

PLANTHOPPERS OF PITCH PINE AND SCRUB OAK IN PINE BARRENS COMMUNITIES (HOMOPTERA: FULGOROIDEA)

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Abstract.—Planthoppers were collected in northeastern pitch pine-scrub oak barrens, the New Jersey Pine Barrens, and in ridgetop pine barrens from Maine to Virginia. The host plants were pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) except for one species taken on sheep laurel (*Kalmia angustifolia*). Fourteen species of Fulgoroidea were collected: 7 species in 3 genera of Achilidae, 4 species in 3 genera of Cixiidae, 2 species in 2 genera of Derbidae, and 1 species of Issidae. Five planthoppers collected consistently from northeastern pine barrens can be considered characteristic of these insect-rich natural communities. The new species *Myndus wheeleri* Wilson from New Jersey is described and illustrated.

Key Words: Insecta, Homoptera, distribution, host plants, North America

The term pine barrens, used in a broad sense, refers to natural shrub-savannah communities that consist of open pitch pine (*Pinus rigida* Mill.) woodlands having an understory of shrubby oaks (*Quercus ilicifolia* Wangenh. and sometimes *Q. prinoides* Willd.); various heaths (Ericaceae); as well as wildflowers, grasses, and other herbs. These disclimax, fire-dependent communities typically occur on sandy, excessively well-drained, nutrient-poor soils—on deep sandy deposits on the Coastal Plain, and inland on glacial till and outwash plains. Northeastern pitch pine-scrub oak barrens and their variants or subtypes (e.g., boreal, coastal, and midlatitude inland) can be considered postglacial relicts. They represent a globally imperiled community type distinct from the better-known New Jersey Pine Barrens, which are characterized by a more southern flora and a mosaic of vegetation types differing from those of northeastern pine barrens. Similar communities are

found on ridgetops, but these barrens are generally not as floristically diverse as more lowland barrens and tend to have a more depauperate insect fauna (Olsvig et al. 1979, Cryan 1985, Rawinski 1987, Schweitzer and Rawinski 1987, Widoff 1987, Reschke 1990, Wheeler 1991, Dirig 1994).

The New Jersey Pine Barrens (e.g., Boyd and Marucci 1979, Boyd 1973, 1991), Albany Pine Bush (Rittner 1980, Stewart and Rossi 1981), and Long Island Pine Barrens (Cryan 1980) have long been favored collecting areas for naturalists and entomologists, particularly lepidopterists. In addition to an interest in characteristic lepidopterans such as the Karner blue butterfly, *Lycaeides melissa samuelis* Nabokov (Dirig 1976, Stewart and Ricci 1988, Andow et al. 1994), and buck moth, *Hemileuca maia* (Drury) (Cryan and Dirig 1977, Cryan 1985), there has been an increasing appreciation of pine barrens as communities that harbor an exceptionally rich lepidopteran

fauna, including numerous species that do not occur in nearby deciduous forests (Cryan 1980, Rawinski 1987, Schweitzer and Rawinski 1987, Widoff 1987). The Nature Conservancy and several State Natural Heritage Programs have recently placed an emphasis on documenting the biotic diversity of pine barrens and related communities.

During a study of plant bugs (Hemiptera: Miridae) associated with *Quercus ilicifolia* (Wheeler 1991) and *Pinus rigida* (AGW, unpublished data), planthoppers representing several families were consistently observed on these two dominant pine barrens plants. Because the Fulgoroidea of pine barrens have received little attention, the planthoppers occurring on scrub oak and pitch pine were collected in northeastern pitch pine-scrub oak barrens and related communities. Herein we record the adult achilids, cixiids, derbids, and issids encountered during the survey (mainly 1990–1992), including one species collected on sheep laurel (*Kalmia angustifolia* L.), and describe the new species *Myndus wheeleri* Wilson (Cixiidae) from the New Jersey Pine Barrens.

