BioOne COMPLETE

# First Record of Hysteroneura setariae (Hemiptera: Aphididae) on Rice in South Sulawesi Province of Indonesia

Author: Nasruddin, Andi

Source: Florida Entomologist, 96(2) : 647-648

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.096.0237

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://bioone.org/journals/Florida-Entomologist on 13 Jul 2024
Terms of Use: https://bioone.org/terms-of-use

# FIRST RECORD OF *HYSTERONEURA SETARIAE* (HEMIPTERA: APHIDIDAE) ON RICE IN SOUTH SULAWESI PROVINCE OF INDONESIA

Andi Nasruddin
Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar 90245, Indonesia

E-mail: andinasruddin@yahoo.com

Rusty plum aphid, *Hysteroneura setariae* (Thomas) (Hemiptera: Aphididae) is native to North America and now distributed in many countries and regions of the world, including India, Malaysia, Philippines, Vietnam, Thailand, China, Cameroun, Gambia, Ghana, Nigeria, Portuguese Guinea, Sierra Leone, South Africa, Australia, Papua New Guinea, Fiji, Solomon Island, Canada, U.S.A., Honduras, Argentina, Brazil, Colombia, Guyana, Surinam, Venezuela (C.I.E. Distribution Map A255 1969); India (Garg & Sethi 1978); Sri Lanka (Wijerathna & Edirisinghe 1995); Kenya (Wangai et al. 1991); Bolivia, Peru (Smith & Cermeli 1979); Chile (Heie et al. 1996); Ecuador (Peck et al. 1998); Nepal (Thapa 2000); and Indonesia (Java Island ) (Noordam 2004).

*Hysteroneura setariae* is a heteroceous between *Prunus* sp., usually *P. domestica* and Poaceae in North America. This insect is a pest of rice, wheat, sugar cane, and maize (Blackman & Eastop 2000; Stoetzel & Miller 2001). It has also been reported as pest of soybean (Jahn et al. 2005). On rice, the aphid feeds on leaves and un-ripened grains. Moderately infested grains show brown necrotic spots. A heavy infestation on milk-stage rice grains results in empty grains and turns all spikelets brown and chaffy (Akibo-Betts & Raymundo 1978). Severe rice damage caused by this aphid have been reported from countries such as Sierra Leone (Akibo-Betts & Raymundo 1978), India (Garg & Sethi 1978), and Nigeria (Akinlosotu 1977). In Java, Indonesia, *H. setariae* was collected from 33 species of weed but not from rice (Noordam 2004).

The rusty plum aphid can also indirectly damage plants by vectoring various plant viruses, including cucumber mosaic virus (CMV), watermelon mosaic virus (WMV) (Coudriet 1962), sugarcane mosaic virus (SCMV) (Harborne 1988), bermuda grass mosaic virus (BgMV) (Masumi et al. 2011), barley yellow dwarf virus (BYDV) (Wangai et al. 1991), soybean mosaic virus (SMV) (Quimio & Calilung 1993; Wijerathna & Edirisinghe 1995), guinea grass mosaic virus (GGMV) (Kukla et al. 1984), onion yellow dwarf virus (OYDV), maize dwarf mosaic virus (MDMV), zucchini yellow mosaic virus (ZYMV) (Blackman and Eastop 2000), and peanut stripe virus (PStV) (Saleh et al. 1989). However, the aphid is not known to transmit any viral diseases of rice (Jahn et al. 2005).

