

The Director General

Maisons-Alfort, 8 April 2021

OPINION of the French Agency for Food, Environmental and Occupational Health & Safety

on a “Request for an express pest risk analysis for Martinique and French Guiana following reports of *Brachyplatys subaeneus*, an invasive Plataspid, in Guadeloupe”

ANSES undertakes independent and pluralistic scientific expert assessments.

ANSES primarily ensures environmental, occupational and food safety as well as assessing the potential health risks they may entail.

It also contributes to the protection of the health and welfare of animals, the protection of plant health and the evaluation of the nutritional characteristics of food.

It provides the competent authorities with all necessary information concerning these risks as well as the requisite expertise and scientific and technical support for drafting legislative and statutory provisions and implementing risk management strategies (Article L.1313-1 of the French Public Health Code).

Its opinions are published on its website. This opinion is a translation of the original French version. In the event of any discrepancy or ambiguity the French language text dated 8 April 2021 shall prevail.

On 8 October 2020, ANSES received a formal request from the Ministry of Agriculture's Directorate General for Food (DGAL) to undertake the following expert appraisal: Request for an express pest risk analysis for Martinique and French Guiana following reports of *Brachyplatys subaeneus*, an invasive Plataspid, in Guadeloupe.

1. BACKGROUND AND PURPOSE OF THE REQUEST

The following sections, “Background” and “Purpose of the request”, come from the text of the formal request which appears in Annex 1 of the collective expert appraisal report; it has not been modified.

1.1. Background

Brachyplatys subaeneus, known as the black bean bug, is a minor pest of plants of the family *Fabaceae*. Native to tropical and subtropical humid areas of Asia, it has been reported in other countries such as Panama (2012), the Dominican Republic and Costa Rica (2019).

The bug was detected in Guadeloupe in August 2020 on pigeon pea (*Cajanus cajan* – *Fabaceae*) in a private garden in the municipality of Petit-Bourg.

This pest is potentially polyphagous. It is assumed that *Brachyplatys subaeneus* has the ability to travel via trade flows. Another species of bug from the same *Plataspidae* family (*Megacopta cribraria*) has been intercepted during the transport of commodities unrelated to the affected host pathways.

The Caribbean and French Guiana have numerous trade operations with countries where *Brachyplatys subaeneus* is already present, such as China and the Dominican Republic.

1.2. Purpose of the request

ANSES is being asked to provide its opinion regarding the following points:

- What is the probability of introduction of *Brachyplatys subaeneus* into Martinique and French Guiana via imports from at-risk third countries or flows between French overseas *départements*? Through what types of flows (plants, wooden pallets, other commodities)?
- Does this pest have the potential to cause damage (economic, environmental or social impacts) in Martinique and French Guiana?
- If *Brachyplatys subaeneus* has the characteristics of a quarantine pest with an unacceptable risk, what appropriate measures (at the border or inside the area) can be taken against this bug?

2. ORGANISATION OF THE EXPERT APPRAISAL

The expert appraisal was carried out in accordance with French standard NF X 50-110 “Quality in Expert Appraisals – General requirements of Competence for Expert Appraisals (May 2003)”.

The expert appraisal falls within the sphere of competence of the Expert Committee (CES) on “Biological risks for plant health”. ANSES entrusted the expert appraisal to the Working Group (WG) on “*Brachyplatys subaeneus*”. The methodological and scientific aspects of the work were submitted to the CES between 17 November 2020 and 15 March 2021. The work was adopted by the CES on “Biological risks for plant health” at its meeting of 15 March 2021.

ANSES analyses interests declared by experts before they are appointed and throughout their work in order to prevent risks of conflicts of interest in relation to the points addressed in expert appraisals.

The experts’ declarations of interests are made public via the website: <https://dpi.sante.gouv.fr/>.

The outline of the collective expert appraisal report follows the Decision-support scheme for an Express Pest Risk Analysis (Express PRA) issued by the European and Mediterranean Plant Protection Organization (EPPO) (PM 5/5(1)) in 2012. Implementation of the expert appraisal followed the guidelines of this scheme, namely an initiation stage, a pest risk analysis stage (assessment of the probability of entry, establishment and spread, assessment of potential economic consequences) and pest risk management. The Agency points out in this regard that the EPPO expert appraisal standards lead the experts to classify the various risks (of entry, establishment, spread, etc.) into levels (low / ... / high, or very unlikely / ... / very likely) and then qualify them (acceptable / unacceptable). ANSES underlines that the final risk rating is the prerogative of risk managers, who can add considerations other than those – primarily scientific and technical – included in its expert appraisal.

The literature search was conducted between October 2020 and January 2021. The following queries were used: '*Brachyplatys subaeneus*', '*Brachyplatys subaeneus*' AND 'impact', '*Brachyplatys subaeneus*' AND 'Interception', 'black bean bug', '*Brachyplatys*' AND 'biology', '*Plataspidae*'. Queries were launched in Scopus, Google Scholar, Web of Science and Google. The final corpus included 30 references and was considered relatively short, with seven references identified concerning *Megacopta cribraria*, a bug in the same family as *Brachyplatys subaeneus*. The aim, in the event of uncertainty, was to be able to extrapolate information available on this bug, which is better described, to answer the questions of the Express PRA. A hearing with SALIM and FREDON Guadeloupe was held on 18 January 2021 to learn about various aspects (reports, damage, establishment, spread, control measures) of the situation in Guadeloupe following the detection of *B. subaeneus*.

