SCIENTIFIC NOTE

# Distribution and Host Range of *Bephratelloides cubensis* Ashmead (Hymenoptera: Eurytomidae) in Mexico

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ABSTRACT - The annona fruit borer wasp *Bephratelloides cubensis* Ashmead was recorded for the first time damaging "ilama" fruits *Annona diversifolia* (Anonaceae) in Coatlan del rio, Morelos, Cacahuamilpa and El Ocotillo, Guerrero, Mexico. Geographical distribution, hosts and damage are mentioned.

KEY WORDS: Annona fruit borer wasp, ilama, bullock heart, sugar apple

The genus *Bephratelloides* is native from the neotropics, and includes six species (Grissel & Foster 1996), five of them associated to *Annona* spp. (Grissell & Schauff 1990). *Bephratelloides cubensis* (Ashmead) and *B. pomorum* (Fabricius) are the most important pests of high value Anonaceae, such as, soursop (*Annona muricata*), atemoya (*A. cherimola* x *A. squamosa*), sugar apple (*A. squamosa*) and bullock heart (*A. reticulata*) (Nadel & Peña 1991a).

*Bephratelloides cubensis* has been reported in the United States of America (Florida, Hawaii), Mexico, Central America, Caribe and the north of South America (Dozier 1932, Korytkowski & Ojeda 1966, Heu 1988, Peña & Bennett 1995). However, its detailed distribution, host range and behavior in Mexico are unknown. This species was only reported from Nayarit and Tabasco states on soursop fruits, without further details (Sánchez-Soto & Franco-Mora 2001, Hernández-Fuentes *et al* 2008).

Considering the importance of this pest of Anonaceae, several sites in five states in Mexico were sampled to determine the distribution, host range and behavior of *B. cubensis* (Table 1). Twenty fruits were collected per site, incubated at room temperature in circular plastic containers (15 x 8 cm) covered with cheese cloth to avoid adult escape. Species confirmation was carried out using the taxonomic key published by Grissell & Schauff (1990).

Based on the morphological traits of the obtained adults (a detailed description of the species may be found in Dozier 1932, Korytkowski & Ojeda 1966, Bruner & Acuña 1967, Grissell & Schauff 1990), the insects attacking *A. reticulata*, *A. squamosa* and *A. diversifolia* in Guerrero, Morelos, Puebla, Veracruz and Yucatan, Mexico were identified as *B. cubensis*. *Annona diversifolia* is reported for the first time as a host of *B. cubensis* in America, supplementing previous reports (Sánchez-Soto & Franco-Mora 2001, Hernández-Fuentes *et al* 2008) that mentioned that the only host of *B. cubensis* in Mexico was soursop. *Annona cherimola* was not observed as a host of *B. cubensis* in our survey, as reported by others (Nadel & Peña 1991a). However it is reported as a host of this insect elsewhere (Korytkowski & Ojeda 1966). In Mexico, *B. cubensis* was found from 0 to 1,254 m above the sea level and *A. cherimola* grows above 1,500 meters above the sea level. The fact that *A. cherimola* is outside the altitudinal range of *B. cubensis* in Mexico supports both reports (Korytkowski & Ojeda 1966, Nadel & Peña 1991a). However, further studies are required to test this hypothesis.

We observed that *B. cubensis* larvae feed and destroy *Annona* seeds (Fig 1a), where they pupate. Up to 26 adults were observed to emerge per fruit (Fig 1b). Males (Fig 1c) emerge before females (Fig 1d). This behavior was reported by Suarez de Lima *et al* (1997) in *B. pomorum*. The exit channels serve as entrance point for other insects and microorganisms. Incidence of *B. cubensis* on *Annona* spp. ranged from 30% to 40%.

*Bephratelloides cubensis* was found during the four seasons in Mexico, probably due to the fact that susceptible hosts and weather conditions favor its reproduction. In Nayarit, *B. cubensis* occurred from March to October, while in Tabasco, adults were found only in July. Adults were observed in February and March in Morelos, Puebla, Guerrero, Veracruz and Yucatan states on *A. reticulata*. Typically, adults emerge from *A. squamosa* fruits during July and August and from *A. diversifolia* in September.

*Bephratelloides cubensis* has been reported as a thelytokous species, males are very rare and female reproduce

Table 1 Lists of sampled localities and *Annona* hosts of *Bephratelloides cubensis* in Mexico.

