

A REVISION OF THE GENUS BUENOA
(NOTONECTIDAE, HEMIPTERA)

by

Fred S. Truxal

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Advisory Committee:

Redacted Signature

Chairman

Redacted Signature

Redacted Signature

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INTRODUCTION

This paper is the result of a taxonomic study of the genus Buenoa. Its primary purpose is to compile and revise previous knowledge concerning the genus and to present additional information made available by the present study. The genus now includes forty species, twenty-two of which are new.

Approximately 28,000 specimens of Buenoa were examined during the study. The types of all the species were studied except those of well-known species and those which have been lost or destroyed. Completion of this paper was made possible only by the full cooperation of a number of institutions and entomologists who made available their type material. I was extremely fortunate in having at my disposal material compared with types in European museums by Dr. H. B. Hungerford in 1928, as well as notes and sketches concerning these species.

Large series of many species were of great value in alleviating confusion concerning species with both brachypterous and macropterous forms and polytypic species where geographic variation occurs.

ACKNOWLEDGMENTS

I am deeply indebted to Dr. H. B. Hungerford for suggesting this study and for the encouragement and guidance he so readily gave. I sincerely appreciate the helpful criticisms

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A great majority of the material studied is located in the Francis Huntington Snow Entomological Collections. In addition, I am deeply grateful for material made available by the following museums and collections, without which this study would have been impossible: United States National Museum; American Museum of Natural History; British Museum (Natural History); Muséum National D'Histoire Naturelle, Paris; Zoologisches Museum der Humboldt-Universität, Berlin; Das Zoologische Staatsinstitut und Zoologische Museum, Hamburg; Naturhistorisches Muséum Zoologische Abteilung, Vienna; Rijksmuseum van Natuurlijke Historie, Leiden; Museo Argentino de Ciencias Naturales, Buenos Aires; University of Michigan; Tulane University; California Academy of Sciences; J. C. Lutz Collection, Philadelphia, Pennsylvania; C. J. Drake Collection, Ames, Iowa.

BIOLOGY OF THE GENUS BUENOA

The information concerning the biology of Buenoa has been based upon B. margaritacea studied in the vicinity of Lawrence, Kansas, unless otherwise indicated.

Habitat

Buenoa is found for the most part in freshwater pools, lakes, and ponds. Some species are found along the shores of slow and fast flowing streams. Most members of this genus inhabit the open water although many are found in water with aquatic vegetation. Only seven species have been found that have brachypterous forms which are incapable of flying from temporary pools or ponds.

Activity

Members of this genus in their various stages of development have been taken in temperate climates during every month of the year. Upon breaking the ice from ponds during the month of December, adult Buenoa have been seen swimming sluggishly in the water below. The Buenoa swim gracefully on their backs in almost perfect equilibrium with the water. However, immediately after replenishing their air supply at the surface, the insect must use vigorous strokes with its hind legs to descend. Soon thereafter, it is able to again attain its equilibrium with the water.

Food

As to food habits, Buenoa are predaceous, feeding largely upon Entomostraca and mosquito larvae which they hold in the crib formed by the bristles arming the fore legs. When these small animals pass within view, the Buenoa makes a sudden dash

to capture them. If missing on the first attempt, no further effort appears to be made. Bare (1928) reports that upon dissecting the abdomen of an adult female, he found what appeared to be Spirogyra chloroplasts in the mid-gut. He states that Buenoa, therefore, may feed upon algae when other food is not available.

Mating

As in the case of Anisops, adult male Buenoa possess various stridulatory areas which are used in courtship prior to mating. Hungerford (1924) described the chirping sounds made by B. limnocastoris in the laboratory at Douglas Lake, Michigan. The serenade is similar to the sound produced when one draws a nail quickly across the teeth of a rubber comb. The stridulating male follows beneath and behind the female for a few moments and when within a half inch or so of the female, the chirping changes to a hum and is followed by a sudden dash to embrace her. If she eludes him, the male begins all over again or transfers his attentions to another.

Oviposition

Oviposition in temperate areas of the United States appears to commence as early as the latter part of April and continues into August. The eggs are placed individually within the stems of aquatic plants with a portion of the surface exposed. The female is equipped with a pair of ovipositor valves armed with

rows of sharp teeth for the purpose of excavating holes in plant tissue. It is not yet known whether the same female lays more than one egg in a day. The total number of eggs that a female lays has not been determined but as many as twelve eggs have been dissected from the abdomen of a single individual. The eggs are elongate and at least a portion of the surface is covered with fine hexagonal reticulations. The eggs hatch in slightly less than two weeks.

Immature Stages

Buenoa undergoes five nymphal instars as do the majority of aquatic Hemiptera. Wing pads appear first in the third stage nymph. Some indication of sex is noted in the form of the seventh abdominal sternum in the third, fourth, and fifth stage nymphs. Adulthood is reached in slightly less than two months in the laboratory. There is more than one generation a year. The insect overwinters as an adult.

DISTRIBUTION AND PHYLOGENY

The insects belonging to the genus Buenoa are limited to the Neotropical region and southern portions of the Nearctic region. The geographical range extends from Canada, through the United States, Mexico, Central America, South America, and the West Indies. Its counterpart in the Eastern Hemisphere, Anisops, extends through Africa, Madagascar and neighboring islands, the Mediterranean area, extending eastward to the

islands of the South Pacific, thence northward into China and Japan. The relationship between these two genera is very close. Buenoa appears to be the more primitive. This conclusion is based primarily on the fact that the males of Buenoa possess an extra segment in the front tarsus. Anisops is the only genus of the Notonectidae in which the males have only a single segment in the front tarsus. The antiquity of the differentiation between Buenoa and Anisops is unknown.

Because of the abundance and diversity of Buenoa in the tropics and the smaller number of species in America North of Mexico, one might speculate as to a Neotropical origin with subsequent invasion of the Nearctic area. There are several possibilities as to the period and manner of this invasion.

The present distribution pattern of the genus suggests that these insects invaded North America from the south, possibly late enough in Tertiary times so that temperate climates no longer reached the Bering Strait area. If this is the case, the geographical isolation of Buenoa and Anisops must have resulted from migration over water and the dating of the differentiation is impossible. It is desirable to point out that there are species in both genera that must repeatedly migrate over water to maintain their specific identity. Examples of Anisops illustrating this are A. nasuta Fieber, known from New Guinea, Celebes, Friendly Islands, Australia, and Guam; A. batillifrons Lundblad, known from Formosa, Iriomote Island, Hainan Island, Burma, Assam, India, Philippine Islands, and Okinawa Island; A. tahitiensis Lundblad, known

from Guadalcanal, New Guinea, Andaman Islands, New Hebrides, Philippine Islands, and Okinawa Island. Examples of Buena illustrating this are B. gracilis, known from Mexico, Honduras, Panama, Cuba, Jamaica, Puerto Rico, St. Croix Island, Grenada Island, and Peru; B. scimitra, known from the United States, Mexico, Cuba, Jamaica, and Puerto Rico; B. albida, known from the United States, Mexico, and Puerto Rico. If repeated transfer over a few hundred miles of water is possible, then transfer over thousands of miles of water once in millions of years is likely.

