

Bark beetle fauna (Coleoptera: Scolytinae) of the coniferous forests in the Mediterranean region of Western Turkey, with a new record for Turkish fauna*

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Abstract: Scolytinae (Coleoptera: Curculionidae) species and their host plants of coniferous forests of the Mediterranean region of Western Turkey were determined between 2006 and 2008. A total of 27 species of Scolytinae were collected from 59 different sites in Afyonkarahisar, Antalya, Burdur, Denizli, Isparta, and Muğla provinces. *Hylastes angustatus* (Herbst), *H. linearis* Erichson, *Tomicus destruens* (Wollaston), *Hylurgus ligniperda* (Fabricius), *Pityogenes calcaratus* (Eichhoff), *P. pennidens* Reitter, *Orthotomicus robustus* (Knotek), and *O. suturalis* (Gyllenhal) were recorded as new species for the Scolytinae fauna of the Mediterranean region of Western Turkey. *Orthotomicus robustus* (Knotek) was recorded for the first time from Turkey.

Key words: Scolytinae, fauna, host plant, coniferous forests, Mediterranean region of Western Turkey

Türkiye faunası için yeni bir kayıtlı birlikte Batı Akdeniz Bölgesi iğne yapraklı ormanlarının kabuk böcekleri (Coleoptera: Scolytinae) faunası

Özet: Batı Akdeniz Bölgesi iğne yapraklı ormanlarında Scolytinae (Coleoptera: Curculionidae) alt familyasına ait tür ve bu türlerin konukçu bitkileri 2006-2008 yıllarında tespit edilmiştir. Antalya, Afyonkarahisar, Burdur, Denizli, Isparta ve Muğla yörelerinde 59 farklı alandan toplanan örnekler değerlendirilmiş, *Hylastes angustatus* (Herbst), *H. linearis* Erichson, *Tomicus destruens* (Wollaston), *Hylurgus ligniperda* (Fabricius), *Pityogenes calcaratus* (Eichhoff), *P. pennidens* Reitter, *Orthotomicus robustus* (Knotek) ve *O. suturalis* (Gyllenhal) türleri Batı Akdeniz Bölgesi için yeni kayıt olarak belirlenmiştir. Bu türlerden *O. robustus* (Knotek) aynı zamanda Türkiye faunası için yeni kayıttır.

Anahtar sözcükler: Scolytinae, fauna, konukçu bitki, iğne yapraklı orman, Batı Akdeniz Bölgesi

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Introduction

The subfamily Scolytinae (Coleoptera: Curculionidae), with more than 6000 described species, is one of the largest groups of Coleoptera (Eroğlu et al., 2005). One hundred and seven species belonging to Scolytinae were known from Turkey before the current study (Selmi, 1998). Adults can be minute, with a body length of little more than 2 mm, although *Dendroctonus micans* Kugelan (1794), which is the biggest species of bark beetles in Turkey, can reach 10 mm body length. Bark beetle species typically cause secondary damage but during occasional outbreaks they are capable of killing relatively vigorous trees (Selmi, 1998; Can, 2005). The adult beetles are the primary tunnellers and make breeding galleries in the wood under the bark of a wide range of trees where the eggs are laid. The larvae then make small lateral galleries where they live and feed (Hill, 1997). Scolytinae is one of the most important insect groups in Turkey due to their damage to forest trees. In recent years, an important increase has been observed on damage level of bark beetles by their outbreaks (İnaç and Laz, 2001; Can, 2005; Sarıkaya and Avcı, 2006).

Pinus brutia Ten., *P. nigra* Arnold, *Cedrus libani* A.Rich, *Abies cilicica* Carr., and *Juniperus excelsa* Bieb. are the main species of coniferous forests of the Mediterranean Region of Western Turkey. The number of trees being killed by Scolytinae species has increased significantly in recent years throughout the region. This increase has been observed especially in damaged forests where windstorms and snowy conditions had caused broken and windfall trees, as well as in areas affected by forest fires. In addition, outbreaks have occurred at low quality sites during dry years when moisture stress increases the vulnerability to beetle attack. Mistakes in silvicultural applications such as incorrect pruning or damage to young trees during harvesting operations can also increase deaths caused by bark beetles.

Among bark beetles, *Tomicus destruens*, *T. minor*, *Pityokteines curvidens*, *Orthotomicus erosus*, *O. tridentatus*, and *Ips sexdentatus* were common and caused economically significant damage in coniferous

forests of the Mediterranean region of Western Turkey (Sarıkaya and Avcı, 2007; Sarıkaya, 2008; Avcı and Sarıkaya, 2009).

There are some records of Scolytinae species associated with coniferous trees of the Mediterranean region of Western Turkey, but these species have not been studied extensively. The aim of the current study was to determine the Scolytinae fauna and host plants of each species in the coniferous forests of that region.

Materials and methods

Surveys were conducted throughout the coniferous forests of the Mediterranean region of Western Turkey between 2006 and 2008. Scolytinae species were collected from 59 sites displaying different forest characteristics in Afyonkarahisar, Antalya, Burdur, Denizli, Isparta, and Muğla provinces. In addition, status of sites, altitude, and geographical coordinates were also noted (Table 1, Figure). Besides forest stands, specimens were also collected from trunks deposited in forest depots (timber storage places).

Trees weakened by other insects or drought were used to determine the Scolytinae fauna. These trees were selected by observing damage symptom and signs like holes in the bark, resin flows, and yellowish or brownish color on crown. Trap logs put in place by Forest Administration personnel for controlling bark beetles were also checked. Ten trap logs were used each site. Using entrance holes and sawdust around the stems as a guide, main galleries were opened. Some species flew to the shoots of nearby trees for maturation feeding, so shoots were checked for evidence of beetles and feeding. Collected specimens were labeled with date, location, and forest characteristics of the sampling area. Bark sections and shoots infested by Scolytinae species were placed in plastic bags and taken to the laboratory where specimens were mounted and sent to specialists for identification. All samples are now deposited at the Entomological Museum of Süleyman Demirel University, Forestry Faculty, Isparta, Turkey.

Table 1. Collection sites, geographical positions, altitudes, and characteristics of sampling locations.

