PROC. ENTOMOL. SOC. WASH.
93(4), 1991, pp. 845–864

FIELD GUIDE TO RECENTLY INTRODUCED SPECIES OF COCCINELLIDAE (COLEOPTERA) IN NORTH AMERICA, WITH A REVISED KEY TO NORTH AMERICAN GENERA OF COCCINELLINI

ROBERT D. GORDON AND NATALIA VANDENBERG

Systematic Entomology Laboratory, PSI, Agricultural Research Service, USDA, % U.S. National Museum of Natural History, Washington, D.C. 20560.

Abstract.—Six species of predaceous Coccinellidae are being released for biological control of the Russian wheat aphid, *Diuraphis noxia* (Mordvilko), in North America. The following 3 species are now established: *Hippodamia* (*Adonia*) *variegata* (Goeze), *Propylea quatuordecimpunctata* (L.), and *Coccinella septempunctata* L. *Hippodamia* (*Semiadalia*) *undecimnotata* (Schneider), *Oenopia conglobata* (L.), and *Scymnus frontalis* (F.) are not known to be established. Two additional species of predaceous Coccinellidae are recent adventive additions to the North American fauna, *Harmonia axyridis* (Pallas) in Louisiana, Mississippi, and Georgia, and *Harmonia quadripunctata* (Pontopiddian) in New Jersey and New York. The key to North American genera of Coccinellini is revised.

Key Words: predaceous Coccinellidae, introduced species, Russian wheat aphid, biological control, key to genera of Coccinellini

Discovery of the introduced Russian wheat aphid, *Diuraphis noxia* (Mordvilko), in the western United States prompted research on predators and parasites of that species by Federal and state biological control laboratories. This research has resulted in the introduction, propagation, and release of several Old World species of Coccinellidae. The USDA Animal and Plant Health Inspection Service (APHIS) is the organization mainly responsible for rearing and releasing foreign Coccinellidae for biological control of the Russian wheat aphid through the APHIS National Biological Control Laboratory, Niles, Michigan. Personnel involved with such releases need to identify the introduced species and distinguish them from native species; hence, the preparation of this "field guide."

Six species of Coccinellidae have thus far been propagated and released specifically for control of the Russian wheat aphid. Of these, *Hippodamia* (*Adonia*) *variegata* (Goeze), *Propylea quatuordecimpunctata* (L.), and *Coccinella septempunctata* L. are established. *Hippodamia* (*Semiadalia*) *undecimnotata* (Schneider), *Oenopia conglobata* (L.) and *Scymnus frontalis* (F.) are not known to be established.

In addition, two adventive species, *Harmonia quadripunctata* (Pontopiddian) and *Harmonia axyridis* (Pallas), have become established in the United States (Vandenberg 1990, J. Chapin and Brou 1991, C. L. Smith 1991, pers. comm.). Although it is unlikely either of these species will be found in association with Russian wheat aphid, they are illustrated and briefly characterized here.

Adults of the species discussed below usually can be distinguished from each other and from native coccinellids by dorsal color pattern alone. Nothing so general can be said about the larval stages; therefore, the

larvae of the introduced species are illustrated as a beginning step in the preparation of an identification guide to larvae of all species of Coccinellidae occurring in North America, native and introduced. The accompanying larval diagnoses were made from live specimens in order to be useful to field personnel; the illustrations were prepared from preserved specimens. Because colors are lost and pigments fade in preserved specimens, the diagnoses differ to some degree from the illustrations. A larval key cannot be prepared now because the larval stages of most native species have not been described. Habitus illustrations and "diagnoses" based on color pattern are presented in lieu of a key because personal experience suggests that most larvae of the subfamily Coccinellinae can be identified by dorsal color pattern.

Larvae bear various rounded or conical fleshy protuberances armed with setae. For our simple color pattern diagnoses, we have abandoned complex morphological categories and refer to these structures collectively as lobes. Each abdominal segment has six lobes visible in dorsal view, three on each side (dorsal, dorsolateral, lateral). The pleural regions of the meso- and metathorax are each equipped with a small anterior and a larger posterior lobe. Each thoracic segment has a pair of dorsal plates or tergites. The dorsal plates of the pronotum may be laterally constricted or completely subdivided by membranous areas. Morphological details of the various species were treated by Savoiskaya (1983).

All of the Russian wheat aphid predators except *S. frontalis* belong to the tribe Coccinellini. Adults of the respective genera are diagnosed in the following key. *Scymnus frontalis* belongs to the Scymninae and is treated separately.

Gordon's (1985) key to genera of Coccinellini includes the genus *Harmonia* Mulsant; however, *H. axyridis* and *H. quadripunctata* will not key out because couplet 9 was constructed to distinguish *H. dimidiata*, the only species of *Harmonia* then known to occur in North America. Further, Gordon's original key does not work for *Neoharmonia* Crotch, because the lack of tibial spurs was overlooked during construction of the key. Chapin and Brou (1991) produced a modified key that corrected these shortcomings; we have incorporated her changes along with further modifications to accommodate newly imported species and improve keyability. The figure numbers in the key refer to illustrations in Gordon (1985).

Revised Key to the Native and Introduced Genera of Coccinellini of North America

1. Tarsal claw not toothed or cleft, simply widened basally (Fig. 567a) 2
– Tarsal claw toothed or apically cleft (Figs. 587i, 614c) 5
2(1). Pronotal base with fine, entire marginal bead 3
– Pronotal base not margined 4
3(2). Metasternum with postcoxal line; elytron with large black spots (Fig. 570g) ..... *Naemia* Mulsant
– Metasternum without postcoxal line; elytron vittate (Fig. 567g) .. *Paranaemia* Casey
4(2). Apex of middle and hind tibia each with 2 spurs; elytron vittate (Fig. 565f); epipleuron sloping downward internally. .. .. *Macronaemia* Casey
– Apex of middle and hind tibia each with single spur; elytron spotted or very irregularly vittate (Fig. 560f); epipleuron horizontal ..... *Anisosticta* Dejean
5(1). Each tarsal claw cleft near apical 1/3 (Fig. 587i); form slender, legs distinctly visible beyond body in dorsal view .... *Hippodamia* Dejean
– Each tarsal claw with subquadrate basal tooth (Fig. 614c); or if tooth median then form rounded, legs barely visible beyond body in dorsal view (genus *Myzia*) 6
6(5). Apex of middle and hind tibia without spurs 7
– Apex of middle and hind tibia with 2 spurs (Fig. 626a)..... 10
7(6). Postcoxal line on 1st abdominal sternum recurved toward base of sternum, of *Pullus* type (Fig. 679a) ..... *Aphidecta* Mulsant
– Postcoxal line on 1st abdominal sternum not recurved, of *Diomus* or *Nephus* type,

but with oblique dividing line sometimes present (Figs. 674, 677, 682) 8

8(7). Postcoxal line on 1st abdominal sternum without oblique dividing line (Fig. 682a) ..... *Mulsantina* Weise

– Postcoxal line on 1st abdominal sternum with oblique dividing line 9

9(7). Lateral margin of elytron transparent, without marginal bead; prosternal carinae ending at anterior coxal margin ..... *Neoharmonia* Crotch

– Lateral margin of elytron not transparent, with more or less distinct marginal bead; prosternal carinae extending anterior to front coxal margin or absent; Old World genus with 3 species established in North America ..... *Harmonia* Mulsant

10(6). Pronotal base with marginal bead 11

– Pronotal base without marginal bead .. 12

11(10). Metasternum, 1st abdominal sternum with distinct postcoxal line (Fig. 1) ..... *Ceratomegilla* Crotch

– Metasternum, 1st abdominal sternum without postcoxal line ..... *Coleomegilla* Timberlake

12(10). Prosternum strongly convex medially, protuberant at apex (Fig. 614b); length 7.20 mm or greater ..... *Anatis* Mulsant

– Prosternum normally rounded, not protuberant at apex; length variable 13

13(12). Postcoxal line on 1st abdominal sternum complete, of *Pullus* type (Fig. 637a) ... *Adalia* Mulsant

– Postcoxal line on 1st abdominal sternum incomplete, of *Diomus* or *Nephus* type (Figs. 634b, 682a) 14

14(13). Hind margin of mesepimeron with median, triangular projection; elytron orangy yellow with black sutural margin, 4 irregular black spots (*C. inaequalis* only) (Fig. 672g); Oriental genus, one species (*C. inaequalis* F.) possibly established in Florida, Hawaii, and Puerto Rico ..... *Coelophora* Mulsant

– Hind margin of mesepimeron straight or curved, without projection; elytron with color pattern not as above; North American or Old World genera 15

15(14). Tarsal claw with median tooth (Fig. 626a); elytron vittate or immaculate ..... *Myzia* Mulsant

– Tarsal claw with subquadrate basal tooth (Fig. 664b); elytron variable, never vittate 16

16(15). Pronotal surface polished, shiny, not alutaceous between punctures; anterior margin of mesosternum with deep, broad, triangular emargination ..... *Calvia* Mulsant

– Pronotal surface alutaceous, often dull, not polished; anterior margin of mesosternum truncate, with shallow emargination, or with deep but narrow emargination .. 17

17(16). Pronotum black with large, subtrapezoidal or triangular white spot on each anterolateral angle; hind pronotal angle much more broadly rounded than anterior angle ..... *Coccinella* L.

– Pronotal color pattern not as described above, or if so, then hind pronotal angle not much more broadly rounded than anterior angle 18

18(17). Pronotum with pale spot on each side of middle, spot entirely enclosed by black area or spot connected to pale anterior border ..... *Cycloneda* Crotch

– Pronotum not as described above 19

19(18). Second tarsal segment elongate, about twice as long as wide, or hind pronotal angle not much more broadly rounded than anterior angle; Old World genus, one species released but not known to be established in North America ..... *Oenopia* Mulsant

– Second tarsal segment short, triangular, not more than 1.5 times as long as wide; hind pronotal angle much more broadly rounded than anterior angle 20

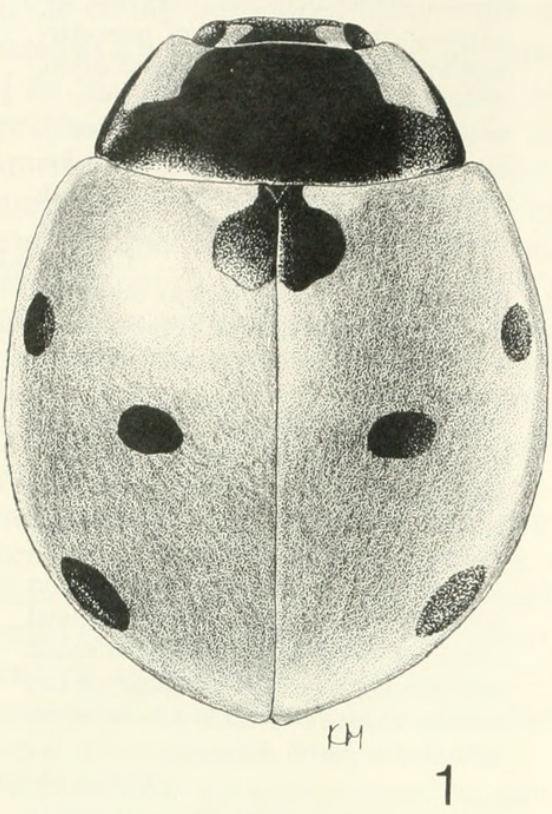
20(19). Distal antennal segment elongate, oval; scutellum with base slightly longer than side; maculation on elytron usually forming yellow and black "checkerboard" pattern; European genus, one species established in North America .. *Propylea* Mulsant