METHODS AND STUDY SITES

Planthoppers were beaten from branches of scrub oak and pitch pine (with one collection from sheep laurel) as described by Wheeler (1991), and all adults collected were identified by SWW. The sites sampled included many of those used in the study of mirids associated with scrub oak (Wheeler 1991): the Albany Pine Bush, New Jersey Pine Barrens, various other northeastern pitch pine-scrub oak barrens, and ridgetop barrens such as New York's Shawangunk Mountains. The description of the new species *Myndus wheeleri* follows the format used by Kramer (1979).

ACHILIDAE

Nymphal achilids are presumed to feed on fungi or decaying vegetation, as they have usually been collected under the bark

of logs (Hepburn 1967, Wilson et al. 1994). Adults feed on plant sap and have been associated with numerous angiosperms and gymnosperms. Slightly over half of the known adult host records indicate a tendency toward polyphagy; slightly fewer than half suggest a more restricted host plant range for those species (Wilson et al. 1994). Host plant records of adults of nine species of *Catonia* include 11 plant families; 6 of the species have been recorded from *Pinus* spp. *Epiptera* adults have been collected beneath the bark of dead hardwood and conifers as well as in sawdust piles (Hepburn 1967, Wilson 1983). Three species appear to be associated with pines (Hepburn 1967). Host records for 17 species of *Synecdoche* include 13 plant families; 5 of the species have been associated with Pinaceae and 7 with Ericaceae (Wilson et al. 1994).

Catonia cinctifrons (Fitch)

Distribution: Massachusetts south to Florida and west to Iowa and Texas (O'Brien 1971).

Pine Barrens records: NEW YORK: Clinton Co., NE Ausable Chasm, 30 Aug 1992, ex *Pinus rigida*, 1 female. WEST VIRGINIA: Greenbrier Co., Kates Mtn., White Sulphur Springs, 25 Aug 1990, ex *Quercus ilicifolia*, 4 males.

Host plant records: *Pinus clausa*, *Pinus* sp., *Quercus* sp., *Carya* sp. (Wilson et al. 1994).

Catonia picta Van Duzee

Distribution: Coastal from Connecticut south to Florida and west to Louisiana (O'Brien 1971).

Pine Barrens records: NEW JERSEY: Burlington Co., Rt. 72 W Rt 539, NW Warren Grove, 11 Aug 1991, ex *Pinus rigida*, 4 males, 1 female.

Host plant records: *Pinus* sp. (Wilson et al. 1994).

Catonia pumila Van Duzee

Distribution: Massachusetts south to Georgia and west to Minnesota and Louisiana (O'Brien 1971).

Pine Barrens records: CONNECTICUT: Hartford Co., Shaker Pines, Enfield, 28 Sept 1991, ex *Pinus rigida*, 3 females. MASSACHUSETTS: Franklin Co., Montague Sand Plains, 14 Sept 1991, ex *Pinus rigida*, 8 females. NEW YORK: Clinton Co., W. Chazy Jack Pine Barrens 29 Aug 1992, ex *Pinus rigida* cones, 3 males, 1 female; Clintonville Sand Plain, 30 Aug 1992, ex *Pinus rigida*, 4 males, 8 females; NE Ausable Chasm, 30 Aug 1992, ex *Pinus rigida*, 5 males, 2 females. Saratoga Co., Rt. 9 junction Rt 197, 3 mi. S South Glens Falls, 22 Aug 1992, ex *Pinus rigida*, 2 males, 1 female. Albany Co., Pine Plaza W., Albany, 22 Aug 1992, ex *Pinus rigida*, 1 male. RHODE ISLAND: Washington Co., Arcadia Management Area, 1 Sept. 1991, ex *Pinus rigida*, 1 female.

Host plant records: *Pinus* sp., *Quercus* sp., *Carya* sp. (Wilson et al. 1994).

Eiptera brittoni Metcalf

Distribution: New Brunswick south to North Carolina and west to British Columbia (Beirne 1950, S.W.W., unpubl. data).

Pine Barrens records: RHODE ISLAND: Kent Co., Trestle Trail, nr. Greene, 5 August 1990, ex *Quercus ilicifolia*, 1 female.

