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Abstract: Wood destroying insects were investigated in forest depots, imported timbers, and wood products in use in Düzce province. In the collection of insect material trap logs, storage decks, and samples of wooden materials were used. In total, 63 insect species belonging to 31 families of 4 orders were found, and 34 of the identified species were categorized as pest species. In forest depots, the most common insects were bark beetles and longhorned beetles. Several wood-destroying insects were found in imported timbers, such as *Platypus cylindrus* (Fabricius), *Xyleborus* sp., and *Lymexylon navale* (Linnaeus). In addition, the Coleopteran species *Lyctus brunneus* (Stephens), *Hylotrupes bajulus* (Linnaeus), *Anobium punctatum* (De Geer), and *Xestobium rufovillosum* (De Geer), which are economically very important, were found in wood products.

Key Words: Düzce, timber, insect, pest, exotic species, forest depot

Düzce Çevresindeki Odun Zararlısı Böcekler

Özet: Odun zararlısı böcekler Düzce'deki orman depolarında, ithal edilen tomruklarda ve kullanılmakta olan ahşap malzemelerde belirlenmiştir. Böcekleri toplamak için tuzak odunları, istifler ve kullanılmış malzeme örneklenmesi kullanılmıştır. Toplam 4 takıma ait 31 familyadan 63 böcek türü belirlenmiş ve bunların otuz dört tanesi zararlı böcek olarak kabul edilmiştir. Orman depolarında, en yaygın olarak bulunanlar kabuk böcekleri ve teke böcekleridir. *Platypus cylindrus* (Fabricius), *Xyleborus* sp., *Lymexylon navale* (Linnaeus) gibi bazı zararlı böcek türleri ithal edilen tomruklarda bulunmuştur. Ayrıca kullanılan ahşap malzemelerde *Lyctus brunneus* (Stephens), *Hylotrupes bajulus* (Linnaeus), *Anobium punctatum* (De Geer), and *Xestobium rufovillosum* (De Geer), gibi ekonomik bakımdan önemli 4 kın kanatlı (Coleoptera) türü belirlenmiştir.

Anahtar Sözcükler: Düzce, kereste, böcek, zararlı, yabancı türler, orman deposu

Introduction

Wood is an important component of human life. In recent years, the consumption and trade of forest products has increased substantially and is projected to further increase in the years ahead (Hicks, 2001). Forest stands are the main source of wood products. Global demand for wood is expected to reach 5.6 billion m^3 in 2020 (Birler, 1995). This demand can not be met by natural forests alone. Some alternative sources, such as commercial plantations, may close this gap between the demand and supply of wood. Importation and exportation of forest products are used by nations to close this gap. The increasing volume of the global trade of forest products has dramatically increased the likelihood of the introduction of exotic pests into non-infested regions throughout the world. Many countries have suffered from the unintentional introduction of exotic forest pests, such as the pine wood nematode (*Bursaphelenchus xylophilus* (Steiner and Buhrer), Nickle), gypsy moth (*Lymantria dispar* Linnaeus), and great spruce bark beetle (*Dendroctonus micans* Kugelann), which have caused enormous economic losses in their newly exploited ecosystems. Like other nations, there is a gap between the demand and supply of wood in Turkey. According to recent data, the demand for industrial wood is met by national forests (65%), private plantations (26%), and importation from other countries (9%) (DPT, 2001). Projections indicate that the industrial wood demand in Turkey will be 15.6 million m^3, of which 12.3 million m^3 will come from national sources and the remaining part (3.3 million m^3) from imports (DPT, 2001).

As nations try to increase the yield of wood, there are some biotic factors affecting the amount and quality of wood products harvested from forest stands and used in

structures. Many pest insects attack wood products of different kinds, causing economic losses, both nationally and globally.

Many economically important forest pests are phloem feeders or wood borers, which are important to both pre-harvest and post-harvest management. In Turkey, because of weather conditions and high elevations, harvesting activities are usually scheduled during spring and summer, or may extend through autumn. During these periods insects are very active and search for host plants. In addition, harvested forest products have to be stored in forest depots located both within and outside forest environments before they are taken to market. These materials are very attractive as breeding sites and for development by wood destroying insects.

There are also some structure-infesting insects that cause considerable economic damage to wood buildings and household items, such as furniture, roof frames, and other woody materials used in or outside homes. In Turkey few studies have been conducted to locate structure-infesting insect species (Özbek, 1978; Sekendiz, 1981; Özkazanç et al., 1996).

