

## THE BOSTRYCHID BEETLES (COLEOPTERA) OF ISRAEL\*

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### ABSTRACT

Twenty species of bostrychid beetles (Coleoptera), or false powderpost beetles, are reported from Israel, seven of them for the first time in this country. Ten belong to the Mediterranean faunal element; seven are of African origin, south of the Sahara; three are of Indo-Malaysian origin. None is endemic. Ten of the species are polyphagous, three are oligophagous and five are monophagous (on pine, tamarisk, acacia, carob and bamboo). Eight species are regarded as noxious. Four species, despite being common, do not cause any damage. Eight species are rare.

### INTRODUCTION

This paper is based mainly on material collected by the senior author in the course of a survey of insects feeding on trees and shrubs of Israel, conducted during the years 1958-78. Data were also obtained by inspection of the major entomological collections in this country. The material collected in Israel, deposited in the British Museum (Natural History), London; Museum National d'Histoire Naturelle, Paris, and the Institut Royal des Sciences Naturelles de Belgique in Brussels, have also been considered.

Identifications were made by the second author (R.D.). Species recorded for the first time from Israel are denoted by an asterisk. Names of regions in Israel are abbreviated in the text as follows: AV, Arava Valley ;CN central Negev; CP coastal plain;DS, Dead Sea area; JM, Judean Mountains; LG, Lower Galilee; NN, northern Negev; UG, Upper Galilee; Other abbreviations frequently used, are: Coll., collected; and em., emerged.

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## DINODERINAE

### *Rhizopertha dominica* F.

Probably the most cosmopolitan bostrychid. Common in all tropical and subtropical regions and introduced by commerce of grains and cereals to the temperate zones. Its origin is probably in India or the Malayan region. Feeds on stored grain, cereals and other starchy products (Avidov and Harpaz, 1969), and therefore of great economic importance.

There are records of its feeding on wood products as well as live plants such as *Bambusa*, *Quassia*, *Quercus suber* L., *Cytisus*, *Artocarpus*, etc. (Lepesme, 1944). In Israel sporadic, but sometimes common on local and imported grains; however thanks to prophylactic measures, of little economic importance (Calderon and Donahaye, 1964).

### *Dinoderus minutus* F.

Cosmopolitan species, of Indo-Malaysian origin. Common in tropical regions but spread by commerce also to temperate zones. Considered as an important pest of bamboo stalks, but feeds also on stem and branches of broad leaved trees and stored products (Lepesme, 1944). First recorded here in 1928 from Jerusalem in bamboo canes (Bytinski-salz, 1966), but established only after World War II, and now widespread.

MATERIAL EXAMINED: Haifa 13.VII.69, em. 14.VII.—20.VIII.69 and 16.XI.69—15.VIII.70, ex *Bambusa vulgaris* Schrader; Haifa 30.V.65, em. 20.VI.—15.VII.66, ex *Dalbergia sissoo* Roxburgh; Ma'barot (CP) 14.VIII.74, ex *B. vulgaris*; Ilanot (CP) 25.VII.69, em. 20.VIII.69 — 1.VI.70, ex *B. vulgaris*; Zahala (CP) 18.I.66, em. 1.II.66, em. 1.II.66 ex *B. vulgaris*; Giv'at ha-Sheloshah (CP) VI.60, in *B. vulgaris* (H. Bytinski-Salz); Tel Aviv 18.I.66, em. 1.II.—1.IX.66, 1.V.—28.VII.67 and 28.IV.68, ex *B. vulgaris*; intercepted 1.XI.61 from *B. vulgaris* imported from Indonesia (H. Bytinski-Salz).

### *Dinoderus bifoveolatus* Wollaston\*

An African species, dispersed by commerce to all hot regions. Feeds on stalks of monocotyledons but also in cereal flours (Lepesme, 1944). In Israel not yet common.

MATERIAL EXAMINED: Yad Hanna (CP) 8.II.76, em. 25.VI.—12.IX.76, 8.XI.76 and 24.II.77, ex *B. vulgaris*. Intercepted VI.28 from bamboo stalks imported from India (Ph. Jolles).

### *Stephanopachys quadricollis* Marseul\*

Distributed in the Mediterranean. Feeds under the bark of pine, but sporadic and rare.

MATERIAL EXAMINED: Nazareth 21.VIII.58, in stem of *Pinus halepensis* Miller.

## BOSTRYCHINAE

### *Bostrychus capucinus* (L.)

Distributed in Central Europe and in the Mediterranean. From its many varieties, it seems that the typical form (body black, elytra and abdominal segments red) has the most easterly distribution (Lesne, 1898).

Probably introduced from Europe with timber (Bytinski-Salz, 1966), but not yet common.

