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Ovipositional Host Plants of 17-Year Cicadas

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OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
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ON THE COVER: Female cicada ovipositing into underside of a twig, a very typical position.

ACKNOWLEDGMENTS

The author is very grateful to Dr. O. D. Diller and Mr. G. B. Berkey, Ohio Agricultural Research and Development Center, Mr. L. Lipp, Holden Arboretum, and Dr. D. S. Dean, Baldwin-Wallace College, for their help in identification of plants and to Mr. G. B. Berkey and Mr. J. Worster for aiding in collection of some records.

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Ovipositional Host Plants of 17-Year Cicadas

H. Y. FORSYTHE, JR.[1]

INTRODUCTION

It has generally been conceded that female cicadas, *Magicicada* spp., will lay eggs in almost any deciduous tree or shrub, and sometimes even in evergreens or herbaceous plants (8, 14, 15, 17, 19). There have been attempts to compile lists of plants which harbor cicada eggs (1, 2, 4, 9). However, no data are available to show that the number of ovipositional host plants exceeds 70-80 species (3). There is also some evidence indicating that female cicadas find some species of plants more desirable than others for oviposition. Oak, hickory, apple, peach, pear, and grape have been listed as being favorite ovipositional host plants (3, 19). Other researchers support these conclusions for apple, oak, and/or hickory (*e.g.*, 1, 4, 8, 11, 12, 17). Plant preference ratings, however, have been based apparently on general observations and relative comparisons.

This report includes a list of plants in which 17-year cicadas lay eggs and data on the relative degree of oviposition on different plants.

PROCEDURE

During the spring of 1965, brood V of 17-year cicadas appeared in most of eastern Ohio. Adults were very numerous in many areas, including the Holden Arboretum in Kirtland Hills, Lake and Geauga counties. Most data presented here were obtained from an extensive survey of this arboretum from August 3 to Sept. 14. Many species of trees and shrubs were planted in relatively open areas which were generally surrounded by old established woods. Because of the extremely large and active populations of cicadas which emerged in the woods, all trees and shrubs appeared to have been exposed to the same potential for ovipositional activity. None of the observed egg slits had been made by other species of cicada during the summer.

Additional host records were collected from late June to mid-July at nine other locations in the northern third of the state (Carroll, Cuyahoga, Holmes, and Wayne counties) where there were active cicada populations.

Each plant was ranked according to the percent of live terminal shoots having at least one egg slit. A terminal consisted of the distal 8-18 inches of twigs, stems, etc. and included that portion available to

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cicadas at the oviposition period. Plants with 0-10% of the terminals bearing egg slits were assigned a rank of 1, 11-50% a rank of 2, and 51-100% a rank of 3. Where possible, a number of plants of a species were examined and the highest ranking was selected to show maximum ovipositional activity. For plants with only one or a few terminals, an average rank was determined from a number of plants of the same species in the immediate area.

The mean number of egg slits per live terminal, which was calculated from two to three terminals having at least one egg slit, was also recorded. Means above 15.0 were rounded off to the nearest multiple of 5. In compiling data on ranks and means, only peripheral twigs or shoots or those most exposed to sunlight were examined because of the positive influence of this factor on cicada activity (13, 16). Observations on large trees were made on lower limbs and were modified slightly by visual estimates of ovipositional activity on higher limbs.

RESULTS AND DISCUSSION

At Holden Arboretum and Olmsted Falls, egg slits were found on 275 species of plants in 105 genera (Appendix Table I). *M. septendecim* (L.) was the only species of 17-year cicada active in these areas. These data support conclusions of many workers that periodical cicadas will lay eggs in almost any deciduous tree or shrub.

Egg slits were found on 18 species of conifers in 9 genera. Prior to this, oviposition was reported on one species of conifer in each of five genera (6, 9, 20). Although Allard (1) did not find egg slits on *Taxodium distichum,* this species bore definite signs of oviposition in Holden Arboretum. There were no egg slits on any species of pines or spruces and, except for a single balsam fir tree, no firs showed signs of ovipositional activity. In a chance observation on June 9 at Holmesville (Holmes Co.), the author observed a female *M. septendecim* attempting to oviposit into a pine terminal; after much probing, she left the terminal without making a noticeable puncture. Riley (19) and Marlatt (15) concluded that pines are ordinarily exempt from ovipositional activity.

Some plant species may be selected for egg laying over others in the same genus. For example, three species of *Betula* averaged two to nine egg slits on less than 11% of the terminals; three other species of birch bore signs of very heavy ovipositional activity (Appendix Table I). A similar situation was found for *Ilex* and *Populus*. While it is possible that environmental conditions and cicada activities could cause these differences, plants within a certain genus or group were generally equal in size and planted at evenly spaced intervals in the same open area at Holden Arboretum, and therefore should have been exposed to similar pressures.

Other workers have also commented on distinct differences in ovipositional activity on plant species within the same immediate area (5).

