



## Report of the pineapple mealybug, *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae): a quarantine pest in date palm groves of Khuzestan province, Iran

Sara Zarghami<sup>1</sup> & Masumeh Moghaddam<sup>2</sup>

1- Date Palm and Tropical Fruits Research Center, Horticultural Science Research Institute, Agricultural Research, Education and Organization (AREEO), Ahvaz, Iran

2- Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection (IRIPP), Agricultural Research Education and Extension Organization (AREEO), Tehran, Iran

✉ sar.zarghami@gmail.com

<https://orcid.org/0000-0003-1386-8661>

✉ moghaddamm2002@yahoo.com

<https://orcid.org/0000-0003-4544-2892>

**Abstract.** The quarantine pest, *Dysmicoccus brevipes* (Cockerell) (Coccothraupidae: Pseudococcidae) is recorded for the first time on the roots of a date tree (*Phoenix dactylifera* L.) from Ahvaz, Khuzestan province. Adult females and different nymphal instars of this polyphagous pest were found on the aerial roots of date palm varieties during the hot and humid summer of 2023. The pest establishment could seriously threaten many subtropical agricultural products, especially sugarcane, which is one of the strategic products in this area.

**Keywords:** Coccothraupidae, invasion, plant virus, vector

### Article History

*Received:*

08 November 2023

*Accepted:*

17 December 2023

*Subject Editor:*

Mehdi Esfandiari

**Citation:** Zarghami, S. & Moghaddam, M. (2023) Report of the pineapple mealybug, *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae): a quarantine pest in date palm groves of Khuzestan province, Iran. *J. Entomol. Soc. Iran*, 43 (4), 405–409.

*Dysmicoccus brevipes* (Cockerell, 1893) (Hemiptera: Pseudococcidae), commonly called the pineapple mealybug, originated in the tropical areas in Central and South America (Rohrbach *et al.*, 1988) and was first described in Jamaica (Cockerell, 1893) on pineapple (*Ananas comosus* (L.)). This mealybug is one of the most economically important pests its direct feeding damages the fruit, causing chlorotic areas on the leaves and fruits, or may occur on the roots of the plants. The plants may recover and continue growing, but they will have reduced weight, leaf size, and root length (CABI 2021). The indirect damage of this mealybug is in the transmission of several pineapple viruses, which worsens the damage. Most importantly, the transmission of pineapple wilt causes pineapple wilt disease. The plant leaves with pineapple wilt disease turn red, then pink, curl inwards and lose stiffness, the roots die, the plants collapse, and the infected fruits are small (Sether and Hu, 2002). *Dysmicoccus brevipes* was first recorded from Iran (Tehran) on the imported pineapples from Uganda or Kenya (Moghaddam, 1999).

During the survey of mealybugs, twenty-year-old date palms were selected randomly in the date palm and tropical fruit research institute groves, Horticultural Science Research Institute, Am-Altamir area. The soil was dug out from the trunk base, up to a depth of 30 cm. The colonies of this pest were found on lateral roots on respiratory roots. The root mealybug was carefully collected from the infected respiratory using soft painting hair brush, transferred into a perforated plastic container, and brought to the laboratory. For the identification of mealybug species, they were preserved in 70% ethanol, in a vial. The specimens were sent to Hayk Mirzayans Insect Museum (HMIM) at the Iranian Research Institute of Plant Protection, Tehran, Iran. Currently, monitoring of this pest is done in the Khuzestan province, Iran.

### *Dysmicoccus brevipes* (Cockerell, 1893) (Fig. 1)

**Synonyms.:** *Dactylopius (Pseudococcud) ananassae* Kuwana; *Dactylopius brevipes* (Cockerell, 1893); *Dactylopius bromeliae* (Bouché); *Dysmicoccus bromeliae* Auct.; *Dysmicoccus cannae* (Green, 1934); the fully grown *D. coccinellae*

Corresponding author: Sara Zarghami E-mail:([sar.zarghami@gmail.com](mailto:sar.zarghami@gmail.com))



©2023 by Author(s), Published by the Entomological Society of Iran

This Work is Licensed under Creative Commons Attribution-Non Commercial 4.0 International Public License.

larva always emerges from the host in the adult stage. The larva spins a cocoon between the host's legs and pupates to emerge as an adult wasp after about 10 days (Ceryngier *et al.*, 2012).

