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SEASONAL FLIGHT PATTERNS OF HEMIPTERA IN A NORTH CAROLINA BLACK WALNUT PLANTATION. 2. COREOIDEA

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ABSTRACT

The seasonal flight patterns of 16 species of Coreoidea collected in window traps in a North Carolina black walnut plantation are described. Flying height distributions and seasonal flight activities of *Alydus eurinus* and *A. pilosulus* are considered in detail.

This is the second 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 superfamily Coreoidea; the first paper dealt with the Pentatomoidea (McPherson and Weber 1980). The study was conducted from 24 March to 14 October 1977, and from 24 March to 13 October 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 were deposited in the Entomology Collection, Zoology Research Museum, Southern Illinois University, Carbondale.

RESULTS AND DISCUSSION

Sixteen coreoid species were collected during the two years of this study including eight coreids, six rhopalids and two alydids; numbers of specimens for these species ranged from 1 to 145 (Table 1). Although most species were collected at several heights, only *Acanthocephala terminalis, Alydus eurinus* and *A. pilosulus* ranged across all heights (i.e., 1–7 m). The coreids generally flew at heights above those of the rhopalids and alydids; of the eight coreid species collected, six (including the three *Leptoglossus* species) had average flying heights of 3.67 m or more while four of the six rhopalid species, and both alydid species, had average flying heights of 3.00 m or less.

The coreoids, in general, first appeared in the traps later in the year than the pentatomoids; only 18.7% of the coreoid species were collected as early as March-April (Table 1) while 45.7% of the pentatomoid species were collected during this time (McPherson and Weber 1980).

Most of the species were collected in numbers too low to permit meaningful comparisons of flying height distributions and seasonal flight activities within and/or between genera (Table 1). The primary exceptions are the two alydids, which were the most frequently collected of the 16 species.

A. eurinus and *A. pilosulus* have been collected from black walnut (Nixon and McPherson 1977) but are usually associated with legumes (Schaefer 1980). Yonke and Medler (1968) studied the life cycles of these alydids in southern Wisconsin and found both species to be bivoltine and to overwinter as eggs. *A. eurinus* adults were found from 29 June to 19

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Table 1. Seasonal flight activity of Coreoidea 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
COREIDAE				
Acanthocephala terminalis (Dallas)	9	3.67±0.62	1–7	16 June–11 Aug.
Anasa armigera (Say)	3	4.33±1.45	2–7	12 Aug.–6 Oct.
Archimerus alternatus (Say)	3	2.33±0.67	1–3	15 April–30 June
Euthochtha galeator (Fabricius)	19	1.05±0.05	1–2	16 June–9 Sept.
Leptoglossus corculus (Say)	9	5.67±0.33	4–7	28 April–15 July
Leptoglossus fulvicornis (Westwood)	1	6.00	—	11 Aug.
Leptoglossus oppositus (Say)	15	4.67±0.39	3–7	30 June–13 Oct.
Merocoris distinctus Dallas	2	5.50±1.50	4–7	25 Aug.–9 Sept.
RHOPALIDAE				
Arhyssus lateralis (Say)	32	1.50±0.14	1–4	28 April–7 Oct.
Aufeius impressicolis Stål	3	4.33±1.67	1–6	23 June–6 Oct.
Harmostes fraterculus (Say)	3	3.67±1.45	1–6	12 Sept.–6 Oct.
Harmostes reflexulus (Say)	34	1.85±0.27	1–6	20 May–13 Oct.
Liorhyssus hyalinus (Fabricius)	4	3.00±1.22	1–6	22 Sept.–13 Oct.
Stictopleurus punctiventris (Dallas)	4	1.25±0.25	1–2	2 June–30 June
ALYDIDAE				
Alydus eurinus (Say)	145	1.30±0.07	1–7	27 May–13 Oct.
Alydus pilosulus (Herrich-Schaeffer)	44	1.45±0.19	1–7	13 May–13 Oct.

October, and *A. pilosulus* adults from 11 July to 17 August. Torre-Bueno and Brimley (1907) found both species (presumably adults) in North Carolina from June to December, with copulation noted in November and December; this suggests life cycles similar to those in southern Wisconsin.

