



ARTICLE

Life stages, biological aspects and geographic distribution of *Platyscytus decempunctatus* (Heteroptera: Miridae: Phylinae)

Evaldo Martins Pires^{1,3}, Paulo Sérgio Fiuza Ferreira¹,
Raul Narciso Carvalho Guedes¹ and José Eduardo Serrão³

Received: March 29 2009

Received after revision: December 11 2009

Accepted: January 10 2010

Available online at <http://www.ufrgs.br/seerbio/ojs/index.php/rbb/article/view/1205>

ABSTRACT: (Life stages, biological aspects and geographic distribution of *Platyscytus decempunctatus* (Heteroptera: Miridae: Phylinae)). *Platyscytus decempunctatus* is a small phytophagous mirid found only on *Solanum cernuum* (Solanaceae) plants. This species is characterized by the presence of two black marks on second antennal segment and by dorsal spots on body. The authors present a taxonomic review of *P. decempunctatus*, with descriptions and illustrations of all stages, from egg to adult. Information about behavior and geographical distribution of the species are also presented.

Key words: dorsal spots, immature stages, phytophagy, taxonomy.

RESUMO: (Estágios de vida, aspectos biológicos e distribuição geográfica de *Platyscytus decempunctatus* (Heteroptera: Miridae: Phylinae)). *Platyscytus decempunctatus* é um pequeno mirídeo fitófago encontrado somente em plantas de *Solanum cernuum* (Solanaceae). A espécie é caracterizada pela presença de duas máculas pretas no segundo segmento antenal e também por manchas dorsais no corpo. Os autores apresentam uma revisão de *P. decempunctatus*, com descrições e ilustrações de todos os estágios, de ovo a adulto. Informações sobre o comportamento e distribuição geográfica também são apresentadas.

Palavras-chave: manchas dorsais, estágios imaturos, fitofagia, taxonomia.

INTRODUCTION

Platyscytus decempunctatus was described by Carvalho (1945) within the genus *Diaphinidia* Uhler. This description was based on a male holotype collected in São Pedro dos Ferros, Minas Gerais (MG), Brazil, and deposited in the National Museum of Rio de Janeiro (Museu Nacional do Rio de Janeiro, Rio de Janeiro, Brazil) and five paratypes (three males, two females) collected in Viçosa, MG, and deposited in the Smithsonian Institute (Washington, DC, USA). Carvalho (1945) illustrated the dorsal habitus of the allotype (female) and the left paramere of the male. *Solanum cernuum* L. (Solanaceae) was reported to be the host plant. Later, Carvalho (1951) studied *Platyscytus* Reuter from Reuter's collection deposited in the Museum Zoologicum Universitatis (Helsinki, Finland), and moved *Diaphinidia decempunctata* to *Platyscytus*. Since 1958, no new information has been published about this species (Pires *et al.* 2007, 2008).

The objective of this study was to describe all developmental stages (egg through adult) of *P. decempunctatus*, providing details of the male genitalia, to show variations on the number and position of the dorsal spots and to provide some biological information and geographic distribution of this species.

MATERIAL AND METHODS

For the adult redescription of *P. decempunctatus*, specimens deposited in the Regional Museum of Entomology ("Museu Regional de Entomologia") of the Federal University of Viçosa ("Universidade Federal de

Viçosa") (UFV) were examined and found to be in agreement with the original holotype description. The first and second stages were obtained from eggs of *P. decempunctatus* collected from leaves of *S. cernuum* and kept in Petri dishes with leaves of its host plant, which were changed every two days. Third, fourth and fifth nymphal stages were collected directly from leaves of *S. cernuum* and identified following Wheeler & Henry (2004), which describes the immature stages of Miridae.

The illustrations were made using a Leica MZ-8 stereoscopic microscope with a connected clear chamber. The measurements were made in millimeters using an ocular micrometric (10x). A survey of the dorsal spots of *P. decempunctatus* was carried out to verify possible variations or different models in the number and position of the spots in the specimens. The adults used in this survey were collected from plants of *Solanum cernuum* (Solanaceae) in 23 sites in the states of Minas Gerais (15) and Rio de Janeiro (8). The sites in Minas Gerais were the State Park of the Brigadeiro Hill Range (Parque Estadual da "Serra do Brigadeiro") (20°38'57" S; 42°27'36" W), located in the Araponga county, and the counties of Araponga (20°35'54" S; 42°26'24" W), Coronel Pacheco (21°36'07" S; 43°17'09" W), Ervália (20°50'24" S; 42°39'26" W), Florestal (19°53'22" S; 44°25'57" W), Guiricema (21°00'28" S; 42°43'04" W), Juiz de Fora (21°45'51" S; 43°21'57" W), Paula Cândido (20°52'27" S; 42°58'49" W), Rio Pomba (21°19'06" S; 43°12'32" W), Tabuleiro (21°21'32" S; 43°14'52" W), Teixeiras (20°39'04" S; 42°51'24" W), Tocantins (21°11'30" S; 43°02'30" W), Ubá (21°03'15" S; 42°53'32" W), Viçosa

1. Departamento de Biologia Animal, Universidade Federal de Viçosa. CEP 36570-000, Viçosa, Minas Gerais, Brazil.

2. Departamento de Biologia Geral, Universidade Federal de Viçosa. CEP 36570-000, Viçosa, Minas Gerais, Brazil.

* Author for correspondence. E-mail: evaldo.pires@gmail.com

(20°46'16" S; 42°52'54" W) and Visconde do Rio Branco (21°02'18" S; 42°51'36" W). The sites in the state of Rio de Janeiro were the counties of Barra Mansa (22°34'27" S; 44°10'23" W), Barra do Pirai (22°28'12" S; 43°49'32" W), Levi Gasparian (22°02'15" S; 43°12'17" W), Paraíba do Sul (22°08'36" S; 43°36'18" W), Pinheiral (22°30'46" S; 44°00'20" W), Pirai (22°37'45" S; 43°53'53" W), Vassouras (22°14'14" S; 43°39'45" W) and Volta Redonda (22°31'23" S; 44°06'15" W).

Dominance analysis, as described by Palma (1975) apud Abreu & Nogueira (1989) and Scatolini & Pentead-Dias (2003), was used to recognize the main models of dorsal spots of *P. decempunctatus*. The dominance index was calculated as (the number of the specimens with one model of the spots divided by total number of individuals of the population) x 100.

RESULTS AND DISCUSSION

First instar

Diagnosis. This instar can be characterized by having the mesothorax and metathorax apparently fused, hard to distinguish. Oval body and without wings (Fig. 1A).

Measurements: mean (minimum and maximum). Body length: 0.56 (0.54 – 0.59), body width: 0.22 (0.21 – 0.24), head length: 0.14 (0.14 – 0.15), head width: 0.18 (0.18 – 0.18), vertex (distance between eyes): 0.15 (0.15 – 0.15), rostrum length: 0.21 (0.19 – 0.22), antennal length: 0.14 (0.13 – 0.14).

Description: The body color is yellowish, but translucent or hyaline, without dorsal spots, yellowish head and reddish eyes. All antennal segments are yellowish with reddish apical marks (Fig. 1A).