The objectives of this study were to collect and catalog wood-destroying insects in forest depots, to collect and catalog exotic species in imported wood products and timbers, and to collect and catalog structure-infesting insects in woody products in use in Düzce.

Materials and Methods

This study was conducted during 2001 and 2002 in Düzce province. Trap logs were prepared to investigate wood-destroying insects in forest depots. Two Forest District Enterprises were selected: Düzce and Gölyaka. Logs used in this experiment were cut from 7 tree species and stands located in different parts of the Düzce and Gölyaka forest districts. Büyükaçma, Muncurlu, and Düzorman Forest Depots in the Düzce Forest District and the Gölyaka Forest Depot in Gölyaka Forest District were selected to store trap logs. For each tree species 20 logs, 90-100 cm in length and 15-20 cm in diameter, were cut and brought into forest depots. Logs of each tree species were stored separately as trap logs in each selected forest depot. In addition, trap logs, 3 m in length and 15-20 cm in diameter, were placed inside the forests to identify wood-destroying insect species in the forests. All trap logs were put in place in February and March, before the flight period of the insects began. Trap logs were checked every 15-20 days between May and November, and logs with insect activity were brought into the laboratory to observe adult emergence. Logs left inside the forests were first cut into pieces 50-60 cm long and brought into the laboratory periodically.

Due to limited laboratory space not all the logs were collected; therefore, some logs with similar insect activity (shape of entrance or emergence holes, frass type, gallery type, etc.) were selected randomly from stacks of each tree species. An equal number of logs from each tree species were brought into the laboratory. Logs were cut into 2 equal pieces and the height and diameter of each part were measured. Basic insect emergence processes were followed (Çanakçıoğlu, 1993). All logs were placed in screen cages to observe insect emergence. They were kept under constant conditions of 22-25 °C, 60%-70% RH, and a photoperiod of 14:10 h (L:D) in a conditioning room during insect development. Logs brought from different forest depots were placed in different emergence cages. Each cage was checked for emergence every 24 h. Emerged insects were collected from each cage and vital information (date of emergence, tree species, depot name, etc.) was noted. Collected specimens were prepared and identified using an Olympus stereomicroscope. This process was continued until the end of insect emergence from each log. Each log was kept for about 5-6 months, and then discarded.

To investigate wood-destroying insects in imported forest products (timbers), 2 wood products companies were selected for sampling in Düzce. These companies import a large quantity of timbers from different countries. Both companies were visited when imported timbers arrived. These companies are referred to as A and B so as to maintain their anonymity, as they requested. One stack of each tree species imported by the companies was selected and controlled for insect activity. If timbers had intact bark, the bark was removed and checked for larvae, pupae, and adults. We were not permitted to take wood samples from the timbers; therefore, only specimens found under bark were collected and brought into the laboratory for identification. Unfortunately, the amount of wood imports decreased dramatically during the study period due to economic conditions, which negatively affected the sampling of timbers.

To investigate structure-infesting insects, wood samples of varying size were collected from urban and

rural residential areas of Düzce province. Samples were collected from insect-infested wooden support timbers, furniture, cabinets, joists, wooden fences, and hardwood floors. Samples were brought to the laboratory and placed in screen cages for insect emergence. They were kept under similar constant conditions as given above. Emerged insects were collected and identified daily.

All collected specimens were prepared according to Çanakçıoğlu (1993). The insects were identified according to a series of guide studies carried out by several authors (Freude et al., 1966, 1967, 1969, 1976, 1979, 1981, 1983; Grüne, 1979; Borror et al., 1989; Cherepanov, 1990a, 1990b, 1990c, 1991a, 1991b; Bense, 1995; Selmi, 1998).

Results

Wood-Destroying Insects in Forest Depots (storage deck)

In this study, 72 logs from 7 different tree species were used. The distribution of tree species in each forest depot is given in Table 1. Some of the trap logs did not have any insect activity. These logs were observed for 30-40 days and then discarded. No insects emerged from logs cut from poplar (*Populus tremula* L.) or hornbeam (*Carpinus betulus* L.) trees. Insects emerged from *Pinus nigra* Arnold, *P. sylvestris* L., *Abies bornmülleriana* Mattf., *Fagus orientalis* Lipsky, and *Quercus* spp.