If one argues against the migration over water to explain the differentiation of Buena and Anisops another suggestion is possible. Buena might have occurred in North America early in the Tertiary (Eocene) when a warm climate extended over most of the North American continent. At this time, one might assume that the genus migrated across the Bering Strait region to later give rise to Anisops. The adaptability to warm climates would have allowed the Buena to occur in the Bering Strait region and to cross to the Old World at a time in the early Tertiary when this area was warm. At a later period these forms isolated by continental separation and cold northern climates diverged to form the Anisops of the Eastern Hemisphere and the Buena of the Western Hemisphere.

It is desirable to point out that although Buena is more primitive than Anisops, there is no certainty that America is where the Buena-Anisops group arose. On the contrary, the possibility exists that Buena or a common ancestor, was once

holarctic and was replaced in the Old World by a more specialized type, Anisops.

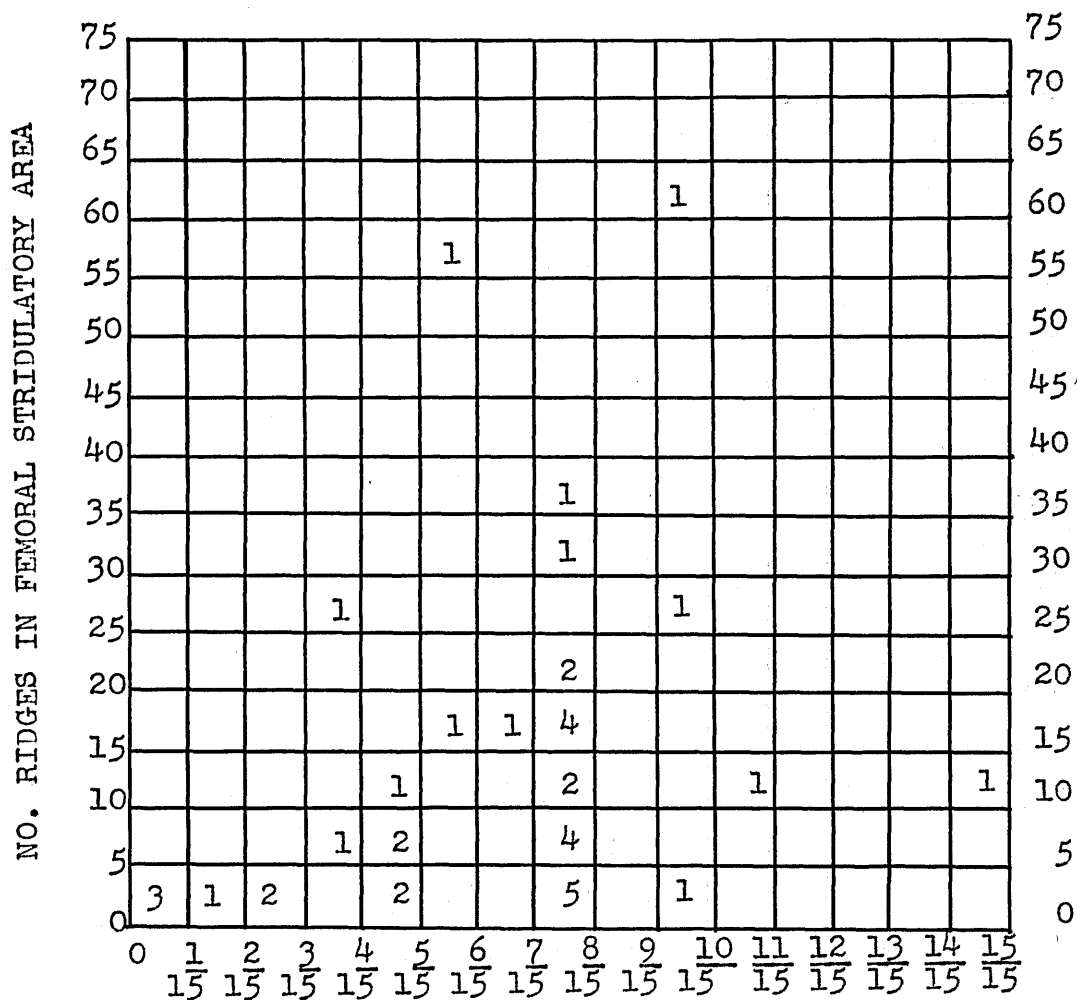
The most widely distributed species within the genus is B. margaritacea. Its range extends from Manitoba, Canada, in the north to Tamaulipas, Mexico, in the south and from New York in the east to California in the west. The greatest North-South distribution is shown by two closely related species, B. limnocastoris and B. confusa. These species range from Manitoba, Canada, in the north to Florida and Grand Cayman Island in the south.

It is interesting to note the distribution pattern of the species within the genus. The range of the genus has been divided into eight geographical subdivisions as follows: (1) Canada, (2) Northern half of the United States (further divided into Northeast and Northwest), (3) Southern half of the United States (further divided into Southeast and Southwest), (4) Mexico, (5) Central America, (6) West Indies, (7) Tropical South America, and (8) Temperate South America. The area boundaries have been arbitrarily indicated in some cases. The United States has been divided into North and South by the parallel of 40° N. latitude. This same area has been further divided into East and West by the eastern borders of Montana, Wyoming, Colorado, and New Mexico. South America has been divided into tropical and temperate areas by arbitrarily selecting the parallel of 30° S. latitude. The number of species in each area is indicated as follows: (1) Canada, 4 sp.;

(2) Northern half of the United States, 4 sp. (Northeast, 4 sp.; Northwest, 0 sp.); (3) Southern half of the United States, 11 sp. (Southeast, 7 sp.; Southwest, 6 sp.); (4) Mexico, 19 sp.; (5) Central America, 8 sp.; (6) West Indies, 11 sp.; (7) Tropical South America, 23 sp.; (8) Temperate South America, 2 sp. The above information indicates that the area of greatest abundance is Tropical South America. As will be shown below, the area of greatest structural diversity is also Tropical South America.

Buenoa is a morphologically monotonous group with few characters. These characters vary within definitely circumscribed limits. It is the combinations of these few characters which make recognition of the various species possible. Tables 1, 2, and 3 show the way in which certain of these characters are correlated. Actually, the striking fact is the lack of correlation. No two characters are correlated better than those indicated in the tables. They are seemingly meaningless recombinations and, therefore, the establishment of a phylogeny is difficult or impossible.

TABLE 1. Scatter diagram showing the relationship between the number of sclerotized ridges in the femoral stridulatory area and the ratio of the width of the synthlipsis to the anterior width of the vertex in Buena. Figures within grid indicate numbers of species.



WIDTH OF SYNTHLIPSIS : WIDTH OF VERTEX

TABLE 2. Scatter diagram showing the relationship between the number of teeth in the tibial comb and the number of sclerotized ridges in the femoral stridulatory area in Buena. Figures within grid indicate numbers of species.