MATERIAL EXAMINED: Dan (UG) 1.V.57; Neot Mordekhai (UG) 11.IV.67, ex *B. vulgaris* (Z. Shoham); Elon (UG) 15.V.59, ex *Ceratonia siliqua* L.; Pardes Hanna (CP) 3.III.43 and 4.IX.43; Nes Harim (JM) 13.IV.63 (H. Bytinski Salz).

### *Heterobostrychus brunneus* Murray

Ethiopian species, imported permanently to Israel with African round-wood and timber. Propagates here sometimes in cut timber and products made of African timber.

MATERIAL EXAMINED: Haifa 15.VIII.77; Pardes Hanna (CP) 1.VII.77, emerged 15.IX.77 and 1.-30.VIII.78, ex *Triplochiton scleroxylon* K. Schumann (= obeche); Netanya 11.VII.77, ex furniture made from plywood; Tel Aviv, ex boards of obeche, coll. 22.VI.77, em. 10.VIII-15.XI.77, and 8.II.78, coll. 2.VII.77, em. 23.X.77, and coll. 22.VII.77, em. 25.VII.-15.XII.77, and 18.III.-20.X.78; Lod (CP) 31.X.43, ex railway sleepers (Ph. Jolles).

### *Heterobostrychus aequalis* Waterhouse\*

Considered as the Indo-Malaysian equivalent of *H. Brunneus*. Introduced consistently to Israel with wood, wooden boxes and wood products, including plywood from the Far East, and propagates here sometimes in the same material.

MATERIAL EXAMINED: Haifa 29.VII.77, em. 30.VIII-20.IX.77., ex doors of a new building; Netanya 11.VII.77, ex plywood; Tel Aviv 2.VII.46 ex exotic wood (H. Bytinski-Salz); 30.V.77 ex case made of *Dyera costulata* Hooker f. (= jelutong), imported from Thailand; Tel Aviv 23.VII.76, em. 16.XII.76, ex plywood made of *Shorea* sp. (meranti and lauan), imported from the Philippines; Ashqelon, 7.II.78 and 14.III.78, ex veneer made of *Shorea* sp.

### *Schistoceros bimaculatus* Oliver

The Mediterranean representative of a genus consisting of many species, distributed in the Old and New World (Lesne, 1898).

Some specimens collected in Haifa and deposited in Reitter's collection in the museums of Budapest and Munich, were identified by Vrydagh (1956, 1958). Common in Israel.

MATERIAL EXAMINED: Neot Mordekhay (UG) ex twigs of *Pyrus malus* L. coll. 21.III.60, (Y. Shelah), and coll. 22.XII.65 (Z. Shoham); Tel Aviv 15.VIII.76; Miqwe Yisra'el (CP) 26.X.58, em. 15.IV.—16.VI.59 ex pruned twigs of *Vitis vinifera* L.; Holon 6.XII.58, ex branch of *Tamarix aphylla* (L.) Karsten; Rehovot, 26.III.73, ex stem of *Delonix regia* (Bojer). En Feshkha (DS) 7.XII.78, em. 17.III.—1.IV.79, ex stem of *Tamarix tetragyna* Ehrenberg.

### *Calopertha truncatula* Ancey

A Sahelian species occurring also in the Arabian peninsula and Punjab, in acacias. Bred by Bytinski-Salz (1954) from desert acacia. Occasionally found here, mainly in the Arava Valley.

MATERIAL EXAMINED: 'En Hazeva (AV) 4.VIII.50, ex *Acacia tortilis* Heyne (H. Bytinski-Salz); 'En Hazeva 8.VIII.53; 'En Gedi (DA) 16.VIII.57, and Evrona (AV) 27.VII.51 (J. Wahrman).

### *Sinoxylon ceratoniae* (L.)

Distributed south of Sahara to South Africa (Vrydagh, 1958) and recorded by the second author also from Egypt and Saudia Arabia. A single specimen marked "India" was found by the second author in Fairmaire's collection in Paris. One of the most common bostrychid in Israel, distributed everywhere, except the high mountains; bred by the senior author mainly from Leguminosae, such as *Acacia*, *Albizia*, *Prosopis*, *Ceratonia*, *Delonix*, *Parkinsonia*, *Dalbergia* and *Robinia*, but also occasionally from *Ficus*, *Jacaranda*, and *Malus*. Flight period from spring to autumn.

### *Sinoxylon sexdentatum* (Olivier)

Mediterranean species, found occasionally in Hungary (Cymorek, 1974).

Present here mainly in the north of the country.

MATERIAL EXAMINED; Mt. Meron (UG), 25.VII.68 ex *Pistacia palaestina* Boissier, and 7.XI.67 ex *Quercus calliprinos* Webb; Carmel, 1.VIII.60, em. 13.IV.61 ex *Cercis siliquastrum* L.; Jerusalem 27.V.40. (H. Bytinski-Salz).

