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(Received November 19, 1959)

Two New Species of the Genus *Hyperaspis* (Coleoptera: Coccinellidae)¹

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Among the more important predacious coccinellids in eastern North America is *Hyperaspis binotata* auct., which has been considered a general feeder on *Toumeyella numismaticum* (P. & M.), *Pulvinaria* spp., and other scale insects. A review of the specimens identified as *H. binotata* in the collections of the Forest Insect Laboratory, Sault Ste. Marie, has revealed, not only *H. binotata* (Say), but two apparently new species, descriptions of which are given in this paper. In addition to the material at Sault Ste. Marie, specimens were obtained from the Canadian National Collection and the Forest Biology Laboratory, Winnipeg, Manitoba.

The discovery of these two new species suggests that *H. binotata* (Say) is not as polyphagous as once thought, but may be restricted to certain types of scale insects. Only *H. congressis* n. sp. is associated with *Toumeyella numismaticum*, whereas both *H. binotata* (Say) and *H. paspalis* n.sp. are associated with scale insects on deciduous trees.

¹Contribution No. 599, Forest Biology Division, Research Branch, Department of Agriculture, Ottawa, Canada.

Both new species are quite similar to *H. binotata* (Say), all three species having the following characters in common: Colour shining black, ♂ with head, and anterior and lateral margins of pronotum variably marked with white. Punctuation of head shallow and dense, of thorax shallow and more widely spaced. Interspaces of head alutaceous. Elytra each with a bright red spot about the middle of the disc. Shape of body moderately convex. Ventrally black with coarse lateral punctuation. Chromosome numbers are identical (Smith, 1960).

***Hyperaspis congressis*, new species**

(Figs. 1-2)

Length 3.2 mm. (2.7 mm. - 3.5 mm); width 2.5 mm. (2.0 mm. - 2.8 mm). Sides of elytra almost parallel in middle third. Punctuation of elytra distinct, irregular, rugose near scutellum. Reddish spot somewhat transverse.

Apices of femora, occasionally tibiae and tarsi, and lateral edges of abdominal segments testaceous. Prosternal lines long, converging to an acute apex near the anterior edge of sternum. Metacoxal arc finely punctate within. Male genitalia; Aedeagus² (Fig. 2) very asymmetrical, apex wide and obliquely truncate, one side deeply concave, the other sinuous with a large convexity between which and the base the margin is straight. Paramera as long as aedeagus, stout, outer margin concave at base, sides otherwise nearly parallel to a broadly rounded apex. Apex of siphon arcuate with a well-defined sclerotized plate at base of ridges.

Female genitalia: Spermatheca spherical, retort-shaped, with a long narrow duct. Bursa urn-shaped, with a stout angular projection from the distal end.

Holotype: ♂, Savanne, Ont., 7-VIII-59, ex *Pinus banksiana* (S-59-4302-01); Slide No. W-396; Type No. 7015 in the Canadian National Collection, Ottawa.

Allotype: ♀, same data, no slide.

Paratypes: 7 ♂ ♂, 19 ♀ ♀ same data; 8 ♂ ♂, 6 ♀ ♀, Agawa, Lake Superior, Ont. 28-VII-56; 3 ♂ ♂, 11 ♀ ♀, Walford, Ont., 15-VIII-50; 2 ♂ ♂, 11 ♀ ♀, Prince Albert, Sask., 5-VII-59 (Brooks-Wallis); 3 ♂ ♂, 7 ♀ ♀, Hudson Bay, Sask., 25-VIII-54 (Brooks-Wallis).

Other Localities: Manitoba; 4 ♀ ♀, Beausejour, 20-VIII-53 (Brooks-Kelton); 1 ♀, Reynolds, 10-VI-53, (Brooks-Kelton); 2 ♂ ♂, 2 ♀ ♀, Victoria Beach, 18-VIII-53 (Brooks-Kelton); 1 ♂, Fairford, 28-VI-56; 1 ♀, Grandview, 27-VII-44; 1 ♀, Pine Falls, 3-VI-41; 3 ♂ ♂, 2 ♀ ♀, Sandilands Forest Reserve, 17-V-38, 16-VIII-45, 21-VII-55, 4-VII-55; 1 ♀, Stead, 15-VIII-55.