Head moderately declined with few hairs, posterior convex vertex, the eyes are situated laterally on the head near the prothorax anterior edge, all antennal segments are cylindrical and the antennae are inserted near the compound eyes. Rostrum reaching mid coxae. Oval body and the pronotum, mesonotum and metanotum are difficult to distinguish. Scutellum indistinct, wings absent, cylindrical legs with hairs (Fig. 1A). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel (Fig. 3A), arising from unguitactor plate (Fig. 3B), pulvilli present (Fig. 3C). Ventral area with few hairs, except on the abdomen.

Second instar

Diagnosis. This instar can be characterized by the presence of distinct prothorax, mesothorax and metathorax and the beginning of the formation of the wings which look like two small structures that are triangular and separated from each other (Fig. 1B).

Measurements: mean (minimum and maximum). Body length: 1.08 (1.08 – 1.08), body width: 0.22 (0.20 – 0.25), head length: 0.15 (0.15 – 0.15), head width: 0.46 (0.45 – 0.47), vertex (distance between eyes): 0.30

(0.30 – 0.30), rostrum length: 0.82 (0.78 – 0.89), pronotal length: 0.25 (0.25 – 0.26). Antennal segments length: I: 0.10 (0.10 – 0.10), II: 0.24 (0.19 – 0.35), III: 0.17 (0.16 – 0.18) e IV: 0.09 (0.09 – 0.09). Legs: anterior femur length: 0.28 (0.28 – 0.28), anterior tibia length: 0.34 (0.34 – 0.35), anterior tarsi length: 0.14 (0.14 – 0.14), median femur length: 0.44 (0.39 – 0.35), median tibia length: 0.46 (0.40 – 0.58), median tarsi length: 0.15 (0.15 – 0.15), posterior femur length: 0.53 (0.50 – 0.57), posterior tibia length: 1.00 (0.98 – 1.02), posterior tarsi length: 0.22 (0.22 – 0.22).

Description: The body color is yellowish, without dorsal spots, head yellowish and reddish eyes, frons, clypeus, juga, lora, buccula, gula and rostrum yellowish and difficult to distinguish. All antennal segments are yellowish with apical reddish marks (Fig. 1B).

Head moderately declined and with few hairs. The head is wider than the pronotum, posterior convex vertex, vertical frons, clypeus, juga, lora and buccula are difficult

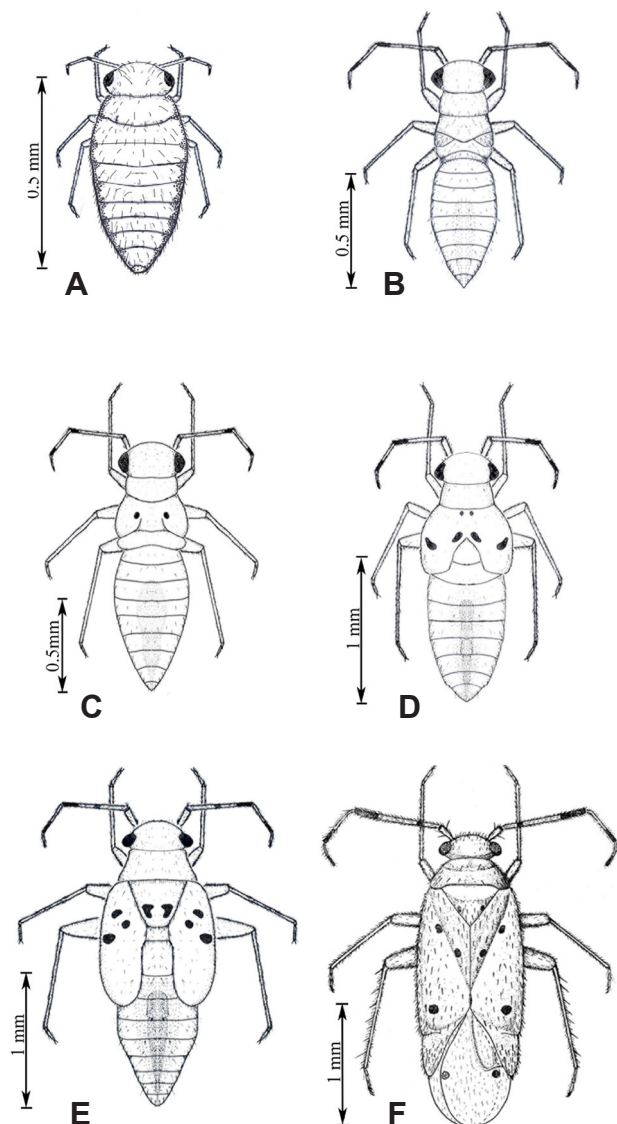


Figure 1. *Platyscytus decempunctatus* (Heteroptera: Miridae) dorsal view. A. I instar, B. II instar, C. III instar, D. IV instar, E. V instar, F- Adult.

to distinguish, eyes are on the posterior part of the head, near the anterior part of the pronotum. All antennal segments are cylindrical, the antennae are inserted near the compound eyes and above frons-clipeus suture, the eyes are situated laterally on the head near the front border of the pronotum, and the relative lengths of antennal segments in ascending order is: $4 < 1 < 3 < 2$. Rostrum cylindrical, 4 segments, reaching mid coxae. Pronotum rectangular-shaped with few and long hairs. Scutellum is difficult to distinguish, triangle-shaped wings and separated from each other. Legs cylindrical and with hairs (Fig. 1B). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel (Fig. 3A), arising from unguitactor plate (Fig. 3B), pulvilli present (Fig. 3C). Ventral area with few hairs, except on the abdomen.

Third instar

Diagnosis. This instar can be characterized by the wings covering a larger part of the metathorax and presence of two reddish spots (Fig. 1C).

Measurements: mean (minimum and maximum). Body length: 1.49 (1.41 – 2.00), body width: 0.70 (0.50 – 0.88), head length: 0.18 (0.18 – 0.18), head width: 0.48 (0.48 – 0.48), vertex (distance between eyes): 0.30 (0.30 – 0.30), rostrum length: 1.07 (1.02 – 1.10), pronotal length: 0.27 (0.26 – 0.30). Antennal segments length: I: 0.15 (0.10 – 0.18), II: 0.17 (0.15 – 0.20), III: 0.13 (0.12 – 0.15) e IV: 0.13 (0.12 – 0.15). Legs: anterior femur length: 0.44 (0.34 – 0.53), anterior tibia length: 0.49 (0.40 – 0.60), anterior tarsi length: 0.19 (0.17 – 0.24),

median femur length: 0.50 (0.43 – 0.60), median tibia length: 0.64 (0.46 – 0.78), median tarsi length: 0.18 (0.17 – 0.20), posterior femur length: 0.52 (0.49 – 0.56), posterior tibia length: 1.00 (0.99 – 1.02), posterior tarsi length: 0.28 (0.26 – 0.33).

Description: The body color is yellowish, but translucent or hyaline with one reddish dorsal spot on each wing, yellowish head and reddish eyes, frons, clypeus, juga, lora, buccula, gula and rostrum yellowish and difficult to distinguish. All antennal segments are yellowish with apical reddish marks (Fig. 1C).

