CAPS Datasheets provide pest-specific information to support planning and completing early detection surveys.

Oxycarenus hyalinipennis

Scientific Name
Oxycarenus hyalinipennis

Synonym(s):
Aphanus hyalinipennis A. Costa, 1843
Aphanus tardus var. *hyalinipennis* Costa, 1847
Cymus cincticornis Walker, 1870
Oxycarenus castaneus (Bergevin, 1932)
Oxycarenus cruralis Stål, 1856
Oxycarenus leucopterus (Fieber, 1852)
Oxycarenus nigricornis Samy, 1969

Common Name
Cotton seed bug (CSB), cotton stainer, dusty or dusky cotton bug (representing common names for both *Oxycarenus hyalinipennis* and *O. laetus*)

Type of Pest
True bug

Taxonomic Position
Class: Insecta, **Order:** Hemiptera, **Family:** Oxycarenidae

Notes on taxonomy and nomenclature: *Oxycarenus hyalinipennis* was classified in the family Lygaeidae, subfamily Oxycareninae; however, Henry (1997) proposed raising the subfamily to the family-level Oxycarenidae based on morphological evidence.

Pest Recognition

A field screening aid for adults is available: http://download.ceris.purdue.edu/file/529

Pest Description

Eggs: Measuring 0.28 mm wide by 0.95 mm long, the eggs are slender with 25 longitudinal ribs or corrugations. During development, the eggs change from straw yellow to orange or pink (**Fig. 1**) (Henry, 1983; Sweet, 2000).

Figure 1. *Oxycarenus hyalinipennis* eggs (image courtesy of Dr. Halil Bolu, Dicle University, Faculty of Agriculture. Diyarbakir Turkey)

Figure 2. From left to right, dorsal images of an adult and descending sizes of nymph-stage *O. hyalinipennis*. Adults have fully developed wings, far left. Wingpads are visible on the older instars, indicating the difference between adults and nymphs. (image courtesy of Natasha Wright, Division of Plant Industry, Florida Department of Agriculture and Consumer Services)

Nymphs: The nymphs are orange-red after hatching and later develop a dark greenish-brown head and thorax with a dark red abdomen (**Fig. 2**). Average nymph lengths range from 1.25 mm during the first instar to 3.81 mm ($^{5}/_{32}$ inches) during the fifth instar (**Fig. 2**) (Kirkpatrick, 1923). The fifth instar has distinct wingpads (**Fig. 2, second from right image**) that extend to at least the third abdominal segment (Henry, 1983).

Figure 3. Dorsal, ventral, and lateral views of *O. hyalinipennis* adult males (image courtesy of Dr. Halil Bolu, Dicle University, Faculty of Agriculture. Diyarbakir Turkey)

Adults: General colors are black, light brown, and white. Males average 3.5 to 4 mm (5/32 inches) long, with females slightly larger at 4 to 5 mm (3/16 inches) long (Samy, 1969). Male abdomens are ovular and terminate in a round lobe (**Fig. 3**), while female abdomens are rounder (**Fig. 4c**). Other distinguishing characteristics include: three tarsal joints, a pair of red simple eyes (ocelli) situated above and behind the compound eyes, and (typically) a partially yellow or pale yellow second antennal segment. The forewings are a glassy translucent and usually whitish. The base of the forewings, called hemelytra, are opaque, whereas the distal end is membranous and translucent (**Fig. 4**) (Henry, 1983; Kirkpatrick, 1923; Smith and Brambila, 2008). Final identification of CSB is based on the morphology of adult male internal structures (Brambila, 2020; Samy, 1969).