Since the estimated height was recorded for each plant observed for ovipositional activity, correlation analyses were made on height vs. ranks or slits per terminal to determine if plant height influenced the degree of ovipositional activity. Of eight botanical families, each with more than 10 species, a significant positive correlation (5% level) between plant height and ranks or slits per terminal was found only for Rosaceae. Although true randomization was not utilized in selection of plants, the results indicate generally that plant height and ovipositional activity are not correlated. Additional correlation analyses on ranks vs. slits per terminal for the same families indicate that the two systems generally reflect the same degree of ovipositional activity, but that both systems should be utilized in any decision on preferred ovipositional host plants (the correlation values for six of eight families were significant at the 10% level).

Many workers have used the term "preferred" for certain groups of plants, *e.g.,* apple, hickory, and oak, without regard to species. Figure 1 shows the mean number of egg slits per terminal and 90% confidence limits (CL) for genera with more than three species observed at Kirtland Hills and Olmsted Falls. Genera showing the greatest number of slits were *Acer* (maple), *Carpinus* (hornbeam), *Cornus* (dogwood), *Crataegus* (hawthorn), and *Quercus* (oak). Other genera with high ovipositional activity were *Magnolia, Malus* (apple), and *Prunus.* In genera with two to three species, *Fagus* (beech), with a mean of 41.7 slits, and *Carya* (hickory), *Corylus* (hazel), *Halesia* (silverbell-tree), *Platanus* (plane-tree), and *Pyrus* (pear) showed a comparably high oviposition level. Generally a rank of 3 had been assigned to species in these genera. These results support observations of researchers who have said that apple, hickory, and oak are preferred plants for oviposition.

Other workers have indicated that favored host plants include beech (4), dogwood (1), hawthorn (4, 11), maple (1, 4, 14), and plane-tree (4). Fruit trees, in general, seem to show a relatively high level of ovipositional activity, as suggested by the author's data and others (1, 3). No reference was found in the literature concerning hazel, hornbeam, *Magnolia,* and silverbell-tree. Other genera have been mentioned in published reports as preferred ovipositional host plants, but the author's data are insufficient to make comparisons or do not support the claims. There are other genera which seem to have a high degree of ovipositional activity, but only one species per genus was observed. Less oviposition was generally noted on *Abies, Juniperus, Picea, Pinus, Spiraea, Taxus,* and *Tsuga.*

