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SEASONAL FLIGHT PATTERNS OF HEMIPTERA IN A NORTH CAROLINA BLACK WALNUT PLANTATION. 6. TINGIDAE AND ARADIDAE

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ABSTRACT

The seasonal flight patterns of 11 species of Tingidae and six species of Aradidae collected in window traps in a North Carolina black walnut plantation are described. Flying height distributions and seasonal flight activities of *Corythucha ciliata* (Say) and *Gargaphia solani* Heidemann are considered in detail.

This is the sixth in a series of papers on seasonal flight patterns of Hemiptera in a black walnut (*Juglans nigra* L.) plantation near Asheville, North Carolina, and deals with the families Tingidae and Aradidae; earlier papers dealt with the Pentatomoidea (1980), Coreoidea (1981a), Reduvioidea (1981b), Cimicoidea (1981c) and Lygaeoidea (1981d). The study was conducted from 24 March to 14 October in 1977, and from 24 March to 13 October in 1978. Specimens were collected weekly by window trapping; traps were suspended at 1, 2, 3, 4, 5, 6 and 7 m. The study site and trap construction were discussed in detail by McPherson and Weber (1980). All hemipteran specimens collected during this study are deposited in the Entomology Collection, Zoology Research Museum, Southern Illinois University, Carbondale.

RESULTS AND DISCUSSION

Eleven tingid and six aradid species were collected during the two years of this study; numbers of specimens collected for all taxa ranged from one to 91 (Table 1).

Most of the species were collected in numbers too low to permit conclusions about seasonal flight patterns. However, *Corythucha ciliata* (Say) and *Gargaphia solani* Heidemann were collected in sufficient numbers (Table 1) to allow a more detailed discussion of flying height distributions and seasonal flight activities.

C. ciliata occurs primarily on sycamore (e.g., Bailey 1951, Barber and Weiss 1922, Blatchley 1926, Drake 1919, Froeschner 1944, Horn et al. 1979, Morrill 1903, Wade 1917) but has also been collected from cypress (Froeschner 1944), ash, hickory, mulberry (Blatchley 1926, Drake 1919) and leather-leaf (Bailey 1951). It overwinters as adults (e.g., Bailey 1951, Barber and Weiss 1922, Froeschner 1944, Wade 1917); in central New England, overwintering adults may be found in abundance under loose tree bark in October and may not emerge until early June (Bailey 1951). Barber and Weiss (1922) felt this species probably has "two broods" (is bivoltine?) in New Jersey.

In the present study, *C. ciliata* adults were found from early April to early September (Table 1). They were collected at all seven flying heights with over 55% captured at 3–5 m (Fig. 1).

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Table 1. Seasonal flight activity of Tingidae and Aradidae during 1977–78 in a North Carolina black walnut plantation.

Taxon	No. Collected	Collection Height (m) $\bar{x}\pm SE$	Collection Height (m) Range	Range of Collection Dates
TINGIDAE				
Corythucha ciliata (Say)	70	4.27±0.21	1–7	1 April–2 Sept.
Corythucha cydoniae (Fitch)	1	3.00	—	23 June
Corythucha juglandis (Fitch)	26	4.62±0.35	1–7	1 April–13 Oct.
Corythucha marmorata (Uhler)	3	3.67±1.45	1–6	13 May–12 Aug.
Corythucha pallida Osborn & Drake	2	6.50±0.50	6–7	22 April
Gargaphia solani Heidemann	91	1.85±0.16	1–7	2 June–13 Oct.
Gargaphia tiliae (Walsh)	1	6.00	—	29 July
Leptoypha costata Parshley	8	4.75±0.25	4–6	3 June–22 July
Melanorhopala infuscata Parshley	1	4.00	—	30 June
Physatocheila brevirostris Osborn & Drake	2	2.50±1.50	1–4	7 April–15 Sept.
Physatocheila variegata Parshley	1	6.00	—	6 May
ARADIDAE				
Aradus cinnamomeus Parshley	3	3.67±0.67	3–5	22 Sept.–23 Sept.
Aradus crenatus Say	1	1.00	—	29 April
Aradus niger Stål	1	6.00	—	29 Sept.
Mezira granulata (Say)	30	4.07±0.33	1–7	22 April–16 Sept.
Mezira lobata (Say)	1	4.00	—	20 May
Neuroctenus sp.[a]	2	3.50±1.50	2–5	20 May–2 June

[a]Genus is currently being revised (Froeschner, pers. comm.).

