

BRUCHIDIUS TERRENUS AND BRUCHIDIUS SILIQUASTRI (COLEOPTERA: CHRYSOMELIDAE: BRUCHINAE) – FIRST RECORDS FOR TURKEY

ERDEM HIZAL* AND N. NIHAN PARLAK

¹Istanbul University, Forestry Faculty, Department of Forest Entomology and Protection, 34473 Bahcekoy, Sariyer, Istanbul

*Corresponding author; E-mail: hizal@istanbul.edu.tr

ABSTRACT

Albizia julibrissin Durazz and *Cercis siliquastrum* L. (Fabales: Fabaceae) are native to Turkey and used as ornamentals. We studied the seed beetles *Bruchidius terrenus* (Sharp) and *B. siliquastrum* Delobel (Coleoptera: Chrysomelidae: Bruchinae), which infest the seeds of *A. julibrissin* and *C. siliquastrum*, respectively, and their parasitoids. We recorded both bruchines from Turkey for the first time. We also found *Dinarmus acutus* (Hymenoptera: Pteromalidae) as a parasitoid of both *B. terrenus* and *B. siliquastrum*.

Key Words: *Albizia julibrissin*, *Cercis siliquastrum*, *Dinarmus acutus*

RESUMEN

Albizia julibrissin Durazz (Fabales: Fabaceae) y *Cercis siliquastrum* L. (Fabales: Fabaceae) son árboles nativos de Turquía que se utilizan como plantas ornamentales. Se estudió dos escarabajos de la semilla, *Bruchidius terrenus* Sharp y *B. siliquastrum* Delobel (Coleoptera: Chrysomelidae: Bruchinae), que infestan *A. julibrissin* y *C. siliquastrum*, respectivamente, y sus parasitoides. Ambos bruchidos fueron registrados en Turquía por primera vez. También se encontró *Dinarmus acutus* (Hymenoptera: Pteromalidae) como parasitoides de ambos coleópteros, *B. terrenus* y *B. siliquastrum*.

Palabras Clave: *Albizia julibrissin*, *Cercis siliquastrum*, *Dinarmus acutus*

The Old World genus *Bruchidius* Schilsky, 1905 (Coleoptera: Chrysomelidae: Bruchinae), comprises about 300 species of seed beetles (Kingsolver 2004). Bruchine chrysomelids are economically important pests of agricultural and stored products. Larval host plants of most *Bruchidius* species are legumes (Fabaceae), as well as species of Apiaceae and Asteraceae (Borowiec 1987). *Albizia julibrissin* Durazz, and *Cercis siliquastrum* L. (Fabales: Fabaceae) are native to Turkey and planted as ornamental trees. We studied the seed beetles *Bruchidius terrenus* (Sharp) and *B. siliquastrum* Delobel, which infest the seeds of *A. julibrissin* and *C. siliquastrum*, respectively, and their parasitoids.

MATERIAL AND METHODS

Seed pods of *Albizia julibrissin* (Mimosa) were collected in 2011 and 2012 on the Istanbul University Forestry Faculty Campus and at the Atatürk Arboretum. *Cercis siliquastrum* (Judas tree) seed pods were collected at the same locations in 2012. Pods were held in the laboratory in plastic boxes until the emergence of adult beetles and parasitoids.

RESULTS AND DISCUSSION

Seeds of *A. julibrissin* collected on the Istanbul University Forestry Faculty campus and at the Atatürk Arboretum were infested (Table 1) with *Bruchidius terrenus* (Fig. 1). In 2011 the rate of infestation of *A. julibrissin* seeds with this bruchid was 71.01% from the Forestry Faculty Campus and 59.07% from the Atatürk Arboretum. The corresponding rates in 2012 were 78.05% and 52.23%. *Dinarmus acutus* (Thomson) (Hymenoptera: Pteromalidae: Pteromalinae) parasitized *B. terrenus* at both locations.