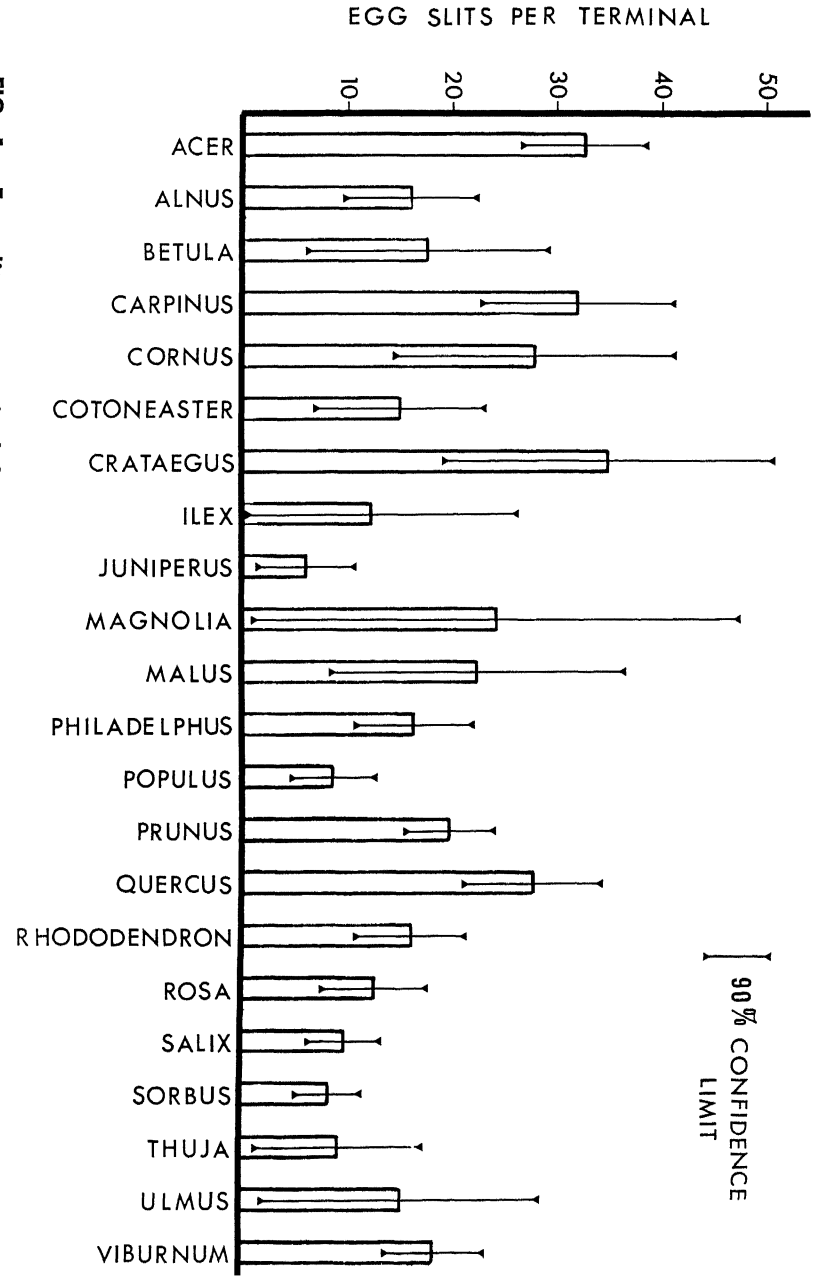

FIG. 1.—Egg slits per terminal for genera of plants at Kirtland Hills and Olmsted Falls, Ohio.

TABLE 1.—Egg Slits per Terminal* and Variation in Slits for Genera of Plants at Eight Survey Locations† in Northern Ohio.

Genus	No. of Observations	Mean ± SE (Slits per Terminal)	
Acer	4	28.8	10.9
Carya	3	16.0	4.0
Castanea	2	27.5	7.5
Cornus	4	38.8	8.3
Corylus	3	11.7	0.9
Fraxinus	3	20.0	5.0
Juglans	2	15.5	9.5
Malus	5	16.6	2.8
Nyssa	5	11.6	2.2
Ostrya	2	14.0	1.0
Populus	3	23.3	6.0
Prunus	7	22.9	4.5
Quercus	14	21.1	3.4
Rubus	3	16.7	1.7
Sassafras	3	8.0	3.5
Syringa	2	10.0	3.0

*Terminal=distal 8-18 inches of twigs, stems, etc.
†Survey locations other than Kirtland Hills and Olmsted Falls.

Results at other survey locations support the conclusions that *Acer, Carya, Cornus, Malus, Prunus,* and *Quercus* show a relatively high level of ovipositional activity (Table 1). Although the means for *Castanea, Fraxinus,* and *Populus* suggest the potential of these genera as being favored, the means at the arboretum were 17.3, 12.0, and 8.8 slits, respectively. Quaintance (17) claimed *Castanea* sp. were preferred host trees.

Some plant families contained more than one genus with a high level of ovipositional activity. Means and 90% CL of families in the Kirtland Hills and Olmsted Falls surveys with at least two genera and more than five species (Aceraceae contained only the genus *Acer* and Cornaceae *Cornus)* are shown in Figure 2. Three families, Aceraceae, Cornaceae, and Fagaceae (the latter composed of *Castanea, Fagus,* and *Quercus),* show the greatest mean numbers of slits per terminal. A breakdown of Betulaceae into two subfamilies, Betuleae and Coryleae, showed that the average number of egg slits for Betuleae *(Alnus* and *Betula)* was 16.9 and for Coryleae *(Carpinus, Corylus,* and *Ostrya)* 30.2 slits per terminal. A "t" test indicated a significant difference (5% level of probability). Subfamilies of Rosaceae also showed significant differences in ovipositional activity; species in Prunoideae and Pomoideae contained more egg slits (18.9 and 18.5, respectively) than those in Spiraeoideae (7.8 slits per

terminal), but the mean of 15.5 slits for Rosoideae plants was not different from Spiraeoideae (t test, 5% level).

In genera composed of numerous species, an attempt was made to determine if differences in ovipositional activity could be traced to some subgeneric unit other than species. *Quercus* plants in the subgenus *Erythrobalanus* averaged 19.4 slits per terminal and those in *Lepidobalanus* 33.8 slits. These means were significantly different at the 10% level of probability but not at the 5% level (t test). Tests of significance between *Cerasus* (13.2 slits) and either *Prunophora* (25.0 slits) or *Amygdalus* (30.0 slits) showed real differences at the 5% level in these subgenera of *Prunus*. The possibility that subgeneric units may not show differences in ovipositional activity is indicated by very similar means obtained for *Acer* (33 to 35 slits per terminal).

The total number of plants on which the author obtained positive ovipositional records is 298 species or 117 genera. The additional 23

