

Holcocranum saturejæ, a Palearctic Cattail Bug Established in Eastern United States and Tropical Africa (Heteroptera: Lygaeidae: Artheneinae)

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One of the most abundant and easily collected seed bugs in the Virginia fauna is a widespread west-Palearctic species which has never been recorded for the New world and which was not found here until July of 1994. *Holcocranum saturejæ* (Kolenati) is a well-known inhabitant of the pistillate heads of cattails (*Typha* spp.) which, possibly since its distribution was last summarized (Slater, 1964) has dispersed across the Atlantic and is now known to occur in tropical Africa as well.

The first indication that any member of the Artheneinae was established in North America was a report by Wheeler & Fetter (1987) documenting the discovery and distribution of *Chilacis typhae* (Perrin) in Pennsylvania, Maryland, Delaware, and New York. This apparent obligate commensal on cattails (*Typha latifolia*) was first found in June 1986, whereupon Wheeler and his collaborators promptly established numerous localities in the four states mentioned later in the same year. The conclusion was drawn that, since *C. typhae* was not found during Claassen's (1922) thorough survey of *Typha* insects in New York State (and could hardly have been overlooked) the species had likely entered the country and become established sometime during the past fifty years.

During preparation of a treatment of the Lygaeidae of Virginia, the first author suspected that *typhae* might occur in at least the northern end of the state, and began to investigate pistillate heads of *Typha* in the summer of 1994. Virtually the first material examined yielded specimens in all developmental stages, as did heads from

subsequent collections in a transect across the Coastal Plain and Piedmont regions of the state. Two or three heads from a given site were placed in closeable plastic bags, returned to the laboratory, and "extracted" with low heat (60 watt bulb) in a Berlese funnel. As many as two hundred adults and nymphs could be recovered from a single sample.

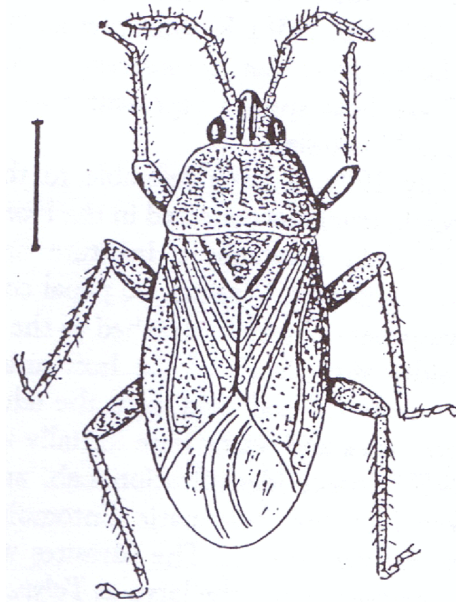


Figure 1. *Holcocranum saturejæ*. Bar=1 mm

However, it was soon apparent that the insects did not exactly match the photograph and descriptive notes published by Wheeler & Fetter for *C. typhae*. Specimens were therefore sent for identification to the second author, who noted their reference to the genus *Holcocranum*. Lacking adequate material of Old World artheneines for comparison, he in turn transmitted the specimens, as well as some apparent conspecifics from tropical Africa, to Jean Péricart (Monterea, France) for his opinion. Dr. Péricart subsequently advised us that all of the specimens are the widespread West Palearctic *H. saturejae*. Thus a second Eurasian cattail inhabitant is confirmed as a well-established immigrant into southeastern United States. The following collection sites in Virginia can be documented (see also the map, Fig. 2), and the establishment of *saturejae* elsewhere along the Atlantic coast is evidenced by material obtained in Florida, New Jersey, North Carolina, and South Carolina. There can be no doubt that it occurs also in Georgia.

Distributional data: Specimens identifiable as *H. saturejae* have been examined from the following localities (collections by the first author unless otherwise specified):

Florida: *Duval Co.*: along US I-95 near jct. with FL Rt. 104, northwest of Jacksonville, 12 October 1994 (J. A. Winston).

