



## First report of the invasive Australian tortoise beetle *Trachymela sloanei* (Blackburn, 1897) (Coleoptera: Chrysomelidae) in Algeria

RACHED HADIBY<sup>1\*</sup>, MEHDI BOUKHEROUFA<sup>1</sup>, FRANCESCO VITALI<sup>2</sup>, FERIEL SAKRAOUI<sup>1</sup>, ABDELAZIZ FRIH<sup>3</sup>, RACHA BENCHACENE<sup>1</sup>, KAMELIA HESNI BENOTMANE<sup>1</sup> & YASMINE ADJAMI<sup>1</sup>.

<sup>1</sup>Ecobiology Laboratory for Marine Environments and Coastal Areas, Department of Biology, Faculty of Sciences, Badji Mokhtar – Annaba University BP 12, P.O. Box 23000, Annaba, Algeria.

✉ [rached.hadiby@univ-annaba.dz](mailto:rached.hadiby@univ-annaba.dz); <https://orcid.org/0000-0003-4238-5722>

✉ [mehdiboukheroufa@yahoo.fr](mailto:mehdiboukheroufa@yahoo.fr); <https://orcid.org/0000-0002-8815-0112>

✉ [fsakraoui@gmail.com](mailto:fsakraoui@gmail.com); <https://orcid.org/0000-0001-9159-8025>

✉ [racha.benchacene@univ-annaba.org](mailto:racha.benchacene@univ-annaba.org); <https://orcid.org/0000-0003-2361-8340>

✉ [kamelienbenotmane@gmail.com](mailto:kamelienbenotmane@gmail.com); <https://orcid.org/0000-0003-0041-2876>

✉ [adjamiy@yahoo.fr](mailto:adjamiy@yahoo.fr); <https://orcid.org/0000-0002-8439-5841>

<sup>2</sup>National Museum of Natural History, rue Münster 24, L-2160 Luxembourg, Luxembourg.

✉ [fvitali@mnhn.lu](mailto:fvitali@mnhn.lu); <https://orcid.org/0000-0003-3052-2910>

<sup>3</sup>Environmental Biomonitoring Laboratory, Department of Biology, Faculty of Sciences, Badji Mokhtar – Annaba University BP 12, P.O. Box 23000, Annaba, Algeria.

✉ [frihabdlaziz00@gmail.com](mailto:frihabdlaziz00@gmail.com); <https://orcid.org/0000-0002-6093-4492>

\*Corresponding author

### Abstract

*Trachymela sloanei* (Blackburn, 1897) (Coleoptera: Chrysomelidae: Chrysomelinae), a leaf beetle native to Australia and recognized as a defoliator of *Eucalyptus* spp. (Myrtaceae), is reported for the first time from Algeria and the African continent. In May 2025, 20 adults were collected from *Eucalyptus camaldulensis* in the urban area of Sidi Amar (Annaba, northeastern Algeria), where characteristic foliar damage and feeding traces were observed. Identification was confirmed using diagnostic morphological characters. Field evidence indicates a reproducing population actively feeding on ornamental *Eucalyptus* trees. Considering its invasive history elsewhere, this detection highlights the risk of further spread and potential impacts on *Eucalyptus* plantations and urban greenery in North Africa. The present record expands the known distribution of *T. sloanei* and underscores the need for continued surveillance of *Eucalyptus*-associated pests in the Mediterranean region.

