ISSN 0100-2945 http://dx.doi.org/10.1590/0100-29452016012

**SCIENTIFIC COMMUNICATION**

# OCURRENCE OF *Revena plaumanni* BONDAR, 1943 (COLEOPTERA: CURCULIONIDAE) IN PINDO PALM FRUIT[1]

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**ABSTRACT -** The objective of this study was to identify and to report the occurrence of one of the insects that feeds on the seeds of the pindo palm (*Butia odorata*). The material was collected in the city of Viamão, Rio Grande do Sul state, Brazil. The larvae obtained in mature fruit were developed in a gerboxe containing sterilized wet sand substrate and not under controlled conditions. The larvae found in the endocarps of Pindo palm originated insects Curculionidae identified as *Revena plaumanni* Bondar, 1943. Comments about it's biology and behavior are based on the observations performed in the laboratory.
**Index terms:** palm, Curculionidae, seeds, *Butia odorata*.

## OCORRÊNCIA DE *Revena plaumanni* BONDAR, 1943 (COLEOPTERA: CURCULIONIDAE) EM FRUTOS DE BUTIAZEIRO

**RESUMO -** O objetivo deste trabalho foi identificar e relatar a ocorrência de um dos insetos que se alimentam das sementes do butiazeiro (*Butia odorata*). O material foi coletado em Viamão, Rio Grande do Sul, Brasil. As larvas obtidas dos frutos maduros foram criadas em caixas plásticas, contendo como substrato areia úmida, e em ambiente não controlado. As larvas encontradas no endocarpo do fruto do butiazeiro deram origem a um inseto Curculionidae identificado como *Revena plaumanni* Bondar 1943. Comentários sobre sua biologia e seu comportamento são discutidos com base nas observações realizadas em laboratório.
**Termos para indexação:** palmeira, Curculionidae, sementes, *Butia odorata*.

According to Deble (2011) *Butia* (Becc.), Becc Palm is a genus that grows mainly in the fields of the central regions of South America, especially in Paraguay, northeastern Argentina, midwestern and southeastern Brazil and Uruguay. The genus includes 19 species, 17 native of Brazil. One such species is the palm *Butia odorata* (Barb. Rod.) Noblick, which has its natural distribution between the southeastern region of Rio Grande do Sul, Brazil, to Rocha, Uruguay (Noblick, 2010). This species produces fruit of a fleshy mesocarp, with a variety of shapes and colors (Lorenzi et al., 2010). In the past half century this plant had great economic importance, and its leaf fiber used in the upholstery industry (Tonietto et al., 2009). Currently, Büttow et al., (2010) reported that the most used part of the Pindo palm fruit is consumed *in natura* or used in the preparation of liquor, jelly, ice cream, among other products.

There are few studies about current infesting insects of Pindo palm seeds. The occurrence of two species of beetles that feed on Pindo palm almonds is mentioned by some authors (LINK; Naibo, 1995; MARTIN et al., 2009). During the harvest period, the presence of the larvae of these beetles can be observed, because after consuming the seed, a channel through the lignified endocarp, mesocarp and exocarp is produced , after leaving the endocarp the larva fall to the ground to become pupa. (MARTIN et al., 2009).

Medeiros et al. (2014) reported the occurrence of *Anchylorhynchus eriospathae* G. G. Bondar, 1943 in *Butia eriosphatha* (Mart. Ex Drude) Becc. . Link and Costa (1982) identified the insect as *Butiobruchus* sp. (Coleopterae: Bruchidae) obtained in the endorcarp of Pindo palm. The authors mention that the larva of this insect can destroy two of the three almonds

[1](Trabalho 040-15). Recebido em: 16-01-2015. Aceito para publicação em: 30-06-2015.
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formed therein, prior to falling to the ground. Johnson et al., (1995), reviewing related articles of predators of the palm seed, reported the occurrence of *Pachymerus bridwelli* (Prevett, 1966) in *Butia capitata* (Mart.). Becc Nilsson and Johnson (1993) in another taxonomic revision on bruchids present in palm trees, considered *Butiobruchus* synonymy of the genus *Pachymerus* Thunberg, 1805. From these considerations it is likely that the genus mentioned by Link and Costa (1982) and Link and Naibo (1995) is the same cited by Nilsson and Johnson (1993). However, in general, bruchids larvae complete their cycle within the endocarp and then there is the emergence of the adult individual (JONHSON et al., 1995). This behavior does not match the description given by Link and Costa (1982) for *Butiobruchus* sp., but with the description of Martin et al., (2009) for *Pachymerus aff nucleorum* Fabricius, 1792.

From this information, this study aimed to identify the curculionídeo beetle that feeds on Pindo palm seeds and to clarify some biological aspects.