### *Scobicia chevrieri* (Villa)

Distributed in the Mediterranean. Very common in all Israel. Polyphagous; bred by the senior author from *Ulmus*, *Ficus*, *Cercis*, *Ceratonia*, *Delonix*, *Citrus*, *Pistacia*, *Eucalyptus*, *Olea*, *Arundo* and *Bambusa*. Main flight period May-August.

### *Enneadesmus forficula* Fairmaire

Ehtiotic species, known also from the Arabian peninsula, the Indian peninsula and from Maghreb (Lesne, 1900). In Israel only in the Negev and Arava Valley. Bred by Bytinski-Salz (1954) from *Acacia* and *Citrus*.

MATERIAL EXAMINED: Mishmar haNegev (NN) 12.VI.50; 'En Gedi (DS) 29.IX.76; Revivim (NN) 8.IV. and 12.V.46. (H. Bytinski-Salz); Yotvata (AV) 11.IV.58 (Y.L. Werner).

*Enneadesmus trispinosus* (Olivier)\*

Distributed in the Mediterranean region, mainly in *Tamarix* (Lesne, 1900). In Israel very rare; collected from the Dead Sea area only.

MATERIAL EXAMINED: Jericho (DS) 6.XI.27, ex *Citrus* (G. Bodkin); 'En Gedi (DS) 15.VI.71, em. 10.X.71 (D. Gerling), and 2. VIII.76, em. 6.X.76 ex *Tamarix nilotica* (Ehrenberg).

*Xylopertha praeusta* Germar\*

Distributed in the western and central Mediterranean region, recorded from - *Quercus*, *Ficus*, *Pistacia lentiscus* L. (Lesne, 1900, *Acacia*, and *Viburnum* (Cymorek, 1974). In Israel very rare.

MATERIAL EXAMINED: Sede Nehemya (UG) 11.XI.69, Neot Mordekhai (UG) 11.V. 77 (Z. Shoham).

*Xylopertha retusa* (Olivier)\*

Distributed in the Mediterranean region, central and eastern Europe, Crimea and Transcaucasus, in *Quercus*, *Ulmus*, *Castanea sativa* Miller, and *Vitis vinifera*. In Turkey also in *Ficus carica* L. and *Acer* (Cymorek, 1974). In Israel rare, found only in the north.

MATERIAL EXAMINED: Sede Nehemya (UG) 26.X.70 (Z. Shoham); 'En Dor (LG) 14.XII.66, ex *Ceratonia siliqua*.

*Xyloperthella picea* Olivier

Originally from tropical Africa, but now found in other tropical regions except for arid zones.

In Israel very common, mainly in the northern and central regions, but not in the high mountains. Bred by the senior author from *Quercus*, *Ulmus*, *Ficus*, *Prunus*, *Ceratonia*, *Delonix*, *Dalbergia*, *Citrus* and *Eucalyptus*. Found also in logs of *Antiaris toxicaria* Leschenault (= ako), imported from west Africa.

APATINAE

*Apate monachus* F.

The most common and the most destructive bostrychid, of Guinean (west African) origin, it spread toward the regions of the Mediterranean, the Indian Ocean and west Asia, and became established also in South America (Lesne, 1903).

In west Africa, affects mainly coffee and cocoa trees (Lesne, 1909). In Israel, damage has been recorded by Peretz and Cohen (1961) and by the senior author (unpublished data) from many native and introduced forest trees, e.g. *Cercis*, *Tamarix*, *Ceratonia*, and to a lesser extent *Eucalyptus*, *Casuarina* and *Acacia*; more than a dozen genera of shade trees, e.g. *Melia* and, to a lesser extent, *Acer*, *Dalbergia*, *Robinia*, *Delonix* and *Grevillea*; and some 20 species of fruit trees, like pomegranate, olive, grapes, guava, annona, and others. Beetles were found also in trunks of Obeche, imported from west Africa. Common throughout Israel, except for the highest elevations. Flight period spring to autumn (Peretz and Cohen, 1961).

### *Phonapate uncinata* Karsch

The genus *Phonapate* was revised by Vrydagh (1961) after examination of the types. Our species corresponds to *Ph. frontalis arabs*, described by Lesne (1909), which distribution is supposed to be east Mediterranean.

*Ph. uncinata* is very rare in Israel and only occasionally found in the Arava Valley on tamarisk.

MATERIAL EXAMINED: En Turaba (DS) 11.VI.71, em. 13.IX.71, ex *Tamarix* sp.

### *Xylomedes coronata* (Marseul)\*

Although a thorough study was made for the identification of this species, which was originally described from Morocco, its identity is still in doubt because the genus *Xylomedes* is poorly represented in collections, and not in all species are the two sexes known.

