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HAWTHORN LACE BUG (HEMIPTERA: TINGIDAE), FIRST RECORD OF INJURY TO ROSES, WITH A REVIEW OF HOST PLANTS

A. G. Wheeler, Jr.¹

ABSTRACT

Hawthorn lace bug, *Corythucha cydoniae* (Fitch), is reported for the first time as damaging roses. Injury to climbing and hybrid Tea roses is described, and a list of known host plants is provided based on observations in Pennsylvania and review of literature. Preferred hosts are native and cultivated species of *Amelanchier* and *Crataegus* and ornamental *Cotoneaster* and *Pyracantha*. Damage to crabapple, fruit trees, mountain ash, and other rosaceous plants may occur when they are grown near more favored hosts.

The hawthorn lace bug, *Corythucha cydoniae* (Fitch), is one of the most common and best studied North American tingids. Comstock (1880) provided background information on life history, habits, and immature stages; Bailey (1951) added considerable new biological data on this univoltine species. Various referred to as the "quince tings" (Fitch 1861) and "pyracantha lace bug" (Watts 1947), *C. cydoniae* is known to feed on a number of rosaceous plants and is considered a pest of ornamental cotoneaster, hawthorn, and pyracantha. Although members of the Rosaceae are preferred hosts, specimens also have been taken on plants in other families: buttonbush, *Cephalanthus occidentalis* L., Rubiaceae (McAtee 1917) and oak, *Quercus* sp., Fagaceae (Torre-Bueno 1933).

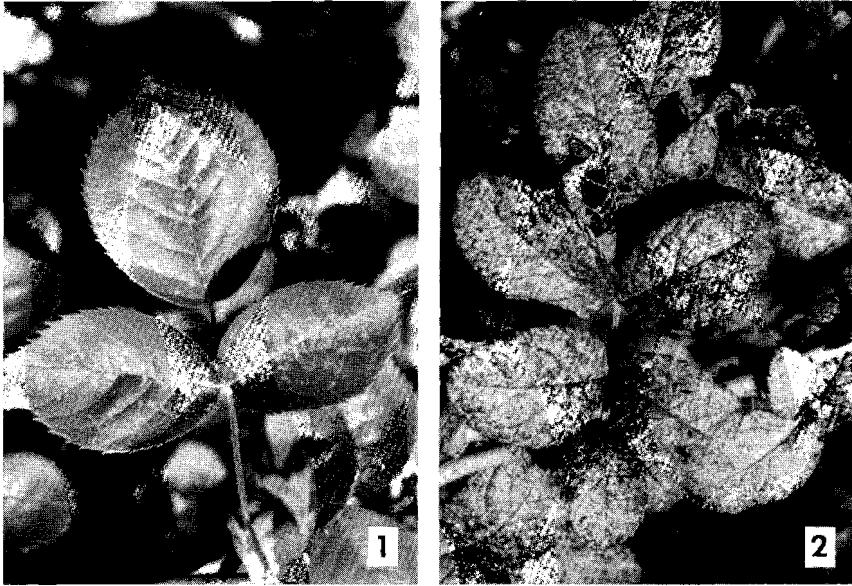
Despite this rather broad host spectrum, I was surprised to discover a population of hawthorn lace bug breeding on rose bushes at Harrisburg, Pennsylvania. Even though it was obvious that the tingid had moved to rose from nearby cotoneaster, the severity of injury to this unrecorded host was remarkable. In this paper I describe damage to hybrid Tea and climbing roses and review the known hosts, emphasizing ornamental plants. Sources of information include literature references, museum specimens, personal collecting, and nursery inspection reports of the Pennsylvania Department of Agriculture.

INJURY TO ROSE

During 25–26 August 1980, I found lace bug-infested rose bushes growing in a landscape planting of spreading cotoneaster, *Cotoneaster divaricata* Rehd. & Wils., at Harrisburg, Pennsylvania. The rose foliage appeared chlorotic, as though damaged by rose leafhopper, *Edwardsiana rosae* L., or tetranychid mites. Nearly every leaf of four climbing roses and one hybrid Tea rose showed discoloration or stippling (Fig. 1); some leaves were completely white (Fig. 2). The numerous cast skins and black spots of excrement on the lower surfaces (Fig. 3) were unmistakable signs of lace bug injury; later, adults of *C. cydoniae* were found.

The numbers of adults on both cotoneaster and rose were small, which is typical of late-summer populations of this lace bug (Bailey 1951). An abundance of cast skins and severe injury indicated that the population had been much larger and was well established. On numerous leaves old eggs were found which had been inserted into midribs on the lower surface.

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Figs. 1-2. Damage to rose foliage by *Corythucha cydoniae*. (1) Slight discoloration. (2) Extensive chlorosis.



Fig. 3. Excrement of *Corythucha cydoniae* on underside of rose leaf.

