POLICY BRIEF

BEE-GUARDS

Resilient beekeeping and breeding to safeguard natural genetic resources and pollination services

Necessity for the EU to take urgent steps to prevent entrance and spread of the exotic species *Apis florea* (and other *Apis* species) and *Tropilaelaps mercedesae*

This work was carried out within the framework of the BEE-GUARDS project and its Multi Actor Forum[1]

Exotic species threatening European apiculture

The European honey bee (*Apis mellifera*) is vital for both agriculture and the environment, as they sustain food security and biodiversity through pollination. Beekeeping also sustains rural economies and cultural traditions across Europe, including recent developments of apitherapy and apitourism. Practiced in every EU country, apiculture reflects diverse climates, landscapes, and production systems. The EU is the world's second-largest honey producer after China, yet it remains a major net importer to meet demand. The leading producers are Romania, Spain, Hungary, Germany, Italy, Greece, France, and Poland, which together account for most of the EU's honey output. Beyond honey and other hive products (such as propolis, pollen, beeswax, royal jelly and bee venom), beekeeping ensures pollination services to European agriculture worth billions of euros annually, as well as a free but invaluable service to the ecosystem.

European apiculture faces multiple threats that endanger honey bee health and the sustainability of beekeeping.

Urgent EU action needed to stop *Apis florea* and *Tropilaelaps mercedesae*

Why it matters

- European apiculture underpins **food security, biodiversity, and rural economies**, providing pollination services worth billions annually.
- New detections of *Apis florea* (Malta, 2024) and *Tropilaelaps mercedesae* (Georgia, 2024) signal a **high risk of entry and establishment** of these exotic species within the EU.
- Both species threaten **honey bee health, pollination services, and ecological balance**, compounding existing pressures from pesticides, *Varroa*, and climate change.

Current gaps

- *Apis florea* **is not yet listed** under Regulation (EU) 1143/2014 on invasive alien species → limited preventive action possible.
- **EU Animal Health Law** focuses only on *Apis mellifera*, leaving gaps for other *Apis* species.
- For *T. mercedesae*, **eradication is not mandatory**; preparedness and surveillance vary across Member States.

Priority actions

- **Include *Apis florea*** on the EU list of invasive alien species; initiate formal risk assessment immediately.
- **Reinforce import, transport, and port inspections**; ensure destruction and reporting of wild swarms or nests.
- **Train and coordinate customs, veterinary, and environmental authorities** for rapid, cross-sectoral response.
- **Enhance surveillance and contingency planning** for *T. mercedesae*; harmonise EU-wide control and notification procedures.
- **Launch awareness and training campaigns** for beekeepers, inspectors, and port officials.

Strategic message

A **coordinated EU-level prevention and preparedness strategy**, built on the principles of **"prevention is better than cure"** and **One Health**, is essential to protect Europe's bees, biodiversity, and agricultural resilience.

[1] BEE-GUARDS Multi Actor Forum members who contributed feed back to this document: Filippo Bosi, Linda Morawetz

Intensive agriculture harms bees directly through pesticide exposure and indirectly by reducing the available forage. However, many of the most severe threats today are posed by organisms that have spread from other parts of the world. The parasitic mite *Varroa destructor* originated in Asia and has spread throughout Europe to fatally weaken colonies by spreading damaging viruses and compromising the bee immune system. Other exotic species such as *Aethina tumida*, the small hive beetle, and *Vespa velutina*, the yellow-legged or Asian hornet, also pose significant risks to honey bee populations. Climate change exacerbates the impact of pathogens, alters flowering patterns, and further increases the stress on colonies.

In the spring – summer season of 2024 BEE-GUARDS partners were involved in the finding and reporting of two species alien to Europe, which could pose a significant risk to the EU apicultural sector:

- *Apis florea* on the island of Malta (Uzunov, A., Galea, T., Chen, C., Cilia, G., Costa, C., & Mifsud, D. (2024). *Apis florea* in Europe: first report of the dwarf honey bee in Malta. Journal of Apicultural Research, 63(5), 1122–1125. https://doi.org/10.1080/00218839.2024.2386888 (Received 21 May 2024, Accepted 24 Jul 2024, Published online: 21 Aug 2024)
- *Tropilaelaps mercedesae* in Georgia (Janashia, I., Uzunov, A., Chen, C., Costa, C. & Cilia, G. (2024). First Report on *Tropilaelaps mercedesae* Presence in Georgia: The Mite is Heading Westward! Journal of Apicultural Science, 68(2), 2024. 183-188. https://doi.org/10.2478/jas-2024-0010 (Received: 22 July 2024; accepted: 12 September 2024, Published: December 2024).