On February 17, 2012, in the municipality of Viamão (30°02'11,34 "S and 51° 01'19,26" O), a bunch of mature Pindo palm (*B. odorata*) was collected, defined by staining and early fruit drop. The bunch was taken to Seed Technology Laboratory of FEPAGRO in Porto Alegre, Rio Grande do Sul, where it remained in an uncontrolled environment, on a tray. The next day the larvae had left the fruit, from which we drew a sample of 13 larvae. These were distributed in a transparent plastic box "gerbox" type , with dimensions of 11x11cm, containing as substrate of sterilized wet sand. The height of the substrate in the box was 2.5 cm and the initial humidity at 50% of water holding capacity.

Upon contact with the substrate , the larvae produced holes in the sand. The box was closed and was set in a laboratory environment without temperature control and lighting, avoiding direct light and tending to the sand in order to remain moist through the visual control. One of the larvae produced a shallow hole enabling the monitoring of the beginning of his metamorphosis (Figure 1a).

The observations were made on a weekly basis , and the juvenile insects were placed in a bottle containing a 70% alcohol solution , and sent for identification to the Department of Zoology at the Federal University of Parana.

The use of a wet sand box provided the necessary conditions for the development and metamorphosis of larvae up to the adult stage. The greatest care was in maintaining the sand moist, which through the use of a manual sprayer this control was done. The larvae were not fed, noting that the Pindo palm seed intake provided sufficient nutrition for the whole insect metamorphosis process. Possibly after the larvae leave the endocarp, and settle in the soil it enters into a diapause or dormant stage .

The larvae were observed from the surface, the onset of metamorphosis began on September 13, 2012, with the transformation of the larva into free pupa (Figure 1b). On October 17, 2012 the metamorphosis of the larva was completed, and there were three adults (Figure 1cd). It was observed that the metamorphosis to the adult insects was complete due to the movement on sand. On 22 and 29 October and 5 November 2012 an adult emerged each day, totaling seven individuals. On the last day the sand was removed carefully with a spatula observing also three larvae and three pupae, which were stored in 70% alcohol. The insects were identified as *Revena plaumanni* Bondar, 1943 (Coleoptera: Curculionidae). Silberbauer-Gottsberger et al. (2013) observed the oviposition of other species of the same genus, *Revena rubiginosa* Boheman, 1936 in *Butia paraguayensis* (Barb. Rodr.) C.H.Bailey. Already Alves-Costa and Knogge (2005) and Silva et al. (2012) cite *R. rubiginosa* as infesting insect of another palm seeds (*Syagrus romanzoffiana* (Cham.) Glassman) in São Paulo and Santa Catarina, respectively.

From hatching larvae in the sand , up to the emergence of the first four adults it took 227 days, with most adults appearing up to 262 days. Perhaps the emergence of adults would last for more days, since there were still three larvae and pupae to complete the metamorphosis.

Rachilles containing female flowers were exposed to adult insects in the hope of observing oviposition. However, insects were observed insering the rostrum on the ovary of one of flowers (Figure 2a). It is possible that the insect was feeding, or checking the internal structures of the flower and ovarian development stage to hold the position.

Both in the fruit and endocarp it can be noted that the outlet orifice of *Revena plaumanni* larva (Figure 2b), which occurs when the fruit stands out from the curl naturally or after harvest. These signs were also described by Link and Naibo (1995), Martin et al., (2009), can be treated also *R. plaumanni* or other species of the same genus.

The studies cited above refer to a species of bruchid feeding the Pindo palm seed. As Martin et al. (2009) report the presence of a curculionídeo. According to Johnson et al., (1995), the species of bruchid that feeds on the Pindo palm seeds completes its cycle inside the endocarp, differing from the observations made by Link and Costa (1982). This

divergence may have been generated by a mistaken association between larvae *R. plaumanni* with the adult beetle Pachymerus bridwelli (Prevett, 1966), causing the occurrence of *R. plaumanni* was not reported until the moment *B. odorata* seeds .

Thus, the present study is the first to identify the presence of *R. plaumanni* as *B. odorata* seed borer, and the first using an adult insect, obtained by monitoring laboratory since its larval stage. New studies on the establishment of seed borer of the Pindo palm (*R. plaumanni*) in the laboratory will be required for further details about its ecology and the control actions of this species.