No.	Collection Sites	Geographical Positions	Altitude (m)	Status of sites
Afyonkarahisar				
01	Başmakçı-Yaka	37°51'N, 30°03'E	1000	Natural <i>Pinus brutia</i> and <i>P. nigra</i> mixed forest
02	Dazkırı-Çiftlikköy	37°55'N, 29°42'E	1350	<i>Pinus nigra</i> plantation
Antalya				
03	Akseki-Geriş	36°57'N, 31°43'E	900	Natural <i>Pinus brutia</i> forest
04	Akseki-Emirhasanbeli	37°05'N, 31°48'E	1350	Natural and mature <i>Abies cilicica</i> forest
05	Alanya-Avsallar	36°36'N, 30°48'E	100	Natural and young <i>Pinus brutia</i> forest
06	Alanya-Demirtaş	36°32'N, 32°07'E	50	Forest depot
07	Antalya-Çakırlar	36°50'N, 30°33'E	100	Forest depot
08	Döşemealtı-Düzlerçamı	36°58'N, 30°32'E	315	Natural and young <i>Pinus brutia</i> forest
09	Elmalı-Çıglıkara	36°30'N, 29°47'E	1685	Natural <i>Cedrus libani</i> forest, protected area
10	Finike-Alacadağ	36°24'N, 30°04'E	460	Natural and young <i>Pinus brutia</i> forest
11	Finike-Üçkuzluk	36°22'N, 30°02'E	1420	Natural <i>Cedrus libani</i> forest
12	Gazipaşa-Demirliçeşme	36°18'N, 32°14'E	80	Forest depot
13	Gazipaşa-Gevne	36°47'N, 32°26'E	1700	Natural <i>Pinus nigra</i> and <i>Juniperus excelsa</i> forest
14	Gazipaşa-Sivastı	36°25'N, 32°24'E	800	Natural <i>Pinus brutia</i> forest
15	İbradı-Genboz	37°15'N, 31°42'E	1300	Natural <i>Cedrus libani</i> and <i>Abies cilicica</i> mixed forest
16	İbradı-Üzümdere	37°07'N, 31°41'E	650	Natural and young <i>Pinus brutia</i> forest
17	Kaş-Kalkan	36°16'N, 29°23'E	100	Natural <i>Pinus brutia</i> forest
18	Kaş-Kasaba	36°18'N, 29°44'E	350	Natural <i>Pinus brutia</i> forest
19	Kemer-Karabucak	36°35'N, 30°32'E	100	Forest depot
20	Kemer-Ulupınar	36°27'N, 30°25'E	110	Natural and young <i>Pinus brutia</i> forest
21	Kumluca-Sarıcasu	36°25'N, 30°13'E	250	Natural and young <i>Pinus brutia</i> forest
22	Manavgat-Bucakşihlar	36°51'N, 31°27'E	150	Natural <i>Pinus brutia</i> forest
23	Manavgat-Sorgun	36°45'N, 31°25'E	50	Natural and mature <i>Pinus brutia</i> forest
24	Serik-Akbaş	37°03'N, 31°06'E	100	Natural <i>Pinus brutia</i> forest
25	Serik-Gebiz	37°06'N, 30°55'E	100	Forest depot
Burdur				
26	Ağlasun-Çamlıdere	37°37'N, 30°41'E	920	Natural and young <i>Pinus brutia</i> forest
27	Ağlasun-Çobanpınarı	37°34'N, 30°45'E	360	Natural and young <i>Pinus brutia</i> forest
28	Ağlasun-Kibrit	37°38'N, 30°31'E	1095	Young <i>Pinus nigra</i> plantation
29	Bucak-Elsazı	37°27'N, 30°47'E	300	Natural and young <i>Pinus brutia</i> forest
30	Bucak-Kargı	37°15'N, 30°49'E	265	Natural and young <i>Pinus brutia</i> forest
31	Bucak-Karlık	37°20'N, 30°39'E	1330	Natural and mature <i>Cedrus libani</i> and <i>Abies cilicica</i> mixed forest
32	Bucak-Kestel	37°19'N, 30°36'E	950	Natural <i>Pinus brutia</i> forest
33	Bucak-Melli	37°18'N, 30°42'E	900	Natural <i>Pinus brutia</i> forest
34	Burdur-Aziziye	37°26'N, 30°15'E	1315	Natural <i>Pinus nigra</i> forest
35	Burdur-Çeltikçi	37°31'N, 30°29'E	950	Natural <i>Pinus brutia</i> forest
36	Burdur-Sülüklügöl	37°30'N, 30°25'E	1200	Natural and young <i>Pinus nigra</i> forests
37	Göhlhisar-Büyükalan	37°12'N, 29°37'E	1020	Young <i>Pinus brutia</i> plantation
38	Göhlhisar-Dirmil	36°55'N, 29°28'E	1520	Natural and young <i>Pinus nigra</i> forest
Denizli				
39	Tavas-Bozdağ	37°17'N, 29°05'E	1550	Natural <i>Cedrus libani</i> , <i>Pinus nigra</i> and <i>Juniperus excelsa</i> mixed forest
Isparta				
40	Aksu-Pazarköy	37°46'N, 31°03'E	1325	Young <i>Pinus nigra</i> plantation
41	Eğirdir-Aşağıgökdere	37°35'N, 30°49'E	440	Natural and young <i>Pinus brutia</i> forest
42	Eğirdir-Boyalı	37°59'N, 30°47'E	930	Young <i>Pinus brutia</i> plantation
43	Eğirdir-Çamyol	37°47'N, 30°56'E	1250	Natural and mature <i>Pinus nigra</i> forest
44	Eğirdir-Yuvalı	37°43'N, 30°54'E	1120	Natural <i>Abies cilicica</i> and <i>Juniperus excelsa</i> forest

Table 1. (Continued).

No.	Collection Sites	Geographical Positions	Altitude (m)	Status of sites
45	Isparta-Çünür	37°50'N, 30°30'E	1010	Young <i>Pinus brutia</i> plantation
46	Isparta-Davras Mountain	37°44'N, 30°38'E	1200	Young <i>Pinus nigra</i> plantation
47	Isparta-Doğandere	37°44'N, 30°38'E	950	Natural and young <i>Pinus brutia</i> forest
48	Isparta-Karatepe	37°44'N, 30°32'E	1500	<i>Pinus nigra</i> plantation
49	Isparta-Kapıkaya	37°38'N, 30°46'E	960	Natural and young <i>Pinus brutia</i> forest
50	Isparta-Manasır Stream	37°41'N, 30°39'E	840	Young <i>Pinus brutia</i> plantation
51	Keçiborlu-Burçaklıksırtı	37°55'N, 30°17'E	1165	Young <i>Pinus nigra</i> plantation
52	Keçiborlu-Sofualanı	37°54'N, 30°17'E	1010	Young <i>Pinus brutia</i> plantation
53	Keçiborlu, Söğütdağı	38°00'N, 30°18'E	1350	<i>Pinus nigra</i> plantation
54	Senirkent-Kapıdağ	38°05'N, 30°43'E	1390	Natural and mature <i>Cedrus libani</i> and <i>Pinus nigra</i> mixed forest, protected area
55	Sütçüler-Ayvalıpınar	37°40'N, 31°07'E	1320	Natural and mature <i>Pinus nigra</i> forest
56	Sütçüler-Karadağ	37°29'N, 30°55'E	650	Natural and young <i>Pinus brutia</i> forest
57	Sütçüler-Yeşilyurt	37°32'N, 30°52'E	460	Natural and young <i>Pinus brutia</i> forest
58	Yenişarbademli-Yokuşyol	37°42'N, 30°22'E	1600	Natural and mature <i>Abies cilicica</i> , <i>Pinus nigra</i> and <i>Juniperus excelsa</i> mixed forest, protected area
Muğla				
59	Köyceğiz-Zeytinalanı	36°57'N, 28°45'E	130	Forest depot

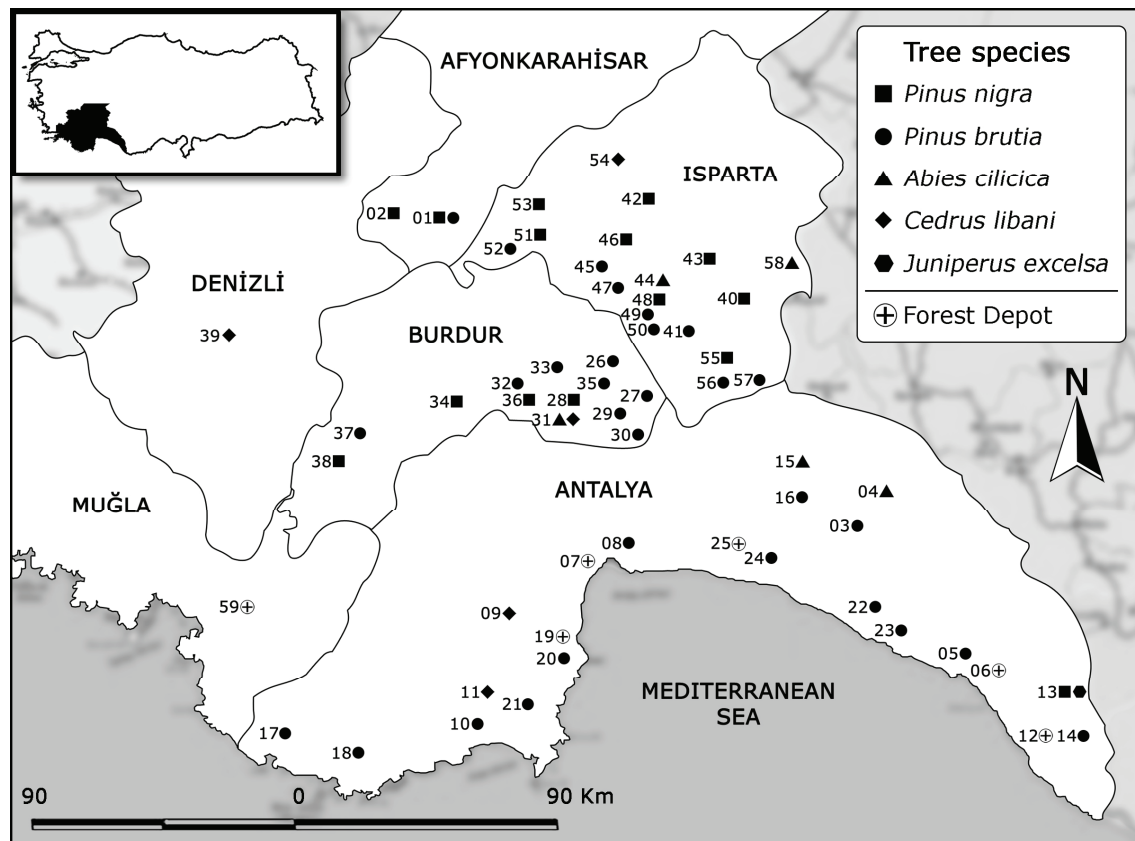


Figure. Sampling sites and main tree species (site numbers see Table 1).

