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OBSERVATIONS ON SCALE INSECTS (HOMOPTERA: COCCOIDEA) OF THE MIDDLE EAST - III*

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ABSTRACT

New data are presented on the distribution, host plants and economic importance of seven species of scale insects from the Middle East. *Exaeretopus harpazi,* a soft scale insect found on annual grasses in Israel, is described from the female. *KEY WORDS:* Homoptera; Coccoidea; scale insects; Middle East; Israel; *Exaeretopus harpazi* n. sp.

The present paper is the third in a series of contributions (Ben-Dov, 1980; 1985) on the scale insects (Homoptera: Coccoidea) of the Middle East.

The material studied and recorded here was collected by various persons, whose names are given in parentheses at the end of each collection; accessions for which no collector's name is presented were collected by the author. All the material is available in the Coccoidea Collection, Department of Entomology, Agricultural Research Organization, Bet Dagan, Israel, unless otherwise stated,

COCCIDAE *Exaeretopus harpazi* n. sp.

(Fig. 1)

External appearance of female elongate-oval; young female 3.5 mm long, 1.5 mm wide; ovipositing female up to 4.5 mm long, 2.3 mm wide. Dorsum of young female with a yellowish-brown, longitudinal area (about 1/6 as wide as dorsum) extending from anal plates to head; on each side of the longitudinal area the dorsum is brownish-grey; margin and submargin yellowish-brown. Ovipositing female completely enveloped within a white ovisac 3.5-6.0 mm long, 2-3 mm wide, 1 mm high.

Males not observed.

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Mounted specimens measured 3.0-4.5 mm, 1.6-2.5 mm wide. Young females membranous. Anal cleft 250μm in young female, 310 μm in largest specimens. Angles of the lobes formed by anal cleft gently rounded. Antennae 8-segmented, 460-560μm long; apical segment 37-51μm long with a total of 7-10 setae, including a seta 117-123 μm long, some shorter pointed setae and some fleshy setae; penultimate segment with both a fleshy and a hair-like seta, each about 27 μm long. Legs well developed; measurements of hind legs: coxa 256-333 μm long, trochanter + femur 384-490 μm long, tibia 340-410 μm long, tarsus 180-225 μm long, and claw about 46 μm long. Each hind leg with 4 setae on trochanter, 13-14 on femur, 18-22 on tibia and 6 on tarsus. Tibia straight, freely articulated with tarsus and with a large articulatory sclerosis. With a marked reduction in diameter between tarsus and tibia. First tarsus curved, with a deep constriction on outer edge about midway, and with a smaller constriction about one quarter of the distance from claw; these constrictions have the appearance of pseudoarticulations. Second and third tarsi curved; constrictions less conspicuous. Claw digitules slender, about 46 μm long, with slightly expanded apices. Tarsal digitules much thinner than claw digitules, about 60 μm long, minutely expanded at tips. Anal plate triangular; each plate 149-169 μm long; the anterolateral margin straight, 71-112 μm long; posterolateral margin slightly concave, 112-128 μm long. Primary discal seta stout, 34 μm long, situated near mesal margin about one-third of the distance of the length of plate from apex. Three apical (dorsal) setae, stout, varying in length; one or two setae longer than primary discal seta sometimes shorter. Ventral side of each plate with one subapical seta (as long as dorsal apical), two setae (each 37 μm long) on ventral ridge,three fringe setae, about 18 μm long, and one about 60 μm long. Eye about 25 μm in diameter. Clypeuslabrum 170 μm long, 123 μm wide; labium 86 μm long, 60 μm wide. Anterior spiracles each about 80 μm long.