Hoebeker et al. (2009) reported about 90% of seeds of some *A. julibrissin* trees in USA were infested with *B. terrenus*. We found seeds of this plant species heavily infested with *B. terrenus* (Table 1), an Asian seed specialist of *A. julibrissin* that occurs widely in the eastern Palearctic Region, North America, Bulgaria (Moritomo 1990; Hua 2002; Hoebeker et al. 2009; Stojanova et al. 2011). According to Stojanova (2010) the presence of its host plant, an appropriate climate, and the absence of natural enemies are conditions favorable for fast and successful invasion by *B. terrenus* in new territories outside its native range.

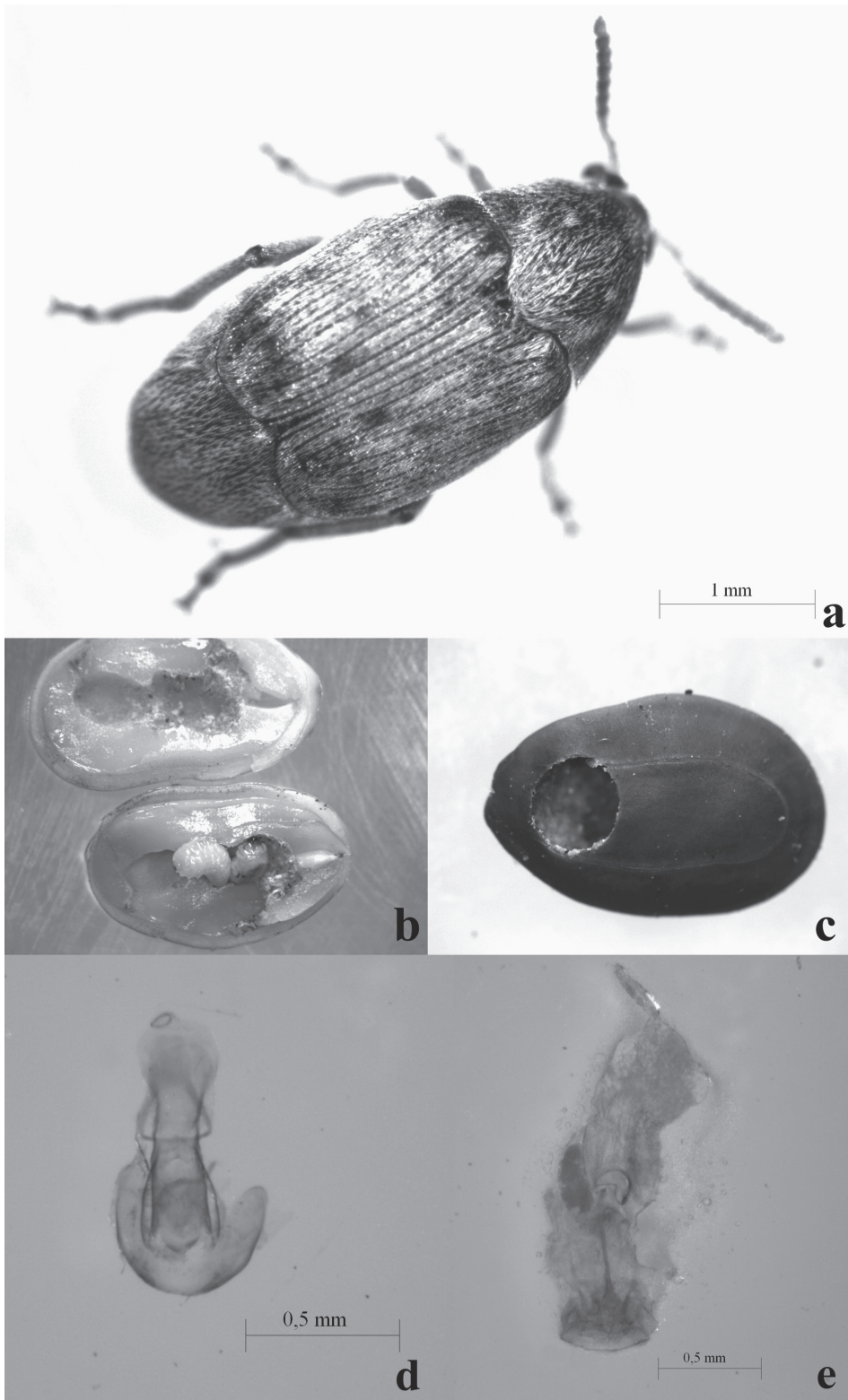


Fig. 1. *Bruchidius terrenus*, a) adult, b) larvae in seed, and c) exit hole on seed d) male genitalia e) female genitalia.

TABLE 1. EMERGENCE OF THE SEED BEETLE *BRUCHIDIUS TERRENUM* FROM SEEDS OF *ALBIZIA JULIBRISSIN* AND EMERGENCE OF A PTEROMALID PARASITOID FROM *B. TERRENUM*.

Forestry Faculty Campus Between 01-30 Sep 2011		Atatürk Arboretum Between 01-30 Sep 2011		Forestry Faculty Campus Between 01-30 Sep 2012		Atatürk Arboretum Between 01-30 Sep 2012								
TSE ¹	TIS ² %	EH ³	A ⁴	PA ⁵	TSE	TIS %	EH	A	PA	TSE	TIS %	EH	A	PA

Bruchidius terrenus (Fig 1.) 238 169 71.01 68 101 — 193 114 59.07 78 36 3 (D. a.)⁶ 164 128 78.05 65 63 7 (D. a.) 211 110 52.23 84 26 4 (D. a)

¹TSE: Total seeds examined; ²TIS: Total infested seeds and percentage of infested seeds; ³EH: Number of seeds with emergence holes; ⁴A: Number of adults; ⁵PA: Number of parasitoids, ⁶D. a.: *Dinarmus acutus*.

TABLE 2. EMERGENCE OF THE SEED BEETLE *BRUCHIDIUS SILIQUASTRI* FROM SEEDS OF *CERCIS SILIQUASTRUM* AND EMERGENCE OF A PTEROMALID PARASITOID FROM *B. SILIQUASTRI*.

Forestry Faculty Campus Between 01-30 Sep 2011		Atatürk Arboretum Between 01-30 Sep 2011		Forestry Faculty Campus Between 01-30 Sep 2012		Atatürk Arboretum Between 01-30 Sep 2012								
TSE ¹	TIS ² %	EH ³	A ⁴	PA ⁵	TSE	TIS %	EH	A	PA	TSE	TIS %	EH	A	PA

Bruchidius siliquastri (Fig 2.) — — — — — — — — — — 259 212 81.85 168 44 11 (D. a.)⁶ 246 186 75.61 124 62 5 (D. a)

¹TSE: Total seeds examined; ²TIS: Total infested seeds and percentage of infested seeds; ³EH: Number of seeds with emergence holes; ⁴A: Number of adults; ⁵PA: Number of parasitoids, ⁶D. a.: *Dinarmus acutus*.

