THE PASSALIDAE OF PERU: A FREQUENCY AND DIVERSITY STUDY

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INTRODUCTION

The importance of the role played by insects, not just as pests, but as an important value to humanity is becoming more appreciated each year. This study began as an inquiry of the frequency of the Passalidae beetle in the Peruvian rainforest. Neotropical rain forests have been considered the most species-rich forests that exist worldwide (Gentry 1988a, 1988b: Valencia *et al.* 1994).

The beetle order, Coleoptera, contains the largest order of insects estimates of more than a million. These species occur in virtually all habitats on the land and freshwater, but Antarctica and in the ocean (Pearson and Beletsky, 2001). One of the most distintctive features of the Coleoptera is the structure of the wings.(insect book).

The family Passalidae: bess beetle suborder Polyphaga, super family Scarabaeoidea. These beetles are called by a variety of names; bess bugs, Bessie-bugs, betsy beetles, patent-leather beetles, and horned passalus beetles (Borror, Triplehorn, and Johnson 1989).

The Passalidae is a cosmopolitan family of Scarabaeoidea which contains about 27 genera and 500 species. They occur mostly in tropical and subtropical regions (Lawrence 1982). The members of this suborder differ from most other beetles in that the first visible abdominal sternum is not divided by the hind coxae, and its posterior margin extends completely across the abdomen (Borror, Triplehorn, and Johnson 1989). This group has specialized biology and exhibits sub-social behaviour. They tend to form colonies in rotten logs and the adults protect the young. . The adults prepare food (decaying wood) with their salivary secretions and feed it to the young (Borror, Triplehorn, and Johnson 1989). There is communication between larvae and adults by stridulation (Matthews 1984). In the adults, stridulation is achieved by friction between the roughened areas on the underside of the wings across similar areas on the dorsal side of the abdomen. The larvae produce a high-pitched sound by scraping the reduced hind leg over a file on the midcoxa (Lawrence & Britton 1991).

The adults are usually black, large in size (20-60 mm) and somewhat flattened, with the head prognathous and sometimes armed with a short horn. The antennae are characteristically curved and there is a narrow pedicel between the prothorax and the elytra. The scutellum is not visible and the elytral striae are conspicuous (Lawrence & Britton 1991). The larvae are distinguished by the mandibles without a ventral process, the antennae are two segmented, and the

body shape is less curved than other scarabaeoid larvae. The hind legs are greatly reduced and unsegmented (Ritcher 1966).

STUDY SITES

This study took place from January 11, 2003 to January 14, 2003, on the Los Amigos Research Station. The Los Amigos Conservation Area is in Madre de Dios, Peru, and encompasses approximately 140,000 hectares (ca. 400,000 acres) of forest. Los Amigos Research Station sits at about 270 m above sea leave and is located at (degrees.minutes.seconds): 12.34.173 S and 70.06.069 W. The station consists of several hundred hectares of property with 35 km of trails, nine different habitat types, from high terrace forest to palm swamp to flooded forest. Of the 17 trails available, two were utlized during this study; Primery Miradorthis and Plataforma trail

METHODS AND MATERIALS

This study took place from January 11, 2003 to January 14, 2003 on the Rio Amigo Research Center. To ascertain samples of the Passalidae, the specimens collected where obtained on two of the seventeen trails of the Rio Amigo Research Center; the Primery Mirador trail and the Plataforma trail.

A blank collection data chart was prepared containing the following information: time, area (log, branch, and vine) percentage of moss and moisture present, position of log/branch (horizontal, vertical), findings, hard or soft wood.

Items used for collection included a watch, pen, plastic zip-lock bags (for specimens), chart (see above), crowbar, and large bag to place plastic zip-lock bags. The collection method is summarized below.

1. Select trail, record time and name of the trail.
2. Choose log/branch in which to survey
3. With crow-bar, carefully chip away each layer of wood
4. Record on chart findings
5. Collect specimens into zip- lock bags

After collecting specimens, place tissue with a few drops of acetone into each zip-lock bags to kill specimens. Label vials with specimen number. Place specimen in vial and pour in alcohol (to preserve). Identify species found.