– Distal antennal segment short, robust, obtriangular; scutellum with side slightly longer than base; elytron black with red spot or pale with minute dark spots never forming "checkerboard" pattern; native North American species ..... *Olla* Casey

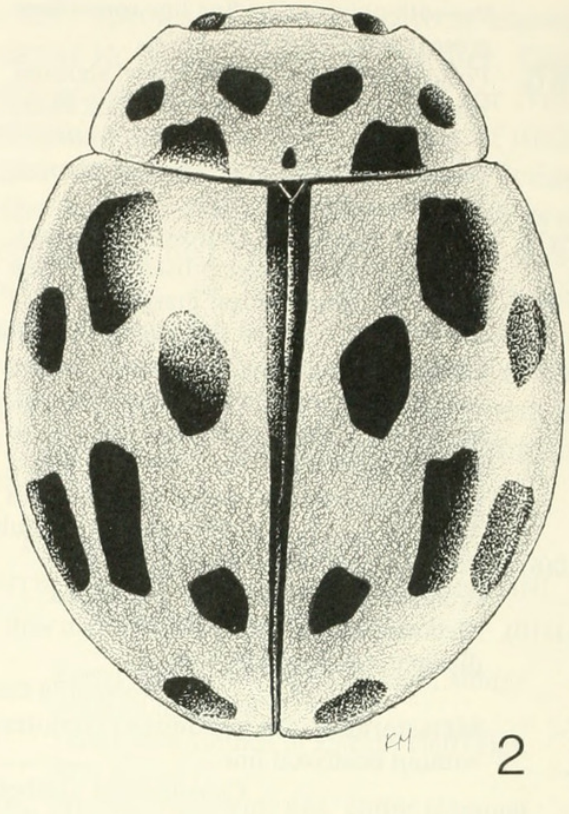
Coccinella septempunctata L.
Figs. (adult) 1, 13a–d; (larva) 20

Adult diagnosis.—Length 6.5 mm or more; head black with 2 well-separated pale spots; pronotum with anterior margin black at middle with ventral pale spot small, extending posteriorly ⅓ as far as dorsal spot; elytron with 3 black spots in addition to scutellar spot; tarsal claw with large basal tooth.

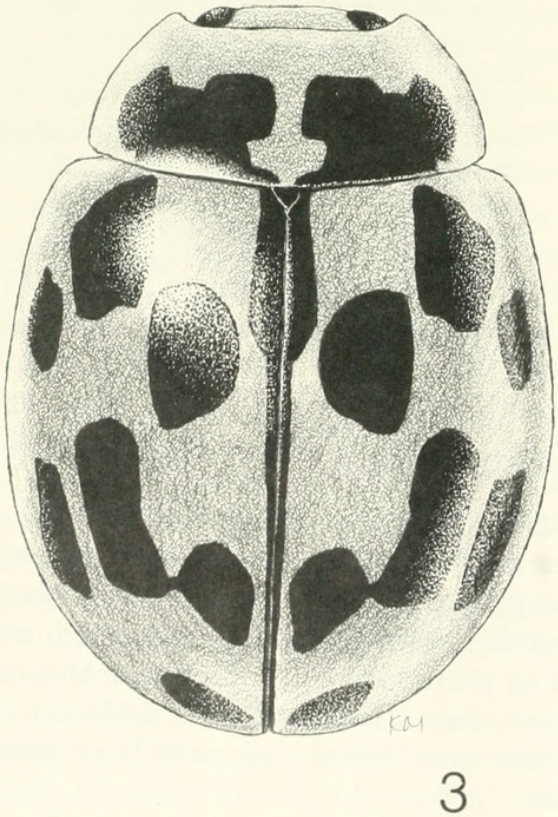
Diagnosis of 4th larval instar.—Body mostly black or dark bluish gray; head yel-



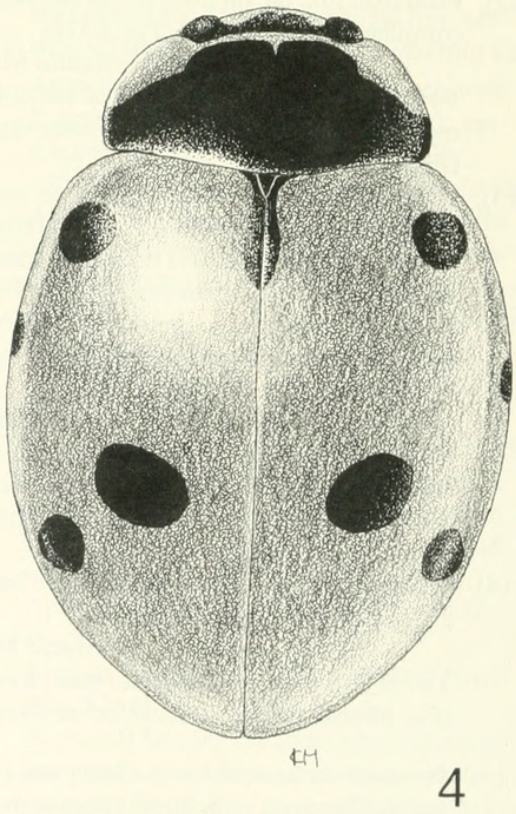
1



2



3



4

Figs. 1–4. Habitus views. 1. *Coccinella septempunctata*. 2, 3. *Propylea quatuordecimpunctata*. 4. *Hippodamia undecimnotata*.

low except basal, lateral margins black; pronotum with apical margin narrowly yellow, lateral margin broadly yellow; metapleuron with posterior ½ of posterior lobe bright orange; 1st and 4th abdominal segments with dorsolateral, lateral patches, including lobes, bright orange.

Current American distribution.—All of the United States and southern Canada, marginally established in California and Nevada.

Comments.—*Coccinella septempunctata,* or C-7 as it is commonly known, is a widespread palearctic species that was intentionally introduced and released in North America several times from 1956 to 1971. Those attempts were apparently unsuccessful but an established population was discovered in Bergen Co., New Jersey, in 1973. This population is thought to have resulted from an accidental introduction (Angalet and Jacques 1975). Since 1973, C-7 has been colonized and released in every state and in southern Canada, and it is now the most commonly collected species of *Coccinella* east of the Rocky Mountains. The advent of the Russian wheat aphid caused an increase in rearing and distribution efforts in the western states that have resulted in at least marginal establishment of C-7 throughout the west.

References.—Angalet and Jacques (1975); Angalet et al. (1979); Tedders and Angalet (1981); Hoebeke and Wheeler (1980); Gordon (1985); Schaefer et al. (1987); Schaefer and Dysart (1988); Hodek (1973) (larva illustrated in color).

Propylea quatuordecimpunctata (L.)
Figs. (adult) 2, 3, 14a–d, 15d; (larva) 21

Adult diagnosis.—Length 3.50 to 5.20 mm; male head usually yellow except vertex black, prosternal plate grayish white; female head usually with black spot on clypeus, prosternal plate black; pronotum yellow with large, irregular, black area medially; elytron yellow with variable black maculation, often with spots rectangular, forming "checkerboard" pattern.

Diagnosis of 4th larval instar.—Body mostly black or at least very dark brown; head yellow with posterolateral margin brown; pronotum pale yellow except dorsal tergite dark brown; mesonotum, metanotum pale yellow between tergites; mesopleuron, metapleuron with anterior, posterior lateral lobes pale yellow; 1st abdominal segment with dorsum between tergites, dorsolateral, lateral lobes pale yellow; abdominal segments 2, 3, 5–8 with narrow, median dorsal area, lateral lobe pale yellow; 4th abdominal segment with median area including dorsal lobe, dorsolateral lobe, lateral lobe pale yellow.

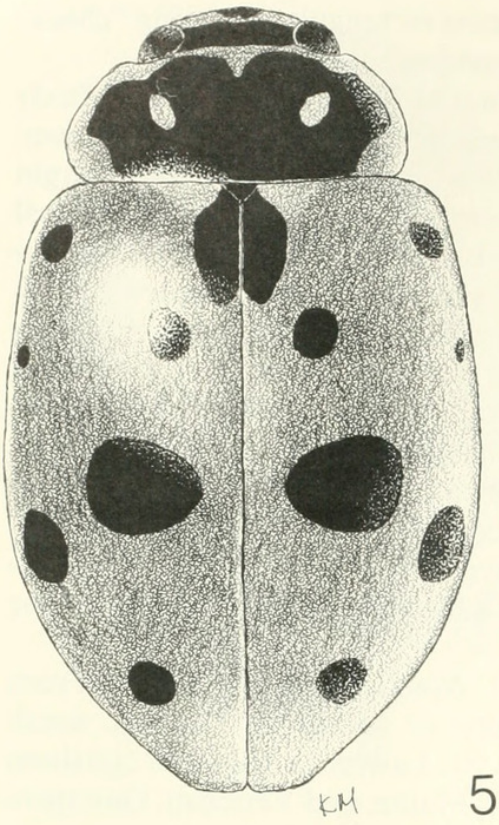
Current American distribution.—From the vicinity of Montreal, Quebec, south along the St. Lawrence River to northern New York, Maine, and Vermont. One specimen examined from Massachusetts.

Comments.—*Propylea quatuordecimpunctata,* or P-Q, is another palearctic intentionally released in North America several times without successful establishment. It is almost certainly an adventive species in North America. Chantal (1972) was the first to report on an established population in Quebec, and Dysart (1988) presented new locality records extending into the northern United States. This species is being reared and released for Russian wheat aphid control in the western United States and Canada, but thus far there is no evidence of new establishment. In addition to Canadian material, P-Q has been brought in for culture from France, Turkey, and several locations in the USSR.

