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EDİTÖRE MEKTUP / LETTER TO THE EDITOR

AN EASY, EFFECTIVE AND CHEAP METHOD OF THE EUROPEAN HORNET'S ERADICATION

Avrupa Hornet'in Yok Edilmesi İçin Kolay, Etkili ve Ucuz Bir Yöntem

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ABSTRACT

A cheap, versatile and effective method of hornets' colony elimination based on the light-provoked contact of flying individuals with the 20-30% solution of NaOH is reported. Importantly, the insects survived from touching with this alkali solution transported the poison to the nest.

Key words: European hornets, Colony elimination, Method, NaOH alkali

ÖZ

Uçan bireylerin %20-30 NaOH çözeltisi ile ışıkla uyarılan temasına dayanan eşek arısı kolonilerinin ortadan kaldırılması için ucuz, çok yönlü ve etkili bir yöntem bildirilmektedir. Daha da önemlisi, bu alkali solüsyonla temastan kurtulan böcekler, zehiri yuvaya taşır.

Anahtar kelimeler: Avrupa eşekarısı, Koloni eliminasyonu, Yöntem, NaOH alkali

The increasing numbers of the bee colonies attacked by the Asian yellow-legged hornets (*Vespa velutina*) reported in Asia, America (Monceau et al. 2017, Requier et al. 2020) and now in Europe (Monceau et al. 2014) become one of the biggest challenges for both scientists and bee-keepers. The matter is that when Asian hornets find a honey bee colony, they tend to settle down and specialize in bees as their prey. This issue stimulates the elaboration of methods to minimize the impact of such kind predators on the bee population. The highlighted menace urged us to portray the episode related to this problem. Its concerned the extinction of the bees' colonies by brownish-yellow 3.0-3.5 cm-long hornets (most probably *V. crabro*) was observed in the Eastern Beskids area (West part of Ukraine). The description of this issue as well as the protocol of its solution is presented therein.

The well-masked hornets' nest was placed in close (about 100 m) proximity to the apiary, between the top of the window and the roof of a hut. The colony was hidden deeply inside the void created with the roof, bricks wall of the hut and wooden side-on desks of the roof (Fig. S1). Such location made the safe elimination of predators almost impossible. Hence, to eradicate the colony we decided to exploit two main instincts of hornets: returning back to the nest at the dark time and their attraction by the light.