Results and discussion

During the studies, 4928 Scolytinae specimens were collected from 59 sites and a total of 27 species belonging to 2 tribes (Hylesinini and Scolytini) were identified.

List of Scolytinae species collected from coniferous trees in the Mediterranean region of Western Turkey

Species were confirmed according to the classifications in Postner (1974) and Schedl (1980). Information on the examined materials is provided in the following order: Host plant - Province: Collecting site, Collecting date (Number of collected specimens).

Tribe- Hylesinini: Hylastina

Hylastes angustatus Herbst, 1793

Material examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 27.04.2006 (2); **Burdur:** Ağlasun, Çobanpınarı, 19.05.2006 (4); **Isparta:** Eğirdir, Aşağıgökdere, 14.05.2006 (7), 09.04.2007 (4); *Pinus nigra* - **Isparta:** Aksu, Pazarköy, 24.04.2007 (3).

Host plants: *Pinus sylvestris*, *P. rotundata*, *P. pinaster*, *P. nigra*, *P. pinea*, *Picea orientalis*, *Abies nordmanniana* (Pfeffer, 1995; Selmi, 1998; Yüksel, 1998).

Distribution: Central and South Europe, Caucasus (Pfeffer, 1995).

Turkish Records: İstanbul, Trabzon (Selmi, 1998; Yüksel, 1998).

Hylastes attenuatus Erichson, 1836

Material Examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 20.04.2006 (2); *Pinus nigra* - **Isparta:** Sütçüler, Ayvalıpınar, 26.04.2008 (3).

Host plants: *Pinus densiflora*, *P. halepensis*, *P. nigra*, *P. pinaster*, *P. pinea*, *P. pentaphylla*, *P. sylvestris* (Pfeffer, 1995).

Distribution: Central and South Europe, Denmark, Caucasus, Crimea (Pfeffer, 1995).

Turkish Records: Taurus Mountains (Selmi, 1998).

Hylastes linearis Erichson, 1836

Material examined: *Pinus brutia* - **Isparta:** Eğirdir, Aşağıgökdere, 14.05.2006 (3), 13.03.2007 (2).

Host plants: *Pinus halepensis*, *P. pinaster*, *P. brutia*, *P. nigra*, *P. sylvestris* (Pfeffer, 1995).

Distribution: Russia, Tunisia, Algeria, Cyprus, South Europe, Canary Islands (Pfeffer, 1995).

Turkish Records: Bursa (Selmi, 1998).

Tomicus destruens (Wollaston, 1865)

Material examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 16.03.2006 (8), 23.03.2006 (6), 30.03.2006 (5), 07.04.2006 (6), 13.04.2006 (5), 20.04.2006 (5), 03.05.2006 (4), 07.06.2006 (4), 14.06.2006 (5); **Antalya:** Akseki, Geriş, 22.06.2007 (11); Alanya, Avsallar, 18.04.2007 (9); Antalya, Çakırlar, 11.03.2006 (15); 13.04.2007 (11); Döşemealtı, Düzlerçamı, 19.03.2006 (7), 23.02.2008 (10); Finike, Alacadağ, 24.05.2007 (3); İbradı, Üzümdere 19.04.2007 (15); Manavgat, Sorgun, 20.04.2007 (8); Serik, Akbaş, 26.10.2007 (2); Serik, Gebiz, 20.04.2007 (11); **Burdur:** Ağlasun, Çamlıdere, 11.10.2006 (12); Ağlasun, Çobanpınarı, 13.02.2006 (11), 20.02.2006 (8), 03.03.2006 (4), 17.03.2006 (4), 28.04.2006 (5), 12.05.2006 (4); Bucak, Elsazı, 01.12.2006 (3); Bucak, Kargı, 13.02.2007 (14), 27.02.2007 (9), 15.04.2007 (5), 22.04.2007 (4), 01.11.2007 (7), 12.11.2007 (5), 14.12.2007 (6), 05.02.2008 (4), 11.04.2008 (7); Bucak, Kestel, 17.07.2006 (4); Gölhisar, Büyükalın, 22.01.2007 (2); **Isparta:** Eğirdir, Aşağıgökdere, 01.03.2006 (12), 10.03.2006 (12), 24.03.2006 (11), 05.05.2006 (4), 19.05.2006 (5), 08.06.2006 (4), 13.02.2007 (4), 06.03.2007 (5), 13.03.2007 (8), 19.03.2007 (6), 02.04.2007 (3), 09.04.2007 (4), 23.04.2007 (6), 30.04.2007 (7), 26.05.2007 (6); Isparta, Çünür 06.07.2007 (3); Isparta, Davras Mountain, 11.03.2008 (8); Isparta, Manasır Stream, 24.01.2008; Sütçüler, Karadağ, 04.03.2007 (4); Sütçüler, Yeşilyurt 25.07.2006 (3); **Muğla:** Köyceğiz, Zeytinalanı, 24.10.2006 (4); *Pinus nigra* - **Isparta:** Isparta, Doğandere, 05.02.2008 (6); Keçiborlu, Burçaklıksırtı, 23.03.2006 (2), 30.03.2006 (4).

Host plants: *Pinus halepensis*, *P. canariensis*, *P. brutia*, *P. pinaster*, *P. nigra*, *P. radiata* (Vasconcelos et al., 2003; Ciesla, 2004; Gallego et al., 2004; Faccoli et al., 2005a; Peverieri et al., 2006; Chakali, 2007).

Distribution: Spain, France, Portugal, Italy, Turkey, Cyprus, Algeria, Palestine (Pfeffer, 1995, Vasconcelos et al., 2003, Ciesla, 2004; Gallego et al., 2004; Faccoli et al., 2005b; Horn et al., 2006; Peverieri et al., 2006; Vasconcelos et al., 2006; Chakali, 2007).

Turkish Records: Hatay-Tekneşin, Muğla-Marmaris, Western Mediterranean region (Lekander, 1971; Horn et al., 2006; Sarıkaya and Avcı, 2007).

***Tomicus minor* (Hartig, 1834)**

Material examined: *Pinus nigra*-**Afyonkarahisar:** Başmakçı, Yaka, 30.03.2006 (6), 26.04.2006 (3), 03.05.2006 (4); **Antalya:** Gazipaşa, Gevne, 05.07.2007 (6); **Burdur:** Ağlasun, Kibrit, 01.03.2006 (4), 24.03.2006 (9), 02.04.2006 (12), 16.04.2006 (8), 23.04.2006 (7), 02.07.2006 (4), 09.07.2006 (7), 16.07.2006 (6); Burdur, Sülüklügöl, 08.03.2006 (4); Burdur, Aziziye, 10.01.2006 (5), 04.04.2006 (3), 24.04.2006 (10), 02.08.2006 (6), 17.04.2006 (3); Burdur, Çeltikçi, 01.03.2006 (4); Gölhisar, Dirmil, 31.10.2007 (5); **Isparta:** Aksu, Pazarköy, 07.03.2007 (12), 05.04.2006 (14), 12.04.2007 (11), 05.07.2006 (6), 12.07.2006 (5), 13.03.2007 (8), 27.03.2007 (16), 10.04.2007 (8), 17.04.2007 (9), 01.05.2007 (6), 08.05.2007 (5), 22.05.2007 (8), 03.07.2007 (6), 10.07.2007 (5); Eğirdir, Boyalı, 25.01.2006 (3); Isparta, Çünür, 07.02.2008 (6), 06.03.2008 (4), 11.03.2008 (2); Isparta, Davras Mountain, 02.10.2006 (6); 31.01.2008 (14); Isparta, Karatepe, 03.07.2007 (11), 19.07.2007 (5); Keçiborlu, Burçaklıksırtı, 02.03.2006 (5), 08.03.2006 (5), 16.03.2006 (5), 23.03.2006 (7), 30.03.2006 (6), 13.04.2006 (6), 20.04.2006 (6), 22.05.2006 (8), 23.06.2006 (4), 07.07.2006 (4), 27.02.2007 (3); Sütçüler, Ayvalıpınar, 26.04.2008 (6); *Pinus brutia* - **Burdur:** Bucak, Kargı, 29.03.2007 (3); **Isparta:** Eğirdir, Aşağıgökder, 17.03.2006 (2), 07.04.2006 (4), 14.04.2006 (2), 02.04.2007 (4), 19.07.2007 (6).