Host plant records: *Picea* spp., *Abies* spp., *Pseudotsuga menziesii* (Mirb.) Franco, *Tsuga heterophylla* (Raf.) Sarg., *Pinus* spp. (Brown 1941).

Eiptera variegata (Van Duzee)

Distribution: Quebec south to North Carolina and west to Ontario and Illinois (Beirne 1950).

Pine Barrens records: MASSACHUSETTS: Hampden Co., Barnes Mun. Airport, nr. Westfield, 14 Sept 1991, ex *Pinus rigida*, 1 male. PENNSYLVANIA: Schuylkill Co., Rt 25, 2.5 mi NW, Newtown, 4 Sept 1989, ex *Pinus rigida*, 1 male, 1 female.

Host plant records: *Picea glauca* (Moench.) Voss. (Brown 1941).

Synecdoche dimidiata (Van Duzee)

Distribution: Maine south to Florida and, in pine barrens habitats, west to Ohio (O'Brien 1971, present study).

Pine Barrens records: MAINE: York Co., Killick Pond Barrens, 8 Aug 1990, ex *Quercus ilicifolia*, 3 males, 5 females; Waterboro Barrens, 9 Aug 1990, ex *Quercus ilicifolia*, 2 females. PENNSYLVANIA: Monroe Co., Long Pond, 16–17 Aug. 1986, T. J. Henry and A. G. Wheeler, Jr., colls., ex *Quercus ilicifolia*, 4 males; Somerset Co., Mt. Davis, 10 Aug 1991, ex *Pinus rigida*, 1 male, 2 females. RHODE ISLAND: Kent Co., Trestle Trail nr. Greene, 5 Aug 1990, ex *Quercus ilicifolia*, 1 female. NEW YORK: Clinton Co., Ausable Chasm, 30 Aug 1992, ex *Pinus rigida*, 1 female. VIRGINIA: Augusta Co., Big Levels barren, 26 Aug 1990, ex *Quercus ilicifolia*, 1 male, 2 females. WEST VIRGINIA: Greenbrier Co., Kates Mtn., White Sulphur Springs, 25 Aug 1990, ex *Quercus ilicifolia*, 1 female.

Host plant records: *Pinus* sp., *Fagus* sp. (Wilson et al. 1994).

Synecdoche impunctata (Fitch)

Distribution: Quebec south to Georgia and west to Iowa and Oklahoma (O'Brien 1971).

Pine Barrens records: MAINE: Oxford Co., E. Brownfield, Fryeburg Barrens, 10 Aug 1990, ex *Quercus ilicifolia*, 1 male, 5 females; York Co., Shapleigh Barrens, 9 Aug 1990, ex *Quercus ilicifolia*, 1 male, 3 females; Waterboro Barrens, 9 Aug 1990, ex *Quercus ilicifolia*, 2 males, 1 female. MASSACHUSETTS: Franklin Co., Montague Barrens, 4 Aug 1990, ex *Quercus ilicifolia*, 2 females; Plymouth Co., Miles Standish State Forest, 5 Aug 1990, ex *Quercus ilicifolia*, 1 male, 3 females. NEW HAMPSHIRE: Carroll Co., Ossipee Barrens, 10 Aug 1990, ex *Quercus ilicifolia*, 1 male, 1 female. RHODE ISLAND: Kent Co., Trestle Trail nr. Greene, 5 Aug 1990, ex *Quercus ilicifolia*, 2 males.

Host plant records: *Quercus* spp., *Prunus* sp. (O'Brien 1971).

CIXIIDAE

Nymphal cixiids feed underground on plant roots, and possibly fungi, whereas adults feed above ground on plant sap (Wilson et al. 1994). Host plant records of adults of 10 species of North American *Cixius* include 8 plant families; 3 of the species have been recorded from *Pinus* spp. Host plant records of adults of 17 species of North American *Myndus* include 8 plant families; 9 of the species have been recorded from Agavaceae. Nymphs of *M. crudus* Van Duzee feed on several grasses (Poaceae); adults feed on palms (Arecaceae) and are vectors of the MLO that causes lethal yellowing disease (Wilson and O'Brien 1987, Wilson et al. 1994). Host plant records of adults of 10 species of North American *Oliarus* include 5 plant families; 2 of the species have been recorded from Pinaceae.