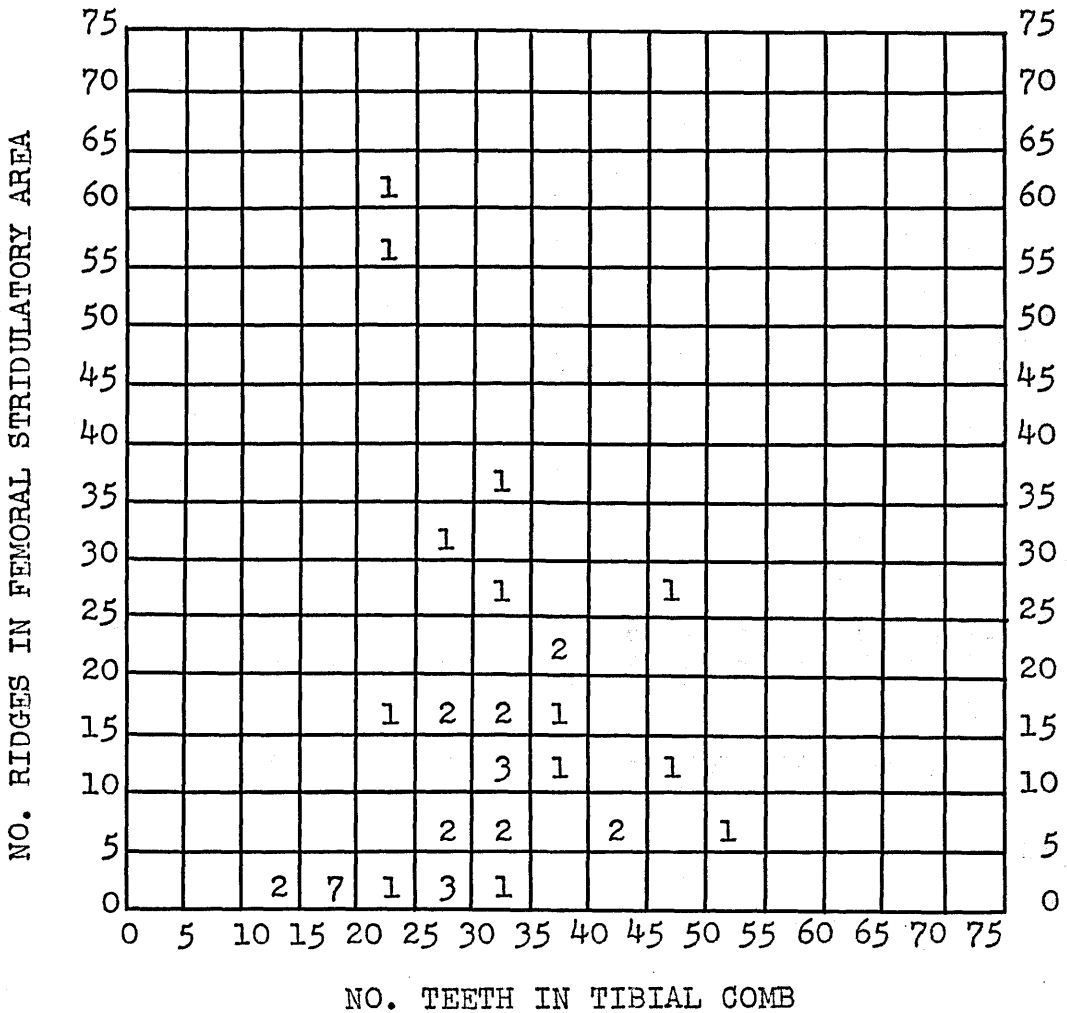
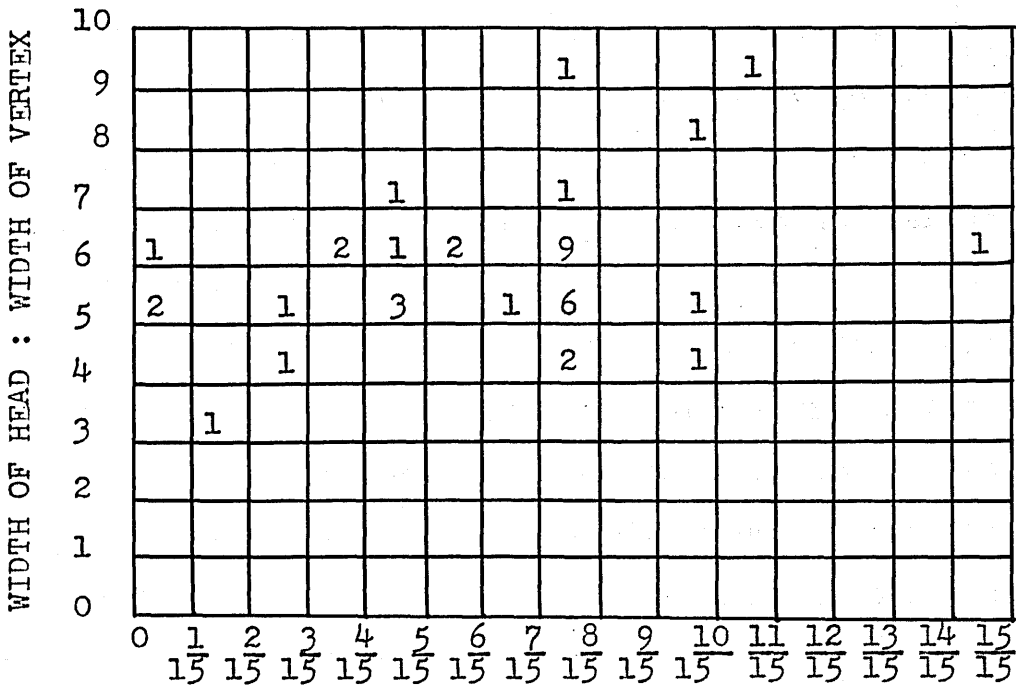


TABLE 3. Scatter diagram showing the relationship between the ratio of the width of the head to the width of the vertex and the ratio of the width of the synthlipsis to the width of the vertex in Buena. Figures within grid indicate numbers of species.



Some features, however, can be established as probably primitive. Some examples: the moderate width of the synthlipsis, a moderate number of sclerotized teeth in the stridulatory areas, and possession of a gland-like structure located laterally on the first abdominal segment. On the other hand, other features can almost certainly be termed specialized. Some examples are: holoptic eyes, a wide or narrow synthlipsis, intermediate tarsal emargination, the bizarre shape of the rostral prong, and a large spine on the caudo-sinistral margin of the seventh abdominal tergum which lies horizontally.

