A CASE OF MALFORMED ANTENNAE OF *LYCTUS LINEARIS* GOEZE (COLEOPTERA, LYCTIDAE)

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Abstract. The present paper proposes to point out a case of malformed antennae of the specie *Lyctus linearis* Goeze (Coleoptera, Lyctidae). This specie is a member of the wood boring beetles group, which develops an attack on hardwood, not very old elm essence being its favorite. The research that is being presented here is a part of the PhD Thesis program that was carried out between 2004 and 2010 at the Faculty of Biology in Iași.

Keywords: Insects, coleopterans, morphology, biodegradation.


Cuvinte cheie: Insecte, coleoptere, morfologie, biodegradare.

Introduction

The specie *Lyctus linearis* named by Goeze in 1777 is a member of the Lyctidae family from the Coleoptera order. As all the others family members *L. linearis* is a wood boring beetle that prefers as a nutritive substrate the elm essence, where it attacks especially in the sapwood of the not very old cut tree (Groden et al., 1999).

The body of the adult insect is elongated, slightly flattened, and around 3 to 5 mm in length. The color is brownish-red with thin golden hairs that cover the whole body of the insect (Fig. 1. a, b, c, d), (Hickin, 1963). The antennae have a characteristic structure for this family: they are relatively short, made of 11 articles of which the last two are enlarged and form a sort of bludgeon (Watson & Dallwitz, 2003).

As all the xylophages coleopterans this specie spends the most of its life span as a larvae boring in the wood and changing about three stages before turning into a pupae after the adult larvae reaches maturity (Lyon, 1991).

In our research we have studied the insect’s pest on the wooden made outside exposed cultural heritage, as xylophages insects represent a part of the multilevel biological pest that acts in wood decay. We have collected this specie from elm essence at the Astra ethnographic museum in Sibiu.

Materials and methods

In order to collect the insect’s specimens we have used mainly two methods: direct capture of the adults on the surface of the wood before flight, and collecting by using adhesive yellow traps without attractants. While the first one was employed on site, the second involved a period from spring until late autumn while the traps were placed on wooden pieces that presented an active attack of xylophage’s coleopterans.

The specimens were processed in the laboratory in order to determine them, and to effectuate a morphological study of the species. For the insects that were collected with
the yellow traps we have used an organic solvent (Xylen) in order to gradually remove the residual glue from the specimen’s bodies, followed by intermediate baths of isobutyl alcohol, and for the preservation of the specimen a solution of 85% ethylic alcohol.

Figure 1. General aspect of the adults of *Lyctus linearis* Goeze (Col. Lyctidae) (scale in the images represents millimeters).

The dissections were made under stereo-magnifier, and after cleaning the pieces in different baths of water and alcohol, the insect’s parts were prepared for examination at the optical microscope and at the electron microscope. For the first type of investigation we have placed the pieces in resin on microscope glass, while for the second type, they were attached on a metal base and plasma coated with a very thin layer of gold for the SEM analysis.

Determinations of the species were made on the basis of keys for identification specific to this group of insects.

**Results and discussions**

While developing the morphological study, we have identified some specimens of *L. linearis* that have a particular structure of the antennae segments. As previously mentioned, the antennae structure consists of 11 articles of which the last 2 are enlarged, this being a characteristic feature for the family of Lyctidae (Fig. 2. a, b). On this last segments are located the chemical receivers through which the insect senses pheromone and kairomone (decay wood attractant) (Fig. 3. a, b).
We have noticed that on some specimens there is an anomaly in the segments structure as two of the antennae body articles appeared to be welded on one side (Fig. 4. a, b, c, d). Although similar situations have been encountered on other insect species, we couldn’t find any records on the specie *Lyctus linearis*.

This kind of anomalies could have a genetic background, but we consider that the lack of appropriate nutritive substrate or a viral effect causing these malformations is a hypothesis not to be totally dismissed.

**Figure 2.** Overall aspect of the antennae of *Lyctus linearis* Goeze (Col. Lyctidae).

**Figure 3.** Detailed view of the sensitive areas on the last two segments of the antennae.
Figure 4. Malformed antennae of the specie Lyctus linearis Goeze (Col. Lyctidae): a, b – general view of the antennae; c, d – detailed view of the malformed segments.

Conclusions
Typically the structure of the antennae of Lyctus linearis Goeze (Coleoptera, Lyctidae) consists in 11 segments (articles), of which the first (scapus) connects with the head, while the last 10 form the body of the antenna, the final 2 segments being enlarged under the form of a bludgeon.

The sensitive areas are located mainly on the final 2 segments where tiny sensorial cylindrical or conically shaped hairs are situated.

The specially adapted sensitive hairs are used as chemical receivers which serve both for mating and finding the most suitable food source.

The antennae articles are inter-articulated, the junction being some how mobile, so that they can be pointed into different directions.

The anomalies that we are pointing out in the present material refer at some particularly situations in which two articles are partially welded together.
We have encountered these situations at only one of the antennae of an individual, the second one being normally developed.

The reason for dis malformations can be a genetic background, but we do not dismissed the possibility of a viral effect, or a case of lack of sufficient nutrients in the wooden substrate on which the insect attack has developed.

The issue remains opened for further discussions and more detailed pin-pointed researches.

References
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