RESULTS

The number of areas where the Passalidae where anticipated ranged from 73 logs, 32 branches 2 vines once on the ground, totalling 108. A total of seven different species were found in the following (TABLE 1); 3 logs (fig.6,fig 4,fig.25), 3 branches (fig. 3,fig. 5,fig.B-1),1on the ground (fig.7). Of the seven times the Passalidae were found, 4 times the scarab larva was identified in the same area.

On three occasions, the scarab larva was found with out finding a Passalidae beetle. There is no definite area in which the Passalidae beetle was found.

Figure 1. Larva

Figure 2. Pupae

Figure 3. Unidentified Beetle with 3 Adult Passalidae

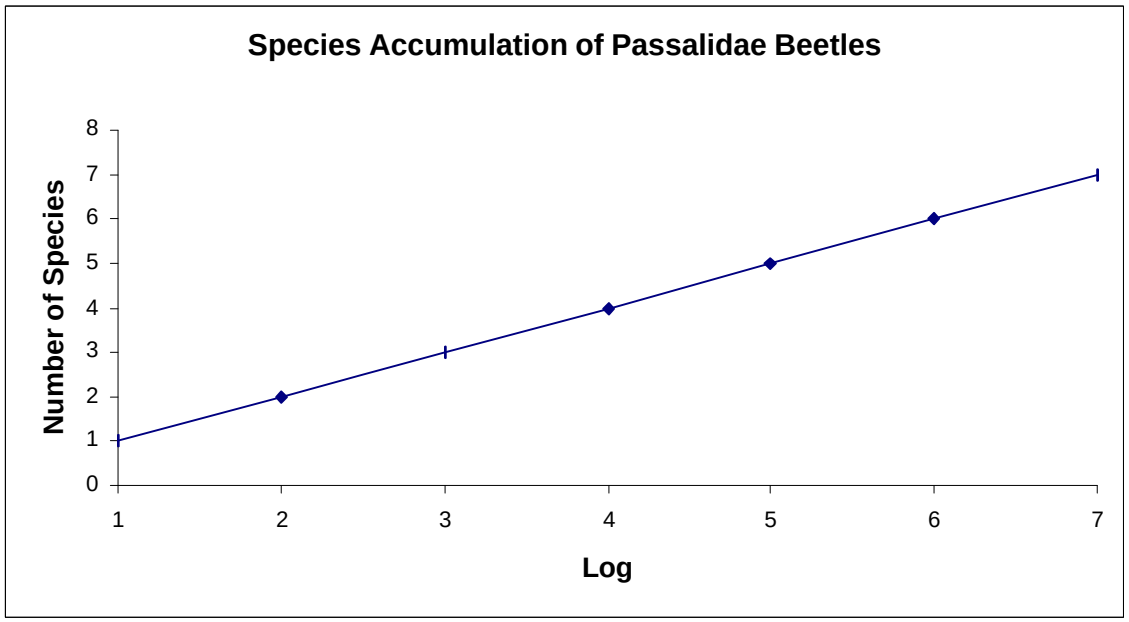
Figure 4. Adult Passalidea

Figure 5. Adult Passalidea

Figure 6. Two Adult Passalidea

Figure 7. Adult Passalidae

Table 1. Species accumulation of the passalidae beetle in logs where they were found.



DISCUSSION AND CONCLUSION

The information provided is not sufficient to formulate neither a proper assessment of habitat, frequency nor the diversity of the Passalidae beetle. Physical constraints, such as lack of proper equipment, limited amount of time, limited resource information, season, all aid in the restriction of the information given.

During my observations, the study showed a possible coexistence between the scarab larva and the Passalidae beetle. This research provided can only aid in further discussion for a possible correlation between the scarab larva and the Passalidae beetle.

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