In the absence of fossils and due to the few useful characters and the baffling way in which they are combined and recombined, no complete scheme of relationships for the species of Buenoa can be devised at present. However, certain forms stand out as obviously specialized branches of the tree. These branches are as follows:

1	2	3	4
hungerfordi	amnigenus	excavata	unguis
distincta	salutis		
macrophthalma	oculata		

On the other hand, there are forms which are presumably relatively primitive. These groups are as follows:

1	2	3
antigone	pallens	margaritacea
femoralis	pallipes	uhleri
ida	platycnemis	scimitra
crassipes	omani	albida
absidata	nitida	
arizonis	mutabilis	
tarsalis	macrotrichia	

The greatest abundance of the specialized forms is found in tropical South America. This is shown by the following distribution of these forms: (1) Southwest United States, 1 sp.; (2) Mexico, 2 sp.; (3) West Indies, 2 sp.; (4) Tropical South America, 7 sp.; (5) Temperate South America, 1 sp. The distribution of the species with the most primitive combination of characters is as follows: (1) Canada, 1 sp.; (2) Northeast United States, 1 sp.; (3) Southeast United States, 2 sp.; (4) Southwest United States, 1 sp.; (5) Mexico, 9 sp.; (6) Central America, 6 sp.; (7) West Indies, 7 sp.; (8) Tropical South America, 10 sp.

The distribution pattern of Buena in the United States appears to substantiate the hypothesis that the group invaded this region by way of the Mexican Plateau. The abundance of species in New Mexico and Arizona and the absence of species in the Northwest compared to the greater numbers in the Southwest is an interesting problem. This distribution pattern is found in many groups of plants and animals, a flora and fauna largely peculiar to the old Mexican Plateau ranging northward into Arizona and New Mexico. Seemingly the Buena adapted to the environmental conditions of this old plateau region have remained, for no obvious reason, in this area of the United States and Mexico. These species are undoubtedly adapted to an arid environment, whereas those species found in the southeastern United States are obviously adapted to humid conditions. The latter forms are also found, for the most part, in the humid areas of Mexico, Central America, and the West Indies.

Since it is not clear how humidity would limit the distribution of aquatic insects, other environmental factors are probably involved. In any case, it is interesting that an aquatic group shows the same distributional pattern as many terrestrial groups.

It is obvious that Buenoa is influenced in its distribution by cold. The present northern limit of the genus is approximately 52° N. latitude. Buenoa was undoubtedly more widespread in the past when a warm climate extended over most of North America. It is logical to assume that as the cold climate progressed southward during the Tertiary, these insects were also pushed southward. Thus, one might have the explanation of the present northern limit of this genus in Canada.

GEOGRAPHICAL VARIATION

It is interesting to note that in spite of wide ranges, a striking feature in Buenoa is the lack of geographical variation in most species studied. There are only three good examples that are obvious. One case is primarily an example of size variation. In the two species with the greatest North-South distribution, B. limnocastoris and B. confusa, one finds a size variation from a large northern form to a small southern form as indicated in tables 4 and 5. This type of geographical variation is comparable to that found in warm-blooded vertebrates where the populations that live in a cooler climate tend to be larger than those that live in a warm district (Bergmann's rule).

TABLE 4. North-South distribution of *B. confusa* with variations of body lengths of brachypterous specimens.

Collection localities (North-South)	Total Specimens	Range & mean body lengths in mm. (mean in bold-face)	
		Males	Females
Manitoba & Alberta, Can.	9	5.65- <u>5.78</u> -5.85	6.04- <u>6.51</u> -6.82
South Dakota	4	5.26- <u>5.39</u> -5.52	5.39- <u>6.07</u> -6.76
Minnesota	8	5.07- <u>5.32</u> -5.78	----- <u>5.31</u> -----
Michigan	40	4.74- <u>5.01</u> -5.39	4.87- <u>5.19</u> -5.65
Connecticut	13	5.20- <u>5.52</u> -5.26	5.20- <u>5.46</u> -5.72
New York & New Jersey	8	4.81- <u>5.07</u> -5.26	4.94- <u>5.11</u> -5.39
Kansas	25	4.94- <u>5.05</u> -5.20	5.13- <u>5.28</u> -5.52
Texas	2	----- <u>4.87</u> -----	----- <u>4.94</u> -----
Mississippi & Alabama	8	4.42- <u>4.51</u> -4.61	4.55- <u>4.59</u> -4.68
Georgia	40	4.16- <u>4.48</u> -4.68	4.42- <u>4.60</u> -4.87
Florida	40	4.16- <u>4.58</u> -5.00	4.29- <u>4.61</u> -5.33

TABLE 5. North-South distribution of *B. limnocastoris* with variations of body lengths of brachypterous specimens.

Collection localities (North-South)	Total Specimens	Range & mean body lengths in mm. (mean in bold-face)	
		Males	Females
Quebec, Canada	2	----- <u>6.17</u> -----	----- <u>6.37</u> -----
Minnesota	11	5.85- <u>6.01</u> -6.17	5.95- <u>6.05</u> -6.43
Michigan	40	5.65- <u>5.88</u> -5.98	5.72- <u>6.00</u> -6.30
Maine & New Jersey	2	----- <u>5.52</u> -----	----- <u>5.65</u> -----
Virginia	2	----- <u>5.59</u> -----	----- <u>5.98</u> -----
Georgia & Florida	19	4.74- <u>4.99</u> -5.07	4.81- <u>5.48</u> -5.86

Although too few specimens of *B. limnocastoris* were available for this study, it is interesting to note that it

parallels B. confusa, where many specimens were available, in its size variation pattern. The difference in the mean body lengths between widely separated localities is statistically significant.

Within these two species, one also finds a variation in the development of flight wings with consequent changes in the thorax and hemelytra. The wings are either fully developed or very short, there being no intermediate condition. This feature is indicated in tables 6 and 7 and the differences in percentage from any one locality to another is statistically highly significant. There is no correlation between the development of the flight wings and the sex or season of the year. It is interesting to note that the long-winged forms have been recorded only in the northern and southern portions of the geographic ranges of these species. A possible explanation of this phenomenon is not available at the present time.

TABLE 6. North-South distribution of *B. confusa* with variation in development of flight wings.

Collection localities (North-South)	Total no. specimens	Percentage of short-winged forms
Manitoba & Alberta, Can.	28	32 %
North Dakota & South Dakota	16	25 %
Minnesota	9	89 %
Michigan	210	100 %
Connecticut	13	100 %
New York & New Jersey	8	100 %
Kansas	29	100 %
Texas	5	40 %
Louisiana	33	0 %
Mississippi & Alabama	11	72 %
Georgia	85	88 %
Florida	239	71 %
Grand Cayman Island, W.I.	3	0 %

TABLE 7. North-South distribution of *B. limnocastoris* with variation in development of flight wings.

Collection localities (North-South)	Total no. specimens	Percentage of short-winged forms
Quebec, Canada	2	100 %
Minnesota	11	72 %
Michigan	148	99 %
Maine, New Jersey & Virginia	4	100 %
Georgia	2	50 %
Florida	21	85 %

A third case of geographical variation is an example of a polytypic species *B. antigone*, which has broken up into geographical races, each differing in minor morphological

characteristics. There is very little difference between the neighboring races, but the peripheral forms or the two extremes are very distinct. Not only does one find a size difference but also variations in the divergence of the lateral margins of the notocephalon anterior to the synthlipsis, and slight differences in the form of the rostral prong, pronotum, femoral stridulatory area, and hind femur. Intergrades between the two extremes are evident. The large form of B. antigone is confined to the southern portions of the United States, Mexico, and south as far as British Honduras. The small form ranges from Mexico, the West Indies, and throughout Central and South America south to Argentina. More detailed data concerning the distribution pattern are given under the species description.