In all, 33 identified and 14 unidentified species belonging to 23 families from 4 orders were collected (Table 2), and 25 species were categorized as wood-destroying insects. Some of the remaining species were important for biological control, e.g., *Thanasimus formicarius* (Linnaeus) and *Rhizophagus dispar* (Paykull). Coleopteran species were dominant (Table 2). Most of the specimens were bark beetles (Coleoptera: Curculionidae: Scolytinae) and *Ips sexdentatus* (Boerner) was the most abundant species. The 2 most prevalent species were longhorned beetles (Coleoptera: Cerambycidae) and bark beetles (Table 2).

Among the forest depots, the greatest number of species was found in Muncurlu (24 species; 16 identified and 8 unidentified), followed by Gölyaka, Düzorman, and Büyükaçma (Table 2). In the Düzorman and Muncurlu forest depots, the greatest number of species was associated with *P. nigra* and *P. sylvestris*, followed by *A. bornmülleriana* and *F. orientalis*. In Gölyaka and Büyükaçma, the greatest number of species was found in *A. bornmülleriana*, followed by *Pinus* spp.

Wood-Destroying Insects in Wood Production Factories

Ten visits were made to the selected wood products companies. Most of the timbers were imported from Russia, Ukraine, Azerbaijan, Romania, USA, Gabon, and the Democratic Republic of Congo. We collected 11 species from the bark of imported timbers (Table 3). All insect specimens were from 8 beetle families (Coleoptera) and only 4 species were classified as pests (Table 3). The remaining species were either predators or saprophytes. Most of the observed entrance holes through the timbers belonged to longhorned beetles. In some timbers, live adult insects or larvae were noted, e.g., *Platypus cylindrus* (Fabricius), *Lymexylon navale* (Linnaeus), *Carpophilus bipustulatus* (Heer), and *Atomaria* spp. Live

Table 1. Distribution of tree species in each forest depot.

Tree Species	Forest Depot			
	Düzorman	Muncurlu	Büyükaçma	Gölyaka
Pinus nigra	+	+	+	+
Pinus sylvestris	-	+	+	-
Abies bornmülleriana	-	+	+	+
Fagus orientalis	+	+	+	+
Carpinus betulus	+	+	-	+
Populus tremula	+	-	+	-
Quercus petrea	+	+	+	+

+: Present
- : Absent

Table 2. Insects collected from tree species located at each forest depot in Düzce.