Figure 4a-c. a) Lateral, b) dorsal, and c) ventral image (female specimen) of *O. hyalinipennis* (image courtesy of Pierre Gros; galerie-insecte.org/)

Symptoms:

- Host plants with brown leaves and stipple marks from feeding (**Fig. 5**). This type of feeding damage is not specific to CSB, but it can help to identify an area for survey (Bolu et al., 2020; Kirkpatrick, 1923).
- Shriveled and discolored seeds inside cotton bolls (Kirkpatrick, 1923). This can be a difficult symptom to find because the cotton plants show no external signs of damage from CSB (Kirkpatrick, 1923; Sweet, 2000).
- Aggregations of adults and nymph-stage CSB. These insects commonly group in tight clusters, especially in seed pods or bolls (**Fig. 6**) (Adu-Mensah and Kumar, 1977; Chin et al., 2009; Smith and Brambila, 2008). Cotton seed bugs resemble fleas in infested bolls. Look for small black or brown bugs running through the cotton (**Fig. 7**).
- Aggregations of CSB produce a pungent odor (Adu-Mensah and Kumar, 1977; Sharma et al., 2010; Smith and Brambila, 2008).
- Crushed CSB stain the lint of cotton pinkish and emit a foul odor (Henry, 1983).

Figure 5. Although *O. hyalinipennis* nymphs and adults feed on seeds, they also suck moisture from leaves, resulting in browning and stippling on leaves. (image courtesy of Dr. Halil Bolu, Dicle University, Faculty of Agriculture. Diyarbakir Turkey)

Figure 6. Aggregations of *O. hyalinipennis* clustered on, and inside dried seed pods (image courtesy of Dr. Halil Bolu, Dicle University, Faculty of Agriculture. Diyarbakir Turkey)

Figure 7. Infested cotton bolls (image courtesy of Julieta Brambila, USDA-APHIS-PPQ)

Easily Mistaken Species

There are two similar looking invasive oxycarenids that have been introduced into the United States: *Metopoplax ditomoides* and *Microplax albofasciata*.

Metopoplax ditomoides (**Fig. 8**) is present in California, Oregon, and Washington (Lattin and Wetherill, 2002; Wheeler and Henry, 2015). Primarily a pest of Asteraceae plants, *M. ditomoides* can be distinguished from CSB because the anterior end of the head is rounded, depressed dorsally, and spoon-like, and CSB does not have these characteristics.

Figure 8. Adult *Metopoplax ditomoides* (image courtesy of Jeffrey W. Lotz, Florida Department of Agriculture and Consumer Services, Bugwood.org)

Microplax albofasciata (**Fig. 9**) was introduced into California from the Mediterranean area (Wheeler and Henry, 2015). Although its preferred host plants are unknown, researchers suspect an association with plants in the Asteraceae family (Wheeler and Henry, 2015). Proper identification will require a dissecting microscope. *Microplax albofasciata* has a rectangular patch of fine white hairs on the third segment of the thorax and their white wings have black spots between the black veins, which CSB lacks (Wheeler and Henry, 2015).

Figure 9. Adult *Microplax albofasciata* (image courtesy of Thomas J. Henry, Systematic Entomology Laboratory, ARS-USDA)

Biology and Ecology

CSB feeds and develops on many plants from the order Malvales and is an important pest of cotton, where it affects the seeds and the quality of the lint (Hill, 1983; Halbert and Dobbs, 2010). Adults and nymphs need to feed on seeds within the plant order Malvales to successfully breed and complete development, respectively. (Halbert and Dobbs, 2010). CSB will also feed on other available plants, fruits, and nearby dew for moisture (Ananthakrishan et al., 1982; Avidov and Harpaz, 1969; Henry, 1983).

Optimal temperatures for CSB reproduction and development are between 71 °F and 95 °F (Khan and Naveed, 2017). Adults congregate on bolls and begin feeding on seeds as soon as the bolls open. Mating occurs soon afterwards inside seed pods or bolls that are ripe, open, or damaged by other pests (Abbas et al., 2015; Halbert and Dobbs, 2010). CSB will move to different hosts as seeds become available, extending the breeding season. Each CSB female lays up to 110 eggs, either singly or in groups. The incubation period lasts from 4 to 8 days (Kirkpatrick, 1923; Sweet, 2000). A complete generation occurs in about a month and, depending on host availability and temperature, four to seven generations can occur per year (Adu-Mensah and Kumar, 1977; Halbert and Dobbs, 2010). In tropical regions, CSB may reproduce continually if malvaceous seeds are available; however, facultative diapause takes place in temperate zones (Pearson, 1958).