Head moderately declined and with few hairs. The head is wider than the pronotum, posterior convex vertex, the vertical frons, clypeus, juga, lora and buccula are difficult to distinguish, eyes are on the posterior part of the head, near the anterior part of the pronotum. All antennal segments are cylindrical, the antennae are inserted near the compound eyes and above frons-clipeus suture, the eyes are situated laterally on the head near the front border of the pronotum, relative lengths of antennal segments in ascending order: $4 < 1 < 3 < 2$. Rostrum cylindrical, 4 segments, reaching beyond hind coxae. The back of the pronotum is convex and with a few long hairs. Scutellum is difficult to distinguish, wings cover a larger part of the mesothorax. Legs cylindrical and with hairs (Fig. 1C). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel, arising from unguitactor plate, pulvilli present (Fig. 3). Ventral area with few hairs, except on the abdomen.

Fourth instar

Diagnosis. This instar can be characterized by wings that extend beyond the metathorax and reaching the second abdominal segment on dorsal view. Mesonotum with six reddish spots, two small apical spots and two large spots near the wing bases. (Fig. 1D). Scutellum

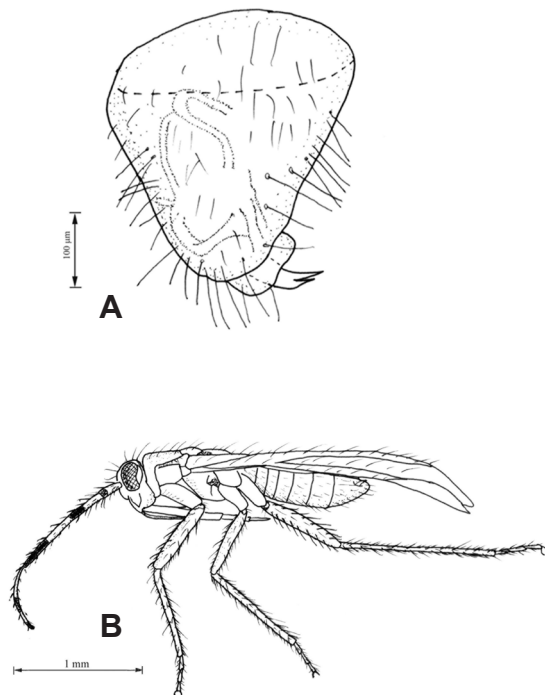


Figure 2. A. Pygophore of *Platyscytus decempunctatus* (Heteroptera: Miridae) showing phallotheca dorsolaterally in the abdomen. B. *P. decempunctatus* lateral view.

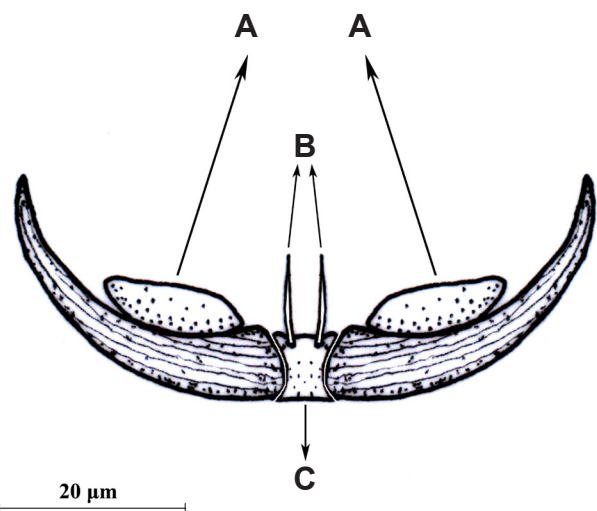


Figure 3. Claw of *Platyscytus decempunctatus* (Heteroptera: Miridae), A. Pulvilli, B. Parempodium, C. Unguitactor plate.

hard to distinguish.

Measurements: mean (minimum and maximum). Body length: 2.16 (1.77 – 2.62), body width: 0.96 (0.81 – 1.09), head length: 0.19 (0.19 – 0.20), head width: 0.52 (0.52 – 0.52), vertex (distance between eyes): 0.32 (0.30 – 0.35), rostrum length: 1.18 (1.15 – 1.25), pronotal length: 0.30 (0.28 – 0.33), pronotal width: 0.58 (0.50 – 0.71), wing length: 0.53 (0.47 – 0.60), hemelytrum width: 0.52 (0.47 – 0.60). Antennal segments length: I: 0.15 (0.15 – 0.20), II: 0.85 (0.65 – 0.95), III: 0.16 (0.12 – 0.22) e IV: 0.13 (0.12 – 0.16). Legs: anterior femur length: 0.50 (0.42 – 0.61), anterior tibia length: 0.55 (0.46 – 0.87), anterior tarsi length: 0.27 (0.22 – 0.30), median femur length: 0.56 (0.50 – 0.59), median tibia length: 0.72 (0.58 – 0.87), median tarsi length: 0.25 (0.23 – 0.27), posterior femur length: 0.70 (0.62 – 0.78), posterior tibia length: 1.32 (1.10 – 1.46), posterior tarsi length: 0.32 (0.31 – 0.34).

The body color is yellowish, but translucent or hyaline with three reddish dorsal spots on each wing, one small spot on the mesonotum and two larger spots, one median and the other laterally on the wing, head yellowish, eyes reddish, frons, clypeus, juga, lora and buccula yellowish and difficult to distinguish, gula and rostrum yellowish. All antennal segments are yellowish with reddish apical marks (Fig. 1D).

Head moderately declined and with few hairs, posterior convex vertex, vertical frons, clypeus, juga, lora and buccula are difficult to distinguish, eyes are on the posterior part of the head, near the anterior part of the pronotum. All antennal segments are cylindrical, the antennae are inserted near the compound eyes above frons-clipeus suture, the eyes are situated laterally on the head near the front edge of the pronotum, relative lengths of the antennal segments in ascending order are: $4 < 1 < 3 < 2$. Rostrum cylindrical, 4 segments, reaching beyond hind coxae. The back side of the pronotum is convex and with few a few long hairs. Scutellum is difficult to distinguish, wings cover part of the methanotum reaching the second abdominal segment. Legs cylindrical and with hairs (Fig. 1D). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel (Fig. 3A), arising from unguitactor plate (Fig. 3B), pulvilli present (Fig. 3C). Ventral area with few hairs, except on the abdomen.

Fifth instar

Diagnosis. This instar can be characterized by the wings that are separated and the presence of the scutellum. Wings reaching the fourth abdominal segment and with three reddish spots on each wing and two reddish on scutellum. Pronotum trapezoid-shaped (Fig. 1E).

Measurements: mean (minimum and maximum). Body length: 2.66 (2.12 – 2.99), body width: 1.08 (0.99 – 1.14), head length: 0.23 (0.22 – 0.25), head width: 0.55 (0.55 – 0.56), vertex (distance between eyes): 0.31 (0.28 – 0.34), rostrum length: 1.22 (1.20 – 1.25), pronotal

length: 0.34 (0.32 – 0.36), pronotal width: 0.73 (0.65 – 0.78), scutellum length: 0.41 (0.38 – 0.42), scutellum apex width: 0.46 (0.42 – 0.48), scutellum basis width: 0.27 (0.27 – 0.27), wing length: 1.08 (0.92 – 1.15), wing width: 0.45 (0.41 – 0.50). Antennal segments length: I: 0.18 (0.15 – 0.21), II: 0.90 (0.62 – 1.04), III: 0.38 (0.30 – 0.45) e IV: 0.13 (0.12 – 0.15). Legs: anterior femur length: 0.64 (0.50 – 0.70), anterior tibia length: 0.72 (0.54 – 0.80), anterior tarsi length: 0.31 (0.27 – 0.34), median femur length: 0.62 (0.59 – 0.65), median tibia length: 0.80 (0.65 – 0.89), median tarsi length: 0.27 (0.27 – 0.27), posterior femur length: 0.81 (0.77 – 0.85), posterior tibia length: 1.39 (1.17 – 1.54), posterior tarsi length: 0.36 (0.31 – 0.40).

