

NOTES ON THE NORTH AMERICAN SPECIES OF
HIPPODAMIA (COLEOPTERA).¹

BY P. H. TIMBERLAKE,

HONOLULU, T. H.

The writer has been studying our North American species of *Hippodamia* for several years past, and presents the results of his studies at the present time as a solicitation for additional material much needed to complete the work. Our species have been studied from a new angle with gratifying result, namely by the aid of characters residing in the male genitalia. The writer has carried on extensive breeding work also with several of the species, which has thrown much light on the extent of variation in the thoracic and elytral markings.

Before proceeding further it might be well to review briefly the work of other writers during the last two decades. Colonel Casey has produced two important articles² on our species, and has done much in elucidating and describing not a few of the western forms. Although his work can not be considered conservative and is not entirely free from errors of identification it has done much to stimulate other workers. It is apparent now that some of his species are merely forms or geographical races which may be recognized as subspecies. Mr. Leng³ on the other hand appears to the writer to be somewhat too conservative in his treatment of the species so that the actual status of our forms in a general way lies somewhere between the extremes set up respectively by him and Colonel Casey. Another important contribution to the knowledge of our species is R. A. Johnson's "Determinate Evolution in the Color Pattern of the Lady-beetles."⁴ Mr. Johnson attacks the subject from the standpoint of the experimental biologist and is much less successful in his taxonomic treatment. On this account his treatment of *Hippodamia con-*

¹ Contributions from Experiment Station, H. S. P. A.

² JOURN. N. Y. ENTOM. SOC., Vol. 7, pp. 61-169, June, 1899; Canad. Entom., Vol. 40, pp. 393-421, Nov., 1908.

³ JOURN. N. Y. ENTOM. SOC., Vol. 11, pp. 35-45, pl. 4, Mar., 1903.

⁴ Carnegie Inst. Washington, Publ. No. 122, pp. i-iv, 1-104, figs. 1-92, June, 1910.

vergens is preposterous and the biological data and conclusions drawn therefrom are vitiated by the fact that he confused at least six valid species under this name, viz., *convergens*, *moesta*, *extensa*, *15-maculata*, *5-signata* and *lecontei*. His treatment of the other species is more conservative and for the most part not open to this objection.

It is also necessary to consider the status of the genus *Spilota* Billberg⁵ to which Mr. H. S. Barber has called the writer's attention as a possible substitute for *Hippodamia*. Apparently this genus was validly proposed and is open to use. Billberg included at least eight described species with references to Schönherr⁶ although he gave no description. The genus was proposed as a segregate of *Coccinella* and included those species known to Billberg which on the whole were more slender and spotted than those remaining in *Coccinella*. So far as the writer can determine this was practically Billberg's sole conception of his genus, sufficiently vague as it may seem. The genus has never been recognized or brought into use by subsequent authors and it seems advisable to reach some conclusion at this time concerning its status, whether to suppress it definitely as a synonym if that is possible, or let it replace some later name.

In selecting a genotype for *Spilota* it seems best to pursue the same course that would be applicable if it had been long in use, that is to consider all subsequent genera as its segregates. This procedure in some cases may distort the author's conception of the genus in question, but on the other hand is less liable to upset the current nomenclature. Pursuant to this course we find that after *Anisosticta*, *Megilla*, *Hippodamia*, *Adonia* and *Aphidecta* with their validly included species have been excluded from consideration there is only one species left in Billberg's list, viz., *11-punctata*. This species is therefore definitely chosen as the genotype of *Spilota* Billberg, although it may be observed that the first species of the list, *19-punctata*, the genotype of *Anisosticta*, probably conforms the most closely to Billberg's conception. *11-punctata* of Billberg and Schönherr is evidently Linné's species⁷ and a slightly aberrant *Coccinella*, so that *Spilota* thus sinks as a synonym of *Coccinella* Linné. This may not seem quite just when *Spilota* was proposed as a segregate

⁵ Enumeratio Insectorum in Museum Billberg, p. 61, 1820.