In the present study, *A. eurinus* and *A. pilosulus* adults were found from May to October (Table 1), and most (ca. 86% of each species) were collected at 1 m (Figs. 1–2). A comparison of the flying height distributions between these species with the χ^2 test for two independent samples showed there was no significant difference at the 0.01 level ($\chi^2 = 1.45$).[3]

The seasonal flight activities of the two alydids suggest life cycles similar to those reported by Yonke and Medler (1968) for southern Wisconsin (i.e., bivoltine with the eggs overwintering). The second generation was apparently represented by the peak during September-October (Figs. 3–4) and presumably gave rise to overwintering eggs. The subsequent developmental time of nymphs during the following spring would explain the late appearance of adults (i.e., May) in the flight traps. Adults of this generation apparently survived into August (Figs. 3–4). Drops in adult abundance, in addition to those in August and late October, are of such short duration (i.e., 1–2 weeks) that they probably resulted from random variation, or were a response to some environmental factor (e.g., temperature), and do not indicate additional generations.

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[3]Data were grouped in the following categories for testing: 1–2, 3–4, 5–7 m.

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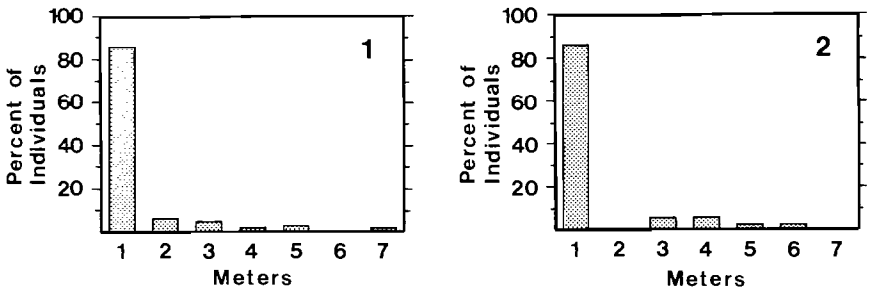
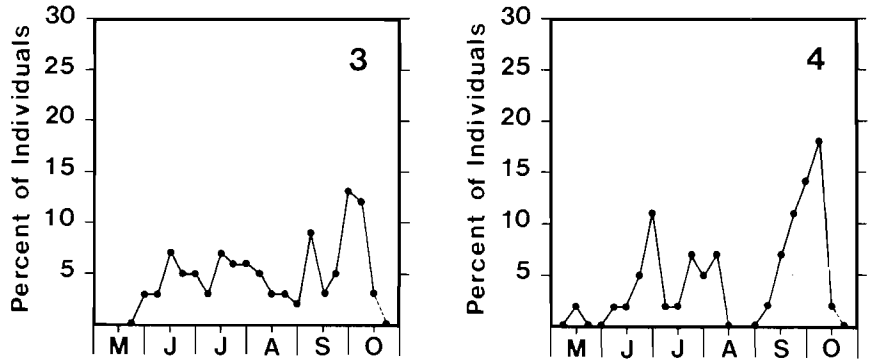


Figs. 1–2. Flying height distributions of two alydid species during 1977–78 in a North Carolina black walnut plantation: (1) *Alydus eurinus*, (2) *A. pilosulus*.



Figs. 3–4. Seasonal flight activities of two alydid species during 1977–78 in a North Carolina black walnut plantation: (3) *Alydus eurinus*, (4) *A. pilosulus*.

ton, D. C., for confirming our identifications of these coreoids. We also wish to acknowledge Mr. D. Brenneman and the staff of the North Carolina Division of Forestry, Morganton, for their help in collecting data and maintaining the window traps. This research was partially supported by the USDA Forest Service, North Central Forest Experiment Station.

LITERATURE CITED

McPherson, J. E. and B. C. Weber. 1980. Seasonal flight patterns of Hemiptera in a North Carolina black walnut plantation. 1. Pentatomoidea. Great Lakes Entomol. 13:177–183.

Nixon, P. L. and J. E. McPherson. 1977. An annotated list of phytophagous insects collected on immature black walnut trees in southern Illinois. Great Lakes Entomol. 10:211–222.

Schaefer, C. W. 1980. The host plants of the Alydinae, with a note on heterotypic feeding aggregations (Hemiptera: Coreoidea: Alydidae). J. Kansas Entomol. Soc. 53:115–122.

Torre-Bueno, J. R. de la and C. S. Brimley. 1907. On some heteropterous Hemiptera from N. Carolina. Entomol. News 18:433–443.