*Dysmicoccus pseudobrevipes* (Mamet, 1914); *Pseudococcus brevipes* (Cockerell), Fernald, 1903; *Pseudococcus bromeliae* (Bouché); *Pseudococcus cannae* Green, 1934; *Pseudococcus longirostralis* James, 1936; *Pseudococcus missionum* Cockerell, 1910; *Pseudococcus palauensis* Kanda, 1933; *Pseudococcus pseudobrevipes* Mamet, 1941.

### Material examined

Iran, Khuzestan province, Ahvaz, Am-Altamir, N31°15'01.3" E48°32'48.1", Alt.200 m, 17 June 2023, on *Phoenix dactylifera* L. (Arecaceae), leg. S. Zarghami.

### Identification

These fuzzy white masses contain both pink-orange females and different nymphal instars on the aerial roots of date palms. The living adult female of *D. brevipes* is pink, coated with white mealy wax and with 17 pairs of slender wax projections around the margins, these are often rather untidy and all of similar, moderate lengths (about 1 mm wide) (Fig. 1, A-D). Slide-mounted adult female oval to broadly oval. Antennae each with 8 segments. The hind leg with translucent pores abundant on the dorsal surfaces of the femur and tibia. Cerarii numbering 17 pairs. Circulus divided by an inter segmental line. Ostioles well developed. Multi locular disc pores, each with 12 loculi, present posterior to vulva and medially at the posterior edges of abdominal segments VI and VII. Oral collar tubular ducts are present in two sizes. Circulus present between segments III and IV (Moghaddam & Watson, 2022).

### Distribution

It has been spread to all zoogeographical regions, mainly in the tropics and subtropics, where the main planting areas of pineapple include Africa, Asia, Europe, North and South America (García Morales *et al.*, 2016). As stated previously, *D. brevipes* was first recorded from Iran on imported pineapples, collected in Mehrabad Airport of Tehran (Moghaddam, 1999), then it was collected on the root of alfalfa (*Medicago sativa*) from Iranshahr, Sistan and Baluchestan province (Moghaddam, 2004). Three other species of *Dysmicoccus* have also been recorded in Iran; *Dysmicoccus boninsis* (Kuwana) on *Lactuca* sp. (Asteraceae) from Khuzestan province (Asadeh and Mosaddegh (1991)), *Dysmicoccus caspianensis* Moghaddam on Poaceae from Qazvin province and *Dysmicoccus zagrosicus* Moghaddam on *Lactuca* sp. (Asteraceae) from Lorestan province (Moghaddam, 2018). *D. brevipes* has been recorded in neighbor countries such as Turkey (Kaydan and Kozár, 2010) and Pakistan (Ben-Dov, 1994).