⁶ Synonyma Insectorum, Vol. 1, pt. 2, p. 185, 1808.

⁷ Systema Naturæ, p. 366, 1758.

of *Coccinella* and included species which have been relegated to other genera by all modern writers, yet Billberg's work was too indefinite and obscure to be taken too seriously, and the writer feels that few workers will object to seeing the name suppressed, instead of being revived for such long-established genera as either *Anisosticta* or *Hippodamia*. Billberg's use of the name, however, invalidates *Spilota* Burmeister, 1844, a segregate of *Anomala*, which must sink as a homonym.

Hippodamia Chevrolat.

Hippodamia Chevrolat, in Dejean's Cat. Coleop., ed. 1833, p. 432, 1833 (or 1834?).

Type of genus: *Coccinella 13-punctata* Linné, designated by Crotch.⁸

Our North American species may be divided into four natural groups by means of the male genitalia as follows:

13-punctata group. Ædeagus slender, bent almost double upon itself, a little thickened just beyond the bend, its dorsal, subapical flaps small and membranous; lateral lobes of the theca (tegmen of Sharp and Muir⁹) unusually large and wide; the posterior lobe of theca abruptly bent downward at the apical third and provided with a distinct chitinized plate beneath, which bears a rather long, linear lobe on each side at the posterior corners, and a pair of median lobes, much longer, reaching nearly to the apex of the theca and frequently after drying bent abruptly outward at their middle.

Parenthesis group. Ædeagus slender, moderately bent in a half circle or a little more, enlarged or somewhat thickened at the dorsal, subapical flaps which are triangular in shape and rather well chitinized; lateral lobes of theca slender; the posterior lobe of theca rather small and narrow, its apex produced into a slender, simple or barbed point.

Convergens group. Ædeagus slender, moderately curved, not thickened or hardly so at the dorsal, subapical flaps, which are more or less membranous and linear; lateral lobes of theca slender; the posterior lobe of theca generally wider and more depressed than in the preceding group, its apex merely acute or produced into a slender, simple point.

⁸ Revision of the Coccinellidæ, p. 94, 1874.

⁹ The Comparative Anatomy of the Male Genitalia Tube in Coleoptera, Trans. Entom. Soc. London, 1912, pp. 477-642, pl. 42-78, Dec., 1912.

Glacialis group. Ædeagus much thickened throughout, generally bent nearly double upon itself, the dorsal, subapical flaps strongly chitinized except at apex, and undergoing various modifications in shape, but never exactly as described in the preceding groups; lateral lobes of theca slender; the posterior lobe of theca rather large, broad and considerably deeper than in the *convergens* group, its apex with an obliquely inclined portion limited by a strongly developed transverse keel, which is either straight or deeply emarginate.

13-punctata Group.

1. *Hippodamia tibialis* (Say).

Coccinella tibialis Say, Journ. Acad. Nat. Sci. Philadelphia, Vol. 4, p. 94, 1824.

Hippodamia 13-punctata of American writers, not Linné.

This is the only species of the group in North America and although very closely allied to *13-punctata* (Linné) of Europe it seems to be sufficiently distinct. In *13-punctata* from Spandau, Prussia (Th. Pergande), the posterior lobe of the theca is abruptly widened close to the apex, its sides in dorsal view meet in a right angle at the apex and are slightly emarginate. In *tibialis* the posterior lobe is only slightly and gradually widened near the apex, its sides are straight and meet more acutely at the apex. Strange as it may seem at first thought, a male from Gifu, Japan (Y. Nava), exhibits the *tibialis* character slightly more accentuated even than in North American specimens. The writer has studied the genitalia of *tibialis* from St. Anthony Park, Minnesota (R. A. Vickery); Madison, South Dakota (R. A. Vickery); Tower City, North Dakota (Miriam W. Reeves) and from Taylorsville, Utah (P. H. Timberlake).

Parenthesis Group.

2. *Hippodamia parenthesis* (Say).

