Factsheet *Ceratitis anonae* Graham

Original name: *Ceratitis anonae* Graham, 1908: 114.

Vernacular name: none

(updated March 23rd, 2021)

Formal redescription (after De Meyer & Freidberg, 2006)

Body length: 5.06 (4.35-5.90) mm; wing length: 5.15 (4.45-5.75) mm.

Male
Head: Antenna yellow. First flagellomere three times as long as pedicel. Arista with short to moderately long rays; ventral rays shorter and sparser than dorsal rays, especially basally. Frons pale, sometimes completely yellow, center yellow; with short scattered setulae distinctly darker than frons. Frontal setae well developed. Face white, sometimes yellowish white. Genal seta and setulae dark, well developed.
Thorax: Postpronotal lobe white, sometimes yellowish white; without spot. Scutal pattern: ground color ash-gray; with streaks and darker markings but without distinct spots or clearly defined stripes except prescutellar white markings separate, sometimes with pale area in between. Scapular setae dark. Scutellum white, sometimes yellowish white, basally without spots, apically with three separate black spots, extending to basal 0.33, sometimes only to basal half. Anepisternum on ventral 0.33-0.5 brown; setulae pale.
Legs: Yellow except where otherwise noted; setation typical for subgenus, mainly dark. Foreleg: femur dark anteriorly along entire dorsal margin, posteriorly along dorsal 0.66, with poorly developed bush of dispersed long dark setulae along entire length, posterodorsal setulae longer; ventral setae dark. Midleg: femur largely brownish black, anteriorly with silvery shine when viewed from certain angle, only distal end pale; ventrally with dark feathering along entire length, basally somewhat less dense; tibia broadened; largely brownish black with silvery shine when viewed from certain angle, with black feathering dorsally along distal 0.9 and ventrally along distal 0.8. Hindleg: femur dark brown except distally, at apical 0.25 with longer setulae dorsally and ventrally.
Wing: Markings yellowish brown. Interruption between marginal and discal bands near vein R_1 clear and complete; discal band often partly or completely interrupted in discal cell; cubital band free; medial band absent; crossvein R-M opposite middle of discal cell. Apex of vein R_1 distal to level of crossvein R-M. Crossvein DM-Cu oblique anterobasally.
Abdomen: Mostly yellow. Border between tergite 1 and 2 narrowly black. Tergites 2 and 4 with pale gray band occupying almost entire tergite, at most narrowly yellow anteriorly. Tergite 3 with distinct brownish black band along posterior half; rarely interrupted medially. Tergite 5 with basal 0.33 brownish, usually divided medially into two spots; posteriorly narrowly brownish. Male epandrium in lateral view with lateral surstylus curved, posterior lobe short.

Female
As male except following characters. Anepisternal pilosity on ventral 0.33 partly dark, especially centrally. Legs without feathering; femora yellow, forefemur posteriorly, and midfemur and hindfemur anteriorly on basal 0.66 often with brownish streaks; sometimes femora completely yellowish brown; forefemur posteroventrally with dark pilosity. Wing with discal band complete. Oviscape shorter than preabdomen. Aculeus at most six times as long as wide; tip with distinct apical indentation and lateral margin slightly sinuous.

Remark: *Ceratitis anonae* belongs to the FAR complex (see De Meyer et al., 2015 for a review). While male specimens can be easily differentiated from the other representatives in this complex, the differences between female specimens are minute and subtle and these can be easily confused.

Encyclopedia of Life link: http://eol.org/pages/726782/overview

DNA barcoding

Multiple reference DNA barcodes from the species distribution are available on the Barcode of Life Data Systems (BOLD) at :

http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxon=Ceratitis+anonae&searchTax= (accessed May 2020)

The molecular identification of *C. anonae* through DNA barcoding proved to be problematic as this species. cannot be properly resolved from the closely related species of the FAR (*C. fasciventris, C. anonae, C. rosa*) complex (De Meyer *et al.* 2015) as well as from the recently described *C. quilicii* (De Meyer *et al.* 2016). Accordingly, in BOLD, these four species are recovered as part of multispecific BINs. Additionally, the presence of unidentified / possibly misidentified reference sequence in BINs in which this species is represented, might also bias its molecular ID

Host plant list

It is a polyphagous species recorded from a number of commercial and wild hosts. Detailed studies on host range can be found for Kenya (Copeland et al., 2006). Throughout its range it is recorded from the hosts listed in the table below.