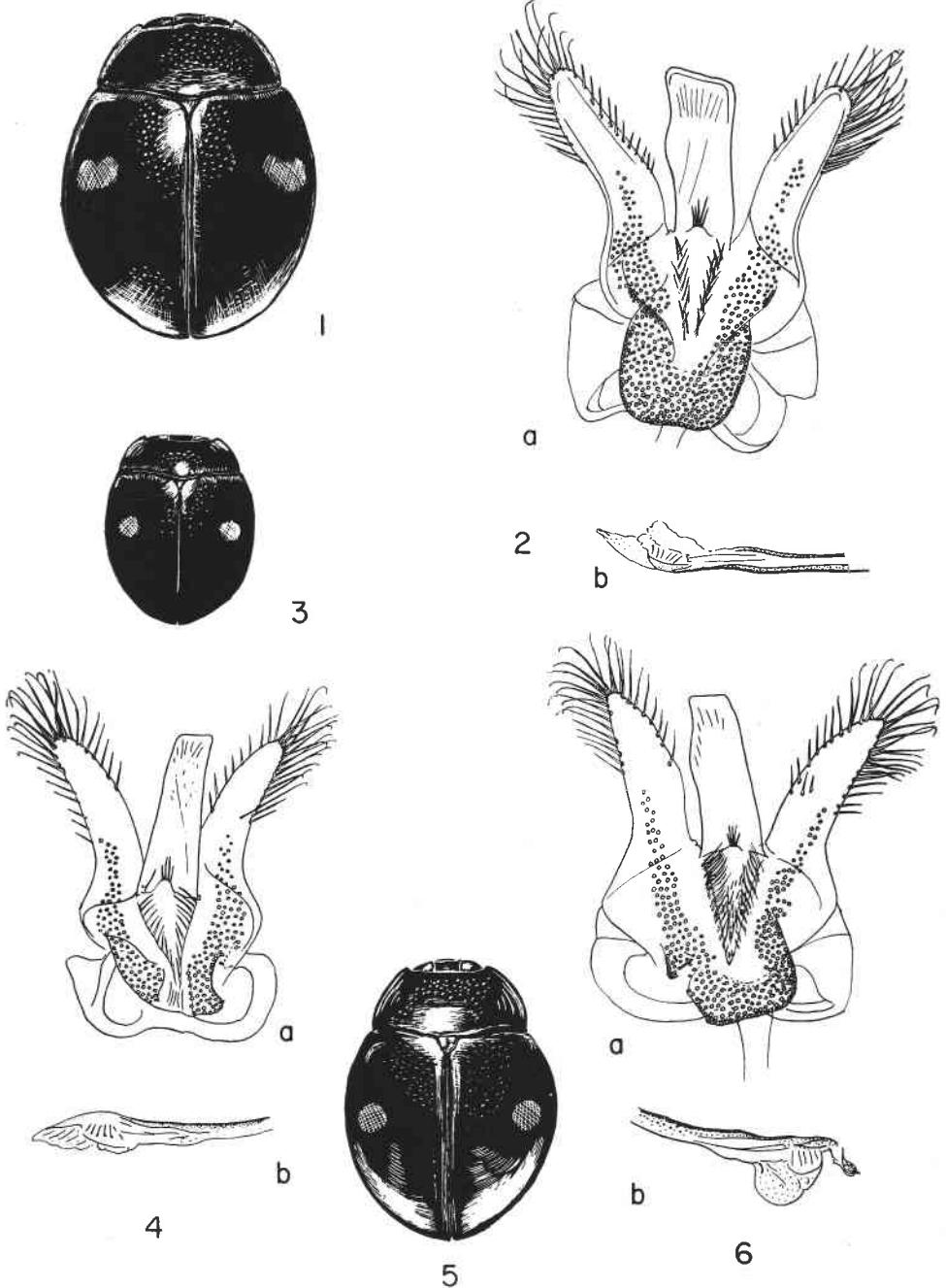
Ontario; 1 ♀, Fort William, 9-V-49; 2 ♂ ♂, German, 6-VI-45; 1 ♀, Gogama, 30-VII-49; 1 ♂, Hawk Lake, 21-V-45; 1 ♂, Lost Bay, 3-VII-45, 1 ♂, McIntosh, 21-VIII-54.

