

YUCCA PLANT BUG, *HALTICOTOMA VALIDA*¹:
AUTHORSHIP, DISTRIBUTION, HOST PLANTS,
AND NOTES ON BIOLOGY

A. G. WHEELER, JR.

Bureau of Plant Industry, Pennsylvania
Department of Agriculture, Harrisburg 17120

ABSTRACT

Authorship of the yucca plant bug, *Halticotoma valida*, has been credited to Reuter, 1913, but Townsend, 1892 is recognized as validating Uhler's manuscript name of *H. valida*. The known distribution is reviewed and 7 new state records are given. Host plant records are discussed, and those from cactus and orchids are considered to be based on misidentifications.

In North Carolina eggs hatched in late March, and first generation adults were abundant by 1 May. Nymphal first-instars of the second generation were present by 1 June, and adults were common by 1 July. At least 2 more generations occurred before killing frosts. *Yucca recurvifolia* and *Y. filamentosa* were more susceptible to injury by yucca plant bug than the thicker-leaved *Y. aloifolia* and *Y. gloriosa*.

Yuccas are used as accents in landscape plantings in the southern states, and their increased popularity as ornamentals has drawn attention to the yucca plant bug, *Halticotoma valida* Townsend. Although this mirid is one of the few important pests of ornamental yuccas (Smith 1967, Pirone 1970, Westcott 1973), it has been little studied. Haviland (1945) investigated the life history in Maryland and presented a description and figure of the egg and descriptions and photographs of the nymphal instars. Her paper has generally been overlooked, e.g., by Weigel and Baumhofer (1948) and Carvalho (1957).

This paper discusses the authorship of *H. valida* and reviews its distribution and host plants. Notes on seasonal history near Charlotte, North Carolina are given.

AUTHORSHIP

Authorship has been credited to Reuter (1913), but the species was first described by Townsend (1892) when he stated that *Halticotoma valida* Uhler (the notation "MS" was omitted, possibly because Townsend thought Uhler already had described the species) is "... a stout looking, short capsid, bluish-black in colour, with the head and thorax reddish-brown." This description, along with Townsend's note that the bug is numerous on *Yucca*, is sufficient to recognize the species and is more complete than Heidemann's (1892) descriptions of several Uhler manuscript species which are accepted by Carvalho (1958, 1959) and Wheeler and Henry (1975). At one time, H. G. Barber² credited Townsend with the description of *H. valida*, but this opinion apparently was never published in a scientific paper. Recognition of

¹Hemiptera: Miridae.

²Mon. Letter No. 235, USDA, Bur. Ent., December 1933.

Townsend's description of *H. valida* does not disrupt stability; the original name is retained and proper credit for the species is assigned. The so-called "50-year rule" of the International Code does not apply since only a change in authorship is involved.

DISTRIBUTION

Townsend (1892) described *H. valida* from New Mexico, and Reuter (1913) redescribed it from Texas and Arizona. This mirid was not known from east of the Mississippi River until Blatchley (1926) recorded it from Florida. Knight (1927) added Colorado, Mississippi, South Carolina, and Tennessee, and Froeschner (1949) added Missouri. In his world catalog, Carvalho (1957) summarized the known distribution but did not list records from Maryland (Haviland 1945) or North Carolina (Brimley 1938) or those from District of Columbia, Georgia, Kentucky, and Virginia cited by Barber.² Later, Milliron (1958) reported yucca plant bug from Delaware; Kelton (1959) listed it from Iowa; and Knight (1968) added California, Oklahoma, and Utah.

New records (all specimens in U.S. National Museum collection unless noted otherwise) are: ALABAMA: Baldwin Co., 17 May 1968, H. F. McQueen; Calhoun Co., 9 May 1969, H. F. McQueen, "A very heavy infestation . . . on the yucca plants used on a lawn. . . ."³ INDIANA: Evansville, 18 July 1971, on yucca, T. J. Henry (Pa. Dep. Agr. coll.). KANSAS: Coolidge, 18 June [19]00, E. D. Ball 1940 Collection. LOUISIANA: Shreveport, N. Banks, W. L. McAtee. NEBRASKA: Glen, Sioux Co., Aug. 1903, H. Barber. NEVADA: Oak Springs, Nye Co., 26 May 1940, P. C. Ting. OHIO: Cincinnati, Sept. 1938, inj[uring] yucca, J. S. Houser.