Dorsal surface with numerous setae 9-12 μm long, slender and pointed apically. Paraopercular pores, about 4 μm in diameter, situated in a longitudinal cluster of 80-95 pores, extending from anal plates to about the level of hind coxae; the cluster is interrupted once or twice; each pore slightly convex at its centre. Minute circular pores, about 2 μm in diameter, numerous and scattered; inner area of pores sieve-like. Minute oval pores, about 2 μm long, 1 μm wide, scattered; each pore with a narrow, slit-like opening surrounded by a dark rim. Clistostomatic ducts numerous; each with an outer ductule (20 μm long, 4 μm wide), and a slender inner ductule slightly longer than the former; inner end of outer ductule sclerotized; ducts are disposed over almost entire surface but are absent at anterior end of head.

Marginal setae stout, pointed; setae placed between the spiracles are 15-22 μm long; a few at angles of lobes are 50 μm long; on the head margin, the setae are up to 45 μm long; setae disposed in a single row, but on head margin arranged in a dense cluster of 2 or 3 rows; 48-82 setae placed between the eyes, 13-24 between eye and anterior stigmatic setae, 15-20 between anterior and posterior stigmatic setae, and 40-79 between posterior stigmatic setae and angle of posterior lobes. With one or two stigmatic setae opposite each spiracle; frequency of setae in 45 specimens of type-series is 1.53 setae per site; setae differ from marginal, slightly curved, 12-16 μm long.