Populations of CSB do not damage seeds until the bolls open; but, if another pest damages the boll, CSB will enter and feed on the internal seeds (Adu-Mensah and Kumar, 1977; Ismail, 2018; Sharma et al., 2010). Symptoms in cotton are most apparent between July and September when the bolls are open (Ritchie et al., 2004). The eggs are generally laid in the cotton boll lint close to the seed or inside the seed pods of other hosts (Hill, 1983). Later in the season, eggs may be found near the base of green bolls or in holes made by other pests (Halbert and Dobbs, 2010). Kirkpatrick (1923) noted a significant increase of CSB damage in cotton when the pink bollworm (*Pectinophora gossypiella*) was present; pink bollworm was eradicated in the continental United States but is still present in Hawaii and Puerto Rico (CABI, 2022).

Nymphs aggregate on hosts in conspicuous feeding swarms. There are five nymphal stages that last 14–22 days, depending on temperature (Kirkpatrick, 1923). To acquire the nutrients necessary to complete their development, the nymphs must pierce ripe or almost ripe seeds from Malvales with their needle-like mouth parts, inject saliva to liquify the contents, and suck the juices out (Abbas et al., 2015; Halbert and Dobbs, 2010). Once nymphs have fed on enough seeds, they mature into adults, disperse to find new hosts, feed, mate, and repeat the process.

At the end of the breeding season, adults enter diapause, leave the cotton fields, and walk or take short flights to various sheltered locations for overwintering. CSB prefers to overwinter away from host plants in cryptic locations such as crevices on tree trunks, leaf litter, dried plant pods, or human-made structures (Adu-Mensah and Kumar, 1977; Kirkpatrick, 1923; Smith and Brambila, 2008).

Known Hosts

The primary economic host plants of concern in the United States include cotton (*Gossypium* spp.), hibiscus (*Hibiscus* spp.), and okra (*Abelmoschus esculentus* (L.) Moench) (Kirkpatrick, 1923; Sweet, 2000). The preferred reproductive host is cotton (Ananthakrishan et al., 1982).

According to Ram and Chopra (1984), millet (*Cenchrus americanus* (L.) Morrone (Poaceae)) and pigeon pea (*Cajanus cajan* (L.) Huth (Fabaceae)) are viable alternative hosts for CSB. The authors suggest that excessive changes in agricultural practices and destruction of wild malvaceous plants may force the insects to attack other cultivated plants. Additionally, CSB damages but does not reproduce on economically valuable fruits such as apricot, peach, persimmon, apple, pear, quince, grapes, dates, figs, and avocados (Avidov and Harpaz, 1969; Nakache and Klein, 1992; Schaefer and Panizzi, 2000).

The host list below includes cultivated and wild plants that 1) are infested by the pest under natural conditions, 2) are frequently described as major, primary, or preferred hosts, and 3) have primary evidence for feeding and damage documented in the literature. Plants are highlighted in bold if they are commercially produced and the pest causes economically significant damage.