It is not unusual to find *C. cydoniae* on a number of rosaceous plants growing near preferred species of Rosaceae. Populations on these other hosts are usually small and cause only slight damage. This makes the anomalous occurrence on roses at Harrisburg all the more noteworthy because of the severe infestation.

HOST PLANTS

The list of hosts (Table 1) is based on Drake and Ruhoff's (1965) world catalogue of the lace bugs and my review of the *Insect Pest Survey Bulletin* (1921-42), *Cooperative Economic Insect Report* (1951-75) (which became the *Cooperative Plant Pest Report* [1976-]), *Index of American Economic Entomology* (1905-59), *Review of Applied Entomology* (1913-), and the *Canadian Insect Pest Review* (1923-). In addition, collecting in Pennsylvania during recent years and nursery inspection reports of the Pennsylvania Department of Agriculture (1975-79) provided a number of new hosts, especially cultivars and varieties of ornamental plants.

More than 35 species of Rosaceae serve as hosts of *C. cydoniae* (Table 1), which tends to confirm McAtee's (1923) statement that this lace bug has a somewhat broader host range than is typical of the genus. Also apparent, as noted by Bailey (1951), is a marked preference for certain rosaceous plants. As Mead (1972) stated, the hawthorn lace bug "selectively attacks" various woody members of the Rosaceae. This idea of preferred hosts is supported by Bailey's observation that black cherry, *Prunus serotina* Ehrh., was not used for breeding, even when its leaves were growing at the branch tips of a common host, Juneberry or shadbush, *Amelanchier* sp. Observations in Pennsylvania show that hawthorn lace bug is able to breed on crabapple (*Malus* spp.) and mountain ash (*Sorbus* spp.), but usually in low numbers when these plants are near favored hosts harboring large lace bug populations. Records of certain other plants (wild cherry and plum, cultivated apple and pear) may also be based on populations of *cydoniae* that originated from nearby, heavily infested hosts.

The 5-year records of Pennsylvania nursery inspection show that hawthorns, *Crataegus* spp., are the most frequent hosts observed in nurseries and garden centers (82 infestations). *C. cydoniae* was encountered less often on *Amelanchier* (4), *Cotoneaster* (2), *Pyracantha* (1), and *Sorbus* (4). These figures, however, cannot be used to assess host preferences. *Amelanchier* is not common in Pennsylvania nurseries, and *Cotoneaster* and *Pyracantha* spp., mainly container-grown plants subject to a rapid turnover, are not normally held long in garden centers and thus are not as apt to become infested as plants growing in the nursery.

My collecting in established landscape plantings, as well as the literature (Table 1), shows that *C. cydoniae* is an important pest not only of ornamental hawthorn but of cotoneaster and pyracantha. Beshear et al. (1976) referred to this lace bug as the most destructive insect affecting pyracantha. In several states different insecticides have been evaluated for their effectiveness in controlling this pest on cotoneaster and pyracantha (Neiswander 1937, Stuckey 1944, Walton 1947, Watts 1947). In the southeastern states loquat, *Eriobotrya japonica*, apparently becomes an important host (Table 1).

Hawthorn lace bug is named for the injury inflicted to quince, *Cydonia oblonga*. Beginning with Fitch (1861) and continuing to at least the 1920's and 30's, *C. cydoniae* was cited as a serious pest in quince orchards. This plant, however, is no longer as available as a host as certain other rosaceous species. Although quince was more common in Colonial American gardens than apple or pear (Hedrick 1950) and was once grown commercially in western New York and parts of New England (Wilcox and Smith 1905), there were fewer than 30,000 trees left by 1965, mostly in home gardens (Childers 1973). Little commercial acreage remains in western New York (L. L. Pechuman, pers. comm.).

Non-rosaceous species recorded as food plants have been questioned as "true" hosts (Bailey 1951). McAtee (1923) reported *C. cydoniae* "in numbers" on buttonbush, *Cephalanthus occidentalis*, but did not note whether nymphs were collected. Torre-Bueno (1933) mentioned beating seven specimens from oak, *Quercus* sp., and I have seen a series of adults taken near Harrisburg, Pa., on other members of the Fagaceae: American chestnut, *Castanea dentata* Borkh., and European beech, *Fagus sylvatica* L. Because I was unable to

Table 1. List of the known hosts of *Corythucha cydoniae*.