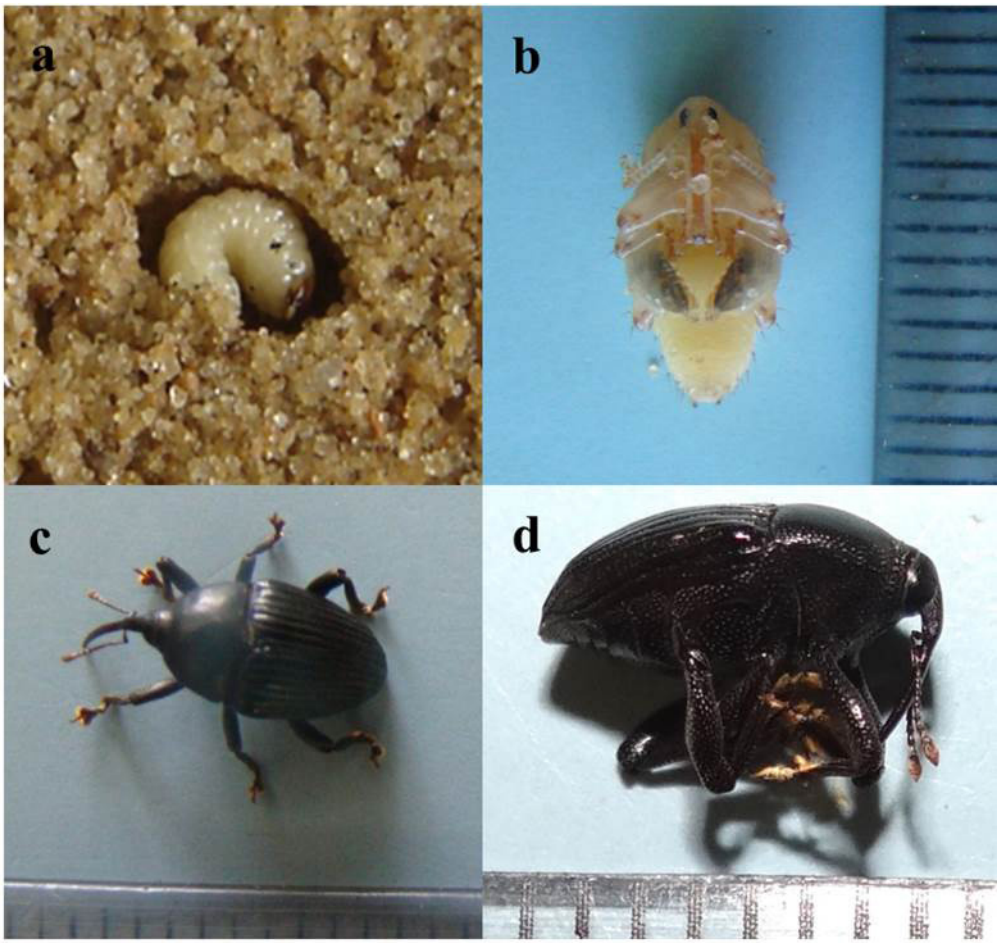


**FIGURE 1**- Stages of development *Revena plaumanni* Bondar 1943: a- larva, pupa b-, c- adult (dorsal view), d-adult (side view).

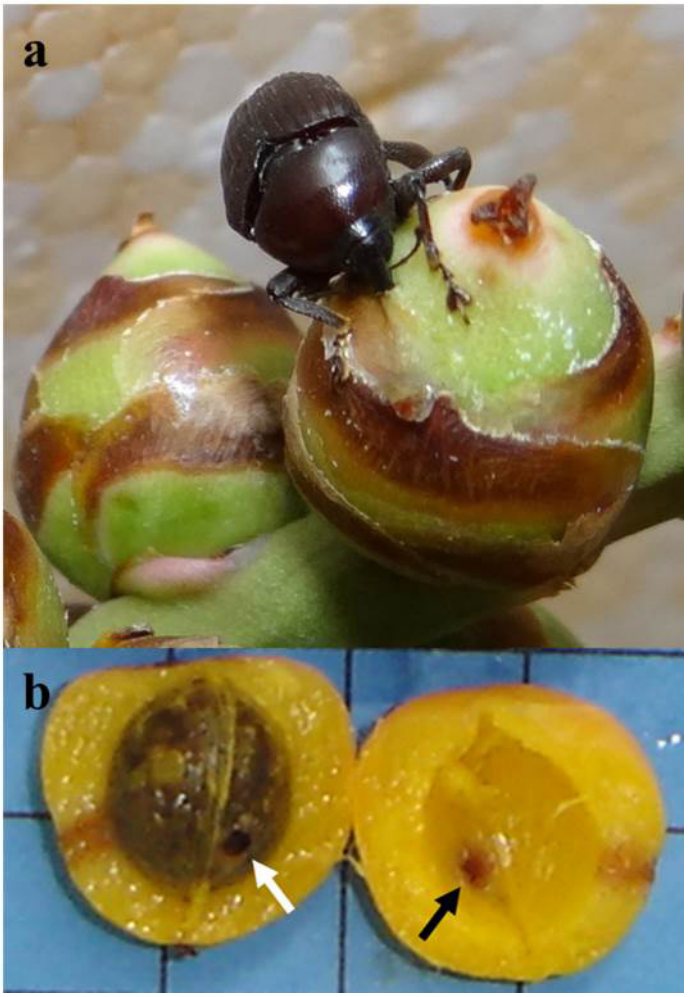


**FIGURE 2**-Adult *Ravenna plaumanni* with rostrum inserted into the ovary of the female flower Pindo palm (a); exit orifice of *R. plaumanni* larva in endocarp (white arrow) and mesocarp (black arrow) of the fruit of *Butia odorata* (b).

## ACKNOWLEDGEMENTS

Professor Dr. Homero Rosado Germano Neto Department of Zoology at the Federal University of Paraná, for insect identification and contributions.

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