

**SURVEY STUDIES OF THE ANOBIIDAE AND LYCTIDAE  
FAMILIES (COLEOPTERA) IN WOOD DEPOTS AND WOOD  
FACTORIES OF SOME PROVINCES IN TURKEY**

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**Abstract:** In this study Anobiidae and Lyctidae family beetles, which damage in the woods of plant factories in the forest industry sector and forest depots in the western Black Sea region, were collected and identified. 9 factories and 21 wood depots area were selected in 7 provinces (Düzce, Bolu, Zonguldak, Bartın, Karabük, Kastamonu, and Sinop) in Turkey. The insects were collected on 20x50 cm working area on woods in wood depots and factory raw material fields. The insects were collected following insect holes on the raw materials in the study areas. Larvae, pupae and adult of the insects were collected and determined according to insect determining keys. *Anobium punctatum*, *Lyctus brunneus*, *Xyletinus* sp. and *Xestobium rufovillosum* insects were found from Anobiidae and Lyctidae (Coleoptera) family insect groups. *Lyctus brunneus* was found only sapwood while *Anobium punctatum* was found heartwood and sapwood. *Anobium punctatum* was very common and highest number of insect in this study. The highest *Anobium punctatum* number was found on oak wood. Generally, the insects were found in woods trunk. As a result it was suggested that infected wood materials and not infected woods should not wait together and same area in log depots and factory areas.

**Keywords:** Anobiidae, Lyctidae, Wood destroying insects, Wood depots, Wood factories

**Özet:** Bu çalışmada, Batı Karadeniz Bölgesinde orman endüstri sektöründe faaliyet gösteren fabrika sahalarında ve tomruk depolarında odunlarda zarar yapan Anobiidae ve Lyctidae familyası böcekleri toplanmış ve teşhis edilmiştir. 7 farklı ilde (Düzce, Bolu, Zonguldak, Bartın, Karabük, Kastamonu ve Sinop) 9 fabrika sahası ve 21 farklı tomruk deposu çalışma alanı olarak seçilmiştir. Böcekler, yoğunluk belirlemek için odunlar üzerinde açılan 20x50 cm'lik bir çalışma alanından toplanmıştır. Odunlarda zarar yapan larva, pupa ve ergin böcekler böcek teşhis anahtarlarından faydalanılarak teşhis edilmiştir. Anobiidae familyasından *Anobium punctatum*, *Xyletinus* sp. ve *Xestobium rufovillosum* böcekleri Lyctidae familyasından *Lyctus brunneus* odun zararlısı böceği bulunmuştur. *Lyctus brunneus* böceği yalnızca diri odunlar üzerinde bulunmuşken, *Anobium punctatum* hem öz odun hem de diri odunlar üzerinde bulunmuştur. Çalışmada en yaygın ve en yoğun böcek türü *Anobium punctatum* türü belirlenmiştir. Diğer yandan *Anobium punctatum* böceği en yoğun meşenin gövde odunlarında bulunmuştur. Sonuç olarak tomruk

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depolarında ve fabrika sahalarında böcek arızı olan materyaller ile sağlıklı odunların birlikte ve aynı sahada depolanmaması gerektiği önerilmektedir.

## 1. INTRODUCTION

Anobiidae and Lyctidae family's beetles are very important for wood and wooden materials. *Anobium punctatum* is one of the most important insect and is named as furniture beetle. It can lay about 20-50 eggs one time. Especially, it damages in the interior of buildings and furniture [1, 2]. *Anobium punctatum* only attacks seasoned sapwood timber, not live or fresh wood. Also, it usually does not attack heartwood timbers. *Anobium punctatum* mostly feeds hardwoods but sometimes feed softwoods.

*Xyletinus* sp is an insect species belonging to the Anobiidae family, and is an insect species that damages wood materials such as *A. punctatum* during construction.

The damage of *Xestobium rufovillosum* is considerable in sapwood of wood materials. Cellulose is used as food. It damage on oak, hornbeam, elm, poplar, beech and willow. It can be seen in various wood materials used in furniture and construction, with hardwoods, dried branches and tree trunks [3].