The description of *H. valida* from the southwest and its report from the east by Blatchley (1926), who noted that *valida* was "a southwestern species," suggested that this mirid might have been introduced into the eastern states. However, specimens had been collected in the southeast nearly 50 years earlier. The USNM collection has an adult and 6 nymphs collected at Bluffton, South Carolina, on 3 July 1877, and 4 specimens taken on yucca at Eustis, Florida, on 22 May 1895. These earlier records do not exclude the possibility of a southwestern origin of *valida*. In fact, all other *Halticotoma* spp. are known only from the southwest, except *brunnea* Knight which is known only from Washington (Carvalho 1957, Knight 1968). Since *Yucca* spp. are native to all the southeastern states from which *valida* has been recorded (Rehder 1927), it is likely that *valida* originated in the southwest and reached the southeastern states by natural dispersal.

Shipment of yucca nursery stock containing eggs of *H. valida* may have been responsible for the infestations in the Washington, D. C. area and for the records from Indiana and Ohio. The possibility of introduction with nursery stock is supported by the interception of yucca plant bug at Ysidro, California, on yucca originating at Campo, California, near the Mexican border.³

HOST PLANTS

In the southwest *H. valida* has been reported from *Y. glauca* Nutt. (cited as *Y. angustifolia*) and *Y. macrocarpa* ? (probably *Y. schottii* Engelm. or *Y.*

²Record from APHIS, PPQ, USDA, Pest Survey and Technical Support Staff.

torreyi Shafer) (Townsend 1892) and has been taken on *Y. elata* Engelm. in the Sierrita Mts. of Arizona (2 specimens in USNM collection, 27 Nov. 1913, E. A. Schwarz); it has been collected on *Y. filamentosa* L. in Maryland (Haviland 1945) and Missouri (Froeschner 1949); and on *Y. smalliana* Fern. in Florida.³ There also is a record of nymphs and adults on *Dasyllirion* sp. (sotol) at Presidio, Texas, 17 March 1944.³ Both *Yucca* and the related genus *Dasyllirion* belong to the family Liliaceae. The USNM collection has 4 females taken on sotol at Presidio in November 1942 that may be *valida*. These specimens differ from typical specimens of *valida* by having orange antennae and shorter pubescence on the dorsum and may represent an undescribed species. The USNM collection also has a specimen of *H. andrei* Knight, a species closely resembling *valida*, that was collected on *Dasyllirion* sp. at Nogales, Mexico, 20 Nov. 1955. Records of *valida* from cactus (Hunter et al. 1912) and orchids (Mackie 1944) probably are based on misidentifications.

Hunter et al. (1912) reported a mirid breeding on yucca in southwestern Texas under the name *Sixeonotus luteiceps* Reuter (synonymized by Carvalho (1957) under *S. scabrosus* (Uhler)). Since *S. scabrosus* breeds on cactus and bears a strong resemblance to *H. valida*, it seems likely that Hunter et al. (1912) had both species under observation. This was the conclusion of Carvalho (1957). Van Duzee (1917) had synonymized the *luteiceps* of Hunter et al. (1912) under *H. valida*, but Carvalho placed *luteiceps* under both *H. valida* and *S. scabrosus*. The addition of "in part" after *luteiceps* would have made the synonymy clearer.

Mackie (1944) reported *H. valida* as intercepted on "numerous species of orchids" shipped from Mexico to California, but the specimens most likely belonged to the bryocorine genus *Tenthetcoris*, species of which are known as pests of orchids (Southwood and Leston 1959) and could have been confused with *H. valida* by someone unfamiliar with the Miridae. There also are records of damage to 2 plants that probably do not serve as hosts. In Mississippi, Harned (1929) observed injury to perennial phlox growing near yucca plants. The USNM collection has 5 adults and 2 nymphs of *valida* collected at Pulaski, Tennessee, 22 July 1911, that are labeled "attacking cotton."

