

Notes on three species of *Eretmocerus* Haldeman occurring in Israel with a description of a new species

by

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ABSTRACT

The occurrence of *Eretmocerus mundus* Mercet, *nairobi* Gerling and *roseni* n. sp. in Israel is noted and the latter is described. The hosts and distribution of the different species are discussed.

INTRODUCTION

The names of four species belonging to the genus *Eretmocerus* have been reported from Israel. They are *E. masii* Silv., *E. mundus* Mercet, *E. diversiciliatus* Silv. and *E. nairobi* Gerling. Of these, the first is a junior synonym of the second and the third is misidentified. It is the purpose of this paper to bring the knowledge on the genus *Eretmocerus* in Israel up to date.

Species of *Eretmocerus* are, in all known cases, parasitic on Aleyrodidae. They deposit their eggs under the nymph of the host, and their larva, while in its second instar, penetrates the host from underneath, waits for the latter's moult into its fourth instar and continues to develop therein to maturity. The adult emerges through a hole that it chews in the anterodorsum of its host. No meconia are left behind in the empty host, which usually appears somewhat darker and swollen than the unparasitized one.

Many of the *Eretmocerus* species are thermophilic, being most successful in periods of warm weather and in warm regions. Some species, most notably *E. serius* Silv., are able to reduce their hosts to subeconomic levels and thus cause successful biological control. Others are unable to do so, as can readily be observed by the severe economic damage that the whitefly *Bemisia tabaci* is causing in many parts of the world, in spite of the *Eretmocerus* species parasitizing it.

In Israel there probably exist examples of both cases. ROSEN (1966) reported that *E. diversiciliatus*, together with *Prospaltella lutea* Masi seem to keep *Acauleurodes citri* Priesner and Hosni under biological control. These observations were confirmed by the present author's collections and records. Contrarily, *B. tabaci*, that is attacked by *P. lutea* and by *E. mundus* Mercet, is not kept under control and may cause heavy damage to its host plants.

During the last two years, immature Aleyrodidae occurring on many plant species were collected from a variety of locations and habitats. They were kept in the laboratory until either their adult, or the adult of their parasite emerged.

RESULTS AND DISCUSSION

Eretmocerus mundus was described by MERCET (1931). He did not mention the species of its host but wrote that it was an Aleyrodid on *Solanum melongena*, and

that *Prospaltella lutea* was reared from the same hosts. These two facts indicate a strong possibility that *E. mundus* emerged from *B. tabaci* since *S. melongena* is frequented by it and since it is often attacked also by *P. lutea*. SILVESTRI (1934) mentioned and figured *E. masii* that he reared from *B. tabaci*, and VIGGIANI (1965) synonymized the two species.

The female of *E. mundus* can be recognized through its antenna (Fig. 1) that has two approximately square funicle segments, and a slender club that is rounded

