Detection of a non-native species of Diptera in the Elephant Refuge, ASPA 132, King George Island

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**Information Paper submitted by Argentina and Uruguay**

***Summary***

One of the most notorious invasions in Antarctica is that of the Diptera *Trichocera maculipennis* (Meigen, 1818). This species was recorded for the first time in 2006 on the Fildes Peninsula and later, in the Antarctic summer of 2017/2018, a joint monitoring programme for this species was started on King George Island. As a result of this monitoring programme, the presence of this species has been detected for the first time within the Elephant Refuge (62°15'18.1''S; 58°37'56.2'W), located within ASPA 132 on King George Island.

***Introduction***

The problem of the introduction of non-native species has been growing in importance in Antarctica, conditioned by the impacts of climate change and by the increase in the number of people who travel to Antarctica for different types of activities (science, logistics and tourism) and act as possible vectors for the transfer of species to Antarctica (Hughes *et al.*, 2015; Hughes *et al.*, 2019, McCarthy *et al.*, 2018). Non-Native Species are currently the threat with the highest priority in the work plans of the Committee for Environmental Protection (Five-Year Plan) as well as in the Work Plan of the Subsidiary Group on Climate Change Response (SGCCR).

Since 2006, the presence has been detected in areas near waste water treatment plants of the winter crane fly *Trichocera maculipennis* (Volonterio *et al*., 2013; Remedios De León, 2019). Its presence has been observed at research stations on King George Island (ATCM XL - WP 26). This situation gave rise to a joint international work programme with the aim of managing this non-native fly. The coordinated actions implemented were the installation of sticky traps inside the facilities to identify population trends throughout the year, pitfall traps around the stations to assess the presence of the species beyond the limits of these stations, and ultraviolet light traps to eliminate adult individuals as a control measure (Remedios De León *et al.*, 2021). This programme was later extended to more bases and included the Carlini Base, which monitors the presence of this species in the base’s facilities.

Imagen que contiene plato, tabla, pequeño, grande

Descripción generada automáticamente

Figure 1: photographic record of the specimen found in the Elephant Refuge.

***Detection of the Non-Native Species***

On 24 February 2022, the presence of a specimen of a possible “non-native species” of insect (Diptera) was detected in the kitchen-dining room of the Elephant Refuge (62°15'18.1''S; 58°37'56.2''W), within ASPA 132 – Potter Cove. Immediately, the scientific staff of the Argentine Antarctic Institute (IAA) informed the staff of the Environmental Management and Tourism Programme (PGAyT) of the National Antarctic Directorate (DNA) of the episode to coordinate the measures to be taken. Scientific staff were informed of the provisions of the Response Protocol (2019) and the precaution was taken, until further information could be obtained, of considering the observed species as an NNS.

This decision was based on the fact that, as established in document ATCM XXXIII - WP 15, there is a high probability of a transfer of winged insects through human activities. As stated in the aforementioned paper, winged insects can probably survive in Antarctica for more than just a few days if they are found in research station buildings.

***Immediate response***

PGAyT staff asked the station staff to collect all the information established in the “*Non-mandatory Response Protocol for implementation upon discovery of a potential non-native species introduced inadvertently to the Antarctic Treaty area*” (ATCM XLII WP034). Photographs of the specimen were received (Figure 1) and this material was immediately sent to the staff of the Antarctic Programme of Uruguay so that, through consultations with their specialists, they could determine the species detected. From the analysis of the photographs sent, it was provisionally determined that they featured the species *Trichocera maculipennis* (Meigen, 1818) (Diptera: Trichoceridae), the non-native species that is being monitored on the island. The specimen was found flying inside the refuge and was captured by the scientific staff. A few days later, as an initial eradication measure, a search for the presence of other specimens was carried out and then a trap was placed inside the refuge and an intensive search was carried out for other specimens of the species in the areas near the refuge. In turn, the material will be sent from the Carlini Base so that it can finally be catalogued by the scientific staff working on this monitoring programme.

***Long-term actions***

Incorporate the site as a new sample-taking point in the permanent monitoring programme, by installing sticky traps inside the refuge and pitfall traps in the refuge’s surroundings.

Reinforce the use of the checklists for supply chain managers of National Antarctic Programmes for the reduction in risk of transfer of non-native species (ATCM XLII - WP 50). Permanent monitoring will be important to assess whether the species is detected at the nearby Carlini Base, and because it has already been proven that using only a single eradication measure has hitherto not been successful. In this sense, it will be necessary to implement an exhaustive Monitoring Plan at the aforementioned station for early detection of the presence of *Trichocera maculipennis*.

***Conclusions***

Non-native species discovered in the Antarctic Treaty Area may be imported anthropogenic species (associated with human activities). According to Annex II of the Protocol, species introduced by humans must be eradicated, while natural populations and long-term residents must be protected.

The detection in the Elephant Refuge of a potential and later confirmed non-native species (*Trichocera maculipennis*), was notified to the national authorities and this made it possible to coordinate the necessary tasks for an immediate response, immediate eradication, preservation and identification of specimens, and initial control of the site of detection. The main task is the establishment of mitigation measures that will be incorporated into the logistic procedures to avoid the introduction of this or other species to the Carlini Base, which is close to the refuge. As previously mentioned, this record confirms that the species continues to expand its range on the island, at least since its original recording in Maxwell Bay in 2006.

For this reason, it is essential to adjust and promote long-term eradication measures, since the continuous expansion of this species through successful reproduction over time, which has allowed it to expand its distribution range in Antarctica, demonstrates that non-native species constitute a growing threat to the diversity of one of the most isolated regions on earth.

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