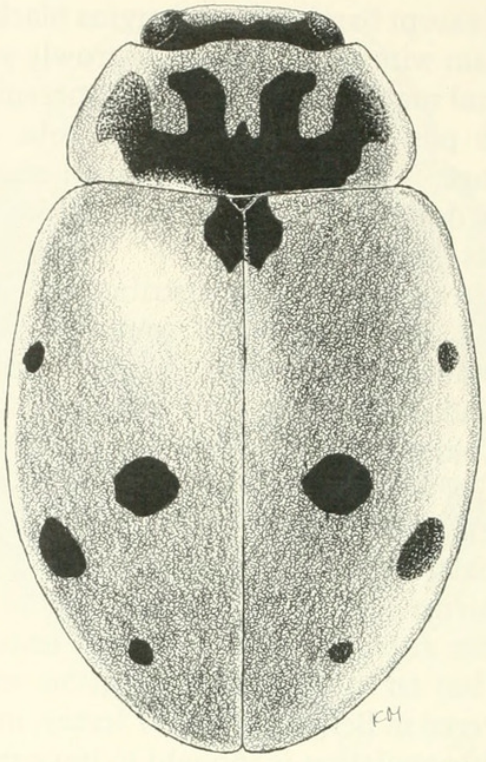
References.—Chantal (1972); Gordon (1985); Dysart (1988); Hodek (1973) (larva illustrated in color); Schaefer and Dysart (1988); Wheeler (1990).

Hippodamia variegata (Goeze)
Figs. (adult) 5, 6, 15a–c; (larva) 22

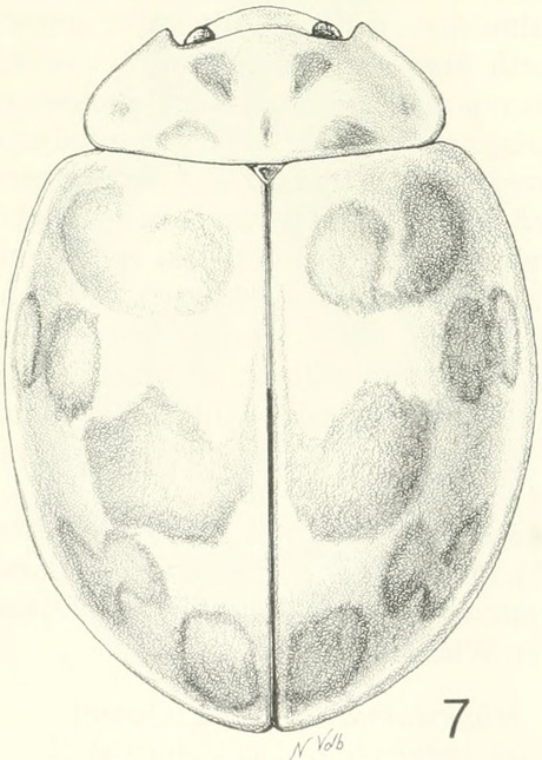
Adult diagnosis.—Length 4.40 to 5.0 mm; base of pronotum with fine marginal bead;



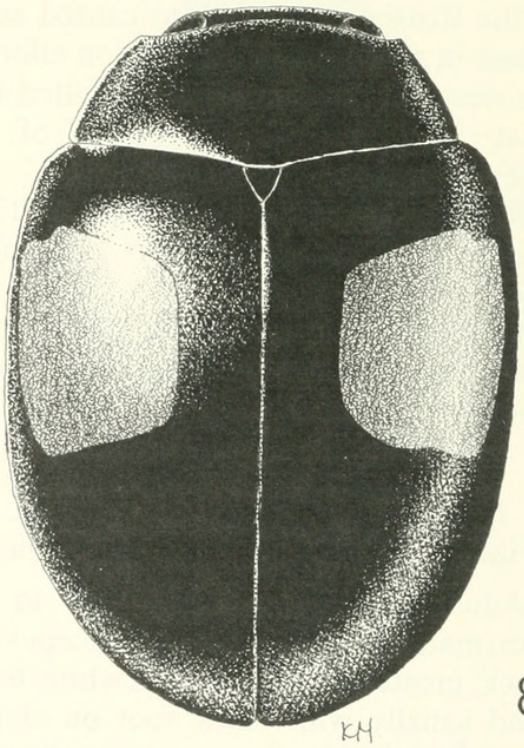
5



6



7



8

Figs. 5–8. Habitus views. 5, 6. *Hippodamia variegata.* 7. *Oenopia conglobata.* 8. *Scymnus frontalis.*

head yellow with vertex black (male) or yellow with vertex and large frontal spot black (female); pronotum black with anterior, lateral borders, small spot on each side of middle yellow (female) or with anterior border of black area deeply emarginate medially with yellow, spot on each side of middle broadly connected to yellow anterior border (male); elytron orange with 5, 6 or 7 black spots: scutellar, posthumeral, 2 postdiscal, apical spot constant; humeral, postscutellar spots or both often absent; ventral surface black except propleuron, meso- and metepimeron yellow, anterior coxa white.

Diagnosis of 4th larval instar.—Body mostly light grayish blue; head brown except median area posterior to mouthparts yellow; pronotum pale yellow except dorsal tergite black; mesonotum and metanotum pale yellow between tergites; mesopleuron with anterior, posterior lobes faintly yellow; metapleuron with posterior lobe pale yellow, with median area of lobe bright yellow; 1st abdominal segment pale yellow between dorsal and dorsolateral lobes, with dorsolateral and lateral lobes bright yellow; all abdominal segments with faint yellow area between dorsal and dorsolateral lobes; 4th segment with area between dorsolateral and lateral lobes, lateral lobe yellow; leg black.

Current American distribution.—Vicinity of Montreal, Quebec, and scattered areas in eastern Canada.

Comments.—Adults of *Hippodamia variegata,* or H-V as it is commonly known, can be immediately distinguished from native American species and *H. undecimnotata* by the distinctly raised margin at the base of the pronotum. The dorsal color pattern is also unlike any of the other species except for a superficial resemblance to *H. convergens* Guerin, which has the anterior coxa black. A curious parallel exists between this species and P-Q in that both were first found established in Quebec and both are apparently adventive. *Hippodamia variegata* was also introduced into North America many times between 1957 and 1981 without successful establishment. Gordon (1987) reported the 1984 establishment in Quebec. Since 1984, and especially since the advent of the Russian wheat aphid, many releases, most involving Canadian stock, have taken place in the United States, thus far without evidence of new establishment. In addition to Canadian material, specimens have been brought into culture from France, Morocco, and several locations in the USSR.

This species is currently classified in the Old World as *Hippodamia* (*Adonia*) *variegata* by Iablokoff-Khnzorian (1982).

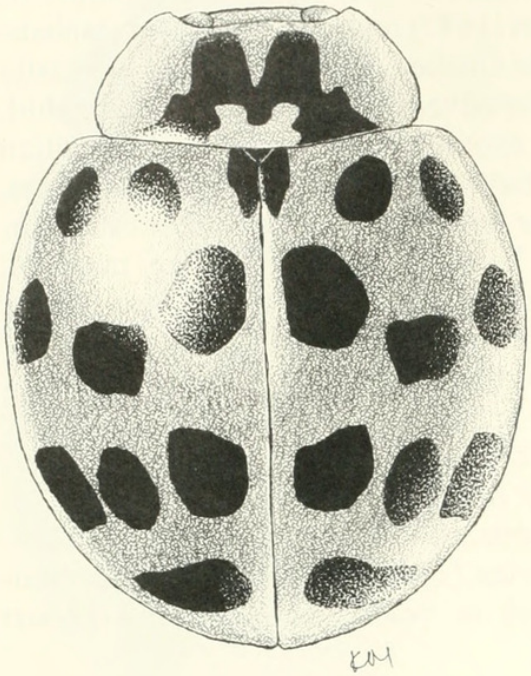
References.—Gordon (1987); Iablokoff-Khnzorian (1982); Hodek (1973) (larva illustrated in color); Schaefer and Dysart (1988).

Hippodamia (*Semiadalia*) *undecimnotata* (Schneider)

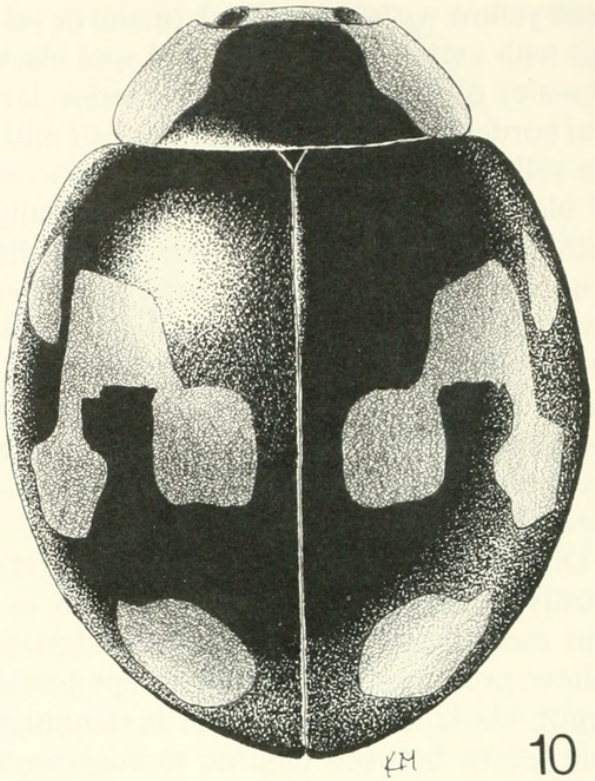
Figs. (adult) 4, 16a–c; (larva) 23

Adult diagnosis.—Length 5.0 to 7.0 mm; pronotum with raised basal margin; head yellow with vertex black (male) or yellow with vertex, clypeus black, black area on clypeus often connected to vertex (female); pronotum black with anterolateral angle broadly yellow (female) or with anterior border completely yellow (male); elytron orange with 4, 5 or 6 black spots, scutellar, humeral, postdiscal spots constant, apical, lateral spots often absent; ventral surface black except propleuron, epipleuron yellow.