TAXONOMY OF THE GENUS BUENOA

Much confusion has existed in the classification of the Buenoa as a result of poor descriptions based primarily on color patterns and inaccurate determinations. Most of the papers dealing with this genus are isolated descriptions of species. Little work of a general nature has been published.

Brief History of the Taxonomy of the Buenoa

The genus Buenoa was erected by Kirkaldy in 1904. He included in this genus all the species formerly included in Anisops that inhabit the Western Hemisphere and possess a two-segmented front tarsus in the male. He retained the name Anisops

for the Eastern Hemisphere forms that possess a one-segmented front tarsus in the male. In this paper Kirkaldy recognized ten former Anisops species as belonging to the Buenoa, placed two species in synonymy, and described two species as new. He designated B. antigone (Kirkaldy) as the genotype.

The first Buenoa species was described in 1803 by Fabricius in "Systema Rhyngotorum" as Notonecta pallipes. Almost forty-eight years later, in 1851, Fieber described the next three species of Buenoa to be made known as Anisops platycnemis, A. femoralis, and A. macrophthalmus. In the same publication Fieber described A. elegans, a name which has for a generation been erroneously applied to Buenoa confusa described below.

In 1879, twenty-seven years later, Berg and White added two more species. These were A. fuscipennis Berg and A. amnigenus White. Some time later, 1899, Kirkaldy described A. antigone which he later (1904) designated as the genotype of his new genus Buenoa, and A. nais which the present writer has relegated to synonymy under B. fuscipennis (Berg).

In 1901, Champion introduced, with some success, the use of structural characteristics for species determination in describing four new species, A. albidus, A. crassipes, A. pallens, and A. carinatus. All of these were Buenoa. A. carinatus was later placed in synonymy with B. antigone by Kirkaldy (1904) but is here considered a subspecies of that species.

Kirkaldy in 1904 established the genus Buenoa, described two new species, B. ida and B. salutis, and placed B. carinata and B. macrophthalma in synonymy with B. antigone. However,

B. macrophthalma is easily distinguished from B. antigone and is a good species, while B. carinata should, as already indicated, be recognized as a subspecies of B. antigone.

In 1908, J. R. de la Torre-Buenoa found that the Buenoa known to a generation of entomologists as B. platycnemis was actually an undescribed species which he designated B. margaritacea.

Not until fourteen years later, in 1923, do additional new species appear in the literature. In this year Hungerford described B. limnocastoris. One year later, 1924, he described another species, B. macrotibialis.

Bare in 1925 described a widespread species, B. scimitra, and three years later, in 1928, Jaczewski described three new species, B. dentipes, B. mallochi, and B. paranensis, all from the state of Parana, Brazil. The present writer has found that B. dentipes is in synonymy with B. fuscipennis, and B. mallochi is in synonymy with B. salutis.

Finally in 1931, B. arizonis was described by Bare.

The present study is the first generic revision since Kirkaldy's paper in 1904. Every species except B. paranensis Jaczewski has been accounted for. The types of this species have been destroyed.

Technique of Identification

To facilitate accurate and rapid interpretation of the species descriptions, it is desirable to mention certain techniques and terminology used by this writer. As indicated

previously, in most species only the males possess adequate structural characters for specific separation. The female, however, can usually be correlated with the male by general resemblance to the male, and various structural details.

The characters and terminology used in the key to the species are, for the most part, self-explanatory or indicated in the illustrations. The reader, however, should be familiar especially with the method used in making the various measurements.

The measurements of the head and pronotum have been made from above the dorsal surface of the insect when held in a horizontal position with the transverse and longitudinal axes horizontal. The length of the rostral prong is determined by placing the insect in such a position that the rostral prong is horizontal. The measurement is then taken from the base of the rostral prong to the apex along a median longitudinal line. The length of the third rostral segment is measured along the frontal surface.

Seldom will it be necessary to make observations of the stridulatory area or chaetotaxy of the front leg to make specific determinations. When such a study is desired the front leg must be removed and cleared. Removal of the leg is best accomplished by placing the bent point of a fine dissecting needle at the base of the coxa or trochanter on its inner surface and rotating the needle outward. The writer finds that this procedure works better on a dry specimen than on one that has been relaxed. It is desirable on occasions to observe

only the femoral stridulatory area. This is easily accomplished by relaxing the insect and pulling the leg to a position perpendicular to the body. Best results in this relaxing procedure are obtained by touching the specimen with a camel's-hair brush that has been dipped in five per cent alcohol or a relaxing fluid consisting of alcohol (95%), 106 cc.; distilled water, 98 cc.; benzol, 14 cc.; ethylacetate, 38 cc.

The illustrations in this paper show only those characters that the writer feels are of particular taxonomic importance. For example, the thick covering of hair-like setae on the inner surface of the leg is omitted so as not to obscure the larger characteristic setae.

Family Characteristics of the Notonectidae

The family Notonectidae is composed of aquatic forms differing from all other such insects, except Pleidae and Helotrephidae, in the habit of swimming on their backs. They are deep-bodied, flat ventrally, and convex dorsally. The eyes are large, reniform, and twice sinuate. Ocelli are absent in this family. The antennae, which are usually hidden from above, consist of three or four segments, and arise on the latero-ventral surface of the head. The beak is four-segmented. The hind pair of legs is more or less flattened and heavily fringed for swimming, while the front and middle pairs are adapted for grasping. The tarsi are two or three segmented except for the one-segmented fore tarsi of the male Anisops.

The tarsi possess two apical claws which are prominent except on the hind legs where they are greatly reduced and inconspicuous. The pronotum is transverse, convex, and usually narrower anteriorly. The abdomen possesses a prominent longitudinal mid-ventral keel, having hairs at least along its lateral margins. Together with the hairs along the sides of the venter, they cover the two longitudinal troughs forming air chambers.

Key to the Genera of Notonectidae

(modified from Hungerford, 1933)

The family Notonectidae consists of eight genera which may be classified by the following key*:

- A. Hemelytral commissure without definite hair-lined pit at anterior end (Subfamily Notonectinae)
- B. Intermediate femur with anteapical pointed protuberance and antennae 4-segmented----- (Tribe Notonectini)
 - C. Anterolateral margins of prothorax not foveate----- Notonecta
 - CC. Anterolateral margins of prothorax foveate----- Enithares
- BB. Intermediate femur without anteapical pointed protuberance and antennae 3- or 4-segmented ----- (Tribe Nychini)
 - C. Sides of prothorax not foveate, the lateral ledge straight. Infracoxal plates bare but margined with hair. Intermediate tarsus with two well-defined segments and a very small basal one in both sexes.----- Neonychia
 - CC. Sides of prothorax foveate, the lateral ledge curving downward to embrace the fovea. Infracoxal plates covered with hair. Intermediate tarsus with one well-defined segment, except in males of Nychia.