Cixius pini Fitch

Distribution: New Hampshire south to North Carolina and west to Minnesota and Tennessee (Kramer 1981).

Pine Barrens records: PENNSYLVANIA: Somerset Co., Mt. Davis, 30 June 1991, ex *Pinus rigida*, 1 male.

Host plant records: *Pinus* sp., *Picea* sp., *Abies* sp. (Kramer 1981), *Gaylussacia* sp. (Osborn 1938).

Cixius quebecensis Beirne

Distribution: Quebec south to Maine and New York (Kramer 1981, present study).

Pine Barrens records: NEW YORK: Ulster Co., Ice Caves Mtn., SE Ellenville, 14 June 1991, ex *Kalmia angustifolia*, 1 male, 2 females.

Host plant records: *Kalmia angustifolia* (present study).

Myndus wheeleri Wilson,

NEW SPECIES

(Figs. 1–3)

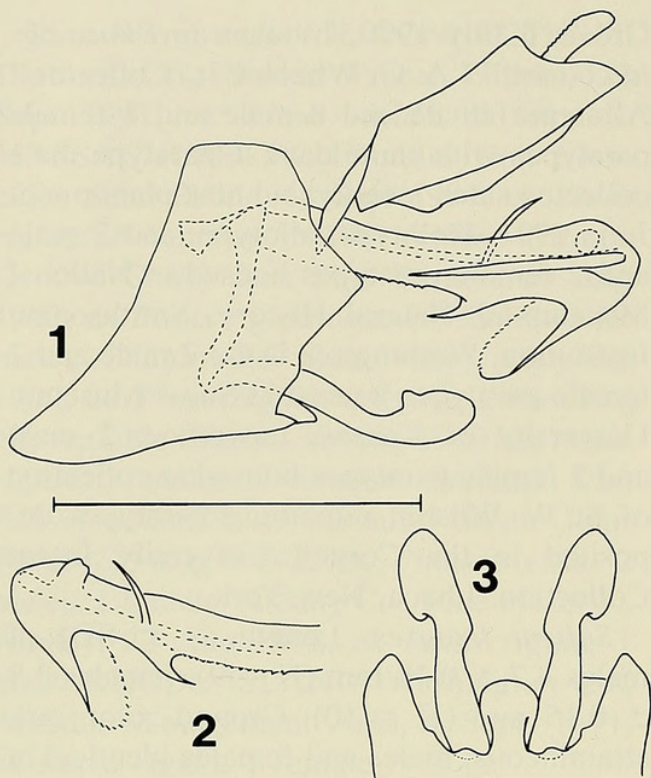
Types: Holotype male with the following labels: "NJ: Burlington Co., Pine Barrens, Rt. 72 3 mi W. of Rt. 539, NW. Warren

Grove, 4 July 1990," "taken in *Pinus rigida* cones," "A. G. Wheeler, Jr., Collector." Allotype female and 8 male and 8 female paratypes with same data; 1 paratype male collected same locality and host plant on 22 June 1991. Holotype, allotype, and 2 male and 2 female paratypes housed at National Museum of Natural History, Smithsonian Institution, Washington, D.C.; 2 male and 2 female paratypes housed at Snow Museum, University of Kansas, Lawrence; 2 male and 2 female paratypes housed at collection of S. W. Wilson; remaining paratypes deposited in the Cornell University Insect Collection, Ithaca, New York.

Salient features: Length ($\bar{x} \pm SD$) of males 3.7 ± 0.16 mm ($N = 9$), females 3.8 ± 0.15 mm ($N = 10$). Ground color dark stramineous; males and females identical in color; vertex, frons, mesonotum, and pro- and mesothoracic legs slightly darker; pronotum, genae, coxae, and abdominal sternites lighter, almost yellow; forewings hyaline, translucent, veins dark with dark pustules.