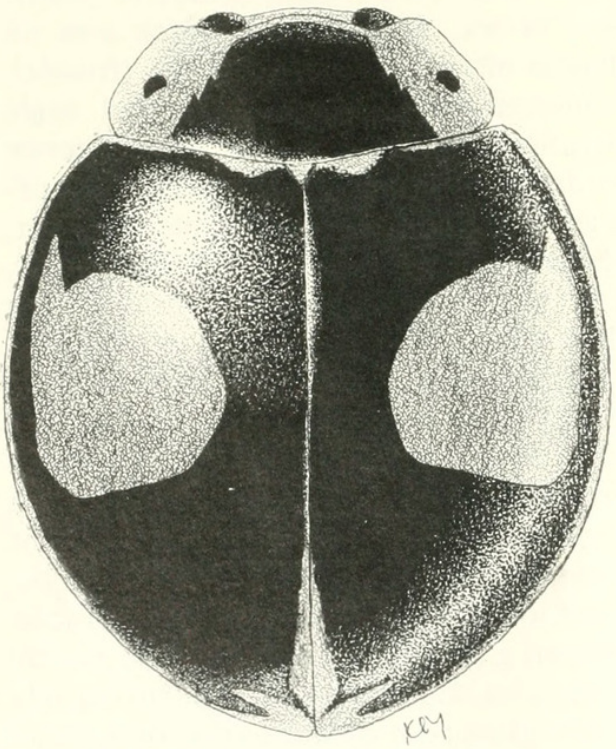
Diagnosis of 4th instar larva.—Body mostly orangy with rosy tints; head entirely dark brown; pronotum with dorsal tergite dark brown; mesonotum, metanotum with tergites dark brown, anterior margin gray; mesopleuron dark gray except anterior lobe, posterior ½ of posterior lobe yellow; metapleuron gray except posterior lobe mostly yellow; 1st, 4th abdominal segment entirely yellow except dorsal lobe dark brown, small area anterior to dorsal lobe, narrow area between dorsolateral, lateral lobes gray; abdominal segments 2, 3 mostly gray except dorsum with basal margin, areas between



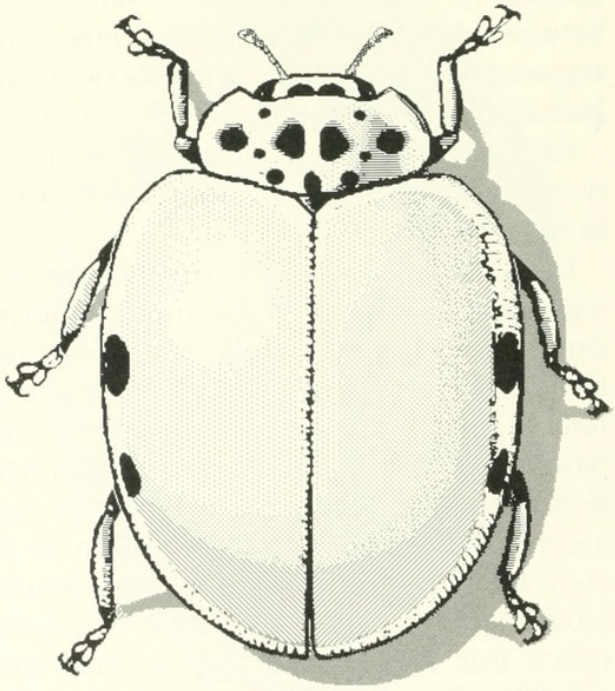
9



10



11



12

Figs. 9–12. Habitus views. 9–11. Variations of *Harmonia axyridis.* 12. *Harmonia quadripunctata.*

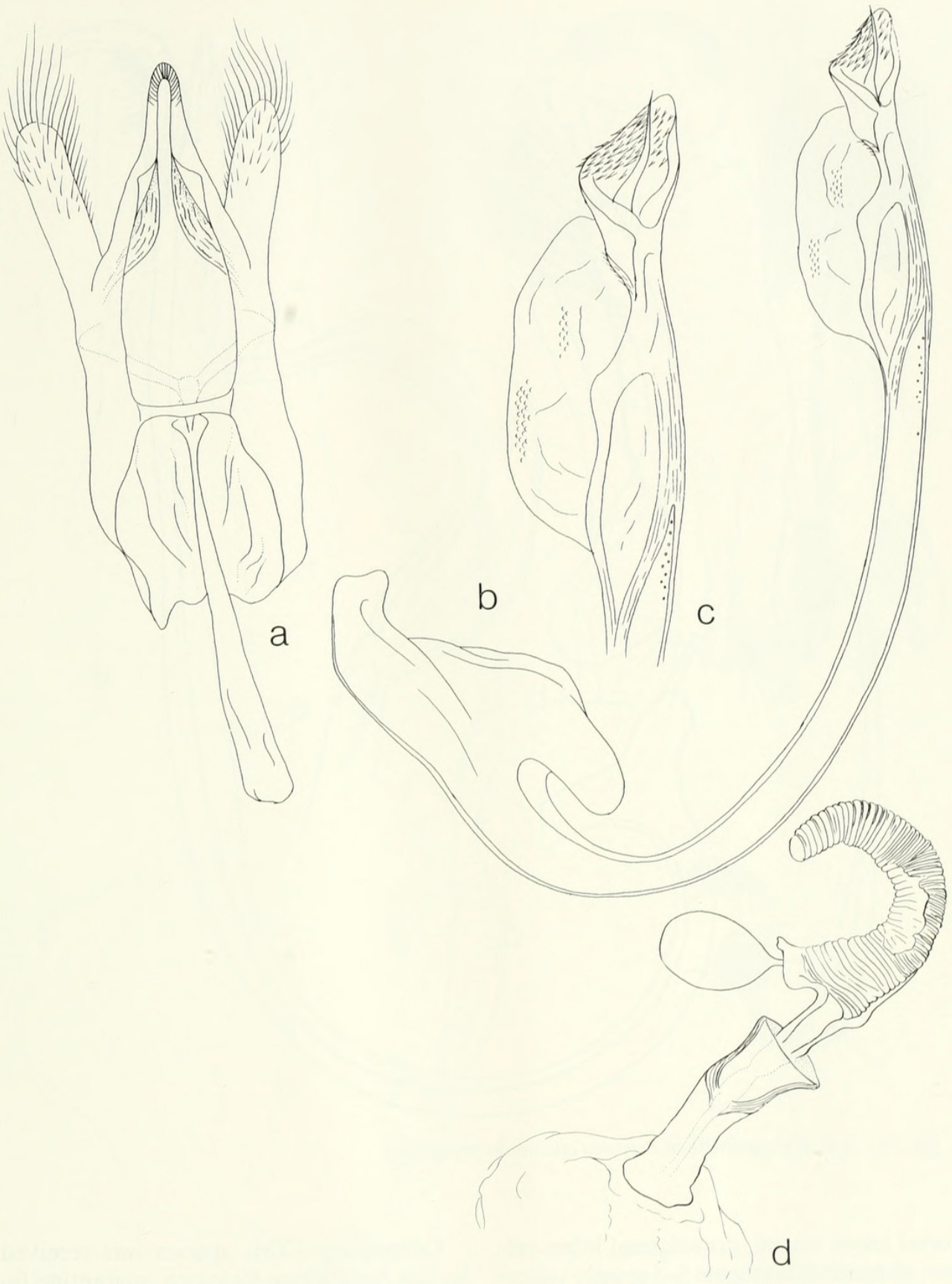


Fig. 13. a–d. Genitalia of *Coccinella septempunctata*. a–c. Male genitalia. d. Female genitalia.

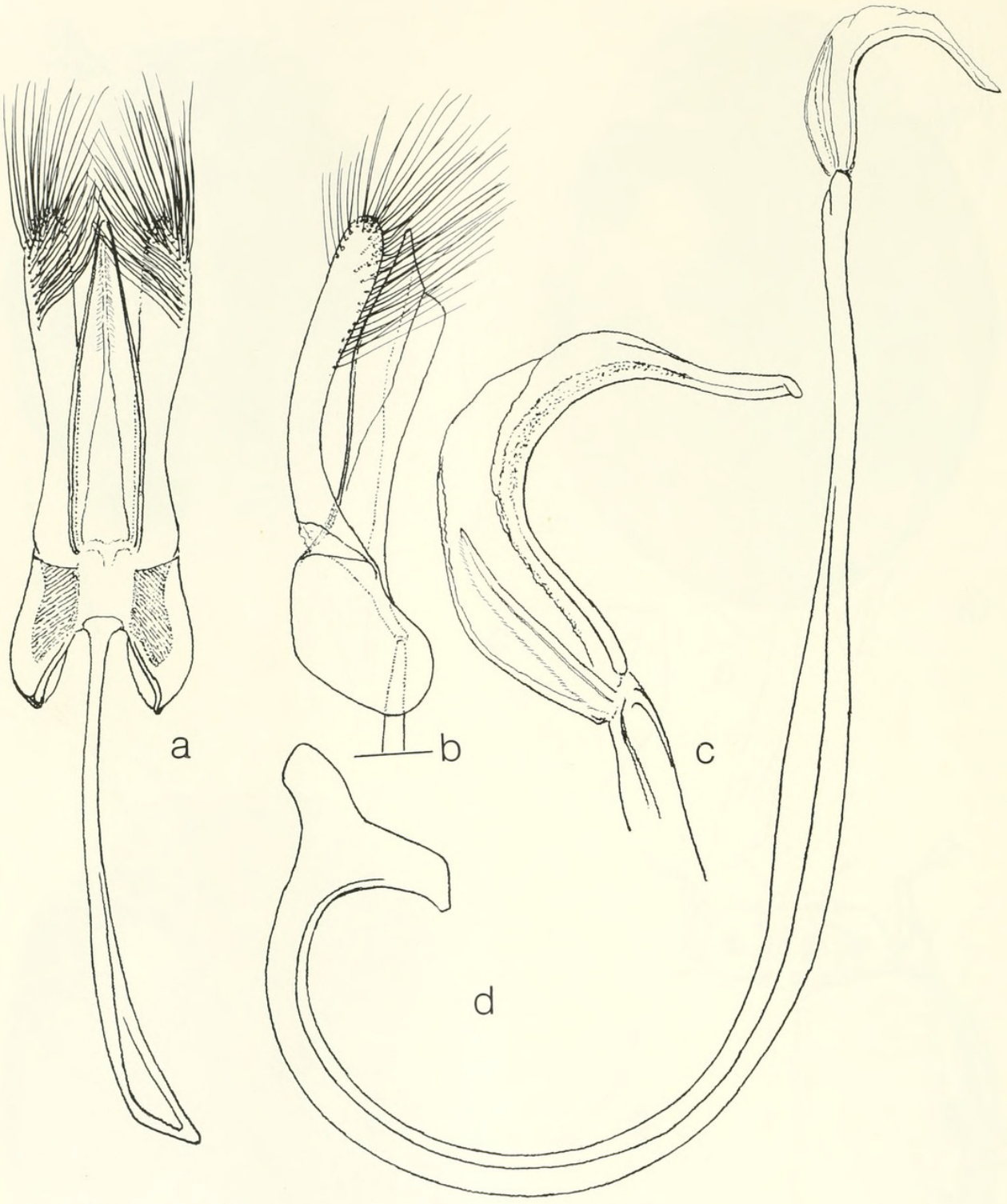


Fig. 14. a–d. Male genitalia of *Propylea quatuordecimpunctata.*

dorsal lobes, dorsal, dorsolateral lobes yellow; abdominal segments 5–8 mostly yellow except all lobes dark brown, apical margin narrowly gray.

Current American distribution.—Not known to be established in America.