This species overwintered as adults and was apparently bivoltine (Fig. 3) Adults began to emerge from overwintering sites in early April and were present to mid-May. Their adult offspring (summer generation) occurred from late June to late July or early August. Adults of the second (overwintering) generation were present in September (and possibly in August).

G. solani occurs primarily on eggplant (e.g., Bailey 1951, Fink 1915, Froeschner 1944, Horn et al. 1979) but has also been collected from horse-nettle (Blatchley 1926, Fink 1915, Froeschner 1944, Somes 1916), white horse-nettle (Froeschner 1944) and sunflower (Horn et al. 1979). It overwinters as adults (Bailey 1951, Fink 1915, Froeschner 1944). Fink (1915) stated that *G. solani* may have 7–8 generations per season in the vicinity of Norfolk, Virginia, with apparently six generations on eggplant and the remainder on horse-nettle.

In the present study, *G. solani* adults were found from early June to mid-October (Table 1). They were collected at all seven flying heights with almost 70% collected at 1 m (Fig. 2).

This species apparently overwintered as adults but the number of generations per year is unclear from the available data (Fig. 4). It appears that during spring (i.e., April and May), adults were either not flying or were not in the plantation. However, adults were quite active from early July to the end of the season.

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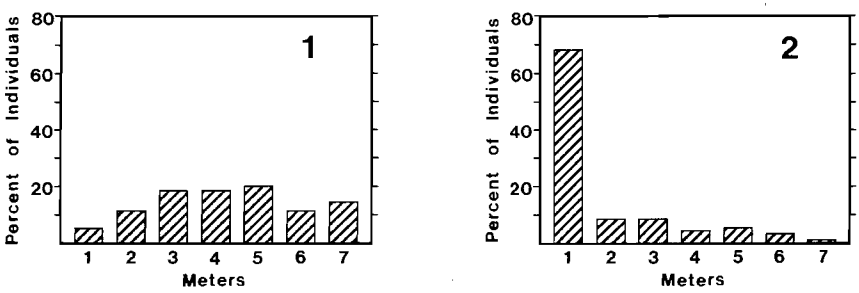
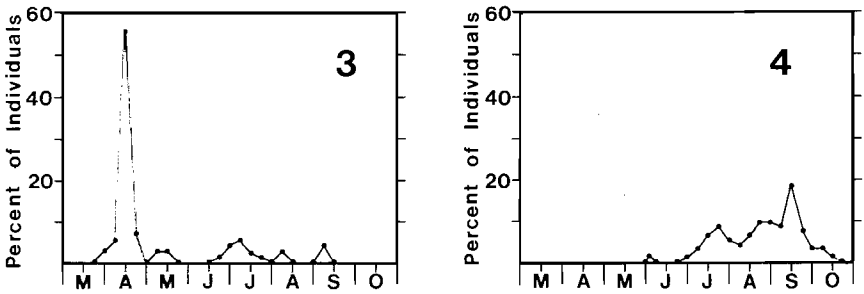


Figs. 1–2 Flying height distributions of two tingid species during 1977–78 in a North Carolina black walnut plantation: (1) *Corythucha ciliata*, (2) *Gargaphia solani*.



Figs. 3–4. Seasonal flight activities of two tingid species during 1977–78 in a North Carolina black walnut plantation: (3) *Corythucha ciliata*, (4) *Gargaphia solani*.

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