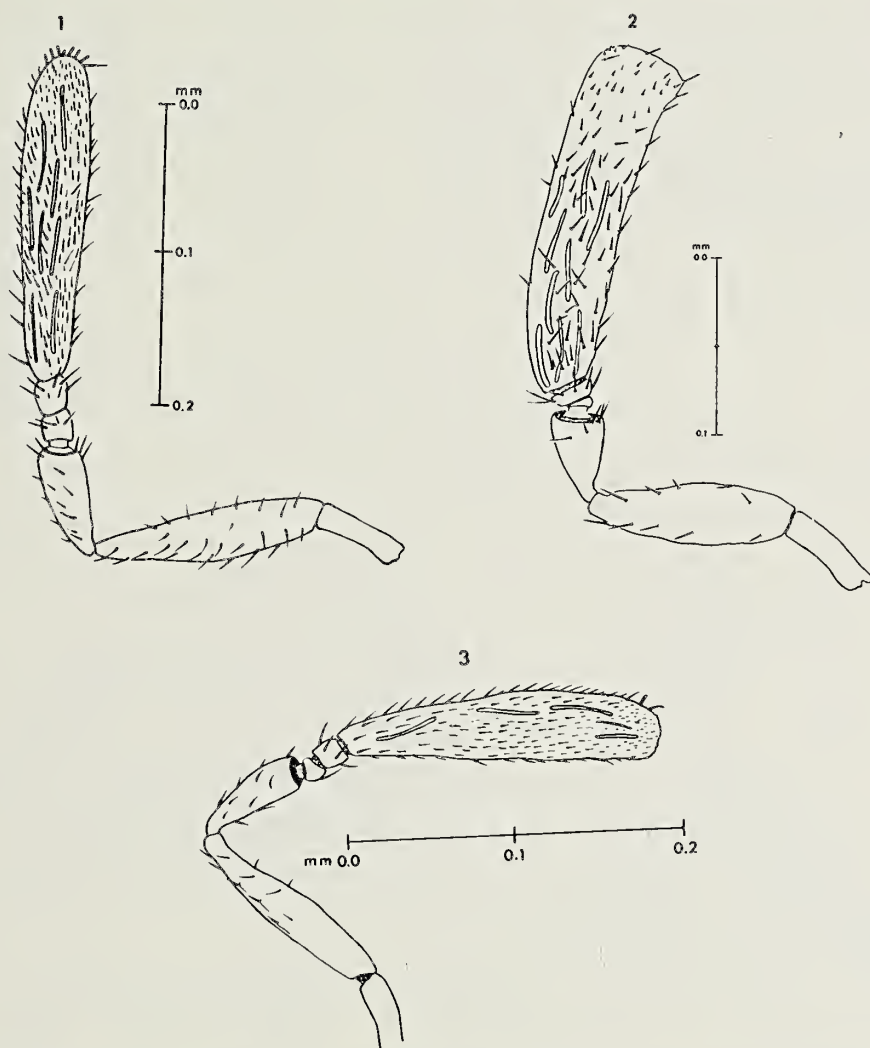


Fig. 1—3. Antennae of females. 1, *Eretmocerus mundus* Mercet; 2, *E. nairobii* Gerling; 3, *E. roseni* n. sp.

at the apex. It has four mesothoracic setae and its forewings are somewhat more slender than those of other sympatric *Eretmocerus* species. The male is somewhat darker than the female, especially in its notum and antennae. The wing and leg characteristics are similar in both sexes.

E. mundus was recorded from the Mediterranean countries and the Sudan. In all cases it attacked *B. tabaci* and may be a host-specific parasite.

E. mundus can be recovered in Israel during most of the year, its development being dependent upon the availability of hosts and warm weather. In the late summer it may be found in high numbers wherever its untreated hosts occur. Samplings were carried out on populations that infested *Lantana camara* L. during the spring and summer of 1969. These undisturbed populations showed (Table 1) that percentage parasitization by *E. mundus* was usually between 15 and 30 %

Table 1. Per cent parasitization of *Bemisia tabaci* by *Eretmocerus mundus* and *Prospatella lutea*.
Summer, 1969

Date	Kiryat Shaul		Herzeliya	
	% <i>E. mundus</i>	% <i>P. lutea</i>	% <i>E. mundus</i>	% <i>P. lutea</i>
14 May	18	36	31	45
21 May	31	53	16	23
2 June	27	41	18	48
21 July	-	-	19	49
27 July	18	56	15	26
7 August	-	-	23	42
7 October	26	69	47	21

and an upward trend in percentage parasitization with the season was observable. The effect that *E. mundus* has upon the host populations is difficult to assess, because it competes for its host with another parasite species, *P. lutea*.

E. nairobii Gerling was described from material that attacked *Aleurocanthus hansfordi* Corbett in Nairobi, Kenya (GERLING 1970). The females of this parasite can easily be distinguished by the thick and short antennal club, by the shape of the funicular segments (Fig. 2) and by the brown spot on the posterior of the mesoscutum. Like the two other species discussed here, it too has four mesothoracic setae.

In Israel *E. nairobii* was recovered from *Aleurocanthus zizyphi* infesting *Zizyphus spina-christi*. The former is found, infrequently, especially in the Rift Valley areas. So far, *E. nairobii* is known only from Kenya and Israel and its hosts belong to the genus *Aleurocanthus*.

ROSEN (1966) recorded and described a parasite species that emerged from *Acauleurodes citri* (Priesner and Hosni) infesting citrus. The parasite was considered, at that time, to belong to the species *diversiciliatus* Silvestri. A careful examination of the material revealed that it is a new species which will be described hereunder as *E. roseni* n. sp.