Description: The body color is yellowish, but translucent or hyaline with dorsal reddish spots, three on each wing and two on the scutellum, yellowish head and reddish eyes, frons, clypeus, juga, lora, buccula and gula conspicuous. All antennal segments are yellowish and with reddish apical marks (Fig. 1E).

Head moderately declined and with few hairs, vertex posterior convex vertex, vertical frons, clypeus extends beyond the juga, juga, lora and buccula difficult to distinguish, eyes are on the posterior part of the head, near the anterior part of the pronotum. All antennal segments are cylindrical, the antennae inserted near the compound eyes and above frons-clipeus suture, the eyes are situated laterally on the head near the front border of the pronotum, relative lengths of the antennal segments in ascending order: $4 < 1 < 3 < 2$. Rostrum cylindrical, 4 segments, extending beyond of the hind coxae. The back side of the pronotum is nearly linear and with few long hairs (Fig. 1E). Wings extend beyond the third abdominal segment. Legs cylindrical and with hairs (Fig. 1E). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel (Fig. 3A), arising from unguitactor plate (Fig. 3B), pulvilli present (Fig. 3C). Ventral area with few hairs, except on the abdomen.

The immature stages can basically be differentiated from one another by body dimensions and shape, the presence and location of spots, the presence of wings, and the presence of the scutellum.

Adult diagnoses

Platyscytus decempunctatus is a small plant bug that has reddish, orange and blackish spots on the dorsal portion of the hemelytron. The second antennal segment shows median and apical blackish marks (Fig. 1F).

Male:

Measurements: mean (minimum and maximum). Body length: 2.97 (2.59 – 3.47), body width: 1.07 (0.83 – 1.29), head length: 0.23 (0.18 – 0.29), head width: 0.55 (0.44 – 0.65), vertex (distance between eyes): 0.32 (0.22 – 0.39), rostrum length: 1.10 (0.94 – 1.36), pronotum length: 0.35 (0.25 – 0.47), maximum pronotum width: 0.82 (0.67 – 0.94), scutellum length : 0.44 (0.36 – 0.53),

scutellum width: 0.36 (0.28 – 0.50), hemelytron length: 2.30 (1.82 – 2.65), maximum hemelytron width: 0.54 (0.42 – 0.65), membrane length: 1.05 (0.72 – 1.29). Antennal segments length: I: 0.25 (0.17 – 0.35), II: 0.91 (0.61 – 1.12), III: 0.35 (0.22 – 0.50) e IV: 0.24 (0.17 – 0.29). Legs: anterior femur length: 0.61 (0.44 – 0.76),

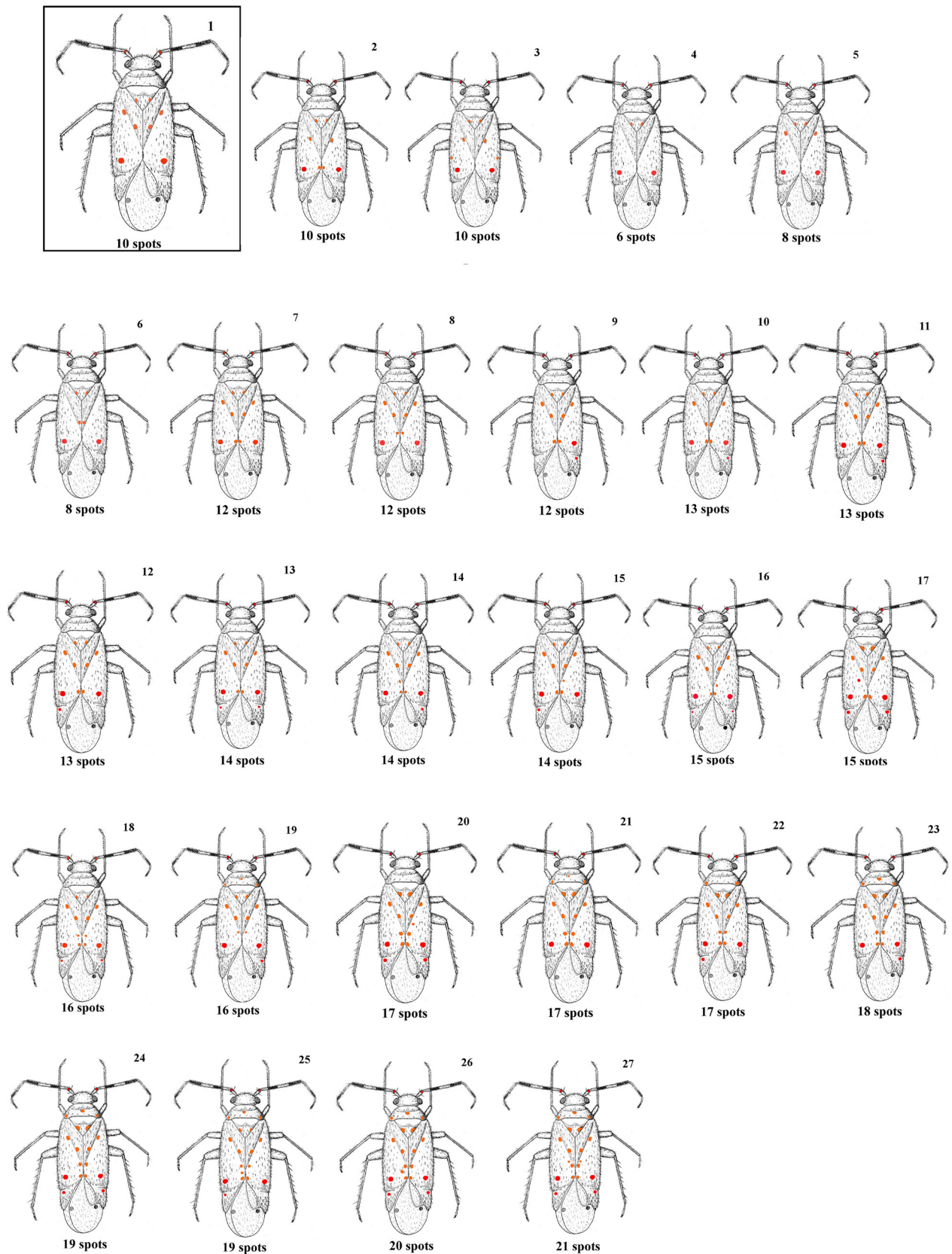


Figure 4. Variations of the number and positions on the dorsal spots reported for *Platyscytus decempunctatus* (Heteroptera: Miridae).

