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THREE NEW SPECIES OF *HYPERASPIS* FROM EASTERN NORTH AMERICA (COLEOPTERA: COCCINELLIDAE)[1]

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A number of apparently related species, including the three which are newly described in this paper, belong to the large ***binotata*** group of Dobzhansky (1941). It has been found necessary to re-examine this group and to divide it into smaller, more homogeneous species clusters. These new species clusters may indicate more clearly the relationships of the species involved.

Specimens which have formed the basis for the new species were located in the collections of the University of Michigan Museum of Zoology (UMMZ) and Illinois Natural History Survey (INHS). To the custodians of these collections I extend my thanks.

Key to separate some of the species of *Hyperaspis* in Eastern North America

1. Elytra with never more than one pair of reddish spots placed near the middle of the elytra 2
   Elytra with two pairs of reddish spots, a larger pair on disc, a smaller pair near apex 3

2. Prosternal lines converging to an anterior point 4
   Prosternal lines parallel (Figs. 3, 4; Watson, 1960). . . . . ***paspalis*** Watson

3. Sides of abdomen testaceous, disc black; aedeagus asymmetrical but without triangular tooth (Fig. 118, Dobzhansky, 1941). . . . . ***signata*** (Say)
   Abdomen wholly black beneath or with a greyish cast; aedeagus with one side having a distinct triangular tooth (Fig. 3). . . . . ***congeminata*** n. sp.

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4. Ventral surface of abdomen wholly black 5
Ventral surface of abdomen black with testaceous margin 6

5. Anterior border of pronotum of male black or narrowly yellow; aedeagus long, narrow, apex truncate (Fig. 6, Watson, 1960). . . . . *binotata* (Say)
Anterior border of pronotum of male broadly yellow (Fig. 4); aedeagus short, apex rounded, one side with triangular tooth (Fig. 1) . . . *concavus* n. sp.

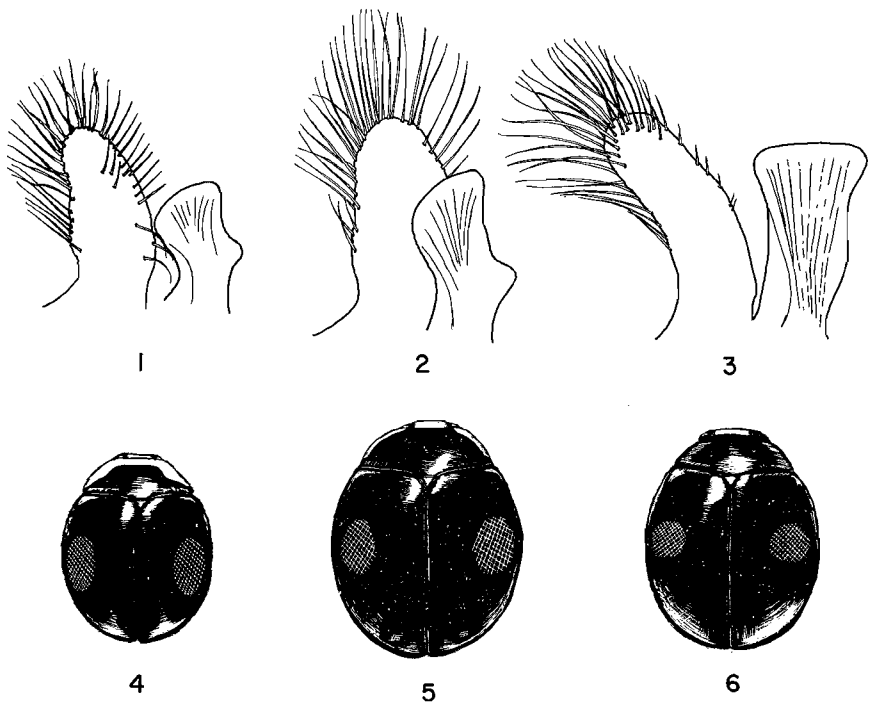
6. Elytral spots large; aedeagus shorter than paramera, one side undulate (Fig. 3) . . . . . *pistillata* n. sp.