**Key words:** *Trachymela sloanei*, first record, Algeria, Annaba, invasive species, *Eucalyptus*, forest pest

### Introduction

*Eucalyptus* L'Héritier (Myrtaceae) is a genus of around 900 tree and shrub species, originally native to Australia, Indonesia, New Guinea, and the Philippines (Boland *et al.* 2015). Due to their fast growth, adaptability, and economic value, many species have been introduced globally for timber, pulp production, reforestation, and ornamental purposes (Doughty 2000, Paine *et al.* 2011, Ruiz & López 2010). Today, large-scale *Eucalyptus* plantations and isolated trees can be found throughout South America, Asia, Africa, and the Mediterranean basin, including northern Algeria. In Algeria, *Eucalyptus* was introduced during the second half of the 19<sup>th</sup> century under French colonial forestry programs, mainly for reforestation, swamp drainage, and land rehabilitation. Today, plantations remain widespread covering several tens of thousands of hectares and are primarily used for aromatherapy, medicinal purposes, windbreaks, and erosion control. Pest studies indicate that *Eucalyptus* in Algeria face multiple invasive insect threats. *Ophelimus maskelli* (Ashmead, 1900) causes high infestation rates in stands near Algiers (Adel-Sellami *et al.* 2025), and *Glycaspis brimblecombei* Moore, 1964 was reported as the first invasive psyllid by Reguia & Peris-Felipo (2013). Although the total plantation extent and direct economic losses are not precisely quantified,

Soumare *et al.* (2017) noted that *Eucalyptus* plantations in comparable African regions contribute to desertification control and household income, meaning pest outbreaks could have socio-economic consequences. The international movement of *Eucalyptus* species has also facilitated the accidental spread of numerous phytophagous insects and their natural enemies beyond their native range (Csóka *et al.* 2017, Paine *et al.* 2011, Rassati *et al.* 2016). Several exotic pests, such as psyllids, gall wasps, and leaf beetles, are now established in parts of Europe and North Africa, raising ecological and economic concerns (Sánchez *et al.* 2015, Suma *et al.* 2018, Schröder *et al.* 2020).

Among these, the Australian beetle *Trachymela sloanei* (Blackburn, 1897) is emerging as a notable invasive species. This herbivore leaf beetle endemic to Australia feeds on the foliage and tender shoots of various *Eucalyptus* species (Reid 2006). Although the species is commonly known as the “Australian tortoise beetle” or “small *eucalyptus* tortoise beetle”, the genus *Trachymela* Weise, 1908 does not belong to the tortoise beetles (Chrysomelidae: Cassidinae) but is instead classified in the tribe Goniocetenini of the subfamily Chrysomelinae (Reid 2006). In recent decades, it has been recorded in multiple regions far beyond its native range, including New Zealand (Steven & Mulvey 1977), California (Garrison 1998), China and Taiwan (Zhang *et al.* 2020), Chile (Villablanca & Villablanca-Miranda 2022), and more recently, Europe (Sánchez *et al.* 2015, Bezděk & Sekerka 2024). Since its first detection in Spain in 2014, the beetle has rapidly expanded its presence across the Iberian Peninsula reaching Portugal (Pérez-Gómez *et al.* 2022) and establishing populations in both forest and urban landscapes (Valera *et al.* 2024, EPPO 2024). Separate introductions were recorded in the Canary Islands (Cordero-Rivera & Santolamazza-Carbone 2023) and Greece (Gastouniotis *et al.* 2023). Due to its increasing geographic spread and the defoliation, it causes on *Eucalyptus* trees, *T. sloanei* has been added to the EPPO Alert List as a potential invasive threat to the Euro-Mediterranean region (EPPO 2024). While the species has not been reported to cause tree mortality in Australia or elsewhere, heavy infestations lead to significant foliar damage, potentially affecting tree health and growth. Furthermore, its cryptic behavior, multivoltine life cycle, and ability to disperse through both natural and human-mediated pathways pose additional challenges for early detection and management (Bain 2001, EPPO 2024, Zhang *et al.* 2020). Until now, *T. sloanei* had not been recorded in Africa. This study presents the first confirmed record of *Trachymela sloanei* in Algeria, based on specimens collected in the city of Annaba in 2025. The objectives of this work are to (i) report the first detection of *T. sloanei* in Algeria and North Africa, (ii) provide morphological confirmation and diagnostic details, and (iii) assess the local impact and risk of further spread in the Mediterranean context.