Apis florea in Europe

Apis florea Fabricius 1787, also known as the "Red dwarf honey bee" is a single-comb, open nesting honey bee, whose native distribution ranges from the Indomalayan in the east to the Persian Gulf in the west (Ruttner, 1988). Its colonies have an annual colony cycle which involves migration, swarming, and absconding, based on the nectar flows. It is a highly adaptive and mobile species with a high reproductive potential. Thus, it is not surprising that in recent decades, aided by global movements and commercial exchange, its distribution range has extended both eastwards (Taiwan, Australia) and westwards (Jordan, Arabian Peninsula and North-eastern Africa) (Haddad et al., 2008; Hepburn and Radloff, 2011; Shebl, 2017; Silva et al., 2020). It should be noted that *A. florea* is a host of many pathogen agents including the Black Queen Cell Virus, Thai Sacbrood Virus, the parasitic mites *Euvarroa sinhai* and *Tropilealaps* spp., the common non-parasitic facultative kleptophage *Neocypholaelaps indica* and an unknown microsporidia (Akratanakul & Burgett, 1976; Needham et al., 2001; Fries, 2011; Warrit and Lekprayoon, 2011).

The *Apis florea* colony hanging on a tree branch of *Acacia saligna*, the Blue-leaved *Acacia,* found in Malta in 2024. Photo by Antoine Borg Bonaci.

In recent years several episodes of detection of *A. florea* on container ships in European ports have been reported:

- Port of Genova, Italy, 2022: a swarm of *A. florea* was found outside a container arriving from India (Agronotizie, 2022);
- United Kingdom port, 2022: a swarm of presumed *A. florea* was found inside a container arriving from India, and honey combs of *A. florea* were confiscated by Customs authorities;
- Port of Gioia Tauro, Italy, 2025: a small nest of *A. florea* was found on the wall of a container coming from India.

The finding of a nest (colony with female and male individuals, and with brood and honey reserves) on a tree not far from the Port of La Valletta, Malta, was the first episode of finding a nest established on land. However, the repeated reports of nests on container ships highlight the high risk of establishment in Europe, especially in the Southern regions where climatic conditions would be favourable to *A. florea*'s biological cycle.

The *Apis florea* nest, with worker bees and drones, found in Malta in 2024. Photo by Thomas Galea.

The movement of *A. florea* outside its native range can pose risks to ecological balance, outcompeting local pollinators for resources and possibly interfering with mating; it could also be a vector of parasites and pathogens which may transfer from one species to another, or novel strains of already existing pests. In short, its movement may pose a real threat for both wild and managed pollinator health.

Other *Apis* species

The other open-nesting Asian species of *Apis* may also be accidentally introduced into Europe, although no reports of expansion outside their native range have as yet been reported.

More serious is the risk of entrance of African subspecies of *Apis mellifera*. As an example, in Italy, in June 2022, a full colony with brood and honey combs was found attached to the bottom side of a container on a ship coming from Equatorial Africa (Filippo Bosi, personal communication). It should be noted that *Aethina tumida* is of sub-Saharan origin, and that African subspecies of *A. mellifera* have pronounced defensive behaviour - the case of the Africanized bees in South and Central America is notorious.

Tropilaelaps mercedesae in Europe

Tropilaelaps mercedesae (Anderson and Morgan, 2007) is one of the four currently described species of the genus of ectoparasitic mites *Tropilaelaps* that naturally parasitize single-comb open-air nesting Asian giant honey bees, *Apis dorsata, A. laboriosa* and *A. breviligula* (Anderson & Roberts, 2013; Chantawannakul et al., 2018). This species also infests the Western honey bee *Apis mellifera* in many Asian countries (Delfinado and Baker, 1961; Anderson & Roberts, 2007; Chantawannakul et al., 2018), where together with *T. clarae* it is considered one of its most damaging pests (Rinderer et al., 1994; Dainat et al., 2009; de Guzman et al., 2017; Gao et al., 2021; Han et al., 2024).