Elytral spots small; aedeagus as long as paramera; one side with a low rounded projection (Fig. 2, Watson 1960) . . . . . *congressis* Watson

Descriptions of New Species

Hyperaspis concavus n. sp.
(Figs. 1, 4)

Length 2.6 mm., width 2.2 mm. Body round, slightly depressed. Head yellow in male, black in female. Pronotum in male with wide lateral borders yellow,



Figures 1-6. Figs. 1-3, apex of male genitalia, excluding sipho. 1, *H. concavus* n. sp. (type); 2. *H. congeminata* n. sp. (type); 3. *H. pistillata* n. sp. (type). Figs. 4-6, adult males (types); 4, *H. concavus*; 5, *H. congeminata*; 6, *H. pistillata*.

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the inner borders of which are straight in the anterior half and concave in the posterior half, and with a complete narrow anterior yellow margin; pronotum of female completely black. Elytra black, each with a round reddish-orange spot just in front of middle and closer to margin than suture. Mouthparts and legs yellow in male, except for basal 2/3 of posterior femora which are piceous; black in female except for fuscous tibia and tarsus. Mesepisternum of male yellow, ventral surface otherwise black.

Aedeagus much shorter than paramera, deeply concave on one side and bearing a blunt triangular projection in the middle of the other side; apical portion, beyond the projection about as wide as long, apex obliquely rounded. Paramera broad.

Holotype: ♂, Summit of Mount Washington, 6,293 feet; VII, 1-10, (July 1, 1910) (UMMZ). (The summit of Mt. Washington is 6,288 feet.)

Paratypes: 1:♂, 2 ♀♀, same data as holotype. All type material has been deposited in the University of Michigan collection.

Remarks: The color of the spots may vary to a pinkish shade. The females may not be as shining as the males.

This species is similar to ***centralis wickhami*** Casey (Dobzhansky, 1941, Figs. 74, 121) from Texas. The two species may be distinguished by the more anterior position of the elytral markings, the lack of pronotal markings in the female and the more strongly rounded apex of the aedeagus of ***concavus.*** This species differs from ***congeminata*** in lacking the apical spot and in having a shorter distance between the apex and the projection on the aedeagus, and from ***rivularis*** Dobzhansky (p. 35, 1941) by the color of the spots and the lack of pronotal markings in the female of ***concavus. H. bigeminata*** (Randall), reported from the same area (Wingo, 1952), has different elytral markings and pronotal markings in the female.

The name is derived from the Latin ***con-*** and ***cavus,*** a hollow or cave, and alludes to the shape of the aedeagus.

Hyperaspis congeminata n. sp.
(Figs. 2, 5)

Length 3.3 mm., width 2.7 mm. Body ovoid. Head and narrow lateral margins of pronotum yellow in male; entirely black in female. Elytra black; each with a large round, deep red spot in front of middle and closer to margin than to suture, and a minute subapical spot also closer to margin. Ventrally black except for the fuscous anterior tibiae and tarsi and the femoral apices which range from fuscous to ivory especially in the tip region.

Aedeagus shorter than paramera, concave on one side, the other side with a distinct triangular projection closer to the base than the apex; apical portion much longer than wide, strongly asymmetrical and obliquely rounded as in ***concavus.*** Paramera very broad and spatulate.

Holotype: 1 ♂, Karber's Ridge, Ill., April 22, 1935, T. H. Frison, Slide of Genitalia, No. 50, 256 (INHS).

Paratypes: 1 ♂, Palos Park, Ill., June 19, 1933, Ross and Mohr (INHS); 1 ♂, Joliet, Ill., June 9, 1933, Slide of Genitalia No. 50, 257 (INHS); 1 ♂, Riverside Woods, Cook's Co., Ill., Sept. 1, 1949, Wm. Metz, Jr. (INHS).

Other Specimens: 1♂, and 1♀, Ill., no locality or date details (Andreas Bolter Coll.) (INHS).

The holotype and three paratypes are deposited in INHS. One paratype is in the insect collection at the Laurentian University.