*See 1949. Truxal, F. S. Jr. Kansas Ent. Soc., vol. XXII, p. 2. Key under A-BB-C, should read "sides of prothorax not foveate".

- D. Antennae 3-segmented-----Nychia
 DD. Antennae 4-segmented-----Martarega
- AA. Hemelytral commissure with definite hair-lined pit at anterior end. (Subfamily Anisopinae)
 B. Ventral abdominal keel not extending onto last abdominal segment. Male genital capsule cleft behind. Males without stridular protuberance on front tibia. Females with short gonapophyses
 -----Paranisops
- BB. Ventral abdominal keel extending onto last abdominal segment. Male genital capsule closed behind. Males with stridular protuberance on front tibia. Females with long subspatulate gonapophyses.
 C. Male with anterior tarsus 2-segmented---Buenoa
 CC. Male with anterior tarsus 1-segmented---Anisops

Description of the Genus Buenoa

(Genotype Buenoa antigone Kirkaldy, 1904)

1901. Anisops, Champion, G. C. *Biologia Centrali Americana*, Heteroptera, vol. II, p. 371.
1904. Buenoa Kirkaldy, G. W. *Wiener Ent. Zeitung*, vol. XXIII, pp. 120-135.
1909. Buenoa, Torre-Bueno, J. R. de la. Jr. *New York Ent. Soc.*, vol. XVII, pp. 74-75.
1917. Buenoa, Hungerford, H. B. *Ent. News*, vol. XXVIII, pp. 175-176.
1919. Buenoa, Hungerford, H. B. *Univ. Kansas Sci. Bull.*, vol. XI, pp. 41-42, 173 & 177.
1923. Buenoa, Hale, H. M. *Records South Australian Mus.*, vol. II, p. 399.
1924. Buenoa, Hungerford, H. B. *Ann. Ent. Soc. Am.*, vol. XVII, p. 225.
1926. Buenoa, Blatchley, W. S. *Heteroptera Eastern N. Am.*, p. 1056.
1928. Buenoa, Bare, C. O. *Univ. Kansas Sci. Bull.*, vol. XVIII, pp. 265-349.
1928. Buenoa, Jaczewski, T. *Ann. Mus. Zool. Polonici*, vol. VII, p. 123.

This genus is very similar to its counterpart in the Old World, the genus Anisops. It is readily distinguishable from all other genera of the Notonectidae by the combination of characters noted in the key. In addition it differs from its close relative, Anisops, by possessing in all males (except B. fuscipennis, B. hungerfordi, B. distincta, and B. macrophthalma) a small gland-like structure located laterally on the first abdominal segment. Male genitalic characters as indicated by Truxal (1952) and the femoral stridulatory area on the front femur of most males also aid in distinguishing Buenoa from Anisops.

The members of this genus are long, slender insects, and more or less conical in cross-section. The widest portion of the body is usually at a point midway of the longitudinal axis. The head is somewhat rounded anteriorly and closely connected to the thorax. The posterior margins of the eyes invade the pronotum. The eyes are large and not holoptic [except B. amignus (White)]. As seen from above, the notocephalon is usually sulcate medianly. The labrum is small, triangular, and covered with many fine hair-like setae. The rostrum is four-segmented, the third segment of the male prolonged laterally into prongs which aid in stridulation. The pronotum is trapezoidal in shape and wider than long. The metathorax is the largest segment of the entire body. The legs each have the same number of segments. All have a large coxa, small trochanter, femur, tibia, two distinct tarsal segments, and

two tarsal claws at the end of the distal tarsal segment. The hemelytra are generally hyaline and distinctly divided into clavus, corium, and membrane, except in brachypterous forms.

The male genital capsule, as in other members of the family, is composed of the ninth abdominal segment. Its tergum is narrow and bridge-like while the sternum is strongly developed, boat-like in shape, and fused posteriorly. The genital claspers are asymmetrical, the left one being larger and hooked at the apex. The genitalic characters are not important in species determination.

An interesting phenomenon of the internal anatomy of this genus is the presence of haemoglobin cells in the abdomen as found by Hungerford (1922). They are grouped about the tracheal trunks which have their connections with the spiracles of the third to the seventh abdominal segments, inclusive. Similar cells were found by Poisson (1925) in the genus Anisops.

To the worker particularly interested in the morphology of the Buenoa, reference should be made to Bare (1928). This study applies to B. margaritacea Bueno in particular. Bare's text figures, illustrating both internal and external structures, are well done.

Key to the Males of Buena

1. Synthlipsis wide, one half or more the anterior width
of vertex----- 2
Synthlipsis narrow, less than one half the anterior
width of vertex-----24
- 2.(1) Rostral prong longer than third rostral segment----- 3
Rostral prong equal to or shorter than third
rostral segment-----20
- 3.(2) Rostral prong with base originating laterally at or
near distal end of third rostral segment (pl. VI,
fig. 47b)----- 4
Rostral prong with base not originating laterally at
or near distal end of third rostral segment (pl. XIII,
fig. 66b)-----12
- 4.(3) Over 7 mm. in length----- 5
Less than 7 mm. in length----- 7
- 5.(4) Tylus strongly inflated with shallow median depression
forming two lateral protuberances (pl. VI, fig. 47b);
pronotum strongly convex-----B. arizonis Bare
(p.64)
Tylus slightly inflated and smoothly rounded; pronotum
not strongly convex----- 6
- 6.(5) Rostral prong with posterior margin distinctly sinuate
(pl. XII, fig. 63c); interocular cephalic space narrow

(pl. II, fig. 16)-----B. speciosa n. sp.
(p. 152)

Rostral prong with posterior margin almost straight;
interocular cephalic space relatively wide (pl. II,

fig. 15)-----B. crassipes (Champion)
(p. 61)

7.(4) Head approximately half to more than half the length of
pronotum along median longitudinal axis----- 8

Head approximately one third to less than one third the
length of pronotum along median longitudinal axis-----10

8.(7) Tylus slightly inflated, with wide median depression;
lateral margins of frons distinctly divergent

anteriorly and posteriorly-----B. albida (Champion)
(p. 108)

Tylus inflated, smoothly rounded; lateral margins of
frons almost parallel----- 9

9.(8) Pronotum distinctly tricarinate; head equal to or wider
than humeral width of pronotum-----B. macrotibialis(Hunger-
(p. 167) ford)

Pronotum unimpressed, not tricarinate; head distinctly
narrower than humeral width of pronotum-----

-----B. macrotrichia n. sp.
(p. 136)

10.(7) Rostrum robust with posterior margin of rostral prong
distinctly sinuate (pl. VII, fig. 50b); tylus only
slightly inflated-----B. rostra n. sp.
(p. 77)

Rostrum not robust and posterior margin of rostral prong almost straight; tylus distinctly inflated-----11

11.(10) Greatest width of head approximately five times the anterior width of vertex; as viewed from above, vertex protuberant-----B. absidata n. sp. (p. 70)