Host plants: *Pinus sylvestris*, *P. mugo*, *P. rotundata*, *P. strobus*, *P. nigra*, *P. halepensis*, *P. densiflora*, *P. brutia*, *P. koraiensis*, *P. thunbergiana*, *P. pinea*, *Picea orientalis*, *Cedrus libani* (Pfeffer, 1995; Çanakçıoğlu and Mol, 1998; Selmi, 1998; Yüksel et al., 2000).

Distribution: Europe, Corsica, Caucasus, Turkey, Siberia, South China (Pfeffer, 1995; Fernandez et al., 1999a, 1999b; Borkowski, 2001; Längström et al., 2002; Martikainen et al., 2005).

Turkish Records: İstanbul, Ayancık, Eskişehir-Çatak, Bursa, Kızılcahamam, Gerede, Karabük, Beyşehir, Merzifon, Ankara, Muğla, Akseki, Isparta, Sarıkamış (Selmi, 1998; Yüksel et al., 2000).

***Hylurgus ligniperda* (Fabricius, 1787)**

Material examined: *Pinus brutia*-**Afyonkarahisar:** Başmakçı, Yaka, 11.04.2006 (3); **Burdur:** Bucak, Kargı, 12.11.2007 (2); **Isparta:** Eğirdir, Aşağıgökder, 24.03.2006 (2), 14.04.2006 (3), 26.03.2007 (4); *Pinus nigra*- **Burdur:** Burdur, Aziziye, 17.04.2006 (3); **Isparta:** Sütçüler, Ayvalıpınar, 26.04.2008 (3).

Host plants: *Pinus sylvestris*, *P. nigra*, *P. halepensis*, *P. brutia*, *P. pinaster*, *P. pinea*, *P. radiata* (Pfeffer, 1995; Reay and Walsh, 2001).

Distribution: Central and South Europe, Caucasus, Turkey, Algeria, New Zealand (Pfeffer, 1995; Reay and Walsh, 2001).

Turkish Records: Bursa-Orhaneli, Eskişehir-Çatacık, Kozak (Schedl, 1961; Selmi, 1998).

***Hylurgus micklitzi* Wachtl, 1881**

Material examined:

Pinus brutia- **Afyonkarahisar:** Başmakçı, Yaka, 07.04.2006 (1), 20.04.2006 (4); **Antalya:** Döşemealtı, Düzlerçamı, 11.03.2006 (2), 15.04.2006 (2); **Burdur:** Bucak, Kargı, 24.05.2008 (5), 04.01.2008 (2); **Isparta:** Eğirdir, Aşağıgökder, 19.03.2007 (4); *Pinus nigra* - **Burdur:** Burdur, Aziziye, 24.04.2007 (3).

Host plants: *Pinus halepensis*, *P. pinaster*, *P. pinea*, *P. nigra* (Pfeffer, 1995).

Distribution: Mediterranean countries (Pfeffer, 1995).

Turkish Records: *Pinus halepensis* areas (Selmi, 1998).

Tribe- Hylesinini: Polygraphina

***Carphoborus henscheli* Reitter, 1887**

Material examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 07.04.2006 (3), 14.04.2006 (7), 31.05.2006 (5); Dazkırı, Çiftlikköy, 19.04.2006 (6); **Antalya:** Alanya, Demirtaş, 27.10.2007 (5); Antalya, Çakırlar, 11.03.2006 (11); Döşemealtı, Düzlerçamı, 19.03.2006 (7), 15.04.2006 (5), 13.05.2006 (8), 13.04.2007 (5); Gazipaşa,

Demirliçeşme, 21.04.2007 (10); Kaş, Kalkan, 25.05.2007 (8); **Burdur:** Ağlasun, Çobanpınarı, 31.03.2006 (13); **Isparta:** Eğirdir, Aşağıgökder, 17.03.2006 (5), 24.03.2006 (4), 14.04.2006 (6), 13.03.2007; **Muğla:** Köyceğiz, Zeytinalanı, 24.10.2006 (3); **Pinus nigra - Isparta:** Aksu, Pazarköy, 27.03.2007 (6); Sütçüler, Ayvalıpınar, 26.04.2008 (5); **Cedrus libani - Burdur:** Bucak, Karlık, 29.03.2007 (13).

Host plants: *Pinus sylvestris*, *P. nigra*, *P. montana*, *P. leucodermis*, *P. brutia* (Pfeffer, 1995).

Distribution: Europe, Russia, Israel, Caucasus, Cyprus, Palestine (Pfeffer, 1995).

Turkish Records: Bursa-Orhaneli, Kozak-Dutlupınar, Tokat-Erbaa, Antalya-Nebiler, Ankara-Kızılcahamam, İzmir (Schedl, 1961; Tosun, 1975; Selmi, 1998).

Tribe- Hylesinini: Phloeosinini

Phloeosinus acatayi Schedl, 1958

Material examined: *Cedrus libani* - **Antalya:** Elmalı, Çıglıkara (9); Gazipaşa, Gevne, 10.07.2007 (8), Gazipaşa, Sivastı, 01.08.2007 (5); **Burdur:** Bucak, Karlık, 12.06.2007 (12); **Denizli:** Tavas, Bozdağ, 06.06.2007; **Isparta:** Senirkent, Kapıdağ, 05.05.2006 (6), 16.05.2006 (7).

Host plants: *Cedrus libani*, *Juniperus excelsa* (Ekici, 1971; Selmi, 1998).

Distribution: Turkey, Syria (Pfeffer, 1995).

Turkish Records: Antalya, Fethiye, Elmalı-Çıglıkara, Finike-Ördübek, Tavas, Şarkıkaraağaç-Kızıldağ, Denizli-Acıpayam, Burdur-Bucak (Ekici, 1971; Tosun, 1975; Selmi, 1998).

Phloeosinus aubei (Perris, 1855)

Material examined: *Juniperus excelsa* - **Antalya:** Gazipaşa, Gevne, 19.07.2007 (3).

Host plants: *Juniperus communis*, *J. excelsa*, *J. foetidissima*, *J. macrocarpa*, *J. phoenicea*, *J. sabina*, *Tetraclinis articulata*, *Cupressus sempervirens*, *Sequoiadendron giganteum*, *Thuja occidentalis*, *T. orientalis* (Schedl, 1961; Pfeffer, 1995).

Distribution: Mediterranean countries, Central Europe, Caucasus, North Africa, Austria, South Slovakia (Pfeffer, 1995).

Turkish Records: Adana-Feke, Mersin-Mut, Bursa-Orhaneli, Antalya, Denizli-Acıpayam, İstanbul (Schedl, 1961; Tosun, 1975; Selmi, 1998).

Tribe- Scolytini: Crypturgina

Crypturgus mediterraneus Eichhoff, 1971

Material examined: *Pinus brutia*- **Antalya:** Alanya, Avsallar, 18.04.2007 (22); Antalya, Çakırlar, 13.04.2007 (18); Kaş, Kalkan, 25.05.2007 (18); Kemer, Karabucak, 23.05.2007 (8); Kumluca, Sarıcasu, 23.05.2007 (12); Serik, Gebiz, 20.04.2007 (11); **Burdur:** Bucak, Kargı, 15.04.2007 (11), 01.11.2007 (24).

Host plants: *Pinus pinaster*, *P. pinea*, *P. halepensis*, *P. brutia* (Pfeffer, 1995).

Distribution: Mediterranean countries, Caucasus, Portugal, Turkey (Pfeffer, 1995).

Turkish Records: Bursa-Orhaneli, İstanbul, Kozak, Antalya-Manavgat (Schedl, 1961; Tosun, 1975; Selmi, 1989).

Crypturgus numidicus Ferrari, 1867

Material examined: *Pinus brutia*- **Antalya:** Alanya, Avsallar, 18.04.2007 (5); Gazipaşa, Demirliçeşme, 21.04.2007 (11), 01.08.2007 (7); Manavgat, Bucakşihlar, 27.10.2007 (5); **Burdur:** Bucak, Kargı, 01.11.2007 (10); 12.11.2007 (9); **Isparta:** Eğirdir, Aşağıgökder, 30.04.2007 (23).