Comments.—This species was received by the Agriculture Research quarantine facility in Newark, Delaware, as a contaminant in shipments of C-7 from the Soviet Union in 1989. It has been reared and released in the western United States against

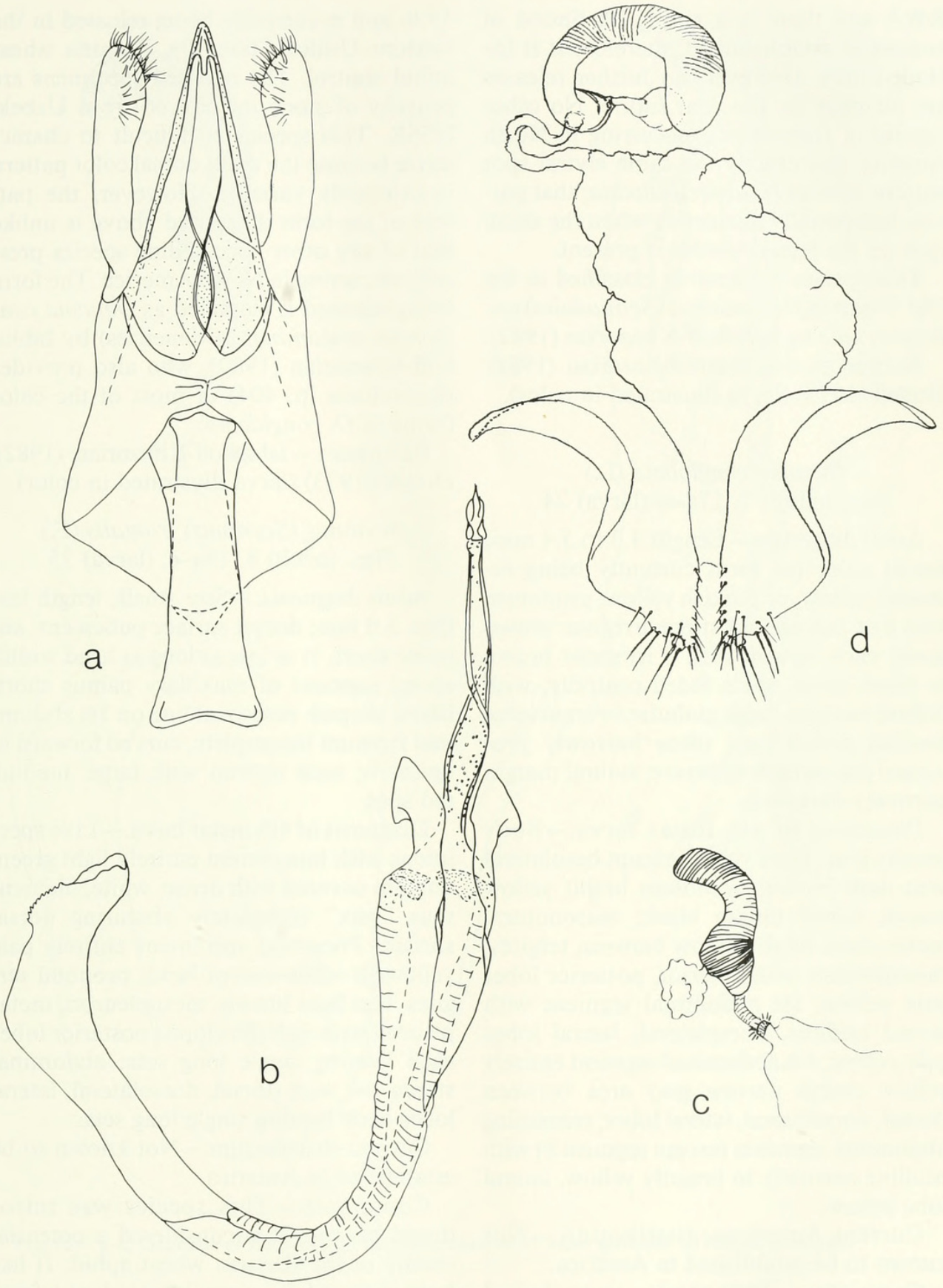


Fig. 15. a–d. Genitalia. a, b. Male genitalia of *Hippodamia variegata*. c. Female genitalia of *Hippodamia variegata*. d. Female genitalia of *Propylea quatuordecimpunctata*.

RWA and there is a strong likelihood of successful establishment; therefore it is included here. However, no further releases are planned for the near future. No other species of *Hippodamia* occurring in North America has exactly the same elytral spot pattern as does *H. undecimnotata*; that pattern is especially distinctive when the small spot on the lateral border is present.

This species is currently classified in the Old World as *Hippodamia* (*Semiadalia*) *undecimnotata* by Iablokoff-Khnzorian (1982).

References.—Iablokoff-Khnzorian (1982); Hodek (1973) (larva illustrated in color).

Oenopia conglobata (L.)
Figs. (adult) 7, 17a–c; (larva) 24

Adult diagnosis.—Length 3.3 to 5.4 mm; dorsal color (of form currently being released) yellow, or pinkish yellow; pronotum with 6 or 7 small, indistinct, irregular brown spots; each elytron with 8 irregular brown to black spots, spots faded centrally, with diffuse margins, large globular or transverse median dorsal spot often narrowly prolonged just outside of suture; sutural margin narrowly darkened.

Diagnosis of 4th instar larva.—Body mostly gray; head yellow except basolateral area dark brown; pronotum bright yellow except dorsal tergite black; mesonotum, metanotum bright yellow between tergites; mesopleuron with anterior, posterior lobes pale yellow; 1st abdominal segment with dorsal midline, dorsolateral, lateral lobes pale yellow; 4th abdominal segment entirely yellow except narrow gray area between dorsal, dorsolateral, lateral lobes; remaining abdominal segments (except segment 9) with midline narrowly to broadly yellow, lateral lobe yellow.

Current American distribution.—Not known to be established in America.

Comments.—This species was released several times in North America from 1957 through 1982 (Gordon 1985) but did not become established. It was reintroduced in 1990 and is currently being released in the western United States for Russian wheat aphid control. The released specimens are progeny of stock introduced from Uzbek, USSR. This species is difficult to characterize because the adult dorsal color pattern is extremely variable. However, the pattern of the form diagnosed above is unlike that of any other coccinelline species presently occurring in North America. The form being released is classified as *Oenopia conglobata contaminata* (Menetries) by Iablokoff-Khnzorian (1982), who also provides illustrations (p. 404) of most of the color forms of *O. conglobata.*

References.—Iablokoff-Khnzorian (1982); Hodek (1973) (larva illustrated in color).

Scymnus (*Scymnus*) *frontalis* (F.)
Figs. (adult) 8, 18a–c; (larva) 25

Adult diagnosis.—Size small, length less than 3.0 mm; dorsal surface pubescent; antenna short, ⅔ or less as long as head width; apical segment of maxillary palpus short, barrel shaped; postcoxal line on 1st abdominal sternum incomplete, curved forward in apical ¼; each elytron with large, median red spot.

Diagnosis of 4th instar larva.—Live specimens with integument entirely light green; dorsum covered with dense, white, filamentous "wax" completely obscuring dorsal surface. Preserved specimens entirely pale yellowish white except head, pronotal tergites, legs light brown; mesopleuron, metapleuron with well developed posterior lobes each bearing single long seta; abdominal sterna 1–7 with dorsal, dorsolateral, lateral lobes each bearing single long seta.

Current distribution.—Not known to be established in America.

Comments.—This species was introduced because it is considered a potential enemy of the Russian wheat aphid. It has been cultured from stock introduced from Turkey and is being released in several western states, thus far without evidence of establishment. The subgenus *Scymnus*

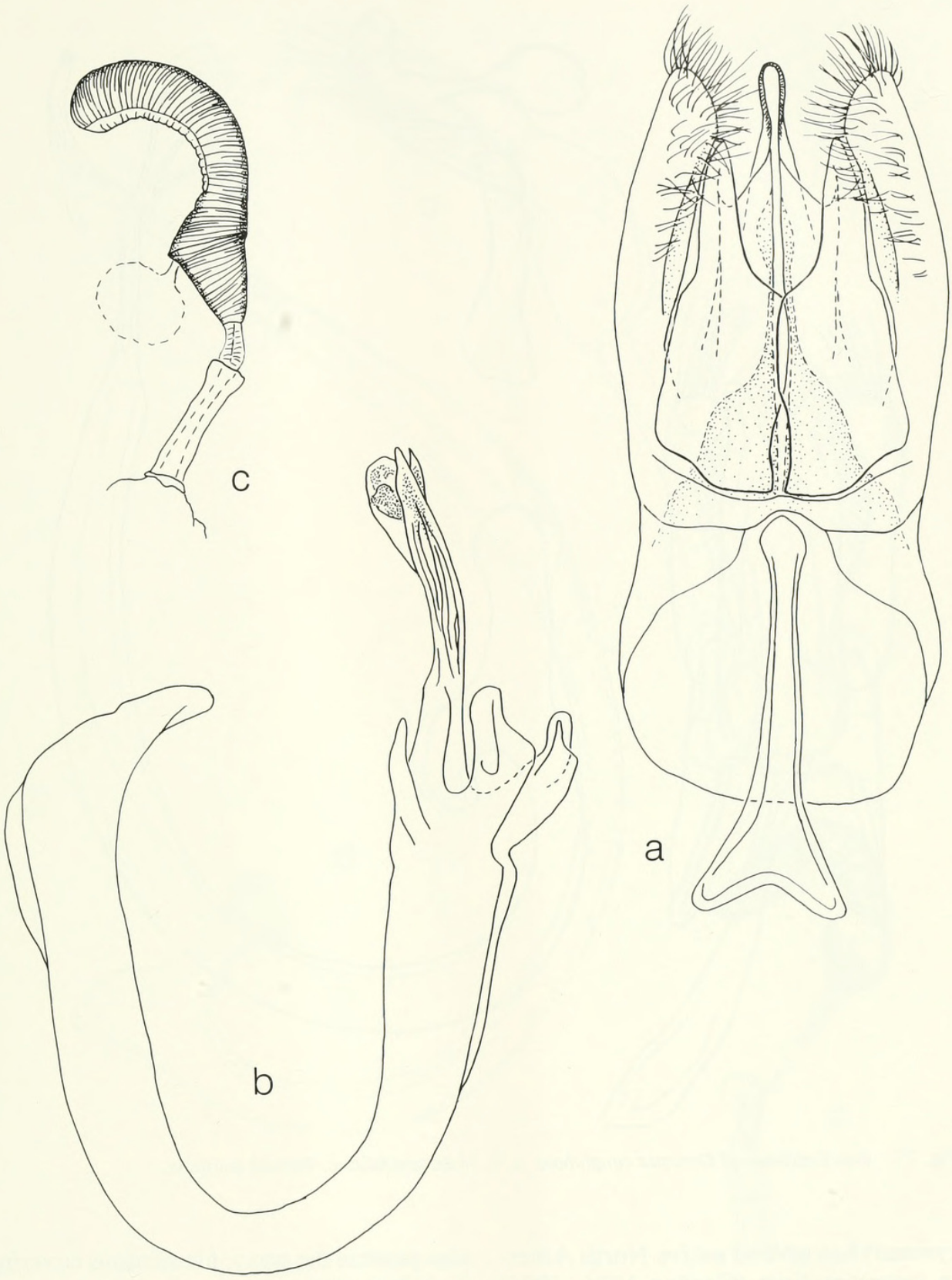


Fig. 16. a–c. Genitalia of *Hippodamia undecimnotata*. a, b. Male genitalia. c. Female genitalia.