3. ANALYSIS AND CONCLUSIONS OF THE CES AND THE WG

3.1. Pest risk analysis (PRA)

3.1.1. Overview of the pest

Brachyplatys subaeneus (Westwood, 1837) (Hemiptera, Heteroptera, Plataspidae) is a bug native to tropical and subtropical humid areas of Asia. It is widely distributed and abundant throughout Indomalaya. Since 2007, it has been reported in the Neotropics and more recently in Florida in 2020. The life cycle of *B. subaeneus* has been studied in its area of origin. This cycle, in particular the hibernation period of the larvae and adults, has not been described in the Neotropics.

Most of the host plants for *B. subaeneus* belong to the family *Fabaceae*. *B. subaeneus* seems to be at least oligophagous and can complete its life cycle on various *Fabaceae* plants. It has been observed on species belonging to other families of plants but there is high uncertainty concerning its ability to complete a full life cycle on these species and cause damage. In the literature, *B. subaeneus* is described as a pest of pulses but its harmfulness is deemed minor except in high-infestation situations. Its feeding results in deformation of the pods or stunting of the host plants. Its impact on crops belonging to other families is very limited according to the literature.

The PRA area covered by this risk assessment is made up of Martinique and French Guiana. A distinction is made between these two *départements* when the probabilities and uncertainties are different.

3.1.2. Entry

In view of:

- the uncertainty associated with the host-plant status of the species on which *B. subaeneus* has been observed and the lack of knowledge on its preferences,
- the diversity and extent of the range of plants on which *B. subaeneus* has been reported,
- the laying of eggs on inert carriers,
- the mobility of the larvae and adults if disrupted,

the WG considers it is not appropriate to associate *B. subaeneus* with a specific pathway.

In light of the above, the pathway selected by the WG is hitch-hiker behaviour (or passive transport). At the same time, this pathway poses a risk related to transport on commodities of all types (fruits or vegetables intended for consumption, plants for planting, cut flowers, cut wood, etc.), the transport of passengers and their luggage, and vehicles, boats and planes. This approach is all the more appropriate since this behaviour is well documented for a similar invasive exotic species, *Megacopta cribraria*, *Plataspidae*, which also attacks *Fabaceae* and is known to be passively transported with various goods in hitch-hiker mode not associated with a particular pathway.

The probability of entry of *B. subaeneus* in Martinique is considered high with low uncertainty due to (i) flows of imports of plant products from countries where *B. subaeneus* is present, (ii) the transport of passengers and pleasure boats, (iii) the ability of *B. subaeneus* to survive during transport, and (iv) the ability of *B. subaeneus* to be transferred to host plants in the PRA area via actively walking adults or larvae.

Since French Guiana is geographically farther from the regions where the insect is currently present and especially because it is engaged in fewer exchanges of goods and passengers, the WG considers that the probability of entry of *B. subaeneus* into French Guiana is moderate and related to the insect's hitch-hiker behaviour. The uncertainty is deemed moderate in light of the lack of precise knowledge on the insect's ability to survive without any food source during transport.

3.1.3. Establishment

According to modelling results, *B. subaeneus* will undoubtedly find weather conditions favourable for its establishment in Martinique as they are very similar to those in Guadeloupe. It will also likely find host plants necessary for its establishment; the local predatory fauna and parasitoids are currently unknown and if they exist, they will probably not hinder its establishment. In light of the above, the probability of outdoor establishment of *B. subaeneus* in Martinique is considered high. The uncertainty is low due to the species' easy establishment in Guadeloupe where the environmental conditions are very similar.

The probability of outdoor establishment of *B. subaeneus* in French Guiana is considered high. The uncertainty is moderate and higher than for Martinique because the weather conditions in French Guiana are different although still favourable. Moreover, the secondary fauna in French Guiana is not well known and French Guiana hosts families of *Pentatomoidea* that are relatively similar to *Plataspidae* (*Megarididae* and *Canopidae* in particular). It is entirely possible that out of the numerous species characterising the biodiversity of French Guiana, some may find *B. subaeneus* to be a suitable host or prey.

3.1.4. Spread

The magnitude of spread in Martinique is considered high with low uncertainty and will probably be due to human-assisted spread and the hitch-hiker behaviour of *B. subaeneus*. A rate of spread as fast as in Guadeloupe is foreseeable.

The WG considers that the magnitude of spread in French Guiana will be high with moderate uncertainty. The growth dynamic in French Guiana, most of which is forested with scattered residential and cultivation areas, is different. In such a forest environment, the spread of *B. subaeneus* will be contained and the insect's hitch-hiker behaviour will be the main means of long-distance spread.