Coccinella parenthesis Say, Journ. Acad. Nat. Sci. Philadelphia, Vol. 4, p. 93, 1824.

Coccinella tridens Kirby, Fauna borealis-Americana, pt. 4, p. 229, 1837.

In this species the posterior lobe of the theca is not compressed beneath and its apex is produced into a short, barbed point. The genitalia have been examined in specimens from West Springfield, Massachusetts (H. E. Smith); Hagerstown, Maryland (J. A. Hyslop); Tower City, North Dakota (Miriam W. Reeves); Fort

Collins, Colorado (C. R. Jones), and Murray, Utah (W. L. Bevon). The species is remarkably constant on the whole throughout its range, and there seems to be no tendency toward the formation of geographical races.

3. *Hippodamia lunatomaculata* Motschulsky.

Hippodamia lunatomaculata Motschulsky, Bull. Soc. Imp. Nat., Moscow, Vol. 18, p. 382, pl. 7, fig. 8, 1845.

Hippodamia parenthesis in part of Crotch, Casey, Leng, Johnson, etc.

SUBSPECIES OR VARIETIES:

Hippodamia apicalis Casey, Journ. N. Y. Entom. Soc., Vol. 7, p. 81, 1899.

Hippodamia parenthesis expurgata Casey, Canad. Entom., Vol. 40, p. 400, 1908.

This species is distinguished from *parenthesis* by having the posterior lobe of the theca strongly compressed beneath, its apex truncate with a slender, median, unbarbed point. The writer has examined specimens of this species from Tillamook, Wilsonville and Forest Grove, Oregon (Creel and Rockwood); Salt Lake City, Utah (P. H. Timberlake); Evenston and Lyman, Wyoming (E. J. Vosler). A species as found in the lowlands of the Pacific Coast in California and Oregon has been confused with *parenthesis*, as the elytral markings are practically the same, although there is some difference in the thoracic markings as pointed out by Johnson. In the interior and Rocky Mountain region it has become differentiated into a sufficiently distinct geographical race or subspecies, described by Casey under the name of *apicalis*. Casey's *expurgata* on the other hand seems to the writer to be hardly more than an individual variation, although it may possibly have become stabilized in some restricted localities. A fairly large proportion of the specimens from Tillamook, Oregon, are of this variety, the rest being typical *lunatomaculata*, with intermediate forms.

The writer has crossed *parenthesis* from Utah with *lunatomaculata* from Oregon and has found the union perfectly fertile in all cases. The genitalia of the resulting offspring is almost exactly intermediate between those of the parent species. Although the range of these two species overlap considerably in the Rocky Mountain region there is no evidence to show that they thus interbreed in nature. Since male *Hippodamia* are not at all adverse to mating with any female they find, even if belonging to another species, it would be too much

to suppose that mating between *parenthesis* and *lunatomaculata apicalis* never takes place in nature. Such unions, however, are probably relatively rare, and in the case of any one female its results might well be nullified by the prepotency of the much more frequent intraspecific matings.

The writer has also examined the genitalia of a third species belonging to this group from Mineral King, Tulare County, California, in the collection of Dr. E. C. Van Dyke, but the specimen is not at hand for description. It is a heavily vittate form intermediate between typical *apicalis* and *lengi* Johnson, and may prove to be the latter species. Much more material in this group is needed, however, from the mountains of California and other parts of the West before our knowledge of *lengi* and its variations is complete.

Convergens Group.

The species allied to *convergens*, so far as their genitalia have been studied, may be separated as follows:

1. Posterior lobe of theca without a small, acute tooth on each side near apex. 2
Posterior lobe of theca with a small, acute tooth on each side near apex, beyond which it slopes downward and backward to an acute, slightly produced point, and is somewhat longitudinally furrowed on its dorsal surface, the concavity being most pronounced between the subapical teeth 4. *sinuata* Mulsant.
2. Posterior lobe of theca without a transverse carina 4
Posterior lobe of theca with a transverse carina a little beyond the middle 3
3. Posterior lobe narrow, triangularly tapering from base to apex; its dorsal surface in front of carina slightly concave, the surface beyond the carina sloping downward and produced into a rather long, slender process as seen from above, but in side view continuous with the strongly compressed concave sides of the under surface.
5. *15-maculata* Mulsant.
Posterior lobe rather short and wide, its lateral margins as seen from above slightly convex to near the apex, then abruptly narrowed and produced into a short, acute point; its dorsal surface in front of the carina somewhat concave, but beyond the carina sloping downward to the apex; the under surface somewhat compressed especially towards the apex. 6. *cockerelli* Johnson.
4. Posterior lobe of theca comparatively large or about as long as the basal part 5

Posterior lobe short and thick or about one-half as long as the basal part of theca, its dorsal surface plane except on the apical part where it is slightly convex; the lateral margins parallel until near the apex, where they abruptly converge and meet in an acute point; the under surface not compressed and provided with a short, rounded membranous flap on each side near the base, which usually projects so as to be visible in dorsal view7. **lecontei** Mulsant.

5. Posterior lobe of theca rather narrow, with subparallel margins arcuately converging near apex which is produced into a short, rather slender process; the dorsal surface of lobe somewhat convex, the under surface depressed; the dorsal, subapical flaps of ædeagus obliquely truncate at apex, the apical portion of ædeagus about twice as long as the flaps.

8. **convergens** Guérin.

Posterior lobe of theca wider than in *convergens*, the lateral margins as seen from above moderately arcuate, the apex produced into a rather long, slender process; the dorsal, subapical flaps of ædeagus rounded at apex, the apical portion of ædeagus about one-half longer again than the flaps9. **moesta** Leconte.

4. **Hippodamia sinuata** Mulsant.

Hippodamia sinuata Mulsant. Spécies des Coléoptères trimères sécuripalpes, p. 1011, 1851.

Hippodamia trivittata Casey, Journ. N. Y. Entom. Soc., Vol. 7, p. 81, 1899.

SUBSPECIES OR VARIETIES:

Hippodamia spuria Leconte, Proc. Acad. Nat. Sci., Philadelphia, vol. 13, p. 358, 1861.

Hippodamia complex Casey, ibidem, p. 80.

Hippodamia crotchii, Casey, ibidem, p. 80.

Hippodamia americana Casey (not Crotch), ibidem, p. 80.

This species is decidedly variable and it is divisible so far as it has been studied by the writer into three well-marked subspecies. One, the typical *sinuata* (*trivittata* Casey) is found in the marshes of San Francisco Bay and along the Sacramento River in California. The second is the Oregon race described by Leconte as *spuria*, distinguished by the heavy, more or less transverse postmedian spots and the expanded sutural spot. *Crotchii* and *complex* of Casey seem to be individual variations connecting with typical *sinuata*, as no proof has been advanced to show that they have become established races. The third race is that found in Utah and Colorado, distinguished from *spuria* by the paler coloration, being generally suffused with yellowish in life, the scutellar spot narrow and often

prolonged to the middle or beyond, the humeral, postmedian and subapical spots small and generally separate, although the postmedian pair are not infrequently united. This subspecies has not been named apparently and may be called *Hippodamia sinuata disjuncta* n. subsp., described from thirty-one type and paratype specimens from Salt Lake City and Murray, Utah. Casey described it under the name of *spuria* and his *americana* (not Crotch) seems hardly more than an individual variation. The type of *disjuncta* will be placed in the U. S. National Museum.

5. *Hippodamia 15-maculata* Mulsant.

Hippodamia 15-maculata Mulsant, *Spécies des Coléoptères trimères sécuripalpes*, p. 20, 1851.

This species which is often confused with *convergens* has the genitalia very distinct from any other species. Two males have been examined, one from Badger, Nebraska (W. C. Colt), and the other from Batchawaung Bay, Lake Superior, Ontario (Hubbard and Schwarz).

6. *Hippodamia cockerelli* Johnson.

Hippodamia cockerelli Johnson, *Carnegie Inst. Washington, Publ.* 122, p. 49, fig. 33, 1910.

The type of this species in the U. S. National Museum has been studied and it has been the only specimen examined.

Oregonensis Crotch and *dispar*, *lilliputana* and *puncticollis* of Casey have not been studied. They all seem to be closely related, and some of them if not all are likely to prove to be forms of one species to which *cockerelli* may also belong.

7. *Hippodamia lecontei* Mulsant.

Hippodamia lecontei Mulsant, *Spécies des Coléoptères trimères sécuripalpes*, p. 1010, 1851.

This species seems to be distributed throughout the Rocky Mountain region, but does not appear to be readily divisible into geographic races. Specimens with the basal bar broken up into a scutellar and the humeral spots occur in most localities apparently in about equal numbers with the form having the basal bar complete. *Mulsanti* Leconte, *abducens* Casey and *bowditchi* Johnson are probably forms of this species. It is frequently mistaken for *H. 5-signata* (Kirby).

8. *Hippodamia convergens* Guérin.

Hippodamia convergens Guérin, Iconogr. Regne Animal, p. 321, 1846.

This species throughout its vast range from the Atlantic to the Pacific and from Washington and Massachusetts southward into Mexico is remarkably constant and the writer has not discovered the slightest tendency toward the formation of geographic races. A small percentage of the beetles in any part of its range has the elytral spots reduced or even altogether absent, and much more rarely the thoracic discal spots are absent. Another uncommon variation is that in which the postmedian spots are somewhat enlarged and united, and sometimes even the outer postmedian spot may be found jointed with the subapical spot. The writer has never seen an individual in which the inner postmedian and subapical spots have become united, but this variation presumably occurs occasionally, and Casey's *juncta*, therefore, is probably nothing but an individual variant of *convergens*. On one occasion at Salt Lake City, Utah, a pair of *convergens* were reared from larvæ collected on a sunny bank in the early spring, which have the scutellar and postscutellar spots united and enlarged to form a broad subcrescentiform band extending back nearly to the inner postmedian spots. From these beetles a large series was bred, which contained both normally and abnormally marked individuals. In some of the latter the band has become jointed with the humeral spots and in others with the inner postmedian spots. All these variations probably occur but little more frequently if at all in the Western States than in the Eastern. Johnson's statement, therefore, that *convergens* "flies to pieces" in the West is entirely erroneous, and based upon his confusion with *convergens* of some five other species.

9. *Hippodamia moesta* Leconte,

Hippodamia moesta Leconte, Proc. Acad. Nat. Sci. Philadelphia, Vol. 7, p. 19, 1854.

This species which is apparently confined to the North West Coastal region is most closely related to *convergens* in the genitalic characters. The writer has examined one male from Monroe, Washington, in the collection of Dr. E. C. Van Dyke.

Glacialis Group.

The four species belonging in this group may be separated as follows:

1. The transverse keel near apex of the posterior lobe of theca deeply emarginate2

The transverse keel not emarginate; the posterior lobe of theca rather thick dorsoventrally, more nearly terete than in the other groups, tapering gradually from the base to the keel and then more abruptly to the acute apex; its dorsal surface rather flat, the apical portion sloping downward and backward from the margin of the keel.....10. **5-signata** (Kirby).

2. Emargination of the transverse keel rounded.....3

Emargination of the transverse keel acutely angled; the posterior lobe of theca of the same general shape as in *5-signata*, but as seen from above the lateral margins are slightly emarginately rounded and somewhat expanded at the ends of the keel; its dorsal surface longitudinally grooved, the area enclosed within the emargination of the keel in the form of a rather deep, rounded depression; the apical portion obliquely inclined from the margin of the keel, the apex of the emargination reaching nearly two-thirds of the distance to the apex of the lobe.

11. **extensa** Mulsant.