Remarks: H. bicentralis major Dobzhansky (p. 33, 1941) has been seen from the same area. It differs from ***congeminata*** in the color of the discal spots and the lack of apical spots.

The name, derived from the Latin ***con-*** and ***geminus*** meaning twins, refers to the two pairs of spots on the elytra.

Hyperaspis pistillata n. sp.
(Figs. 3, 6)

Length 3.6 mm., width 2.6 mm. Body nearly round. Head as in ***concavus.*** Pronotum of male with a broad yellow lateral border continuing almost to posterior angle and a narrow anterior border which may be absent; pronotum in female entirely black as in ***concavus, binotata,*** and others. Elytra black with a round red spot slightly in front of middle and closer to lateral margin than to suture. Ventrally black; male with dark fuscous mouthparts, piceous sides of abdomen , and ivory on the apex of the anterior femora; female with piceous or black anterior femora.

Aedeagus about 2/3 as long as paramera, apex obliquely truncate, one side simply and slightly concave, the other undulate. Paramera thick with apices broadly rounded, not spatulate as in ***congeminata,*** or tapering as in some other species. ***Holotype:*** 1♂, Dunedin, Fla., IV-4-24, W.S.B., (Calder Collection) (UMMZ).

Paratypes: 2 ♂♂, same data as holotype; 1♂, and 1♀, Dunedin, Fla., IV-1-24 (Calder Collection), 3 ♂♂ and 3 ♀♀, Dunedin, Fla., no date W.S.B. (Calder Collection (UMMZ).

Holotype and five paratypes deposited in UMMZ. Three paratypes deposited in the insect collection at Laurentian University.

Remarks: The elytral spots show a tendency to become transverse in some. The bright ivory markings of the anterior femora of the male, and the aedeagus easily distinguish this species from ***binotata.*** The aedeagus will distinguish ***pistillata*** from other species described in this paper, and indeed, from most other ***Hyperaspis*** in eastern North America.

The name is from the Latin ***pistillum,*** a pounder used in a mortar, and applies to the shape of the aedeagus.

Discussion

The ***binotata*** group (Dobzhansky, 1941, p. 27) includes a varied assemblage of species having rather mixed elytral patterns and several types of male genitalia. With the description of the species in this paper and elsewhere (Watson, 1960) it is now possible to suggest some subdivision of this large group into more convenient clusters of species. It is therefore proposed to separate the ***binotata*** group into three in the following way;

binotata group

Characteristics: Elytral pattern variable ranging from a central red spot through

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elongation to stripes (*nigrosuturalis* Blatchley). Aedeagus long, slender; paramera tapering, fingerlike.

Species included:

binotata (Say)
pinorum Casey
haematosticta Fall
lewisi Crotch
leachi Nunenmacher
regalis Casey
nigrosuturalis Blatchley
paspalis Watson
rivularis Dobzhansky
tuckeri Casey

Remarks: In some of these species, the male genitalia are as yet unknown, so that their placement in this group is tentative. They do not fit into either of the other groups to be defined.

signata group

Characteristics: Elytral pattern consisting of a central red spot on each elytron; or two spots, the apical one of which is frequently absent. Aedeagus long, asymmetrical but not deeply excavated on either side; paramera broad, apex rounded.

Species included:

signata (Olivier)
b. bicentralis Casey
b. major Dobzhansky
congressis Watson
pistillata n. sp.

Remarks: There is some variability in the aedeagus of this group but the tendency seems to be a straight central axis with the variations involving the sides of the aedeagus only.

centralis group

Characteristics: Elytral pattern of one spot on each elytron situated either apically or at least behind the middle. The aedeagus short, very asymmetrical and deeply excavated on one side; paramera very broad and frequently spatulate.

Species included:

c. centralis (Mulsant)
c. wickhami Casey
c. plagiata Dobzhansky
oculifera Casey
bigeminata (Randall)
concavus n. sp.
congeminata n. sp.

Remarks: Despite the discal and apical spots on *congeminata* the form of the aedeagus requires that this species be placed in this group.

the species *uniformis* Casey has not been assigned to any group although Dobzhansky tentatively placed it in his *binotata* group.

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