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TB55: Food Lists of Hippodamia (Coleoptera: Coccinellidae)

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ABSTRACT

Food lists for *Hippodamia tredecimpunctata* (Linnaeus) and the genus *Hippodamia* as reported in the literature are given. A complete list of citations is included.

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W. L. Vaundell[1] and R. H. Storch

The larval and adult coccinellids of the subfamily Coccinellinae, except for the Psylloborini, are predaceous (Arnett, 1960). The possible use of lady beetles to aid in the control of arthropod pests has had cosmopolitan consideration, for example, Britton 1914, Lipa and Sem'yanov 1967, Rojas 1967, and Sacharov 1915. Although prey are mainly aphids and coccids, lady beetles may also feed upon other arthropods. The biology of the family Coccinellidae has been summerized by Balduf 1935, Clausen 1940, Hagen 1962, and Hodek 1967.

Hippodamia parenthesis and *Hippodamia tredecimpunctata* are two of the species of coccinellids which feed on potato infesting aphids in Maine. In attempting to determine the effect of these coccinellids on the populations of potato infesting aphids, it is necessary to know which other arthropods would serve as possible food sources. Lady beetles have certain food preferences, and the food source has an effect on development. These factors, however, were not considered in this work.

A complete literature survey was made on the genus *Hippodamia*. We summarize herein the results of a survey on the prey reported for *H. tredecimpunctata* (Table 1) and the genus *Hippodamia* (Table 2). This survey was accomplished by reviewing all papers citing beetles in the genus *Hippodamia* listed in volumes 1-57 of The Review of Applied Entomology and examination of some of the older literature.

In the tables the accepted scientific and common names are given. The number of the reference from the Literature Cited is given in parenthesis. If the scientific name used in the reference is different from the accepted scientific name, the name used in the reference follows the common name and is placed in brackets. A few articles were not available for examination. The source for these articles is given in parenthesis following the citation of the article. The sources for names presented in the tables are as follows: Palmer (1952) for Aphididae, Blickenstaff (1970) for common names, Borror and DeLong (1970) for family names, Baker and Wharton (1952) for Acarina, MacGillivray (1921) for Coccidae, and Stone *et al* (1965) for Diptera. Some scientific names have been changed since the above sources for

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names were published. The current scientific names which are accep by most workers in a particular field are used whenever possible.

TABLE 1

FOOD LIST FOR *HIPPODAMIA TREDECIMPUNCTATA*

Arachnida
Acarina
Tetranychidae

Panonychus ulmi (Koch), European red mite, [*Metatetrany ulmi*], (141)
Tetranychus urticae Koch, two spotted spider mite, [*Tetrany telarius*], (141)

Insecta
Hemiptera
Lygaeidae

Blissus leucopterus (Say), chinch bug, (81)

Homoptera
Aphididae
Aphinae
Aphini

Acyrthosiphon pisum (Harris), pea aphid, (15, 44, 161)
Acyrthosiphon pisum (Harris), pea aphid, [*Illinoia pisi*], (6
Acyrthosiphon pisum (Harris), pea aphid, [*Macrosiphum pis* (63, 147)
Aphis fabae Scopoli, bean aphid, (151, 161)
Aphis frangulae Kaltenbach, (66)
Aphis gossypii Glover, cotton or melon aphid, (15, 151, 178)
Aphis nasturtii Kaltenbach, buckthorn aphid, (66)
Aphis pomi DeGeer, apple aphid, (151)
Brevicoryne brassicae (Linnaeus), cabbage aphid, (36)
Brevicoryne brassicae (Linnaeus), cabbage aphid, [*Aphis bra cae*], (151)
Coloradoa rufomaculatum (Wilson), [*Rhopalosiphum rufomac tum*], (141)
Lipaphis erysimi (Kaltenbach), turnip aphid, [*Rhopalosiphum dobrassicae*], (36)
Macrosiphum avenae (Fabricius), English grain aphid, (1)
Macrosiphum avenae (Fabricius), English grain aphid, [*Mac rosiphum granarium*], (15, 137)
Macrosiphum euphorbiae (Thomas), potato aphid, [*Macrosipl solanifolii*], (89)
Myzus cerasi (Fabricius), black cherry aphid, (150, 151)
Myzus persicae (Sulzer), green peach aphid, (36)
Nearctaphis bakeri (Cowen), clover aphid, [*Anuraphis bakeri*] 168)
Rhopalosiphum maidis (Fitch), corn aphid, (1, 155, 161)
Rhopalosiphum maidis (Fitch), corn aphid, [*Aphis maidis*],

Rhopalosiphum nymphaeae (Linnaeus), waterlily aphid, [*Myzus nymphaeae*], (36)
Rhopalosiphum padi (Linnaeus), choke-cherry grain aphid, (1)
Rhopalosiphum padi (Linnaeus), choke-cherry grain aphid, [*Rhopalosiphum avenae*], (87)
Schizaphis graminum (Rondani), greenbug, [*Toxoptera graminum*], (120, 151, 152, 171)

Cicadellidae
Empoasca fabae (Harris), potato leafhopper, [*Empoasca mali*], (57)

Fulgoridae
Phylloscelis atra Germar, (160)

Psyllidae
Paratrioza cockerelli (Sulc), potato psyllid, (97, 140)

Lepidoptera
Olethreutidae
Grapholitha molesta (Busck), oriental fruit moth, (141)

Pyralidae
Ostrinia nubilalis (Hubner), European corn borer, (170)

Coleoptera
Chrysomelidae
Lema oryzae (Kuwayama), (34, 104, 105)
Leptinotarsa decemlineata (Say), Colorado potato beetle, (15)

TABLE 2

FOOD LIST FOR THE GENUS *HIPPODAMIA*

Arachnida
Acarina
Tetranychidae
Oligonychus pratensis (Banks), Banks grass mite, (46)
Oligonychus pratensis (Banks), Banks grass mite, [*Paratetranychus pratensis*], (110)
Panonychus citri (McGregor), citrus red mite, [*Paratetranychus citri*], (47)
Panonychus ulmi (Koch), European red mite, [*Metatetranychus ulmi*], (141)
Tetranychus cinnabarius (Boisduval), carmine spider mite, [*Tetranychus telarius*], (123)
Tetranychus cinnabarius (Boisduval), carmine spider mite, [*Tetranychus telarius*], (114, 115)
Tetranychus urticae Koch, two-spotted spider mite, [*Tetranychus*

Chilopoda
Geophilomorpha
Geophilidae

Geophilus sp., (62)

Insecta
Thysanoptera
Thripidae

Caliothrips fasciatus (Pergande), bean thrips, [*Hercothrips fa*
(8)
Frankliniella tritici (Fitch), flower thrips, (186)
Tainiothrips inconsequens (Uzel), pear thrips, (51)

Hemiptera
Lygaeidae

Blissus leucopterus (Say), chinch bug, (60, 62, 81, 90, 182)

Miridae

Lygus hesperus Knight, (26)
Pseudomoscelis seriatus (Reuter), cotton fleahopper, [*Psallus seriatus*], (142)

Tingidae

Gargaphia solani Heidemann, eggplant lace bug, (58, 59)

Homoptera
Aphididae
Aphinae
Aphini

Acyrthosiphon pisum (Harris), pea aphid, (39, 44, 161, 17
Acyrthosiphon pisum (Harris), pea aphid, [*Illinoia pisi*], (
73, 77, 78, 129)
Acyrthosiphon pisum (Harris), pea aphid, [*Macrosiphum o*
chis], (18, 99, 100, 125, 166)
Acyrthosiphon pisum (Harris), pea aphid, [*Macrosiphum p*
(58, 63, 65, 72, 96, 101, 134, 147, 172)
Aphis cornifoliae Fitch, dogwood aphid, (134)
Aphis fabae Scopoli, bean aphid, (26, 161)
Aphis fabae Scopoli, bean aphid, [*Aphis rumicis*], (33, 38,
78, 79, 88)
Aphis fabae Scopoli, bean aphid, [*Aphis carbocolor*], (134)
Aphis forbesi Weed, strawberry root louse, (111)
Aphis frangulae Kaltenbach, (66)
Aphis gossypii Glover, cotton or mellon aphid, (2, 7, 23, 28, 3
75, 106, 117, 121, 122, 132, 134, 156, 175, 178, 184, 185
Aphis gossypii Glover, cotton or melon aphid, [*Aphis cucum*
(86)
Aph's helianthi Monell, sunflower aphid, (134)
Aph's helianthi Monell, sunflower aphid, [*Aphis oxybaphi*],
Aphis heraclella Davis, wild parsnip aphid, [*Aphis heraeclei*],
Aphis lutescens Monell, oleander and milkweed aphid, [*Aphis*
(33)
Aphis medicaginis Koch, cowpea aphid, (134)

Aphis nasturtii Kaltenbach, buckthorn aphid, (66)
Aphis oenotherae Oestlund, evening primrose aphid, (134)
Aphis pomi DeGeer, apple aphid, (3, 78, 134, 149, 151, 176)
Aphis rubicola Oestlund, (162)
Aphis spiraecola Patch, spirea aphid, (35, 63, 148, 176, 184)
Aphis setariae (Thomas), rusty plum aphid, (134)
Aphis viburni Scopoli, (52, 53)

Brevicoryne brassicae (Linnaeus), cabbage aphid, (36, 139, 158)
Brevicoryne brassicae (Linnaeus), cabbage aphid, [*Aphis brassicae*], (33, 53, 58, 84, 134, 151)
Bipersona torticauda (Gillette), red thistle aphid, [*Aphis torticauda*], (134)

Capitophorus elaeagni (DeGeer), oleaster thistle aphid, [*Myzus braggi*], (95)
Capitophorus elaeagni (DeGeer), oleaster thistle aphid, [*Rhopalosiphum braggi*], (134)
Capitophorus elongatus Knowlton, (101)
Coloradoa rufomaculatum (Wilson), [*Rhopalosiphum rufomaculatum*], (141)

Dactynotus ambrosiae (Thomas), brown ambrosia aphid, [*Macrosiphum ambrosiae*], (134)
Dactynotus eoessigi (Knowlton), red hollyhock aphid, [*Macrosiphum eoessigi*], (101)
Dactynotus rudbeckiae (Fitch), goldenglow aphid, [*Macrosiphum rudbeckiae*], (58, 134)

Fimbriaphis scammelli Mason, [*Myzus scammelli*], (64)

Hayhurstia atriplicis (Linnaeus), boat-gall aphid, [*Aphis atriplicis*], (134)
Hyadaphis foeniculi (Passerini), honeysuckle or parsnip aphid, [*Rhopalosiphum melliferum*], (78)
Hyadaphis foeniculi (Passerini), honeysuckle or parsnip aphid, [*Rhopalosiphum pastinaceae*], (134)
Hyalopterus pruni (Geoffroy), mealy plum aphis, [*Hyalopterus arundinis*], (33, 38, 40, 134)

Kakimia cynosbati (Oestlund), dogberry aphid, [*Macrosiphum cynosbati*], (134)

Lipaphis erysimi (Kaltenbach), turnip aphid [*Rhopalosiphum pseudobrassicae*], (36, 77, 78, 112, 139)
Lipaphis erysimi (Kaltenbach), turnip aphid, [*Aphis pseudobrassicae*], (22, 39, 130, 131)

Macrosiphum avenae (Fabricius), English grain aphid, (1)
Macrosiphum avenae (Fabricius), English grain aphid, [*Macrosiphum granarium*], (137)
Macrosiphum cockerelli Hottes, Hottes green goldenglow aphid, (102)

Macrosiphum euphorbiae (Thomas), potato aphid, [*Macrosiph solanifolii*], (58, 89, 189, 190)
Macrosiphum gaurae Williams, (134)
Macrosiphum rosae (Linnaeus), rose aphid, (33, 134, 153, 178
Myzus cerasi (Fabricius), black cherry aphid, (52, 70, 107, 13
Myzus persicae (Sulzer), green peach aphid, (26, 36, 39, 49, 58 101, 139, 157, 196)

Nearctaphis bakeri (Cowen), clover aphis, [*Anuraphis bakeri* (93, 168)
Nearctaphis bakeri (Cowen), clover aphis, [*Aphis bakeri*], (20, 21)

Ovatus menthae (Buckton), [*Phorodon menthae*], (101)

Phorodon humuli (Shrank), hop aphid, (33, 53, 80, 103, 123, 136)

Rhopalosiphum braggi (Gillette), (134)
Rhopalosiphum cerasifoliae (Fitch), choke cherry aphid, [*Aphi cerasifoliae*], (134)
Rhopalosiphum maidis (Fitch), corn leaf aphid, (1, 161, 173)
Rhopalosiphum maidis (Fitch), corn leaf aphid, [*Aphis maid* (39, 41, 62, 151, 155, 193)
Rhopalosiphum nymphaeae (Linnaeus), waterlily aphid, [*Myz nymphaeae*], (36)
Rhopalosiphum padi (Linnaeus), choke-cherry grain aphid, (1
Rhopalosiphum padi (Linnaeus), choke-cherry grain aphid, [*Aphis avenue*], (43, 52)
Rhopalosiphum padi (Linnaeus), choke-cherry grain aphid, [*Rhopalosiphum avenae*], (87)

Sappaphis plantaginea (Passerini), rosy apple aphid, [*Aphis malifoliae*], (169)
Sappaphis plantaginea (Passerini), rosy apple aphid, [*Anurap roseus,*] (3)
Sappaphis plantaginea (Passerini), rosy apple aphid, [*Aphis sorbi*], (52)
Schizaphis graminum (Rondani), greenbug, [*Toxoptera gramin* (37, 55, 56, 57, 67, 92, 120, 152, 163)

Lachnini

Longistigma caryae (Harris), giant bark aphid, (77, 78)

Panaphini

Chaitophorus populicola (Thomas), cloudy-winged cottonwo aphid, (134)
Chaitophorus populifoliae Davis, clear winged aspen aphid, (1
Chromaphis juglandicola (Kaltenbach), walnut aphid, (17, 19, 38, 118, 181)

Iziphya flabella (Sanborn), [*Callipterus flabellus*], (134)
Lachnus sp., (134)

Monellia caryella (Fitch), little hickory aphid, (38)
Monellia californica (Essig), (38)
Monellia costalis (Fitch), black margined aphid, [*Callipterus costalis*], (69)
Monelliopsis caryae (Monell), American walnut aphid, [*Monellia caryae*], (38)

Periphyllus lyropictus (Kessler), Norway maple aphid, (183)
Periphyllus negundinis (Thomas), box elder aphid, [*Chaitophorus negundinis*], (134, 163, 164, 191)
Pterocomma bicolor (Oestlund), reddish-brown willow bark aphid, [*Melanoxantherium bicolor*], (134)
Pterocomma smithiae (Monell), black willow aphid, [*Clavigerus smithiae*], (78)
Pterocomma smithiae (Monell), black willow aphid, [*Melanoxantherium smithiae*], (134)

Therioaphis maculata (Buckton), spotted alfalfa aphid, (11, 45, 72, 96, 127, 128, 133, 159, 167, 172, 173)
Therioaphis maculata (Buckton), spotted alfalfa aphid, [*Myzocallis maculata*], (48)
Therioaphis trifolii (Monell), yellow clover aphid, [*Callipterus trifolii*], (42)
Therioaphis trifolii (Monell), yellow clover aphid, [*Myzocallis trifolii*], (76)
Tinocallus caryaefoliae (Davis), black pecan aphid, [*Melanocallis caryaefoliae*], (69)

Eriosomatinae

Eriosomatini

Colopha ulmicola (Fitch), Cockscomb aphid of elm, (78)
Eriosoma lanigerum (Hausmann), woolly apple aphis, (5, 12, 177)
Eriosoma lanigerum (Hausmann), woolly apple aphis, [*Schizoneura lanigera*], (33, 134, 146)
Georgiaphis ulmi (Wilson), (78)

Pemphigini

Pemphigus balsamiferae Williams, poplar sugar beet root aphid, [*Pemphigus betae*], (33, 113)
Pemphigus populicaulis Fitch, poplar leaf petiole gall aphid, (78)
Pemphigus populitransversus Riley, poplar leaf stem gall aphid, (77, 78)
Prociphilus fraxinifolii (Riley), leaf curl ash aphid, (134)

Mindarinae

Mindarus abietinus Koch, balsam twig aphid, (4)

Cicadellidae

Circulifer tenellus (Baker), beet leafhopper, [*Eutettix tenellus*], (98)
Empoasca fabae (Harris), potato leafhopper, [*Empoasca mali*], (57)
Erythroneura elegantula (Osborn), (94)

Diaspididae

Chrysomphalus aonidum (Linnaeus), Florida red scale, (184)

Lepidosaphes beckii (Newman), purple scale, (184)
Paratoria pergandii Comstock, chaff scale, (184)

Quadraspidiotus perniciosus (Comstock), San Jose scale, [*Aspidiotus perniciosus*], (3)

Eriococcidae
Gossyparia spuri (Modeer), European elm scale, (83)

Margarodidae
Icerya purchasi Maskell, cottony-cushion scale, (143, 144)
Xylococcus macrocarpae Coleman, (154)

Pseudococcidae
Ehrhornia cupressi (Ehrhorn), (82)

Planococcus citri (Risso), citrus mealybug, [*Pseudococcus citri*], (32)
Pseudococcus fragilis Brain, citrophilus mealybug, [*Pseudococcus citrophilus*], (32)
Pseudococcus longispinus (Targioni Tozzetti), long-tailed mealybug, (32)
Pseudococcus maritimus (Ehrhorn), grape mealybug, [*Pseudococcus bakerii*], (32)

Fulgoridae
Phylloscellis atra Germar, (160)

Psyllidae
Paratrioza cockerelli (Sulc), potato psyllid, (97, 140)
Psylla pyricola Foerster, pear psylla, (192)

Lepidoptera
Lyonetiidae
Bucculatrix thurberiella Busck, cotton leafperforator, (179)

Noctuidae
Heliothis sp., (25)
Heliothis virescens (Fabricius), tobacco budworm, (194)
Heliothis zea (Boddie), bollworm or corn earworm, [*Chloridea obsoleta*], (16, 68)
Heliothis zea (Boddie), bollworm or corn earworm, [*Heliothis armigera*], (54, 126)
Heliothis zea (Boddie), bollworm or corn earworm, [*Heliothis obsoleta*], (138, 195)

Olethreutidae
Grapholitha molesta (Busck), oriental fruit moth, (141)

Pyralidae
Ostrinia nubilalis (Hubner), European corn borer, (170)

Coleoptera

Chrysomelidae

Crioceris asparagi (Linnaeus), asparagus beetle, (27, 187, 188)

Crioceris duodecimpunctata (Linnaeus), spotted asparagus beetle, (16)

Erynephala puncticollis (Say), beet leaf beetle, [*Monoxia puncticollis*], (31)

Lema oryzae (Kuwayama), (34, 104, 105)

Leptinotarsa decemlineata (Say), Colorado potato beetle, (15, 58, 190)

Coccinellidae

Epilachna varivestis Mulsant, Mexican bean beetle, [*Epilachna corrupta*], (29, 30, 50, 91, 116, 119, 145)

Curculionidae

Hypera postica (Gyllenhal), alfalfa weevil, (101, 180)

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