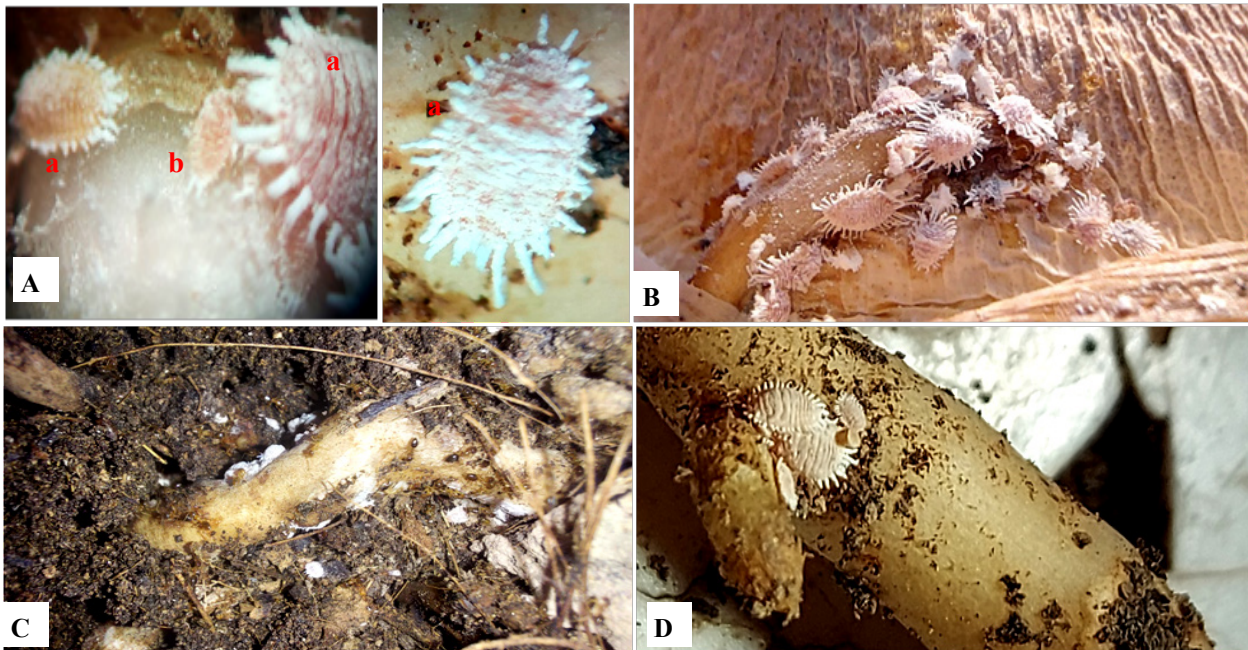
### Host plant

Pineapple mealybug is highly polyphagous, attacking host plants belonging to more than 161 genera placed in 63 families (García Morales *et al.*, 2016). It is common on pineapple but is also recorded on a wide range of other crops, mostly fruit crops and ornamentals, including avocado, banana, celery, citrus, clover, cocoa, coconut, coffee, cotton, custard apple, figs, ginger, guava, maize, mango, oil palm, orchids, groundnut, peppers, plantain, potato, and sugarcane (Ben-Dov, 1994; García Morales *et al.*, 2016; CABI, 2021). In this study, the colonies of pineapple mealybug were found on Barhi, Estameran and Zahedi date varieties. Later, it was reared on pineapple in the laboratory (Fig. 1, B).

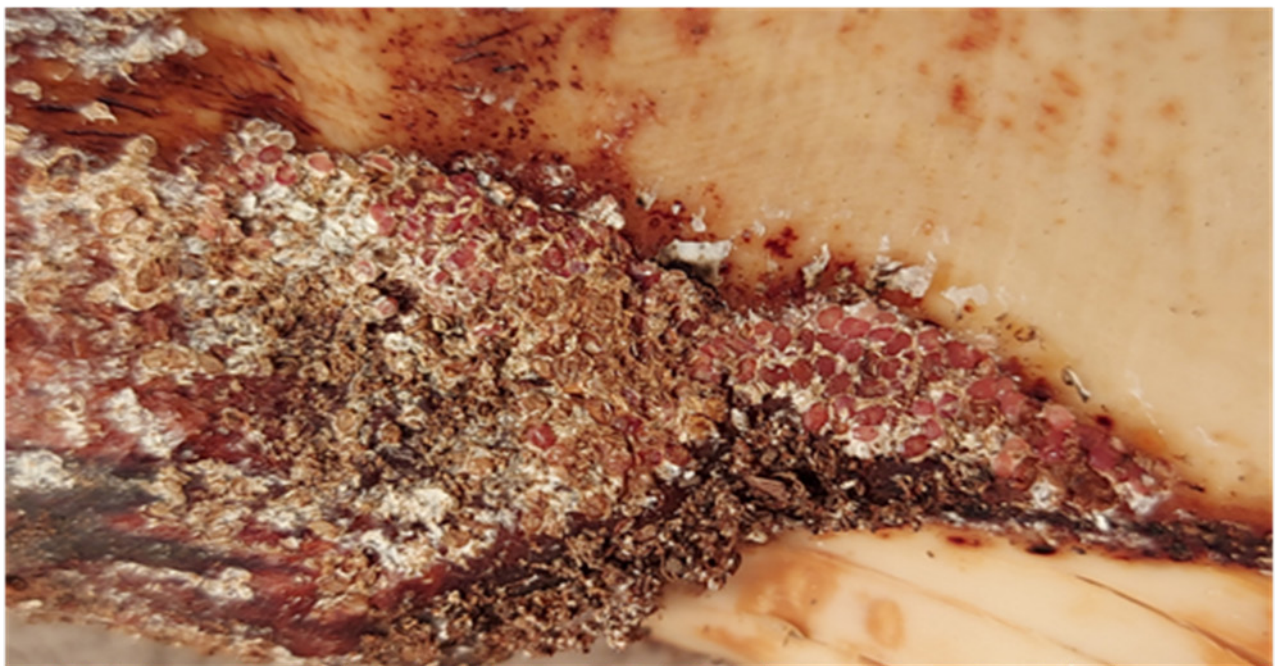
During the search in this area, the colonies of another mealybug, the phoenicococcid *Phoenicococcus marlatti* Cockerell, were visible (Fig. 2). This species was recorded for the first time from Iran, Khuzestan and Kerman provinces, on date palm (Afchar, 1937). Live adult females of *Ph. marlatti* are red to reddish-brown, spherical-shaped, with a body length of approximately 1 to 1.5 mm. The body margin with series of dermal papillae. Slide-mounted adult female with 1-segmented antenna, and apex bearing 5 short spines. Legs are usually absent, or highly reduced. Spiracles are all similar, each with an elongated bar without any associated sclerotized area, and a loose cluster of 12-15 quinquelocular disc pores around the opening. Anal ring situated ventrally near the posterior apex of the body, small, simple, heavily sclerotized, bearing lower 2 setae only. Long tubular ducts (sometimes called 8-shaped tubular ducts), each with a longitudinal internal division that makes a cross-section of inner end appear bilocular, varying in size, a few scattered dorsally, but mostly occurring along dorsal sub-margin and margin, and ventrally (Stickney *et al.*, 1950).