3.1.5. Impact in the current area of distribution

The losses associated with *B. subaeneus* are described qualitatively in the literature; no yield or quality losses have been quantitatively estimated. The WG considers the impact in the current area of distribution to be low. Given the recent arrival of *B. subaeneus* in Guadeloupe and in the Neotropics, the available information is very limited and the uncertainty is deemed moderate.

3.1.6. Impact in the PRA area

In Martinique and French Guiana, the WG considers that the magnitude of the impact of *B. subaeneus* would likely be the same as that observed in its current area of distribution; it is estimated as low with moderate uncertainty. No publications mention reductions in yields due to *B. subaeneus* in its current area of distribution. Moreover, the crops in question are of minor economic significance. Given the recent arrival of *B. subaeneus* in Guadeloupe and in the Neotropics, the available information remains very limited and the uncertainty is deemed moderate. Unlike for *Megacopta cribraria*, known for its non-negligible societal impact during its first years as a home invader (noise, flight, odour, skin reactions), no societal impact has been attributed to *B. subaeneus* to date, whether in its area of origin or in invaded regions.

3.1.7. Overall assessment of risk

The WG considers that the overall risk associated with *B. subaeneus* in Martinique is low with low to moderate uncertainty.

The WG considers that the overall risk associated with *B. subaeneus* in French Guiana is low with moderate uncertainty.

In both cases, the risk is acceptable. Since the introduction of *B. subaeneus* is highly likely, recommendations are being proposed with the aim of improving our knowledge of this species and to be able offer management strategies tailored to the situation in the event that it evolves.

3.2. Pest risk management

With regard to entry, the surveillance of a specific pathway is not appropriate. Monitoring all products and passengers coming from areas where *B. subaeneus* is present would be disproportionate given the overall risk considered as low.

Within the PRA area, the creation of a surveillance network is recommended in order to enable the early detection and monitoring of populations so as to assess potential damage, which would also help confirm whether or not *B. subaeneus* is present in the PRA area. Detection is relatively easy and a citizen science programme could be set up to supplement the surveillance network. A poster campaign in marinas and airports is also recommended to raise the public's awareness and collect reports.

In the event of introduction, eradication is unlikely and were it to succeed, there could be new infestations. It seems difficult to stop this species at the border, due to its hitch-hiker behaviour, and eradicate it in case of introduction.

If there is confirmed damage in the years following the entry and establishment of *B. subaeneus*, the introduction of the oophagous parasite *Paratelenomus saccharalis* (Hymenoptera: Platygasteridae) could be considered for containment purposes after verifying that it is specific to *Plataspidae*.

3.3. Uncertainties and other recommendations

The uncertainties encountered are related to two main points:

- Little information on the biology of *B. subaeneus* or on the damage it causes (very short and old bibliography for its area of origin).
- Recent introduction and current expansion in the area of introduction: non-exhaustive list of host plants, extent of damage difficult to assess in agriculture and even more so in forestry.

The WG recommends exploring the presence of natural enemies, including *P. saccharalis*, in newly invaded areas including Guadeloupe.

Although the overall risk was deemed low, it is difficult to predict changes in the distribution and impact of *B. subaeneus*. Since *P. saccharalis* is a good candidate for biological control, it would be advisable to undertake research into this parasitoid to prepare its introduction should this prove necessary. It would be worthwhile to retrace the routes of introduction (genetic study of populations) to understand its introduction and identify the source areas. It would then be possible to research natural enemies of *B. subaeneus* in the areas of origin of the introduced populations.

4. AGENCY CONCLUSIONS AND RECOMMENDATIONS

The French Agency for Food, Environmental and Occupational Health & Safety endorses the conclusions of the CES on “Biological risks for plant health” and underlines the uncertainties associated with the biology of *B. subaeneus* in the Neotropics and its impact in its current area of distribution on both agricultural and forest crops.

The French Agency for Food, Environmental and Occupational Health & Safety reiterates that despite the high probabilities of entry, establishment and spread of *B. subaeneus* in the PRA area, the overall risk in Martinique and French Guiana is deemed low, as the potential impact is considered low, and is ultimately similar to that described in the current area of distribution (Asian area of origin and Neotropical area of recent introduction). This conclusion may be revised if data become available attributing yield losses or societal disturbances to *B. subaeneus*.

The French Agency for Food, Environmental and Occupational Health & Safety recommends setting up a surveillance system for *B. subaeneus* in Guadeloupe where it is already present and in the PRA area despite the acceptable risk, in particular via citizen science since the characteristics of this bug are compatible with this type of monitoring (relatively large size (4.5-5.8 mm) compatible with mobile phone cameras; easy to identify on stems; present on cultivated plants and in gardens; relatively characteristic appearance, easy to distinguish from the local entomofauna). Observing long-term trends in the distribution and impact of *B. subaeneus* is essential to acquire knowledge on this species, adjust the overall risk level, and implement appropriate management measures.

Dr Roger Genet

KEYWORDS

Brachyplatys subaeneus, évaluation du risque simplifiée, Martinique, Guyane, Fabaceae, Plataspidae

Brachyplatys subaeneus, express pest risk analysis, Martinique, French Guiana, *Fabaceae*, *Plataspidae*.

SUGGESTED CITATION

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