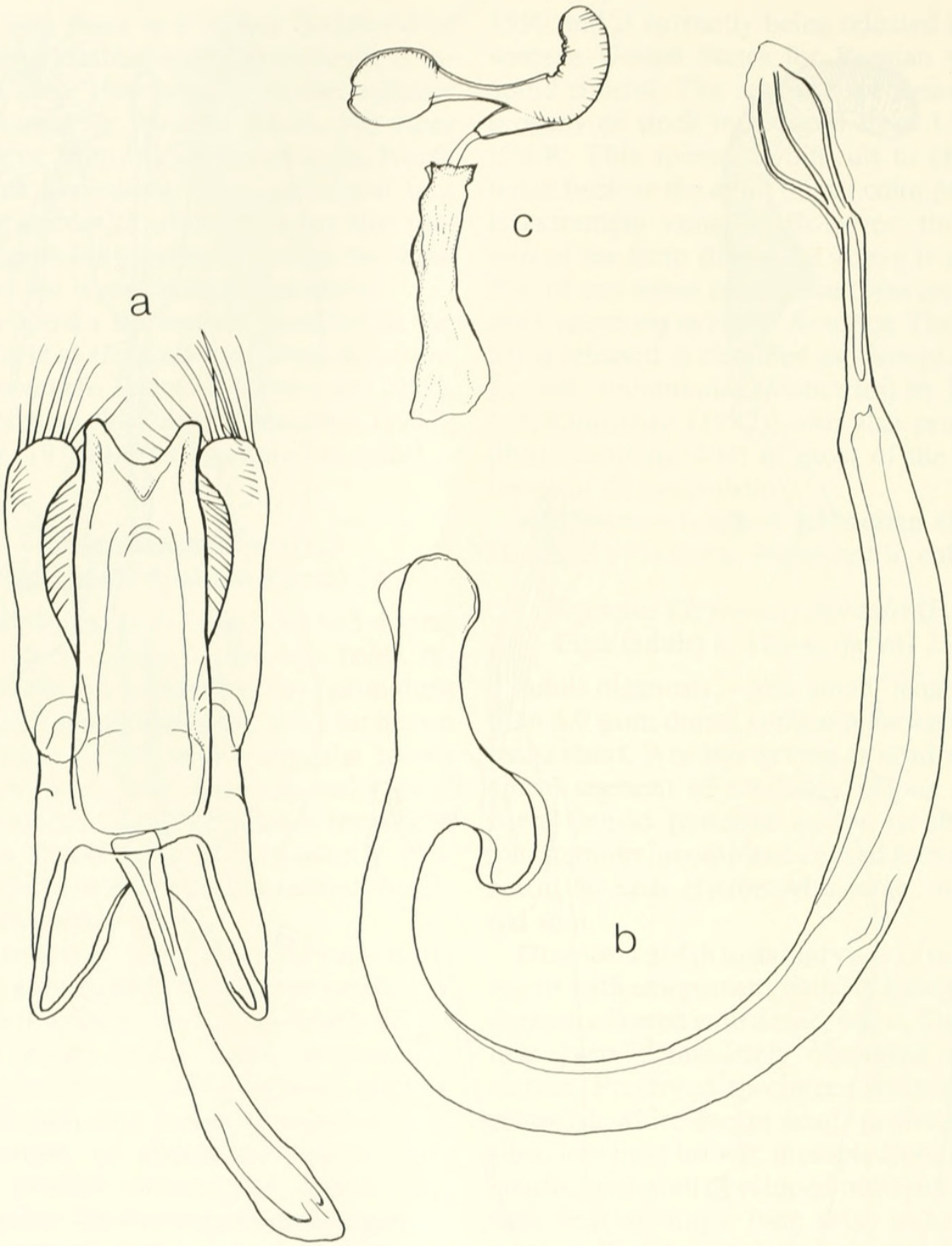


Fig. 17. a–c. Genitalia of *Oenopia conglobata*. a, b. Male genitalia. c. Female genitalia.

(*Scymnus*) has several native North American representatives (Gordon 1976, 1985) but none possess the large, red spot on each elytron; thus *S. frontalis* adults are immediately recognizable in the American fauna. The larvae cannot be recognized in the field because many native species of *Scymnus* also possess the waxy, filamentous covering described above.

References.—None.

The following species of *Harmonia* have only recently been recorded from North America, hence were not included in the North American coccinellid treatment

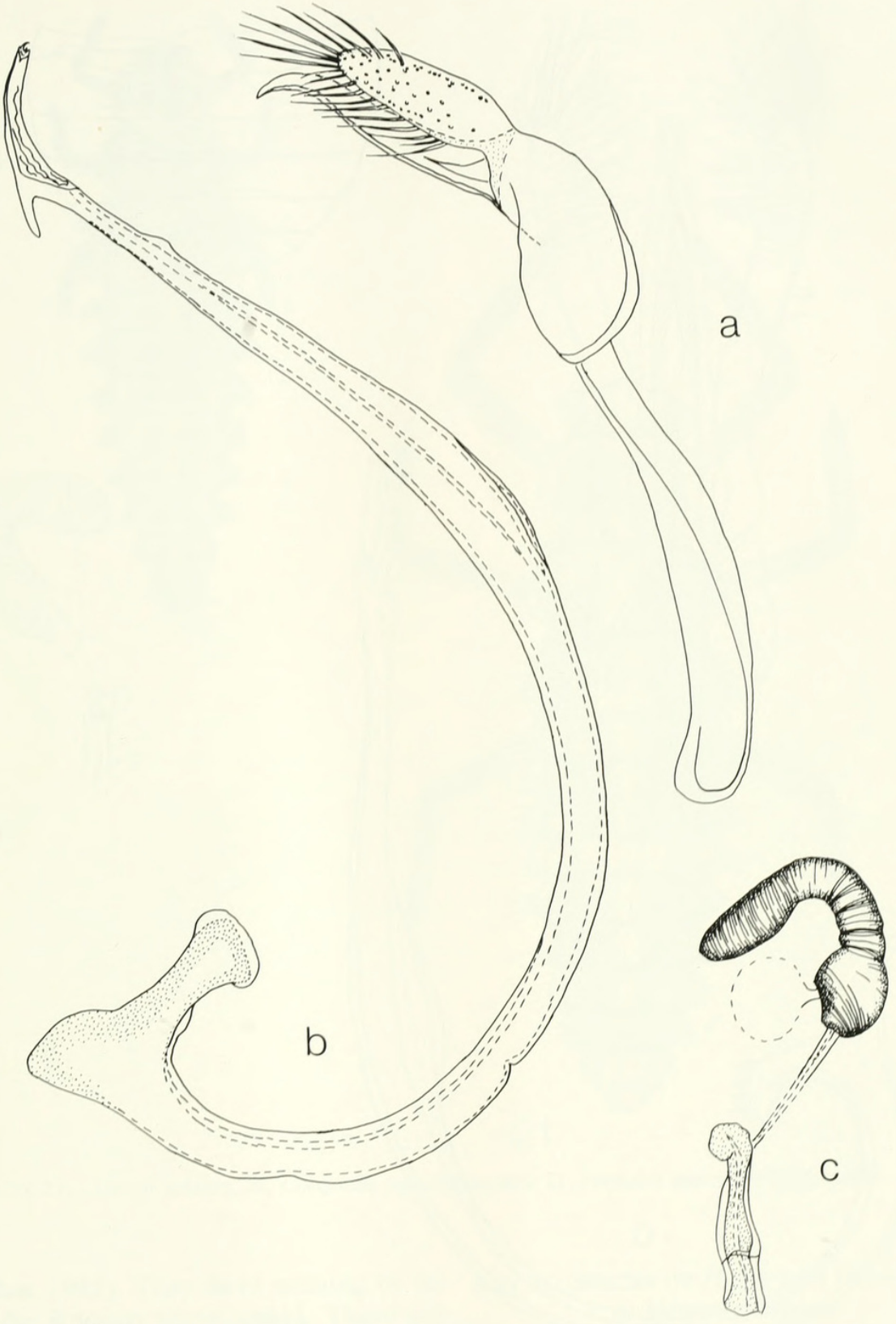


Fig. 18. a–c. Genitalia of *Scymnus frontalis*. a, b. Male genitalia. c. Female genitalia.