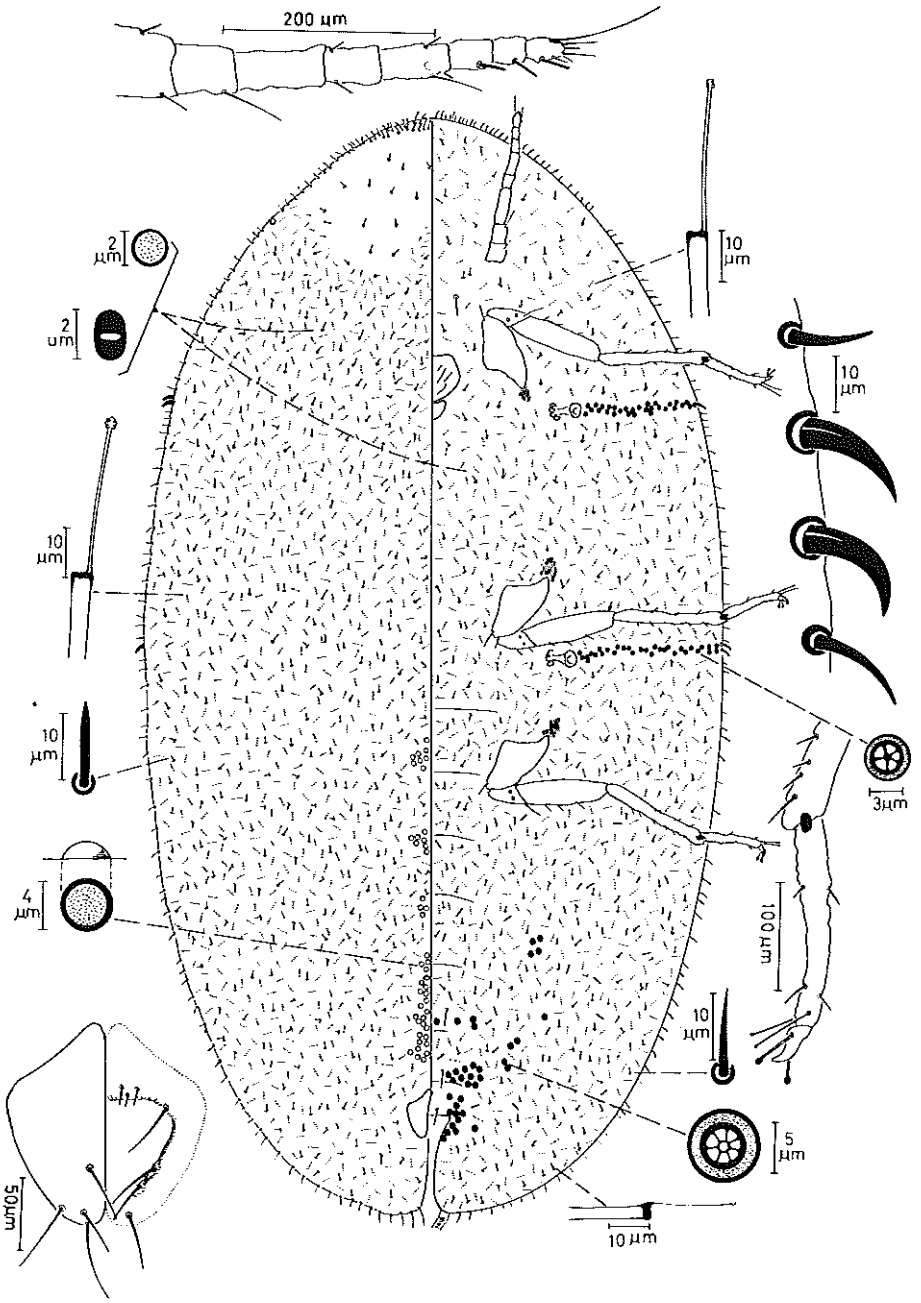

Fig. 1. *Exaeretopus harpazi* n.sp., adult female.

Ventral setae numerous and scattered; resemble dorsal setae in size and shape. Three pairs of prevulvar setae on midregion of last three abdominal segments; each about 45 μm long. With a thick interantennal seta, 30-40 μm long, and 3 or 4 smaller setae, placed medially to the base of each antenna. Minute circular pores, and minute oval pores, similar to dorsal ones, scattered. Clistostomatic ducts similar to those on dorsum present on all segments; on abdominal segments they are mixed with smaller ducts; measurements of small duct: outer ductule 20 μm long, 2-3 μm wide; inner ductule very slender, about 30 μm long. Multilocular pores located on midregion of last three abdominal segments; pore are with 6, 7 (mainly) or 8 loculi; 6-7 μm in diameter. Quinquelocular pores of stigmatic furrows each about 4 μm in diameter; disposed in bands 2-4 pores wide; anterior furrow with 29-32 pores, posterior with 30-38.

MATERIAL EXAMINED. Holotype ♀, Israel, Rehovot, on leaf of *Aegilops*, 2.IV.1987, (Y. Ben-Dov), ICV; 44 paratypes (on leaves and stems) same data as holotype. Paratypes will be deposited in the British Museum (Natural History), London; Museum National d'Histoire Naturelle, Paris; U.S. National Museum of Natural History, Washington, D.C.

Additional material (not included in type-series), all from Israel, and in ICV: Sede Boqer, Gramineae, 8.III.1966, M. Berlinger; Rehovot, *Lolium rigidum*, 29.III. 1987, R. Kenneth; Rehovot, *Avena sterilis*, 3.IV.1987; Rehovot, *Hordeum spontaneum*, 3.IV.1987.

ETYMOLOGY. This new species is named after the late Prof. Isaac Harpaz (1924-1987).

NOTES. Morphologically this new species is related to *E. tritici* Williams, 1977, differing from it mainly in the shape of the stigmatic setae, and in the extension of paraopercular pores as forward as the level of hind coxae. Both species appear to be distributed along the southern range of distribution of the genus *Exaeretopus* (see Koteja, 1980).

Pulvinaria urbicola Cockerell

Pulvinaria urbicola Cockerell, 1893:160; Hamon and Williams, 1984:105.

The occurrence of this Neotropic soft scale in Israel is very likely a result of its inadvertent introduction on imported ornamentals from Central and South America. Although its present distribution in Israel is very limited, *P. urbicola* has been developing successfully since 1985 in central Coastal Plain both in a greenhouse and in the open.

MATERIAL EXAMINED. Israel, Tel Aviv, *Citharexylum spinosum* (Verbenaceae) 1.IX.1985, 19.IX.1986; Tel Aviv, fern, 2.I.1986, M. Cohen.

