THE DETERMINATION OF SEXES OF THE CACAO WEEVIL BORER *PANTORHYTES SZENTIVANYI* MARSHALL (COLEOPTERA: CURCULIONIDAE)

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ABSTRACT

A rapid and simple method for sexing Pantorhytes szentivanyi *Marsh. adults by visual examination of the ventral abdominal sternites is described.*

INTRODUCTION

P. szentivanyi Marsh. is an important pest of cacao (*Theobroma cacao*) in the Northern District of Papua New Guinea (Szent-Ivany and Ardley 1963).

Marshall (1957), when he originally described *P. szentivanyi*, stated that the only difference between the sexes was that "the hind tibia are flattened on the inner face and quite smooth on both sides in the male, but rugulose on the inner side in the female". Whilst this character is certainly consistent, it can only be determined by microscopic examination.

The necessity to develop a rapid method of sexing adults without microscopic genitalia examination became apparent when *P. szentivanyi* laboratory and field population studies were commenced in April 1968.

METHODS AND RESULTS

Over 6000 field-collected *P. szentivanyi* adults were closely studied under the microscope for morphological characters which could be used to differentiate the sexes.

Many characters were initially selected for examination, but were abandoned when it became obvious that they were highly variable. These included differences in size, colour, punctuation of cuticle, shape of the body, legs, antennae, eyes, mouth parts and of the head, particularly the width and depth of a frontal groove of both sexes. None of these alone or in various combinations were found consistent enough to provide a reliable indication of the sex.

After failing to find any obvious morphological differences, male and female beetles were separated by examination of genitalia. This material was then closely studied for sexual differences in morphological features.

Using this method, clear and consistent differences in the shape of the first, second, seventh and eighth abdominal sternites were observed and these are described below:—

To detect the sexual differences in living or dead weevils, the adult specimen must be held upside down to view the ventral abdominal segments clearly. The fifth segment must be lifted or excised to expose the seventh and eighth sternites.

In the male, the first and second sternites are almost flat, and clearly separated by a complete, anteriorly curved suture which bears a pit like depression at the mid-ventral line as shown in *Figure* 1A.

In the female, the first and second sternites are fused into a single, large, solid, somewhat swollen plate, in which the dividing suture is only visible on the sides, and the mid-ventral pit is reduced to a broad, shallow depression as shown in *Figure* 1B.

When viewed ventrally, only five segments are normally visible. To expose the seventh and eighth abdominal segments, the fifth segment must be lifted or excised. In both sexes, the dorsum of the vestibulum is a single plate with bluntly conical tergites. The venter consists of two sclerites (7th sternite) in the male, and in the female is made up of a single sclerite (8th sternite as shown in *Figures* 2A and B).

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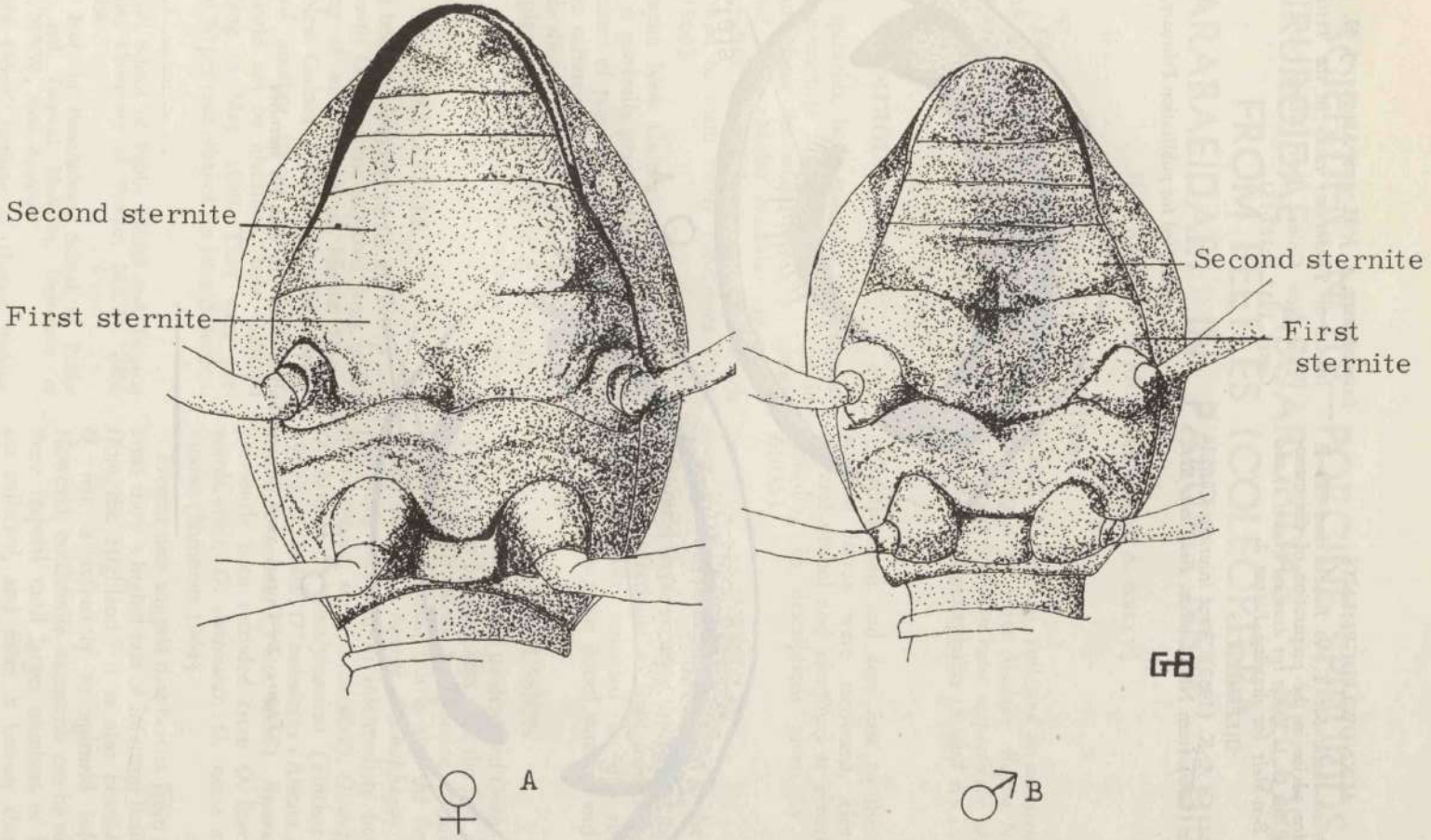