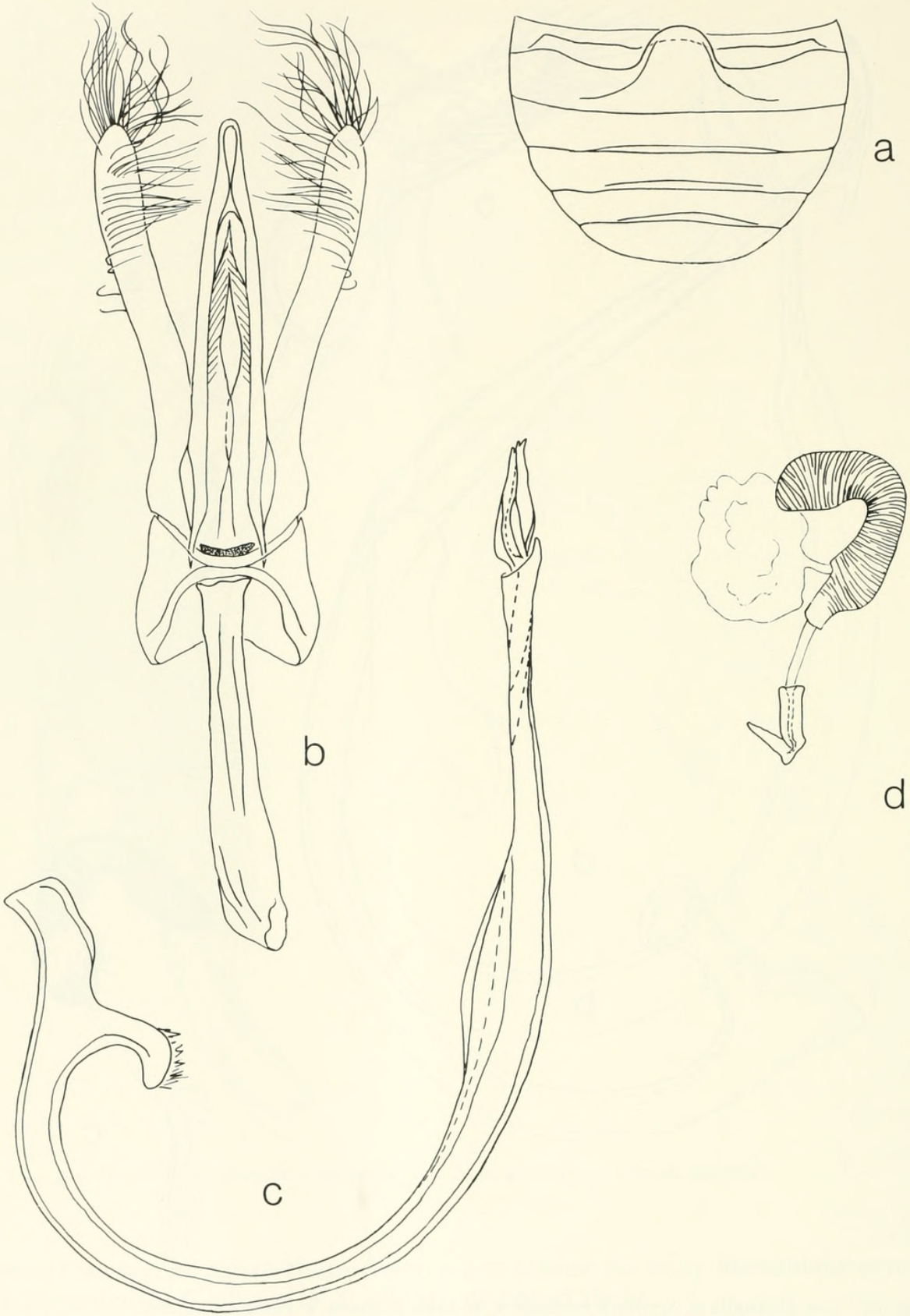
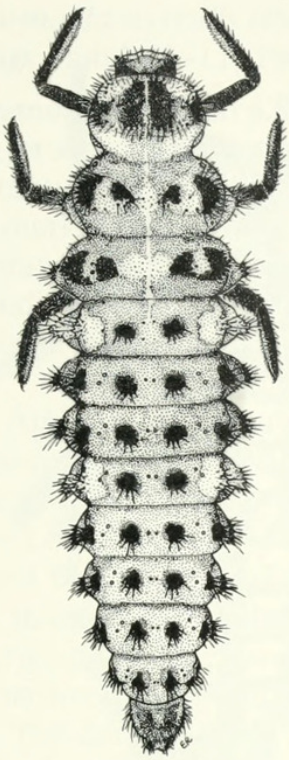
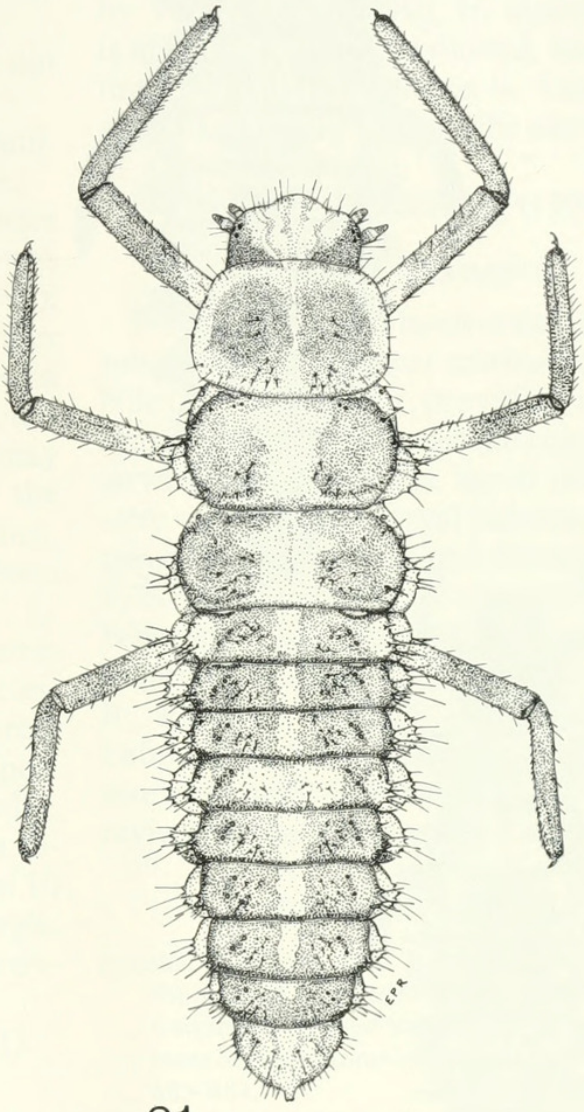


Fig. 19. a–d. *Harmonia axyridis*. a. Abdomen. b, c. Male genitalia. d. Female genitalia.



20



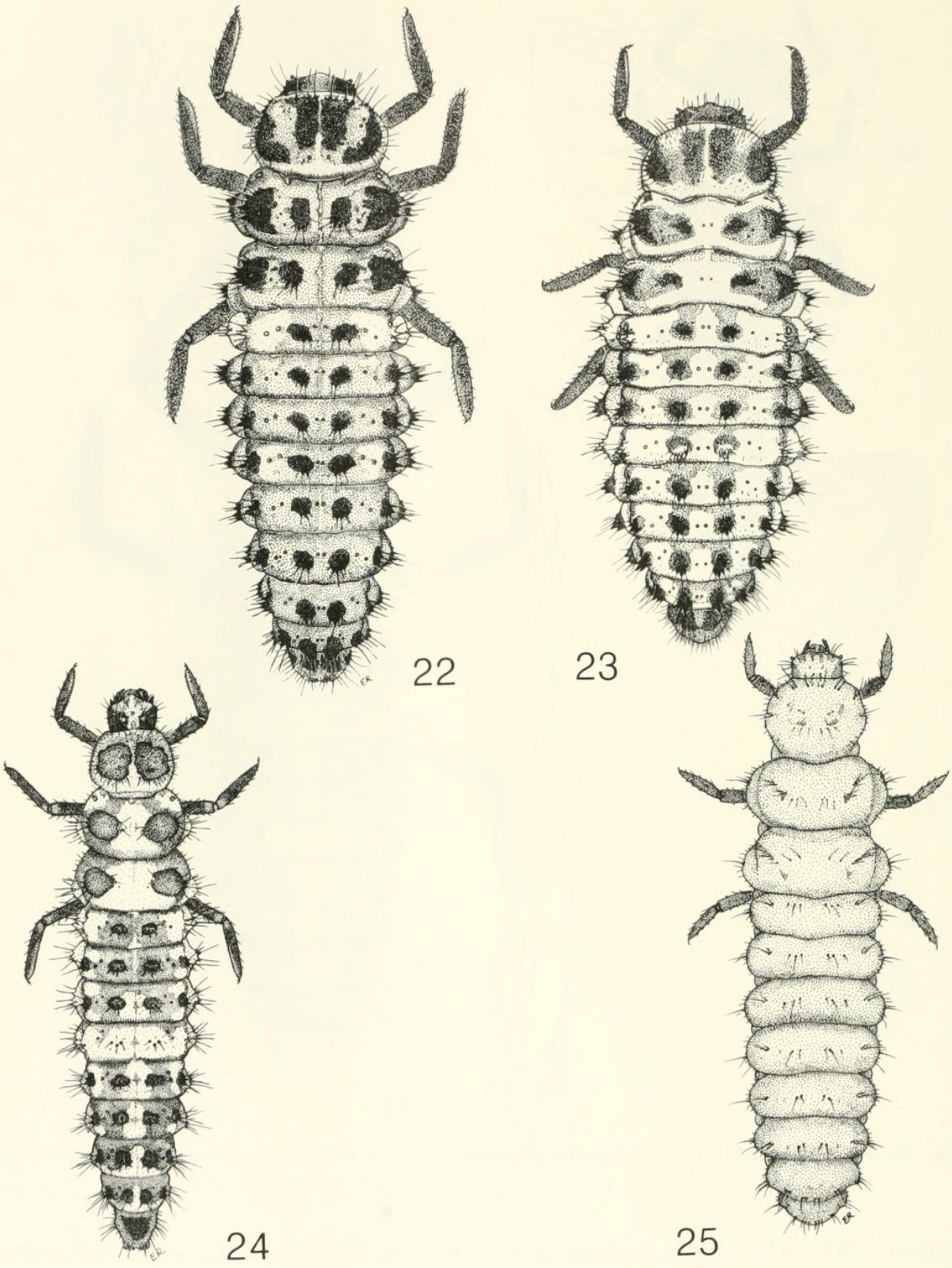
21

Figs. 20, 21. Larval habitus. 20. *Coccinella septempunctata.* 21. *Propylea quatuordecimpunctata.*

(Gordon 1985). They have nothing to do with the Russian wheat aphid. There are now 3 species of *Harmonia* established in North America (Chapin and Brou 1991); the following key will allow their identification. *Harmonia dimidata* is not discussed because its status is unchanged since Gordon's (1985) treatment.

Key to Species of *Harmonia* Established in North America

1. Elytron immaculate or with a pair of black spots on lateral margin, 1 on each side of midline; pronotum with 7–11 discrete maculae; form ovoelliptical, depressed .... *quadripunctata* (Pontopiddian)
– Elytron with more than 6 spots; pronotum with



Figs. 22–25. Larval habitus. 22. *Hippodamia variegata.* 23. *Hippodamia undecimnotata.* 24. *Oenopia conglobata.* 25. *Scymnus frontalis.*

2 to 5 spots, spots often confluent; form oval or circular, convex 2

2. Form oval, longer than wide; pronotum with up to 5 spots usually joined to form an M-shaped mark or solid trapezoid .... *axyridis* (Pallas)

– Form circular; pronotum with pair of confluent black spots at base ..... *dimidiata* (F.)

Harmonia axyridis (Pallas)
Figs. (adult) 9–11, 19a–d

Adult diagnosis.—Length 4.8 to 7.50 mm; form oval; pronotum yellow with up to 5 black spots usually joined to form an M-shaped mark or solid trapezoid; elytron yellowish orange with 10 black spots in fully maculate individuals.

Diagnosis of 4th instar larva.—Larva not available.

Current American distribution.—Southeastern Louisiana, northern Mississippi.

Comments.—The presence of this species in southern Louisiana and Mississippi was first reported by Chapin and Brou (1991); that paper should be consulted for further details. *Harmonia axyridis* was released in Louisiana between 1978 and 1981 but not recovered. The current establishment may be a result of these introductions, or the population may be adventive. Since then, *H. axyridis* has been found in Haralson County, Georgia. Specimens sent by C. L. Smith of the University of Georgia Museum of Natural History proved to be that species. The specimens were collected in March, 1991 aggregated on a house with some specimens actually inside the house (C. L. Smith, pers. comm.). *Harmonia axyridis* was released at several Georgia localities about 10 years ago (Lewis Tedders, Byron, Georgia, pers. comm.) but not subsequently recovered.

References.—Chapin and Brou (1991).

Harmonia quadripunctata (Pontopiddian)
Fig. (adult) 12

Adult diagnosis.—Length 5.0 to 8.0 mm; form ovoelliptical, depressed; pronotum of fully maculate individuals with 11 punctiform black spots, 1 or 2 pairs sometimes faint or absent; elytron immaculate or with pair of black spots on lateral margin, 1 on each side of midline.

Diagnosis of 4th instar larva.—Larval specimens not available.

Current distribution.—Known only from 3 localities: New Jersey (Paterson and Westfield); New York (Mt. Kisco).