South Carolina: *Aiken Co.*: S. Fork Edisto River on SC Rt. 302, E of Aiken, 11 March 1995 (A. G. Wheeler, Jr.). *Georgetown Co.*: along US 17 at Pawley's Island, 2 March 1995. *Horry Co.*: along US 17 at North Myrtle Beach, 3 March 1995 (large numbers of all stages, many adults in copula).

New Jersey: *Salem Co.*: NJ Rt. 40, NW of Elmer, 22 August 1987 (A. G. Wheeler, Jr.).

North Carolina: *Columbus Co.*: beside NC 244 in Hallsboro, 2 March 1994.

Virginia: *Botetourt Co.*: Daleville, int. US 220 and Va. 181, 3 November 1994, (M. W. Donahue). *Caroline Co.*: pond beside US 301, 6 mi/10 km N of Dawn, 14 February 1995. *Charles City Co.*: north approach to Benjamin Harrison bridge, Va. Rts. 106/156, 8 mi/13 km W of Charles City Court House, 12 January 1995 (J. M. Anderson). *Charlotte Co.*: Cub Creek floodplain, 2.5 mi/4 km N of Phoenix, 11 August 1994. *Franklin Co.*: county recreation park, 6 mi/10 km SSE of Rocky Mount, 8 October 1994 (J. M. Anderson). *Greensville Co.*: Meherrin River floodplain, 1 mi/1.6 km NE of Claesville, 19

August 1994 (VMNH survey). *Hanover Co.*: beside Va. Rte. 271 at Hylas, 7 September 1994 (W. H. Mitchell). *Henry Co.*: Martinsville, Forest Hill Country Club, August-October 1994; March 1995. *Montgomery Co.*: Blacksburg, VPISU campus, 3 November 1994 (M. W. Donahue and Cheryl Gruver). *Roanoke Co.*: int. US I-581 and Va. 117, 12 November 1994 (M. W. Donahue). *City of Suffolk*: US 58 at Magnolia, 13 September 1994.

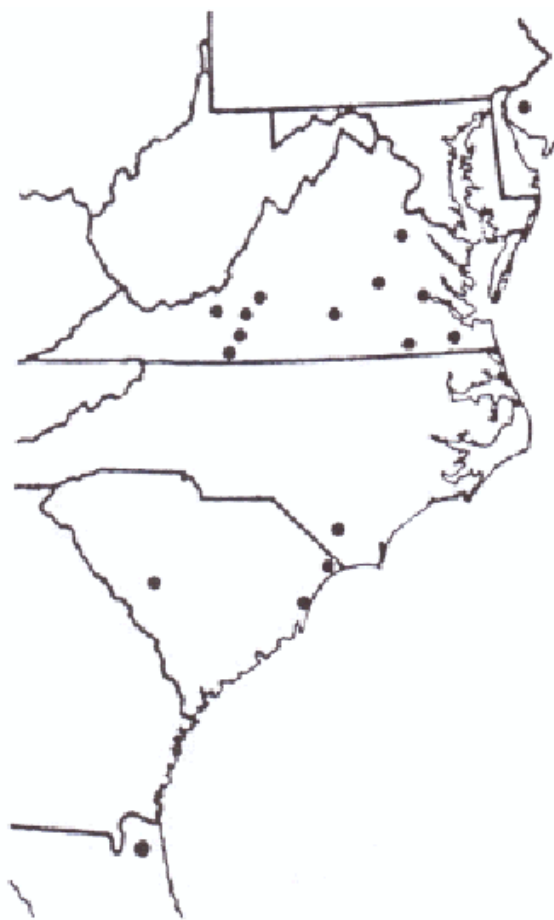


Figure 2. Central Atlantic states, showing all known localities for *Holcocranum saturejae*.

As recently as the end of 1960 (Slater, 1964) there were no published records of *saturejae* in Africa except for the Palearctic belt along the southern Mediterranean rim. However, material in the Slater collection (Péricart det.) originated from the following countries:

Ghana: 2♂♂, 2♀♀, Tafo, 13 April 1966 (D. Leston),
on *Typha australis*.