Order	Family	Species	Tree Species*	Depot	Pest Status
Coleoptera	Anthicidae	*Formicomus* sp.	*Pn, Ps*	Muncurlu	↑
Coleoptera	Buprestidae	*Phaenops cyanea*	*Pn, Ps, Ab*	Gölyaka, Düzorman	↗
Coleoptera	Carabidae	Undetermined	*Pn, Ps*	Muncurlu	↑
Coleoptera	Carabidae	Undetermined	*Pn, Ps*	Gölyaka	↑
Coleoptera	Cerambycidae	*Acanthocinus griseus*	*Ab*	Düzorman, Büyükaçma	↗
Coleoptera	Cerambycidae	*Callidium aeneum*	*Ab*	Gölyaka	↗
Coleoptera	Cerambycidae	*Clytus rhamni*	*Qp*	Muncurlu	↗
Coleoptera	Cerambycidae	*Criocephalus rusticus*	*Pn, Ps*	Düzorman, Muncurlu, Büyükaçma	↗
Coleoptera	Cerambycidae	*Monochamus galloprovincialis*	*Pn, Ps*	Düzorman, Muncurlu	↗
Coleoptera	Cerambycidae	*Morimus ganglbaueri*	*Pn, Ps, Fo*	Muncurlu, Gölyaka	↗
Coleoptera	Cerambycidae	*Plagionotus detritus*	*Qp*	Muncurlu	↗
Coleoptera	Cerambycidae	*Rhagium inquisitor*	*Pn, Ps, Ab*	Gölyaka	↗
Coleoptera	Cerambycidae	*Stromatium fulvum*	*Fo*	Gölyaka	↗
Coleoptera	Cleridae	*Thanasimus formicarius*	*Ab*	Büyükaçma	↑
Coleoptera	Colydiidae	*Aulomum ruficorne*	*Pn, Ps*	Muncurlu	↑
Coleoptera	Colydiidae	*Bitoma crenata*	*Pn, Ps*	Muncurlu	↑
Coleoptera	Cucujidae	*Uleiota planata*	*Pn, Ps*	Muncurlu	↑
Coleoptera	Curculionidae	Undetermined	*Pn, Ps*	Düzorman	↗
Coleoptera	Curculionidae	Undetermined	*Pn, Ps*	Muncurlu	↗
Coleoptera	Curculionidae	*Pissodes piceae*	*Ab*	Düzorman, Muncurlu, Büyükaçma	↗
Coleoptera	Curculionidae	*Pissodes notatus*	*Ab*	Büyükaçma	↗
Coleoptera	Elateridae	Undetermined	*Pn, Ps*	Gölyaka	↑
Coleoptera	Histeridae	*Paromalus parallelepipedus*	*Ab*	Düzorman	↑
Coleoptera	Histeridae	*Cylister oblongum*	*Pn, Ps*	Muncurlu, Gölyaka	↑
Coleoptera	Melandryidae	*Serropalpus barbatus*	*Ab*	Gölyaka	↗
Coleoptera	Mycetophagidae	*Litargus conexus*	*Ab*	Gölyaka	↑
Coleoptera	Rhizophagidae	*Rhizophagus dispar*	*Ab*	Büyükaçma	↑
Coleoptera	(Curculionidae: Scolytinae)	*Cryphalus piceae*	*Ab*	Büyükaçma	↗
Coleoptera	(Curculionidae: Scolytinae)	*Ips acuminatus*	*Pn, Ps*	Muncurlu	↗
Coleoptera	(Curculionidae: Scolytinae)	*Ips sexdentatus*	*Pn, Ps*	Düzorman, Muncurlu, Büyükaçma, Gölyaka	↗
Coleoptera	(Curculionidae: Scolytinae)	*Orthotomicus erosus*	*Pn, Ps, Ab*	Muncurlu, Gölyaka	↗
Coleoptera	(Curculionidae: Scolytinae)	*Pityokteines curvidens*	*Ab*	Düzorman, Büyükaçma, Gölyaka	↗
Coleoptera	(Curculionidae:Scolytinae)	*Pityophthorus pityographus*	*Ab*	Büyükaçma	↗
Coleoptera	(Curculionidae: Scolytinae)	*Scolytus intricatus*	*Fo*	Düzorman, Muncurlu	↗
Coleoptera	(Curculionidae:Scolytinae)	*Xyleborus saxeseni*	*Fo*	Gölyaka	↗
Coleoptera	(Curculionidae: Scolytinae)	*Trypodendron lineatum*	*Ps, Ab*	Büyükaçma	↗
Coleoptera	Staphylinidae	*Paederus litoralis*	*Ab*	Gölyaka	↑
Hymenoptera	Formicidae	Undetermined	*Pn, Ps*	Muncurlu	↑
Hymenoptera	Ibaliidae	*Ibalia leucospoides*	*Pn, Ps, Ab*	Düzorman, Muncurlu	↑
Hymenoptera	Siricidae	*Sirex noctilio*	*Pn, Ps*	Düzorman, Muncurlu, Büyükaçma	↗
Diptera	Dolichopodidae	Undetermined	*Pn, Ps*	Düzorman	↑
Diptera	Dolichopodidae	Undetermined	*Ab*	Muncurlu	↑
Diptera	Dolichopodidae	Undetermined	*Ab*	Gölyaka	↑
Diptera	Muscidae	Undetermined	*Pn, Ps*	Muncurlu	↑
Diptera	Sciaridae	Undetermined	*Pn, Ps*	Muncurlu	↑
Diptera	Cecidomiidae	Undetermined	*Pn, Ps*	Düzorman	↑
Hemiptera	Lygaeidae	Undetermined	*Ab*	Muncurlu	↑

**Pn: Pinus nigra; Ps: Pinus sylvestris; Ab: Abies bornmülleriana; Fo: Fagus orientalis; Qp: Qercus petrea.*

↗: Detrimental

↑: Non-detrimental

Table 3. Insects collected from tree species located at each wood product company in Düzce.