In mid Jul 2012, an unknown aphid colony was found naturally infesting rice in the greenhouse of the Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar Indonesia. Aphid individuals were found mostly on the peduncles of panicles, some on the spikelets, and very few on the leaves. The aphids excreted honey dew and left their exuviae on the leaves and panicles. Microscopic examinations showed that the aphid characteristics matched with the published characteristics of rusty plum aphid, *H. setariae* (Stoetzel & Miller 2001; Walker 2007). Body is small and brown with dark siphunculi and the cauda unusually long and pale. The third and fourth antennal segments are pale to colorless but the distal segments are dark to black in color. Proximal and distal portions of tibiae are pale to colorless and dark to black in color, respectively. The hind wings of alates are unusual with a single oblique vein. The nymphs are rusty brown or deep purple. Aphid samples were sent to Dr. Susan E. Halbert, Florida Department of Agriculture, Division of Plant Industry, for confirmation of *H. setariae* identity of the samples. Voucher specimens are deposited at Florida State Collection of Arthropods (FSCA) with accession numbers: E2012-6769 - E2012-6771. Literature searches indicated that this is the first record of rusty plum aphid occurrence in the South Sulawesi Province and the Island of Sulawesi for that matter. In addition, the finding is also the first record of rusty plum aphid infestation on rice in Indonesia.

Initial introduction of the aphids into the greenhouse was most likely through flowering rice plants cv. 'Cisadane' brought from a farmer's rice field into the greenhouse chamber. However, the presence of the aphid was not recognized until the panicles were fully developed. During a subsequent visit to the field, *H. setariae* individuals were found on the rice plants adjacent to a sugar cane field. Hence, it is possible that the aphid infestation on the rice plants originated from the sugar cane plants whose propagating materials were imported from other countries.

The ability of the aphid to live and reproduce on rice seedlings were assessed by transferring a single adult aptera on a 7 day-old seedling confined in a small cage. Ten seedlings were used in this trial. The number of aphids in each cage was determined every 24 h for 3 days. The results showed that *H. setariae* was not capable of surviving and reproducing on rice seedlings. All aphids died 48 h after they were transferred onto the

Downloaded From: https://bioone.org/journals/Florida-Entomologist on 13 Jul 2024
Terms of Use: https://bioone.org/terms-of-use

seedlings. In the greenhouse, the aphid preferred to feed on panicle peduncles, followed by spikelets, and leaves with the average percentages of aphids found were approximately 81, 18, and 1%, respectively.

## Summary

The first record of the occurrence of rusty plum aphid, *Hysteroneura setariae* (Hemiptera: Aphididae) on rice in Indonesia and its presence in South Sulawesi Province is reported. *Hysteroneura setariae* could not survive on 7 day-old rice seedlings and preferred feeding on panicle peduncles and spikelets rather than on leaves. A survey to determine the distribution of *H. setariae* and its potential damage to rice crop in the province is currently underway.

Key Words: rusty plum aphid, geographical distribution, plant virus vector

## Resumen

Se informa sobre la primera aparición del áfido de la ciruela, *Hysteroneura setariae* (Hemiptera: Aphididae) sobre el arroz en el sur de Sulawesi de Indonesia. Este áfido es también el primer áfido colonizador del arroz reportado en la región. El *H. setariae* no pudo sobrevivir en plántulas de arroz de 7 días de edad y preferió alimentarse sobre los pedúnculos de la panícula y espiguillas que las hojas. Un estudio para determinar la distribución de *H. setariae* y su daño potencial a los cultivos de arroz en la provincia está en curso.

Palabras Clave: áfido del ciruelo, distribución geográfica, vector de virus de plantas

## Acknowledgment

I am deeply thankful to Dr. Susan E. Halbert, Florida Department of Agriculture, Division of Plant Industry for promptly confirming the identity of *H. setariae* of the aphid specimens sent to her.

## References Cited

Akibo-Betts, D. T., and Raymundo, S. A. 1978. Aphids as rice pests in Sierra Leone. Intl. Rice Res. Newsl. 3(6): 15-16.

Akinlosotu, T. A. 1977. Outbreak of the rusty plum aphid, *Hysteroneurea setariae* Th. (Homoptera: Aphididae), on rice (*Oryza sativa* L.) in Ibadan Nigeria. Ghana J. Agr. Sci. 10(2): 149-150.

Blackman R. L., and Eastop, V. F. 2000. Aphids on the World's Crops. An Identification and Information Guide. John Wiley & Sons, Ltd. Chichester. 466 pp.

Commonwealth Institute of Entomology. 1969. Distribution Maps of Pests, Series A, Map No. 255. Jun 1969.