Eretmocerus roseni n. sp.

Eretmocerus diversiciliatus Silv. (Rosen 1966).

F e m a l e: Colour all yellow, cheeks, scape and pedicel, medial stripe on scutellum, with brownish hue.

B o d y l e n g t h (excluding head): 630 μ ; width at widest part of thorax: 290 μ .

A n t e n n a: (Fig. 3) club 4—4½ times longer than wide, narrowest at proximal end, widest at distal ¾; first funicle segment trapezoidal, wider than long; second square, or somewhat longer than wide.

T h o r a x: Mesoscutum and scutellum, each with 4 setae; first 0.25, second 0.5 times longer than wide; mesoscutum 1.5 length of scutellum.

Legs as in Fig. 4.

Wings: Forewing (Fig. 5) 2.2—2.5 times longer than wide; disc 1.5—1.7 times retinaculum, stigmal subequal marginal, submarginal about 3 times marginal; disc about 4 times longest fringe; bare area posterior to marginal with 8—11 cilia, marginal with 2 prominent setae.

Hindwing (Fig. 6) about 6 times as long as wide; fringe equals disc width.

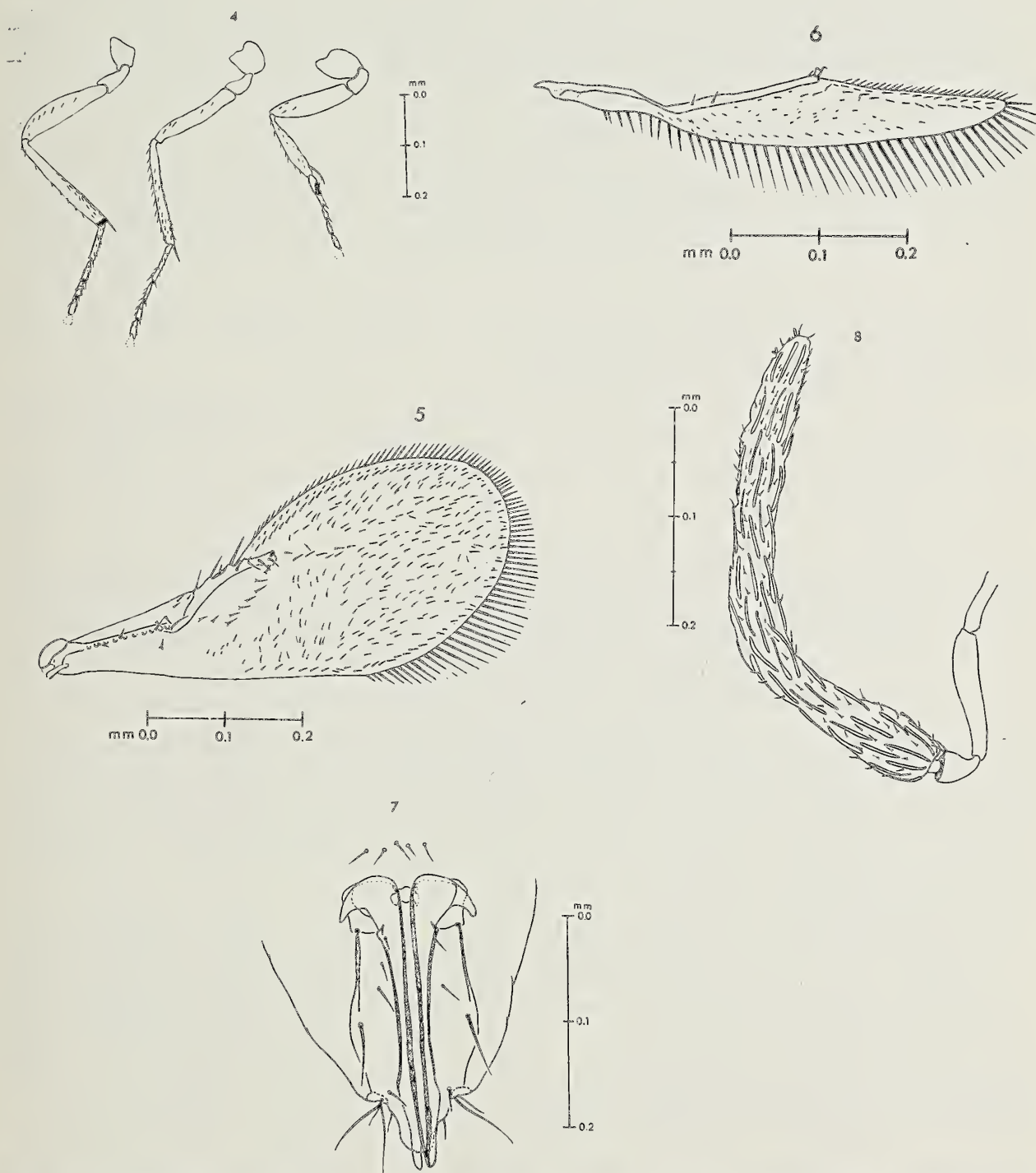


Fig. 4—8. *Eretmocerus roseni* n. sp. 4, legs; 5, fore wing; 6, hind wing; 7, subabdominal setation; 8, antenna of male.

Abdomen: Ovipositor/club ratio: 0.8; subabdominal setation (Fig. 7) includes 5—6 setae anterior to rami, 2—3 small pairs and 1 large pair along shaft. Dimensions (in microns) (in case of paired organs, readings are an average of both; numbers in parentheses show range of variation). Antennal radicle

length: 85 (80—110); scape: 230 (220—240); pedicel: 130 (110—130); funicle 1: 20 (20—30); funicle 2: 40 (30—40); club: (350—340), wide: 85 (80—90); mesoscutum wide: 125 (110—125), long: 170 (140—170); scutellum wide: 80 (80—75), long: 150 (145—150); leg 1: coxa 90, trochanter 45, femur 155, tibia 140, tarsus I 65, II 30, III 30, IV 40, tibial spur 45; leg 2: coxa 60, trochanter 50, femur 170, tibia 210, tarsus I 70, II 45, III 35, IV 30, tibial