## Materials and Methods

Specimens of *Trachymela sloanei* were collected during visual surveys conducted between May and August 2025 in *Eucalyptus* plantations and ornamental trees in northeastern Algeria, specifically in the province of Annaba (Fig. 1). The surveys, both diurnal and nocturnal, revealed clear signs of infestation on several trees, including foliar damage and feeding traces. Sampling was carried out on 22 May 2025 in the urban area of Sidi Amar, near the Badji Mokhtar University campus (36°48'58.6"N, 7°43'22.6"E). Adult beetles were observed and hand-collected directly from the foliage of *Eucalyptus camaldulensis* Dehnhardt, with a total of 20 individuals recorded (Fig. 1). The Annaba province is ecologically significant, notably due to the presence of the Edough massif forest, a recognized biodiversity hotspot that hosts numerous rare and endemic species, underscoring its high biogeographical value (Véla & Benhouhou 2007, Laref *et al.* 2022, Benhacene *et al.* 2024, Hadiby *et al.* 2022, 2025).

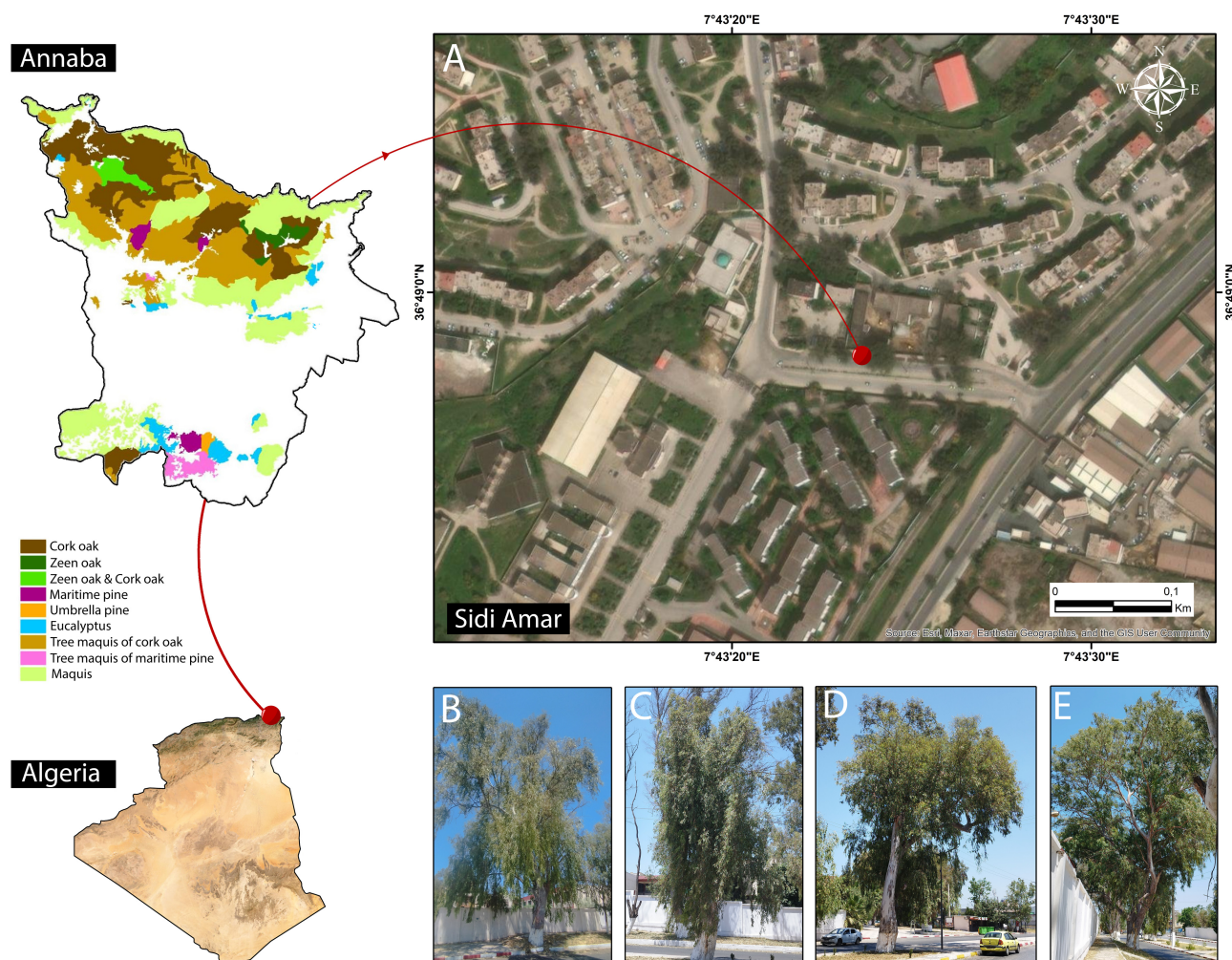
Collected specimens were preserved in 70% ethanol and deposited in the authors' private collections. One reference specimen was later transferred to the National Museum of Natural History (MNHN) in Luxembourg for further examination and conservation.