Male genitalia (Figs. 1–3): Median lobe of pygofer in ventral view spatulate, broadly rounded at apex, apices of styles broadly rounded; genital capsule in lateral view with posterior margin strongly triangular, style capitate, anal flap with posteroventral apex almost acute and with membrane projecting between ventral margins; aedeagus in left lateral view with large apical appendage bearing teeth on anterior aspect, with elongate anteriorly directed spine extending about half length of aedeagus; aedeagus in right lateral view with slender upright process in anterior half, with anteriorly directed acute process on aedeagal shaft on ventral aspect near middle of shaft, ventral aspect serrate anterior to acute process.

Notes: The sharply triangular posterior margin of the pygofer, the shapes of the anal flap and styles, and the orientation of the dorsal and lateral processes ally this species with *M. pusillus* Van Duzee. It differs from *M. pusillus* in the presence of a



Figs. 1–3. Male genitalia of *Myndus wheeleri* Wilson. 1, Complete genitalia, left lateral view. 2, Aedeagus, right lateral view. 3, Apex of pygofer and styles, ventral view. Bar = 0.5 mm.

strong, acute process on the ventral aspect of the aedeagal shaft and the serrate region anterior to this process. Adults were collected from inside previous seasons' cones on *Pinus rigida*, where they were unlikely to have been feeding and were probably seeking shelter as in some achilids which hide in the dry fronds of palms during the day and leave to feed on green foliage at night (O'Brien, personal comm.). Field notes indicate that adults were abundant; 15–20 were observed in a single cone. This planthopper is named in recognition of Dr. A. G. Wheeler Jr.'s contributions to our knowledge of planthopper biology.

Oliarus quinquelineatus (Say)

Distribution: Nova Scotia south to Florida and west to Ontario, Colorado and Louisiana (Mead and Kramer 1982).

Pine Barrens records: MASSACHUSETTS: Franklin Co., Montague Sand Plains, 15 June 1991, ex *Pinus rigida*, 1 male, 3 females. Hampden Co., Barnes Mu-

nicipal Airport, nr. Westfield, 16 June 1991, ex *Pinus rigida*, 1 male, 3 females. Plymouth Co, Miles Standish State Forest, 4 July 1991, ex *Pinus rigida*, 2 males, 4 females. NEW JERSEY: Burlington Co., Rt. 532, 3 mi. W. Chatsworth, 22 June 1991, ex *Pinus rigida*, 1 male, 1 female. NEW YORK: Albany Co., Rt. 155, Karner, Pine Bush, 14 June 1991, ex *Pinus rigida*, 1 male, 2 females. Steuben Co., NW of West Cameron, 9 July 1994, ex *Pinus rigida*, 2 males, 1 female. Ulster Co., Ice Caves Mtn., SE Ellenville, 14 June 1991, ex *Pinus rigida*, 1 male, 1 female; Mohonk Preserve, Overcliff Rd., nr. New Paltz, 2 June 1991, ex *Pinus rigida*, 4 males, Mohonk Preserve, nr. New Paltz, 3 July 1991, ex *Pinus rigida*, 2 males, 3 females. PENNSYLVANIA: Chester Co., Nottingham Park, 23 June 1991, ex *Pinus rigida*, 4 males, 4 females; Goat Hill Barrens, SW Nottingham, 23 June 1991, ex *Pinus rigida*, 7 males, 3 females. RHODE ISLAND: Washington Co., Arcadia Management Area, Rt. 165, 20 June 1993, ex *Pinus rigida*, 3 males; 7 July 1991, ex *Pinus rigida*, 1 male, 4 females.

Host plant records: "Hard pine" (*Pinus rigida*) in the Albany Pine Bush during July–August, 1901 (see Rittner 1979).

Oliarus spp.