Greatest width of head approximately six times the anterior width of vertex; as viewed from above, vertex slightly indented-----B. pallipes (Fabricius) (p. 117)

12.(3) Posterior margin of hind femur with more than forty setae in ventral row-----13

Posterior margin of hind femur with forty or less setae in ventral row-----14

13.(12) Greatest width of head more than seven times the anterior width of vertex; interocular cephalic space narrow-----
-----B. artafrons n. sp. (p. 163)

Greatest width of head less than seven times the anterior width of vertex; interocular cephalic space relatively wide-----B. pallens (Champion) (p. 112)

14.(12) Over 7.75 mm. in length; posterior margin of hind femur with less than thirty, large setae in ventral row-----15

Less than 7.75 mm. in length; posterior margin of hind femur with thirty or more, small setae in ventral row

- 15.(14) Greatest width of head approximately seven times the anterior width of vertex; head at least half the length of pronotum along median longitudinal axis-----
 -----B. femoralis (Fieber)
 (p.54)
 Greatest width of head six times or less the anterior width of vertex; head one third the length of pronotum along median longitudinal axis-----16
- 16.(15) Pronotum almost unimpressed, not tricarinate; length of fore femur two times the width at apex; approximately twenty-five teeth in tibial comb---B. ida Kirkaldy
 (p.57)
 Pronotum tricarinate; length of fore femur three times or more the width at apex; forty to fifty teeth in tibial comb-----B. antigone (Kirkaldy)
 (p.41)
- 17.(14) Pronotum distinctly tricarinate; fore femur narrowed at apex (pl. VII, fig. 49a)-----18
 Pronotum almost unimpressed, not distinctly tricarinate; fore femur widened at apex (pl. XI, fig. 60a)-----19
- 18.(17) Intermediate leg with first tarsal segment deeply emarginate on inner margin (pl. VII, fig. 49b)-----
 -----B. tarsalis n. sp.
 (p.73)
 Intermediate leg with margins of first tarsal segment straight-----B. uhleri n. sp.
 (p.102)

19.(17) Rostrum with frontal surface protruding at base of rostral prong (pl. XI, fig. 60b); interocular cephalic space relatively wide; approximately thirty teeth in tibial comb and seven sclerotized ridges in femoral stridulatory area-----B. nitida n. sp.
(p. 140)

Rostrum with frontal surface flat, not protruding; interocular cephalic space narrow; approximately sixteen teeth in tibial comb and four sclerotized ridges in femoral stridulatory area-----B. omani n. sp.
(p. 132)

20.(2) Stridulatory area absent on inner surface of fore femur -----21
Stridulatory area present on inner surface of fore femur -----22

21.(20) Over 8 mm. in length; greatest width of head less than five times the anterior width of vertex; spine from caudo-sinistral margin of seventh abdominal tergite large and sickle-shaped, horizontal (pl. II, fig. 14)
-----B. hungerfordi n. sp.
(p. 231)

Less than 8 mm. in length; greatest width of head six or more times the anterior width of vertex; spine from caudo-sinistral margin of seventh abdominal tergite small and straight, vertical (pl. II, fig. 11)-----
-----B. alterna n. sp.
(p. 216)

- 22.(20) Synthlipsis more than half the anterior width of vertex;
greatest width of head more than seven and one half
times the anterior width of vertex--B. arida n. sp.
(p. 148)
- Synthlipsis approximately half to less than half the
anterior width of vertex; greatest width of head less
than seven and one half times the anterior width of
vertex-----23
- 23.(22) Over 8 1/2 mm. in length; posterior margin of hind
femur with less than thirty, large setae in ventral
row-----B. ida Kirkaldy
(p. 57)
- Less than 8 1/2 mm. in length; posterior margin of
hind femur with more than thirty, small setae in
ventral row-----B. margaritacea Bueno
(p. 80)
- 24.(1) Stridulatory area present on inner surface of fore
femur-----25
- Stridulatory area absent on inner surface of fore
femur-----42
- 25.(24) Fore femur narrowed at apex, with length more than three
times the width at apex (pl. XII, fig. 64a)-----26
- Fore femur widened at apex, with length three times or
less the width at apex (pl. XI, fig. 60a)-----34
- 26.(25) Rostral prong equal to or shorter than third rostral
segment-----27

Rostral prong longer than third rostral segment-----29

- 27.(26) Synthlipsis less than one third the anterior width of vertex; fore tibia with four short, peg-like setae on inner surface at apex (pl. XII, fig. 64d); femoral stridulatory area with six to nine sclerotized ridges

-----B. gracillis n. sp.
(p.155)

Synthlipsis one third or more the anterior width of vertex; fore tibia without short, peg-like setae on inner surface at apex; femoral stridulatory area with fifteen or more sclerotized ridges-----28

- 28.(27) Fore femur with long, conspicuous, sword-shaped stridulatory area consisting of more than forty sclerotized ridges; fore femur not acuminate at apex (pl. VIII, fig. 52a)-----B. scimitra Bare

(p.93)

Fore femur with small, subtriangular to oval stridulatory area consisting of less than twenty-five sclerotized ridges; fore femur acuminate at apex (pl. VIII, fig. 51a)-----B. margaritacea Bueno

(p.80)

- 29.(26) Pronotum distinctly tricarinate-----30
Pronotum almost unimpressed, not distinctly tricarinate-----33

- 30.(29) Synthlipsis less than one third the anterior width of vertex; femoral stridulatory area with more than twenty-five sclerotized ridges-----B. communis n. sp.
(p. 160)
- Synthlipsis more than one third the anterior width of vertex; femoral stridulatory area with less than twenty-five sclerotized ridges-----31
- 31.(30) Tylus slightly inflated with wide median depression---
-----B. albida (Champion)
(p. 108)
- Tylus slightly inflated, smoothly rounded-----32
- 32.(31) Over 8 mm. in length; greatest width of head more than six and one half times the anterior width of vertex---
-----B. femoralis (Fieber)
(p. 54)
- Less than 8 mm. in length; greatest width of head less than six and one half times the anterior width of vertex-----B. uhleri n. sp.
(p. 102)
- 33.(29) Posterior margin of hind femur with less than forty setae in ventral row; greatest width of head six and one half times the anterior width of vertex-----
-----B. mutabilis n. sp.
(p. 143)
- Posterior margin of hind femur with more than forty setae in ventral row; greatest width of head six times the anterior width of vertex-----B. pallens (Champion)
(p. 112)

- 34.(25) Head equal to or slightly wider than humeral width
of pronotum-----35
Head narrower than humeral width of pronotum-----39
- 35.(34) Pronotum strongly inflated, with median length equal to
humeral width; greatest width of head less than six
times the anterior width of vertex--B. *limnocastoris*
(Hungerford)
(p.173)
Pronotum not strongly inflated, with median length
three fourths to less than three fourths the humeral
width; greatest width of head six or more times the
anterior width of vertex-----36
- 36.(35) Pronotum almost unimpressed, not tricarinate; rostral
prong with base originating laterally midway to near
proximal end of third rostral segment-----37
Pronotum tricarinate, median carina distinct; rostral
prong with base originating laterally at distal end of
third rostral segment-----38
- 37.(36) Interocular cephalic space very narrow (pl. II, fig. 16);
femoral stridulatory area with approximately sixty, fine,
sclerotized ridges-----B. *arida* n. sp.
(p.148)
Interocular cephalic space relatively wide (pl. II,
fig. 15); femoral stridulatory area with six to nine,
thick, sclerotized ridges-----B. *nitida* n. sp.
(p.140)