In the present study, adult females and different nymphal instars of *D. brevipes* were observed in natural conditions in summer in Ahvaz on the aerial roots of mature date palm trees. Sometimes, infested roots are found associated with ant colonies in the rhizosphere. The mutualistic ant species play a key role in dispersing mealybugs from one host to another. Since natural conditions are suitable for the growth of mealybugs and there are different types of crops which are hosts of this pest, infestation of palm by *D. brevipes* can become a risk form any crops in this area, especially for tropical fruits which are the main host and sugarcane. However, at the moment, the infested palm trees seem to be without any damages, but the infestation is observed when the bark of the tree is removed.



**Fig. 1.** A. Adult females (a) and first nymphal instar (b) of *Dysmicoccus brevipes*; B. *Dysmicoccus brevipes* on aerial root of pineapple; C. & D. *Dysmicoccus brevipes* on respiratory root of date palm; Khuzestan, Iran.



**Fig. 2.** *Phoenicococcus marlatti* on date palm offshoot; Khuzestan, Iran.

## Acknowledgments

Authors appreciate from Date Palm and Tropical Fruits Research Center, Horticultural Science Research Institute, (AREEO), Ahvaz, Iran.

## Funding

The work supported financially by Date Palm and Tropical Fruits Research Center, Horticultural Science Research Institute, Agricultural Research, Education and Organization (AREEO), Ahvaz, Iran.

## REFERENCES

- Afshar, D. J. (1937) *Les Insectes Nuisiblesaux Arbres Fruitiers en Iran*. Ministry of Agriculture, Iran, 112 pp.
- Asadeh, Gh. & Mosaddegh, M. S. (1991) The mealybug fauna of Khuzestan province. *The Scientific Journal of Agriculture* 6(1, 2), 47-52.
- Ben-Dov, Y. (1994) *A Systematic catalogue of the mealybugs of the world (Insecta: Homoptera: Coccoidea: Pseudococcidae and Putoidae) with data on geographical distribution, host plants, biology and economic Importance*. pp. 686. Intercept Limited, Andover (GB).
- CABI (2021) *Dysmicoccus brevipes* (pineapple mealybug). Invasive species compendium. Datasheets, maps, images, abstracts and full text on invasive species of the world. Available from: <http://www.cabi.org/isc/datasheet/20248> (accessed on 16 Novemver 2021).
- Cockerell, T. D. A. (1893) The West Indian species of *Dactylopius*. *The Entomologist* 26, 177 - 179.
- Cockerell, T. D. A. (1910) A new mealy-bug (Coccidae) from South America. *The Entomologist* 43,113. <https://doi.org/10.5962/bhl.part.28541>
- Fernald, M. E. (1903) A catalogue of the Coccidae of the world. *Bulletin of the Hatch Experiment Station of the Massachusetts Agricultural College*, 88, 1-360.
- García, M. M., Denno, B. D., Miller, D. R., Miller, G. L., Ben-Dov, Y. & Hardy, N. B. (2016). ScaleNet: A literature-based model of scale insect biology and systematics. Available from: <https://scalenet.info/> (accessed 30 January 2021).
- Green, E. E. (1934) Note on a "Mealybug" wrongfully attributed to *Pseudococcus bromeliae*, Bouché. *Stylops* 3,162. <https://doi.org/10.1111/j.1365-3113.1934.tb01570.x>
- James, H. C. (1936) New mealybugs from East Africa. *Transactions of the Royal Entomological Society of London* 85,197-216. <https://doi.org/10.1111/j.1365-2311.1936.tb00132.x>
- Kanda, S. (1933) Two new species of the genus *Pseudococcus* from Yokohama and the island of Palau. *Annotationes Zoologicae Japonenses Tokyo* 14, 133 -138.
- Kaydan, M. B. & Kozár, F. (2010) New and rare mealybugs (Hemiptera: Coccoidea: Pseudococcidae, Putoidae) from Eastern Anatolia (Turkey). *Zoosystematica Rossica* 20, 28-39. <https://doi.org/10.31610/zsr/2011.20.1.28>
- Mamet, J. R. (1941) A new mealy bug attacking pineapple plants in Mauritius. *Bulletin of Entomological Research* 32, 57-59. <https://doi.org/10.1017/S0007485300005228>
- Moghaddam, M. (1999) The record of *Dysmicoccus brevipes* (Cockerell) (Coccoidea: Pseudococcidae). *Journal of Entomological Society of Iran* 18, 44.
- Moghaddam, M. (2004) The list of Coccoidea in the Insect Museum of Hayk Mirzayans in Plant Pests and Diseases Research Institute (1). Plant Pests & Diseases Research Institute, Insect Taxonomy Research Dept. No. 11: 55 pp.
- Moghaddam, M. (2018) Three new mealybug species (Hemiptera: Cocomorpha: Pseudococcidae) from Iran, *Zootaxa* 4420, 180-188. <https://doi.org/10.11646/ZOOTAXA.4420.2.2>
- Moghaddam, M. & Watson, G. W. (2022) The Scale Insects of Iran (Hemiptera: Cocomorpha) Part 2 The Mealybugs (Pseudococcidae and Rhizoecidae) and Putoidae. *Zootaxa* 5126, 1-169. <https://doi.org/10.11646/zootaxa.5126.1.1>
- Rohrbach, K. G., Beardsley, J. W., German, T. L., Reimer, N. J. & Sanford, W. G. (1988) Mealybug wilt, mealybugs, and ants on pineapple. *Plant Disease* 72, 558-565. <https://doi.org/10.1094/PD-72-0558>
- Sether, D. M. & Hu, J. S. (2002). Closterovirus infection and mealybug exposure are necessary for the development of mealybug wilt of pineapple disease. *Phytopathology* 92, 928-935. <https://doi.org/10.1094/PHYTO.2002.92.9.928>
- Stickney, F. S., Barnes, D. W. & Simmons, P. (1950) Date palm insects in the United States. United States Department of Agriculture Circular 846. 57 pp.