*Lyctus brunneus* or the powderpost beetle is a species of beetle in the family Lyctidae. It is another important pest beetle attacking the sapwood of hardwood trees such as oak, elm, ash, walnut and eucalypt. The heartwood of hardwoods is not infested. It can lay about 70 eggs on *Bu makale*, sapwood pores of woods and lays up to 3 eggs per pore. This study focused on Anobiidae and Lyctidae family insects found on woods in wood depots and the wood factories in western black sea region of Turkey. There is no study related with this beetles in forest depots and factory areas in the region in literature [2].

## 2. METHOD

Insect collection was carried out in 9 factories and 21 log storages area in 5 provinces (Düzce, Bolu, Zonguldak, Bartın, Kastamonu). The study was conducted in February-October 2015-2016. Larva, pupa and adult insect investigations were carried out on timber and logs in the factory and log storages. On the factory grounds, walnut yellow pine, beech, oak, and Turkish pine have been researched. A 20x50 cm area was opened on the woods to determine the number of insects. In addition, damage of insects to sapwood, heartwood, cambium and bark has been determined.

## 3. FINDINGS

A total of 148 *Anobium punctatum* insects were collected and determined. As it can be seen on Table 1, the most insect's number was found on oak wood. On the other hand, 4, 3 and 17 insects were found on pine, Scotch pine and poplar, respectively. The highest insect number was found in Kastamonu (location code: 6.4). Larvae of insects were found more than adults in the wood. In 2015, more insects were determined than 2016 year.

*Lyctus brunneus* was found on walnut wood. 81 larvae and 14 adults were found on walnut sapwood at 20x50 cm area in a timber factory raw material area in Düzce. *Xestobium rufovillosum*, *Xyletinus* sp., *Stegobium paniceum* and *Ernobius pini* were rarely found in the study. Generally the insect were found on sapwoods of woods for all insects in the holding materials brought from abroad in the factory areas.

Table 1 shows that wood destroying insects found in this study. The location codes were shown as a number because the companies requested. Figure 1 shows *A. Punctatum* larvae damage to wood and its holes and faces.

**Table 1.** Anobiidae and Lyctidae family insects in wood depots and the wood factory raw material areas

Insects	Location Type	L.C	Date	I. S.	I. N.	Tree	W.P
<i>Anobium punctatum</i>	Wood depot	6.4.	09.05.2015	Larvae	66	Oak	Sapwood
		6.4.	09.05.2015	Pupae	1	Oak	Sapwood
		2.1.	24.06.2015	Larvae	9	Oak	heartwood
		6.7.	19.03.2015	Larvae	4	Pine	Sapwood
		2.1.	15.04.2016	Larvae	3	Scotch pine	Sapwood
		2.1.	20.06.2016	Larvae	26	Oak	Sapwoodheartwood
	Wood factory	6.7.	28.06.2016	Adult	22	Oak	Sapwoodheartwood
		1.6.	09.06.2016	Larvae	12	Poplar	Sapwoodheartwood
		1.6.	09.06.2016	Adult	5	Poplar	Sapwoodheartwood
<i>Lyctus brunneus</i>	Wood factory	1.6.	09.06.2016	Larvae	81	Walnut	Sapwood
		1.6.	09.06.2016	Adult	14	Walnut	Sapwood
<i>Xestobium rufovillosum</i>	Wood depot	1.3.	02.05.2015	Adult	1		
<i>Xyletinus sp.</i>	Wood depot	1.1.	09.05.2015	Adult	1		
<i>Stegobium paniceum</i>	Wood factory	1.6.	01.06.2015	Adult	1	Oak	Sapwood
<i>Ernobius pini</i>	Wood factory	1.6.	07.06.2015	Adult	1	Scotch pine	Sapwood