T. mercedesae is recently gaining the attention of beekeepers and researchers worldwide, due to recent invasions into new territories and the devastating effects on Western honey bee colonies when not controlled (Anderson & Roberts, 2013). The species *T. mercedesae* was recently reported to have spread to Central Asia (Uzbekistan) and even more worryingly, to have reached the European continent, the Krasnodar and Rostov regions in southwestern Russia

(Namin et al., 2024; Brandorf et al., 2024). Given that the life cycle, biology, reproduction, and pathology of *Tropilaelaps* spp. are comparable to those of *Varroa destructor* (de Guzman et al., 2017), the expected scenario of west and southward spread poses great alarm for beekeepers and authorities in Europe, and the finding in Georgia by Janashia and colleagues in summer 2024 confirms the high risk of transfer and movement of the mite.

Adult individuals of *Tropilaelaps mercedesae* (on the left) and *Varroa destructor* female (on the right) on a honey bee prepupa. Photo by Irakli Janashia.

EU legislation

The legislation that applies to the two species differs, as they are regulated under different frameworks, and we here want to highlight gaps and provide recommendations.

Preventing introduction and establishment of *Apis florea* and of other *Apis* species

A. florea, as a potential invasive alien species, would be subject to the Regulation (EU) 1143/2014 of the European Parliament and of the Council of 22 October 2014 (EU, 2014) on the prevention and management of the introduction and spread of invasive alien species, which establishes criteria for a species to be classified as "invasive" and "alien" and procedures for eradication and management in case of detection. Currently no member of the *Apoidea* super family is listed according to this Regulation. However, a recent report commissioned by the EU Commission "Invasive Alien Species Horizon Scanning in support of implementation of Regulation 1143/2014" (EU, 2025), based on the finding of the *A. florea* colony in Malta, included *A. florea* among the 165 species considered the most likely to enter or spread in the EU, and among the 57 presenting the highest threats to biodiversity. Furthermore, the genus *Apis* was identified as one of the taxonomic groups with a high potentially high number of invasive species that would call for additional policy measures to prevent their negative impact on European biodiversity.

However, accidental introduction of any *Apis* species should be prevented even before the species *A. florea* and the genus *Apis* are on the official "List of invasive alien species of Union concern" (Art. 4 of Regulation 1143/2014). Although highlighted in the Horizon Scanning, a risk assessment procedure is necessary for inclusion of a species on the Union list and has not yet been initiated. In the meantime, the high reproductive potential and high mobility of accidentally introduced *Apis* swarms may determine a fast spread, also in the light of the milder winter temperatures across Europe. Thus, we highlight some key points of the EU animal health legislation which could also serve as reference for preventing the accidental introduction of exotic species of *Apis*:

- Regulation (EU) 2016/429 on transmissible animal diseases ("Animal Health Law") Article 237 (EU, 2016), establishes that Member States may authorize the entry into the Union of consignments of animals only if accompanied by the required health certification.
- Delegated Regulation (EU) 2019/2035 (Article 2, point 13) (EU, 2019), although referring to "kept animals", defines "honey bees" as animals belonging to the species *Apis mellifera*.
- Delegated Regulation (EU) 2020/692 (Article 63 and following) (EU, 2020) authorizes the entry into the EU only of *Apis mellifera* queens, each accompanied by a limited number of worker bees, and only if originating

from third countries that meet specific conditions.

Based on the above, we conclude that:

- any *Apis* species entering from non-compliant third countries (including wild swarms) require immediate action by the competent authority (veterinary authorities, customs officials, port officials);
- wild swarms should be safely destroyed, with biosafety precautions and sample collection and conservation for analysis (species identification, presence of pathogens)
- nest destruction / finding must be also notified to the competent authority;
- operations may be complex, requiring coordination across competent authorities (including non-health bodies), with involvement of stakeholders and organizations;
- timeliness is essential: the case of the detection of *A. florea* in Malta shows that action taken by various stakeholders, even in absence of appropriate and clear legislation and guidelines was probably effective (at the current date, 30th September 2025 no further sighting have been reported).