For morphological studies, genitalia were dissected and cleared using 10% potassium hydroxide (KOH) for 12 hours. Then, they were conserved in a vial containing glycerin pinned under the prepared specimen. Photographs of adult *T. sloanei* were taken CMOS Camera mounted on a Keyence VHX 6000 digital microscope equipped with a VHX-S660E free-angle observation system, a VH-ZST 20–2000x double zoom objective, 2D/3D image stitching system and stacking system taking 200 images at 2 million pixels of resolution. Image stacking was performed using Photoimpact software to enhance depth of field and detail.

Only specimens exhibiting a complete habitus and clear diagnostic characters (n=1) were included in the study. Morphological identification was based on established taxonomic keys and reference literature (Blackburn 1897, Garrison 1998, Reid, 2006, Sánchez *et al.* 2015, Zhang *et al.* 2020). Diagnostic traits used for identification

included: hemispherical body shape; pronotum broadest at midline or base; punctate pronotal disc; ventral side flattened; body coloration dark brown with irregular black markings, often covered in a white waxy layer; and non-striate, verrucose or acervate elytra.

Distribution maps were generated using ArcGIS Desktop 10.3. Data on *Eucalyptus* plantations and local forestry context were obtained from the Annaba Provincial Forestry Department.



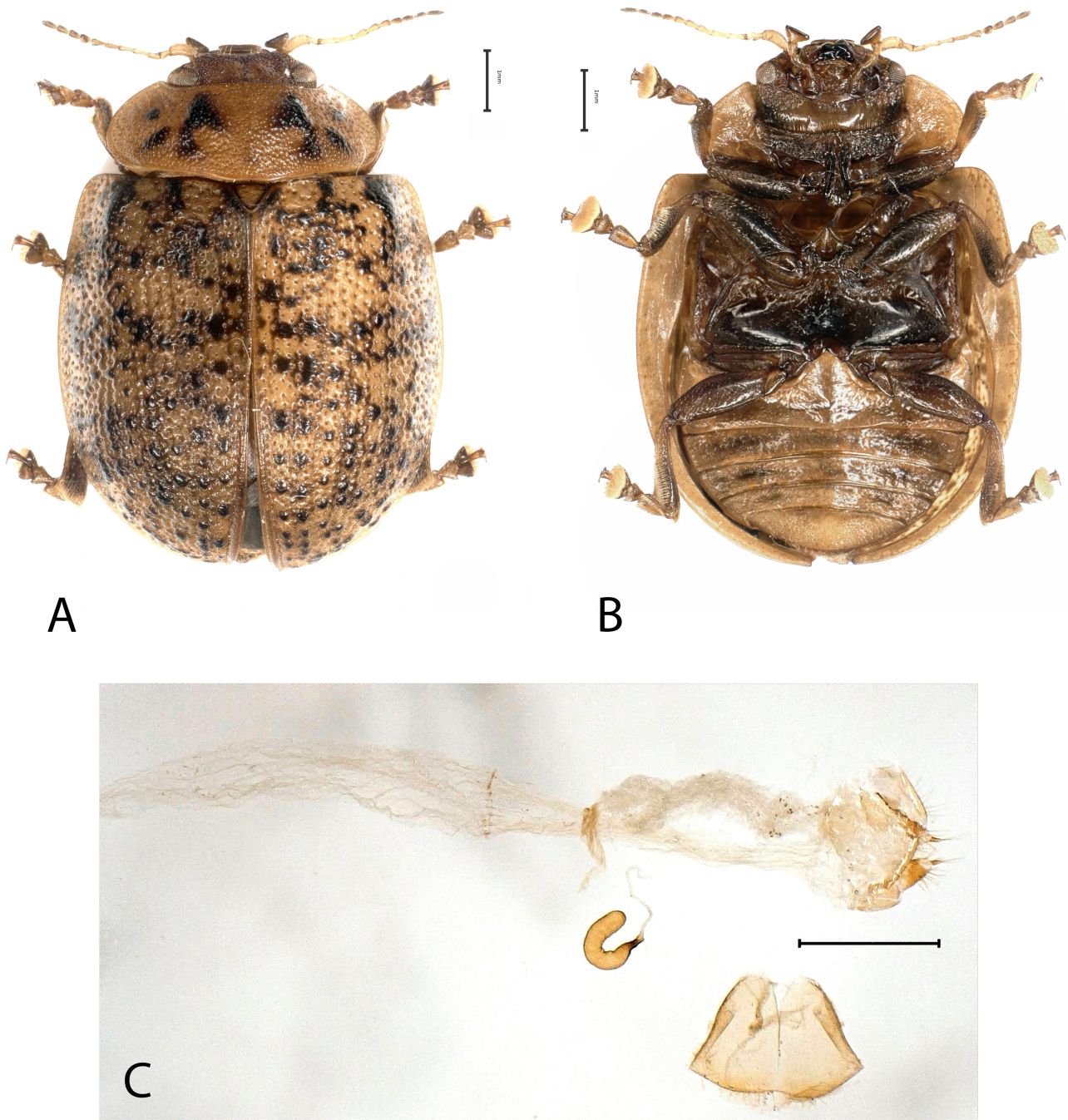
**FIGURE 1.** Geographic location of *Trachymela sloanei* records in northeastern Algeria based on field sampling in Annaba. Sites: A – Sidi Amar; B–E – Infected *Eucalyptus* trees.

## Results and Discussion

### *Trachymela sloanei* (Blackburn, 1897)

The identification of *Trachymela sloanei* was confirmed using the original taxonomic key provided by Blackburn (1897), and further comparisons with descriptions from Sánchez *et al.* (2015), Reid (2006), and Gastouniotis *et al.* (2023). The species exhibits a distinct external morphology that clearly differentiates it from native Chrysomelinae known in Algeria.

*Trachymela sloanei* adults (6–8 mm) display a hemispherical brownish-red body mottled with irregular black spots (Fig. 2) and often covered with a removable white waxy layer. The elytra reveal reddish hues under certain light angles, which are characteristic features of this species. Another diagnostic morphological trait includes the presence of a row of fine hairs on the distal half of the meso- and metatibiae (Zhang *et al.* 2020, Gastouniotis *et al.* 2023). The ventral side of the terminal tarsomeres bears dense golden setae (Fig. 2).



