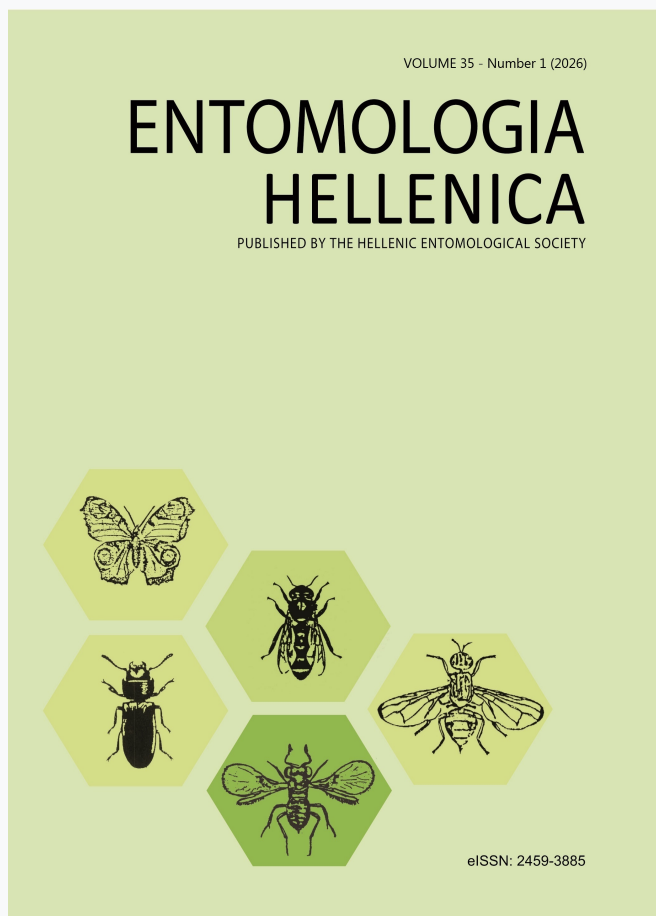


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SHORT COMMUNICATION

Hemiberlesia cyanophylli* (Signoret, 1869) (Hemiptera: Diaspididae), a new record on urban trees of *Ficus microcarpa* (Bonsai) and citrus in Morocco*M. BOUKAISS^{1,2}, N. HADDAD¹, S. AIT BADDOU^{1,3}, N. AUAJJAR², R. BENKIRANE³ AND M. C. SMAILI^{1*}**¹Laboratory of Entomology, Regional Center of Agricultural Research of Kenitra, National Institute of Agricultural Research, 14000 Kenitra, Morocco.²Laboratory of Biology and Health, Department of Biology, Faculty of Sciences, University Ibn Tofail, Kenitra, Morocco.³Laboratory of Botany, Biotechnology, and Plant Protection, Department of Biology, Faculty of Sciences, University Ibn Tofail, Kenitra 14000, Morocco.**ABSTRACT**

A routine survey of several tree species, some of them crops in five provinces in Morocco was conducted between February 2023 and June 2025, to assess the presence of armored scale insects (Hemiptera: Coccoomorpha: Diaspididae) and their natural enemies. *Hemiberlesia cyanophylli* (Signoret, 1869) (Diaspididae) was observed for the first time on the leaves of two trees, *i.e.* the first time on a *Ficus microcarpa*, in 2024, and the second on a citrus tree (*Citrus aurantium* L.), in 2025, in Kenitra city (Kenitra province, North-West Morocco), in very low numbers. Herein, a morphological diagnosis of *H. cyanophylli* is provided, based on adult females from Morocco, mounted on microscope slides. The scale insect is not causing any economic damage in Morocco, but its presence may present a threat to other commercial crops in the country. The predatory adults of *Chilocorus bipustulatus* L. (Coleoptera: Coccinellidae) were observed on leaves and stems in the same citrus tree where *H. cyanophylli* was found.