Coudriet, L. 1962. Efficiency of various insects as vectors of cucumber mosaic and watermelon mosaic viruses in cantaloupes. J. Econ. Entomol. 55(4): 519-520.

Garg, A. K., and Sethi, G. R. 1978. Biology and seasonal incidence of *Caroliniana (Hysteroneura) setariae* (Thomas) infesting paddy in Delhi. Indian J. Entomol 40: 221-223.

Harborne, K. M. 1988. Population dynamics of the main aphid vectors of sugarcane mosaic virus in Natal. Proc. South African Sugar Technol. Assoc. Jun 1988.

Heie, O. E., Pettersson, J., Fuentes-Contreras, E., and Niemeyer, H. M. 1996. New records of aphids (Hemiptera: Aphidoidea) and their host-plants from northern Chile. Rev. Chilena 23: 83-87.

Jahn, G. C., Almazan, M. L. P., and Pacia, J. B. 2005. Effect of nitrogen fertilizer on the intrinsic rate of increase of *Hysteroneura setariae* (Thomas) (Homoptera: Aphididae) on rice (*Oryza sativa* L.). Philippine Entomol. 19(2): 207.

Kukla, B., Thouvenel, J. C., and Fauquet, C. 1984. A strain of guinea grass mosaic virus from pearl millet in the Ivory Coast. Phytopathol. Zeitschrift 109: 65-73.

Masumi, M., Zare, A., and Izadpanah, K. 2011. Biological, serological and molecular comparisons of potyviruses infecting poaceous plants in Iran. Iran. J. Plant Path. 47(1): 11-14.

Noordam, D. 2004. Aphids of Java. Part V: Aphidini (Homoptera: Aphididae). Zool. Verh. Leiden 346: 7-83, Figs. 1-225. ISSN 0024-1652/ISBN 90-93239-91-5.

Peck, S. B., Heraty, J., Landry, B., and Sinclair, B. J. 1998. The introduced insect fauna of an oceanic archipelago: The Galapagos Islands, Ecuador. American Entomol. 44: 218-237.

Quimio, G. M., and Calilung, V. J. 1993. Survey of flying viruliferous aphid species and population build-up of *Aphis glycines* Matsumura in soybean fields. Philippines Entomol. 9: 52-100.

Saleh, N., Middleton, K. J., Baliadi, Y., Horn, N., and Reddy, D. V. R. 1989. Research on peanut stripe virus in Indonesia, pp. 9 *In* Proc. 2nd Coordinators' Mtg. on Peanut Stripe Virus, ICRISAT, Patancheru, Andhra Pradesh, India, 1-4 Aug 1989.

Smith, C. F., and Cermeli, M. M. 1979. Annotated list of Aphididae (Homoptera) of the Caribbean Islands and South and Central America. North Carolina Agr. Res. Serv., Tech. Bull. 259: 1-121.

Stoetzel, M., and Miller, G. 2001. Aerial feeding aphids of corn in the United States with reference to the root-feeding *Aphis maidiradicis* (Homoptera: Aphididae). Florida Entomol. 84(1): 83-98.

Thapa, V. K. 2000. An inventory of Nepal's insects. IUCN-The World Conservation Union. pp. 6.

Walker, K. 2007. Rusty plum aphid (*Hysteroneura setariae*). http://www.padil. gov.au. Accessed 21 Aug 2012).

Wangai, A., Plumb, R., Forde, S., and Herts, H. 1991. Incidence of barley yellow dwarf virus in Kenya. Regional Wheat Workshop: For Eastern, Central and Southern Africa, Nakuru (Kenya), 16-19 Sep 1991.

Wijerathna, M. A. P., and Edirisinghe, J. P. 1995. Preliminary observations on graminaceous aphids (Homoptera: Aphididae) of the Peradeniya University Park. Ceylon J. Sci. (Bio. Sci.) 24(1): 34-41.

Downloaded From: https://bioone.org/journals/Florida-Entomologist on 13 Jul 2024
Terms of Use: https://bioone.org/terms-of-use