Preferred hosts
***Abelmoschus esculentus* (okra)**[*], *Abelmoschus moschatus* (musk okra), ***Abelmoschus* spp. (okra)**[*], *Abutilon fruticosum* (Texas Indian mallow)[*], *Abutilon grandifolium* (hairy Indian mallow), *Abutilon incanum* (pelotazo)[*], *Abutilon indicum* (monkeybush), *Abutilon pictum* (Chinese-lantern)[*], *Alcea* spp. (hollyhock)[*], *Alcea rosea* (common hollyhock)[*], *Brachychiton populneus* (bottletree)[*], *Cajanus cajan* (pigeon pea)[*], *Dombeya* spp., *Gossypium arboreum* (tree cotton), ***Gossypium hirsutum* (upland cotton)[*], *Gossypium* spp. (Cotton)[*]**, *Grewia asiatica* (phalsa), *Grewia tiliifolia* (raisin bush), *Herissantia crispa* (bladdermallow), *Hibiscus cannabinus* (Indian hemp)[*], *Hibiscus mutabilis* (Dixie rosemallow)[*], *Hibiscus rosa-sinensis* (China-rose)[*], *Hibiscus schizopetalus* (coral hibiscus)[*], *Hibiscus* spp. (rosemallow)[*], *Hibiscus syriacus* (rose-of-Sharon)[*], *Hibiscus trionum* (flower of an hour)[*], *Lagunaria patersonia* (primrose tree)[*], *Malva multiflora* (Cretan-hollyhock)[*], *Malva parviflora* (cheeseweed mallow)[*], *Malva* spp. (Mallow)[*], *Malva sylvestris* (high mallow)[*], *Malvaviscus* spp. (wax mallow), *Pavonia spinifex* (gingerbush)[*], *Pennisetum glaucum* (pearl millet), *Phymosia umbellata* (Mexican bush mallow), *Pterospermum acerifolium* (bayur tree), *Sida rhombifolia* (Cuban jute)[*], *Sida* spp. (fanpetals)[*], *Sphaeralcea miniata* (Latin globemallow), *Sphaeralcea* spp. (fanpetals), *Thespesia populnea* (portia tree), *Urena lobata* (caesarweed)[*], *Wissadula amplissima* (big yellow velvetleaf)[*] (Adu-Mensah and Kumar, 1977; Ananthakrishan et al., 1982; Atta et al., 2015; Beucke, 2019; Bolu et al., 2020; Dimetry, 1971; El-Rahim et al., 2015; Kirkpatrick, 1923; Rajashekhargouda et al., 1983; Ram and Chopra, 1984; Ribeiro dos Santos et al., 1977; Shah et al., 2016)

Pest Importance
CSB is a pest of malvaceous plants, including many of economic importance. The insect is particularly damaging to cotton because it feeds on seeds. Large populations in cotton bolls can reduce the oil content and weight of the seed by 15 percent, which can reduce seed vitality, seed quality, germination, and oil content (Annecke and Moran, 1982; Kirkpatrick, 1923; Schaefer and Panizzi, 2000). CSB present in bolls during the ginning process stain the lint (Sweet, 2000; Halbert and Dobbs, 2010).

Other impacts occurring while the insects feed on cotton or other fruits include greasy spots and disfigurement of fruit and bolls caused by their saliva liquefying plant tissues (Abbas et al., 2015), a pungent odor on the affected plants, and unsightly black stains caused by CSB feces (Nakache and Klein, 1992; Schaefer and Panizzi, 2000).

Known Distribution
CSB is present in:

Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, the Democratic Republic of the Congo, Republic of the Congo, Côte d'Ivoire, Egypt, Eritrea, Eswatini, Ethiopia, Ghana, Guinea, Kenya, Libya, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Tunisia,

[*] Hosts with known U.S. distribution

Uganda, Zimbabwe; **Asia:** Bangladesh, Cambodia, China, India, Iran, Iraq, Israel, Laos, Myanmar, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Syria, Thailand, Turkey, Vietnam, Yemen; **Europe:** Austria, Cyprus, France, Germany, Greece, Hungary, Italy, Kosovo, Malta, Montenegro, Portugal, Russia, Republic of Serbia, Spain; (CABI, 2022; EPPO, 2022; Protić, 2000; Slater and Baranowski, 1994)

CSB is introduced and likely established in the following countries:
North America: United States (California); **Central America & Caribbean:** Bahamas, Cayman Islands, Hispaniola (Dominican Republic and Haiti), Puerto Rico, Turks and Caicos Islands; **South America:** Argentina, Bolivia, Brazil, Paraguay (CABI, 2022; EPPO, 2022; Segarra-Carmona et al., 2020; Slater and Baranowski, 1994)

Status of infestation in the United States (May 2023)
In 2010, CSB was detected on Stock Island, FL on *Gossypium* spp. (wild cotton) (NAPPO, 2010). The infestation was limited to one plant with roughly 100 adults and 100 nymphs, which were immediately destroyed (Vitanza, 2010). After three years of regulatory and control activities and extensive surveys with no positive detections, Florida Department of Agriculture and Consumer Services and the USDA declared that CSB was eradicated in Florida (APHIS, 2014; UF/IFAS, 2014). This eradication effort occurred under exceptionally advantageous conditions where the CSB population occurred on a single plant on a small island and was detected before it was able to spread (UF/IFAS, 2014).