Host plants: *Pinus halepensis*, *P. pinaster*, *P. nigra*, *P. brutia* (Pfeffer, 1995).

Distribution: Mediterranean countries, Caucasus (Pfeffer, 1995).

Turkish records: Antalya-Kumköy, Kozak (Selmi, 1998).

Crypturgus pusillus (Gyllenhal, 1813)

Material examined: *Pinus brutia*- **Antalya:** Gazipaşa, Sivastı, 13.10.2007 (6); **Isparta:** Eğirdir, Aşağıgökder, 30.04.2007 (9).

Host plants: *Picea abies*, *P. jezoensis*, *P. obovata*, *P. omorica*, *P. orientalis*, *Pinus cembra*, *P. densiflora*, *P. halepensis*, *P. brutia*, *P. koraiensis*, *P. leucodermis*, *P. mugo*, *P. peuce*, *P. pinaster*, *P. pinea*, *P. pumila*, *P. rotundata*, *P. sibirica*, *P. strobus*, *P. sylvestris*, *Abies alba*, *A. holophylla*, *A. sibirica*, *Larix decidua*, *L. gemelinii*, *L. sibirica* (Pfeffer, 1995).

Distribution: Europe, Siberia, Caucasus, Turkey (Pfeffer, 1995).

Turkish records: Artvin, Ordu, Giresun, Trabzon, Bolu, Tokat, Bursa, Uşak, Marmaris, Çameli, Antalya, Elmalı, Köyceğiz (Selmi, 1989, 1998; Tosun, 1975; Yüksel, 1998).

Tribe- Scolytini: Cryphalina

***Cryphalus piceae* (Ratzeburg, 1837)**

Material examined: *Abies cilicica* - **Antalya:** İbradı, Genboz, 19.04.2007 (6); **Isparta:** Eğirdir, Yuvalı, 24.04.2007 (12), 21.05.2007 (8), 28.06.2007 (3).

Host plants: *Abies alba*, *A. nordmanniana*, *A. borisii regis*, *A. cephalonica*, *A. nordmanniana* subsp. *bornmülleriana*, *A. cilicica* (Tosun, 1975; Pfeffer, 1995).

Distribution: Europe, the Balkans, Caucasus, Turkey (Pfeffer, 1995).

Turkish records: Artvin, Trabzon, Karabük, Bartın, Kastamonu-Daday, Çankırı-Ilgaz, Sinop, Ordu, Gümüşhane-Torul, Bursa, Ankara-Kızılcahamam, Burdur-Bucak, Konya-Beyşehir, Antalya-Akseki (Tosun, 1975; Sekendiz, 1991; Aksoy, 2000; Şimşek and Öner, 2003; Toper, 1999; Toper Kaygın and Sivacioğlu, 2002; Şimşek, 2003a, 2003b, 2005).

Tribe- Scolytini: Ipina

***Pityogenes bistridentatus* (Eichhoff, 1878)**

Material examined: *Pinus nigra* - **Antalya:** Gazipaşa, Gevne, 10.07.2007 (16), 19.07.2007 (20); **Burdur:** Burdur, Aziziye, 24.04.2006 (24); **Isparta:** Aksu, Pazarköy, 24.04.2006 (26), 10.04.2007 (14), 17.04.2007 (22), 24.04.2007 (15), 01.05.2007 (9), 03.07.2007 (14), 10.07.2007 (11), 24.07.2007 (6), 27.08.2007 (21), 05.09.2007 (16); Sütçüler, Ayvalıpınar, 26.04.2008 (14).

Host plants: *Pinus nigra*, *P. leucodermis*, *P. pinaster*, *P. brutia*, *Cedrus libani*, *Picea orientalis* (Pfeffer, 1995; Schedl, 1961; Tosun, 1975; Selmi, 1989; Yüksel, 1998).

Distribution: South France, Corsica, Italy, Slovakia, the Balkans, Austria, Hungary, Caucasus, Turkey (Pfeffer, 1995).

Turkish records: Bursa, Muğla-Yılanlı, Köyceğiz, Akseki-Cevizli, Eğirdir-Çamyol, Denizli-Acıpayam, Edirne-Keşan, Artvin-Şavşat (Schedl, 1961; Tosun, 1975; Selmi, 1989; Yüksel, 1998).

***Pityogenes calcaratus* (Eichhoff, 1878)**

Material examined: *Pinus brutia*- **Burdur:** Bucak-Melli, 26.05.2007 (8).

Host plants: *Pinus halepensis*, *P. brutia*, *P. pinaster*, *P. sylvestris* (Schedl, 1961; Pfeffer, 1995)

Distribution: Mediterranean countries, Portugal, Syria, Palestine, Algeria (Pfeffer, 1995).

Turkish records: Milas-Marçalı, Manisa-Soma, Bursa-Orhaneli (Schedl, 1961).

***Pityogenes pennidens* Reitter, 1889**

Material examined: *Pinus brutia* - **Antalya:** Alanya, Avsallar, 18.04.2007 (4); Antalya, Çakırlar, 11.03.2006 (6); Döşemealtı, Düzlerçamı, 13.05.2006 (6); Gazipaşa, Sivastı, 01.08.2007 (3); Kemer, Karabucak, 23.05.2007 (5); Kumluca, Sarıcasu, 23.05.2007 (12); Manavgat, Sorgun, 20.04.2007 (7); **Burdur:** Bucak, Melli, 26.05.2007 (5); **Isparta:** Eğirdir, Aşağıgökdere, 10.03.2006 (5), 17.03.2006 (8), 26.03.2007 (11), 23.04.2007 (13); **Muğla:** Köyceğiz, Zeytinalanı, 24.10.2006 (10).

Host plants: *Pinus brutia*, *P. halepensis*, *P. pinea* (Pfeffer, 1995).

Distribution: Greece, Cyprus, Caucasus, Turkey, Palestine (Schedl, 1961; Pfeffer, 1995).

Turkish records: Kozak, Aydın-Sarıkısıık, Çanakkale-İntepe, Manisa-Soma (Schedl, 1961; Selmi, 1989, 1998).

***Pityokteines curvidens* (Germar, 1824)**

Material examined: *Abies cilicica* - **Antalya:** Akseki, Emirhasanbeli, 11.05.2007 (23), 18.05.2007 (14), 25.05.2007 (16), 15.06.2007 (32), 09.07.2007 (17); 30.07.2007 (11); İbradı, Genboz, 19.04.2007 (9); **Isparta:** Eğirdir, Yuvalı, 04.05.2006 (7), 20.03.2007 (11), 27.03.2007 (6), 01.04.2007 (6), 24.04.2007 (5), 08.05.2007 (9), 15.05.2007 (7), 28.05.2007 (6), 12.06.2007 (3), 10.07.2007 (8), 24.07.2007 (10), 06.08.2007 (4), 05.09.2007 (3), 26.09.2007 (2); Yenişarbademli, Yokuşyol, 21.09.2006 (6), 18.05.2007 (4).

Host plants: *Abies alba*, *A. cephalonica*, *A. borisii regis*, *A. nordmanniana* subsp. *bornmulleriana*, *A. cilicica*, *A. nordmanniana* subsp. *equitrojani*, *A. nordmanniana*, *A. firma*, *A. sachalinensis*, *Cedrus libani*, *Picea abies*, *P. orientalis*, *Larix decidua*, *Pinus sylvestris* (Schedl, 1961; Pfeffer, 1995; Çanakçıoğlu and Mol, 1998, Selmi, 1998).

Distribution: Caucasus, Corsica, Italy, the Balkans, Turkey, Japan (Schedl, 1961; Pfeffer, 1995).

Turkish records: Bursa-Uludağ, Bursa-Nergizpınar, Ayancık, Devrek, Karabük, Küre, Bartın, Düzce, Bolu-Gerede, Mudurnu, Ankara-Kızılcahamam, Çanakkale-Bayramiç, Bucak-Sobya, Bucak-Karlık, Akseki, Manavgat-Cevizli (Schedl, 1961; Tosun, 1975; Selmi, 1998; Çanakçıoğlu and Mol, 1998, Toper, 1999; 2000; 2001; 2003; Aksoy, 2000;

Şimşek and Öner, 2002; Akbulut, 2005).