Order	Family	Species	Tree Species*	Depot	Pest Status
Coleoptera	Cryptophagidae	*Atomaria* sp.	*Ki*	A	↑
Coleoptera	Cucujidae	*Uleiota planata*	*Ki*	A	↑
Coleoptera	Platypidae	*Platypus cylindrus*	*Eo*, *Mb*	A, B	↗
Coleoptera	(Curculionidae: Scolytinae)	*Xyleborus* sp.	*Eo*, *Es*	A, B	↗
Coleoptera	Colydiidae	*Bitoma crenata*	*Eo*, *B*	A, B	↑
Coleoptera	Nitidulidae	*Carpophilus bipastulatus*	*Q*	A	↑
Coleoptera	Nitidulidae	*Epuraea* sp.	*Q*	A	↑
Coleoptera	Nitidulidae	*Brachypeplus rubidus*	*Es*	A	↑
Coleoptera	(Curculionidae: Scolytinae)	*Xyleborus* sp.	*Es*	B	↗
Coleoptera	Lymexylonidae	*Lymexylon navale*	*B*	B	↗
Coleoptera	Colydiidae	*Bitoma crenata*	*B*	B	↑
Coleoptera	Anthicidae	*Anthicus* sp.	*Mb*	B	↑

**Ki: Khaya ivorensis; Eo: Eribroma oblanga; Q : Quercus, Es: Entandrophrapwa sprapue; B: Berbau; Mb: Microberlinia brozzocillensis.*
↗: Detrimental
↑: Non-detrimental

larvae were brought into the laboratory, but adults did not develop from these larvae. In all, 8 insect species were collected from company A and 7 from company B.

Structure-Infesting Insects in Wood Products

In the wood products we examined, 7 species (5 of which are detrimental) belonging to 6 families and 2 orders were identified (Table 4). The species we found in wood products are very common structure-infesting and economically important insects in Turkey: the old house borer, *Hylotrupes bajulus* (Linnaeus), the furniture beetle, *Anobium punctatum* (De Geer), and the death-watch beetle, *Xestobium rufovillosum* (De Geer). *Valgus hemipterus* (Linnaeus), also commonly collected, feeds on decaying woody materials on the outside of structures. During the identification process we were unable to identify 2 hymenopteran (family) specimens beyond the family level.

Discussion and Conclusions

In this study, wood destroying-insect species were investigated in Düzce and 63 insect species belonging to 31 families of 4 orders were found; 34 of the insect

Table 4. Structure-infesting insects collected from tree species in Düzce.

Order	Family	Species	Tree species	Pest Status
Coleoptera	Scarabaeidae	*Valgus hemipterus*	*Salix* sp.	↗
Coleoptera	Lyctidae	*Lyctus brunneus*	*Fraxinus* sp.	↗
Coleoptera	Cerambycidae	*Hylotrupes bajulus*	*Pinus* sp.	↗
Coleoptera	(Curculionidae: Scolytinae)	*Anobium punctatum*	*Pinus* sp.	↗
Coleoptera	(Curculionidae: Scolytinae)	*Xestobium rufovillosum*	*Pinus* sp.	↗
Hymenoptera	Braconidae	Undetermined	*Pinus* sp.	↑
Hymenoptera	Ichneumonidae	Undetermined	*Pinus* sp.	↑

↗: Detrimental
↑: Non-detrimental

species were categorized as pest species and the remaining as non-pest. Most of the harmful insects found in the forest depots were bark beetles (Coeloptera: Curculionidae: Scolytinae), longhorned beetles (Coleoptera: Cerambycidae), metallic wood-borers (Coleoptera: Buprestidae), snout beetles (Coleoptera: Curculionidae), and horntails (Hymenoptera: Siricidae). They are the most common wood-destroying insects and have very widespread distribution in Turkey (Çanakçıoğlu and Mol, 1998; Toper Kaygın, 2007).

I. sexdentatus and *P. curvidens* Germer are well known and widely distributed in Turkish forests (Selmi, 1998). The occurrence of bark beetles in commercial forests constitutes a serious problem for forest management (Coulson and Witter, 1984). It is known that bark beetles cause serious damage to fir and pine forests in Turkey (Öymen, 1992; Yüksel, 1996; Yüksel, 1998; Öymen and Selmi, 1997; Çanakçıoğlu and Mol, 1998; Selmi, 1998).

Another important group found in the forest depots was longhorned beetles. In the current study, *Acanthocinus griseus* Linnaeus, *Criocephalus rusticus* Linnaeus, and *Monochamus galloprovincialis* subsp. *pistor* Germer were commonly found in storage decks. Attacks by these beetles negatively impact the economic value of woody materials (Toper Kaygın, 2007). In some cases, storage decks of conifer logs in forest depots are discarded because of the extensive damage caused by these insects. Buprestid beetles, snout beetles, and horntails have a similar impact on logs and timbers stored in forest depots, but were not as common.