In 2019, CSB was reported and officially identified from a residential property in Los Angeles County on *Abutilon palmeri* (Palmer mallow) (Beucke, 2019). Subsequent surveys conducted by the California Department of Food and Agriculture have confirmed CSB is present in four counties (Los Angeles, Orange, Riverside, and San Diego) (CDFA, 2021), encompassing roughly 17,265 mi^2. Additionally, nearly 50 observations of CSB have been posted on the community scientist website iNaturalist (iNaturalist, 2022), all within the four counties listed above. Photographs of these observations were reviewed by a USDA entomology identifier and confirmed to most likely be CSB (Mikulas, 2022). Distinguishing CSB from other species in the genus *Oxycarenus* requires dissecting and examining adult male internal structures (Samy, 1969). However, since CSB is the only member of the genus present in the United States, photographs work well for identification of specimens originating from known areas of infestation in the United States (Mikulas, 2022). The iNaturalist observations and a single post from BugGuide indicate CSB may have been present in California as early as 2017 (BugGuide, 2022; iNaturalist, 2022).

Pathway
Cotton seed bug is likely established in four Californian counties and domestic spread can occur both naturally and via humans. Cotton seed bug moves easily in trade, even with commodities that are not known hosts (Henry, 1983). Since 2017, agricultural port inspectors have intercepted over 150 cotton seed bugs at U.S. ports-of-entry. Most of the interceptions were on cut flowers or fruit for consumption (USDA, 2022).

Adu-Mensah and Kumar (1977) observed CSB flight behaviors and durations, but few other studies on CSB flight capability are available. They found that CSB could fly for up to five seconds and suggested that CSB is not an active migrant and cannot sustain flight. The typical flight behavior of CSB is for individual insects to climb to a high point and take off quickly in the direction that the wind is blowing. Cotton seed bugs are then able to control flight towards an object in the downwind direction (Adu-Mensah and Kumar, 1977). Because wind can assist CSB dispersal, hurricanes or tropical storms may help spread CSB from the Caribbean islands or southern California to the rest of the continental United States.

Use the PPQ Commodity Import and Export manuals listed below to determine 1) if host plants or material are allowed to enter the United States from countries where the organism is present and 2) what phytosanitary measures (e.g., inspections, phytosanitary certificates, post entry quarantines, mandatory treatments) are in use. These manuals are updated regularly.

Agricultural Commodity Import Requirements (ACIR) manual: ACIR provides a single source to search for and retrieve entry requirements for imported commodities. https://acir.aphis.usda.gov/s/

Plants for Planting Manual: This manual is a resource for regulating imported plants or plant parts for propagation, including buds, bulbs, corms, cuttings, layers, pollen, scions, seeds, tissue, tubers, and like structures. https://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/plants_for_planting.pdf

Treatment Manual: This manual provides information about treatments applied to imported and domestic commodities to limit the movement of agricultural pests into or within the United States. https://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment.pdf

Potential Distribution within the United States

As of 2019, CSB is likely established in southern California (Beucke, 2019). Based on where CSB is known to occur in the world and comparing those climates with Global Plant Hardiness Zones, we expect that CSB could survive in plant hardiness zones 8–11 (Takeuchi et al., 2018). Moreover, hosts are available throughout these regions of the United States and include field crops (e.g., cotton and okra), horticultural crops (e.g., *Hibiscus*), ornamentals, and wild plants (native and weeds in urban and suburban landscapes). Areas of concern are the cotton-growing states of the southeastern United States, all of California, much of the western, south central, and eastern United States, and Hawaii.

Survey and Key Diagnostics

Approved Methods for Pest Surveillance:

For the current approved methods and guidance for survey and identification, see

Approved Methods for Pest Surveillance (AMPS) pest page on the CAPS Resource and Collaboration website, at https://caps.ceris.purdue.edu/approved-methods.