***Orthotomicus erosus* (Wollaston, 1857)**

Material examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 13.04.2006 (9), 20.04.2006 (17), 27.04.2006 (15), 03.05.2006 (26), 11.05.2006 (15), 31.05.2006 (27), 07.06.2006 (19); **Antalya:** Alanya, Avsallar, 18.04.2007 (16), Antalya, Çakırlar, 11.03.2006 (17), 13.04.2007 (12); Döşemealtı, Düzlerçamı, 12.03.2006 (22), 25.03.2006 (25), 02.04.2006 (33), 15.04.2006 (28), 20.05.2006 (15), 27.05.2006 (21), 03.06.2006 (17), 10.06.2006 (23), 24.06.2006 (17), 04.07.2006 (11); 13.04.2007 (13); 22.02.2008 (4); Finike, Alacadağ, 24.05.2007 (13); Gazipaşa, Demirliçeşme (22); İbradı, Üzümdere, 19.04.2007 (12); Kaş, Kalkan, 25.05.2007 (14); Kaş, Kasaba, 25.05.2007 (27), 20.10.2007 (7); Kemer, Karabucak, 23.05.2007 (14); Kemer, Ulupınar, 23.05.2007 (25), Kumluca, Sarıcasu, 23.05.2007 (18); Manavgat, Bucakşihlar, 27.10.2007 (8); Manavgat, Sorgun, 20.04.2007 (19); Serik, Akbaş, 26.10.2007 (5); Serik, Gebiz, 20.04.2007 (26); **Burdur:** Ağlasun, Çobanpınarı, 13.02.2006 (9), 17.03.2006 (13), 24.03.2006 (21), 31.03.2006 (25), 07.04.2006 (15), 14.04.2006 (28), 21.04.2006 (32), 05.05.2006 (22), 12.05.2006 (9), 01.06.2006 (6), 08.06.2006 (17), 15.06.2006 (27), 13.07.2006 (18); Bucak, Kargı, 13.02.2007 (8), 27.02.2007 (11), 29.03.2007 (24), 04.04.2007 (12), 15.04.2007 (24), 22.04.2007 (31), 29.07.2007 (18), 19.08.2007 (14), 02.09.2007 (21), 16.09.2007 (17), 23.09.2007 (25), 14.10.2007 (17);

Göhlisar, Büyükalın, 22.01.2007 (5); **Isparta:** Eğirdir, Aşağıgökdere, 01.03.2006 (11), 10.03.2006 (14), 17.03.2006 (24), 24.03.2006 (32), 31.03.2006 (22), 07.04.2006 (17), 14.04.2006 (19), 21.04.2006 (31), 05.05.2006 (26), 12.05.2006 (14), 01.06.2006 (6), 08.06.2006 (18), 15.06.2006 (22), 13.07.2006 (16), 20.07.2006 (12), 10.08.2006 (16), 17.08.2006 (11), 24.08.2006 (15), 05.10.2006 (21), 13.03.2007 (4), 19.03.2007 (15), 26.03.2007 (26), 02.04.2007 (17), 09.04.2007 (32), 15.04.2007 (28), 30.04.2007 (21), 07.05.2007 (16), 14.05.2007 (23), 26.05.2007 (19), 03.06.2007 (23), 11.06.2007 (19), 17.06.2007 (13), 25.06.2006 (23), 08.07.2006 (11), 12.08.2007 (13), 26.08.2007 (8), 02.09.2007 (14); Keçiborlu, Sofualanı, 14.03.2007 (11), 21.03.2007 (9), 01.04.2007 (8), 09.04.2007 (21), 23.04.2007 (25), 30.04.2007 (31), 07.05.2007 (29), 04.06.2007 (15), 25.06.2007 (21), 09.07.2007 (25), 16.07.2007 (14), 29.07.2007 (22), 05.08.2007 (19), 12.08.2007 (22), 19.08.2007 (32), 02.09.2007 (12), 15.09.2007 (7); **Muğla:** Köyceğiz, Zeytinalanı, 24.10.2006 (5); **Pinus nigra** - **Burdur:** Burdur, Aziziye, 08.03.2006 (6), 24.04.2006 (18), 17.05.2006 (22), 25.05.2006 (16), 01.06.2006 (11), 08.06.2006 (14), 22.06.2006 (17), 29.06.2006 (12); **Isparta:** Aksu, Pazarköy, 07.03.2006 (4), 12.04.2006 (6), 19.04.2006 (5), 17.05.2006 (11), 25.05.2006 (19), 31.05.2006 (9), 21.06.2006 (4), 28.06.2006 (7); Keçiborlu, Burçaklıksırtı, 07.04.2006 (5).

Host plants: *Pinus halepensis*, *P. canariensis*, *P. brutia*, *P. pinaster*, *P. pinea*, *P. nigra*, *P. sylvestris*, *Cedrus atlantica*, *C. libani*, *C. deodora*, *Abies bornmülleriana*, *Picea orientalis* (Schedl, 1961; Tosun, 1975; Selmi, 1989, 1998; Pfeffer, 1995; Çanakçıoğlu and Mol, 1998).

Distribution: Central and South Europe, Israel, Morocco, Tunisia, Algeria, Crimea, Caucasus, North America (Mendel and Halperin, 1982; Mendel, 1983; Pfeffer, 1995; Henin and Pavia, 2004; Haack, 2004; Lee, 2005; Jamaa et al., 2007).

Turkish records: Artvin, Şavşat, Ardanuç, Maçka, Mesudiye, Rize-İkizdere, Trabzon, Samsun, Tokat-Erbaa, Ankara-Beştepe, Ayancık, Karabük, Bolu, Abant, Düzce, İstanbul, Tekirdağ-Keşan, Çanakkale, Bursa-Uludağ, Orhaneli, Manisa-Soma, Denizli, Tavas, Acıpayam, Aydın, İzmir, Adana-Feke, Muğla, Marmaris, Milas, Antalya, Elmalı, Manavgat, Akseki, Serik, Fethiye, Mersin, Silifke, Anamur,

Kahramanmaraş (Schedl, 1961; Tosun, 1975; Selmi, 1989; 1998; Çanakçıoğlu and Mol, 1998).

***Orthotomicus longicollis* (Gyllenhal, 1827)**

Material examined: *Pinus nigra* - Isparta: Aksu, Pazarköy, 24.04.2007 (5), 01.05.2007 (4); Keçiborlu, Söğütadağı, 09.04.2007 (4); *Pinus brutia* - Afyonkarahisar: Başmakçı, Yaka, 03.05.2007 (2); **Antalya:** Gazipaşa, Demirliçeşme, 01.07.2007 (11); **Isparta:** Eğirdir, Aşağıgökdere, 07.05.2007 (3).

Host plants: *Pinus sylvestris*, *P. nigra* (Pfeffer, 1995).

Distribution: Europe, Caucasus, Turkey (Pfeffer, 1995).

Turkish records: İstanbul, Karabük, Bolu, Beyşehir-Kurucaova, Keles-Kocayayla, Muğla-Yılanlı, Isparta-Şarkikaraağaç (Schedl, 1961; Selmi, 1998).

***Orthotomicus pinivora* Schedl, 1961**

Material examined: *Pinus nigra* - Isparta: Aksu, Pazarköy, 24.04.2007 (12), 29.05.2007 (9).

Host plants: *Pinus nigra* (Schedl, 1961; Pfeffer, 1995).

Distribution: Turkey (Schedl, 1961; Pfeffer, 1995).

Turkish records: Bursa-Orhaneli, Kovalıdere, Köyceğiz-Gökçeova (Schedl, 1961; Selmi, 1989; 1998, Pfeffer, 1995).

***Orthotomicus robustus* (Knotek, 1899)**

Material examined: *Cedrus libani*- Antalya: Elmalı, Çıglıkara, 26.09.2006 (3).

Host plants: *Pinus nigra*, *P. leucodermis*, *Cedrus libani* (Pfeffer, 1995).

Distribution: Bosnia, Bulgaria, Greece, Austria, Hungary (Pfeffer, 1995).

Turkish records: New record

***Orthotomicus suturalis* (Gyllenhal, 1827)**

Material examined: *Pinus nigra*- Antalya: Gazipaşa, Sivastı, 13.10.2007 (5).

Host plants: *Picea abies*, *P. glehnii*, *P. jezoensis*, *P. orientalis*, *P. obovata*, *Pinus sylvestris*, *P. sibirica*, *P. densiflora*, *P. koraiensis*, *P. nigra*, *P. pumila*, *Larix decidua* (Pfeffer, 1995).