Nigeria: 2♂♂, NE St. Potkiskum, 17 May 1973 (R. Linnavuori).

Chad; 1♂, Adide-Douara, 24 May 1973 (R. Linnavuori).

Tanzania: 1♀ Ilonga, 11 October 1964, 1 without abdomen, 4 March 1965, 2♀♀, 19 September 1965, 1♂ 2♀♀, 12 September 1965, 2♀♀, 2 April 1964, 1♂, 4 November 1962, all collected at light trap (I. A. D. Robertson).

This information suggests migratory activity by *saturejae* of truly epic proportions: not only has the species crossed the Atlantic from one or more Palearctic sources, but it has apparently transgressed the Sahara as well, and with outstanding success in colonizing the new territories. It is of course possible that its arrival in both areas is not a recent event but merely one not documented by adequate collecting. Having no baseline studies comparable to Claassen's work in New York, it is impossible to estimate when *saturejae* arrived on the eastern coast of North America nor is the mechanism for dispersal (aeolian, anthropogenic, or other) known. Yet the insects have been able to disseminate themselves widely (usually between minuscule cattail stands many miles apart) and even if nobody previously looked into cattail heads for bugs, it is astonishing that they have not been picked up during dispersal, simply through statistical probability. It seems quite likely that the several areas occupied by the species along the Atlantic Coast represent different entry events, possibly something that could be investigated by molecular techniques.

In the Franklin County sample, *saturejae* occurred with *Chilacis typhae* in a ratio of about 20:1 and the sample from Blacksburg contained 23 *saturejae* and two *typhae*. In a cattail colony 1 mi/1.6 km west of Newcastle, Craig Co., Virginia, only *typhae* was present. These three localities are the only ones so far known for *C. typhae* in Virginia, but suggest that the species may be restricted to the western, upland part of the state, whereas most localities for *saturejae* are distinctly more eastern and lowland. Jean Péricart (MS) notes that in Europe, *typhae* and *saturejae* often occur together, with *typhae* being more abundant, but the reverse seems to be the case in western Virginia.

In the western Palearctic *Chilacis typhae* has a relatively more northern distribution (see Slater, 1964)

whereas *H. saturejae* is essentially Mediterranean in range. Until recently five species of *Holcocranum* were reported from the Palearctic Region. Péricart (1994) synonymized three of these with *saturejae*. Distant (1909) described *Teutates sculpturatus* as a new genus and species from India. The genus was synonymized by Horvath (1911) but revalidated by Chopra & Rustagi (1980) on the basis of phallic and spermathecal features, although their paper did not provide comparative differences. To judge from Distant's 1910 figure, this Indian species appears to be a typical *Holcocranum*, and if it is valid, three species are to be recognized: *saturejae* over the Mediterranean region and into western Asia; *diminutum* Horvath in Turkestan (and reported by Linnavuori [1978] from the Sudan); and *sculpturatum* (Distant) from India.

While *H. saturejae* appears to be primarily associated with species of *Typha*, this is not the only plant upon which it develops in Eurasia. Dr. Péricart has kindly allowed us to examine manuscript notes for his forthcoming work on west Palearctic Lygaeidae, which cites numerous records of the species on cattails. However, Putschkov (1960, 1961) established the development of *saturejae* on the catkins of *Salix alba*. It may occasionally inhabit other plants as well.

In Eurasia, hibernation is in the adult stage in litter near water, under bark, and in birds' nests, but our discovery of adults and nymphs inside cattail heads in mid-January demonstrates "in house", active overwintering. Putschkov (1969) has described the nymphs. Details about the biology of the species in North America are unknown, and the mechanism by which individuals get from one cattail stand to another remains a particularly challenging mystery.

Wheeler & Fetter (1986) provided a good description and photograph of *Chilacis typhae*. Specimens of *H. saturejae* are generally similar in habitus (shortened antennae, explanate pronotal margins, etc.) but are distinctly smaller (dimensions), ashy gray in color, with the two black lines between the eyes remaining parallel, and with four polished longitudinal light stripes on the pronotum (Figure 1). Specimens taken in late Fall and Winter are distinctly darker in color than in midsummer, presumably a trait of the second yearly generation.