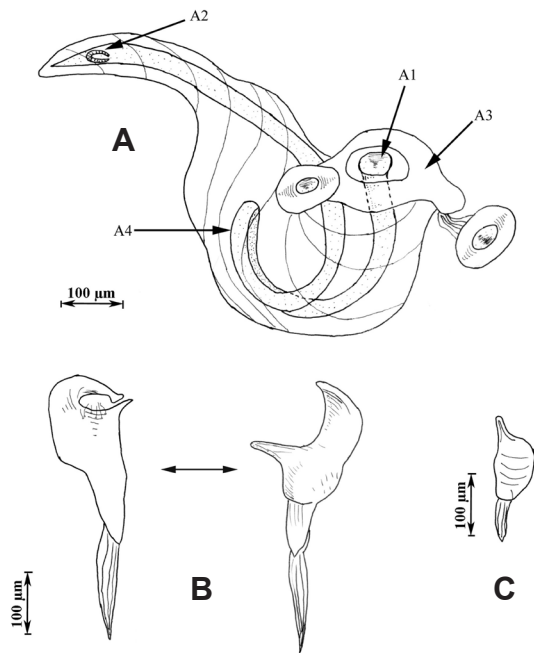


Figure 5. Male genital structure of *Platyscytus decempunctatus* (Heteroptera: Miridae): A. Phallus, A1. Primary gonopore, A2. Secondary gonopore, A3. Basal plate, A4. Seminal tube, B. Left paramere, C. Right paramere.

anterior tibia length: 0.70 (0.53 – 0.88), anterior tarsi length: 0.27 (0.18 – 0.35), median femur length: 0.70 (0.50 – 0.88), median tibia length: 0.83 (0.53 – 1.18), median tarsi length: 0.28 (0.20 – 0.35), posterior femur length: 0.88 (0.67 – 1.12), posterior tibia length: 1.38 (1.16 – 1.71), posterior tarsi length: 0.36 (0.29 – 0.48).

Description: Body translucent or hyaline with yellowish or whitish general coloration, two orange spots laterally on the scutellum, two orange spots on the corium apex close to the corium-clavus suture and two orange spots on the clavus close to the clavus-corium suture, two big red spots on the basal region of the corium, a little bit above the angle formed between the corium base and cuneous, two blackish spots on the membrane. Some individuals have orange spots on the cuneous, pronotum, on the corium base close to the membrane and also a small reddish spot laterally close to the ostiolar peritreme. Propleuron, mesepisternum and mesepimerom are yellowish, yellowish head, reddish eyes with black spots, frons, clipeus, juga, lora, buccula, gula, antenna insertion and antennal and rostrum segments are all yellowish. All antennal segments are cylindrical, yellowish and with marks, the first one with a small apical mark, the second have two blackish marks, one apical and one in the middle, the third and fourth segments have each an apical blackish mark (Fig. 1F).

Head moderately declined, hyaline and with few hairs. The head is wider than the callus, apical convex vertex, vertical frons, clypeus prominent, projecting more anteriorly than frons, juga and lora prominent, buccula clearly delimited, the eyes are on the posterior part of the

head, near the anterior part of the pronotum. All antennal segments are cylindrical, antennae inserted near the compound eyes and above frons-clipeus suture, relative lengths of antennal segments in ascending order are: $4 < 1 < 3 < 2$. Rostrum cylindrical, 4 segments, extending slightly beyond the posterior coxae (Fig. 2B). Pronotal collar absent. Pronotum hyaline trapezoid-shaped with few and long hairs and disc moderately convex. Scutellum diamond-shaped convex covered with long hairs. Hemelytra slightly rounded laterally and with long hairs. Membrane with two cells, cuneous longer than wide. Legs cylindrical with hairs (Fig. 1F). Tarsi segments: fore, middle and hind legs all 3-segmented. Long claws, parempodia setae-shaped, short and parallel (Fig. 3A), arising from unguitactor plate (Fig. 3B), pulvilli present (Fig. 3C). Ventral area with few hairs, except on the abdomen.

Male genitalia (Fig. 5): Pygophore exposes part of the phallosome, what is characteristic of the Philini tribe (Fig. 2A and B) (Carvalho & Costa 1997). Phallus with characteristic basal plate (Fig. 5A), seminal tube re-twists about itself and is highly curved, vesica with elongated seminal canal in the falus length, secondary gonopore with apical opening. Left paramere (Fig. 5B) with acute apex and median lateral portion, there are five to six bristles on the surface. Right paramere (Fig. 5C) small, oval-shaped and projects sharply to the apex.

Female:

The female color is similar to males but they are slightly wider and longer than males and their antennae are slightly smaller than those of the males.

Measurements: mean (minimum and maximum).

Body length: 2.95 (2.59 – 3.59), body width: 1.10 (0.94 – 1.90), head length: 0.24 (0.17 – 0.34), head width: 0.55 (0.50 – 1.00), vertex (distance between eyes): 0.33 (0.28 – 0.50), rostrum length: 1.17 (1.03 – 1.31), pronotum length: 0.34 (0.18 – 0.45), maximum pronotum width: 0.83 (0.72 – 0.94), scutellum length: 0.43 (0.37 – 0.50), scutellum width: 0.36 (0.28 – 0.47), hemelytron length: 2.20 (1.83 – 2.76), maximum hemelytron width: 0.52 (0.47 – 0.65), membrane length: 0.96 (0.67 – 1.24). Antennal segments length: I: 0.23 (0.17 – 0.30), II: 0.75 (0.56 – 0.94), III: 0.32 (0.22 – 0.49) e IV: 0.22 (0.11 – 0.40). Legs: anterior femur length: 0.61 (0.44 – 0.71), anterior tibia length: 0.73 (0.57 – 0.82), anterior tarsi length: 0.26 (0.20 – 0.29), median femur length: 0.66 (0.52 – 0.88), median tibia length: 0.75 (0.64 – 0.98), median tarsi length: 0.27 (0.23 – 0.35), posterior femur length: 0.79 (0.61 – 1.00), posterior tibia length: 1.34 (1.11 – 1.65), posterior tarsi length: 0.34 (0.25 – 0.41).

Dorsal spots

No information about variations in the number and position of the dorsal spots of *P. decempunctatus* was previously available since the holotype, allotype and paratypes have only ten spots on the hemelytron and no spots on the ostiolar peritreme. However, we observed as

many as 26 variations in the number and position of the dorsal spots of *P. decempunctatus*. For some specimens, 21 dorsal spots were observed as in model 27 (Fig. 4); spots on the pronotum and cuneus were also observed

here and were not previously described (Carvalho 1945, 1951). Asymmetrical distributions of the dorsal spots also were reported for *P. decempunctatus* and are depicted in the models 9 to 17, 19 and 20, 22 and 23, and 25 and 26 (Fig. 4).

Dominance of a particular model prevailed within each population. Model 1 (holotype model) (Fig. 4) had the highest dominance with 42.44% for males and 45.32% for females. The second highest dominance was of model 7 (Fig. 4), observed in 17.07% of the males and 14.63% of the females collected (Tab. 1).