Yonke, T. R. and J. T. Medler. 1968. Biologies of three species of *Alydus* in Wisconsin. Ann. Entomol. Soc. Amer. 61:526–531.

SEASONAL FLIGHT PATTERNS OF HEMIPTERA IN A NORTH CAROLINA BLACK WALNUT PLANTATION. 3. REDUVIOIDEA

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ABSTRACT

The seasonal flight patterns of 18 species of Reduvioidea collected in window traps in a North Carolina black walnut plantation are described. Flying height distributions and seasonal flight activities of *Sinea diadema* and *S. spinipes* are considered in detail.

This is the third 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 superfamily Reduvioidea; earlier papers dealt with the Pentatomoidea (McPherson and Weber 1980) and Coreoidea (McPherson and Weber 1981). The study was conducted from 24 March to 14 October 1977, and from 24 March to 13 October 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 were deposited in the Entomology Collection, Zoology Research Museum, Southern Illinois University, Carbondale.

RESULTS AND DISCUSSION

Eighteen reduvioid species were collected during the two years of this study including 15 reduviids and three phymatids; numbers of specimens for these species ranged from 1 to 45 (Table 1). Although most species were collected at several heights, only *Phymata americana* averaged as high as 5.00 m; unfortunately only two specimens of this species were collected and, thus, the high average flying height may simply reflect random variation.

Most of the species were collected in numbers too low to permit meaningful comparisons of flying height distributions and seasonal flight activities within and/or between genera (Table 1). The primary exceptions are *Sinea diadema* and *S. spinipes*, which were the most frequently collected of the 18 species.

S. diadema occurs in grassy and weedy fields (Readio 1924) and feeds on a wide variety of insects (Readio 1924, 1927). In Kansas, where its life cycle has been studied, it overwinters as adults and is bivoltine (Readio 1924, 1927); the first generation matures in June and early July, and the second in August and early September (Readio 1924).

S. spinipes is usually collected in woodlands on twigs and leaves of forest trees, including walnut (Readio 1927). In Kansas, it overwinters as adults and is univoltine (Readio 1927). Eggs are deposited from late April and early May to early August. Adults of the new generation begin to appear by early July with additional adults continuing to appear until late in the season (Readio 1927).

In the present study, *S. diadema* adults were found from June to October, and *S. spinipes*

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Table 1. Seasonal flight activity of Reduvioidea 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
REDUVIIDAE				
Acholla multispinosa (De Geer)	6	3.33±0.67	1–5	19 Aug.–13 Oct.
Apiomerus crassipes (Fabricius)	19	2.26±0.44	1–7	2 June–18 Aug.
Arilus cristatus (Linnaeus)	3	4.00	—	15 Sept.–16 Sept.
Melanolestes abdominalis (Herrich–Schaeffer)	4	1.25±0.25	1–2	7 April–15 April
Melanolestes picipes (Herrich–Schaeffer)	17	1.76±0.34	1–6	14 April–15 Sept.
Narvesus carolinensis Stål	14	1.43±0.25	1–4	16 June–21 July
Oncocephalus geniculatus Stål	1	1.00	—	17 June
Pnirontis modesta Banks	14	4.43±0.56	1–7	14 April–5 Aug.
Pselliopus barberi Davis	3	2.67±0.88	1–4	26 May–23 Sept.
Pselliopus cinctus (Fabricius)	4	3.50±1.50	1–7	15 April–23 June
Pygolampis pectoralis (Say)	5	2.80±1.11	1–6	1 April–4 Aug.
Pygolampis sericea Stål	2	1.00	—	1 April–8 April
Sinea complexa Caudell	3	3.33±1.20	1–5	14 July–22 July
Sinea diadema (Fabricius)	45	1.29±0.13	1–5	16 June–13 Oct.
Sinea spinipes (Herrich–Schaeffer)	33	4.06±0.36	1–7	1 April–22 July
PHYMATIDAE				
Phymata americana Melin	2	5.00±2.00	3–7	15 Sept.–22 Sept.
Phymata f. fasciata (Gray)	7	4.43±0.84	2–7	15 April–13 Oct.
Phymata pennsylvanica Handlirsch	2	3.00±1.00	2–4	2 Sept.–15 Sept.

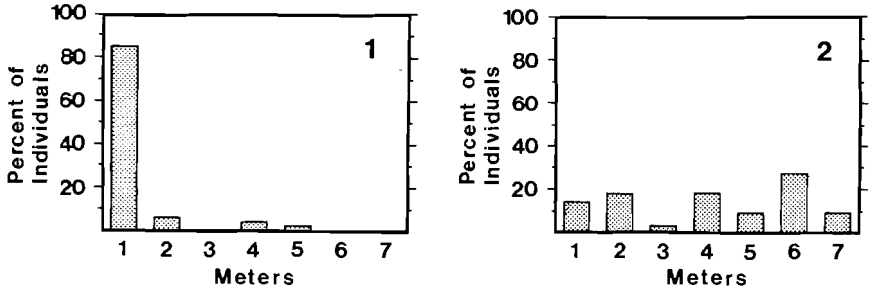
adults from April to July (Table 1). Most specimens of *S. diadema* were collected at 1 m while those of *S. spinipes* were more evenly distributed across the seven heights (Figs. 1–2). A comparison of the flying height distributions between these species with the χ^2 test for two independent samples showed that this difference was significant at the 0.01 level (i.e., most adults of *S. diadema* flew at a lower height than those of *S. spinipes*).[3]

The patterns of seasonal flight activity for *S. diadema* and *S. spinipes* were irregular (Figs. 3–4), thus, making it difficult to correlate them with the number of generations per year. However, if the life cycles of these species in Kansas (Readio 1924, 1927; see above) and North Carolina are similar, then the flight patterns become more understandable.

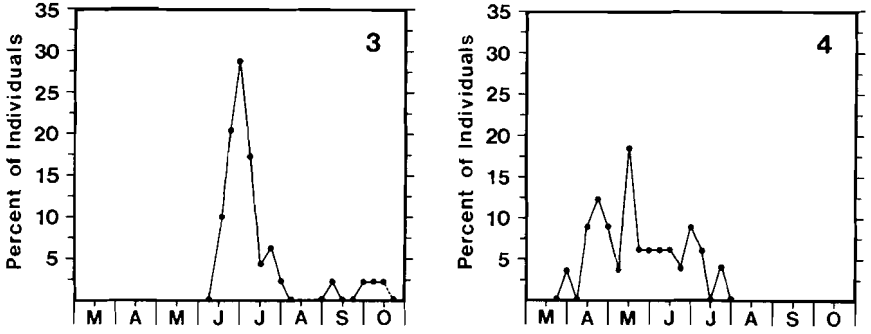
In the present study, *S. diadema* overwintered either as adults or eggs. Assuming its life cycle in North Carolina is similar to that in Kansas (Readio 1924, 1927), then it overwintered as adults which emerged and reproduced early the following spring; overwintered individuals apparently exhibited little or no spring flight activity since no adults were found in the traps during this time. Their adult offspring (summer generation) occurred from mid-June to late July, and were quite active (Fig. 3). Adults of the second (overwintering) generation were active from early September to late October.

S. spinipes also overwintered as adults. These adults began to emerge in late March and early April and were present until at least June (Fig. 4). Adults of the new generation apparently began to appear in late June and early July and were no longer flying by late July. It is likely, however, that sweeping of vegetation throughout the rest of the season would have shown that the adults were present and still active.

[3]Data were grouped in the following categories for testing: 1–2, 3–4, 5–7 m; $\chi^2 = 31.92$.



Figs. 1–2. Flying height distributions of two reduviid species during 1977–78 in a North Carolina black walnut plantation: (1) *Sinea diadema*, (2) *S. spinipes*.



Figs. 3–4. Seasonal flight activities of two reduviid species during 1977–78 in a North Carolina black walnut plantation: (3) *Sinea diadema*, (4) *S. spinipes*.

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LITERATURE CITED

McPherson, J. E. and B. C. Weber. 1980. Seasonal flight patterns of Hemiptera in a North Carolina black walnut plantation. 1. Pentatomoidea. Great Lakes Entomol. 13:177–183.

————. 1981. Seasonal flight patterns of Hemiptera in a North Carolina black walnut plantation. 2. Coreoidea. Great Lakes Entomol. 14:11–13.

Readio, P. A. 1924. Notes on the life history of a beneficial reduviid, *Sinea diadema* (Fabr.), Heteroptera. J. Econ. Entomol. 17:80–86.

————. 1927. Studies on the biology of the Reduviidae of America north of Mexico. Univ. Kansas Sci. Bull. 17:5–291.