Comments.—The American specimens of this species were discovered and reported by Vandenberg (1990). There is no record of an intentional introduction; therefore the species apparently is adventive. As stated by Vandenberg (1990), *H. quadripunctata* is almost exclusively arboreal, and its habitat and prey preferences in America will most likely be the same as the native species of *Anatis* and *Myzia*.

References.—Vandenberg (1990).

Acknowledgments

We thank R. V. Flanders and D. J. Nelson, APHIS biological control laboratory, Niles, Michigan, for providing adult and immature specimens and the color slides of larvae from which the larval descriptions were derived. The larval habitus were prepared by Lisa Roberts and the adult habitus by Kellie Marsh. We are also indebted to A. Wheeler, Pennsylvania Department of Agriculture, R. Hoebeke, Cornell University, R. Flanders, APHIS Biological Control Laboratory, Niles, Michigan, and R. Peterson, Systematic Entomology Laboratory, for reviewing the manuscript.

Literature Cited

Angalet, G. W. and R. L. Jacques. 1975. The establishment of *Coccinella septempunctata* L. in the Continental United States. United States Department of Agriculture Cooperative Insect Report 25: 883–884.

Angalet, G. W., J. M. Tropp, and A. N. Eggert. 1979. *Coccinella septempunctata* L. in the continental United States: Recolonizations and notes on its ecology. Environmental Entomology 8: 896–901.

Chantal, C. 1972. Additions a la faune Coleopterique du Quebec. Nature Canada 99: 243–244.

Chapin, J. B. and V. A. Brou. 1991. *Harmonia axyridis* (Pallas), the third species of the genus to be found in the U.S. (Coleoptera: Coccinellidae). Proceedings of the Entomological Society of Washington 93: 630–635.

Dysart, R. J. 1988. The European lady beetle *Propylea quatuordecimpunctata*: (Coleoptera: Coccinellidae). Journal of the New York Entomological Society 96: 119–121.

Gordon, R. D. 1976. The Scymnini (Coleoptera: Coccinellidae) of the United States and Canada: Key to genera and revision of *Scymnus, Nephus* and *Diomus*. Bulletin of the Buffalo Academy of Sciences 28: 1–362.

———. 1985. The Coleoptera (Coccinellidae) of America north of Mexico. Journal of the New York Entomological Society 93: 1–912.

———. 1987. The first North American records of *Hippodamia variegata* (Goeze) (Coleoptera: Coccinellidae). Journal of the New York Entomological Society 95: 307–309.

Hodek, I. 1973. Biology of Coccinellidae. Academia, Czechoslovak Academy of Science. Prague. 260 pp.

Hoebeke, R. R. and A. G. Wheeler, Jr. 1980. New distribution records of *Coccinella septempunctata* L. in the eastern United States (Coleoptera: Coccinellidae). The Coleopterists Bulletin 34: 209–212.

Iablokoff-Khnzorian, S. M. 1982. Les Coccinelles Coleopteres-Coccinellidae Tribu Coccinellini des regions Palearctique et Orientale. Paris. 568 pp.

Tedders, W. L. and G. W. Angalet. 1981. Colonization of *Coccinella septempunctata* (L.) in Georgia. Journal of the Georgia Entomological Society 16: 47–53.

Savoiskaya, G. I. 1983. Larvae of the coccinellid (Coleoptera, Coccinellidae) fauna of the USSR. Academy of Sciences, Union of Soviet Socialist Republics, Zoological Institute. Leningrad. 242 pp.

Schaefer, P. W. and R. J. Dysart. 1988. Palearctic aphidophagous coccinellids in North America, pp. 99–103. *In* Niemcyzk, E. and A. F. G. Dixon (eds.), Ecology and Effectiveness of Aphidophaga. SPB Academic Publishers, The Hague, The Netherlands. 341 pp.

Schaefer, P. W., R. J. Dysart, and H. B. Specht. 1987. North American distribution of *Coccinella septempunctata* (Coleoptera: Coccinellidae) and its mass appearance in coastal Delaware. Environmental Entomologist 16: 368–373.

Vandenberg, N. J. 1990. First North American records for *Harmonia quadripunctata* (Pontopiddian) (Coleoptera: Coccinellidae); a lady beetle native to the palaearctic. Proceedings of the Entomological Society of Washington 92: 407–410.

Wheeler, A. G., Jr. 1990. *Propylea quatuordecimpunctata*: Additional U.S. records of an adventive lady beetle (Coleoptera: Coccinellidae). Entomological News 101: 164–166.

PROC. ENTOMOL. SOC. WASH.
93(4), 1991, pp. 865–866

NOTE

Apteraliplus parvulus (Roberts) (Coleoptera: Haliplidae) in the Pacific Northwest

Apteraliplus parvulus (Roberts) is a diminutive water beetle usually thought to occur only in Santa Clara and San Mateo counties of westcentral California (Doyen, J. T. 1984. Aquatic Coleoptera, pp. 361–437 *in* R. W. Merritt and K. W. Cummins, eds. An Introduction to the Aquatic Insects of North America. Kendall/Hunt Publ. Co., Dubuque, Iowa). Adults occur in the spring of the year and take advantage of temporarily flooded areas which are ordinarily dry the greater part of the year.

On 16 July 1989, a small series of *A. parvulus* was collected from a temporary cattle watering pool in Harney County Oregon ca 12 miles south of Riley. The pool, which was approximately 20 × 5 m at that time of the year, was along the side of a road in open rangeland and had a mud base. There was no macrovegetation in the pool. It was typical of the artificial and naturally occurring depressions found throughout the arid region of southcentral Oregon. Water was muddy with a maximum depth of 25 cm. Numerous species of dytiscids and hydrophilids were also in the pool; however, there were very few Heteroptera. This was the only location, of four similar pools sampled within a 20 mile radius, in which *A. parvulus* was found.

On 13 July 1990 the same pool was visited in the hopes of obtaining quantitative biological information concerning the beetle and the microhabitat. Unfortunately, the pool was found to be dry. Again, several similar pools in the vicinity were examined without finding the beetle.

Other records of *A. parvulus* are available in the literature but have been difficult to substantiate. Hatch (Hatch, M. H. 1944. Bull. Brookl. Entomol. Soc. 39: 45–47) described *Haliplus wallisi* which he collected at several locations in the arid Grand Coulee region of eastcentral Washington. The habitat he described is much like that in which I found the beetle. Eventually, Hatch (Hatch, M. H. 1953. The Beetles of the Pacific Northwest Part 1: Introduction and Adephaga. Univ. Wash. Publ. Biol. 16: 1–340) synonymized *H. wallisi* with *A. parvulus* in his treatment of the Pacific Northwest beetle fauna. I have examined the type of *H. wallisi* which is indeed a specimen of *A. parvulus*; I have labeled it as such. The type is from Steamboat Rock in the upper Grand Coulee region of Washington (probably collected in Grant Co.). In his work, Hatch recorded *A. parvulus* from northeastern Washington and western Oregon and called it locally common. However, beyond the type of *H. wallisi,* the only additional specimens from Oregon or Washington found were three from the Poe Valley of Klamath County, Oregon (US-NMNH). I could locate only one specimen of *A. parvulus* in the collection at Oregon State University (where the major portion of the Hatch material is deposited); it is labeled "Corvallis ?? Ore." The California Academy of Sciences only contains material from the two California counties previously mentioned.

It is probable that *A. parvulus* is more widespread than the few locations in central California, southcentral Oregon, and northcentral Washington where it has been collected. Unfortunately, the area where Hatch obtained his greatest number of specimens (Steamboat Rock in Washington) is now flooded by the development of Grand Coulee irrigation project. There are, however, hundreds of pools similar to those described by Hatch throughout eastern Washington and Oregon. A thorough examination of this

area, in the early spring, should provide new locations of *A. parvulus*.

I thank Adam Asquith, Oregon State University, and Roberta Brett, California Academy of Sciences, for information on specimens in their care. The types of *A. parvulus* and *H. wallisi* were made available by P. J. Spangler and G. F. Hevel of the United States National Museum of Natural History (US-NMNH).

Richard S. Zack, *James Entomological Collection, Department of Entomology, Washington State University, Pullman, Washington 99164-6432.*

PROC. ENTOMOL. SOC. WASH.
93(4), 1991, pp. 867–868

GENERIC REASSIGNMENT OF *ANISOSTENA CHAMPIONI* (BALY) TO *SUMITROSIS* (COLEOPTERA: CHRYSOMELIDAE, HISPINAE)

C. L. STAINES

3302 Decker Place, Edgewater, Maryland 21037.

Abstract.—*Anisostena championi* (Baly) is redescribed and **transferred** to *Sumitrosis.* A lectotype and paralectotype are designated.

Key Words: *Anisostena, Sumitrosis,* lectotype

Baly (1885) described *Charistena championi* from Guatemala. Weise (1911a) transferred the species to *Anisostena.* All subsequent authors have followed this generic placement.

The bodies of *Anisostena* species [type species *Charistena elegantula* Baly, designated by Monrós and Viana (1947)] are elongate, subcylindrical, and parallel-sided. The head is small, the eyes not swollen, and the vertex sulcate or micropunctate. The pronotum is transverse and is not margined. The elytra are parallel-sided, not widened apically, and with apices evenly rounded. The legs have clearly curved mesotibiae.

I have examined the syntypes of *A. championi* and found them to belong to the genus *Sumitrosis* Butte [type species *Hispa rosea* Weber, designated by Butte (1969)]. The bodies of *Sumitrosis* species are not elongate and are widened apically. The head has eyes which are more or less swollen and finely granulose, vertex deeply sulcate. The pronotum is transverse, the lateral margins are obtusely subangulate at middle, slightly narrowing apically and obliquely more so basally. The elytra are elongate-ovate with apices conjointly rounded. The legs have straight or slightly curved mesotibiae.

For the following description, measurements were taken with an ocular micrometer. Total length is from the anterior margin of the pronotum to the elytral apex. Pronotal length is from the base to the apex of the pronotum. Pronotal width is along the midlength. Elytral length is from the base to the apex. Elytral width was taken at the humeri. In recording the label data from type specimens, a slash (/) divides data on different labels.

Sumitrosis championi (Baly)
NEW COMBINATION

Charistena championi Baly 1885: 46. Lectotype (here designated): Tamahu, Vera Paz. Champion/Syntype (white disk with blue border)/Godman-Salvin Coll. Biol. Centr.-Amer./Charistena championi Baly, Guatemala/Lectotype Sumitrosis championi (Baly) des. C. L. Staines, 1990 (red label) (BMNH). Paralectotype (here designated): Zaporte, Guatemala, G. C. Champion./Syntype (white disk with blue border)/Godman-Salvin Coll. Biol. Centr.-Amer./Paralectotype Sumitrosis championi (Baly) des. C. L. Staines 1990 (red label) (BMNH). Champion 1894: 234; Donckier 1899: 583.

Anisostena championi (Baly). Weise 1911a: 21, 1911b: 33; Blackwelder 1946: 724; Papp 1953: 58; Uhmann 1957: 74.

Description.—*Head:* Black, tinged with metallic green; vertex and front with four