- 38.(36) Greatest width of head seven or more times the
 anterior width of vertex-----B. confusa n. sp.
 (p. 119)
- Greatest width of head six and one half times the
 anterior width of vertex-----B. macrotibialis
 (Hungerford)
 (p. 167)
- 39.(34) Rostrum robust, with posterior margin of rostral prong
 distinctly sinuate (pl. VII, fig. 50b)-----
- B. rostra n. sp.
 (p. 77)
- Rostrum not robust and posterior margin of rostral
 prong almost straight-----40
- 40.(39) Pronotum distinctly tricarinate----B. platycnemis (Fieber)
 (p. 123)
- Pronotum almost unimpressed, not distinctly
 tricarinate-----41
- 41.(40) Less than 6 mm. in length; greatest width of head more
 than six times the anterior width of vertex; fore femur
 with large, spatulate setae on inner posterior margin
 (pl. X, fig. 59a)-----B. macrotrichia n. sp.
 (p. 136)
- Over 6 mm. in length; greatest width of head six times
 or less the anterior width of vertex; fore femur with
 small setae on inner posterior margin (pl. XI, fig. 60a)
- B. nitida n. sp.
 (p. 140)

- 42.(24) Greatest width of head five times or less the anterior width of vertex-----43
 Greatest width of head more than five times the anterior width of vertex-----49
- 43.(42) Rostral prong equal to or longer than third rostral segment-----44
 Rostral prong shorter than third rostral segment-----47
- 44.(43) Over 7 mm. in length; tylus strongly inflated with median depression forming two lateral protuberances (pl. XVI, fig. 79b)-----B. *macrophthalmia* (Fieber) (p.226)
 Less than 7 mm. in length; tylus flat or slightly inflated and smoothly rounded-----45
- 45.(44) Eyes holoptic or synthlipsis extremely narrow, less than one tenth the anterior width of vertex-----46
 Eyes not holoptic, synthlipsis wide, one third to more than one third the anterior width of vertex-----
 -----B. *thomasi* n. sp. (p.213)
- 46.(45) Eyes holoptic; greatest width of head less than three times the anterior width of vertex; over 4 mm. in length-----B. *amnigenus* (White) (p.195)
 Eyes not holoptic, synthlipsis extremely narrow; greatest width of head more than three times the anterior width of vertex; less than 4 mm. in length--B. *salutis* Kirkaldy (p.207)

- 47.(43) Front leg with inner tarsal claw shield-like at base
(pl. XV, fig. 78a); synthlipsis narrow, approximately
one fifth the anterior width of vertex---B. unguis n. sp.
(p.219)
- Front leg with inner tarsal claw gradually tapering
from base to apex; synthlipsis wide, approximately half
the anterior width of vertex-----48
- 48.(47) Less than 8 mm. in length; trochanter of front leg with
prominent tubercle on posterior margin (pl. XIV, fig.
71a); spine from caudo-sinistral margin of seventh
abdominal tergite small and straight, vertical
(pl. II, fig. 7)-----B. fuscipennis (Berg)
(p.190)
- Over 8 mm. in length; trochanter of front leg with
posterior margin smoothly rounded; spine from caudo-
sinistral margin of seventh abdominal tergite large
and sword-shaped, horizontal (pl. II, fig. 13)-----
-----B. distincta n. sp.
(p.235)
- 49.(42) Synthlipsis one fourth to more than one fourth the
anterior width of vertex-----50
Synthlipsis less than one fourth the anterior width
of vertex-----53
- 50.(49) Over 8 mm. in length; tylus strongly inflated with
median depression forming two lateral protuberances
(pl. XVI, fig. 79b); rostral prong extremely long
(pl. XVI, fig. 79b)-----B. macrophthalma (Fieber)
(p.226)

Less than 8 mm. in length; tylus not inflated or inflated and smoothly rounded; rostral prong relatively short (pl. XIV, fig. 71b)-----51

51.(50) Trochanter of front leg with prominent tubercle on posterior margin (pl. XIV, fig. 71a); fore tibia with base and apex approximately same width-----
-----B. fuscipennis (Berg)
(p. 190)

Trochanter of front leg with posterior margin smoothly rounded; fore tibia with base distinctly wider than apex-----52

52.(51) Greatest width of head less than six times the anterior width of vertex; fore tibia with approximately seventeen stout, club-shaped setae on inner surface at apex (pl. XV, fig. 76d)-----B. thomasi n. sp.
(p. 213)

Greatest width of head six times or more the anterior width of vertex; fore tibia without area of club-shaped setae on inner surface at apex-----B. alterna n. sp.
(p. 216)

53.(49) Tylus strongly excavate with short anteromedial ridge (pl. XV, fig. 75b)-----B. excavata n. sp.
(p. 224)

Tylus not excavate, smoothly rounded-----54

54.(53) Synthlipsis one fifteenth the anterior width of vertex; pronotum not tricarinate; intermediate leg with first

tarsal segment emarginate on inner surface (pl. XIV,
fig. 72d)-----B. oculata n. sp.
(p. 204)

Synthlipsis one fifth the anterior width of vertex;
pronotum tricarinate; intermediate leg with margins
of first tarsal segment straight---B. incompta n. sp.
(p. 200)

Buena antigone (Kirkaldy)

(Pl. III, fig. 30; Pl. IV, figs. 42, 43)

This variable species is divisible into two subspecies as indicated in the following pages.

Size: Male, length 7.80 mm. to 8.97 mm., greatest body width 2.46 mm. to 2.79 mm.; female, length 8.25 mm. to 9.75 mm., greatest body width 2.60 mm. to 3.12 mm.

Color: General facies testaceous to dark brown. Head, pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum rufo-testaceous to testaceous with base, brown to black. Abdomen usually black except ventral keel and portions of connexivum and dorsum, testaceous to light brown. This species somewhat variable in color with some specimens entirely sordid white to testaceous.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head five and one half to slightly more than six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis one half to

two thirds the anterior width of vertex; along median longitudinal axis, head is approximately one third the length of pronotum; notocephalon slightly sulcate, with lateral margins variable in amount of divergence anterior to synthlipsis; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. IV, figs. 42b, 43b) distinctly longer than third rostral segment, with base originating laterally midway to near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. IV, figs. 42a, 43a) neither wide nor greatly thickened at apex; triangular stridulatory area somewhat variable, consisting of seventeen to thirty-two sclerotized ridges, located medianly. Fore tibia (pl. IV, figs. 42a, 43a) with stridulatory comb (pl. IV, figs. 42c, 43c) consisting of forty-one to fifty-one teeth; apical teeth thicker and slightly narrower than basal. