Israel Journal of Entomology
Vol. XXXI (1997) pp. 59–96

AN ANNOTATED LIST OF THE BRUCHIDAE (COLEOPTERA) OF ISRAEL AND ADJACENT AREAS

K-W. ANTON[1], J. HALPERIN[2] AND M. CALDERON[3]
[1]*Grünewaldstr. 13, D-79312 Emmendingen, Germany*
[2]*Department of Entomology, Agricultural Research Organization, The Volcani Center, Bet Dagan 50250, Israel*
[3]*Department of Stored Products, Agricultural Research Organization, The Volcani Center, Bet Dagan 50250, Israel*

ABSTRACT

Seventy-nine species of Bruchidae are recorded from Israel, 17 of them for the first time. Keys to all Israeli genera and species are provided. A list of 30 host plants is included. Twenty-seven of the known host species belong to the family Fabaceae, with the largest number of bruchids developing in seeds of *Acacia, Lens* and *Vicia*. A list of synonyms and misidentifications, and a table of parasitic Hymenoptera are also given.

KEYWORDS: Bruchidae, Coleoptera, Israel, host plants, Hymenopteran parasitoids.

INTRODUCTION

Bruchidae are a small family of beetles consisting of about 1600 species, most of which occur in tropical and subtropical regions. They are characterized by small size (the Israeli species do not exceed 6 mm) and a compact, oval or round, sclerotized, mostly gray, brown or black body, usually with dense, short pubescence. The head is prolonged into a short and broad snout, and the elytra are short, not covering the pygidium (the last abdominal segment). The larvae of most of the species develop in seeds of legumes, including fresh and stored products such as beans, peas and lentils. Bruchids have been accidentally introduced into many countries via cargos of seeds and stored food and are therefore an important component of quarantine lists.

Because of their economic importance bruchids have been intensively surveyed. The first record on bruchids in Israel was by Baudi (1886a, b), who reported the occurrence of 17 species. Schilsky (1905), Sahlberg (1913) and Bodenheimer (1926) provided additional records. Bodenheimer (1937) listed 48 species. However, nine of them, which have probably been misidentified, were not found in our study (Table 1). In subsequent extensive surveys made by Calderon (1959, 1962, 1994) and Calderon et al. (1987), a total of 32 species were recorded, eight of them new to Israel. Bruchids from Israel were further recorded by Avidov and Harpaz (1969), Southgate (1976), Decelle (1966, 1979, 1982), Decelle and Lodos (1989), Borowiec (1980,

1985a,b,c, 1987a), Zampetti (1992) and Borowiec and Anton (1993). Bruchids of economic importance in Israel were reviewed by Calderon (1958).

Bruchids were surveyed also in neighbouring countries such as Egypt (Shomar, 1964), Syria (El Hariri, 1968), Saudi Arabia (Decelle, 1979; Anton 1994), Lebanon (Zampetti, 1979, 1993) and Jordan (Wendt 1983). Borowiec and Anton (1993) reported the occurrence of 74 species in the Middle East.

The objectives of the present study are to summarize the published records of bruchids in Israel and adjacent areas and information based on the following collections: a) collection of J.H. — specimens collected or reared in the last 40 years; b) material in the National Collection of Insects, Department of Zoology, Tel Aviv University; c) specimens collected by the third author (M.C.) mostly in the 1950's and 1960's, which were re-studied; d) old collections at the Department of Entomology, Agricultural Research Organization, The Volcani Center, Bet Dagan; e) Bet Gordon Museum, Deganya; f) The Hungarian Natural History Museum, Budapest; g) Staatliches Museum für Naturkunde, Stuttgart; h) Zoological Museum, Lomonosov University, Moscow; i) Zoological Institute, Academy of Sciences, St. Petersburg; j) material in the collection of the first author.

Most of the studied specimens were collected by: F.S. Bodenheimer, H. Bytinski-Salz, M. Calderon, A. Freidberg, D. Furth, D. Gerling, J. Halperin, and Y. Palmoni. Most of the specimens are deposited at the National Collection of Insects, Department of Zoology, Tel Aviv University, except for specimens collected by Palmoni, which are kept at Bet Gordon Museum, and by Dolgovskaya and Volkovitsh, which are kept in the Zoological Institute, St. Petersburg. The identifications were made by the first author and part of the identified material is kept in his personal collection, in Emmendingen. Taxonomic terminology follows that of Borowiec (1987b) and Kingsolver (1970).

ENUMERATION OF ISRAELI BRUCHIDS, HOST PLANTS AND PARASITIC HYMENOPTERA

The information is presented in five parts: a) an enumeration of the bruchid species of Israel and adjacent areas; b) a list of host plants and their bruchid species; c) bruchid names requiring consideration; d) keys to subfamilies, genera and species of Israel and adjacent areas; and e) a list of bruchid Hymenoptera parasitoids from Israel.

A. ENUMERATION OF BRUCHIDAE

The subfamilies are arranged in a systematic order, with the genera and species listed alphabetically. Annotations consist of the following information: (i) Distribution: Known general distribution based on the literature and the first author's data; (ii) Hosts: Known hosts in the world not including our records; (iii) In Israel: Known hosts in Israel; distribution in Israel (regions and numbers as in Fig. 1); phenology (data regarding months of collection and emergence, in Roman numerals); (iv) Notes: Other data. Species recorded from Israel for the first time are marked with an asterisk.

Pachymerinae Bridwell, 1929

*1. ***Caryedon germari*** (Küster, 1845)

DISTRIBUTION: From Dalmatia to Iran, Cyprus, Israel.

HOSTS: Unknown.

IN ISRAEL: Yizre'el Valley, Samaria; vi–ix.

*2. ***Caryedon*** sp. near ***germari*** (Küster, 1845)

DISTRIBUTION: Turkey, Israel.

HOSTS: Unknown.

IN ISRAEL: Jordan Valley (Sha'ar haGolan); v.

3. ***Caryedon palaestinicus*** Southgate, 1976

DISTRIBUTION: From Algeria to Oman, western Pakistan and southern Turkmenia.

HOSTS: *Acacia, Prosopis*.

IN ISRAEL: *A. gerrardii* ssp. *negevensis*, *A. raddiana*, *A. tortilis*, *P. farcta*; most central regions, Northern Coastal Plain, Arava Valley (4–10, 12–14); i–xii.

NOTE: This species was described by Southgate (1976) as a subspecies of *Carydeon serratus* and was elevated to species by Pfaffenberger (1984). It was often confused with *C. serratus* (Olivier, 1790) by earlier authors (Avidov and Harpaz, 1969).

*4. ***Caryedon*** sp. near ***saudicus*** Anton, 1994

DISTRIBUTION: From Senegal to the Arabian Peninsula, Israel.

HOSTS: *Acacia*.

IN ISRAEL: *A. raddiana*, *A. tortilis*; Arava Valley; vi–xi.

5. ***Caryedon serratus*** (Olivier, 1790)

DISTRIBUTION: Africa, Israel; introduced into tropical Asia, Oceania and Central America.

HOSTS: *Arachis hypogaea* (peanuts), *Bauhinia, Caesalpinia, Cassia, Prosopis, Tamarindus, ?Acacia*.

IN ISRAEL: *Bauhinia variegata*, *Prosopis juliflora*; Jordan Valley, Central Coastal Plain; i, vii, xi, xii.

*6. ***Caryedon yemenensis*** Decelle, 1979

DISTRIBUTION: Arabian Peninsula, Israel, Pakistan.

Hosts: *Cassia*.

IN ISRAEL: *Cassia italica*; Arava Valley (Elat); iii.

Bruchinae Latreille, 1802

7. ***Acanthobruchidius spiniger*** (Baudi, 1886)

DISTRIBUTION: East Mediterranean.

HOSTS: *Vicia*.

IN ISRAEL: *Vicia* sp.; almost all northern and central regions (1–11, 18); iii–ix.

8. ***Acanthoscelides obtectus*** (Say, 1831)

DISTRIBUTION: Cosmopolitan.

HOSTS: Mainly *Phaseolus* spp.; also *Cicer arietinum*, *Glycine max (soybean), Lens culinaris*, *Pisum sativum*, *Vicia faba* and *Vigna sinensis*.

IN ISRAEL: *Astragalus* spp., *C. arietinum*, *L. culinaris*, *Phaseolus lunatus*, *P. vulgaris*, *V. sinensis*; from Lower Galilee to Judean Foothills (2, 5–10); v–xi.

NOTE: Nearctic origin.

9. ***Bruchidius albolineatus*** (Blanchard, 1844)

DISTRIBUTION: South Mediterranean.

Hosts: *Hedysarum*.

IN ISRAEL: Jordan Valley; v.

10. ***Bruchidius albopictus*** (Allard, 1883)

DISTRIBUTION: East Mediterranean.

HOSTS: *Cicer arietinum*, *Lens culinaris*, *Pisum* spp.

IN ISRAEL: *Vicia faba*; almost all northern and central regions (1–6, 8–11, 18–19); iv–vii, xii.

*11. ***Bruchidius annulicornis*** (Allard, 1868)

DISTRIBUTION: East Mediterranean.

HOSTS: *?Vicia faba*.

IN ISRAEL: Lower Galilee, Carmel Ridge, Golan Heights; i–vii.

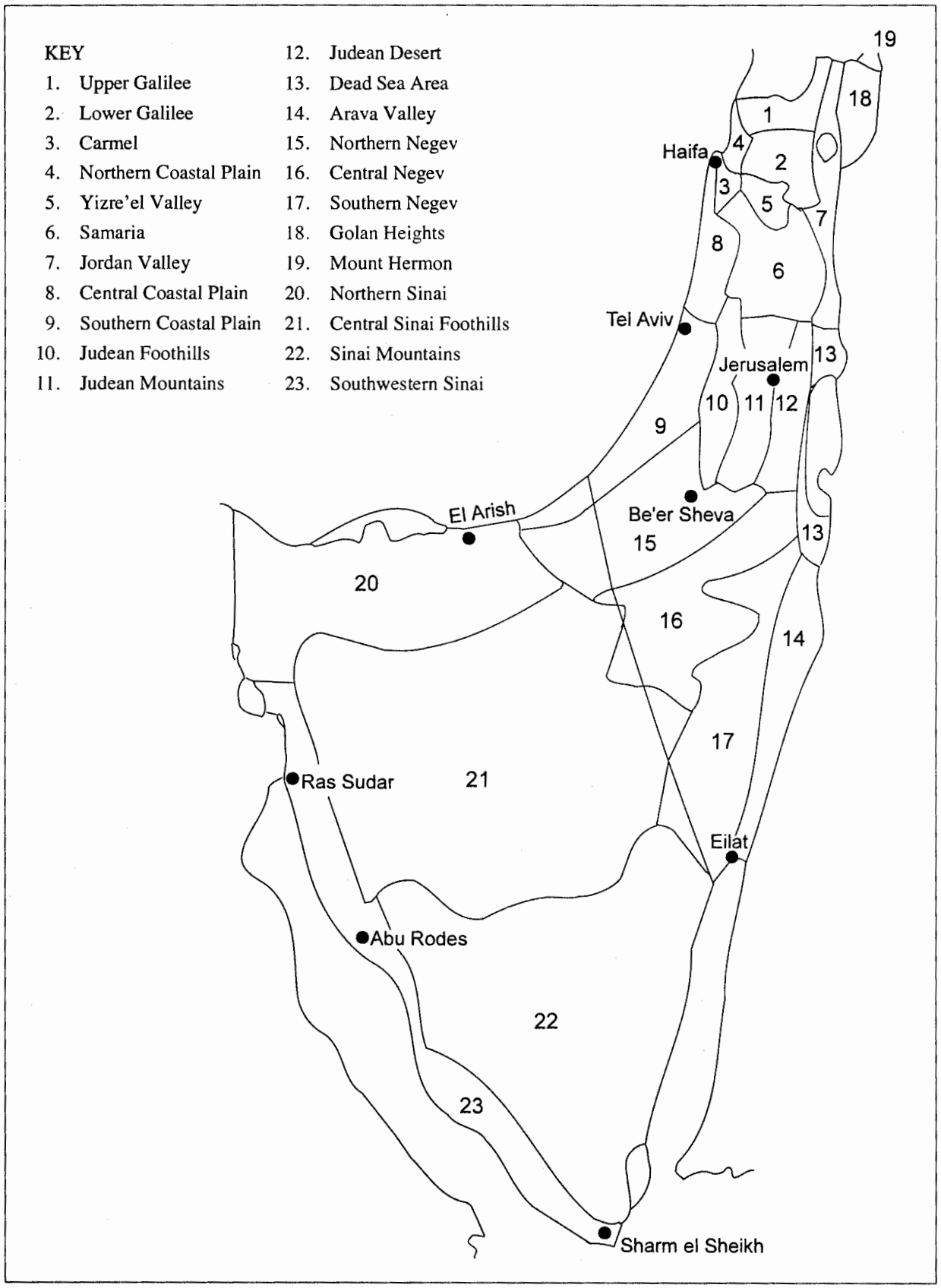

Fig. 1. The "Fauna Palaestina Committee" map of the regions of Israel and of adjacent areas.

12. ***Bruchidius anobioides*** (Baudi, 1886)

DISTRIBUTION: Greece, Turkey, Lebanon, Israel.

HOSTS: Unknown.

IN ISRAEL: Upper Galilee, Jordan Valley, Golan Heights; v, viii.

NOTE: This species will be discussed by the first author in a separate paper (Anton, in press).

*13. ***Bruchidius arabicus*** Decelle, 1979

DISTRIBUTION: Saudi Arabia, Israel.

HOSTS: Unknown.

IN ISRAEL: Southern Negev (Nahal Zihor); 12.iv.

14. ***Bruchidius*** sp. near ***arabicus*** Decelle, 1979

DISTRIBUTION: North Africa, Israel, Jordan, Saudi Arabia, Oman.

HOSTS: *Acacia*.

IN ISRAEL: *A. farnesiana, A. gerrardii* ssp. *negevensis, A. raddiana, A. tortilis*; most central and southern regions (6, 8, 9, 13–16); i–viii, x, xi.

NOTE: This species was previously confused with *B. albosparsus* (Fahraeus) (Calderon, 1959; Halevy, 1974; Karschon, 1975).

15. ***Bruchidius biguttatus*** (Olivier, 1795)

DISTRIBUTION: Circummediterranean, Ukraine (Crimea), Caucasus.

HOSTS: *Cistus*.

IN ISRAEL: *C. creticus, C. salviifolius*; most northern and central regions, Northern Negev (1–11, 15); iii–xii.

16. ***Bruchidius bimaculatus*** (Olivier, 1795)

DISTRIBUTION: Circummediterranean, Iraq.

HOSTS: *Astragalus, Lathyrus, Medicago, Vicia*.

IN ISRAEL: *Astraglus* spp., *Medicago* spp.; most northern and central regions, Northern Negev (1–11, 13, 15); i–v, vii, xi, xii.

17. ***Bruchidius bituberculatus*** Schilsky, 1905

DISTRIBUTION: From Croatia to Israel and Jordan.

HOSTS: *Hymenocarpus*.

IN ISRAEL: Most northern and central regions, Northern Negev (1–6, 8–11, 18); i–xii.

*18. ***Bruchidius buettikeri*** Decelle, 1979

DISTRIBUTION: From Jordan and Israel to Somalia and Oman.

HOSTS: *Acacia*.

IN ISRAEL: *A. gerrardii* ssp. *negevensis*, *A. raddiana*, *A. tortilis*; Arava Valley, Central and Southern Negev (14, 16, 17); i, ii, iv, viii, xi, xii.

*19. ***Bruchidius caninus*** (Kraatz, 1869)

DISTRIBUTION: Circummediterranean.

Hosts: *Astragalus*, *Bonjania*, *Spartium*.

IN ISRAEL: Samaria, ii, vi.

20. ***Bruchidius cinerascens*** (Gyllenhal, 1833)

DISTRIBUTION: Circummediterranean, Ukraine (Crimea), Caucasus, Iran.

HOSTS: *Eryngium*.

IN ISRAEL: Upper and Lower Galilee, Carmel Ridge, Judean Mountains, Mount Hermon; iv–viii.

21. ***Bruchidius dispar*** (Gyllenhal, 1833)

DISTRIBUTION: All Europe except the northern parts, Ukraine (Crimea), Algeria, Israel, Jordan, Iraq.

HOSTS: *Lotus*.

IN ISRAEL: Upper and Lower Galilee, Samaria, Judean Mountains; ii–iv, x.

22. ***Bruchidius foveolatus*** (Gyllenhal, 1833)

DISTRIBUTION: Circummediterranean; Iran.

HOSTS: *Genista, Spartium*.

IN ISRAEL: *G. fasselata, S. junceum*; most northern regions (1–3, 5–7, 18); i–v, x, xii.

23. ***Bruchidius fulvescens*** (Baudi, 1886)

DISTRIBUTION: From Greece (Crete and Rhodes) to Iraq, Israel.

HOSTS: *Scorpiurus*.

IN ISRAEL: *Pisum* spp., *Scorpiurus murinus, Vicia* spp, *Vigna sinensis*; most northern and central regions, Northern Negev (1–10, 13, 15, 18, 19); i–viii.

NOTE: This species will be discussed by the first author in a separate paper (Anton, in press).

24. ***Bruchidius fulvus*** (Allard, 1883)

DISTRIBUTION: From Libya to western Pakistan.

HOSTS: *Alhagi, Glycyrrhiza, Medicago.*

IN ISRAEL: Jordan Valley; ix.

25. ***Bruchidius holosericeus*** (Schönherr, 1832)

DISTRIBUTION: From Italy to Iran and Turkmenia, Israel.

HOSTS: *Lathyrus.*

IN ISRAEL: Recorded by Bodenheimer (1937) and by Decelle and Lodos (1989).

26. ***Bruchidius kieneri*** Zampetti, 1992

DISTRIBUTION: Turkey, Israel, Jordan, Iraq.

HOSTS: Unknown.

IN ISRAEL: Upper Galilee, Central Coastal Plain, Judean Mountains; vii, ix.

27. ***Bruchidius lividimanus*** (Gyllenhal, 1833)

DISTRIBUTION: Southern Central Europe, Circummediterranean.

HOSTS: *Calicotome, Cytisus, Genista, Lathyrus, Ononis, Ornithopus, Spartium, Tetragonolobus, Vicia.*

IN ISRAEL: *Calicotome villosa, S. junceum, Vicia* sp.; most northern and central regions, Northern Negev (1–12, 15, 18, 19); ii–vi, viii.

28. ***Bruchidius longulus*** Schilsky, 1905

DISTRIBUTION: Circummediterranean, eastward to Central Asia.

HOSTS: *Astragalus, Trigonella*

IN ISRAEL: *Astragalus* sp., *T. foenum-graecum;* Judean Foothills; iii, viii.

29. ***Bruchidius lutescens*** (Blanchard, 1844)

DISTRIBUTION: From Italy (Sicily and Sardinia) to Israel, Jordan and Central Asia.

HOSTS: *Onobrychis.*

IN ISRAEL: Most northern and central regions, Northern Negev (1–6, 8–11, 15); iii–v.

*30. ***Bruchidius*** sp. near ***lutescens*** (Blanchard, 1844)

DISTRIBUTION: Israel.

HOSTS: Unknown.

IN ISRAEL: Mount Hermon; viii.

NOTE: The species will be described by the first author in a separate paper.

31. ***Bruchidius mordelloides*** (Baudi, 1886)

DISTRIBUTION: East Mediterranean, Ukraine (Crimea).

HOSTS: Unknown.

IN ISRAEL: Lower Galilee, Carmel Ridge, Jordan Valley; iv, v.

*32. ***Bruchidius mulsanti*** (Brisout, 1863)

DISTRIBUTION: From Spain and southern France to Israel, Jordan and Tadjikistan.

HOSTS: *Cytisus*.

IN ISRAEL: Central and Southern Coastal Plain; iv, v.

33. ***Bruchidius murinus*** (Boheman, 1829).

DISTRIBUTION: Circummediterranean; Caucasus.

HOSTS: *Medicago, Pisum, Vicia*.

IN ISRAEL: Northern and Central regions, Northern Negev (1, 8–11, 15, 19); i–v, vii, x.

34. ***Bruchidius obscuripes*** (Gyllenhal, 1839)

DISTRIBUTION: Circummediterranean, Caucasus, Iraq, Afghanistan.

HOSTS: ?*Veronica*.

IN ISRAEL: North- and central-eastern regions, Judean Mountains (7, 11, 13, 18, 19); iv–viii, xi.

35. ***Bruchidius parumpunctatus*** (Baudi, 1886)

DISTRIBUTION: From Greece (Crete) to Turkey, Israel and Jordan.

HOSTS: Unknown.

IN ISRAEL: Northern and central regions (2, 7–12, 18); ii, iii–vi.

36. ***Bruchidius plagiatus*** (Reiche and Saulcy, 1857)

DISTRIBUTION: From Greece to Caucasus, Israel and Jordan.

HOSTS: *Astragalus*.

IN ISRAEL: *Astragalus* sp.; northern and central regions (2, 7–9, 12); ii, iii, vi.

NOTE: This species was originally described in *Bruchus* and later transferred to *Bruchidius* by Schilsky (1905). Lukjanovitch and Ter-Minassjan (1957) recorded it under *Acanthoscelidus*.

Borowiec (1987b) and Decelle and Lodos (1989) support the placement in *Bruchidius*, which we follow here.

37. ***Bruchidius poecilus*** (Germar, 1824)

DISTRIBUTION: Circummediterranean, Ukraine (Crimea), Caucasus, Iran.

HOSTS: Unknown.

IN ISRAEL: Central regions, Northern Negev (7, 12, 13, 15); iii, vi.

*38. ***Bruchidius*** sp. near ***poupillieri*** (Allard, 1868)

DISTRIBUTION: Israel.

HOSTS: Unknown.

IN ISRAEL: Samaria, Judean Foothills; viii.

NOTE: This species will be described by the first author in a separate paper.

*39. ***Bruchidius pusillus*** (Germar, 1824)

DISTRIBUTION: From Spain and southern France to Israel, Jordan and Iran.

HOSTS: *Vicia*.

IN ISRAEL: Upper Galilee; x.

40. ***Bruchidius pygmaeus*** (Boheman, 1833)

DISTRIBUTION: Circummediterranean.

HOSTS: *Lotus, Medicago, Trifolium*.

NOTE: Recorded by Bodenheimer (1937) as synonym of *B. perparvulus* (see Table 1) and by J. Decelle (in a letter to the first author).

41. ***Bruchidius quinqueguttatus*** (Olivier, 1795)

DISTRIBUTION: East Mediterranean, Iran.

HOSTS: *Cicer arietinum, Vicia faba, V. sativa*.

IN ISRAEL: *C. arietinum, Lupinus* sp., *Medicago* sp. *Prosopis farcta, Vicia* sp.; most northern and central regions (1–11, 18); iii–vii.

42. ***Bruchidius rufisurus*** (Allard, 1833)

DISTRIBUTION: East Mediterranean.

HOSTS: Unknown.

IN ISRAEL: Most northern and central regions, as far south as Central Negev (1–12, 15, 16, 18); iii–vi, xii.

43. ***Bruchidius sahlbergi*** Schilsky, 1905

DISTRIBUTION: From Egypt and Israel to Saudi Arabia and South Africa.

HOSTS: *Acacia*.

IN ISRAEL: *A. farnesiana, A. raddiana, A. tortilis*; Jordan Valley, Central and Southern Coastal Plain; v, vi, ix–xi.

NOTE: Often misidentified as *B. aurivilli* (Blanc), *B. albonotatus* (Pic) and *B. albosparsus* (Fahraeus).

44. ***Bruchidius seminarius*** (Linnaeus, 1767)

DISTRIBUTION: Central Europe, Circummediterranean, Iran.

HOSTS: *Scorpiurus*.

IN ISRAEL: ?*Medicago* sp.; most northern and central regions, Central Negev (1–11, 13, 15); iii–x.

45. ***Bruchidius sericatus*** (Germar, 1824)

DISTRIBUTION: From France to Ukraine (Crimea), Israel and Jordan.

HOSTS: *Hippocrepis, Trifolium*.

IN ISRAEL: Northern and central regions (3, 5–11, 19); iv–vi, x, xi.

46. ***Bruchidius serraticornis*** (Fabricius, 1775)

DISTRIBUTION: Turkey, Israel.

HOSTS: *Vicia*.

IN ISRAEL: *Lupinus luteus, L. palaestinicus*; most northern and central regions (1–11, 19); iii–viii.

*47. ***Bruchidius suratus*** (Motschulsky, 1873)

DISTRIBUTION: Turkey, Iran, Israel.

HOSTS: Unknown.

IN ISRAEL: Mount Hermon; v.

48. ***Bruchidius tibialis*** (Boheman, 1829)

DISTRIBUTION: Circummediterranean, Ukraine (Crimea), Caucasus, Iran.

HOSTS: Unknown.

IN ISRAEL: Yizre'el Valley, Samaria, Jordan Valley, Judean Mountains, Mount Hermon; ii–v, ix.

49. ***Bruchidius trifolii*** (Motschulsky, 1873)

DISTRIBUTION: Circummediterranean, Ukraine.

HOSTS: *Trifolium*.

IN ISRAEL: *T. alexandrinum, T. clypeatum*; most northern and central regions (1–11, 18, 19); ii–viii.

50. ***Bruchidius tuberculatus*** (Hochhut, 1847)

DISTRIBUTION: Circummediterranean, Caucasus to Central Asia and Afghanistan.

HOSTS: ?*Centaurea*.

IN ISRAEL: Most northern and central regions, Northern Negev (1–11, 15, 19); iii–vii.

51. ***Bruchidius varipictus*** (Motschulsky, 1873)

DISTRIBUTION: Circummediterranean, Caucasus, Transcaucasia, Iran.

HOSTS: *Lens, Medicago*.

IN ISRAEL: Most northern and central regions (2–9, 13); i, ii.

52. ***Bruchidius varius*** (Olivier, 1795)

DISTRIBUTION: Central Europe, Circummediterranean, Ukraine (Crimea) to Afghanistan and Israel.

HOSTS: *Genista, Lotus, Trifolium*.

IN ISRAEL: *G. fasselata, Trifolium*; most northern and central regions (1–10, 18); ii–iv, vii.

53. ***Bruchus dentipes*** (Baudi, 1886)

DISTRIBUTION: East Mediterranean; eastwards to Afghanistan.

HOSTS: *Vicia*.

IN ISRAEL: *V. faba, V. sativa*; Jordan Valley, Central and Southern Coastal Plain; ii, xi.

54. ***Bruchus emarginatus*** Allard, 1868

DISTRIBUTION: Circummediterranean, Transcaucasia, Iran.

HOSTS: *Cicer arietinum, Lathyrus, Pisum sativum, Vicia*.

IN ISRAEL: All northern and central regions (1–13, 18, 19); i–iv, viii, xiii.

55. ***Bruchus ervi*** Frölich, 1799

DISTRIBUTION: Circummediterranean, eastwards to Iran; introduced into Central Europe and Russia (Siberia).

HOSTS: *Lathyrus, Lens culinaris, Vicia.*

IN ISRAEL: *Lens culinaris;* all central regions (6–13); i–vi, ix–xi.

*56. ***Bruchus laticollis*** Boheman, 1833

DISTRIBUTION: Europe to Central Asia and Afghanistan, Israel.

HOSTS: *Lathyrus, Vicia.*

IN ISRAEL: *L. gorgoni;* Mount Hermon; v.

57. ***Bruchus lentis*** Frölich, 1799

DISTRIBUTION: Circummediterranean, Ukraine, Caucasus, Iran; introduced into Central Europe and Russia (Siberia).

HOSTS: *Glycine max* (soybean), *Lathyrus, Lens culinaris, Pisum sativum, Vicia.*

IN ISRAEL: *Lens culinaris;* Upper and Lower Galilee, Samaria, Jordan Valley; i–iii, vi.

58. ***Bruchus pisorum*** (Linnaeus, 1758)

DISTRIBUTION: Subcosmopolitan.

HOSTS: *Lathyrus, Pisum sativum* (main host plant), *Vicia.*

IN ISRAEL: *Pisum sativum;* most northern and central regions, Northern Negev (2, 5–11, 15); iii–vii, ix–xi.

NOTE: Origin in the Middle East.

59. ***Bruchus rufimanus*** Boheman, 1833

DISTRIBUTION: Subcosmopolitan.

HOSTS: *Cicer arietinum, Lathyrus, Lens culinaris, Lupinus, Pisum sativum, Vicia faba* (main host plant), *Vicia* spp.

IN ISRAEL: *V. faba, V. sativa;* most northern and central regions, Northern Negev (2, 5–11, 15); i–xii.

NOTE: Origin in West Asia.

60. ***Bruchus rufipes*** Herbst, 1783

DISTRIBUTION: Circummediterranean, Europe, Ukraine (Crimea), Caucasus.

HOSTS: *Lathyrus, Lens culinaris, Vicia.*

IN ISRAEL: *Trigonella foenum-graecum, Vicia sativa;* Lower Galilee, Judean Foothills, Judean Mountains; iv–vii, ix–xi.

61. ***Bruchus tristiculus*** Fahraeus, 1839

DISTRIBUTION: Circummediterranean, eastwards to Turkmenia and Iran.

HOSTS: *Cicer arietinum, Lathyrus, Lens culinaris, Lupinus, Pisum, Vicia.*

IN ISRAEL: Judean Mountains; iii–v.

62. ***Bruchus tristis*** Boheman, 1833

DISTRIBUTION: Circummediterranean, Iran.

HOSTS: *Lathyrus, Pisum sativum, vicia.*

IN ISRAEL: *L. blepharicarpus;* most central regions (6–11); iv–vii, x.

63. ***Bruchus ulicis*** Mulsant and Rey, 1858

DISTRIBUTION: Circummediterranean, eastwards to Afghanistan.

HOSTS: *Calicotome, Lens culinaris, Pisum, Vicia.*

IN ISRAEL: *C. villosa;* central regions (8–11); iv, v.

64. ***Bruchus viciae*** Olivier, 1795

DISTRIBUTION: Central and South Europe, Turkey, Ukraine (Crimea), Caucasus, Syria, Lebanon, Israel.

HOSTS: *Lathyrus, Vicia.*

IN ISRAEL: Mount Hermon; iv.

65. ***Callosobruchus chinensis*** (Linnaeus, 1778)

DISTRIBUTION: Cosmopolitan.

HOSTS: *Cicer arietinum, Dolichos, Glycine max* (soybean), *Lathyrus, Lens culinaris, Phaseolus, Pisum, Vicia faba, Vigna sinensis.*

IN ISRAEL: *C. arietinum, L. culinaris, Pisum sativum, V. faba, V. sinensis;* most northern and central regions (3–10, 12); i, iv, vii, ix.

NOTE: Oriental origin.

66. ***Callosobruchus maculatus*** (Fabricius, 1775)

DISTRIBUTION: Cosmopolitan.

HOSTS: *Cicer arietinum, Dolichos, Glycine max* (soybean), *Lathyrus, Lens culinaris, Phaseolus, Pisum, Vicia faba, Vigna sinensis.*

IN ISRAEL: *Cicer arietinum, Lens culinaris, Pisum sativum, Vigna sinensis;* northern and central regions (4–9); iii, vii, ix–xii.

NOTE: Probably of Afrotropical origin.

67. ***Callosobruchus phaseoli*** (Gyllenhal, 1833)

DISTRIBUTION: Cosmopolitan.

HOSTS: *Cicer arietinum, Dolichos, Lupinus, Phaseolus vulgaris, Pisum sativum, Vicia faba, Vigna.*

IN ISRAEL: *D. lablab;* Northern and Central Coastal Plain; x.

NOTE: Oriental or Afrotropical origin.

*68. ***Mimosestes amicus*** (Horn, 1873)

DISTRIBUTION: USA, Mexico, Costa-Rica, Israel.

HOSTS: *Acacia, Caesalpinia, Cassia, Parkinsonia, Prosopis.*

IN ISRAEL: *Acacia* sp., *Prosopis juliflora;* Jordan Valley, Dead Sea Area, Arava Valley, Northern Negev; i–vi, xi.

NOTE: First record outside of the Nearctic region.

69. ***Pseudopachymerina spinipes*** (Erichson, 1834)

DISTRIBUTION: South America (from Brazil to Argentina); introduced and established in North Africa, Greece (Crete), Turkey, Syria, Lebanon, Israel.

HOSTS: *Acacia, Astragalus, Caesalpinia, Cassia, Ceratonia siliqua.*

IN ISRAEL: *Acacia caven, A. farnesiania, A. raddiana, A. tortilis, Astragalus* sp., *Cassia* sp., *Ceratonia siliqua;* most central regions (6, 8–11); i–v, viii–xi.

70. ***Salviabruchus retusus*** (Baudi, 1886)

DISTRIBUTION: Turkey, Syria, Lebanon, Israel, Iraq.

HOSTS: *Salvia.*

IN ISRAEL: *Salvia fruticosa;* Upper and Lower Galilee, Carmel Ridge, Judean Foothills; i–v, xii.

71. ***Tuberculobruchus sinaitus*** (K. Daniel, 1907)

DISTRIBUTION: North Africa, Israel, Jordan, Saudi Arabia, Oman.

HOSTS: *Acacia.*

IN ISRAEL: *A. farnesiana, A. raddiana, A. tortilis;* most central and southern regions (8–11, 13–17); ii–iv, vi, ix–xi.

Amblycerinae Bridwell, 1932

72. ***Spermophagus calystegiae*** (Lukjanovitch and Ter-Minassjan, 1957)

DISTRIBUTION: Western Palaearctic, eastwards to Central Asia, Iran, Israel and Saudi Arabia.

HOSTS: *Calystegia, Convolvulus*.

IN ISRAEL: *Convolvulus* sp.; most northern and central regions, Northern Negev (1–11, 15, 18, 19); iii–x.

*73. ***Spermophagus caucasicus*** Baudi, 1886

DISTRIBUTION: Eastern Palaearctic, from Turkey to China and Korea, Israel.

HOSTS: Unknown.

IN ISRAEL: Central and Southern Coastal Plain; v.

*74. ***Spermophagus klapperichi*** Borowiec, 1985a

DISTRIBUTION: Jordan, Israel.

HOSTS: Unknown.

IN ISRAEL: Central and Southern Coastal Plain; ii–v.

75. ***Spermophagus kuesteri*** Schilsky, 1905

DISTRIBUTION: Circummediterranean, eastwards to Central Asia and Afghanistan.

HOSTS: *Calystegia, Convolvulus*.

IN ISRAEL: *Convolvulus* sp.; most northern and central regions, Northern Negev (1–11, 15); iii–viii; x, xi.

76. ***Spermophagus pubiventris*** Baudi, 1886

DISTRIBUTION: From Greece and Turkey to Israel and Jordan.

HOSTS: Unknown.

IN ISRAEL: *Convolvulus dorycnium*; Lower Galilee, Judean Foothills, Judean Mountains; iv–vi.

NOTE: First record of a host plant.

77. ***Spermophagus sericeus*** (Geoffroy, 1785)

DISTRIBUTION: Palaearctic, Afghanistan, Saudi Arabia, Israel.

HOSTS: *Calystegia, Convolvulus*.

IN ISRAEL: *Convolvulus* sp.; most northern and central regions (1–11); v–viii; xii.

78. ***Spermophagus wittmeri*** Borowiec, 1985b

DISTRIBUTION: Israel.

HOSTS: Unknown.

IN ISRAEL: Dead Sea Area (En Gedi); iii.

79. ***Zabrotes subfasciatus*** (Boheman, 1833)

DISTRIBUTION: Subcosmopolitan.

HOSTS: *Cicer arietinum, Dolichos, Glycine max* (soybean), *Lens culinaris, Phaseolus, Pisum.*

IN ISRAEL: *Phaseolus vulgaris, Vigna sinensis;* northern and central regions, Northern Negev (1, 8–10, 15); vii–x.

NOTE: Origin in Central America.

B. LIST OF HOST PLANTS

The plants and their bruchid fauna are arranged alphabetically.

Acacia spp. (Mimosaceae)
Bruchidius buettikeri
B. sahlbergi
B. sp. near *arabicus*
Caryedon palaestinicus
C. sp. near *saudicus*
Mimosestes amicus
Pseudopachymerina spinipes
Tuberculobruchus sinaitus

Alhagi maurorum (Fabaceae)
Bruchidius poupillieri

Astragalus spp. (Fabaceae)
Acanthoscelides obtectus
Bruchidius longulus
B. plagiatus
Pseudopachymerina spinipes

Bauhinia variegata (Caesalpiniaceae)
Caryedon serratus

Calicotome villosa (Fabaceae)
Bruchidius lividimanus
Bruchus ulicis

Cassia spp. (Caesalpiniaceae)
Caryedon yemenensis
Pseudopachymerina spinipes

Cicer arietinum (Fabaceae)
Acanthoscelides obtectus
Bruchidius quinqueguttatus
Callosobruchus chinensis
C. maculatus

Cistus spp. (Cistaceae)
Bruchidius biguttatus

Convolvulus spp. (Convolvulaceae)
Spermophagus calystegiae
S. kuesteri
S. pubiventris
S. sericeus

Dolichos lablab (Fabaceae)
Callosobruchus phaseoli

Genista fasselata (Fabaceae)
Bruchidius foveolatus
Bruchidius lividimanus

Lathyrus spp. (Fabaceae)
Acanthoscelides obtectus
Bruchidius holosericeus
Bruchus emarginatus
B. rufipes
B. tristis

Lens culinaris (Fabaceae)
Acanthoscelides obtectus
Bruchidius albopictus
Bruchus ervi
B. lentis
Callosobruchus chinensis
C. maculatus

Lotus creticus (Fabaceae)
Bruchidius quinqueguttatus

Lupinus spp. (Fabaceae)
Bruchidius quinqueguttatus
B. serraticornis

Medicago spp. (Fabaceae)
Bruchidius bimaculatus
B. quinqueguttatus

Onobrychis spp. (Fabaceae)
Bruchidius lutescens

Ononis spp. (Fabaceae)
Bruchidius lividimanus

Phaseolus spp. (Fabaceae)
Acanthoscelides obtectus
Zabrotes subfasciatus

Pisum spp. (Fabaceae)
Bruchidius albopictus
B. fulvescens
B. murinus
Bruchus pisorum
B. tristis
Callosobruchus chinensis
C. maculatus

Prosopis farcta (Mimosaceae)
Bruchidius quinqueguttatus
B. seminarius
Caryedon palaestinicus

Prosopis juliflora (Mimosaceae)
Careydon serratus
Mimosestes amicus

Salvia fruticosa (Labiatae)
Salviabruchus retusus

Scorpiurus muricatus (Fabaceae)
Bruchidius fulvescens

Spartium junceum (Fabaceae)
Bruchidius foveolatus
Bruchidius lividimanus

Trifolium spp. (Fabaceae)
Bruchidius trifolii

Trigonella spp. (Fabaceae)
Bruchidius longulus
Bruchus rufipes

Vicia spp. (Fabaceae)
Acanthobruchidius spiniger
Bruchidius albopictus
B. bimaculatus
B. fulvescens
B. quinqueguttatus
B. serraticornis
Bruchus dentipes
B. rufimanus
B. rufipes
Callosobruchus chinensis

Vigna sinensis (Fabaceae)
Acanthoscelides obtectus
Callosobruchus chinensis
C. maculatus
Zabrotes subfasciatus

C. BRUCHID NAMES REQUIRING CONSIDERATION

The following table (Table 1) contains problematic records of various authors (most of which are synonyms or misidentifications) and their valid or probable names. These data are not included in the first part (enumeration). Thirty-four species are mentioned. Eleven of them are synonyms of the enumerated species, and thirteen reveal misidentifications with the enumerated species after being re-identified from the old original material. Three of them are firstly identified to species or their taxonomic relationship is determined. The identity of the others remain obscure, and it is not clear with which species they might have been confused.

TABLE 1
Taxonomic status of Bruchidae species from Israel and adjacent areas

Published name	Reference	Current status
Acanthoscelides obsoletus (Say, 1831)	Bodenheimer, 1937	*A. obtectus* (Say) sensu auctorum
Bruchidius albonotatus (Pic, 1930)	Bytinski-Salz, 1954	Misidentification of *B. sahlbergi* Schilsky
B. albosparsus (Fahraeus, 1839)	Calderon, 1962; Halevy, 1974; Karschon, 1975	Misidentification of *B.* sp. near *arabicus* Decelle
B. alfierii Pic, 1922	Bodenheimer, 1937	Form of *B. trifolii* (Motschulsky)
B. anobioides (Baudi, 1886)	Borowiec and Anton, 1993; Decelle and Lodos, 1959	Synonym of *B. fulvescens* (Baudi, 1886) (Anton, in press)
B. astragali (Boheman, 1829)	Bodenheimer, 1937	Misidentification of *B. varius* (Olivier)?
B. halodendri (Gebler, 1825)	Bodenheimer, 1937	Misidentification of *B.* near *poupilleri* (Allard)?
B. lucifugus (Boheman, 1833)	Bodenheimer, 1937	Misidentification of *B. tuberculatus* (Hochhut)
B. meleagrinus (Gene, 1839)	Bodenheimer, 1937	Misidentification of *B. quinqueguttatus* (Olivier) or *B. albopictus* (Allard)?
B. nudus (Allard, 1868)	Borowiec, 1987a	Misidentification of *B. parumpunctatus* (Baudi) (Borowiec and Anton, 1993)
B. ovalis (Blanchard, 1844)	Bodenheimer, 1937	Form of *B. foveolatus* (Gyllenhal)
B. pauper (Boheman, 1829)	Borowiec, 1987a	Misidentification of *B. kieneri* Zampetti
B. perparvulus(Boheman, 1839)	Bodenheimer, 1937	Misidentification of *B. trifolii* (Motschulsky)
B. poupillieri (Allard, 1868)	Bodenheimer, 1937	Misidentification of *B.* sp. near *poupillieri* (Allard)?
B. pusillus (Germar) var. *picipes* (Germar, 1824)	Calderon, 1959, 1962	Misidentification of *B. seminarius* (Linnaeus)

TABLE 1 (continued)

Published name	Reference	Current status
B. retusus (Baudi, 1886)	Bodenheimer, 1937	Synonym of *Salviabruchus retusus* (Baudi)
B. riedeli Borowiec, 1985	Borowiec, 1985c	Synonym of *B. fulvescens* (Baudi) (Anton, in press)
B. unicolor (Olivier, 1795)	Calderon, 1959, 1962	Misidentification of *B. lutescens* (Blanchard) or *B.* sp. near *lutescens* (Blanchard)?
Bruchidius sp. I	Calderon, 1959	*B.* sp. near *arabicus* Decelle
Bruchidius sp. II	Calderon, 1959, 1962	*B. fulvescens* (Baudi)
Bruchidius sp. III	Calderon, 1959, 1962	*B. fulvescens* (Baudi) and *B.* sp. near *arabicus* Decelle
Bruchus brisouti Kraatz, 1868	Bodenheimer, 1937	Misidentification of *B. ervi* Frölich
B. luteicornis Illiger, 1794	Bodenheimer, 1937	Misidentification of *B. rufipes* Herbst?
B. serratus Illiger (sic!)	Bodenheimer, 1937	Synonym of *B. ervi* Frölich; mistake in writing of *B. sertatus* Illiger, 1805
B. villosus Fabricius, 1792	Bodenheimer, 1937	Misidentification of *Salviabruchus retusus* (Baudi)
Caryedon fuscus (Goeze, 1777)	Calderon, 1959	Misidentification of *C. palaestinicus* Southgate sensu auctorum: *C. serratus* (Olivier)
C. gonagra (Fabricius, 1798)	Calderon, 1962; Donahaye et al, 1966	Synonym of *C. serratus* (Olivier); misidentification of *C. palaestinicus* Southgate
C. serratus (Olivier, 1790)	Avidov and Harpaz, 1969	Misidentification of *C. palaestinicus* Southgate
Caryoborus pallidus (Olivier, 1790)	Baudi, 1886a	Misidentification of *C. germari* (Küster)?
Mylabris annulipes Allard, 1869	Baudi, 1886b	Synonym of *B. tuberculatus* (Hochhut)
Pachymerus pallidus (Olivier, 1790)	Bodenheimer, 1937	Misidentification of *C.* sp. near *germari* (Küster)
Pseudopachymerus lallemanti (Marseul,1875)	Avidov and Harpaz, 1969; Bodenheimer, 1937; Calderon, 1962	Synonym of *Pseudopachymerina spinipes* (Erichson)
Spermophagus heydeni Allard, 1868	Calderon, 1959, 1962	Misidentification of S. caucasicus Baudi?
S. subfasciatus Baudi (sic!)	Bodenheimer, 1937	Synonym of *Zabrotes subfasciatus* (Boheman); mistake in Author's name

D. KEYS TO THE SUBFAMILIES, GENERA AND SPECIES OF BRUCHIDAE IN ISRAEL AND ADJACENT AREAS

To facilitate key handling, we mostly used simple external characters, and genitalia preparations are therefore not necessary except for two *Spermophagus* species (see Borowiec, 1981, Figs. 1–10). Sexual dimorphism is cited only when other differences are insufficient.

Body length is measured from pronotal apex to elytral apex. Morphological terminology follows Borowiec (1987b) and Kingsolver (1970). Species not yet recorded from Israel are put in brackets.

KEY TO THE SUBFAMILIES OF BRUCHIDAE

1. Two movable spines (calcaria) at ventral apex of hind tibia ..... *Amblycerinae* Bridwell (p. 79)
— Without calcaria at ventral apex of hind tibia 2

2. Hind tibia strongly curved ventrad; hind femur strongly swollen, with at least six denticles on pecten or on ventral margin ..... *Pachymerinae* Bridwell (p. 80)
— Hind tibia mostly straight, rarely slightly curved posterad; hind femur moderately swollen, without or with at most four spines or denticles on ventral margin ..... *Bruchinae* Latreille (p. 81)

KEY TO THE GENERA OF AMBLYCERINAE

1. Tenth elytral stria present at basal half only. Elytral pubescence with distinct transverse band of whitish hairs at apical half. Integument black; antennal segments 1–2 and calcaria red ..... *Zabrotes* Horn (*Z. subfasciatus* (Boheman))
— Tenth elytral stria at least reaching into apical half of elytral length, usually extends to apex ..... *Spermophagus* Schoenherr

KEY TO THE SPECIES OF *SPERMOPHAGUS*

1. Calcaria of hind tibia blackish to black. Pubescence uniform, greyish 2
— Calcaria of hind tibia yellowish-red to red. Pubscence uniform or spotted 3

2. Median lobe of male genitalia with noticable constriction at preapical part; lateral lobes arranged roof-like, with bases widely distant. Female genitalia with apex of ovipositor distinctly rounded. 1.4–3.1 mm ..... *calystegiae* (Lukjanovitch and Ter-Minassjan)
— Median lobe of male genitalia without constriction in preapical part; lateral lobes arranged side by side in same plane, with bases nearly in contact. Female genitalia with apex of ovipositor distinctly acute. 1.5–2.5 mm ..... *sericeus* (Geoffroy)

3. Claws of legs with reduced basal tooth 4
— Claws of legs with large basal tooth 5

4. Pubescence uniform, greyish to somewhat brownish; hairs relatively short. 1.3–1.6 mm . . . . . *klapperichi* Borowiec
— Pubescence greyish to brownish, pronotum with distinct white spots, elytra with two transverse bands of whitish hairs at end of first and second thirds; hairs relatively long. 1.7–2.2 mm . . . . . *caucasicus* Baudi

5. Pronotal and elytral pubescence uniform, greyish to yellowish 6
— Pronotal and elytral pubescence at least indistinctly brownish spotted 7

6. Antennal segments 7–10 each about 1.6–2.0 times as long as wide. 2.0–2.4 mm . . . . . *pubiventris* Baudi
— Antennal segments 7–10 each nearly as wide as long. 1.9–3.0 mm . . . . *kuesteri* Schilsky

7. Pronotal and elytral pubescence indistinctly brownish spotted, pygidial pubescence more or less uniformly greyish. Integument black, antennal segments 1–2 reddish. 1.5–2.0 mm . . . . . *wittmeri* Borowiec
— Pronotal and elytral pubescence dark brown, elytron with striking pale yellowish bands, one transverse at base, another longitudinal at intervals 1–2, two transverse and interrupted at middle and at apex; pygidial pubescence greyish to pale yellowish, with medial pair of dark brown spots. Integument black. 2.5–2.6 mm. Lebanon . . . . . [*caricus* Decelle]

KEY TO THE GENERA OF PACHYMERINAE

1. Lateral pronotal carina complete. Hind tibia with ventrobasal tubercle; hind femur with 16–20 denticles, without prominent denticle. Pubescence uniform, yellowish. Integument dark greyish-brown. 10.0–16.0 mm. South America; intercepted in Israel . . . . . [*Pachymerus* Thunberg (*P. bridwelli* (Prevett))]
— Lateral pronotal carina incomplete, only at posterior half. Hind tibia without ventrobasal tubercle; hind femur with 9–16 denticles on pecten, first (proximal) denticle prominent. Pubescence uniform, pale yellowish, or brownish spotted. Integument varying from yellowish to brown. 2.0–6.0 mm . . . . . *Caryedon* Schoenherr

KEY TO THE SPECIES OF *CARYEDON*

1. Pygidial disc with appressed pubescence only. Integument of body's ventral and dorsal side of same color 2
— Pygidial disc with sparse more or less upright setae between appressed pubescence. Integument of body's ventral side distinctly darker than that of dorsal side 4

2. Smooth carina between eyes, frons at narrowest part as wide as combined diameters of four eye-facets. Elytral pubescence uniform, pale yellowish. Integument yellowish to pale greyish-brown. 2.0–4.0 mm . . . . . *yemenensis* Decelle
— Sharp carina between eyes, frons at narrowest part at most as wide as combined diameters of three eye-facets. Elytral pubescence usually uniform, in part with few pale brownish spots apically 3

3. Frons at narrowest part as wide as combined diameters of two eye-facets. Male antennal segments 6–10 about 1.4 times as long as wide. Female pygidium with smooth, shining elevation near apex. 2.0–4.2 mm ..... sp. near *saudicus* Anton
— Frons at narrowest part as wide as combined diameters of three eye-facets. Male antennal segments 6–10 about 1.6 times as long as wide. Female pygidium without elevation. 2.8–4.1 mm. Jordan ..... [*saudicus* Anton]

4. Pygidial integument uniform, dark brown to blackish; elytral integument uniform, red-brown. Pubescence uniform, pale yellowish on elytra, olive-golden on pygidium. 4.0–4.5 mm ..... sp. near *germari* (Küster)
— Pygidial integument at least apically somewhat reddish, usually reddish with dark spots 5

5. Elytral and pygidial pubescence uniform, pale yellowish. Elytral integument uniform, yellowish-red to red-brown; pygidial integument at least apically more or less reddish, with dark spots basally reaching towards disc. 2.0–3.5 mm ..... *germari* (Küster)
— Elytral pubescence pale yellowish, brownish spotted; pygidial pubescence pale yellowish, basolaterally mixed with brownish hairs. Usually larger size 6

6. Hind femoral pubescence at lateral side yellowish, at least near pecten brown spotted (ventrolateral view!) 3.1–6.0 mm..... *serratus* (Olivier)
— Hind femoral pubescence at lateral side uniform, pale yelowish. 2.8–5.2 mm .... *palaestinicus* Southgate

KEY TO THE GENERA OF BRUCHINAE

1. Hind femur ventrally with blunt to acute subapical denticle at outer margin; inner margin without denticle. Pronotal mid side with blunt to acute denticle, in part hidden below pubescence, rarely absent. Mid leg of male with spine(s) and/or modified plate at ventral tibial apex ..... *Bruchus* Linnaeus
— Hind femur ventrally with other characters concerning denticle(s) at margins or carinae, in part without denticle. Pronotal mid side without denticle. Mid leg of male without spine or plate at tibial apex..... 2

2. Hind femur ventrally more or less bicarinate and channeled..... 3
— Hind femur ventrally neither bicarinate nor channeled, but with two more or less distinct margins 5

3. Hind femur ventrally on each of both carinae with acute preapical denticle. Antennal segments often strongly sexually dimorphic. Elytron with or without basal tubercle .... *Callosobruchus* Pic
— Hind femur ventrally only on inner carina with denticle(s). Antennal segments nearly identical in both sexes, sexual dimorphism barely visible. Elytron with basal tubercle 4

4. Elytron basally with small, sharp tubercles at striae 3–5(6). Hind femur ventrally on inner carina with 3–4 distinct denticles ..... *Mimosestes* Bridwell
— Elytron basally with twice-peaked tubercle at intervals 4–5. Hind femur ventrally on inner carina with small preapical denticle. Pubescence pale yellowish, covering surface; elytral and pygidial pubescence more or less distinctly brownish spotted. Integument yellowish to reddish. 2.1–3.1 mm ..... *Tuberculobruchus* Decelle (*T. sinaitus* (K. Daniel))

5. Hind tibia posterolaterally serrulated. 6
— Hind tibia posterolaterally simple, not serrulated 7

6. Elytral intervals shining, with flat punctuation. Hind femur ventrally on inner margin with strong, acute preapical denticle, and on outer margin with several minute spines. Pubescence pale yellowish, but brownish on darkened parts of elytral integument, not covering surface. Integument reddish; at least head and body's ventral side including pygidium black, occasionally whole body black except reddish fore and mid tibiae and elytron basally, mediolaterally and apically. 2.4–3.3 mm .....
..... *Acanthobruchidius* Borowiec (*A. spiniger* (Baudi))
— Elytral intervals with serrulate punctuation. Hind femur ventrally on inner margin with small preapical denticle and 1–2 minute spines or tubercles; outer margin without spines .... *Bruchidius* Schilsky partim (*B. obscuripes* (Gyllenhal), *B. tuberculatus* (Hochhut))

7. Hind tibia curved posterad, hind tibial apex posterolaterally with two long, acute coronal denticles and very short mucro; hind femur ventrally on inner margin with short preapical denticle and some serrulations. Pubescence uniform, greyish, not covering surface. Integument black; antennal segments 2–4 completely and segment 1 ventrally yellowish-red. 1.9–2.7 mm ..... *Salviabruchus* Decelle (*S. retusus* (Baudi))
— Hind tibia straight, not curved ventrad, hind tibial apex laterally with coronal denticles and murco varying in length 8

8. Hind femur ventrally on inner margin with or without preapical denticles .....
..... *Bruchidius* Schilsky partim (most species)
— Hind femur ventrally on inner margin with 3–4 preapical denticles 9

9. Pronotum laterally with distinct margin. Elytron serrulate near scutellum. Hind femur ventrally on preapical pecten with 4 stronger denticles. Pubescence greyish, yellowish and dark brown spotted, with striking longitudinal, yellowish spot at second quarter of interval 3. Integument red to dark brown, elytra and pygidium with symmetrically arranged blackish spots. 2.5–4.0 mm ..... *Pseudopachymerina* Zacher (*P. spinipes* (Erichson))
— Pronotum laterally without margin. Elytron not serrulate 10

10. Integument dark brown; antennal segments 1–4 and 11, legs and in part abdomen including pygidium yellowish-red to red. Pubescence variegated, yellowish and brownish. 2.0–3.7 mm ..... *Acanthoscelides* Schilsky (*A. obtectus* (Say))
— Integument black; antennal segments 1–4(5), fore and mid legs, elytral disc and apex yellowish-red to red. Pubescence uniform, greyish to yellowish .....
..... *Bruchidius* Schilsky partim (*B. plagiatus* (Reiche and Saulcy))

KEY TO THE SPECIES OF *BRUCHUS*

1. Hind tibial apex with long mucro; mucro distinctly longer than anterolateral denticles . .11
— Hind tibial apex with short mucro; mucro not longer than anterolateral denticle 2

2. Pronotum ventrolaterally with shining thin furrow 3
— Pronotum ventrolaterally simple, without furrow 4

3. Pubescence uniform, dark brown; pydigial base medially with white spot. Integument black; antennal segments 1–5, fore leg except femoral base, and mid tibia at least apically red. 2.3–3.5 mm ..... *tristis* Boheman
— Pubescence brownish; pronotum and elytra fine greyish spotted; pygidial base without white spot. Integument black; antennal segments 1–5, fore leg completely and mid leg from tarsi to femoral apex red. 2.7–3.5 mm ..... *tristiculus* Fahraeus

4. Pygidial pubescence varying, from mixed greyish and brownish to greyish with a pair of narrow longitudinal, pale to dark brown spots at apical half. Male fore tibia broadened and slightly curved 5
— Pygidial pubscence greyish, with a pair of usually broad, rounded dark brown spots at apical half; spots rarely pale brown. Male fore tibia straight, not broadened 8

5. Pronotal side without denticle, pronotal disc with shallow depressions. Pubescence brownish, pronotum and elytra greyish spotted. Integument black; antennal segments 1–4(5) and fore leg except femoral base yellowish-red. 1.7–2.7 mm .. *laticollis* Boheman
— Pronotal side medially with blunt to acute denticle; pronotal disc without depressions . . .6

6. Mid tarsal segments darkened. Male antennal segment 5 lateroapically with tapered process. Pubescence dark to pale brownish, elytron markedly greyish spotted. Integument black; male antenna completely, female antennal segments 1–5 (and 11) and fore leg yellowish-red. 2.3–3.4 mm. Lebanon..... [*hamatus* Miller]
— Mid tarsal segments yellowish-red. Male antennal segment 5 simple, without process .. 7

7. Mid tibia black. Pubescence varying, from dominant greyish to dominant ochre-yellow; elytron mediolaterally, apically and three times along interval 3 with brownish spots. Integument black; antennal segments 1–3(4), fore leg and mid tarsi yellowish-red. 2.0–3.5 mm ..... *ulicis* Mulsant and Rey
— Mid tibial apex yellowish-red. Pubescence dark to pale brownish; elytron greyish spotted, with incomplete transverse greyish band at begin of apical third. Integument black; antennal segments varying, in female usually and in male rarely segments 1–5 and 11, in male often additional segments or whole antenna yellow-red, also fore leg and mid tarsi including tibial apex. 2.3–3.3 mm. Lebanon ..... [*signaticornis* Gyllenhal]

8. Pronotal side medially with distinct denticle 9
— Pronotal side medially with barely visible denticle; denticle usually weakly developed, rarely hidden under dense pubescence..... 10

9. Pronotum strongly convex, hind edge well depressed. Elytron distinctly narrowed to apex. Pubescence blackish to pale brownish; elytron greyish spotted, with distinct, transverse whitish band at beginning of apical third. Integument black; antennal segments varying similar to *B. signaticornis*, but segment 11 testaceous in female; fore leg except femoral base and at least mid tibia more or less yellowish-red. 2.7–3.8 mm ..... *emarginatus* Allard

— Pronotum moderately convex, hind edge weakly depressed. Elytron nearly parallel sided. Pubescence similar to *B. emarginatus*. Integument like *B. emarginatus*, but antennal segments 5–11 constantly black in both sexes. 2.3–4.6 mm ..... *pisorum* (Linnaeus)

10. Mid femur completely black. Pubescence paler brownish; pronotum and elytron greyish spotted. Integument black; antennal segments 1–5, fore and mid leg yellowish-red, 1.9–2.7 mm ..... *lentis* Frölich

— Mid femur yellowish-red except darkened base. Pubescence dark to pale brownish; elytron with striking, transverse whitish band at beginning of apical third. Integument similar to *B. lentis* except mid femur. 2.2–3.0 mm ..... *ervi* Frölich

11. Legs usually black, rarely fore tibial apex testaceous. Pubescence blackish; elytron with two incomplete, transverse greyish bands at mid and apical third. Integument black; antennal segments 1–2 often, segments 3–4 rarely, partially reddish. 2.0–3.0 mm ..... *viciae* Olivier

— At least fore leg except femoral base yellowish-red 12

12. Mid leg yellowish-red, often tibia and femur basally darkened. Male mid tibia without keel 13

— Mid leg black, rarely tarsi somewhat testaceous. Male mid tibia on outer side with keel on whole length 14

13. Maximal pronotal width at mediolateral denticle (middle). Pubescence blackish; elytron greyish spotted, with striking longitudinal yellowish spot at basal half of intervals 1–2. Integument black; antennal segments 1–4(5), fore and mid legs except femoral base yellowish-red. Male mid tibia on inner side apically with bifid plate; recess between both denticles at most as wide as maximal width of first mid tarsus. 1.9–2.9 mm..... *rufipes* Herbst

— Maximal pronotal width at base. Pubescence, integument and male mid tibia similar to *B. rufipes*, but elytral pubescence with striking yellowish spot only at basal third of intervals 1–2, integument of mid tibia often medially darkened, male mid tibial plate with recess between both denticles distinctly wider than maximal width of first mid tarsus. 2.5–3.7 mm. Lebanon ..... [*libanensis* Zampetti]

14. Hind femur ventrally with stronger preapical denticle; denticle right angeled at deeper emargination. Pronotal side medially with distinct denticle 15

— Hind femur ventrally with weaker preapical denticle; denticle oblique at shallower emargination. Pronotal side medially with indistinct denticle. Pubescence blackish; pronotum and elytron with numerous greyish spots. Integument black; antennal segments 1–4 and fore leg except base of femur yellowish red. 2.0–3.7 mm. Lebanon... [*atomarius* (Linnaeus)]

15. Pronotum about 1.5 times as wide as long, with mediolateral denticle well developed and often hidden under thick pubescence. Pubescence blackish to yellowish-brownish; elytron greyish spotted, with indistinct, transverse greyish band at beginning of apical third. Integument black; fore leg except femoral base and rarely mid tarsi partially reddish. Male mid tibia on inner side subapically with larger, more or less right angeled denticle and apically with smaller, pointing posterad denticle; deep recess between both of denticles. 2.2–4.1 mm ..... *dentipes* (Baudi)
— Prontoum about 1.4 times as wide as long, with mediolateral denticle weakly developed. Pubescence and integument similar to *B. dentipes,* but usually mid tarsi yellowish-red. Male mid tibia on inner side apically with broadened plate ending posterad in a denticle; denticle sometimes somewhat bifid. 2.6–4.3 mm ..... *rufimanus* Boheman

KEY TO THE SPECIES OF *CALLOSOBRUCHUS*

1. Sternites moderately whitish pubescent, segments 2–5 dorsolaterally with striking, very thick white spots. Male antenna more or less pectinate. Elytral pubescence yellowish at basal third, mediolaterally dark brown with two bordering oblique greyish bands at beginning and end of medial third, dark brown at apical third. Integument blackish to reddish; at least antennal base, fore and mid leg yellowish-red, hind leg red. 2.0–2.8 mm ..... *chinensis* (Linnaeus)
— Sternites uniformly and moderately whitish pubescent. Male antenna serrate or subpectinate 2

2. Pygidium as long as wide. Pronotum for most part darkened. Male antenna serrate, segments 7–10 distinctly longer than wide. Pubescence greyish to yellowish, on darkened integument brownish. Integument for most part reddish; elytron often mediolaterally and apically with homogenous darkened spot; antenna often distally darkened. 1.8–3.2 mm ... . *maculatus* (Fabricius)
— Pydigium about 1.2 times as long as wide. Pronotum for most part reddish. Male antenna subpectinate, segments 7–10 distinctly wider than long. Pubescence greyish to yellowish, on darkened integument brownish. Integument for most part pale reddish; elytron basolaterally with inhomogenous darkened area; antenna distally darkened. 2.4–3.5 mm .... *phaseoli* (Gyllenhal)

KEY TO THE SPECIES OF *BRUCHIDIUS*

1. Basal carina of elytron with 3 denticles in front of intervals 3–5. Antenna short, barely reaching pronotal base, antennal segments nearly identical in both sexes. Elytral pubescence variegated, greyish, yellowish and brownish. Integument inhomogenous reddish to brown 1.5–3.2 mm ..... *sahlbergi* Schilsky
— Basal carina of elytron without denticles 2

2. Elytral intervals 4–5 basally with more or less distinct simple or double-hooked tubercle, rarely hidden by pubescence (dorsolateral view!) 3
— Elytral intervals basally without tubercle 18

3. Elytron basally with double-hooked tubercle. Pubescence completely covering surface 4

— Elytron basally with simple tubercle. Pubescence completely or incompletely covering surface. 8

4. Body elongated, elytra at least 1.3 times as long as combined width, with pygidium oblique, 1.5 times as long as wide. Pubescence uniform, olive-whitish. Integument black. 1.5–2.3 mm . . . . . *cinerascens* (Gyllenhal)

— Body stout, elytra at most 1.1 times as long as combined width; pygidium vertical, about as long as wide. Integument yellowish to reddish-brown 5

5. Elytral pubescence uniform, whitish. Scutellum somewhat square, indistinctly bifid. 1.5–1.9 mm . . . . . *fulvus* (Allard)

— Elytral pubescence variegated, whitish, yellowish and brownish. Scutellum rectangular, distinctly bifid. 6

6. Male antennal segment 4 distinctly serrate, segments 6–10 distinctly square. Female pygidium apically with protuberance. 1.5–2.7 mm . . . . . *buettikeri* Decelle

— Male antenna and female pygidium different 7

7. Male antennal segment 4 subserrate, segments 6–10 nearly as long as wide. Female pygidium homogenously pubescent, without protuberance. 2.3–3.5 mm . . . . . *arabicus* Decelle

— Male antennal segment 4 filiform, segments 7–10 distinctly square. Female pygidium with slite-eye-like hairless area at both sides near apex. 1.4–2.8 mm . . . . . sp. near *arabicus* Decelle

8. Body stout, thick-set; elytra at most 1.1 times as long as combined width. Pubescence thin, not covering surface 9

— Body less stout; elytra at least 1.2 times as long as combined width. Pubescence dense, completely or nearly completely covering surface 11

9. Head oblong, visible part at least 1.3 times as long as wide including eyes (head slanted forwards). Pubescence uniform, greyish. Integument black. 2.4–3.2 mm . . . . . *holosericeus* (Schönherr)

— Head moderately long, visible part about as long as wide including eyes. 10

10. Pronotum about 1.4 times as wide as long; pronotal side linear to somewhat concave. Pubescence uniform, greyish. Integument varying, black to partially or nearly completely yellowish-red including antenna and legs. 1.5–2.6 mm. . . . . *biguttatus* (Olivier)

— Pronotum about 1.6 times as wide as long; pronotal side distinctly convex. Pubescence barely visible, darker greyish. Integument black, often with dark metallic blue shine. 1.9–2.5 mm. . . . . *parumpunctatus* (Baudi)

11. Mucro shorter than mediolateral coronal denticle, sometimes absent (lateral view!); tibia moderately broadened to apex 12
— Mucro distinctly longer than mediolateral coronal denticle; tibia strongly broadened to apex 17

12. Mucro very tiny or absent. Pubescence olive-whitish, indistinctly brownish spotted. Integument black; ventral side of antennal segments 1–4 yellowish-red, dorsal side darkened to black. 1.8–2.4 mm ..... *caninus* (Kraatz)
— Mucro distinctly visible. Pubescence strictly uniform 13

13. Head oblong, visible part 1.1–1.3 times as long as wide including eyes. Antennal segments 6–10 distinctly longer than wide or just reverse. Body more thick-set 14
— Head moderately long, visible part nearly as long as wide. Antennal segments nearly as long as wide. Body less thick-set 16

14. Antennal segments 6–10 about 1.1 times as wide as long. Pygidium at least 1.2 times as long as wide. Pubescence dull, greyish-yellowish to olive-yellowish, body's ventral side distinctly brighter. Integument varying, black to partially or nearly completely yellowish-red including antenna and legs. 1.5–3.2 mm ..... *lutescens* (Blanchard)
— Antennal segments 6–10 about 1.1 times as long as wide. Pygidium at most as long as wide. Pubescence of ventral and dorsal side of body nearly identical 15

15. Pubescence dark olive, shining. Integument black. 2.8–3.2 mm ..... sp. near *lutescens* (Blanchard)
— Pubescence whitish. Integument black; often ventral side of antennal segments 1–3 reddish. 1.6–2.4 mm. Jordan ..... [*robustus* Lukjanovitch and Ter-Minassjan]

16. Elytra at least 1.3 times as long as combined width, elytral sides parallel, disc considerably flat. Pygidium at least 1.2 times as long as wide. Pubescence greyish. Integument yellowish-red to red-brown; elytron and antenna paler; head darker than pronotum. 1.5–1.7 mm ..... sp. near *poupillieri* (Allard)
— Elytra at most 1.2 times as long as combined width; elytral sides and disc considerably convex. Pygidium at most 1.1 times as long as wide. Pubescence pale yellowish. Integument black; basal antennal segments, elytron and legs varying, partially to nearly completely reddish to yellowish-red 1.2–2.0 mm. Egypt, Jordan ..... [*poupillieri* (Allard)]

17. Elytral pubescence uniform, greyish to pale olive-yellowish. Integument varying, from black with antennal segments 1–4(5), fore and mid leg except tarsi and femoral base yellowish-red, to completely yellowish-red or red-brown 1.5–2.2 mm ..... *anobioides* (Baudi)
— Elytral pubescence variegated, greyish, yellowish and brownish. Integument black, antennal segments 1–4(5), fore and mid leg except femoral base yellowish-red, fore and mid tarsi often darkened. 1.7–2.5 mm ..... *bituberculatus* Schilsky

18. Hind femur posterolaterally and elytral intervals serrulate 19
— Hind femur and elytral intervals not serrulate 20

19. Eyes more bulging, distance between eyes smaller: in male about 6.3 times, in female about 4.8 times as small as width of head including eyes. Elytral pubescence rather greyish, indistinctly brownish spotted. Integument black; antennal segments 1–3(4) ventrally yellowish-red, fore and mid tibia at most apically reddish. 2.0–3.0 mm ..... *obscuripes* (Gyllenhal)

— Eyes less bulging, distance between eyes larger: in male about 4.4 times, in female about 3.8 times as small as width of head. Elytral pubescence rather yellowish, distinctly browinish spotted. Integument black; antennal segments 1–3(4) often completely, fore and mid leg at least apically yellowish-red. 2.0–2.8 mm ..... *tuberculatus* (Hochhut)

20. Hind femur ventrally with preapical prominent denticle accompanied by 2–3 smaller denticles. Pubescence uniform, greyish to yellowish, not covering surface. Integument black; antennal segments 1–4, fore and mid leg except femoral base, elytral disc and apex yellowish-red. 2.4–3.3 mm..... *plagiatus* (Reiche and Saulcy)

— Hind femur ventrally without or with denticle..... 21

21. Antenna relatively long, in male longer than body length, in female at least as long as 3/4 of body length (from pronotal apex to elytral apex). Pronotum at least 1.4 times as wide as long. Body stout, thick-set 22

— Antenna relatively short, in male at most 0.8 times as long as body length, in female at most 0.6 times as body length. Body not thick-set 24

22. Elytral pubescence without whitish spot in front of mid of intervals 7–9, uniform and brownish to blackish with interval 1 pale yellowish, also nearly uniform and pale yellowish in male. Male antenna strongly pectinate. Integument black to completely red-brown; at least fore and mid leg except tarsi and femoral base reddish. 3.3-4.0 mm..... *serraticornis* (Fabricius)

— Elytral pubescence with greyish to whitish spot in front of mid of intervals 7–9; pubescence rarely uniform and yellowish 23

23. Male antenna strongly serrate to subpectinate, very rarely pectinate; female antenna serrate; antennal segments 6–10 about 1.2 times as long as wide in both sexes. Elytral pubescence usually dark brown, with whitish spot in front of mid of interals 7–9 and in front of apex of interval 3, with longitudinal yellowish band from base to apex of intervals 1–2. Integument black; at least antennal segment 2, fore and mid leg except tarsi and femoral base reddish; very rarely completely reddish. 2.2–3.8 mm..... *quinqueguttatus* (Olivier)

— Male antenna moderately serrate, segments 6–10 about 1.5 times as long as wide; female antenna serrate, segments 6–10 as long as wide. Elytral pubescence similar to *B. quinqueguttatus*. Integument black; tibiae, femora except base and at least antennal segments 1–3 yellowish-red; elytron from apex to lateral side rarely reddish. 1.4–2.9 mm ..... *albopictus* (Allard)

24. Antenna nearly identical in the sexes..... 25

— Antenna distinctly different the sexes 32

25. Mucro distinctly shorter than mediolateral coronal denticle. Antennal segments 6–10 at least as long as wide. Pubescence uniform, pale yellowish, often with hairs considerably denser at median longitudinal line of pronotum and pygidium. Integument red to brownish; antenna and tarsi distally, head and abdomen often darker. 1.9–3.0 mm. . . . . *albolineatus* (Blanchard)

— Mucro distinctly longer than mediolateral coronal denticle. Antennal segments 6–10 at most as long as wide, usually square 26

26. Body shape short-oval (dorsal view), body at most 1.4 times as long as combined width of elytra 27

— Body shape moderate to oblong-oval; body at least 1.5 times as long as combined width of elytra 28

27. Dorsal side of body flat (lateral view). Elytral pubescence usually variegated, rarely rather uniform, greyish to yellowish-brown. Integument black; at least antennal segments 1–6, fore and mid leg except femoral base reddish, at most antenna and legs nearly completely reddish. 1.7–2.6 mm . . . . . *lividimanus* (Gyllenhal)

— Dorsal side of body distinctly convex. Elytral pubescence variegated. Integument black; antennal segments 1–5, fore and mid leg except tarsi and femoral base yellowish-red. 1.3–1.9 mm . . . . . *mulsanti* (Brisout)

28. Pygidium oblique, mostly visible (dorsal view). Elytral pubescence variegated, greyish, pale to straw yellowish, with distinct elongated spots of denser hairs. Integument black; antennal segments 1–4, fore, and mid leg except tarsi and femoral base yellow-red 1.6–3.5 mm . . . . . *rufisurus* (Allard)

— Pygidium vertical, barely visible 29

29. Integument black; at most antennal segments 1–3, fore and mid tibia apically reddish. Pubescence generally dark brown; elytral pubescence poorly greyish spotted. 1.9–2.5 mm . . . . . *suratus* (Motschulsky)

— At least fore and mid tibia nearly completely and antennal segments 1–4 yellow-red. Elytral pubescence uniform or variegated 30

30. Body shape oblong-oval (dorsal view); body length about 1.7 times as long as combined width of elytra. Elytral sides more parallel. Elytral pubescence variegated. Integument black; antennal segments 1–4, fore and mid leg except tarsi and femoral base yellowish-red. Female pygidium with shiny, less pubescent area. 1.6–2.3 mm. . . . . *pusillus* (Germar)

— Body shape moderately oval; body at most 1.6 times as long as combined width of elytra. Tarsi coloration and elytral pubescence different 31

31. Elytral pubescence variegated; similar to *B. pusillus*, but paler. Integument black; antenna and legs varying, from antennal segments 1–4, fore and mid leg except femoral base yellowish-red to antenna and all legs nearly completely yellowish-red. Female pygidium uniformly pubescent, without shiny or polished area. 1.5–2.6 mm. . . . . *seminarius* (Linnaeus)

— Elytral pubescence uniform, greyish to pale yellowish. Integument varying from black, with antennal segments 1–4, fore and mid leg except tarsi and femoral base yellowish-red, to completely red with yellowish antenna and legs. Female pygidium with shiny, less pubescent area. 1.8–2.5 mm . . . . . *fulvescens* (Baudi)

32. Integument varying, from black with basal antennal segments, fore and mid leg except femora blackish-red, to yellowish-red with head, scutellum and metathorax somewhat darkened. Pubescence uniform, yellowish-greyish. 1.7–2.2 mm . . . . . *kieneri* Zampetti

— Integument not varying, antenna and legs black or partially black or completely yellowish-red; rest of body always black 33

33. Legs black. 34

— At least fore leg red. 41

34. Pygidium at least 1.4 times as long as wide 35

— Pygidium at most 1.2 times as long as wide. 36

35. Body shape cigar-like (dorsal view!). Pubescence uniform, greyish, not covering surface. Integument black 2.0–2.5 mm . . . . . *mordelloides* (Baudi)

— Body shape moderate. Pubescence uniform, scutellum, elytral interval 1, pygidium and ventral side greyish, rest of dorsal side ochre to olive. Integument black; antennal segments 1–3(4) ventrally reddish. 3.5–4.2 mm. Jordan . . . . . [*ochraceus* (Baudi)]

36. Mucro distinctly shorter than mediolateral coronal denticle (lateral view!). Elytral pubescence dark brown, greyish-yellowish longitudinal band along intervals 1–2, rather greyish transverse bands at end of first and second third of intervals 3–9. Integument black. 2.5–3.5 mm. Lebanon . . . . . [*virgatus* (Fahraeus)]

— Mucro at least as long as mediolateral coronal denticle. Elytral pubescence without bands 37

37. Elytral pubescence uniform, greyish, without spots 38

— Elytral pubecence at least with a few barely visible spots 39

38. Integument black; antennal segments (1)2–3(4) ventrally yellowish-red. Male antennal segment 3 about as long as segment 2. Male mid tarsus with third tarsomere nearly twice as wide as second tarsomere. 1.0–1.8 mm . . . . . *pygmaeus* (Boheman)

— Integument black; antennal segments (1)2(3) ventrally reddish. Male antennal segment 3 twice as long as segment 2. Male mid tarsus with second and third tarsomeres of equal width. 1.8–2.7 mm. Jordan . . . . . [*nanus* (Germar)]

39. Elytral pubescence olive-yellowish, with greatly elongated greyish spots at odd intervals. Integument black; antennal segments 2–3(4) reddish. 2.0–3.0 mm. Lebanon ..... [*lineatus* (Allard)]
— Elytral pubescence rather greyish, with barely visible brownish spots or areas; without elongated spots 40

40. Hind femur ventrally without preapical denticle at inner margin. Male antennal segments 6–10 about 1.1 times as long as wide. Male mid tarsus with third tarsomere about 1.5 times as wide as second tarsomere. Integument black; usually antennal segments 2–3 ventrally yellowish-red 1.2–2.6 mm ..... *foveolatus* (Gyllenhal)
— Hind femur ventrally with minute, sharp preapical denticle at inner margin. Male antennal segments 6–10 1.3–1.4 times as long as wide. Male mid tarsus with second and third tarsomeres of equal width. Integument black; usually antennal segments 2–3(4) completely yellowish-red. 1.4–2.1 mm..... *trifolii* (Motschulsky)

41. Fore leg except femoral base yellowish. Pubescence uniform, greyish. Integument black; antennal segments 1–4(5) at least ventrally and fore leg yellowish. 1.1–1.7 mm ..... *sericatus* (Germar)
— At least fore and mid tibia yellowish-red 42

42. Hind leg black..... 43
— Hind leg at least partially reddish..... 47

43. Antenna yellowish in both sexes; male antennal segments 5–10 about 1.4 times as long as wide. Elytral pubescence indistinctly variegated. Integument black; antenna yellowish; fore and mid leg except base yellowish. 1.8–2.5 mm ..... *tibialis* (Boheman)
— Antenna black with basal segments at least partially yellowish to yellowish-red..... 44

44. Elytra at least 1.5 times as long as combined elytral width. Elytral pubescence usually distinctly variegated. Integument black; antennal segments 1–4 yellowish with at least segment 1 dorsally blackish; fore and mid leg except femoral base, often mid tibial base yellowish, at most tarsi of both legs partially yellowish. 1.7–2.4 mm... *longulus* Schilsky
— Elytra at most 1.4 times as long as combined elytral width 45

45. Elytral pubescence mediolaterally with striking, rarely twice yellowish interrupted, usually dark brown spot on intervals 5–10; remaining elytral pubescence variegated, with additional dark brown spot at apex. Integument black; antennal segments 1–3(4) except ventral side of segment 1, fore and mid leg except femoral base yellowish-red. 1.7–2.9 mm..... *bimaculatus* (Olivier)
— Elytral pubescence mediolaterally without striking dark brown spot on intervals 5–10 ...46

46. Fore and mid tarsi black; fore and mid tibiae and antennal segments 1–4(5) yellowish-red; remaining integument black. Elytral pubescence variegated. Male: first tarsomere of mid tarsus without process. 2.0–3.0 mm ..... *murinus* (Boheman)
— At least fore and mid tarsi 1–2 yellowish-red, remaining integument like *B. murinus*. Elytral pubescence similar to *B. murinus*. Male: first tarsomere of mid tarsus ventroapically with long, thin process. 2.0–2.9 mm..... *varipictus* (Motschulsky)

47. Elytral pubescence mediolaterally with striking, rarely twice yellowish interrupted, dark brown spot on intervals (4)5–10 48

— Elytral pubescence mediolaterally without striking spot on intervals 5–10 49

48. Antenna yellowish-red. Pygidium about 1.2 times as long as wide. Pronotal pubescence laterally striking ochre-yellowish; elytral pubescence in addition to mediolateral spot with medially striking whitish hairs on intervals 1–4, in basal and apical third variegated, whitish, ochre-yellowish and dark brown. Integument black; antenna, legs except basal half of femora yellowish-red. 2.1–2.7 mm ..... *poecilus* (Germar)

— At least antennal segment(s) (5)6 blackish. Pygidium about 1.1 times as long as wide. Pronotal pubescence laterally striking whitish; elytral pubescence similar to *B. poecilus*, but pale yellowish instead of ochre-yellowish. 1.7–2.5 mm ..... *dispar* (Gyllenhal)

49. Antenna with at least segments (4)5–7(8) blackish; male segments 7–10 as long as wide. Elytral pubescence varying, greyish-yellowish and barely visible brown spotted to variegated. Integument black; usually antennal segments 1–4 and 8–11 in male, segments 1–4 and 10–11 in female yellowish-red; legs except basal half of femora yellowish-red; sometimes hind tarsi blackish. 1.7–2.6 mm ..... *annulicornis* (Allard)

— Antenna yellowish, very rarely reddish in distal half 50

50. Legs with at least basal half of femora black. Elytral pubescence distinctly variegated. Integument black; antenna and legs except femoral base yellowish-red. 1.7–2.4 mm ..... *varius* (Olivier)

— Legs usually yellowish, rarely femoral base of mid and hind leg reddish. Elytral pubescence mostly greyish, barely visible brownish spotted. Integument black except antenna and legs. 1.4–2.1 mm ..... *trifolii* (Motschulsky) form *alfierii* P

KEY TO THE SPECIES OF *MIMOSESTES*

1. Eyes flat. Pubescence usually mixed greyish and pale brownish, without spots. Integument blackish; antennal segments 1–4, femora distally and often basal part of elytral disc reddish. 2.1–3.8 mm ..... *amicus* (Horn)

— Eyes bulging. Pubescence varying, from nearly uniformly greyish-yellowish to brown with usually longitudinal greyish spots on elytral disc. Integument brown to red; antennal base and legs yellowish-red. 2.0–4.3 mm. Egypt ..... [*mimosae* (Fabricius)]

E. PARASITIC HYMENOPTERA

The following list of parasitic Hymenoptera (Table 2) contains species reared in Israel from seeds infested by bruchids, which were recorded in the literature or are new records (cited in the reference column as "present publication").

TABLE 2
Parasitic Hymenoptera reared from seeds infested by bruchids

Parasite species	Family	Host plant	Bruchid species	Reference
Habrobracon hebetor Say	Braconidae	*Acacia raddiana*	*Caryedon serratus*	Donahaye et al, 1966; Halperin, 1986
Rhaconotus aciculatus Ruthe	Braconidae	*Acacia* spp.	*Careydon palaestinicus*	Bodenheimer, 1937
		Prosopis farcta	*Caryedon palaestinicus*	Gerling and Kugler, 1973
Triaspis thoracica (Curtis)	Braconidae	*Calicotome villosa*	*Bruchidius lividimanus*	Present publication
Triaspis thoracica (Curtis)	Braconidae	*Pisum sativum*	*Bruchus pisorum*	Avidov and Harpaz, 1969; Calderon, 1962
Triaspis thoracica (Curtis)	Braconidae	*Pisum sativum*	*Callosobruchus maculatus*	Present publication
Triaspis thoracica (Curtis)	Braconidae	*Pisum sativum*	*Spermophagus* sp.	Present publication
Triaspis thoracica (Curtis)	Braconidae	*Vicia* sp.	*Bruchus dentipes*	Present publication
Triaspis thoracica (Curtis)	Braconidae	*Vicia* sp.	*Bruchus rufimanus*	Calderon, 1962
Tetrastichus bruchopfagi Gahan	Eulophidae	*Vicia* sp.	*Bruchus rufimanus*	Present publication
Bruchocida vuilleti Crawford	Eupelmidae	*Acacia tortilis*	*Caryedon* sp. near *saudicus*	Donahaye et al, 1966
Bruchocida vuilleti Crawford	Eupelmidae	*Acacia tortilis*	*Caryedon palaestinicus*	Donahaye et al, 1966
Bruchophagus gibbus (Boheman)	Eurytomidae	*Medicago*	*Caryedon palaestinicus*	Present publication
Bruchophagus sp.	Eurytomidae	*Phaseolus lunatus*	*Caryedon palaestinicus*	Present publication
Eurytoma sp.	Eurytomidae	*Acacia raddiana*	*Caryedon* sp. near *saudicus*	Present publication
Anisopteromalus calandrae (Howard)	Pteromalidae	*Acacia tortilis*	*Caryedon* sp. near *saudicus*	Donahaye et al, 1966
Anisopteromalus calandrae (Howard)	Pteromalidae	*Acacia tortilis*	*Caryedon palaestinicus*	Donahaye et al, 1966
Anisopteromalus calandrae (Howard)	Pteromalidae	*Cicer arietinum*	*Callosobruchus maculatus*	Avidov and Harpaz, 1969
Anisopteromalus calandrae (Howard)	Pteromalidae	*Phaseolus vulgaris*	*Zabrotes subfasciatus*	Present publication
Anisopteromalus calandrae (Howard)	Pteromalidae	*Pisum sativum*	*Callosobruchus maculatus*	Present publication
Anisopteromalus calandrae (Howard)	Pteromalidae	*Vigna sinensis*	*Callosobruchus maculatus*	Present publication
Bruchobius mayeri (Masi)	Pteromalidae	*Trifolium purpureum*	*Callosobruchus maculatus*	Present publication
Bruchobius sp.	Pteromalidae	*Cicer arietinum*	*Callosobruchus maculatus*	Calderon, 1962
Oedaule magnus (Roh.)	Pteromalidae	*Vigna sinensis*	*Callosobruchus maculatus*	Avidov and Harpaz, 1969
Oedaule stringifrons Waterson	Pteromalidae	*Acacia tortilis*	*Caryedon* sp. near *saudicus*	Donahaye et al, 1966
Oedaule stringifrons Waterson	Pteromalidae	*Acacia tortilis*	*Caryedon palaestinicus*	Donahaye et al, 1966
? Tritneptis sp.	Pteromalidae	*Acacia caven*	*Pseudopachymerina spinipes*	Karschon and Weinstein, 1981
Liodontomerus terebrator (Masi)	Torymidae	*Trifolium alexandrinum*	*Bruchidius trifolii*	Avidov and Harpaz, 1969; Calderon, 1962
Uscana group semifumipennis Girault	Trichogrammatidae	*Prosopis farcta*	*Caryedon palaestinicus*	Belinsky, 1976

DISCUSSION

The most common species in nature in Israel are *Bruchidius lividimanus, B.* sp. nr. *arabicus* and *Spermophagus calystegiae*.

Seed infestation by bruchids may be as high as 99%, e.g. of *Bruchidius* sp. nr. *arabicus* in *Acacia tortilis* in the southern Negev, but no significant ecological impact of this infestation on reproduction of the tree is recorded, and part of the infested seeds even germinate better than the uninfested ones (Halevy, 1974). Bruchid infestation in agricultural crops can also be high entailing significant damage. Significant economic losses are expected in multivoltine species which reproduce in stored seeds, such as *Acanthoscelides obtectus, Callosobruchus chinensis* and *C. maculatus*.

Four species develop in seeds of Convolvulaceae, one species each in Apiaceae, Cistaceae and Labiatae, and possibly in Asteraceae and Scrophulariaceae. The other species feed mostly in legumes, approximately one third of them in crop plants.

Of the 79 Israeli Bruchids, nearly three quarters are represented by Circummediterranean (32) and Eastmediterranean (25) elements. Other species are Afrotropical (8), endemic (3) or an element of the Arabian Peninsula (3). Eight species were introduced to Israel, of which six are already widespread there.

ACKNOWLEDGMENTS

We are indebted for the kind loan of material to the curators of the following institutions: National Collection of Insects, Department of Zoology, Tel Aviv University, Israel; the Departments of Entomology and of Stored Products, the Volcani Center, Bet Dagan, Israel; Bet Gordon Museum, Deganya, Israel; Abteilung Entomologie des Staatlichen Museums für Naturkunde, Stuttgart, Germany; Zoological Museum, Lomonosov University, Moscow, Russia; and Zoological Institute, Academy of Sciences, St. Petersburg, Russia. We thank Dr. J. Decelle, Section Entomologie, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, f information and identification of some species, and Prof. L. Borowiec, Zoological Institute, University of Wroclaw, Poland, for procuring material deposited in the Hungarian Natural History Museum, Budapest. We are also indebted to both colleagues for reviewing the manuscript, which was worked out when Dr. J. Decelle was still alive.

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