PlantFamily	PlantLatinName	PlantCommonNameEnglish
Anacardiaceae	Mangifera indica	mango
Annonaceae	Annona diversifolia	
Annonaceae	Annona montana	
Annonaceae	Annona muricata	soursop
Annonaceae	Annona reticulata	custard apple
Annonaceae	Annona senegalensis	wild custard apple
Annonaceae	Anonidium mannii	
Annonaceae	Artabotrys monteiroae	
Annonaceae	Monodora sp.	
Annonaceae	Rollinia mucosa	wild sweetsop
Annonaceae	Rollinia sp.	
Arecaceae	Areca alicae	
Cecropiaceae	Myrianthus arboreus	bugtree?
Cecropiaceae	Myrianthus sp.	
Clusiaceae	Guttiferae sp.	
Combretaceae	Terminalia catappa	tropical almond
Dichapetalaceae	Dichapetalum bangii	
Euphorbiaceae	Drypetes gossweileri	

Fabaceae	Cynometra sp.	
Flacourtiaceae	Flacourtia sp.	
Flacourtiaceae	Rawsonia lucida	
Irvingiaceae	Irvingia smithii	
Lauraceae	Persea americana	avocado
Melastomataceae	Bellucia sp.	
Menispermaceae	Tiliacora funifera	
Moraceae	Antiaris africana	upas-tree
Moraceae	Antiaris toxicaria	antiaris, false iroko, false mvule
Moraceae	Artocarpus sp.	
Moraceae	Dorstenia sp.	
Moraceae	Morus mesozygia	
Myrtaceae	Eugenia uniflora	surinam cherry, pitanga cherry
Myrtaceae	Pseudomycrianthes rosea	
Myrtaceae	Psidium cattleyanum	strawberry guava, cherry guava
Myrtaceae	Psidium guajava	common guava
Myrtaceae	Psidium sp.	
Olacaceae	Strombosia scheffleri	
Pandaceae	Panda oleosa	
Passifloraceae	Passiflora foetida	
Rhamnaceae	Ziziphus abyssinica	
Rubiaceae	Coffea arabica	arabica coffee
Rubiaceae	Coffea canephora	robusta coffee
Rubiaceae	Coffea sp.	coffee
Rubiaceae	Leptactina platyphylla	
Rubiaceae	Omaralia calycina	
Rutaceae	Citrus aurantium	sour orange
Rutaceae	Citrus sinensis	sweet orange
Rutaceae	Citrus sp.	
Rutaceae	Citrus x paradisi	grapefruit
Rutaceae	Murraya sp.	
Sapindaceae	Nephelium lappaceum	rambutan
Sapindaceae	Pancovia laurentii	
Sapotaceae	Achra sapota	
Sapotaceae	Chrysophyllum imperiale	
Sapotaceae	Chrysophyllum sp.	
Sapotaceae	Englerophytum oblanceolatum	
Sapotaceae	Mimusops sp.	milkwood
Sapotaceae	Pouteria altissima	
Sapotaceae	Synsepalum brevipes	
Sapotaceae	Vitellaria paradoxa	shea butter
Solanaceae	Solanum mauritianum	bugtree
Sterculiaceae	Sterculia sp.	
Sterculiaceae	Theobroma cacao	cocoa

Additional information on host records and associated specimens can be found on :
http://projects.bebif.be/fruitfly/taxoninfo.html?id=56

Impact & management

Details on losses incurred by *Ceratitis anonae* on commercial crops are very limited. Foba et al. (2012) list this as one of the main pest species on several Citrus varieties in Ghana (together with *C. ditissima* and *Bactrocera dorsalis*). Vayssières et al. (2004, 2015) reports very minor occurrence of this fly in mango orchards in Mali and Benin respectively.

Management for this species is, as for most fruit fly pests, most efficient using an IPM (Integrated Pest Management) program, including aspects such as orchard sanitation, bait sprays, mass trapping among others. General reviews on the current IPM components applied in Africa can be found in chapters 13 to 20 of Ekesi et al. (2016).

No SIT (Sterile Insect Technique) application specifically for this species has been developed in Africa.

Attractants & trapping

Both sexes can be attracted by protein bait products such as liquid protein baits and three component Biolure

Male flies can be attracted by the following lures: trimedlure

General information on trapping, types of traps, lures and required density of trapping stations can be found in IAEA (2013), Shelly et al. (2014), and Manrakhan (2016).

Distribution

Ceratitis anonae is found throughout Sub-Saharan Africa, but along a belt approximately 12°N and 10°S of the Equator. In eastern Africa its occurrence east of the Gregory Rift is doubtful (see Copeland et al., 2006 for detailed occurrence in Kenya). Not established outside mainland Africa.

Distribution map for Africa, based upon specimen records with georeferences is available at:

http://projects.bebif.be/fruitfly/taxoninfo.html?id=56

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