spur 35; leg 3: trochanter 60, femur 190, tibia 230, tarsus I 80, II 50, III 40, IV 30, tibial spur 30. Forewing 290 (260—310) wide, 685 (650—700) long, fringe 70 (60—80), retinaculum 415 (380—450), submarginal 200 (200—230), marginal 65 (60—70), stigmal 60 (55—65); hindwing 90 (90—100) wide, 550 (550—610) long, fringe 75 (75—90); ovipositor 310 (280—310).

Male: Basic colour yellow, somewhat darker than female, antennal sensillae brown; scutum and scutellum brownish; anterior and posterior margins darkest; wing venation brown; dorsal aspect of abdominal segments brownish. Rest of features resemble female, except for those typical of males in the genus *Eretmocerus*.

Dimensions in microns: Antennal club 500 long, 50 wide; scape 50 long; pedicel 120; aedeagus 140; parameres 40.

The host, *A. citri*, is polyphagous and occurs, among others, on *Citrus* spp., *Ceratonia siliqua* L., *Cercis siliquastrum* L., *Bauhinia purpurea* L., *Punica granatum* L., *Cassia* sp., *Zizyphus spina-christi* (L.), *Salvadora persica* L., *Morus* spp., *Tephrosia appolinea* (Del.) Link, *Psidium guava* L., *Dodonea viscosa* L. and *Lawsonia inermis* L. This host-parasite association was recorded from a wide climatic and geographical range that included the Upper Galilee, the Coastal Plain of Israel, Ein Geddi, and Santa Catherina monastery, Sinai Peninsula (average annual rainfall over 1000 mm., 500 mm. and 50 mm. or less respectively).

A. citri is not considered an agricultural pest throughout the above-mentioned range. Its populations are usually scarce, individuals being usually found scattered singly upon the plant leaves. This is the case not only on economically important plants but on the wild host-plants as well. Only on one occasion did the author receive a few, severely attacked plants of *Tephrosia appolinea* that were collected in the area of Nabek on the Sinai Peninsula.