SEASONAL HISTORY IN NORTH CAROLINA

A population of yucca plant bug on *Y. recurvifolia* Salisb. 10 miles south of Charlotte, N. C., was studied by taking biweekly samples from 15 April to 15 November 1974. Collections were made by tapping several leaves over a plastic box, preserving all dislodged specimens in 70% alcohol, and sorting them to stage. Except when populations were small in early spring and late fall, samples consisted of 15-25 individuals.

H. valida is known to overwinter as eggs inserted in yucca leaves (Haviland 1945, Froeschner 1949). At the sample site, overwintered eggs had hatched when the plants were examined on 22 March. Nymphal first-instars were observed in small aggregations at the base of leaves. In 1970 eggs had first hatched on 1 April. Haviland (1945) reported yucca plant bug eggs to hatch in late April-early May in Maryland, and in Missouri, Froeschner (1949) found the first nymphs on 15 May.

In the 15 April sample the population consisted of nearly equal numbers of instars III-V (Table 1). Adults predominated in the May samples. First instars of the second generation were present in the June 1 sample, and second generation adults were common on July 1.

TABLE 1.—SEASONAL HISTORY OF *H. valida* ON *Yucca recurvifolia* IN NORTH CAROLINA, BASED ON BIWEEKLY SAMPLING DURING 1974.

Date	Predominant stages*	Generation and notes
Apr. 15	III-V	1st
May 1	V,A	1st
May 15	A	1st; no nymphs present
June 1	II	2nd; adults of 1st
June 15	III,IV	2nd; no adults
July 1	V,A	2nd; early instars of 3rd
July 15	A	2nd; late instars of 3rd
Aug. 1	III,IV	3rd
Aug. 15	A,II	3rd; early instars of 4th ?
Sept. 1	A,IV	3rd; early instars of 4th
Sept. 15	I,II	4th; adults & late instars of 3rd
Oct. 1	II,III	4th
Oct. 15	II,III	4th
Nov. 1	II,III	4th; 1st instars of 5th ?
Nov. 15	II,III	4th; early instars of 5th ?

*Roman numerals = Nymphal instars; A = Adults.

After the second generation, it was more difficult to delimit generations. Haviland (1945) and Froeschner (1949) noted that eggs continue to hatch for a week or more and that all instars frequently occur on the same plant. First- and second-instar nymphs in the July samples probably represented the start of a third generation. The peak in numbers of third generation adults came in the early September sample, and the small numbers of early instars present may have represented the beginning of a fourth generation. The mid-September sample contained larger numbers of early nymphal instars, but a corresponding peak in fourth generation adults did not occur. That a third and fourth generation could occur by September in North Carolina is supported by Haviland's (1945) observation that only 20 days were required for nymphal development in Maryland during mid-summer. The early instars present through mid-November could have resulted from delayed hatching of fourth generation eggs or could have represented the start of a fifth generation. Nymphs persisted until late November, and adults until late December. Dead nymphs and adults often were found on leaves following heavy frosts.

Populations of yucca plant bug build up rapidly and exert severe feeding pressure on the plants. In Maryland, Haviland (1945) counted nearly 2,000 bugs on a single *Y. filamentosa* plant and an average of over 700 on 10 plants. Yucca foliage became severely yellowed by mid-summer in North Carolina. As noted by Haviland (1945), black specks of excrement on the leaves contribute to the unsightliness. *Y. recurvifolia* and other thin-leaved yuccas appeared to be particularly susceptible to plant bug injury. In a landscape planting of *Y. recurvifolia* and *Y. aloifolia* L. near the sample site, yucca plant bug damaged

recurvifolia plants in both 1973 and 1974, but the numbers of bugs on *aloifolia* were always small and no discoloration of foliage was observed.

ACKNOWLEDGEMENTS

I express sincere appreciation to F. R. Wheeler for taking the biweekly samples. J. A. Slater, University of Connecticut and my colleagues T. J. Henry and K. Valley kindly read the manuscript and offered suggestions for its improvement. I thank A. R. Hardy for checking for specimens of *Halticotoma valida* in the California Department of Food and Agriculture collection.