Figure 1.—Structure of the ventral abdominal segments

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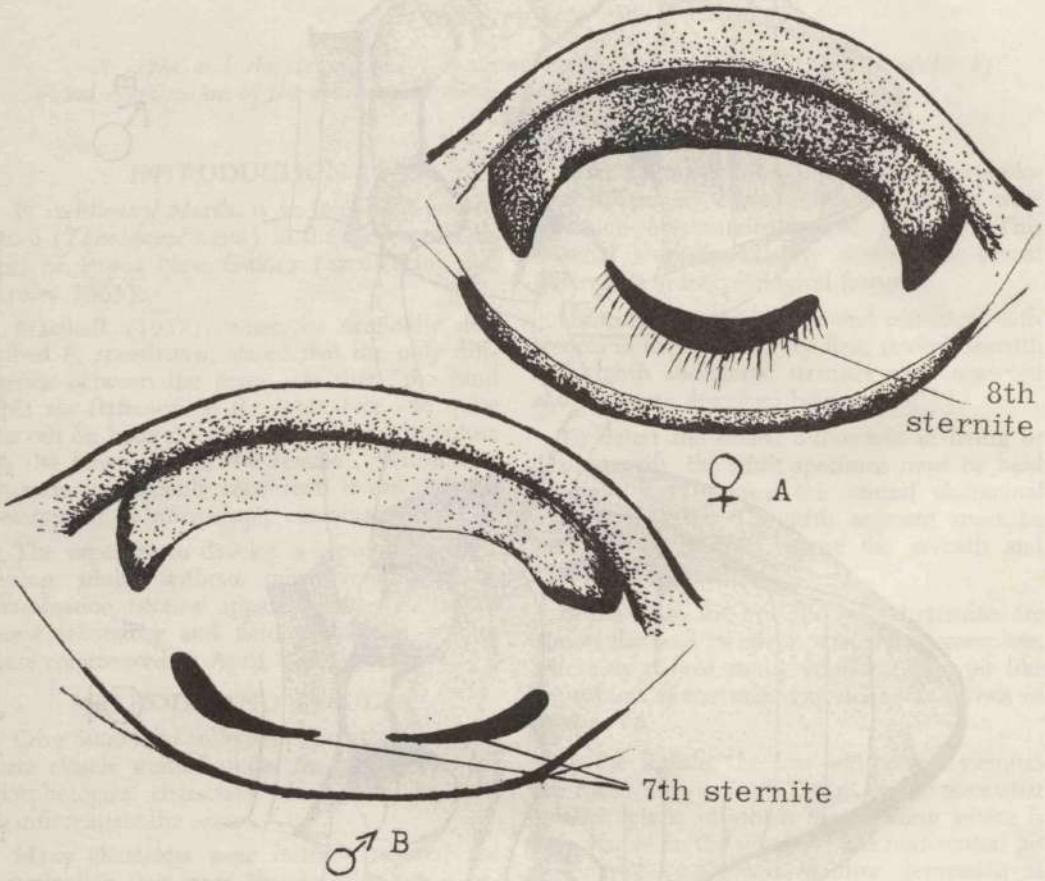

Figure 2.—Dorsal view of vestibulum with 7th and 8th sternites