Saskatchewan; 1 ♀, Holbein, 19-VIII-45; 1 ♂, Prince Albert, 4-VII-55.

Remarks: This species may be distinguished from *H. binotata* (Say) by its larger average size, pale edges to the abdominal sterna, and irregular aedeagus. There is some variation in size but the greater number of individuals fall within .2 mm. of the mean. There is no apparent difference between males and females in size. The elytral spot, although usually somewhat transverse in this species, may be ovoid or almost round.

H. congressis has been found in large numbers along the eastern shore of Lake Superior when the adults may be thickly settled in crevices in the bark of trees as well as in the beach drift. In September this species has been found pupating in the litter beneath jack pine trees infested with *Toumeyella*. The pupae were attached to sticks, pieces of grass, dried leaves, and the shrivelled fronds of bracken fern. Among the pupae were some uneclosed adults, that is

²Figures of genitalia made from specimens mounted in Hoyer's Fluid.



Figs. 1-6. 1, *Hyperaspis congressis* n. sp., paratype ♂; 2, *H. congressis*: a, ♂ genitalia; b, apex of siphon; 3, *H. paspalis* n. sp., paratype ♂; 4, *H. paspalis*: a, ♂ genitalia; b, apex of siphon; 5, *H. bimotata* (Say), ♀; 6, *H. bimotata* (Say); a, ♂ genitalia; b, apex of siphon.

they had split the pupal skin and were fully coloured but had not emerged from the pupal cell. In all areas where the species could be associated with a host, this host was *Toumeyella numismaticum*.

The name *congressis* is derived from the Latin *congressus* meaning a gathering or assembly, and here refers to the habit of the adults on certain occasions.

The name also honours those members of the Tenth International Congress of Entomology who found this insect in such large numbers during a visit to the Sault Ste. Marie area.

***Hyperaspis paspalis*, new species**

(Figs. 3-4)

Length 2.4 mm. (2.1 mm. - 2.9 mm.); width 1.9 mm. (1.7 mm. - 2.3 mm.). Sides of elytra arcuate; punctures of elytra relatively large, deep, and irregular. Anterior side of femora white in ♂, black in ♀. Abdominal sternites black or with a greyish cast. Prosternal lines, parallel or only slightly convergent, not meeting near front edge of sternum. Metacoxal arc impunctate within. Spot on the average rounded rather than transverse.

Male genitalia: Aedeagus (Fig. 4) long, knife-like, with virtually parallel sides and an obliquely truncate apex. Apex of siphon arcuate, not definitely sclerotized at base of ridges. Paramera digitate, shorter than aedeagus and narrowing towards the apex.

Female genitalia: Smaller but otherwise as in *congressis*.

Holotype: ♂, Iron Bridge, Ont., 17-VIII-59, ex *Quercus rubra* (S-59-6503-01), Slide W-389; Type No. 7016 in the Canadian National Collection, Ottawa.

Allotype: ♀, same data, no slide.

Paratypes: 23 ♂♂, 39 ♀♀, same data; 9 ♂♂, 26 ♀♀, Walsingham, Ont., 12-VIII-59.

Other Localities: Ontario; 1 ♀, St. Williams, 29-VII-59 (S-59-5403-01), 1 ♂, St. Williams, 6-IX-50, ex *Castanea* sp. (S-58-9091), 1 ♀, Sault Ste. Marie, 3-IX-54 (W. Y. Watson); 1 ♂, Gravenhurst, ---VIII-54; 1 ♀, Ridgeway, 24-VII-59, ex *Tilia* sp. (S-59-5392-01); 1 ♀, South Cayuga, 9-VII-59, ex *Tilia* sp. (S-59-5391-01); 1 ♂, 3 ♀♀, Normandale, 18-VI-31 (W. J. Brown); 1 ♂, 1 ♀, Blackburn, 12-IV-37 (W. J. Brown).