| State | Locality | Collection date | Coordinates | Meters above the sea level | Hosts |
|---|---|---|---|---|---|
| Guerrero | El Ocotillo | Sep 2007 | 16º57'N 99º24'W | 483 | *A. diversifolia* |
| | Cacahuamilpa | Feb - Sep 2007 | 18º40'N 99º30'W | 1163 | *A. diversifolia*<br>*A. reticulata* |
| Morelos | Tepalcingo | Feb 2007 | 18º35'N 98º50'W | 1169 | *A. reticulata* |
| | Coatlan del rio | Sep 2007 | 18º43'N 99º27'W | 1148 | *A. diversifolia* |
| Puebla | Zacapala | Feb 2009 | 18º35'N 98º03'W | 1254 | *A. reticulata* |
| Veracruz | Martinez de la Torre | Feb 2007 | 20º04'N 97º04'W | 151 | *A. reticulata* |
| | Papantla | Feb 2007 | 20º27'N 97º19'W | 180 | *A. reticulata* |
| | Actopan | Oct 2007 - Feb 2008 | 19º30'N 96º37'W | 260 | *A. squamosa*<br>*A. reticulata* |
| | Tlapacoyan | Feb 2007 | 19º58'N 97º13'W | 430 | *A. reticulata* |
| | Emiliano Zapata | Oct 2007 - Feb 2008 | 20º15'N 97º24'W | 750 | *A. squamosa*<br>*A. reticulata* |
| Yucatan | Hunucma | Feb 2008 | 21º01'N 89º52'W | 0 | *A. reticulata* |
| | Tetis | Feb 2008 | 20º56'N 89º55'W | 0 | *A. reticulata* |

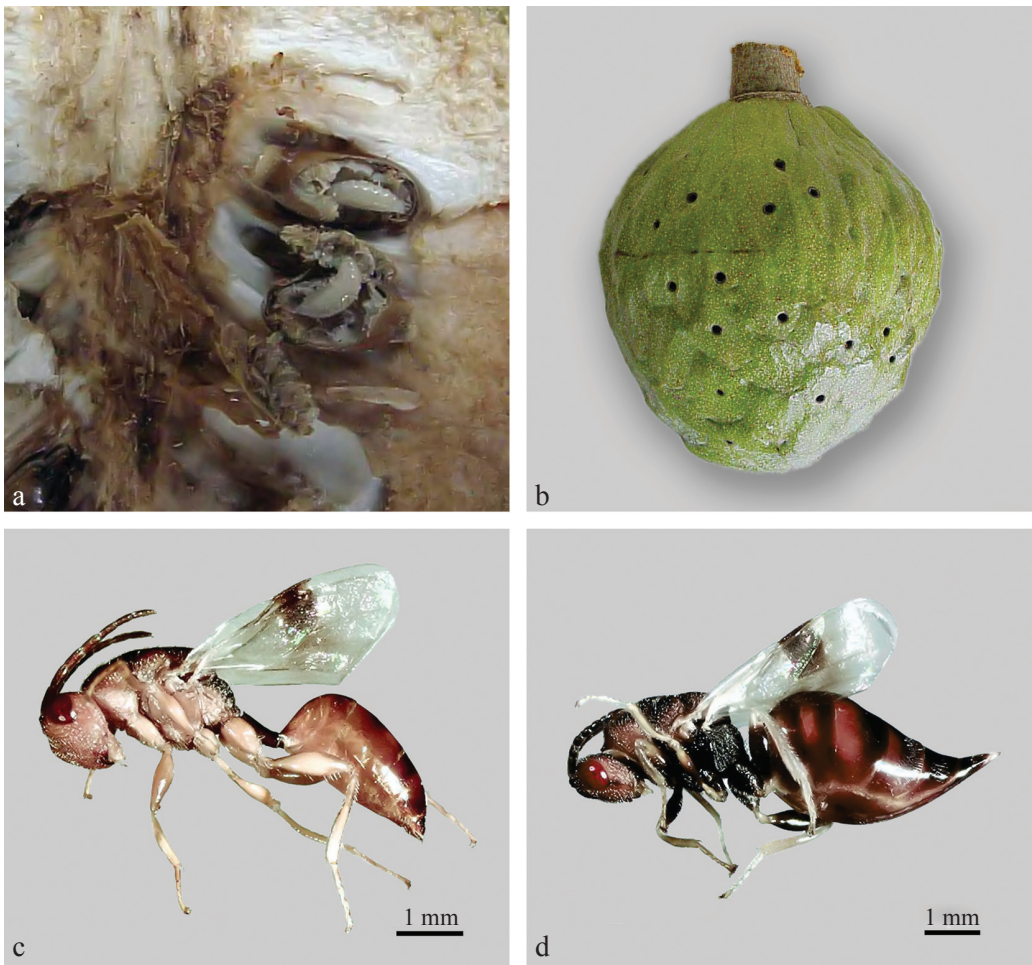


Fig 1 *Bephratelloides cubensis*. a) larvae; b) damage in *Annona reticulata*; c) male; d) female.

by parthenogenesis (Grissell & Schauff 1990, Nadel & Peña 1991b). However, our observations show a 1:1 proportion of male to female, supporting the hypothesis that under our conditions, *B. cubensis* does not reproduce by thelytoky. Voucher specimens were deposited in the fruit pest collection at the "Fundación Salvador Sánchez Colín CICTAMEX, S.C" and "Universidad Veracruzana".

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