



<http://dx.doi.org/10.11646/zootaxa.3905.3.9>

<http://zoobank.org/urn:lsid:zoobank.org:pub:35AC1A3B-72F5-482F-AB0E-353CA74E017D>

## *Unaspis lansivora* sp. n. (Hemiptera: Diaspididae), a new pest of *Lansium domesticum* (Meliaceae), and a key to *Unaspis* species

GILLIAN W. WATSON

Plant Pest Diagnostic Center, California Department of Agriculture, 3294 Meadowview Road, Sacramento, CA 95832, U.S.A.

E-mail: [gillian.watson@cdfa.ca.gov](mailto:gillian.watson@cdfa.ca.gov)

### Abstract

Since 2004, an undescribed species of *Unaspis* (Hemiptera: Diaspididae) has become a damaging pest on *Lansium domesticum* Corrêa in the Philippines. Its attack on the leaves causes premature senescence and defoliation, resulting in the production of few, underdeveloped, sour fruit and sometimes killing the trees. The scale was misidentified initially as *Lepidosaphes ulmi* (Linnaeus) and then as *Unaspis citri* (Comstock), but further study indicated that it was an undescribed species of potential plant quarantine significance. The pest is described as *U. lansivora* sp. n. and an identification key to all 19 species of *Unaspis* is provided. Its distribution, host range and prospects for its biological control are discussed.

**Key words:** invasive species, scale insect, lanzones, langsat, damage

### Introduction

*Lansium domesticum* Corrêa (family Meliaceae) is a tree native to western Malesia (Mabberley, 1997); it grows wild in the forests of southern Sumatra (Anonymous, 2014). It requires a fairly narrow range of environmental conditions to thrive: moist, well-drained, acid to neutral soil, an altitude of 0–600 m. above sea level, 2000–4000 mm of rain per year and a two-month dry season to initiate flowering (Galang, 2012). The nutritious fruit are very popular in South-East Asia and several varieties are cultivated where environmental conditions permit, from southern India to the Philippines (mainly in southern India, Malaysia, Thailand, Cambodia and Vietnam). It has been successfully introduced also to Hawaii, Surinam (Tacio, 2008) and Costa Rica (Anonymous, 2014). Other parts of the plant have multiple medicinal uses (Tacio, 2008).

In the Philippines, *L. domesticum* is called lanzones or langsa, while in other South-East Asian countries it is called langsat, duku or other local names. Lanzones is grown in home gardens and commercial orchards, mainly for local consumption. Once ripe, the fruit are highly perishable and deteriorate rapidly, so are difficult to transport. However, demand is strong in South-East Asia so there is potential for export to international markets like Taiwan, Hong Kong, mainland China and Singapore (Galang, 2012). In 2009, the main lanzones-producing provinces in the Philippines were (in order of importance): Sulu in Mindanao (75% of the total); Camiguin island; Davao del Norte, Davao City, Zamboanga del Norte in Mindanao; and Laguna and Batangas on the island of Luzon (based on Tacio, 2008; and Galang, 2012).

In 2004, in North Cotabato province in Mindanao, lanzones were reportedly attacked by “snow scale” (Provido, 2007), also in South Cotabato in the towns of Banga and Tupi, and in Malungon and Maitum in Sarangani province (Tacio, 2008). “Snow scales” are species of Diaspididae in which the immature males with white scale covers form conspicuous clusters. The identity of the scale insect species responsible was given as *Lepidosaphes ulmi* (Linnaeus) (Hemiptera: Diaspididae), but the source of this identification was not mentioned (Anonymous, 2007). Clearly the identification was erroneous, as immature male *Lepidosaphes* have brown scale covers, not white.

Provido (2007) recorded the same lanzones scale insect pest from South Cotabato, Seranangani and Davao City provinces in Mindanao, stating that the scales fed on the leaves, turning them red and causing defoliation, so

## Acknowledgements

I wish to thank Ms Susan McCarthy (Branch Chief of the Plant Pest Diagnostic Center at CDFA) for permitting the study of samples from the Philippines at this facility. Travel to the Philippines and collection of specimens by Drs Merle Shepard and Gerald Carner of Clemson University, North Carolina, U.S.A. were funded by the United States Agency for International Development and the generous support of the American people through USAID Cooperative Agreement Number EPP-A-00-0400016-00. Thanks are also due to Drs Bonifacio Cayabyab and Candida B. Adalla (University of the Philippines at Los Banos) for collection activities and sending me samples to work on. I am grateful to Drs Chris Hodgson (National Museum of Wales, Cardiff, Wales, U.K.) and Douglass Miller (ex-United States Department of Agriculture, retired) for helpful critique of the manuscript. Dr Chaofan Shi (School of Earth Science and Geological Engineering, Sun Yat-Sen University, Guangzhou, China) kindly translated some text from Chinese to English.

