

# Research on the Proper Usage of the Pheromone Trap Method for Monitoring and Mass Trapping of *Ips typographus* L. and *Pityogenes chalcographus* L. in the Federation of Bosnia and Herzegovina

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## Abstract

The purpose of this paper is to determine the number of installed synthetic pheromone baited traps for monitoring and mass trapping of *Ips typographus* and *Pityogenes chalcographus*. The types of traps and pheromone dispensers and the propriety of used method on the site (trap position, trap distance of the nearest healthy spruce tree, trap height, etc.) are examined. The number of controlled traps was 1116; the number of those completely correctly placed traps was 223, that is 20 percent.

**Keywords:** *Ips typographus*, *Pityogenes chalcographus*, aggregation pheromones, traps

## Kurzfassung

**Untersuchung über die richtige Anwendung der Pheromonfallen-Methode zur Überwachung und zur Bekämpfung von *Ips typographus* L. und *Pityogenes chalcographus* L. in der Föderation von Bosnien-Herzegowina**

Ziel dieser Arbeit ist es, die Zahl der eingerichteten mit Pheromonen bestückten Fallen zur Kontrolle und zur Bekämpfung von *Ips typographus* und *Pityogenes chalcographus* zu bestimmen. Es werden der Fallentyp, die Art der Pheromonabgabe und richtige Anwendung der Methode bezüglich Aufstellungsort (Fallenposition, Fallenabstand zur nächsten gesunden Fichte, Fallenhöhe, etc.) geprüft. Die Zahl der kontrollierten Fallen betrug 1116. Davon waren 223 Fallen oder 20 % völlig korrekt platziert.

**Schlüsselworte:** *Ips typographus*, *Pityogenes chalcographus*, Aggregationspheromone, Fallen

## Introduction

The monitoring and mass trapping of *Ips typographus* and *Pityogenes chalcographus*, using pheromone baited traps, was first used in Bosnian Forestry in 1986. In the spruce forests of the Federation of Bosnia-Herzegovina a huge number of different types of traps with various aggregation pheromones for bark beetles were installed. The aim of this study was to investigate the proper usage of this method in the forest sector of the Federation of Bosnia-Herzegovina following discovery of improperly installed traps in previous years.

## Materials and Methods

The study was initiated in spring 2007 with a questionnaire being sent to six state forest enterprises in the Federation of Bosnia-Herzegovina in order to obtain information about the number and type of traps and pheromone dispensers used and the date of their placement. During the summer of 2007 field surveys were carried out. Investigations included: trap position (the distance between traps and nearest spruce trees in accordance with recommendations of traps and pheromone dispensers producers), proper placement of pheromone lures in the traps, height of traps on site, counting damages of the traps and lures, purity of the collecting trays, cleanliness of area around the traps, methods of quantification of caught, and monitoring intervals. The total number of controlled traps was 1116. Comparison of catches between proper and improper installed traps has not been made.

## Results

In the Federation of Bosnia and Herzegovina forests 3877 pheromone baited traps were used during 2007. Two types of traps were used: Theysohn (1603 traps or 42.4 %) and Ecotrap II (2185 traps or 57.6 %).

Also the following pheromone dispensers were used: Pheroprax, Chalcoprax, IT Ecolure, PC Ecolure, PCIT Ecolure and Typopher. During this study the pheromone dispenser Typopher was used for the first time in Bosnian forests. This study revealed that seven traps (0.62 %)



Figure 1: Totally destroyed trap in the field

Abbildung 1: Völlig zerstörte Falle



Figure 2: Trap installed too close to the nearest spruce trees  
Abbildung 2: Zu nahe an die nächsten Fichten aufgestellte Falle

were totally destroyed in the field (Figure 1), 75 (6.72 %) traps were damaged and 1034 (92.65 %) had no visible damages. Proper positioning of traps was done in 466 cases (41.76 %). It was found that 496 traps were located too close to the nearest healthy spruce trees (44.44 %) (Figure 2), while 147 (13.17 %) traps were placed too far



Figure 3: Trap placed too far from the nearest healthy spruce trees  
Abbildung 3: Zu weit von der nächsten gesunden Fichte aufgestellte Falle

from the nearest healthy spruce trees (Figure 3). Also this study determined that 898 traps (80.46 %) were installed at the correct height, 29 (2.6 %) were installed too high and 182 (16.31 %) too low (Figure 4). A number of traps (16 or 1.43 %) were found empty without dispensers. 705 (63.17 %) dispensers were placed properly in the traps. In the collecting trays (containers) 395 (35.39 %) dispensers and ampoules were found. Collecting trays and containers were clean in 921 (82.53 %) trap cases and 188 (16.2 %) were found abandoned. Surrounding areas of the traps were clean on 937 (83.96 %) sites but 172 (15.41 %) traps were surrounded by high grass, bushes, bracken, etc.

## Conclusions

The results of this study show that only 223 (20 %) out of 1116 pheromone baited traps were installed properly in the Bosnian forests during 2007. The main reason for such a low percentage is considered to be the lack of control in the Forestry Protection Sector, including the lack of planning and forest health strategies for bark beetle suppression in the Federation of Bosnia-Herzegovina.

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Figure 4: Trap placed too low in the field  
Abbildung 4: Zu niedrig installierte Falle