3. Posterior lobe of theca much as in *5-signata*, but a little wider, more depressed, less tapering toward the apex and wider at the transverse keel; its dorsal surface slightly longitudinally grooved in the middle on the basal part, the area enclosed by the keel somewhat obliquely inclined, but hardly concave; the apical portion obliquely inclined from the margin of the keel, the apex of the emargination reaching about one-half of the distance to the apex of the lobe; dorsal flaps of ædeagus linear, rounded and membranous at apex, but heavily chitinized at base, the apical part of ædeagus nearly three times as long as the flaps.

12. **glacialis** (Fabricius).

Posterior lobe of theca as in *glacialis* except that the keel is a little more deeply and ^{more} broadly rounded emarginate, the lateral margins as seen from above nearly parallel as far as the obliquely inclined apical part; dorsal flaps of ædeagus chitinized throughout, a little broader toward the base, and somewhat emarginate on the inner side just before the apex, the apical part of ædeagus about twice as long as the flaps.

13. **Hippodamia** sp. indet.

10. **Hippodamia quinquesignata** (Kirby).

Coccinella 5-signata Kirby, Fauna borealis-Americana, pt. 4, p. 230, pl. 7, fig. 1, 1837.

This species is extremely variable and has become segregated into numerous geographical races of which the following have been studied:

Hippodamia coccinea Casey, Canad. Entom., vol. 40, p. 395, 1908.

Hippodamia vernix Casey, Journ. N. Y. Entom. Soc., vol. 7, p. 79, 1899.

Hippodamia uteana Casey, *Canad. Entom.*, vol. 40, p. 397, 1908.

Hippodamia convergens, var. *caseyi* Johnson, *Carnegie Inst.*, Washington, Publ. 122, p. 21, 1910.

Hippodamia ambigua Leconte, *Proc. Acad. Nat. Sci.*, Philadelphia, vol. 6, p. 131, 1852.

Hippodamia obliqua Casey, *Journ. N. Y. Entom. Soc.*, vol. 7, p. 79, 1899.

Hippodamia politissima Casey, *ibidem*, p. 80.

Hippodamia punctulata Leconte, *ibidem*, p. 131.

Hippodamia ambigua of authors, not Leconte.

Besides those enumerated above it is likely that *subsimilis* Casey and perhaps *leporina* Mulsant belong here.

Of the typical *5-signata* only one female from Escanaba, Michigan (Hubbard and Schwarz) has been studied, but the pronotal and elytral markings are so similar to certain of the western subspecies and varieties that there is hardly a question but what it is correctly placed with them. This and the subspecies of the Rocky Mountain region are characterized by the heaviness of the elytral markings in varying degrees and in some forms by the brilliancy of the ground color. Of *coccinea* a male from Buena Vista, Colorado (Hubbard and Schwarz) has been studied. Of *vernix* specimens from Mullan and Helena, Montana (Hubbard and Schwarz); Moccasin, Montana (S. J. Snow); and Buhl, Idaho (L. P. Rockwood) have been examined. Specimens of *uteana* have been studied from Enterprise, Utah (T. R. Chamberlin) and Kaysville and Salt Lake City, Utah (P. H. Timberlake).

Uteana was found in the vicinity of Salt Lake City quite infrequently during the summers of 1913 to 1915. None was seen in the summer of 1913, one male only was found on alfalfa in the fall of 1914, but in July, 1915, some half a dozen specimens were discovered among great numbers of *convergens* and *sinuata disjuncta* on the flowers of poison hemlock infested with *Aphis heraclei* Koch. All that were found in 1915 were brought to the laboratory and kept under observation for weeks. It is interesting to note that two or three of the females proved to be infertile when captured, thus substantiating the rarity of the species in that locality. From these specimens a good series was reared, showing an interesting amount of variation. Some of the beetles, except for the more brilliant coloration

tion and somewhat smaller size, were rather like typical *5-signata*. The single specimen taken in 1914, however, verged toward the subspecies *caseyi* of Washington. *Uteana* also ranges westward to the mountains of California, as the form figured by Essig in his Injurious and Beneficial Insects of California, under the name of *lecontei*, seems to belong here.