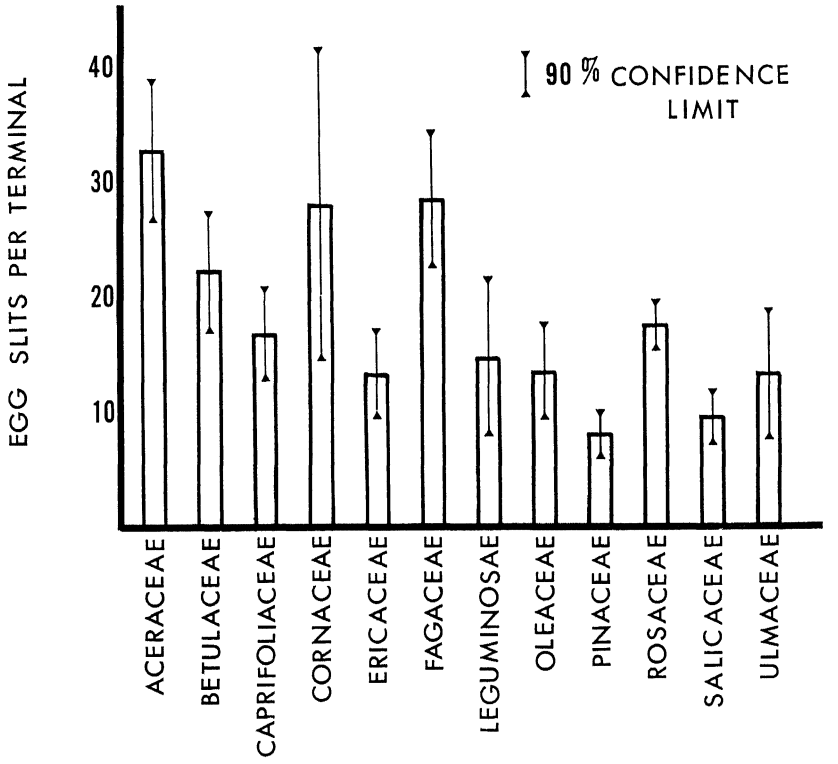

FIG. 2.—Egg slits per terminal for families of plants at Kirtland Hills and Olmsted Falls, Ohio.

species and 12 genera (Table 2) were found in other surveyed areas, where more than one species of 17-year cicada were present (*M. septendecim, M. cassini* (Fisher), and possibly *M. septendecula* Alexander and Moore). The presence of egg slits in stems of herbaceous plants has also been noted by other workers (10, 14, 17, 19).

It is apparent from these ovipositional host plant records that 17-year cicadas, especially *M. septendecim,* will make egg slits on almost any plant. There is an indication, however, that certain plants are more preferred than others.

TABLE 2.—Additional Ovipositional Host Plants of 17-Year Cicadas at Eight Survey Locations* in Northern Ohio, 1965.

Name of Plant		Ovipositional Rating	
Scientific†	Common‡	Rank**	Egg Slits per Terminal††
Aster sp.	(aster g.)	1	8
Carya glabra (Mill.) Sweet	Pignut	3	20
Carya pecan (Marsh.) Engl. & Graebn.	Pecan	3	8
Carya tomentosa (Lam.) Nutt.	Mockernut	3	20
Corylus maxima Mill.	Filbert	1	12
Gymnocladus dioicus (L.) K. Koch	Kentucky coffee-tree	1	12
Hamamelis sp.	(witch-hazel g.)	2	25
Hypericum calycinum L.	Rose of Sharon	3	8
Malus pumila Mill.	Common apple	3	20
Melilotus officinalis (L.) Lam.	Yellow melilot	2	20
Metasequoia glyptostroboides Hu & Cheng	Dawn redwood	1	15
Phellodendron sp.	(rue f.)	2	10
Quercus coccinea Muenchh.	Scarlet oak	3	6
Rhus radicans L.	Poison ivy	2	15
Ribes sp.	(saxifrage f.)	1	5
Rosa multiflora Thunb.	(rose g.)	1	15
Rubus sp.	(raspberry subg.)	3	15
Rudbeckia serotina Nutt.	Black-eyed Susan	2	3
Rumex sp.	(dock g.)	2	30
Salix blanda Anders.	Wisconsin weeping willow	3	9
Sambucus sp.	(elder g.)	2	20
Viburnum dentatum L.	Arrow-wood	2	7
Vitis sp.	(grape g.)	1	6

*Survey locations other than Kirtland Hills and Olmsted Falls.
†Nomenclature according to Rehder (18), except for *Metasequoia* (O. D. Diller) and *Aster, Melilotus, Rudbeckia,* and *Rumex* (7).
‡Names in parentheses=genus (g.) or family (f.) of plant.
**1=< 10% terminals with egg slits, 2=11-50%, 3=> 50%.
††Av. no. slits per distal 8-18 inches of twigs, stems, etc.

SUMMARY

A survey in an arboretum and at nine other locations in 1965 in Ohio revealed that 17-year cicadas, *Magicicada* spp., oviposited into 298 species of plants in 117 genera.

Data on number of egg slits per terminal shoot and percentage of terminals with egg slits showed that the greatest numbers of egg slits were in the genera *Acer, Carpinus, Carya, Cornus, Corylus, Crataegus, Fagus, Halesia, Magnolia, Malus, Platanus, Prunus, Pyrus,* and *Quercus.* Genera bearing the least number of egg slits were *Abies, Juniperus, Spiraea, Taxus,* and *Tsuga.* No egg slits were found on *Picea* or *Pinus.* The families of Aceraceae, Cornaceae, and Fagaceae showed the highest levels of ovipositional activity.