Pine Barrens records: MASSACHUSETTS: Franklin Co., Montague Sand Plains, 15 August 1991, ex *Pinus rigida*, 6 females; 4 July 1991 ex *Pinus rigida*, 3 females. Hampden Co., Barnes Mun. Airport, nr. Westfield, 4 July 1991, ex *Pinus rigida*, 1 female. NEW JERSEY: Burlington Co., Rt. 72 W Rt 539, NW Warren Grove, 22 June 1991, ex *Pinus rigida*, 1 female; 11 Aug 1991, 3 females; Rt. 70 W Burrs Mill, 11 Aug 1991, ex *Pinus rigida*, 1 female. NEW YORK: Jefferson Co., Wellesley Island State Park, 16 Aug 1992, ex *Pinus rigida*, 1 female. PENNSYLVANIA: Clinton Co., Petes Run Rd., Sproul State Forest, 29 June 1991, ex *Pinus rigida*, 1 female; Schuylkill Co., Rt. 25 W Newtown, 2 June 1991, ex *Pinus rigida*, 1 female.

DERBIDAE

Nymphal derbids are thought to feed under bark on fungi while adults are found on the above ground parts of monocots, woody dicots, and, rarely, on ferns. About 60% of derbid species have been recorded from a single host suggesting a tendency toward monophagy (Wilson et al. 1994). *Apache degeerii* nymphs have been found beneath the bark of a living oak tree (Wilson 1982); adults have been collected on woody dicots in three plant families. Three species of *Otiocerus* have been taken on woody dicots in two plant families. *Otiocerus coquebertii* nymphs have been collected from under the bark of dead trees and adults have been recorded from woody dicots in two plant families (Wilson et al. 1994).

Apache degeerii (Kirby)

Distribution: Maine south to Florida and west to Minnesota and Texas; also recorded from British Columbia and Cuba (Metcalf 1945, Wilson and McPherson 1980, S.W.W., unpubl. data).

Pine Barrens records: MAINE: York Co., Killick Pond Barrens, 8 Aug 1990, ex *Quercus ilicifolia*, 2 males, 1 female; Waterboro Barrens, 7 Aug 1990, ex *Quercus ilicifolia*, 2 females. Oxford, Co., Fryeburg Barrens, 10 Aug 1990, ex *Quercus ilicifolia*, 1 male, 1 female. MASSACHUSETTS: Franklin Co., Montague Barrens, 4 Aug 1990, ex *Quercus ilicifolia*, 1 female. NEW YORK: Ulster Co., Mohonk Preserve, Overcliff Rd., 3 Aug 1990, ex *Quercus ilicifolia*, 1 male. Warren Co., Peggy Ann Rd., W Glens Falls, 3 Aug 1990, ex *Quercus ilicifolia*, 3 females. WEST VIRGINIA: Greenbrier Co., Kates Mtn., White Sulphur Springs, 25 Aug 1990, ex *Quercus ilicifolia*, 1 female.

Host plant records: *Quercus ilicifolia* (present study). *Quercus* sp., *Fagus* sp., *Acer* sp., *Carya* sp. (Swezey 1904).

Otiocerus coquebertii Kirby

Distribution: Nova Scotia south to North Carolina and west to Ontario, Minnesota, and Texas (Metcalf 1945, present study).

Pine Barrens records: MAINE: York Co., Killick Pond Barrens, 8 Aug 1990, ex *Quercus ilicifolia*, 1 female

Host plant records: *Quercus* sp., *Fagus* sp., *Acer* sp. (Van Duzee 1889).

ISSIDAE

Nymphal and adult issine issids appear to be mainly polyphagous on the above ground parts of woody dicots with some feeding on gymnosperms (Wilson et al. 1994). No common pattern of host plant relationships is apparent for the North American species of *Thionia*. *Thionia bullata* (Say) has been recorded from *Pinus* spp., *T. elliptica* (Germar) from oaks (Fagaceae), *T. producta* Van Duzee from *Juniperus* (Cupressaceae), and *T. simplex* from numerous dicots (Wheeler and Wilson 1988, Wilson et al. 1994).