ERIOCOCCIDAE

Eriococcus coccineus Cockerell

This scale insect was reported for the first time from Israel by Ben-Dov (1985).

However, after studying several old accessions from the Bodenheimer Collection (see Ben-Dov and Harpaz, 1986), it became apparent that this eriococcid has been present in the country already in the 1940s, on various Cactaceae in Jerusalem.

MATERIAL EXAMINED. Israel, Jerusalem, 16,26.VIII.1942, *Cereus silvestris*,, *Echinocactus texensis* (Cactaceae), F.S. Bodenheimer.

PSEUDOCOCCIDAE

Vryburgia brevicruris (McKenzie)

Chorizococcus brevicruris McKenzie, 1960:697; 1967:93.
Vryburgia brevicruris (McKenzie); Williams, 1985:387.

This mealybug was first described from California, and recorded subsequently also from Arizona (McKenzie, 1967). Later it was reported from New South Wales (Brookes, 1977), Denmark (Kozarzhevskaya and Reitzel, 1977), and England (Williams, 1984). This is the first record from Israel and from the Middle East. The present observations together with the above records indicate the subterranean habits of this species, and its preference for host plants of the Asclepiadaceae and Cactaceae.

MATERIAL EXAMINED. Israel, Tivon, 10.V., 13.IX.1986, on roots of *Stapelia* sp. (Asclepiadaceae), N. Plaut.

Misericoccus imperatae (Hall)

Ripersia imperatae Hall, 1923:8.
Misericoccus imperatae (Hall); Ezzat, 1961:68.

A grass-infesting mealybug which previously was known in the Middle East from Egypt (Hall, 1923) and Iraq (Bodenheimer, 1943). Here it is reported from the southern Arava Valley of Israel.

MATERIAL EXAMINED. Israel, Elot, *Cynodon dactylon* (Gramineae), 6.I.1983, A. Venezian.

Phenacoccus avenae Borchsenius

Phenacoccus avenae Borchsenius, 1949:217; Williams and Miller, 1985:672.

The original description was based on material collected from oats in Armenia, USSR. However, the study by Williams and Miller, 1985, has shown that this species was repeatedly intercepted in England, the Netherlands, and U.S.A., on bulbs, corms and rhizomes imported from Turkey. The present new record from Israel suggests that this mealybug is more widely distributed in middle-Eastern countries.

MATERIAL EXAMINED. Israel, Yarhiv (central Coastal Plain), 9.XI.1979, *Urginea maritima* (Liliaceae).

Pseudococcus affinis (Maskell)

Dactylopius affinis Maskell, 1894:90
Pseudococcus affinis (Maskell); Miller *et al.*, 1984:707.

This mealybug is recorded here for the first time from Israel, but the available records indicate that it has been present in the country at least since the 1940's. The mealybug infests mainly ornamentals both in greenhouses and in the open, but sofar is not a pest of economic importance in this country.

MATERIAL EXAMINED. Israel: Jerusalem, 29.XI.1944, 19.IX.1945, *Gynura aurantiaca* (Compositae), F.S. Bodenheimer; Haifa, 29.VIII.1970, *Punica granatum* (Punicaceae), M. Berlinger; Be'er Sheva, 11.XII.1975, *simmondsia chinensis* (Buxaceae), M. Berlinger; Jerusalem, 12.VIII.1977, *Hoya carnosa* (Asclepiadaceae), *Phillyrea media* (Oleaceae); Nezer Sereni, 13.IX.1979, *Persea americana* (Lauraceae), on roots; Sha'ar Hagai, 22.IX.1980, *Punica granatum*, Y. Golan; Be'er Sheva, 20.XI.1980, *Simmondsia chinensis*; Be'er Sheva, 26.II.1985, *Dracaena* sp., (Liliaceae); Be'er Sheva, 29.VI.1985, *Pittosporum* (Pittosporaceae), M. Berlinger.

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