were only recently made, e.g. in Sweden, Denmark (Gertsson 2024) and The Netherlands (Jansen & Hartog 2020, Gertsson 2024). The northward expansion of the species' range is most likely due to natural causes and a result of ongoing climate change. The species shows strict host plant associations and is reported from the following host plants only: Araliaceae (*Hedera helix*), Fabaceae (*Acacia)*, Lauraceae (*Laurus nobilis*) and Sapindaceae (*Acer negundo*) (García Morales et al. 2016). In Luxembourg, the species might be already widely distributed, but overlooked so far. This can be attributed to its minute size as well as to the difficulty in separating it from its widespread congener *A. nerii*.

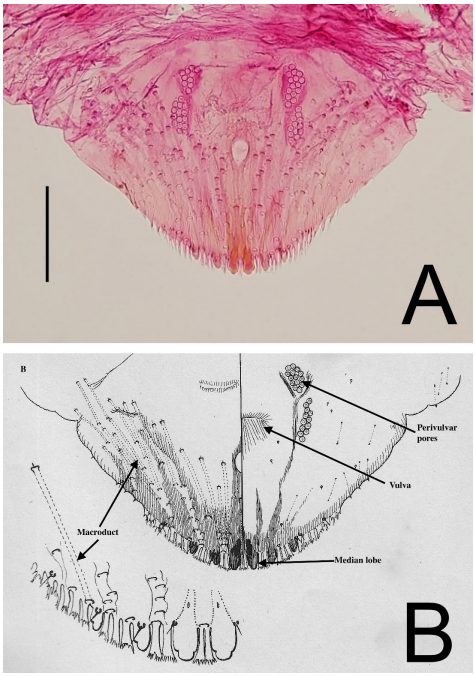


Fig. 6. Pygidium of female *Aspidiotus hedericola*. A, slide-mounted, scale bar: 0.1 mm. Photo: C.-A. Gertsson. B, drawing from Ferris (1946).

Little is known about the ecology and reproductive biology of the species (Schmutterer & Hoffmann 2016). Females in the family Diaspididae have three developmental stages: two nymphal stages and the adult. Males undergo five developmental stages: two nymphal stages, prepupa, pupa and the

adult. The scale insects have sucking mouthparts that penetrate the leaf tissue (parenchyma), but not the vascular tissue. This means that no honeydew is produced, which is generally true for all species in the family Diaspididae (Gill 1997). The population in Luxembourg forms one generation per year and overwinters as adult females (personal observations).

Likewise, information regarding parasites and predators of *A. hedericola* is scarce. Only two Hymenopteran parasites belonging to the family Aphelinidae Thomson, 1876 – *Aphytis chilensis* (Howard, 1900) and *Aphytis mytilaspidis* (Le Baron, 1870) – and two predators – the lady beetle *Thalassa montezumae* Mulsant, 1850 and the green lacewing *Chrysoperla carnea* (Stephens, 1836) are reported in the literature (Özbesnili & Özsisli 2013, García Morales et al. 2016).

The current findings bring the total number of scale insects (Hemiptera, Coccomorpha) in Luxembourg to 48. The family Diaspididae is the most species-rich, with 17 species. Yet, in light of the still limited research into the biodiversity of scale insects in Luxembourg and the considerable number of species identified from the natural flora (n=78; Jansen 2009, Jansen & Hartog 2020) but also from imported goods and greenhouses (n=234; Jansen & Alferink 2023) in countries such as the Netherlands, it is clear that many more species of scale insects remain to be discovered. The ongoing trade in plant material will only contribute to this.

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