LITERATURE CITED

- BLATCHLEY, W. S. 1926. Heteroptera or true bugs of eastern North America. Nature Publ. Co., Indianapolis. 1,116 p.
- BRIMLEY, C. S. 1938. The insects of North Carolina. N. C. Dep. Agr., Div. Ent., Raleigh. 560 p.
- CARVALHO, J. C. M. 1957-1959. Catalogue of the Miridae of the world. Pts. I; III-IV. Archos. Mus. Nac., Rio de J. 44:1-158; 47:1-161; 48:1-384.
- FROESCHNER, R. C. 1949. Contributions to a synopsis of the Hemiptera of Missouri. Pt. IV. Hebridae, Mesoveliidae, Cimicidae, Anthocoridae, Cryptostemmatidae, Isometopidae, Miridae. Amer. Mid. Nat. 42:123-88.
- HARNED, R. W. 1929. A plant bug (*Halticotoma valida* Reut.). USDA Insect Pest Bull. 9(4):152.
- HAVILAND, E. E. 1945. A pest of yucca, *Halticotoma valida*, Reut. Univ. Md. Agr. Exp. Sta. Bull. A37 p. 103-12.
- HEIDEMANN, O. 1892. Note on the food-plants of some Capsidae from the vicinity of Washington, D. C. Proc. Ent. Soc. Wash. 2:224-26.
- HUNTER, W. D., F. C. PRATT, AND J. D. MITCHELL. 1912. The principal cactus insects of the United States. USDA, Bur. Ent., Bull. 113. 71 p.
- KELTON, L. A. 1959. Male genitalia as taxonomic characters in the Miridae (Hemiptera). Can. Ent. Suppl. 11. 72 p.
- KNIGHT, H. H. 1927. Notes on the distribution and host plants of some North American Miridae (Hemiptera). Can. Ent. 59:34-44.
- KNIGHT, H. H. 1968. Taxonomic review: Miridae of the Nevada Test Site and the western United States. Brigham Young Univ. Sci. Bull., Biol. Ser. 9(3):1-282.
- MACKIE, D. B. 1944. Division of Plant Industry: Bureau of Entomology and Plant Quarantine. Bull. Calif. Dep. Agr. 32(4):240-88.
- MILLIRON, H. E. 1958. Economic insect and allied pests of Delaware. Univ. Del. Agr. Exp. Sta. Bull. 321. 87 p.
- PIRONE, P. P. 1970. Diseases and pests of ornamental plants. 4th ed. Ronald Press Co., New York. 546 p.
- REHDER, A. 1927. Manual of cultivated trees and shrubs hardy in North America. Macmillan Co., New York. 930 p.
- REUTER, O. M. 1913. Über *Sixeonotus luteiceps* Reut. und Beschreibung einer neuen Bryocorine (Hem. Het.). Ann. Soc. Ent. Belg. 57:278-79.
- SMITH, F. F. 1967. Controlling insects on flowers. USDA Agr. Info. Bull. No. 237. 81 p.
- SOUTHWOOD, T. R. E., AND D. LESTON. 1959. Land and water bugs of the British Isles. Frederick Warne & Co. Ltd., London & New York. 436 p.
- TOWNSEND, C. H. T. 1892. Biologic notes on New Mexico insects. Can. Ent. 24:193-200.

- VAN DUZEE, E. P. 1917. Catalogue of the Hemiptera of America north of Mexico excepting the Aphididae, Coccidae and Aleurodidae. Univ. Calif. Publ. Ent. 2:1-902.
- WEIGEL, C. A., AND L. G. BAUMHOFFER. 1948. Handbook on insect enemies of flowers and shrubs. USDA Misc. Publ. No. 626. 115 p.
- WESTCOTT, C. 1973. The gardener's bug book. 4th ed. Doubleday & Co., Inc., Garden City, N.Y. 689 p.
- WHEELER, A. G., JR., AND T. J. HENRY. 1975. Recognition of seven Uhler manuscript names, with notes on thirteen other species used by Heidemann (1892). Trans. Amer. Ent. Soc. 101:355-69.



GUATEMALAN EARTHQUAKE DAMAGES

The Universidad del Valle de Guatemala has suffered severe damages to buildings & equipment. They would appreciate donations of new or used equipment, books, journals, or of funds for their biology and entomology programs. Donations tax deductible. Please contact Dr. Jack C. Schuster, Univ. del Valle de Guatemala, Apartado Postal 82, Guatemala GUATEMALA.