In the keys to lygaeid genera in Blatchley's manual (1926) and "How to know the true bugs" (Slater & Baranowski, 1978), these two genera work out — with some easements — to *Crophius* (subfamily Oxycaere-

ninae). The very short antennae and approximate metacoxae readily distinguish the two artheneines from *Crophius*. Further, they are the only Virginia lygaeids with clear, explanate corial margins in which the posterior half of the wing lies *within* the connexival margins when at rest.

The majority of the Virginia specimens are retained at the Virginia Museum of Natural History. Small voucher series have been dispersed to The National Museum of Natural History, American Museum of Natural History, Cornell University, the University of Kansas, and the collection of the second author. Florida specimens are deposited with the Florida State Collection of Arthropods, vouchers from South Carolina with the Department of Entomology collection at Clemson University, and those from North Carolina in the corresponding collection at North Carolina State University.

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We are indebted to Dr. Jean Péricart for providing the specific identification of our material from Virginia and Africa and making available his manuscript notes on the species. John M. Anderson, Michael W. Donahue, Wendy H. Mitchell, Cheryl Gruver, and Dr. Judith A. Winston have earned our gratitude for their efforts in collecting cattail heads in Virginia and Florida. Dr. A. G. Wheeler, Jr., aside from initiating the discovery of *Holcocranum* in Virginia, carefully reviewed this paper in manuscript form and provided important locality records resulting from his own field work.

References

Claassen, P. W., 1922 ("1921"). *Typha* insects: Their ecological relationships. *Memoirs of the Cornell University Agricultural Experiment Station* 47: 459-531.

Chopra, N. P., and K. B. Rustagi, 1980. Artheneinae of India (Hemiptera: Lygaeidae). *Oriental Insects* 14: 291-296.

Distant, W. L. 1909. Rhynchotal notes XLVII. *Annals and Magazine of Natural History* (8) 3: 317-345.

Distant, W. L. 1910. The fauna of British India, including Ceylon and Burma. Rhynchota. Vol. 5. Heteroptera: Appendix. London, Taylor & Francis, 362 pp.

Horvath, G. 1911. *Miscellanea Hemipterologica I-IV. Annotationes synonymicae. Annales Musei Nationalis Hungarici* 9: 327-338.

Linnavuori, R. 1978. Hemiptera of the Sudan, with remarks on some species of the adjacent countries. 6. Aradidae, Merizidae, Aneuridae, Pyrrhocoridae, Stenoccephalidae, Coreidae, Alydidae, Rhopalidae, Lygaeidae. *Acta Zoologica Fennica* 153: 1-108.

Péricart, J. 1994. Lygaeidae Palearctiques: synonymies, combinaisons nouvelles et description de deux *Geocoris* nouveaux (Hemiptera). *Bulletin de la Societe entomologique du France* 99: 93-105.

Putshkov (Puchkov), V. G. 1960. On the ecology of some little-known species of Heteroptera. I. *Entomologicheskoe Obozrenie* 39: 300-312 [in Russian].

Putshkov (Puchkov), V. G. 1961. Subfamily Artheneinae (Het. Lyg.) of the fauna of the Ukrainian SSR. *Dopovodi Akademii Nauk Ulcrainskoi RSR (Kiev)* 1961: 3: 371-379 [in Russian].

Putshkov (Puchkov), V. G. 1969. Fauna Ukraine: Lygaeidae. *Akademii Nauk Ukrainskoi RSR* 211: 1-388 (in Russian).

Slater, J. A., 1964. A Catalogue of the Lygaeidae of the World. University of Connecticut, Storrs. Two volumes, 1668 p.

Wheeler, A. G. Jr. and J. E. Fetter, 1987. *Chilacis typhae* (Heteroptera: Lygaeidae) and the subfamily Artheneinae new to North America. *Proceedings of the Entomological Society of Washington* 89(2): 244-249.