Thus, considering the high risk of entry of *A. florea* and of other *Apis* species into the EU and the potential serious consequences on European ecosystems and biodiversity, the recommendation is that initiatives to alert and train involved stakeholders in enacting the above points should be put in place immediately. The absence of such training could lead to a failure to report and manage new introductions , due to an underestimation of risk to EU apiculture.

Preventing establishment of *Tropilaelaps mercedesae*

T. mercedesae is a notifiable parasite of honey bees according to the World Organization of Animal Health and according to EU legislation: Regulation (EU) 2016/429 on transmissible animal diseases ("Animal Health Law") (Regulation EU, 2016), alongside Commission Delegated Regulation (EU) 2018/1629 (EU, 2018a) and Commission Implementing Regulation (EU) 2018/1882 (EU, 2018b). *T. mercedesae* is included in the categories of diseases requiring measures to prevent their introduction into the EU or spread between Member States through animal movement (Category D) and those for which notification and surveillance within the EU is mandated (Category E). Thus, eradication measures for *T. mercedesae* are not mandatory according to the EU Animal Health Law, and whether to enact eradication initiatives, in the event of introduction into the EU, would be the choice of the involved Member State. As highlighted by Mutinelli & Bertola (2025), eradication measures are costly and usually unpopular in the sector, require logistical capabilities, a legislative framework, a trained veterinary workforce and effective communication and collaboration with beekeepers to ensure an effective implementation (a successful example was the eradication of *Aethina tumida* in Portugal in 2004). However, acceptance and management will require intense monitoring efforts and approved control products, and will strongly limit movement and trade of beekeeping live material.

The current provisions of the Animal Health Law are such that each Member State will decide which measures to implement in the event of detection of *T. mercedesae*, whether to simply restrict movements (for example, under current regulations, based on the Terrestrial Animal Health Code developed by the World Organisation for Animal Health (WOAH, 2024) honey bee queen imports or exchanges within the EU require absence of *Tropilaelaps* spp. within a 100 km radius) or to enact eradication measures. However, considering the likely

dramatic consequences that the arrival of *Tropilaelaps* mites would have to European apiculture and the wild populations of *Apis mellifera*, a concerted EU level action aimed at heightening awareness, strengthening training, and preparedness of beekeepers, veterinarians, researchers and policy makers would have clear benefits. There could also be cause to consider trade and exchange of live beekeeping materials within the EU and its borders depending on the risk posed by this invasive mite. Any actions that seek to promote the EU principle "prevention is better than cure", or consider a "One Health approach" could be useful to help slow the spread of this damaging mite.

Tropilaelaps mercedesae adult on honey bee larva. Photo by Irakli Janashia.

Conclusion

History has provided many examples of invasive species significantly impacting the health of EU apiculture. Rapid, coordinated, and pragmatic action is critical to prevent introduced exotic species becoming established, and effective national and EU regulation are essential to achieve this.

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Authors: Cecilia Costa (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agrarian), Filippo Bosi (Veterinarian BEE-GUARDS MAF), Aleksandar Uzunov (Ss. Cyril and Methodius University in Skopje), Raffaele Dall'Olio (BeeSources), Gherardo Bogo (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agrarian), David Mifsud (Universita ta Malta), Ursula Wirtz (ConsulTech GmbH), Giles E. Budge (University of Newcastle upon Tyne)

Project Identity:

Resilient beekeeping and breeding to safeguard natural genetic resources and pollination services (BEE-GUARDS)

Promoting sustainable beekeeping practices: Beekeeping (or apiculture), like any other agricultural activity, is susceptible to factors such as climate change, nutrition, resource limitations and management practices. The EU-funded BEE-Guards project aims to strengthen the beekeeping community's resilience and promote sustainable practices. The project will establish and validate threshold management and breeding strategies by conducting studies on hives equipped with digital monitoring tools. In each case, BEE-Guards will consider solutions that are eco-friendly and reflect local conditions, while minimising any impact on species of natural pollinators. Project results, including advice and best practice models, will be made available to stakeholders on digital platforms.

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Get in touch with us:

BEE-GUARDS coordinator:
Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria –
Centro di ricerca agricoltura ed ambiente (CREA)
www.bee-guards.eu
info@beeguards.eu

BEE-GUARDS

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