## References

- Anonymous (2007) Insects destroy lanzones trees but growers urged against using pesticides. *Minda News*, 24 August, 2007. Available from: <http://www.mindanews.com/business/agriculture/2007/08/24/insects-destroy-lanzones-trees-but-growers-urged-against-using-pesticides/> (accessed 13 September 2014)
- Anonymous (2008) Chemicals no match for lanzones pest. *GMA News Online*, 23 October, 2008. Available from: <http://www.gmanetwork.com/news/story/128791/news/regions/chemicals-no-match-for-lanzones-pest> (accessed 13 Sept. 2014)
- Anonymous (2011a) Scale insects threaten Davao lanzones industry. *Sun Star Davao*, 10 July, 2011. Available from: <http://www.sunstar.com.ph/davao/business/2011/07/10/scale-insects-threaten-davao-lanzones-industry-166079> (accessed 13 Sept. 2014)
- Anonymous (2011b) New hosts of the lanzones mussel scale insects. *University of Southern Mindanao Monitor*, 27 June, 2011. Available from: <http://www.usm.edu.ph/usm-monitor/150-june-2011-issue/593-new-hosts-of-the-lanzones-mussel-scale-insects> (accessed 13 September 2014)
- Anonymous (2014) *Lansium parasiticum*. Wikipedia. Available from: [http://en.wikipedia.org/wiki/Lansium\\_parasiticum](http://en.wikipedia.org/wiki/Lansium_parasiticum) (accessed 20 October 2014)
- Balachowsky, A.S. (1954) *Les cochenilles Paléarctiques de la tribu des Diaspidini*. Mémoires scientifiques de l'Institut Pasteur, Paris, 450 pp.
- Ben-Dov, Y., Miller, D.R. & Gibson, G.A.P. (2014) ScaleNet, Scales on a Host Query Results. Available from: <http://www.sel.barc.usda.gov/scalecgi/scaleson.exe?family=Meliaceae&scalefamily=Diaspididae&genus=Lansium&scalegenus=&species=> (accessed 16 September 2014)
- Chen, F.G. (1983) [*The Chionaspini (Diaspididae, Coccoidea, Homoptera) from China.*] Science & Technology Publishing House, Sichuan Province, China, 175 pp. [In Chinese]
- Chou, I. (1982) [*Monograph of the Diaspididae of China. Vol. 1.*] Shanxi Publishing House of Science & Technology, Shanxi, 195 pp. [In Chinese]
- Collena, R. (2008) Kidapawan seeks new name for delayed fruit festival. *GMA NewsTV*, 5 September, 2008. Available from: <http://www.gmanetwork.com/news/story/118407/news/regions/kidapawan-seeks-new-name-for-delayed-fruit-festival> (accessed 13 September 2014)
- Danzig, E.M. (1971) Suborder Coccinea - coccids or mealybugs and scale insects. In: Bei-Bienko, G.Y. (Ed.), *Keys to the Insects of the European USSR. Vol. 1.* Academy of Sciences of the USSR. Zoological Institute. Israel Program for Scientific Translations, Jerusalem, pp. 800–850.
- Danzig, E.M. (1993) [*Fauna of Russia and neighbouring countries. Rhynchota, Volume X: suborder scale insects (Coccinea): families Phoenicococcidae and Diaspididae.*] 'Nauka' Publishing House, St. Petersburg, 452 pp. [In Russian]
- Farms, M.J. (2011) Pest/diseases attacking lanzones. *PCAARRD Forum*, 29 April, 2011. Available from: <http://mboard.pcaarrd.dost.gov.ph/forum/viewtopic.php?id=11856> (accessed 13 September 2014)
- Ferris, G.F. (1942) *Atlas of the scale insects of North America*. Series 4. Stanford University Press, Palo Alto, California, 253 pp.
- Galang, H.B. (2012) Roadmap: lanzones industry, northern Mindanao. Agriculture and Fisheries Market Information System (AFMIS), Lanzones\_Roadmap\_Region\_10. Available from: <http://afmis.da.gov.ph/index.php/component/search/Lanzones.html?ordering=&searchphrase=all> (accessed 13 September 2014)
- Germplasm Resources Information Network (2014) *Lansium domesticum* Corrêa. Available from: <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?70393> (accessed 20 October 2014)
- Green, E.E. (1899) *The Coccidae of Ceylon, Part II*. Dulau, London, pp. 105–169.
- Kosztarab, M. (1996) *Scale insects of Northeastern North America. Identification, biology and distribution*. Virginia Museum of Natural History, Martinsburg, Virginia, 650 pp.
- Kuwana, S.I. (1928) The diaspine Coccidae of Japan. V. Genera *Chionaspis*, *Tsukushiaspis* [n. gen.], *Leucaspsis*, *Nikkoaspsis* [n.