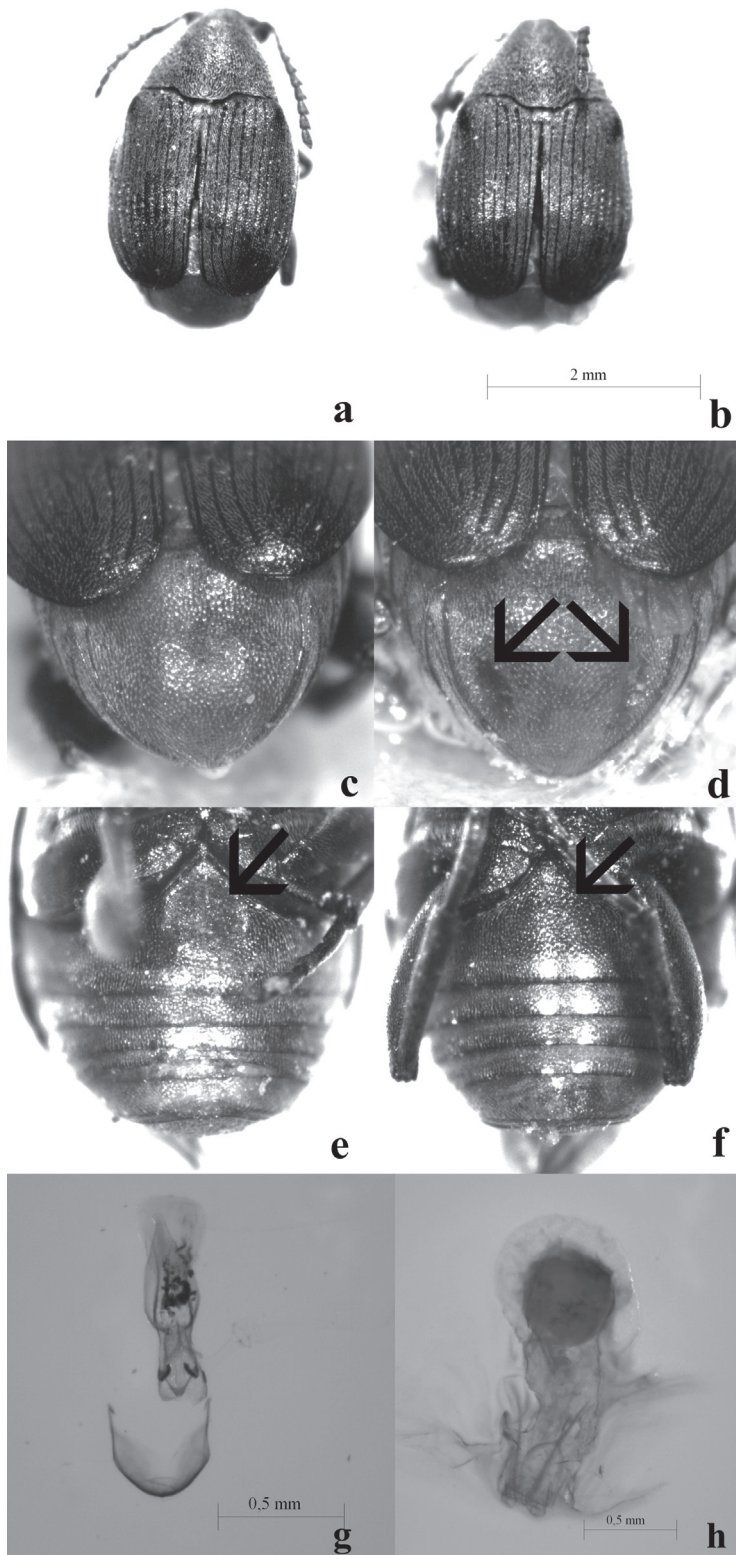


Fig. 2. *Bruchidius siliquastri*, a) male, b) female, c) male pygidium, d) female pygidium showing foveae, e) male venter I, showing the large setiferous patch, f) female venter I. g) male genitalia h) female genitalia.

Seeds of the *C. siliquastrum* collected on the Istanbul University Forestry Faculty Campus and at the Atatürk Arboretum were infested (Table 2). The infestation rate of *Cercis siliquastrum* seeds by *B. siliquastrum* (Fig. 2) on the Forestry Faculty campus was 81.85% and 75.61% at the Atatürk Arboretum. Also *D. acutus* was a parasitoid of *Bruchidius siliquastrum* at the 2 locations. *Bruchidius siliquastrum* was newly recorded in France as a seed beetle of *C. siliquastrum* (Kergoat et al. 2007), and subsequently in China, Hungary, Spain, Belgium, Slovakia, Czech Republic and Bulgaria (Stojanova et al. 2011; Šefrová 2010; Yus Ramos 2009a,b,c).