# گزارش شیپشک آردآلود آناناس، *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae): آفت قرنطینه نفیلات استان خوزستان، ایران

سارا زرغامی<sup>۱</sup> و معصومه مقدم<sup>۲</sup>

۱- پژوهشکده خرما و میوه های گرمسیری، موسسه تحقیقات علوم باغبانی، اهواز، ایران

۲- موسسه تحقیقات گیاه پزشکی کشور، تهران، ایران

✉ sar.zarghami@gmail.com

 <https://orcid.org/0000-0003-1386-8661>

✉ moghaddamm2002@yahoo.com

 <https://orcid.org/0000-0003-4544-2892>

تاریخچه مقاله

دریافت: ۱۴۰۲/۰۸/۱۷ | پذیرش: ۱۴۰۲/۰۹/۲۶ | دبیر تخصصی: مهدی اسفندیاری

## چکیده

در این گزارش، آفت قرنطینه خارجی شیپشک آردآلود آناناس (*Dysmicoccus brevipes* (Cockerell) (Hemiptera: Pseudococcidae))، برای اولین بار از روی ریشه نخل خرما از استان خوزستان گزارش می‌شود. فعالیت ماده‌های بالغ و سنین مختلف پورگی روی ریشه‌های تنفسی ارقام خرما در طی تابستان گرم ۱۴۰۲ در شهرستان اهواز، مشاهده شد. با توجه به دامنه میزبانی وسیع این آفت، استقرار این شیپشک در نخلستان‌های استان می‌تواند خطری برای محصولات کشاورزی گرمسیری و بویژه نیشکر باشد که از میزبان‌های آن بوده و محصول استراتژیک منطقه محسوب می‌شود.

**کلمات کلیدی:** Cocomorpha، مهاجم، ناقل، ویروس‌های گیاهی

نویسنده مسئول: سارا زرغامی (پست الکترونیک: [sar.zarghami@gmail.com](mailto:sar.zarghami@gmail.com))

**Citation:** Zarghami, S. & Moghaddam, M. (2023) Report of the pineapple mealybug, *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae): a quarantine pest in date palm groves of Khuzestan province, Iran. *J. Entomol. Soc. Iran*, 43 (4), 405–409. <https://doi.org/10.61186/jesi.43.4.8>