References

Abbas, M., F. Hafeez, M. Farooq, and A. Ali. 2015. Dusky cotton bug *Oxycarenus* spp. (hemiptera: Lygaeidae): Hibernating sites and management by using plant extracts under laboratory conditions. Polish Journal of Entomology 84(3):127-136.

Adu-Mensah, K., and R. Kumar. 1977. Ecology of *Oxycarenus* species (Heteroptera: Lygaeidae) in southern Ghana. Biological Journal of the Linnean Society 9:349-377.

Ananthakrishan, T. N., K. Raman, and K. P. Sanjayan. 1982. Comparative growth rate, fecundity, and behavioral diversity of the dusky cotton bug, *Oxycarenus hyalinipennis* Costa (Hemiptera: Lygaeidae) on certain Malvaceous host plants. Proceedings of the Indian National Science Academy B48(5):577-584.

Annecke, D. P., and V. C. Moran. 1982. Insects and mites of cultivated plants in South Africa. Butterworth & Co., Durban, South Africa. 383 pp.

APHIS. 2014. APHIS declares eradication of cotton seed bug (*Oxycarenus hyalinipennis*) from Florida (DA-2014-15).

Atta, B., M. D. Gogi, F. Mustafa, M. Adil, M. F. Raza, M. A. Farooq, and M. W. Abbas. 2015. Repellency of some insect Growth Regulators (IGRs) against dusky cotton bug *Oxycarenus hyalinipennis* Costa (Hemiptera: Lygaeidae: Oxycareninae) under laboratory conditions. Academic Journal of Entomology 8(2):52-55.

Avidov, Z., and I. Harpaz. 1969. Plant Pests of Israel. Israel University Press, Jerusalem. 549 pp.

Beucke, K. 2019. California Pest Rating Profile for *Oxycarenus hyalinipennis* (Costa): Cotton Seed Bug Hemiptera: Oxycarenidae California Department of Agriculture, Sacramento, CA. 8 pp.

Bolu, H., P. Dioli, and H. Çelik. 2020. Various observations on some biological character of *Oxycarenus hyalinipennis* (A. Costa, 1843) (Hemiptera: Lygaeoidea: Oxycarenidae) in South-Eastern Turkey. Munis Entomology and Zoology Journal 15(2):481-488.

Brambila, J. 2020. Field screening aid for the cotton seed bug *Oxycarenus hyalinipennis* (Hemiptera). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Gainesville, FL. 1 pp.

BugGuide. 2022. *Oxycarenus hyalinipennis*. Iowa State University, Ames, IA. Last accessed 7/6/2022, BugGuide.net.

CABI. 2022. Crop Protection Compendium. Centre for Argiculture and Bioscience International, Wallingford, UK.

CAPS. 2022. Approved Methods for Pest Surveillance: Cotton seed bug - *Oxycarenus hyalinipennis*. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Cooperative Agricultural Pest Survey (CAPS). http://pest.ceris.purdue.edu/services/approvedmethods/sheet.php?v=675&from=2023.