In Israel, found occasionally in two isolated foci, in the Galilee and Negev only.

MATERIAL EXAMINED: Shezor (UG) 8.VII.77 (Z. Shoham); Revivim (NN) 13.VI. and 14.VII.50, and Nizzana (CN) 4.VI.70 (H. Bytinski-Salz).

### ZOOGEOGRAPHICAL DISTRIBUTION

The Mediterranean element is represented in the bostrychid fauna of Israel by ten species (50%). One of them (*B. capucinus*) is common also in Europe; another (*X. coronata*) has a very limited distribution, and is known from Morocco and Israel only. Seven species (35%) are of African origin, south of the Sahara; two of them (*E. forficula* and *H. brunneus*) belong to the Ethiopian element. Two others (*A. monachus* and *D. bifoveolatus*) became cosmopolitan, and one (*X. picea*) pantropic. One species (*C. truncatula*) is Sahelian and another (*S. ceratoniae*) is Saharo-Arabian.

Three species (15%) represent the Indo-Malaysian element; two of them (*R. dominica* and *D. minutus*) became cosmopolitan.

### FOOD HABITS AND DAMAGE

Of the 20 species, ten are polyphagous, three oligophagous and five monophagous. The monophagous species feed on pine (*S. quadricollis*), tamarisk (*Ph. uncinata*), acacia (*C. truncatula*), carob (*X. retusa*) and bamboo (*D. bifoveolatus*). Data on food habits of two species (*X. coronata* and *X. praeusta*) are not available.

Seven species are regarded as noxious: the imago of *A. monachus* bores into the stem and branches of healthy trees, while the larvae of *S. bimaculatus* develop sometimes in the stem and branches of living plants; *R. dominica* develops mainly in starchy grains. Four species cause damage to stored or manufactured products: *D. minutus* and *D. bifoveolatus* (bamboo), and *H. aequalis* and *H. brunneus* (tropical wood). Four other species — *S. chevrieri*, *S. ceratoniae*, *S. sexdentatus* and *X. picea* — are quite common, but since they develop only in dead wood and slash, they can be considered as useful. Nine species are rare and therefore any damage or benefit from them is negligible.

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#### REFERENCES

- Avidov, Z. and Harpaz, I. 1969. Plant Pests of Israel. Israel Universities Press, Jerusalem, 549 pp.
- Bytinski-Salz, H. 1954. Insects associated with desert acacias in Israel. *Bulletin of the Research Council of Israel*, 4: 284-292.
- Bytinski-Salz, H. 1966. An annotated list of insects and mites introduced into Israel. *Israel Journal of Entomology*, 1: 15-48.
- Calderon, M. and Donahaye, E. 1964. Records on the occurrence and hosts of stored products insects in Israel. *Rivista di Parassitologia*, 25: 55-68.
- Cymorek, S. 1974. Bostrychidae, in: Schwenke, W. (Ed.) Die Forstschädlinge Europas. II. Käfer, pp. 69-75, Paul Parey Verlag, Hamburg and Berlin.
- Lepesme, P., 1944. Les Coléoptères des denrées alimentaires et des produits industriels entreposés. *Encyclopédie entomologique de France, sér. A, XXII*, 335 pp.
- Lesne, P. 1898. Révision des Bostrychides, 3ème mémoire. *Annales de la Société entomologique de France*, 67: 438-621.
- Lesne, P., 1900. Révision des Coléoptères de la famille des Bostrychides, 4ème Mémoire. *Annales de la Société entomologique de France*, 69 (4): 473-639.
- Lesne, P., 1903. La distribution géographique des coléoptères Bostrychides dans ses rapports avec le régime alimentaire de ces insectes. Rôle probable des grandes migrations humaines. *Compte rendu de l'Académie de Sciences*: 13.VII.1903.
- Lesne, P., 1909. Révision des coléoptères de la famille des Bostrychides. *Annales de la Société entomologique de France*, 78: 471-574.
- Peretz, I. and Cohen, M. 1961. *Apate monachus* (F.). Israel Ministry of Agriculture, Extension Service, Agricultural Publications Division, Tel Aviv, Bulletin 38, 32 pp. (in Hebrew, English summary).
- Vrydagh, J.-M., 1956. Contribution à l'étude des Bostrychidae. 8. — Collection de la "Zoologische Sammlung des Bayerischen Staates" à München. *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, 32 (6): 1-20.
- Vrydagh, J.-M., 1958. Contribution à l'étude des Bostrychidae. 16. — Collection du Musée G. Frey a Tutzing. *Entomologische Arbeiten aus den Museum Georg Frey*, 9: 1068-1077.
- Vrydagh, J.-M., 1961. Contribution à l'étude des Bostrychidae. 28. — Etude des Types de Fahraeus, désignation de Lectotypes.. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, 37 (7): 1-10.