Distribution: Europe, Caucasus, Siberia, North China, Mongolia, Japan, Turkey (Pfeffer, 1995; Selmi, 1998).

Turkish records: Tokat-Tekmezar, Erbaa-Ardıç (Selmi, 1998).

***Orthotomicus tridentatus* Eggers, 1921**

Material examined: *Cedrus libani* - Antalya: Elmalı, Çıglıkara, 12.05.2007 (14); Finike, Üçkuzluk, 24.05.2007 (12); İbradı, Genboz, 19.04.2007 (18); **Burdur:** Bucak, Karlık, 15.06.2006 (8), 21.08.2006 (22), 04.09.2006 (17), 09.10.2006 (6), 29.03.2007 (15), 04.05.2007 (16), 20.05.2007 (11), 07.06.2007 (7), 24.07.2007 (21), 07.08.2007 (13), **Denizli:** Tavas, Bozdağ, 25.06.2008 (5).

Host plants: *Cedrus libani* (Schedl, 1961; Pfeffer, 1995).

Distribution: Turkey (Schedl, 1961; Pfeffer, 1995).

Turkish records: Adana-Feke, Antalya-Gazipaşa, Elmalı-Çıglıkara, Avlan, Kaş-Demre, Gömbe, Finike, Akseki-Merkez, İbradı, Murtıçı, Bucak-Melli, Pamucak, Kahramanmaraş-Andırın, Konya-Ermenek, Mersin (Schedl, 1961; Aytar et al., 2008).

***Ips mannsfeldi* (Wachtl, 1879)**

Material examined: *Pinus nigra* - Isparta: Aksu, Pazarköy, 07.03.2006 (11), 12.04.2006 (5), 19.04.2006 (8), 10.05.2006 (7), 15.06.2006 (9), 21.06.2006 (7), 12.07.2006 (5), 19.07.2006 (8), 04.10.2006 (3); *Pinus brutia* - Afyonkarahisar: Başmakçı, Yaka, 03.05.2006 (6).

Host plants: *Pinus nigra*, *P. sylvestris* (Pfeffer, 1995; Stauffer et al., 1997).

Distribution: Austria, Corsica, Romania, Croatia, Bosnia, Macedonia, Turkey (Pfeffer, 1995; Stauffer et al., 1997; Selmi, 1998).

Turkish records: Orhaneli-Çatak, Köyceğiz-Gökçeova, Muğla-Yılanlı, Amasya, Ayancık, Karabük, Bursa-Kemalpaşa, Çameli, Akseki-Cevizli (Schedl, 1961; Tosun, 1975; Selmi, 1998).

***Ips sexdentatus* (Boerner, 1776)**

Material examined: *Pinus nigra* - Burdur: Burdur, Aziziye, 08.03.2006 (16), 10.04.2006 (8), 17.04.2006 (14), 24.04.2006 (22), 01.05.2006 (13),

15.05.2006 (9), 08.06.2006 (4); **Isparta:** Aksu, Pazarköy, 07.03.2006 (7), 05.04.2006 (15), 12.04.2006 (24), 19.04.2006 (17), 26.04.2006 (21), 07.06.2006 (13), 14.06.2006 (11), 05.07.2006 (14), 12.07.2006 (9), 01.08.2006 (12), 08.08.2006 (11), 22.08.2006 (7), 24.04.2007 (4), 01.05.2007 (15), 08.05.2007 (26), 22.05.2007 (18), 12.06.2007 (9), 03.07.2007 (8), 31.07.2007 (5), 05.09.2007 (3), 12.09.2007 (11); Eğirdir, Çamyol, 11.09.2007 (6); Isparta, Kapıkaya, 24.08.2006 (6); Keçiborlu, Burçaklıksırtı, 22.05.2006 (6), 27.02.2007 (8); Sütçüler, Ayvalıpınar, 26.04.2008 (6); **Pinus brutia** - **Afyonkarahisar:** Başmakçı, Yaka: 23.03.2006 (5), 30.03.2006 (7), 13.04.2006 (11), 27.04.2006 (6), 11.05.2006 (4), 25.05.2006 (7), 07.06.2006 (3), 21.06.2006 (4), 05.07.2006 (2), 11.07.2006 (4); **Isparta:** Eğirdir, Aşağıgökder, 15.04.2006 (4), 27.04.2006 (5), 13.05.2006 (3), 19.05.2006 (2), 03.08.2006 (3), 14.08.2006 (4), 11.03.2007 (2), 23.03.2007 (4), 07.04.2007 (8); Keçiborlu, Sofualanı, 09.04.2007 (3), 23.04.2007 (7), 07.05.2007 (4), 20.05.2007 (1), 11.06.2007 (2), 02.07.2007 (6).

Host plants: *Pinus sylvestris*, *P. nigra*, *P. leucodermis*, *P. sibirica*, *P. koraiensis*, *P. brutia*, *Picea orientalis*, *Abies nordmanniana* subsp. *bornmulleriana*, *A. nordmanniana* (Defne, 1954; Chararas, 1966; Tosun, 1975; Sekendiz, 1991; Pfeffer, 1995; Kolk and Starzyk, 1996; Yüksel, 1998; Yüksel et al., 2000; Faccoli, 2004; Gilbert et al., 2005; Yüksel et al., 2005).

Distribution: Europe, Caucasus, Turkey, Siberia, Korea, Japan, North China (Pfeffer, 1995, Kolk and Starzyk, 1996).

Turkish records: Artvin, Trabzon, Rize, Giresun, Samsun, Ayancık, Küre, Karabük, Ankara, Kızılcahamam, Soğuksu, Bolu, Düzce, Eskişehir, Bursa, Balıkesir-Dursunbey, Uşak, İzmir, Manisa, Denizli, Akseki, Muğla, Gölhisar, Erzurum, Sarıkamış (Defne, 1954; Chararas, 1966; Tosun, 1975; Serez, 1984; Sekendiz, 1991; Yüksel, 1998; Yüksel et al., 2000; Yüksel et al., 2005).

Tribe- Scolytini: Xyleborina

Xyleborus eurygraphus (Ratzeburg, 1837)

Material examined: *Pinus brutia* - **Afyonkarahisar:** Başmakçı, Yaka, 15.04.2006 (6); **Antalya:** Alanya, Avsallar, 18.04.2006 (3); **Burdur:**

Ağlasun, Çobanpınarı, 26.05.2006 (4); **Isparta:** Eğirdir, Aşağıgökder, 13.04.2006 (5), 22.05.2007 (7), 13.06.2007 (4); **Pinus nigra** - **Burdur:** Burdur, Aziziye, 24.04.2006 (3); **Isparta:** Aksu, Pazarköy, 15.05.2006 (2), 12.04.2007 (4), 01.05.2007 (3), 18.05.2007 (4), 02.06.2007 (2), 19.06.2007 (4), 03.07.2007 (5).

Host plants: *Pinus nigra*, *P. sylvestris*, *P. brutia*, *P. halepensis*, *P. pinaster*, *P. pinea* (Pfeffer, 1995).

Distribution: Europe, Algeria, Turkey, Caucasus (Pfeffer, 1995).

Turkish records: Orhaneli-Kovalıdere, Manavgat-Çayıci, Milas-Marçalı, Akseki-Cevizli, Manavgat, Köyceğiz-Gökçeova, Antalya-Nebiler (Schedl, 1961; Tosun, 1975).

Among the 27 species collected belonging to 2 tribes of Scolytinae, 8 are new records for the coniferous forests in the Mediterranean region of Western Turkey. They are *Hylastes angustatus* (Herbst), *H. linearis* Erichson, *Tomicus destruens* (Wollaston), *Hylurgus ligniperda* (Fabricius) (Hylesinini), *Pityogenes calcaratus* (Eichhoff), *P. pennidens* Reitter, *Orthotomicus robustus* (Knotek), and *O. suturalis* (Gyllenhal) (Scolytini). In addition, this is the first record of *O. robustus* for the Turkish fauna.