In this study we recognized that these seed beetle species are very specialized to their host plants, because we did not find *Bruchidius siliquastrum* in *Albizia julibrissin* seeds nor *B. terrenus* in *Cercis siliquastrum* seeds.

Bruchidius terrenus and *B. siliquastrum*, Delobel 2007 are recorded for the first time from Turkey in our study.

REFERENCES CITED

- BOROWIEC, L. 1987. The genera of seed beetles (Coleoptera, Bruchidae). *Polskie Pismo Entomol.*: 57: 3-207.
- HOEBEKE, E. R., WHEELER JR., A. G., KINGSOLVER, J. M., AND STEPHAN, D. L. 2009. First North American records of the east Palearctic seed beetle *Bruchidius terrenus* (Coleoptera: Chrysomelidae: Bruchinae), a specialist on mimosa (*Albizia julibrissin*, Fabaceae) *Florida Entomol.* 92(3): 434-440.
- HUA, L.-Z. 2002. List of Chinese Insects. Vol. II. Zhongshan University Press, Guangzhou. 612 pp.
- KERGOAT, G. J., DELOBEL, P., AND DELOBEL, A. 2007. Phylogenetic relationships of a new species of seed-beetle infesting *Cercis siliquastrum* L. in China and in Europe (Coleoptera: Chrysomelidae: Bruchinae: Bruchini). *Ann. Soc. Entomol. France (n.s.)* 43(3): 265-271.
- KINGSOLVER, J. M. 2004. Handbook of the Bruchidae of the United States and Canada (Insecta: Coleoptera). Vol. 1. U.S. Dept. Agr., Tech. Bull. no. 1912, xi + 324 pp.
- MORITOMO, K. 1990. A synopsis of the bruchid fauna of Japan, pp. 131-140 *In* K. Fujii, A. M. R. Gatehouse, C. D. Johnson, R. Mitchel and T. Yoshida [eds.], *Bruchids and Legumes: Economics, Ecology and Coevolution*. Academic Publishers, Dordrecht, The Netherlands.
- ŠEFROVÁ, H. 2010. Faunistic records from the Czech Republic-302, *Klapalekiana* 46: 229-230.
- STOJANOVA, A. 2010. Seed beetle *Bruchidius terrenus* (Sharp) (Coleoptera: Chrysomelidae: Bruchinae)-New invasive species to the Bulgarian fauna, pp. 646-647 *In* Second Balkan Conf. on Biology, 21-23 May, Plovdiv, 50 Years University of Plovdiv.
- STOJANOVA, A. M., GYÖRGY, Z., AND LÁSZLÓ, Z. A. 2011. New seed beetle species to the Bulgarian fauna: *Bruchidius siliquastrum*, Delobel (Coleoptera: Chrysomelidae: Bruchinae), *Ecologica Balcanica* 3(1): 117-119.
- YUS RAMOS, R., BENSUSAN, K., PEREZ, CH., AND GARCIA, P. C. 2009a. Aproximacion a la biologia de *Bruchidius siliquastrum* Delobel, 2007 (Coleoptera: Bruchidae) en *Cercis siliquastrum* L. *Bol. Soc. Entomol. Aragonesa* 44: 435-440.
- YUS RAMOS, R., BENSUSAN, K., PEREZ, CH., AND GARCIA, P. C. 2009b. Descripción de los estadios preimaginales de *Bruchidius siliquastrum* Delobel, 2007 (Coleoptera: Bruchidae). *Bol. Asoc. Española Entomol.* 33(1-2): 161-170.
- YUS RAMOS, R., GARCIA, P. C., PEREZ, D. V., BENSUSAN, K., AND PEREZ, CH. 2009c. Ciclo biológico de *Bruchidius siliquastrum* Delobel, 2007 (Coleoptera: Bruchidae) en *Cercis siliquastrum* L. primera cita para España peninsular. *Bol. Soc. Entomol. Aragonesa* 45: 349-356.