Remarks: The size of the body and structure of the prosternal lines and aedeagus will distinguish this species from both *congressis* and *binotata*. Although the size variation is apparently greater in this species than in *congressis*, the majority of the individuals still fall within .2 mm. of the mean. The spot shows little or no tendency to become transverse.

Little is known about the biology of *paspalis* except that specimens have been taken from *Castanea* sp., *Tilia* sp., and *Quercus* sp., the last known to be infested with a *Lecanium* scale. The name *paspalis* is derived from the Latin *paspalum*, a kind of millet, and here refers to the shape of the adult, being like that of millet seed.

***Hyperaspis binotata* (Say)**

(Figs. 5-6)

This is not a common species in eastern Canada, being restricted to southern Ontario and southern Quebec, where its distribution broadly mingles with that of *paspalis* and overlaps slightly the southern distribution of *congressis*. Although similar to each of the new species, *binotata* (Say) is intermediate in size and more polished. The aedeagus is convex on one side but otherwise parallel-sided, and the apex of the siphon is sharply curved rather than arcuate. The prosternal lines are like those of *congressis*, whereas the aedeagus is more like that of *paspalis*.

The characters of *binotata* are either like those of the two new species or are almost intermediate between them, and suggest that *binotata* might be nothing more than a hybrid between the other two species. Other evidence, however, points conclusively to its being a valid species. The apparent intermediate nature of some characters remains constant throughout the range of the insect, even though this overlaps the ranges of the other two species. The host preferences

of *congressis* and *paspalis* are such as to reduce to a minimum the chance of these species coming together to mate. And finally, there is no cytological evidence of hybridity (Smith, pers. comm.).

The following key will fit into that of Casey (1899), continuing from the *binotata* part of couplet 12 (p. 124);

1. Prosternal lines converging to an acute apex near the anterior margin of the sternum, size 2.7 mm. or more 2
1. Prosternal lines nearly parallel, not meeting near the anterior margin of the sternum, aedeagus narrow, parallel-sided, size not exceeding 2.9 mm. *paspalis*, n. sp.
2. Ventral surface of abdomen black, aedeagus with a slight convexity on one side *binotata* (Say)
2. Ventral surface of abdomen with lateral areas testaceous, aedeagus very asymmetrical *congressis*, n. sp.

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(Received December 5, 1960)

A Technique for Maintaining Acarine Predator-Prey Populations

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Experiments with the growth-forms of acarine predator and prey populations require a constant supply of both species. This note describes a technique used for maintaining large numbers of *Tyrophagus castellanii* (Hirst) and its predator *Melichares dentriticus* (Berl.) and of *Acarus siro* L. and its predator *Cheyletus eruditus* (Schrank).

Prey populations are propagated from individual female adults in a microcell similar to the type commonly used (Rivard, 1958). The cell (Fig. 1) consists

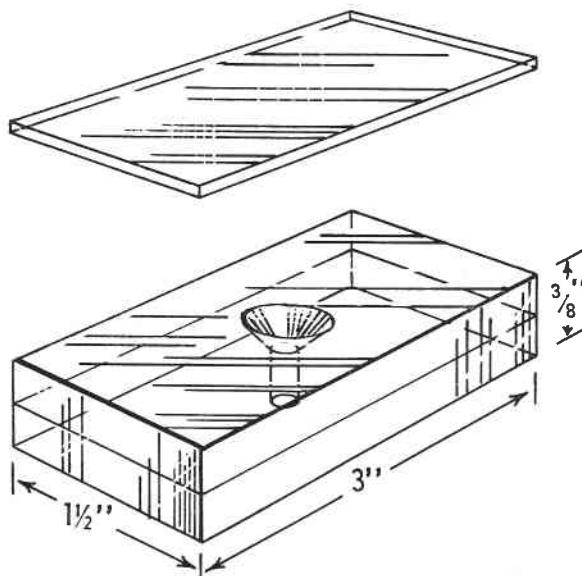


Fig. 1. Cage for rearing prey populations beginning with one female.