The previously determined 19 species were as follows: in Hylesinini *Hylastes attenuatus* Erichson, *Tomicus minor* (Hartig), *Hylurgus micklitzi* Wachtl, *Carphoborus henscheli* Reitter, *Phloeosinus acatayi* Schedl, *P. aubei* (Perris); in Scolytini *Crypturgus mediterraneus* Eichhoff, *C. numidicus* Ferrari, *C. pusillus* (Gyllenhal), *Cryphalus piceae* (Ratzeburg), *Pityogenes bistridentatus* (Eichhoff), *Pityokteines curvidens* (Germar), *Orthotomicus erosus* (Wollaston), *O. longicollis* (Gyllenhal), *O. pinivora* Schedl, *O. tridentatus* Eggers, *Ips mannsfeldi* (Wachtl), *I. sexdentatus* (Boerner), and *Xyleborus eurygraphus* (Ratzeburg).

O. erosus, *T. destruens*, and *T. minor* were the most common species. *O. erosus* and *T. destruens* were found in 25 sites. In addition, *T. minor* specimens were collected from 16 sites. Among the collected total of 4928 specimens, *O. erosus* (46.0%), *Ips sexdentatus* (9.9%), *T. destruens* (8.0%), *T. minor* (7.6%), and *P. bistridentatus* (4.6%) were found as abundant species. As the most common species, *O.*

Table 2. Distribution and host plants of Scolytinae species in the Mediterranean region of Western Turkey.

Collection Sites No.	Collected Species	<i>Hylastes angustatus</i>	<i>Hylastes attenuatus</i>	<i>Hylastes linearis</i>	<i>Tomicus destruens</i>	<i>Tomicus minor</i>	<i>Hylurgus ligniperda</i>	<i>Hylurgus micklizi</i>	<i>Carpoborus henschei</i>	<i>Phloeosinus acatayi</i>	<i>Phloeosinus aubei</i>	<i>Crypturgus mediterraneus</i>	<i>Crypturgus numidicus</i>	<i>Crypturgus pusillus</i>	<i>Cryphalus piceae</i>	<i>Pityogenes bistridentatus</i>	<i>Pityogenes calcaratus</i>	<i>Pityogenes perridensis</i>	<i>Pityokteines curvidens</i>	<i>Orthotomicus erosus</i>	<i>Orthotomicus longicollis</i>	<i>Orthotomicus pinivora</i>	<i>Orthotomicus robustus</i>	<i>Orthotomicus suturalis</i>	<i>Orthotomicus tridentatus</i>	<i>Ips nansfeldi</i>	<i>Ips sexdentatus</i>	<i>Xyleborus curygraphus</i>
Afyon Khisar	01 Başmakçı-Yaka	●	●		●	■	●	●	●											●	●					●	●	●
	02 Dazkırı-Çiftlikköy								●																	●	●	●
Antalya	03 Akseki-Geriş				●																							
	04 Akseki-Emirhasanbeli				●							●	●					●	▲	●								●
	05 Alanya-Avsallar				●							●						●		●								
	06 Alanya-Demirtaş				●				●			●						●		●								
	07 Antalya-Çakırlar				●				●			●						●		●								
	08 Döşemealtı-Düzlerçamı				●		●		●									●		●								
	09 Elmalı-Çiğlikara									◆								●				◆		◆				
	10 Finike-Alacadağ				●															●								
	11 Finike-Üçkuzluk																			●					◆			
	12 Gazipaşa-Demirliçeşme								●		●		●							●	●							
	13 Gazipaşa-Gevne					■				◆	●																	
	14 Gazipaşa-Sivastı									◆				●				●						■				
	15 İbradı-Genboz														▲				▲						◆			
	16 İbradı-Üzümdere				●				●			●								●	●							
	17 Kaş-Kalkan								●			●								●	●							
	18 Kaş-Kasaba											●						●		●	●							
	19 Kemer-Karabucak											●						●		●	●							
	20 Kemer-Ulupınar											●						●		●	●							
	21 Kumluca-Sarıcasu											●						●		●	●							
	22 Manavgat- Bucakşihlar											●	●					●		●	●							
	23 Manavgat-Sorgun				●													●		●	●							
	24 Serik-Akbaşı				●															●	●							
	25 Serik-Gebiz				●							●								●	●							
Burdur	26 Ağlasun-Çamlıdere		●		●				●											●								●
	27 Ağlasun-Çobanpınarı	●			●				●											●								
	28 Ağlasun-Kibrit				●	■														●								
	29 Bucak-Elsazi				●															●								
	30 Bucak-Kargı				●	●	●	●				●	●							●								
	31 Bucak-Karluk				●				◆	◆		●	●							●					◆			
	32 Bucak-Kestel				●													●										
	33 Bucak-Melli																●	●									■	■
	34 Burdur-Aziziye					■	■	■								■				■							■	■
	35 Burdur-Çeltikçi																											
	36 Burdur-Sülüklügöl					■																						
	37 Gölhisar-Büyükalın				●															●								
	38 Gölhisar-Dirmil					■																						
Denizli	39 Tavas-Bozdağ									◆																		
Isparta	40 Aksu-Pazarköy	■				■			■							■				■	■	■				■	■	■
	41 Eğirdir-Aşağıgökdere	●		●	●	●	●	●	●			●	●					●		●	●					■	■	■
	42 Eğirdir-Boyalı					■														●	●							
	43 Eğirdir-Çamyol																										■	
	44 Eğirdir-Yuvalı														▲				▲									
	45 Isparta-Çünür				●	■																						
	46 Isparta-Davras Mountain				●	■																						
	47 Isparta-Doğandere				■																							
	48 Isparta-Karatepe					■																						
	49 Isparta-Kapıkaya																										■	
	50 Isparta-Manasır Stream				●																							
	51 Keçiborlu-Burçaklıksırtı				■	■														■						■	■	
	52 Keçiborlu-Sofualanı																			●						●	●	
	53 Keçiborlu-Söğütadağı																				■							
	54 Senirkent-Kapıdağ									◆																		
	55 Sütçüler-Ayvalıpınar		■			■	■		■							■											■	
	56 Sütçüler-Karadağ				●																							
	57 Sütçüler-Yeşilyurt				●																							
	58 Yenişarbademli-Yokuşyol																		▲									
Muğla	59 Köyceğiz-Zeytinalanı				●				●									●		●								

Host Plant ● *Pinus brutia* ■ *Pinus nigra* ▲ *Abies cilicica* ◆ *Cedrus libani* ● *Juniperus excelsa*

erosus specimens were collected throughout the period from February to November. *T. destruens* adults were observed from November to June in the following season. According to our observations on trap logs, its flight period varied depending on the elevation. The flight period of this beetle at 0 and 300 m altitude started at the beginning of November; was between 300 and 600 m in the second half of December, and was at 600 m and higher elevations, at the beginning of February. *T. minor* adults were found in trap logs in the second half of March. Moreover, specimens of *T. minor* were collected from shoots after April.

Among 59 sites, Eğirdir-Aşağıgökdere was the most abundant site in species diversity with 14 species. The main reason of this diversity was the existence of the biggest forest depot in the region near collecting stands. Beetles that reproduced on trunks spread out easily from this depot to surrounding trees and increased that richness. Başmakçı-Yaka, Aksu-Pazarköy, Burdur-Aziziye, and Bucak-Kargı sites followed Eğirdir-Aşağıgökdere with 12, 10, 7, and 7 species, respectively.

During our studies, *C. henscheli* was found on 3 host species: *Pinus brutia*, *P. nigra*, and *Cedrus libani*. Moreover, *H. angustatus*, *H. attenuatus*, *T. destruens*, *T. minor*, *H. ligniperda*, *H. micklitzi*, *O. erosus*, *O. longicollis*, *I. mannsfeldi*, *I. sexdentatus*, and *X. eurygraphus* were collected from *P. brutia* and *P. nigra*. The other 15 species were determined on only one host tree species like *P. nigra*, *P. brutia*, *C. libani*, *Abies cilicica*, and *Juniperus excelsa* (Table 2).

In this study, *P. brutia* is reported for the first time in the world as a host plant of *H. angustatus*, *H.*

attenuatus, *H. micklitzi*, and *O. longicollis*. The occurrence of *O. suturalis* and *C. henscheli* on *P. nigra* in Turkey is also reported for the first time. In addition, *O. tridentatus*, an endemic species of Turkey, was recorded as a monophagous pest that feeds only on *C. libani*.

In conclusion, bark beetles are very important pests for coniferous forests of the region due to their damage. Many dead trees were observed as well as trees weakened by Scolytinae species. Among the determined species, *O. erosus*, *I. sexdentatus*, *T. destruens*, and *T. minor* cause economically important damage, especially in pine stands. *P. curvidens* and *O. tridentatus* are other important species.

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