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APPENDIX TABLE I.—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Abeliophyllum distichum Nakai	(olive f.)	1	5
Abies balsamea (L.) Mill.	Balsam fir	2	6
Acer cappadocicum Gleditsch	(maple g.)	3	40
Acer ginnala Maxim.	(maple g.)	3	25
Acer grandidentatum Nutt.	(maple g.)	3	40
Acer griseum (Franch.) Pax	Paperbark maple	3	55
Acer mono Maxim.	(maple g.)	3	30
Acer nigrum Michx. f.	Black maple	3	30
Acer pennsylvanicum L.	Moosewood	3	60
Acer platanoides L.	Norway maple	3	45
Acer pseudoplatanus L.	Sycamore maple	3	55
Acer rubrum L.	Red maple	3	20
Acer rufinerve Sieb. & Zucc.	(maple g.)	3	10
Acer saccharinum L.	Silver-maple	3	40
Acer saccharum Marsh.	Sugar maple	3	30
Acer sieboldianum Miq.	(maple g.)	2	13
Acer spicatum Lam.	Mountain maple	3	25
Acer tataricum L.	Tatarian maple	3	35
Acer triflorum Komar.	(maple g.)	3	15
Acer truncatum Bge.	(maple g.)	3	20
Aesculus carnea Hayne	Red horse-chestnut	3	25
Aesculus hippocastanum L.	Common horse-chestnut	3	20
Aesculus parviflora Walt.	(horse-chestnut g.)	3	11
Alnus cordata Desf.	(alder g.)	3	10
Alnus glutinosa (L.) Gaertn.	Black alder	3	14
Alnus hirsuta (Spach) Rupr.	(alder g.)	3	30
Alnus orientalis Dcne.	(alder g.)	3	14
Alnus tenuifolia Nutt.	(alder g.)	3	20
Alnus viridis DC.	European green alder	1	8
Amelanchier canadensis (L.) Med.	(shadbush g.)	2	12
Amelanchier laevis Wieg.	(shadbush g.)	3	20
Amelanchier spicata (Lam.) K. Koch	(shadbush g.)	3	15
Aronia arbutifolia (L.) Elliott	Red chokeberry	3	15
Berberis thunbergii DC.	(barberry g.)	2	6
Betula costata Trautv.	(birch g.)	1	2
Betula lenta L.	Cherry birch	3	25
Betula maximowicziana Reg.	(birch g.)	3	55
Betula nigra L.	River birch	1	9
Betula papyrifera Marsh.	Canoe birch	1	6

*Nomenclature according to Rehder (18), except for *Solidago and Vernonia* (7).

†Names in parentheses = genus (g.) or family (f.) of plant.

‡1= <10% terminals with egg slits, 2= 11-50%, 3= >50%.

**Av. no. slits per distal 8-18 inches of twigs, stems, etc.

APPENDIX TABLE I (Continued).—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Betula pendula Roth	European birch	3	25
Betula populifolia Marsh.	Gray birch	2	7
Betula raddeana Trautv.	(birch g.)	3	12
Buddleia alternifolia Maxim.	(butterfly-bush g.)	3	15
Caragana arborescens Lam.	Pea-tree	1	2
Carpinus betulus L.	European hornbeam	3	25
Carpinus caroliniana Walt.	American hornbeam	3	20
Carpinus cordata Bl.	(hornbeam g.)	3	35
Carpinus laxiflora Bl.	(hornbeam g.)	3	45
Carpinus orientalis Mill.	(hornbeam g.)	3	35
Carya cordiformis (Wangh.) K. Koch	Bitternut	3	20
Carya ovata (Mill.) K. Koch	Shagbark hickory	3	20
Castanea crenata Sieb. & Zucc.	Japanese chestnut	3	15
Castanea dentata Borkh.	American chestnut	3	12
Castanea mollissima Bl.	Chinese chestnut	3	25
Catalpa hybrida Spaeth	Hybrid catalpa	3	10
Catalpa ovata Don	(bignonia f.)	3	10
Celtis laevigata Willd.	Mississippi hackberry	3	15
Celtis occidentalis L.	(hackberry g.)	2	4
Cephalanthus occidentalis L.	(buttonbush g.)	2	3
Cercidiphyllum japonicum Sieb. & Zucc.	Katsura-tree	3	15
Cercis canadensis L.	(redbud g.)	3	12
Cercis chinensis Bge.	(redbud g.)	3	6
Chamaecyparis pisifera (Sieb. & Zucc.) Endl.	Sawara cypress	3	15
Chamaecyparis thyoides (L.) B.S.P.	White cedar	3	12
Chaenomeles lagenaria (Loisel.) Koidz	Japan quince	2	8
Chionanthus virginicus L.	(fringe-tree g.)	3	20
Cladrastis lutea (Michx.) K. Koch	Yellow-wood	3	30
Colutea gracilis Freyn & Sint.	(bladder-senna g.)	2	4
Cornus alba L.	(dogwood g.)	3	15
Cornus florida L.	Flowering dogwood	3	35
Cornus kousa Hance	(dogwood g.)	3	15
Cornus mas L.	Cornelian cherry	3	55
Cornus racemosa Lam.	(dogwood g.)	3	50
Cornus slavinii Rehd.	(dogwood g.)	3	13

*Nomenclature according to Rehder (18), except for *Solidago and Vernonia* (7).
†Names in parentheses = genus (g.) or family (f.) of plant.
‡1= <10% terminals with egg slits, 2= 11-50%, 3= >50%.
**Av. no. slits per distal 8-18 inches of twigs, stems, etc.