CDFA. 2021. CDFA Activities in Response to Cotton Seed Bug (presentation). California Department of Agriculture (CDFA). 18 pp.
Chin, D., B. Thistleton, and H. Brown. 2009. Factsheet: Swarming Bugs (family Lygaeidae) (ENT7). Department of Regional Development, Primary Industry, Fisheries and Resources, Northern Territory Government. 2 pp.
Cotton Counts. 2010. Cotton: From Field to Fabric. Educational Resources. Last accessed June 1, 2010, http://www.cotton.org/pubs/cottoncounts/fieldtofabric/index.cfm.
Derksen, A., K. Griffiths, and T. R. Smith. 2010. 2009 Florida CAPS *Oxycarenus* Survey Report (Program Report No. 2009-05-OH-01). Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Florida Cooperative Agricultural Pest Survey.
Dimetry, N. Z. 1971. Studies on the host preference of the cotton seed bug *Oxycarenus hyalinipennis* Costa (Lygaeidae: Hemiptera). Z. ang. Ent. 68:63-67.
El-Rahim, A., H. Gamal, and M. Amro. 2015. Population fluctuations of *Oxycarenus hyalinipennis* and effect of certain compounds on its population on okra in Asyut Governorate. Egyptian Journal of Agricultural Research 93(1):25-34.
EPPO. 2022. EPPO Global database. European and Mediterranean Plant Protection Organization (EPPO). Last accessed August 20, 2022, https://gd.eppo.int/.
Halbert, S. E., and T. Dobbs. 2010. Pest Alert: Cotton Seed Bug, *Oxycarenus hyalinipennis* (Costa): a serious pest of cotton that has become established in the Caribbean Basin (DACS-P-01726). Florida Department of Agriculture and Consumer Services, Division of Plant Industry
Henry, T. J. 1983. Pests not known to occur in the United States or of limited distribution (No. 38: Cottonseed bug). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Raleigh, NC. 6 pp.
Henry, T. J. 1997. Phylogenetic Analysis of Family Groups within the Infraorder Pentatomomorpha (Hemiptera: Heteroptera), with Emphasis on the Lygaeoidea. Annals of the Entomological Society of America 92(3):275-301.
Hill, D. S. 1983. Agricultural Insect Pests of the Tropics and their Control. Cambridge University Press, Cambridge. 746 pp.
iNaturalist. 2022. iNaturalist website. California Academy of Sciences, National Geographic. Last accessed 7/6/2022, https://www.inaturalist.org.
Ismail, H. A. 2018. The main sucking insect pests and their associated predators on okra plants. Zagazig Journal of Agricultural Research 45(4):1257-1271.
Khan, R. A., and M. Naveed. 2017. Seasonal population dynamics and management of Dusky Cotton Bug (DCB), *Oxycarenus hyalinipennis* Costa in cotton. Journal of Animal and Plant Sciences 27(4):1348-1352.
Kirkpatrick, T. W. 1923. The Egyptian cottonseed bug (*Oxycarenus hyalinipennis* (Costa)). Its bionomics, damage, and suggestions for remedial measures. Bulletin, Ministry of Agriculture, Egypt. Technical and Scientific Service 35:28-98.
Lattin, J. D., and K. Wetherill. 2002. *Metopoplax ditomoides* (Costa), a species a Oxycarenidae new to North America (Lygaeoidea: Hemiptera: Heteroptera). Pan-Pacific Entomologist 78:63-65.

Mikulas, M. 2022. Cotton seed bug identification. Personal communication to T. Hardin on 7/6/2022, from M. Mikulas (USDA Entomology Identifier).
Nakache, Y., and M. Klein. 1992. The Cotton seed bug, *Ocycarenus* [sic] *hyalinipennis*, attacked various crops in Israel in 1991. Hassadeh 72:773-775.
NAPPO. 2010. Update on the spread of the cotton seed bug, *Oxycarenus hyalinipennis*. North American Plant Protection Organization (NAPPO), Phytosanitary Alert System. http://www.pestalert.org/oprDetail.cfm?oprID=431.
Pearson, E. O. 1958. The Insect Pests of Cotton in Tropical Africa. Empire Cotton Growing Corporation and Commonwealth Institute of Entomology, London. 355 pp.
Péricart, J. 1998. Hemipteres Lygaeidae euro-méditerranéens. Seconde partie: Systématique, II: Oxycareninae, Bledionotinae, Rhyparochrominae. Faune de France, Montpellier. 453 pp.
PPQ. 2021. New Pest Response Guidelines: *Oxycarenus hyalinipennis* (Costa) cotton seed bug. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection Quarantine (PPQ), Raleigh, NC. 52 pp.
Protić, L. 2000. Biodiversity of the Heteroptera of Serbia. Acta entomologica serbica 5(1/2):1-12.
Rajashekhargouda, R., M. C. Devaiah, and S. Yelshetty. 1983. New record of insect pests infesting kasuri bhendi, *Hibiscus abelomoschus* Linnaeus, a medicinal plant. Journal of the Bombay Natural History Society 81(1):212-213.
Ram, P., and N. P. Chopra. 1984. Host plant relationships of *Oxycarenus hyalinipennis* Costa (Hemiptera: Lygaeidae: Oxycareninae). Bulletin of Entomology 25(2):111-116.
Ribeiro dos Santos, J. H., F. V. Vieira, and J. F. Alves. 1977. Influência da aplicação de insecticidas na época de ocorrência do *Oxycarenus hyalinipennis* (COSTA, 1847) sobre a produção do algodã “mocó” na safra seguinte. Fitossanidade, Flortaleza 2(1):11-13.
Ritchie, G. L., C. W. Bednarz, P. H. Jost, and S. M. Brown. 2004. Cotton growth and development (Bulletin 1252). The University of Georgia Cooperative Extension, Athens, GA. 16 pp.
Samy, O. 1969. A revision of the African species of *Oxycarenus* (Hemiptera: Lygaeidae). Transactions of the Royal Entomological Society of London 121(4):79-165.
Schaefer, C. W., and A. R. Panizzi. 2000. Heteroptera of Economic Importance. CRC Press, Boca Raton. 828 pp.
Segarra-Carmona, A. E., R. A. Franqui, and H. Pérez-Martínez. 2020. Biodiversity of Heteroptera in Puerto Rico: Part II. Annotated Checklist and Keys of Lygaeoidea (Pentatomomorpha). The Journal of Agriculture of the University of Puerto Rico 104(3):1-80.
Shah, Z. U., A. Ali, I. Haq, and F. Hafeez. 2016. Seasonal history of dusky cotton bug (*Oxycarenus hyalinipennis* Costa). Journal of Entomology and Zoology Studies 4(3):228-233.
Sharma, S., S. Tafel, and A. Hodges. 2010. Cotton seed bug *Oxycarenus hyalinipennis* (presentation). Florida Department of Agriculture and Consumer Services, Gainesville, FL.