Model 1 (Fig. 4) was observed in all locations where specimens were collected and its dominance for males was in 17 places out of a total of 23 (Tab. 2) and for the females 19 places out of a total of 23 (Tab. 2). The within population dominance of model 1 reaches 90 to 100% in some instances, as for males collected in Visconde do Rio Branco, MG (Tab. 2). None of the dorsal spot models reported were specific to males or females, with only some occurrences observed in only one sex, a likely consequence of our sampling.

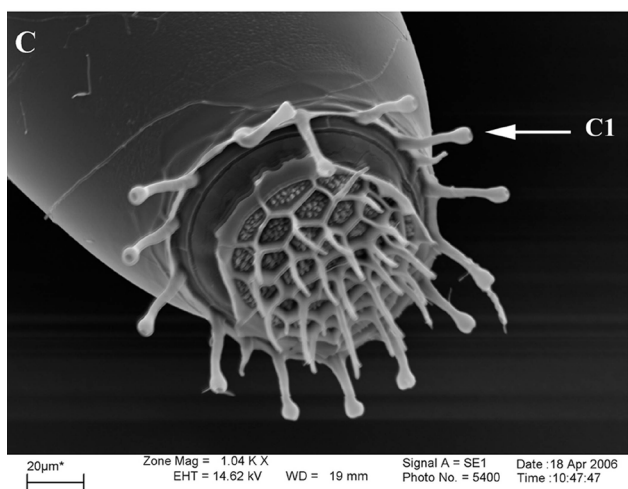
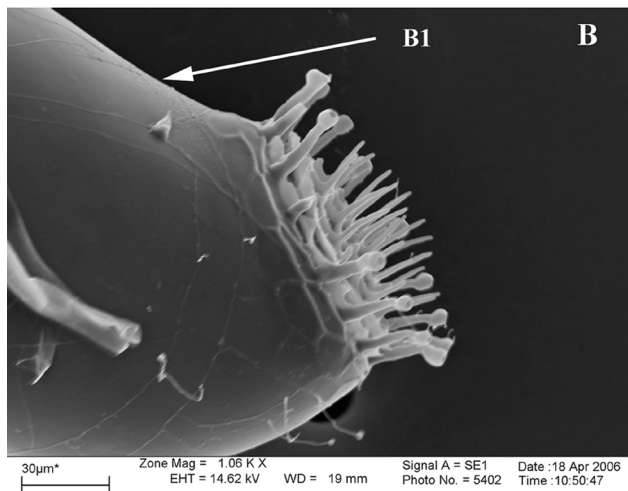
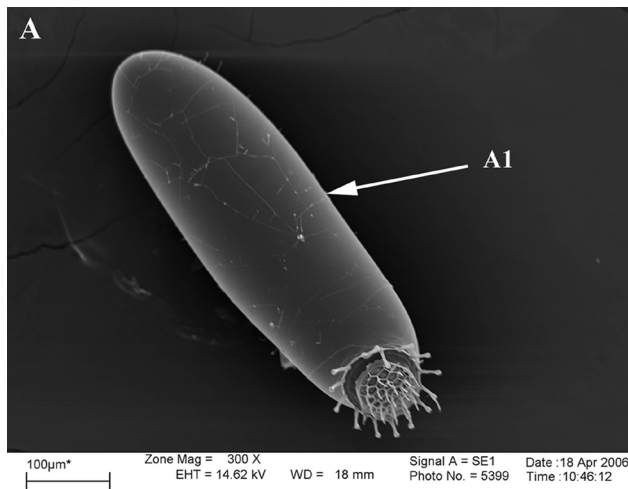


Figure 6. A. Egg of *Platyscytus decempunctatus* (Heteroptera: Miridae) general view, A1. Corium external part, B. Micropyle area (lateral view), B1. Slightly inclination, C. Operculum, C1. Long respiratory structures (aeropyla) on operculum.

Egg

Measurements: mean (minimum and maximum). Egg length: 0.54 (0.53 – 0.55), egg width: 0.16 (0.16 – 0.16)

Description: The egg morphology of *P. decempunctatus* is similar to the others species of mirids, which were elongated and oval-shaped (Hinton 1981, Ma *et al.* 2002). The egg of *P. decempunctatus* leans towards the micropyle (the egg opening), unlike what was observed in *Lygus lineolaris* (Palisot de Beausvois). The egg chorion of *P. decempunctatus* has a smooth surface (Fig. 6A) and aeropyla projecting from around the operculum resembling a crown (Fig. 6 B and C).

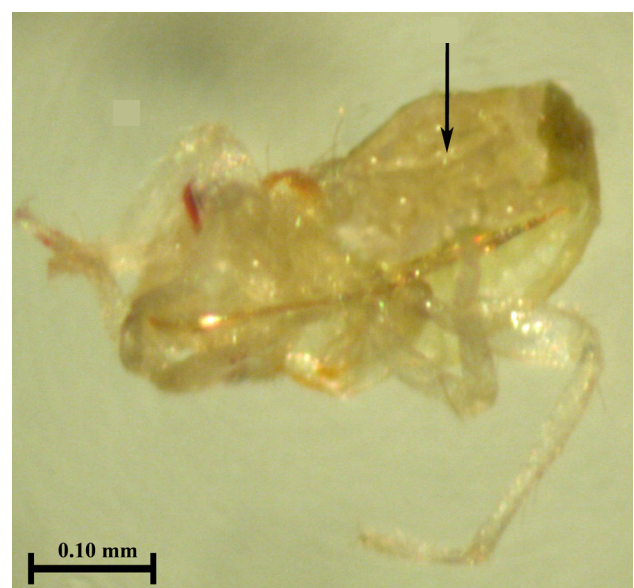


Figure 7. First instar of *Platyscytus decempunctatus* (Heteroptera: Miridae). The cut on the abdomen show the absent of chlorophyll pigment (arrow).

Table 1. Dominance (%) of the models of dorsal spot distribution in *Platyscytus decempunctatus* (Heteroptera: Miridae).

Male			Female		
Model	N° specimens	Dominance (%)	Model	N° specimens	Dominance (%)
1	174	42.44	1	189	45.32
2	2	0.49	2	17	4.08
3	4	0.98	3	7	1.68
4	5	1.22	4	9	2.16
5	18	4.39	5	14	3.36
6	13	3.17	6	8	1.92
7	70	17.07	7	61	14.63
8	0	0.00	8	10	2.40
9	4	0.98	9	4	0.96
10	1	0.24	10	1	0.24
11	27	6.59	11	15	3.60
12	5	1.22	12	0	0.00
13	17	4.15	13	17	4.08
14	12	2.93	14	15	3.60
15	1	0.24	15	0	0.00
16	1	0.24	16	6	1.44
17	5	1.22	17	12	2.88
18	29	7.07	18	12	2.88
19	2	0.49	19	0	0.00
20	1	0.24	20	0	0.00
21	1	0.24	21	0	0.00
22	5	1.22	22	3	0.72
23	1	0.24	23	0	0.00
24	2	0.49	24	6	1.44
25	4	0.98	25	7	1.68
26	3	0.73	26	1	0.24
27	3	0.73	27	3	0.72

Biological aspects of *P. decempunctatus*

P. decempunctatus is only observed in all of its life stages on the underside of leaves of *Solanum cernuum*, colonizing the entire leaf area. It was observed that this species has preference for mature leaves that are closer to the top of the plant. They are difficult to find on injured leaves. When they are subjected to a disturbance or stress, they hide under the more prominent veins, generally under the main leaf veins. Then they will wait for the disturbance to pass, sometimes flying to escape.