The main cause of the infestation of logs and other woody materials in forests or forest depots is the storage of these materials for long periods without taking any precautionary measures such as the removal of bark. Debarking is often not performed because of economic constraints or difficult terrain. In fact, most small diameter logs are bought for pulp and other wood products with the bark intact. The only way to eliminate this problem is to remove logs and other woody materials from forests before the insect flight period starts or to debark all conifer forest products if they are to be kept in forests or forest depots for a considerably long period. Damaged materials in forests or forest depots serve as sites for reproduction and development of the progeny of colonized pest species, and increase population densities of wood-infesting insects.

Several wood-destroying insects were found in imported timbers, such as *Platypus cylindrus, Xyleborus* sp., and *Lymexylon navale*. This finding shows that some imported timbers are received with insects from exporter countries, which may result in the introduction of a very serious exotic pest into Turkish forests. There are very few studies that have investigated the potential introduction of exotic wood-destroying insects in imported forest products at harbors in Turkey. Yalınkılıç and Serez (1992) carried out a study to investigate fungal and insect damage of wood imported into Turkey at some Black Sea harbors. They found some fungal species, galleries, and tunnels of bark beetles, longhorned beetles, and metallic wood borers. They also found that 10% of the 160 m^3 of timbers they sampled had at least 20% surface damage.

Yalınkılıç and Serez (1992) suggested that exotic pests may be introduced very easily in forest products imported into Turkey because there is a big gap between wood production and demand in Turkey. To close this gap, Turkey has to import wood products from wood exporting countries. The importation of wood from different countries increases the possibility of the inadvertent introduction of exotic pests into Turkey. To eliminate this possibility, precautionary guidelines should be evaluated carefully to prevent the inadvertent introduction of exotic pests, and phytosanitary inspection at busy entry points should be performed more carefully.

Several insect species damage stored wood, structural timbers, and other wood products, such as furniture and wood frames. In this study we found 4 very important beetle (Coleoptera) species, the true powder post beetle (*L. brunneus*), the old house borer (*H. bajulus*), the furniture beetle (*A. punctatum*), and the death-watch beetle (*X. rufovillosum*). They are very common species in Turkey and cause serious economic loss. Similar species were also found in historical buildings in Bartın (Özkazanç et al., 1996). The true powder post beetle attacks products and structural components made from hardwoods (Hedges and Lacey, 1996). In our study they were especially abundant in hardwood floors. We counted 23 adult emergence holes in a 160-cm^2 area of a hardwood floor. One of the most significant insects that infest wood is the old house borer, which generally attacks structural softwoods (Hedges and Lacey, 1996). In this study, the old house borer was found most frequently in attic rafters and joists. This beetle can cause

severe damage to buildings (Coulson and Witter, 1984; Creffield, 1996). Özbek (1978) emphasized the importance of this species as a wood pest in buildings in Erzurum. Old house borer larvae can collapse a wooden roof in 15-25 years (Ozkazanç et al., 1996).

The furniture beetle (*A. punctatum*) primarily infests structural wood, as well as furniture. The death-watch beetle prefers structural timber in damp areas. In this study, they were found in softwood (*Pinus* spp.), structural materials, and other wooden materials. Özkazanç et al. (1996) found 18 adult *A. punctatum* emergence holes in a 100-cm^2 area of cabinet doors.

The extent of damage created by structure-infesting insects is significant. The costs of wood protection and repair of damage to wooden structures caused by wood-destroying insects worldwide are difficult to estimate. No studies have been conducted to estimate the cost of damage caused by wood-destroying insects in Turkey. Homeowners should know the methods of preventing and controlling wood-destroying insects. Most of the procedures that will prevent attacks on wood before it is used are the responsibility of those who harvest, mill, or store the wood.

In conclusion, a considerable number of wood-destroying insects, as well as some beneficial insects, were found. These findings suggest that wood is not well protected against wood-destroying insects during all stages, from forest harvest to use in home products. There are no detailed studies that have evaluated the effects of wood-destroying insects in Turkey; therefore, it is difficult to reach a conclusion about the economic consequences of damage caused by wood-destroying insects. More detailed studies should be conducted to identify wood-destroying insects in different regions of Turkey.

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