APPENDIX TABLE I (Continued).—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Cornus stolonifera Michx.	Red-osier dogwood	3	12
Corylus avellana L.	European hazel	3	45
Corylus colurna L.	Turkish hazel	3	12
Corylus cornuta Marsh.	Beaked hazel	3	15
Cotinus coggygria Scop.	Smoke-tree	3	25
Cotoneaster divaricata Rehd. & Wils.	(rose f.)	3	20
Cotoneaster multiflora Bge.	(rose f.)	3	20
Cotoneaster rosea Edgew.	(rose f.)	3	15
Cotoneaster rotundifolia Lindl.	(rose f.)	2	5
Crataegus arkansana Sarg.	(hawthorn g.)	3	30
Crataegus lavallei Herincq.	(hawthorn g.)	3	55
Crataegus monogyna Jacq.	(hawthorn g.)	3	25
Crataegus oxyacantha L.	Hawthorn	3	30
Cudrania tricuspidata (Carr.) Bur.	(mulberry f.)	3	15
Cytisus austriacus L.	(pea f.)	1	10
Daphne burkwoodii Burkwood	(mezereum f.)	3	12
Diospyros virginiana L.	Common persimmon	3	20
Dirca palustris L.	Leatherwood	1	4
Enkianthus campanulatus (Miq.) Nichols.	(heath f.)	1	4
Eucommia ulmoides Oliv.	(eucommia f.)	3	25
Euonymus alata (Thunb.) Sieb.	Winged spindle-tree	2	8
Euonymus bungeana Maxim.	(spindle-tree g.)	2	4
Euonymus europaea L.	European spindle-tree	3	20
Exochorda giraldii Hesse	(rose f.)	3	7
Fagus engleriana Seemen	(beech g.)	3	55
Fagus orientalis Lipsky	Oriental beech	3	55
Fagus sylvatica L.	European beech	3	15
Forestiera neo-mexicana Gray	(olive f.)	3	12
Forsythia intermedia Zab.	(golden-bell g.)	3	25
Forsythia suspensa (Thunb.) Vahl	(golden-bell g.)	1	2
Franklinia alatamaha Marsh.	Franklinia	2	6
Fraxinus americana L.	White ash	3	12
Fraxinus pennsylvanica Marsh.	Red ash	2	12
Ginkgo biloba L.	Ginkgo	3	9
Gleditsia triacanthos L.	Honey-locust	3	45
Halesia carolina L.	(silverbell-tree g.)	3	25

*Nomenclature according to Rehder (18), except for *Solidago and Vernonia* (7).

†Names in parentheses = genus (g.) or family (f.) of plant.

‡1= <10% terminals with egg slits, 2= 11-50%, 3= >50%.

**Av. no. slits per distal 8-18 inches of twigs, stems, etc.

APPENDIX TABLE I (Continued).—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Halesia monticola (Rehd.) Sarg.	(silverbell-tree g.)	3	20
Hemiptelea davidii (Hance) Planch.	(elm f.)	3	10
Hibiscus syriacus L.	Shrubby althaea	2	20
Ilex crenata Thunb.	(holly g.)	1	4
Ilex glabra (L.) Gray	Inkberry	2	6
Ilex opaca Ait.	American holly	3	9
Ilex verticillata (L.) Gray	Black-alder	3	30
Juglans cinerea L.	Butternut	1	10
Juglans nigra L.	Black walnut	2	9
Juniperus chinensis L.	Chinese juniper	2	8
Juniperus communis L.	Common juniper	2	3
Juniperus sabina L.	Savin	2	2
Juniperus virginiana L.	Red cedar	3	11
Kalmia latifolia L.	Mountain-laurel	2	4
Kalopanax pictus (Thunb.) Nakai	(ginseng f.)	3	4
Koelreuteria paniculata Laxm.	China-tree	3	11
Laburnum alpinum Bercht. & Presl	Scotch laburnum	2	8
Larix occidentalis Nutt.	Western larch	3	5
Ligustrum amurense Carr.	Amur privet	3	25
Ligustrum ovalifolium Hassk.	California privet	3	6
Ligustrum vulgare L.	Common privet	3	25
Lindera umbellata Thunb.	(laurel f.)	3	35
Liquidambar styraciflua L.	Sweet-gum	3	25
Liriodendron tulipifera L.	(tulip-tree g.)	3	25
Lonicera korolkowii Stapf	(honeysuckle g.)	2	12
Lonicera tatarica L.	Tatarian honeysuckle	3	12
Lonicera xylosteum L.	European fly-honeysuckle	3	8
Maackia amurensis Rupr.	(pea f.)	3	20
Maackia chinensis Takeda	(pea f.)	3	10
Magnolia acuminata L.	Cucumber-tree	3	50
Magnolia kobus DC.	(magnolia f.)	3	7
Magnolia tripetala L.	Umbrella magnolia	1	10
Magnolia virginiana L.	Sweet bay	3	30
Malus angustifolia (Ait.) Michx.	(apple g.)	3	15

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‡1= <10% terminals with egg slits, 2= 11-50%, 3= >50%.
**Av. no. slits per distal 8-18 inches of twigs, stems, etc.

APPENDIX TABLE I (Continued).—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Malus coronaria (L.) Mill.	(apple g.)	3	20
Malus ioensis (Wood) Brit.	(apple g.)	3	40
Malus prunifolia (Willd.) Borkh.	(apple g.)	3	15
Mespilus germanica L.	(medlar g.)	3	25
Morus alba L.	White mulberry	3	12
Nyssa sylvatica Marsh.	Tupelo	3	45
Ostrya virginiana (Mill.) K. Koch	American hop-hornbeam	3	40
Oxydendrum arboreum (L.) DC.	Sorrel-tree	1	9
Paeonia suffruticosa Andr.	Tree peony	3	10
Philadelphus californicus Benth.	(mock-orange g.)	3	20
Philadelphus cymosus Rehd.	(mock-orange g.)	3	15
Philadelphus grandiflorus Willd.	(mock-orange g.)	3	25
Philadelphus purpurascens (Koehne) Rehd.	(mock-orange g.)	3	12
Philadelphus tenuifolius Rupr. & Maxim.	(mock-orange g.)	3	10
Photinia villosa (Thunb.) DC.	(rose f.)	3	20
Platanus occidentalis L.	Buttonwood	3	20
Platanus orientalis L.	Oriental plane-tree	3	20
Populus candicans Ait.	Balm of Gilead	1	4
Populus deltoides Marsh.	Cottonwood	3	15
Populus grandidentata Michx.	Large-toothed aspen	1	8
Populus simonii Carr.	(poplar g.)	1	3
Populus tremuloides Michx.	Quaking aspen	3	15
Populus trichocarpa Hook.	Western balsam poplar	1	8
Prinsepia sinensis (Oliv.) Oliv.	(rose f.)	2	4
Prunus americana Marsh.	(rose f.)	3	25
Prunus avium L.	Mazzard	3	14
Prunus glandulosa Thunb.	Dwarf flowering almond	1	3
Prunus hortulana Bailey	(rose f.)	3	30
Prunus incisa Thunb.	(rose f.)	3	14
Prunus maackii Rupr.	(rose f.)	3	8
Prunus maritima Marsh.	Beach plum	3	35
Prunus mume (Sieb.) Sieb. & Zucc.	Japanese apricot	3	15
Prunus persica (L.) Batsch	Peach	3	35
Prunus sargentii Rehd.	(rose f.)	3	25
Prunus serotina Ehrh.	Black cherry	3	15
Prunus spinosa L.	Blackthorn	3	20

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APPENDIX TABLE I (Continued).—Ovipositional Host Plants of 17-Year Cicadas at Kirtland Hills and Olmsted Falls, Ohio, 1965.

Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Prunus subhirtella Miq.	Higan cherry	3	8
Prunus tenella Batsch	Dwarf Russian almond	3	20
Prunus tomentosa Thunb.	(rose f.)	3	15
Prunus triloba Lindl.	Flowering almond	3	35
Pseudolarix amabilis (Nels.) Rehd.	Golden larch	3	8
Pyracantha coccinea Roem.	(firethorn g.)	3	12
Pyrus betulaefolia Bge.	(pear g.)	3	25
Pyrus calleryana Dcne.	(pear g.)	3	20
Pyrus syriaca Boiss.	(pear g.)	3	15
Quercus acutissima Carruthers	(oak g.)	3	55
Quercus alba L.	White oak	3	55
Quercus aliena Bl.	(oak g.)	3	25
Quercus borealis Michx. f.	Red oak	3	25
Quercus falcata Michx.	Spanish oak	3	30
Quercus glandulifera Bl.	(oak g.)	3	45
Quercus imbricaria Michx.	Shingle oak	3	15
Quercus lyrata Walt.	Overcup oak	3	35
Quercus montana Willd.	Chestnut oak	3	20
Quercus palustris Muenchh.	Pin oak	3	30
Quercus petraea (Mattuschka) Lieblein	Durmast oak	3	25
Quercus phellos L.	Willow oak	3	12
Quercus prinoides Willd.	Chinquapin oak	3	15
Quercus prinus L.	Basket oak	3	8
Quercus robur L.	English oak	3	55
Quercus shumardii Buckl.	(oak g.)	3	9
Quercus velutina Lam.	Black oak	3	15
Rhamnus pallasii Fisch. & Mey.	(buckthorn g.)	2	6
Rhododendron arborescens (Pursh) Torr.	(rhododendron g.)	3	12
Rhododendron calendulaceum (Michx.) Torr.	(rhododendron g.)	2	6
Rhododendron gandavense (K. Koch) Rehd.	(rhododendron g.)	3	9
Rhododendron luteum Sweet	(rhododendron g.)	3	15
Rhododendron minus Michx.	(rhododendron g.)	3	12
Rhododendron mixtum Wils.	(rhododendron g.)	3	25
Rhododendron schlippenbachii Maxim.	(rhododendron g.)	3	30

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Name of Plant*		Ovipositional Rating	
Scientific	Common†	Rank‡	Egg Slits per Terminal**
Rhododendron viscosum (L.) Torr.	(rhododendron g.)	3	20
Rhus copallina L.	Shining sumac	3	8
Robinia pseudoacacia L.	Black locust	3	15
Rosa alba L.	(rose g.)	3	4
Rosa coriifolia Fries	(rose g.)	3	11
Rosa corymbifera Borkh.	(rose g.)	3	20
Rosa gallica L.	French rose	3	6
Rosa palustris Marsh.	(rose g.)	3	20
Rosa pomifera Herrm.	(rose g.)	3	20
Rosa rubrifolia Vill.	(rose g.)	2	8
Rubus allegheniensis Porter	(blackberry subg.)	2	35
Salix alba L.	White willow	3	14
Salix amygdaloides Anders.	Peach-leaved willow	1	4
Salix cordata Muhlenb.	(willow g.)	3	9
Salix gilgiana Seemen	(willow g.)	3	12
Salix humilis Marsh.	Prairie willow	3	10
Sassafras albidum (Nutt.) Nees	Sassafras	3	8
Securinega suffruticosa (Pall.) Rehd.	(spurge f.)	3	25
Solidago sp.	(goldenrod g.)	1	7
Sorbaria assurgens Vilm. & Bois	(rose f.)	3	20
Sorbus aucuparia L.	Rowan tree	3	12
Sorbus discolor (Maxim.) Hedl.	(rose f.)	3	12
Sorbus esserteauiana Koehne	(rose f.)	3	7
Sorbus intermedia (Ehrh.) Pers.	(rose f.)	2	6
Sorbus pohuashanensis (Hance) Hedl.	(rose f.)	2	5
Spiraea arguta Zab.	(spirea g.)	1	4
Spiraea japonica L. f.	(spirea g.)	1	2
Spiraea margaritae Zabel	(spirea g.)	2	6
Styrax japonica Sieb. & Zucc.	(snowbell g.)	3	15
Styrax obassia Sieb. & Zucc.	(snowbell g.)	2	8
Syringa vulgaris L.	(lilac g.)	3	11
Syringa wolfi Schneid.	(lilac g.)	3	6
Taxodium distichum (L.) Rich.	Bald cypress	1	11
Taxus canadensis Marsh.	Canada yew	1	3
Taxus media Rehd.	(yew g.)	1	4
Thuja occidentalis L.	American arbor-vitae	3	7
Thuja orientalis L.	Oriental arbor-vitae	3	4

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Scientific	Common†	Rank‡	Egg Slits per Terminal**
Thuja plicata Lamb.	Giant arbor-vitae	3	6
Thuja standishii (Gord.) Carr.	Japanese arbor-vitae	3	20
Tilia cordata Mill.	Small-leaved European linden	3	9
Tsuga canadensis (L.) Carr.	Common hemlock	1	6
Tsuga diversifolia (Maxim.) Mast.	Japanese hemlock	1	2
Ulmus americana L.	White elm	3	14
Ulmus carpinifolia Gleditsch	Smooth-leaved elm	3	15
Ulmus fulva Michx.	Slippery elm	3	30
Ulmus parvifolia Jacq.	Chinese elm	1	2
Vaccinium corymbosum L.	Highbush blueberry	3	11
Vaccinium pallidum Ait.	Dryland blueberry	3	14
Vernonia altissima Nutt.	(ironweed g.)	1	7
Viburnum dilatatum Thunb.	(honeysuckle f.)	2	6
Viburnum lantana L.	Wayfaring-tree	3	35
Viburnum nudum L.	Smooth withe-rod	3	15
Viburnum opulus L.	European cranberry-bush	3	15
Viburnum prunifolium L.	Black-haw	3	14
Viburnum rufidulum Raf.	Southern black-haw	3	15
Viburnum sargenti Koehne	(honeysuckle f.)	3	12
Viburnum setigerum Hance	(honeysuckle f.)	3	15
Viburnum sieboldii Miq.	(honeysuckle f.)	3	20
Viburnum tomentosum Thunb.	(honeysuckle f.)	3	35
Viburnum trilobum Marsh.	Cranberry-bush	3	20
Zelkova serrata (Thunb.) Mak.	(elm f.)	2	14

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