Platyscytus decempunctatus does not feed during its

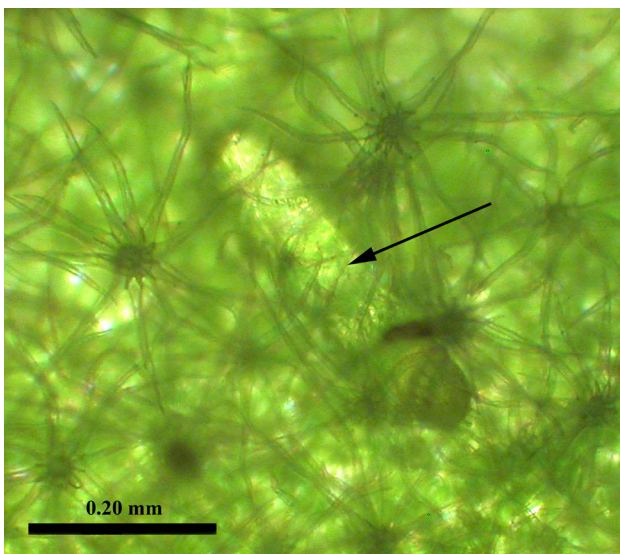


Figure 8. Detail of the egg of *Platyscytus decempunctatus* (Heteroptera: Miridae) embedded in the leaf of *Solanum cernuum* (Solanaceae).

first stage due to the lack of chlorophyll pigment in its digestive duct (Fig. 7). This fact was also reported for species of Pentatomidae that does not feed in the first stage (Brailovsky *et al.* 1992, Barcelos *et al.* 1991, Juscelino Filho *et al.* 2001, 2003).

Platyscytus decempunctatus lays its eggs underside of the leaves of *S. cernuum* in the trichome layers (Fig. 8).

Geographic distribution of *P. decempunctatus*

The reports concerning the geographic distribution of *P. decempunctatus* were previously circumscribed to the counties of São Pedro dos Ferros and Viçosa, MG (Car-

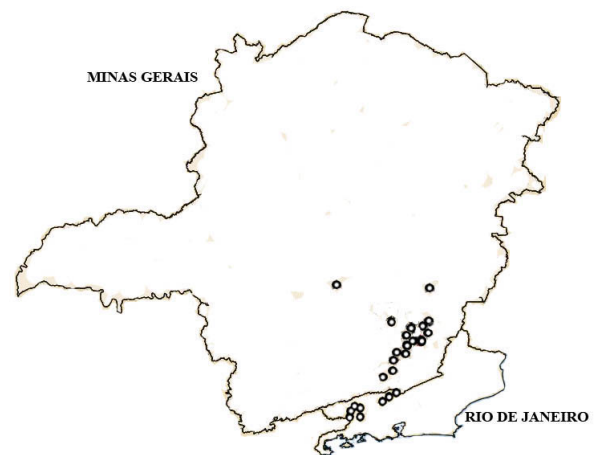


Figure 9. Occurrence of *Platyscytus decempunctatus* (Heteroptera: Miridae) on Minas Gerais and Rio de Janeiro States.

Table 2. Dominance (%) of the models of dorsal spot distribution in males of *Platyscytus decempunctatus* (Heteroptera: Miridae) collected in Minas Gerais and Rio de Janeiro, Brazil. (a- Guiricema, MG, b- Paula Candido, MG, c- Serra do Brigadeiro (Araponga), MG, d- Volta Redonda, RJ, e- Viçosa, MG, f- Pinheiral, RJ, g- Teixeira, MG, h- Ervália, MG, i- Pirai, RJ, j- Visconde do Rio Branco, MG, l- Ubá, MG, m- Rio Pomba, MG, n- Tabuleiro, MG, o- Juiz de Fora, MG, p- PESB (Araponga), MG, q- Levi Gaparian, RJ, r Vassouras, RJ, s- Barra do Pirai, RJ, t- Barra Mansa, RJ, u- Florestal, MG, v- Tocantins, MG, x- Coronel Pacheco, MG and z- Paraíba do Sul, RJ).

Models	Dominance / places																						
	a	b	c	d	e	f	g	h	i	j	l	m	n	o	p	q	r	s	t	u	v	x	z
1	5	20	55	90	55	50	55	35	40	100	50	45	40	20	40	25	20	30	25	40.0	33.3	53.3	46.6
2	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	10	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	6.7	-	-	-
4	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	-
5	-	-	15	-	-	-	15	-	-	-	-	-	-	10	6.7	15	80	-	-	-	40.0	-	-
6	-	-	10	5	-	25	-	-	-	-	-	-	-	-	13.3	-	-	-	-	20.0	-	-	-
7	25	-	-	5	-	5	25	30	35	-	15	25	10	-	40	-	-	60	20	26.7	-	46.6	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0	-	-
10	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	5	-	-	-	-	-	-	-	-	-	20	-	20	10	-	30	-	-	10	-	-	-	-
12	-	10	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	35	-	-	-	30	-	-	-	-	-	15	-	-	-	-	-	-	-	-	5	-	-	-
14	-	10	-	-	-	-	-	-	-	-	-	25	10	-	-	-	-	-	15	-	-	-	-
15	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	5	-	-	-	-	-	-	5	15	-	-	-	-	-	-	-	-	-	-
18	20	15	-	-	-	-	5	15	10	-	-	-	5	5	-	20	-	10	25	-	-	-	26.6
19	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-
23	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	5	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-
25	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
26	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	5	-	-	-	-	-	-	6.7
27	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-

Table 3. Dominance (%) of the models of dorsal spot distribution in females of *Platyscytus decempunctatus* (Heteroptera: Miridae) collected in Minas Gerais and Rio de Janeiro, Brazil. (a- Guiricema, MG, b- Paula Candido, MG, c- Serra do Brigadeiro (Araponga), MG, d- Volta Redonda, RJ, e- Viçosa, MG, f- Pinheiral, RJ, g- Teixeira, MG, h- Ervália, MG, i- Pirai, RJ, j- Visconde do Rio Branco, MG, l- Ubá, MG, m- Rio Pomba, MG, n- Tabuleiro, MG, o- Juiz de Fora, MG, p- PESB (Araponga), MG, q- Levi Gaparian, RJ, r Vassouras, RJ, s- Barra do Pirai, RJ, t- Barra Mansa, RJ, u- Florestal, MG, v- Tocantins, MG, x- Coronel Pacheco, MG and z- Paraíba do Sul, RJ).