**FIGURE 2.** *Trachymela sloanei*. (A) Dorsal view and (B) Ventral view of imago. (C) Female genitalia.

All specimens of *Trachymela sloanei* were collected from a small urban park in Annaba hosting seven *Eucalyptus* trees. Each tree exhibited clear signs of foliar damage consistent with *T. sloanei* feeding activity. Adult beetles were primarily observed on the foliage during nighttime surveys and occasionally during the day, particularly under conditions of elevated temperature and humidity. The presence of damaged leaves on all seven trees throughout the site indicates that the species has established a stable and likely expanding population in the area. While the current level of defoliation does not appear to threaten tree survival, ongoing monitoring will be necessary to assess long-term impacts on tree health and to determine whether the beetle will spread to other *Eucalyptus* stands in Algeria (Fig. 3).



**FIGURE 3.** (A) Signs of a severe infestation of *Trachymela sloanei* in a *Eucalyptus* tree. (B) Slightly and heavily damaged leaf of *Eucalyptus* tree.

### Ethology and Habitat

*Trachymela sloanei* adults and larvae were observed feeding actively on the leaves and young shoots of *Eucalyptus camaldulensis*. Feeding damage was characterized by irregular notches and semicircular holes along leaf margins, often leaving the central midvein intact. Both lightly and heavily defoliated trees were recorded at the sampling site. These symptoms are consistent with observations reported from other invaded regions, including Europe, South America, and Asia (Sánchez *et al.* 2015, Villablanca & Villablanca-Miranda 2022, Gastouniotis *et al.* 2023, Pérez-Gómez *et al.* 2022, Zhang *et al.*, 2020).

Females lay 5 to over 40 eggs either on the underside of leaves or beneath loose bark. The larval stages, ranging from dark green to reddish brown, develop through four instars before pupating under bark or in the litter layer near the host tree. This beetle is multivoltine, capable of completing several generations per year; under favorable conditions (e.g., in California), development from egg to adult can take as little as five weeks (EPPO 2024).

Although *T. sloanei* is primarily associated with *Eucalyptus*, it has been reported to persist in diverse habitats and may survive short periods in the absence of host plants, indicating a capacity for broad dispersal (Pérez-Gómez *et al.* 2022). Adults can fly, but dispersal over long distances is likely facilitated by human activities such as trade or plant transport (EPPO 2024). Previous studies have highlighted its cryptic behavior both adults and larvae tend to hide under bark or within foliage during the day, making early detection challenging (Bain 2001, Sánchez *et al.* 2015).

Although no direct tree mortality has been documented, repeated defoliation caused by heavy infestations is known to stress trees and may impair growth, especially in industrial or ornamental *Eucalyptus* plantations. As observed in New Zealand, the beetle caused extensive damage before populations were naturally regulated by local parasitoids or predators (Bain 2001). At the regional level, *T. sloanei* adds to a growing list of invasive *Eucalyptus* pests in the EPPO region, including *Phoracantha* spp. (Coleoptera, Cerambycidae), *Ophelimus maskelli* (Ashmead, 1900) and *Leptocybe invasa* Fisher & La Salle, 2004 (Hymenoptera, Eulophidae), *Thaumastocoris peregrinus* Carpintero & Dellapé, 2006 (Hemiptera, Thaumastocoridae), and others (EPPO 2024).

### Conclusions

*Trachymela sloanei* is reported here for the first time in Algeria, marking a new step in its westward and northward expansion beyond its native range. Its detection in Annaba, associated with visible damage on *Eucalyptus*

*camaldulensis*, highlights its potential as an emerging pest in North African *Eucalyptus* plantations. Given the species' known adaptability and capacity to disperse across varied habitats, its establishment in Algeria raises concerns for broader ecological and economic impacts. While its long-term behavior in this new region remains uncertain, early detection is critical. Continued surveillance and early-warning systems, possibly integrating citizen science networks, will be essential to track its spread and assess its real threat to *Eucalyptus* ecosystems across the region.

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