PRIESNER and HOSNI (1934) mentioned that *A. citri* is widely distributed over all of Egypt. They also mentioned that a species of *Eretmocerus* was recorded from it and that, in many cases, no economic damage was caused by this pest. Some cases of damage to citrus trees, were, however, recorded mainly from Upper Egypt, and the authors conclude that climatic conditions rather than the action of parasites are responsible for this condition.

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Brown, F. M. & B. Heinemann, Jamaica and its Butterflies. XV + 493 4to blz., 10 gekleurde platen met 167 fig. E. W. Classey Ltd., 353 Hanworth Road, Hampton, Middx, England; 1972. Prijs £ 16.50.

In de eerste 76 bladzijden van dit fraaie boek worden een aantal algemene onderwerpen besproken: vroegere verzamelaars, de ervaringen van de auteurs zelf, de natuurlijke gesteldheid en de zoögeografie van het eiland, waarbij de dagvlinderfauna van Jamaica vergeleken wordt met die van de andere Grote Antillen en van Midden-Amerika.

Het grootste deel van het boek wordt uiteraard ingenomen door de behandeling van de 133 dagvlindersoorten die van het eiland bekend zijn. Hiertoe blijkt ook de *Atalanta* te behoren, maar of die zich op Jamaica kan voortplanten, of dat alle waargenomen exemplaren immigranten uit de V.S. zijn, is nog niet uitgemaakt. De taxonomie wordt vaak uitvoerig behandeld en de biologie voor zover die bekend is. Alle bekende vindplaatsen zowel uit de literatuur als uit de collecties worden bij elke soort vermeld.

De gekleurde afbeeldingen naar tekeningen van Marjorie S. FAVREAU laten niets te wensen over. Het geheel is een heel mooi modern standaardwerk over de dagvlinderfauna van het kleinste der Grote Antillen. — LPK.

Dagvlinders van Australië. Bijna gelijktijdig verschenen in 1971 twee prachtige boeken waarin de dagvlinderfauna van dit gebied behandeld wordt. Het zijn:

1. **D'Abbrera, B., Butterflies of the Australian Region.** 413 groot 4to pags, ruim 4000 gekleurde afbeeldingen. Lansdowne Press Pty Ltd, Melbourne.

Het boek bevat een systematische behandeling van alle aan de auteur bekende dagvlinders met hun ondersoorten uit de Australische regio, met uitzondering van de Hesperiden, die in een afzonderlijk deel aan de orde moeten komen. Behalve Australië en Tasmanië worden tot de regio gerekend: Timor, de Molukken, Nieuw-Guinea, de Bismarck Archipel, de Solomon eilanden, de Nieuwe Hebriden, de Fiji eilanden en Nieuw-Zeeland. De tekst is zo beknopt mogelijk gehouden, wat mogelijk was door de enorme hoeveelheid schitterende kleurenfoto's, alle door de auteur zelf vervaardigd, waarbij het Brits Museum (Nat. Hist.) een flink deel van het materiaal leverde. Er worden enkele nieuwe ondersoorten beschreven en er zijn vrij veel holotypen afgebeeld, vooral bij de Lycaeniden. Heel fraai zijn ook de afbeeldingen van rupsen, poppen en levende vlinders, de laatste soms op pagina-grootte.

2. **McCubbin, C., Australian Butterflies.** XXX + 237 groot 4to pags, Thomas Nelson (Australia) Ltd, Melbourne.

Dit werk behandelt uitsluitend de dagvlinders (inclusief de Hesperiden) van het continent en Tasmanië, samen 357 soorten. Alle zijn in kleuren afgebeeld, nu niet naar foto's, maar naar aquarellen van de auteur. Behalve de vlinder zelf is ook vaak een deel van het biotoop erbij getekend of de voedselplant van de rups (met de naam!). Ook in dit boek zijn de afbeeldingen zeldzaam mooi.

Beide boeken geven ook bijzonderheden over de rupsen, voor zover die althans bekend zijn. Overigens vullen ze elkaar prachtig aan. Het eerste bevat o.a. een korte geschiedenis van het verzamelen en de bestudering van de Australische dagvlinders, het tweede geeft een uitvoerige bibliografie.

Voor Europa berust de alleenverkoop van de twee werken bij E. W. Classey Ltd, 353, Hanworth Road, Hampton, Middx, England. Het eerste kost £ 15, het tweede £ 12.50. — LPK.