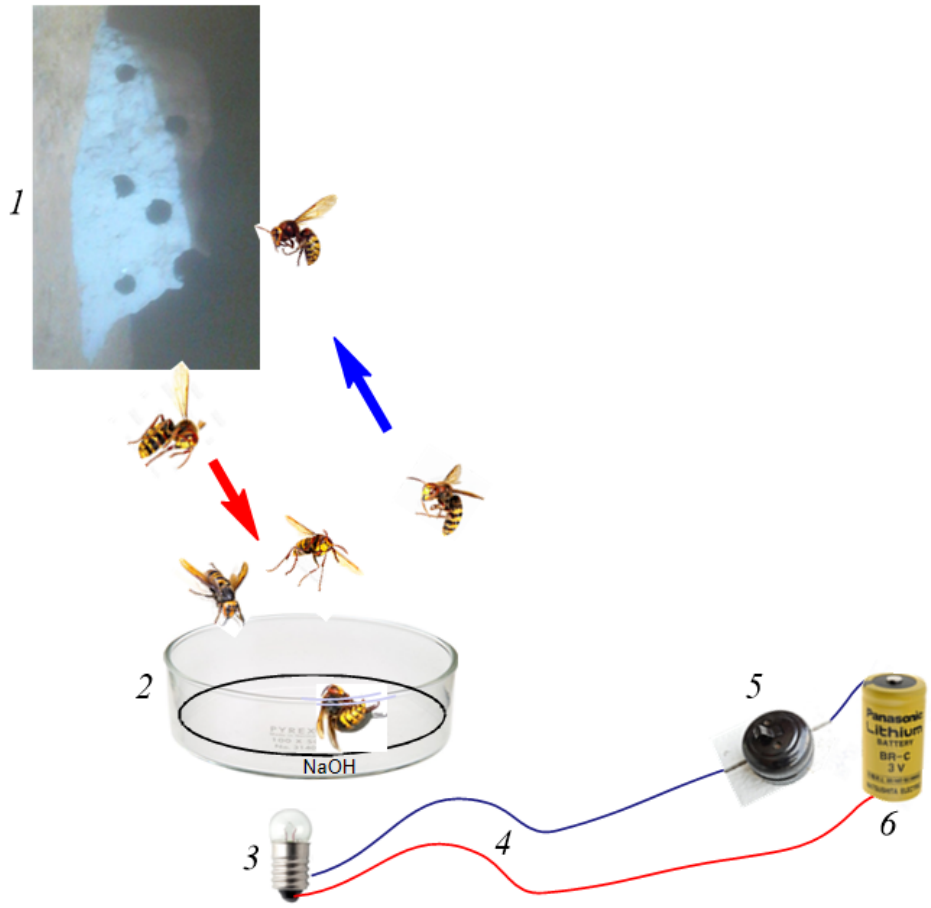
For this aim two plastic trays (20 cm × 10 cm × 3 cm) containing commercial unblock-pipes solutions (about 100 mL of 20-30% aqueous NaOH) were placed on the windowsill of the hut. Switching on the light inside the hut at nightfall prompted the hornets to rush towards the light source. They strongly hit the window glass and fell into the basic solution, leading many of them to death. The survived hornets flew to their nest, transporting the fatal solution to the whole colony. In few days the gradual decrease of the hornet activity was discerned, leading, after a couple of weeks, to the flight of only a very few predators. Next year, no hornets visiting their previous nest were detected.

One year later the carpenter removed one desk from the wooden side-on panel of the roof enabled us to uptake the exiting photo of the former “apartments” of the hornets (Fig. 1 and Fig. S2). What was interesting that the nest was actually assembled with several individual grey-colored moieties separated from each other and glued to the inner side of these vertical desks (Fig. 1 and inset). These counterparts were constructed probably from the soil particles and had a concrete-like hardness.

To prove that the poisoning of the nest by NaOH alkali was the main origin of colony extermination, the several moieties of the nest were rinsed with distilled water. After decantation, the pH of the resulting aqueous phase (according to HANNA pH meter model HI 991002) was 7.78. Such practice is essential, because the soil used by the hornets for building the nests had an acidic pH (Hamkalo et al. 2017). Therefore, we assumed that tiny droplets of NaOH solution unintentionally carried to the nest by the adult hornets was the plausible reason of the colony extinction.

The described method was damaging neither to the bees nor to the people and animals. The matter is that due to the location of the nest (on the side of the hut opposite to the apiary) the bees were not disturbed by the light. Additionally, the trays with NaOH aqueous solution were placed on the windowsill situated more than 2 m from the ground and were removed early in the morning, daily. We suppose that similar approach may be suggested for keeping the number of akin social winged bee killers, including *Vespa velutina* and *Vespa soror* (Mattila et al. 2020). For this aim, the improved trap device is recommended for installation and testing (Scheme 1).

Fig. 1. The hornets nest. Red arrow at the inset points the residual of the larva dead in its cocoon. The box of matches (4 cm × 5 cm, right up corner on the inset) was added for sake of the nest components size estimation.



Scheme 1. Principal putative scheme of hornets colony extermination using NaOH alkali.

1 - hornets nest; 2 - transparent dish of 10-15 cm diameter contains 20-30% NaOH solution; 3 - source of light; 4 - electric cable; 5 - electric on-off switcher; 6 - 3 V-battery.

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Methodology: APP

Investigation: APP

Visualization: APP, JM

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