KEY WORDS: Polyphagous species, Sternorrhyncha.**Introduction**

Scale insects (Hemiptera: Sternorrhyncha: Coccoomorpha), comprise about 8595 described species in 57 families (35 extant and 22 extinct) (García Morales et al. 2016). They are obligate plant parasites, well known for their morphological specialization for sucking sap, and some species are widely recognized as significant agricultural pests due to their detrimental impacts on crop plants (Kondo and Watson 2022). The depletion of phloem sap or parenchyma cell contents from leaves, fruits and branches due to their feeding can cause severe damage to trees. Diaspididae is the largest family of scale insects, currently comprising 2722 described species belonging to 422 genera (García-Morales et al. 2016). Members of this family feed on parenchyma cell contents, have a

discontinuous gut and do not produce honeydew (Watson 2002).

The cyanophyllum scale, *Hemiberlesia cyanophylli* (Signoret, 1869) belongs to the family Diaspididae. It was first described from France but has since become cosmopolitan, having been reported from 81 countries (García Morales et al. 2016). In Africa, *H. cyanophylli* is known from Angola, Bulgaria, Cameroon, Egypt, Georgia, Kenya, Madagascar, Mauritius, Mozambique, Réunion, Senegal, Seychelles, Somalia, South Africa, Tanzania, Tunisia and Uganda (García Morales et al. 2016). Within Europe, it has been recorded from the Czech Republic, France, Germany, Malta, Poland, Portugal (Madeira Islands), Slovenia, Spain and Italy. *Hemiberlesia cyanophylli* is polyphagous, having been reported on plant species belonging to 176 genera in 77 families, including

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tree crops and ornamental plants (García Morales et al. 2016). Literature records of its economic importance include on avocado trees in Israel (Gerson and Zor 1973), and on tea in the Western Highlands Province in Papua New Guinea (Williams and Watson 1988). Recently, it was found in Tunisia on phyllodes of *Opuntia triacanthos* Willd (Cactaceae) in a private garden (Ben Halima Kamel et al. 2025).

Materials & Methods

Between February 2023 and June 2025, a routine survey was made of several orchards of crops (mainly citrus and avocado), including urban trees, across five provinces in North-Western Morocco (Larache, Sale, Kenitra, Sidi Slimane, Sidi Kacem). The samples were processed, and slide mounted using EPPO (2005) methodologies. The species was identified as *H. cyanophylli* using the keys in Watson (2002) and the identification was confirmed by Dr Gillian W. Watson (Science: Research, Natural History Museum, Cromwell Road, London, UK) from images of slide-mounted adult females.

Hemiberlesia cyanophylli was observed in only two amenity trees growing on roadsides in an urban area of Kenitra city (North-Western Morocco): one was a *F. microcarpa* Bonsai (Moraceae) (34.256142 N, -6.561280 W) and the other a citrus rootstock tree (*Citrus aurantium*) (34.263917 N; -6.584051 W). The field appearance of the insects is shown in Fig.1 and Fig. 2. This is the first report of *H. cyanophylli* infesting *F. microcarpa* and citrus trees (*Citrus aurantium* L.) in Morocco. It was found at very low infestation levels, without any chlorotic spotting on the leaves or noticeable direct damage to the trees. Despite its known polyphagy and pest potential, currently *H. cyanophylli* is not an important pest in Morocco.

Results

Field characteristics: The insect was found on the leaf undersides. Adult female scale cover: subcircular, convex, pale yellow, with central exuvia central; cover 1.0-1.0 mm long (Fig. 1). In life, exposed adult female body cream-colored to yellow, subcircular to pyriform, flat to slightly convex, and membranous.

Body of slide-mounted adult female membranous and pyriform (Fig. 2). Perivulvar pores present in 4 or 5 groups. Prosomal margin opposite each anterior spiracle with a single, sharp sclerotized spur. Anal opening usually fairly large, situated towards posterior margin; distance between anal opening and rear edge of pygidium about 1.5-2.0x length of a median lobe. Median lobes (L1) large and parallel, each with a large basal sclerosis, lobe symmetrical

with distal corners notched; L1 separated by a space about 1/3 as wide as a lobe which contains 2 fringed plates as long as L1. Second lobe (L2) much smaller, each with tip rounded. Third lobe (L3) sclerotized and bluntly pointed. Plates on margin lateral to each L3 numbering about 6, all shorter than L1. Paraphyses present on margin between L3, shorter than lobes; interlobular spaces without any strongly sclerotised paraphyses.