Thionia elliptica (Germar)

Distribution: Pennsylvania south to Virginia and North Carolina and west to Arkansas (Wheeler and Wilson 1987, present study).

Pine Barrens records: VIRGINIA: Augusta Co., Big Levels barren, 26 Aug 1990, ex *Quercus ilicifolia*, 4 females. For records from pine barrens in Pennsylvania, see Wheeler and Wilson (1987).

Host plant records: *Quercus ilicifolia*, *Q. marilandica* (Wilson et al. 1994).

DISCUSSION

Even for the well-collected New Jersey Pine Barrens there are relatively few papers that specifically treat its insect fauna (Boyd and Marucci 1979). Great diversity, however, is known to characterize many insect families of this community, although species richness varies considerably among the groups (Boyd and Marucci 1979, Boyd 1991). Less is known about the insects of northeastern pitch pine-scrub oak barrens, though recent surveys of selected barrens have revealed a rich lepidopteran fauna (Schweitzer and Rawinski 1987, Widoff 1987). In addition, more than 40 plant bug

Table 1. Synopsis of collecting data on pine barrens planthoppers.

Taxon	<i>Quercus ilicifolia</i>	<i>Pinus rigida</i>	<i>Kalmia angustifolia</i>	Number of	
				♂	♀
Achilidae					
<i>Catonia cinctifrons</i> (Fitch)	•	•		4	1
<i>Catonia picta</i> Van Duzee		•		4	1
<i>Catonia pumila</i> Van Duzee		•		15	23
<i>Epiptera brittoni</i> Metcalf	•				1
<i>Epiptera variegata</i> (Van Duzee)		•		2	1
<i>Synecdoche dimidiata</i> (Van Duzee)	•			11	12
<i>Synecdoche impunctata</i> (Fitch)	•			8	15
Cixiidae					
<i>Cixius pini</i> Fitch		•		1	
<i>Cixius quebecensis</i> Beirne			•	1	2
<i>Myndus wheeleri</i> Wilson		•		10	9
<i>Oliarus quinquelineatus</i> (Say)		•		29	31
Derbidae					
<i>Apache degeerii</i> (Kirby)	•			5	9
<i>Otiocerus coquebertii</i> Kirby	•				1
Issidae					
<i>Thionia ellpitica</i> (Germar)	•				4

species are known from scrub oak in these barrens and related communities (Wheeler 1991). Our collecting in pine barrens has now shown that these communities are also inhabited by a diversity of Fulgoroidea.

A total of 154 adults of 13 planthopper species in four families was collected from pitch pine or scrub oak in pine barrens and related communities (Table 1), ranging from the northern limits of pitch pine-scrub oak barrens in Maine to a ridgetop barren in Virginia. Three specimens of an additional species, the cixiid *C. quebecensis*, were taken on sheep laurel. Of the 13 pine- and oak-associated planthoppers, only two, the achilids *C. cinctifrons* and *S. dimidiata*, were found on both pitch pine and scrub oak. Although none of the species are restricted to pine barrens, several were collected consistently in northeastern pitch pine-scrub oak barrens. Those that probably can be considered characteristic of this community type include the achilid *C. pumila* and the cixiid *O. quinquelineatus* on pitch pine, the achilid *S. impunctata* on scrub oak, and *S. dimidiata* on both plant species. The issid *T. elliptica*, recorded here

only from scrub oak in a Virginia barren, should also be considered a characteristic pine barrens species (Wheeler and Wilson 1987).

Nearly all of the 14 planthopper species reported here are known to be widely distributed. The most notable range extension is that of *C. quebecensis* from the Shawangunk Mountains in southeastern New York. This cixiid, described as *C. fulvus* from Quebec and Prince Edward Island (Beirne 1950), has since been reported only from Maine (Kramer 1981). Another significant discovery during this survey was an undescribed species of the cixiid genus *Myndus*. Described herein as *M. wheeleri*, it was encountered only in the New Jersey Pine Barrens, where adults were sometimes common in old cones on pitch pine trees.

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