Slater, J. A., and R. M. Baranowski. 1994. The occurrence of *Oxycarenus hyalinipennis* (Costa) (Hemiptera: Lygaeidae) in the West Indies and new Lygaeidae records for the Turks and Caicos Islands of Providenciales and North Caicos. Florida Entomologist 77(4):495-497.
Smith, T. R., and J. Brambila. 2008. A major pest of cotton, *Oxycarenus hyalinipennis* (Heteroptera: Oxycarenidae) in the Bahamas. Florida Entomologist 91(3):479-482.
Sweet, M. H. 2000. Seed and Chinch Bugs (Lygaeoidea). Pages 143-264 *in* C. W. Schaefer and A. R. Panizzi, (eds.). Heteroptera of Economic Importance. CRC Press, Boca Raton.
Takeuchi, Y., G. Flower, and A. S. Joseph. 2018. SAFARIS: Global Plant Hardiness Zone Development. North Carolina State University, Center for Integrated Pest Management, United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Science and Technology, Plant Epidemiology and Risk Analysis Laboratory. https://safaris.cipm.info/.
UF/IFAS. 2014. Pest Alert: Cotton seed bug declared eradicated from Florida. *in*. University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS), Gainsville, FL.
USDA. 2022. Agriculture Risk Monitoring (ARM). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Raleigh, NC.
Vitanza, S. 2010. Pest Alert: The cotton seed bug (Oxycarenus hyalinipennis). Issues in Agriculture: The News Letter About Integrated Pest Management for the El Paso Valley 35(5):2.
Wheeler, A. G., and T. J. Henry. 2015. First North American record of the palearctic *Microplax albofasciata* (Costa) (Hemiptera: Lygaeoidea: Oxycarenidae). Proceedings of the Entomological Society of Washington 117(1):55-61.

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Versions

March 2023 Update (Version 2):

- Added new **Synonyms**
- Added more **Common names**
- Changed **Type of pest**
- Family name has changed, so updated **Taxonomic position**
- Added more information and new images to the **Pest Recognition** section
- Included two **Easily Mistaken Species**
- Since the publication of the last CAPS datasheet, agricultural surveyors have detected CSB in four counties in California where it is likely established. Updated **Potential Distribution in the United States** section to reflect new incursion.

- Added a new section on approved diagnostics method

Datasheet completed in 2016 (Version 1)

Reviewer(s)

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