FIG. 1. *Hemiberlesia cyanophylli* (Signoret, 1869) in life. (A). Dorsal view of adult female with early-instar larvae. B-C. Dorsal view of immature female. Habitat: (C). *Ficus microcarpa*; (D). Citrus rootstock (*Citrus* sp.). Photographs by M. Boukaiss, S. Ait Baddou and M. C. Smaili.

Biology and dispersal: Like other armored scale insects, natural dispersal of *H. cyanophylli* occurs at the first-instar (crawler) stage, either by the insects crawling a very short distance or by wind or phoretic dispersal, which provides passive transport over greater distances. There is great potential for this species to be spread by transport or trade in infested live planting material.

Associated natural enemies: An extensive list of natural enemies attacking *H. cyanophylli* is provided in García Morales et al. (2016). This includes parasitoid species of Hymenoptera in the families Aphelinidae, Encyrtidae, Eulophidae, and Signiforidae, and predators belonging to Coleoptera (Coccinellidae). In our survey, few specimens of the predatory beetle *Chilocorus bipustulatus* L.

(Coleoptera: Coccinellidae), were found in the vicinity where *H. cyanophylli* was found.

Microscopic diagnosis

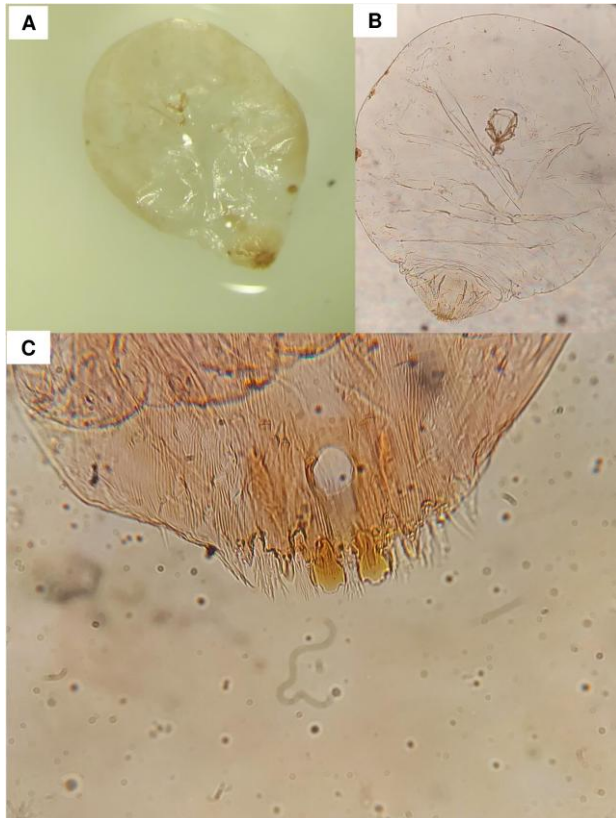


FIG. 2. An adult female of *Hemiberlesia cyanophylli* (Signoret, 1869). (A). Ventral view of intact adult female, with body convex, pyriform and membranous. Slide-mounted adult female: (B). Body subcircular, prosoma membranous. (C). Ventral view of pygidial margin showing, median (L1) lobes broad, with large basal sclerites, lobes symmetrical, parallel and well separated, second lobes (L2) with rounded tips, third lobes (L3) sclerotized and pointed, and paraphyses shorter than the lobes. Photographs by M. Boukaiss, S. Ait Baddou and M. C. Smaili.

Conclusion

In Morocco, the cyanophyllum scale was found at very low infestation levels on only two trees (one ficus and one citrus). At present, the scale species is regarded as rare occurrence, found only in amenity trees growing on roadsides in an urban area of Kenitra city. However, in the future climatic change or other factors may alter the biology of *H. cyanophylli* and hence its degree of economic impact on other commercial crops. Therefore, it is very important that these sites are surveyed regularly to detect any population increase, to prevent any spread to other parts of Morocco.

Acknowledgements

Dr Gillian W. Watson (Science: Research, Natural History Museum, Cromwell Road, London, UK) kindly confirmed the identification of *H. cyanophylli* and drafted the species diagnosis.

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