Models	Dominance / places																						
	a	b	c	d	e	f	g	h	i	j	l	m	n	o	p	q	r	s	t	u	v	x	z
1	25	-	45	30	60	55	25	25	50	55	35	50	50	45	55.3	40	60	70	65	35	53.3	53.3	73.3
2	-	-	15	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
3	-	-	15	-	-	-	-	-	-	-	-	-	-	10	6.67	-	-	-	-	5	-	-	-
4	-	-	-	-	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
5	5	-	5	-	-	-	-	5	-	-	-	-	-	5	13.3	5	-	-	-	15	-	26.7	-
6	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
7	20	11.8	-	-	10	10	45	40	-	15	40	15	15	5	26.7	20	40	30	5	-	-	20	-
8	10	-	-	15	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.7	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	10	15	15	10	-	10	-	-	15	-	-	-	20
12	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	15	5.9	-	-	20	-	-	20	-	20	-	5	5	-	-	-	-	-	-	-	-	-	-
14	5	-	-	-	-	-	-	-	-	-	-	5	5	15	-	5	-	-	5	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	5	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-
17	-	5.9	-	-	-	-	-	10	5	10	15	5	5	-	-	-	-	-	5	-	-	-	-
18	10	23.5	-	-	-	-	5	-	20	-	-	5	5	-	-	-	-	-	5	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	11.7	-	-	-	-	5	-	-	-	-	-	-	5	-	10	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.7
26	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	10	-	-	-	-	-	-	-

valho 1945, 1951). This research extends these reports on the geographic distribution of *P. decempunctatus* in the states of Minas Gerais and also to the state of Rio de Janeiro (Fig. 9). In Minas Gerais, the species is present in the Brigadeiro Hill Range (Parque Estadual da “Serra do Brigadeiro”), and the counties of Araponga, Coronel Pacheco, Ervália, Florestal, Guiricema, Juiz de Fora, Paula Cândido, Rio Pomba, Tabuleiro, Teixeiras, Tocantins, Ubá, Viçosa and Visconde do Rio Branco. In Rio de Janeiro, the species is present in the counties of Barra Mansa, Barra do Pirai, Levi Gasparian, Paraíba do Sul, Pinheiral, Pirai, Vassouras and Volta Redonda.

Platyscytus decempunctatus is directly associated with its host plant *S. cernuum*. Thus its geographic distribution follows the geographic distribution of its host plant. Some resources show that *S. cernuum* has a geographic distribution that corresponds to the states of Minas Gerais, Rio de Janeiro, São Paulo and Paraná, occurring in the pluvial forests, low mountain ranges and in secondary forests (Carvalho 1989, 1996, Araújo et al. 2002).

ACKNOWLEDGMENTS

We are grateful to the “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)” for the financial support provided, to Luis Antonio Alves Costa (MNRJ) for the assistance with the pictures and to Thomas Henry (Smithsonian Institute, USA) for information about the paratypes.

REFERENCES

- ABREU, P. C. O. V. & NOGUEIRA, C. R. 1989. Spatial distribution of Siphonophora species at Rio de Janeiro Coast, Brazil. *Ciência e Cultura*, 41: 897-902.
- ARAÚJO, C. E. P., RODRIGUES, R. F. O.; OLIVEIRA, F. & SCHREINER, L. 2002. Análise preliminar da atividade antiulcerogênica do extrato hidroalcoólico de *Solanum cernuum* Vell. *Acta Farmacêutica Bonaerense*, 21: 283-286.
- BARCELOS, J. A. V., ZANUNCIO, J. C., SANTOS, G. P. & REIS, F. P. 1991. Viabilidade da criação, em laboratório, de *Podisus nigrilimbatus* (Spinola, 1852) (Hemiptera: Pentatomidae) sobre duas dietas. *Revista Arvore*, 15: 316-322.
- BRAILOVSKY, H., CERVANTES, L. & MAYORGA, C. 1992. *Hemiptera: Heteroptera de Mexico XLIV. Biología, Estadios Ninfales y Fenología de la Tribu Pentatomini (Pentatomidae) em la Estación de Biología Tropical “Los Tuxtlas”*. Primera edición. Universidad Nacional Autónoma de México, Instituto de Biología. Veracruz. 204 p.
- CARVALHO, J. C. M. 1945. Mirídeos Neotropicais, gêneros *Diaphinidia* Uhler, *Hyaliodocoris* Reuter, *Hyaliodocoris* Knight, *Sinervus* Stal e *Spartacus* Distant, com descrições de espécies novas. *Boletim do Museu Nacional, (n.S.) (Zool.)*: 361-379.
- CARVALHO, J. C. M. 1951. Mirídeos Neotropicais, XXXIX: sobre duas espécies novas do Brasil (Hemiptera). *Societas Scientiae Fennica*, 12: 1-6.
- CARVALHO, J. C. M. & COSTA, L. A. A. 1997. Chaves taxonômicas de subfamílias e tribos de Miridae Hahn, 1831 do Mundo (Insecta: Heteroptera). *Arquivos do Museu Nacional*, 57: 1-49.
- CARVALHO, L. D’A. F. 1989. Espécies de *Solanum* (seção *Cernuum* e *Lepidotum*) usadas na medicina popular brasileira (Solanaceae). *Revista Brasileira de Farmacologia*, 70: 7-10.
- CARVALHO, L. D’A. F. 1996. Espécies de *Solanum* das séries *cernuum* Carv. & Sheph. e *lepidotum* (Dun.) Seithe v Holf. (Solanaceae). *Pesquisas (Série Botânica)*, 46: 5-83.
- HINTON, H. E. 1981. *Biology of Insect Eggs*. Oxford: Pergamon Press. 1125 p.
- JUSSELINO-FILHO, P., ZANUNCIO, J. C., GUEDES, R. N. C. & FRAGOSO, D. B. 2001. Desarrollo y reproducción del depredador *Brontocoris tabidus* (Heteroptera: Pentatomidae) alimentado com larvas de *Tenebrio molitor* (Coleoptera: Tenebrionidae). *Revista Colombiana de Entomología*, 27: 45-48.
- JUSSELINO-FILHO, P., ZANUNCIO, J. C., FRAGOSO, D. B., SERRÃO, J. E. & LACERDA, M. C. 2003. Biology of *Brontocoris tabidus* (Heteroptera: Pentatomidae) fed with *Musca domestica* (Diptera: Muscidae) larvae. *Brazilian Journal of Biology*, 63: 463-468.
- MA, P. W. K., BAIRD, S. & RAMASWAMY, S. B. 2002. Morphology and formation of the eggshell in the tarnished plant bug, *Lygus lineolaris* (Palisot de Beausvois) (Hemiptera: Miridae). *Arthropod Structure and Development*, 31: 131-146.
- PIRES, E. M., FERREIRA, P. S. F., GUEDES, R. N. C. & SERRÃO, J. E. 2007. Morphology of the phytophagous bug *Platyscytus decempunctatus* (Carvalho) (Heteroptera: Miridae). *Neotropical Entomology*, 36: 510-513.
- PIRES, E. M., GUEDES, R. N. C., SERRÃO, J. E. & FERREIRA, P. S. F. 2008. Seasonal and interpopulational morphometry variation of *Platyscytus decempunctatus* (Carvalho) (Heteroptera: Miridae). *Biota Neotropica*, 8: 21-28.
- SCATOLINI, D. & PENTEADO-DIAS, A. M. 2003. Análise faunística de Braconidae (Hymenoptera) em três áreas de mata nativa do Estado do Paraná, Brasil. *Revista Brasileira de Entomologia*, 47: 187-195.
- WHEELER, A. G. JR. & HENRY, T. J. 2004. Plant bugs (Hemiptera: Miridae). In: CAPINERA, J. (Ed.). *Encyclopedia of Entomology*. Oxford: Kluwer Academic Publishers. p. 1737-1742.