Host ^a , Locality, and Reference ^b	
ROSACEAE	
<i>Amelanchier arborea</i> (Michx. Fil) Fern. PA	<i>C. uniflora</i> Moench (as <i>C. parvifolia</i>) DC (16)
<i>A. canadensis</i> (L.) Medic. ND (29), PA (23) ^c	<i>C. viridis</i> L. TX (USNM)
<i>A. laevis</i> Wieg. PA	<i>C. sp.</i> DC (34, 35), DE (53), GA (48, 9), IN (11, 4), MA (38, 5), Man. (10), MD (55), ME (6), MI (31), MO (22), MS (1), NJ (20, 61), NY (54), Ont. (3), WA (USNM)
<i>A. stolonifera</i> Wieg. PA	
<i>A. sp.</i> DC (34, 35), IN (11), MA (5, 6), NJ (7, 60)	<i>Cydonia oblonga</i> P. Mill. DC (35), FL (24), IN (11), MA (21, 12), MD (45), MI (30), MO (22), MS (24, 33), OH (43, 39, 40), PA (47), PA, WA (42), Mex.—Coah. (USNM), (25) ^e
<i>Aronia melanocarpa</i> Ell. MA (5)	<i>Eriobotra japonica</i> Lindl. FL (52, 36), SC (USNM)
<i>A. sp.</i> IN (11)	
<i>Chaenomeles japonica</i> Lindl. PA	<i>Malus coronaria</i> (L.) P. Mill. FL (36)
<i>C. speciosa</i> Nakai NC (28), PA	<i>M. floribunda</i> Sieb. FL (36)
<i>C. sp.</i> MA (5), MS (33), NC (13)	<i>M. halliana</i> Koehne PA
<i>Cotoneaster apiculata</i> Rehd. & Wils. PA	<i>M. pumila</i> P. Mill. OR (46) ^f
<i>C. divaricata</i> Rehd. & Wils. PA	<i>M. sp.</i> NC (28), PA
<i>C. horizontalis</i> Decne. PA	<i>Prunus serrulata</i> Lindl. NC (28)
<i>C. hupehensis</i> Rehd. & Wils. MA (6)	<i>P. subhirtella</i> Miq. NC (28)
<i>C. salicifolia</i> Franch. VA	<i>P. sp.</i> (wild cherry & plum) AR (USNM), OR (46)
<i>C. sp.</i> GA (9), OH (39, 40), Ont. (2), WV (56)	<i>Pyracantha coccinea</i> Roem. NC (28), PA
<i>Crataegus biltmoreana</i> Beadle or <i>intricata</i> Lange (as <i>C. coccinea</i>) DC (16)	<i>P. coccinea</i> var. <i>lalandi</i> (as <i>P. lalandi</i>) AL (17), MD (59)
<i>C. calpodendron</i> (Ehrh.) Medic. (as <i>C. tomentosa</i>) DC (16), NJ (60)	<i>P. koidzumii</i> Rehd. (as <i>P. formosana</i>) AL (17)
<i>C. crus-galli</i> L. DC (16), NC (28), PA	<i>P. sp.</i> CT (18, 14), FL (51, 36), GA (8, 48, 9), MS (32, 33), NC (13, 37), OK (57, 50), SC (44, 58), Va (26)
<i>C. floridana</i> Sarg. FL (36)	<i>Pyrus communis</i> L. OR (46), WA (41)
<i>C. monogyna</i> Jacq. PA	<i>Rosa</i> spp. (hybrid Tea, climbing) PA
<i>C. nitida</i> (Engelm.) Sarg. NY (USNM) ^d	<i>Sorbus americana</i> Marsh. MA (5)
<i>C. oxycantha</i> L. DC (USNM), MA (19), NJ (62), NY (19), VA (26)	<i>S. aucuparia</i> L. MA (5), PA
<i>C. oxycantha</i> 'Crimson Cloud' and 'Paulii' PA	
<i>C. phaenopyrum</i> (L. Fil) Medic. DC (16), NC (28), PA	
<i>C. 'Toba'</i> (<i>succulenta</i> × <i>oxycantha</i> 'Paulii') PA	
FAGACEAE	
<i>Quercus</i> sp. AR (49)	
RUBIACEAE	
<i>Cephalanthus occidentalis</i> L. DC (34, 35)	

^aWhere possible, current nomenclature is used with the botanical name as cited in reference listed in parentheses.

^bPlants followed by "PA" and "VA" without a reference are hosts observed in this study.

^cCited as *A. intermedia* Spach without a state record.

^dFrom specimens in U.S. National Museum collection.

^eNo locality given.

^fTentatively identified owing to vague description of damaged specimens.

confirm the presence of a breeding population, these two plants are omitted from Table 1; literature records, of course, had to be accepted at face value.

Hawthorn lace bug can be characterized as a selective feeder on rosaceous shrubs, preferring native and cultivated species of *Amelanchier* and *Crataegus* and ornamental cultivars of *Cotoneaster* and *Pyracantha*. Its original hosts probably were species of hawthorn (*Crataegus*) and shadbush (*Amelanchier*) rather than *Malus*, *Prunus*, *Pyrus*, or *Sorbus*. Quince was an important host when commercial orchards were more common. An increasing awareness of the uses of ornamentals and development of new pyracantha, and especially, cotoneaster cultivars as ground covers and accents may have prompted outbreaks of this lace bug in landscape plantings. Small populations may occur on other rosaceous shrubs, usually when they are grown near more favored hosts. A good example of this lace bug's rather broad host range and adaptability, especially under the more artificial conditions of urban environments, is the unusual infestation reported herein on hybrid Tea and climbing roses.

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