As we proceed westward we find the forms of *5-signata* characterized by a gradual obliteration of the elytral markings, until on the Pacific Coast we encounter the spotless subspecies, *ambigua* and *punctulata*. In the case of *ambigua* this condition is coupled with enlargement of the white discal marks on the pronotum, and with the reduction or even the total obliteration of these marks in the case of *punctulata*. In the interior valleys of Washington, however, we find the small-spotted subspecies, *caseyi*, in which the spots are arranged much as in *convergens*. So similar indeed is the arrangement, shape and size of the spots that some specimens cannot be separated from *convergens* with any degree of certainty, unless the student takes cognizance of the male genitalia. During the summer of 1915 the writer crossed *uteana* with *punctulata* and thus produced a form similar to *caseyi*, but with the elytral spots still further reduced or in part absent. The scutellar and postscutellar spots proved to be the most constant in the hybrid offspring.

Of *caseyi* the writer has examined numerous specimens from Pullman, Washington (G. I. Reeves), and Wenatchee, Washington (E. J. Newcomer). This form, as mentioned above, might easily pass for *convergens*. Mr. Newcomer found it and *convergens* about equally abundant at Wenatchee. *Ambigua* is abundant in parts of Oregon and the writer has seen many specimens from Forest Grove, McMinnville, Wilsonville and Millsboro of that State (Creel and Rockwood), and one specimen from Vancouver, Washington (G. I. Reeves), which belongs here rather than with *caseyi*. *Punctulata* is extremely common in the lowlands of California and the writer has examined large series from Berkeley, Milbræ, Sacramento, Pasadena, Whittier, San Diego, etc. (P. H. Timberlake). It has been called *ambigua* universally in recent years, although the true *ambigua* is the subspecies later redescribed by Casey under the name of *obliqua*, of which *pollitissima* seems to be either a synonym or a minor variation.

11. *Hippodamia extensa* Mulsant.

Hippodamia extensa Mulsant, *Spécies des Coléoptères trimères sécuripalpes*, p. 15, 1851.

This species probably has the most limited range of any North American species, as apparently it is confined to the salt marshes of San Francisco Bay region, California. The writer has examined specimens from Alameda and Milbræ (E. C. Van Dyke).

12. *Hippodamia glacialis* (Fabricius).

Coccinella glacialis Fabricius, *Systema Entomologiæ*, p. 80, 1775.

Coccinella abbreviata Fabricius, *Mantissa Insectorum*, p. 54, 1787.

Coccinella remota Weber, *Observationes entomologicæ*, p. 49, 1801.

This common Eastern species has been examined from Melrose Highlands and Forest Hills, Massachusetts (P. H. Timberlake); West Springfield, Massachusetts (H. E. Smith); Salisbury, North Carolina (R. A. Vickery); and Tower City, North Dakota (Miriam W. Reeves).

13. *Hippodamia* species.

One male from Soda Springs, Idaho, remains undetermined. It runs to *subsimilis* in Casey's tables, and may possibly be that species, although *subsimilis* on the other hand might as likely prove to be a form of *5-signata*.

ON THE GENUS RHODESIELLA C. F. ADAMS (DIPTERA).

BY M. BEZZI,

TURIN, ITALY.

In 1905 Mr. C. F. Adams erected the genus *Rhodesiella* for a small South African fly collected in Rhodesia, near Salisbury, January, 1901, by Mr. Frank L. Snow. The new genus was placed in the family Agromyzidæ, but nothing was said about its natural affinities; the name has subsequently appeared only twice in the dipterological literature, besides the citation in the Zoölogical Record for 1906, vol. XLIII, p. 391. It was conserved by me in the family Agromyzidæ in my Catalog of the African Diptera (1908, p. 194), but Prof. Melander has removed it to the Milichiinæ in his table of the genera of the subfamily (1913, p. 237).



Timberlake, P. H. 1919. "Notes on the North American Species of *Hippodamia* (Coleoptera)." *Journal of the New York Entomological Society* 27, 162–174.

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