- gen.]. *Scientific Bulletin (Ministry of Agriculture and Forestry, Japan)*, 1, 1–39.
- Mabberley, D.J. (1997) *The Plant Book*. Second edition. Cambridge University Press, Cambridge, U.K., 706 pp.
- Miller, D.R. & Davidson, J.A. (2005) *Armored scale insect pests of trees and shrubs*. Cornell Univ. Press, Ithaca, New York, U.S.A., 442 pp.
- Miller, D.R., Denno, B.D. & Gimpel, M.E. (2014) ScaleNet, *Unaspis*. Available from: <http://www.sel.barc.usda.gov/catalogs/diaspidi/UnaspisAll.htm> (accessed 16 September 2014)
- Pinoy, M. (2014) Living up to its name: city of fruits and highland springs. *Facebook*, 29 April, 2014. Available from: <https://www.facebook.com/braveheartmanokpinoy/posts/654986351222313> (accessed 13 September 2014)
- Provido, N.T. (2007) How to control lanzones pest. *Philippine Headline News Online; MANILA (STAR)*, 26 September, 2007. Available from: <http://www.newsflash.org/2004/02/si/si002421.htm> (accessed 13 September 2014)
- Rao, V.P. (1949) The genus *Unaspis* MacGillivray (Homoptera: Coccoidea: Diaspididae). *Microentomology*, 14, 59–72.
- Suh, S.J. & Ji, J. (2009) Intercepted armored scales (Hemiptera: Diaspididae) on imported plants at the port of entry in the Republic of Korea. *Acta Entomologica Sinica*, 52 (9), 1039–1054.
- Tacio, H.D. (2008) Meet the luscious lanzones. *Random Thoughts*, 18 September 2008. Available from: <http://henrytacio.blogspot.com/2008/09/meet-luscious-lanzones.html> (accessed on 13 September 2014)
- Takagi, S. (1961) A contribution to the knowledge of the Diaspididini of Japan (Homoptera: Coccoidea) Pt. II. *Insecta Matsumurana*, 24, 4–42.
- Tang, F.T. (1986) [*The scale insects of horticulture and forest of China. Volume III.*] Shanxi Agricultural University Press, Taigu, Shanxi, 305 pp. [In Chinese; summary in English]
- Watson, G.W. (2002) *Arthropods of economic importance: Diaspididae of the world. An illustrated identification guide and information source*. CD-ROM. Expert Center for Taxonomic Identification (ETI), University of Amsterdam, The Netherlands. ISBN No. 90-75000-48-0. Text available from: <http://wbd.etbioinformatics.nl/bis/diaspididae.php> (accessed 15 September 2014)
- Watson, G.W., Adalla, C.B., Shepard, B.M. & Carner, G.R. (2014) *Aspidiotus rigidus* Reyne (Hemiptera: Diaspididae): a devastating pest of coconut in the Philippines. *Agricultural and Forest Entomology*. Available from: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1461-9563/earlyview](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1461-9563/earlyview) (accessed 14 September 2014)
- Williams, D.J. & Watson, G.W. (1988) *The scale insects of the tropical South Pacific region. Part 1. The armoured scales (Diaspididae)*. CAB International, Wallingford, UK, 290 pp.
- Zeng, T. (2000) [Species of *Unaspis* MacGillivray in China (Homoptera: Coccoidea: Diaspididae).] *Journal of South China Agricultural University*, 21 (1), 51–52. [In English; summary in Chinese]