1.6, 1.1, 1.3 (Düzce log depots and factories), 6.4, 6.7 (Bolu log depots and factories), 2.1 (Bolu log depot), L.C: Location Code, I.S: Insect Stage, I.N: Insect number W.P: Wood Part

During the factory visits in Düzce, it was understood that some factories were closed due to the damage of *Lyctus brunneus* insect. Physical and visual damage has been detected, especially in the sapwoods. It was observed that timbers in some timber deposits have been exposed with partially to *Anobium punctatum* beetle damage after 2 or 3 years holding times. As it can be seen on the Table 1, the insects researched were found totally 6 wood depots and wood factories. Because these insects do not appear on freshly cutting wood materials. It can be seen after wood holding time period for 2 or more years.

In the Bolu region, a large number of *Anobium punctum* insects and damages were observed on the waste timbers waiting for a depot. For this reason worked wooden materials should not waited with new log samples (Komut et al. 2010).



**Figure 1.** Images of *Anobium punctatum* and its damage on wood.

Figure 2 shows that *Lyctus brunneus* larvae and its damage to walnut wood species. This figures obtained from a factory wood holding materials for 2 or 3 years in Düzce province.



**Figure 2.** *Lyctus brunneus* larvae and its damage to wood

#### 4. CONCLUSION AND DISCUSSION

According to findings, some important wood destroying insects were determined from Anobiidae and Lyctidae families in wood working factories areas and forest depots. Generally, *Anobium punctatum* and *Lyctus brunneus* wood destroying insect species were found on hardwoods. For this reason, it indicates that these insects prefer hardwoods. *Anobium punctatum* was found on sapwood and heartwood unlike *Lyctus brunneus* was found on sapwood of woods [2]. In this region, some similar studies were conducted by Akbulut et al. [5] in Düzce companies. They found several wood-destroying insects in imported timbers. *Lyctus brunneus*, *Hylotrupes bajulus*, *Anobium punctatum*, and *Xestobium rufovillosum* that is economically important. Yalcin et al [6] also conducted a study in Yiğilca Aksu wood depot in Duzce.

Generally, trapped insects were seen on waited wooden materials in our study. In depots and factory areas, insect infected woods should not wait so that insects do not put its eggs on not infected wood materials.

This study also showed that Anobiidae family insects particularly *Anobium punctatum* can damage on wood depots and factory areas as well as it can damage on museum [7] and furniture.

The adults of harmful insects were found after May - Jun in this study. Therefore, it can be said that struggle methods should be applied in these months.

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## 6. REFERENCES

- [1]. Bozkurt, Y., Göker, Y., and Erdin, N., (1993). *Impregnation Technic*, Istanbul University, Press I., Publication No:3879, Forest Faculty publication no: 4135, İstanbul.
- [2]. Kaygın A.T. (2007). *Industrial wood destroying insects*. I. Press, Nobel Publication No: 1082, Science and Biology Publications Series: 31, Ankara, 243.
- [3]. Çanakçıoğlu, H., and Mol, T., (1998). *Orman entomolojisi (zararlı ve yararlı böcekler)* İ.Ü. Orman Fakültesi Yayınları, ISBN: 975-404-487-2.
- [4]. Komut, O., Imamoğlu, S., and Öztürk A., (2010). The effective damage in forestry enterprises selling storage and precautions. *III. National Black Sea Forestry Congress*, Artvin, Turkey, 2022 May, 270-278.
- [5]. Akbulut, S., Keten, A., Yüksel, B., (2008). Wood destroying insects in Düzce province. *Turkish Journal of Zoology*, 32: 343-350.
- [6]. Yalcin, M., Yuksel, B., Akcay, C., and Cil, M. (2016). Integrated Pheromone Trap System for Collecting Pests: Insects Collecting Cages. *KSU journal of natural science*, 19, (4).
- [7]. David, P., (2013). Past, present and future: changes in status and distribution of museum insect pests. *Integrated Pest Management (IPM) in Museums, Archives and Historic Houses - Proceedings of the International Conference in Vienna, Austria*.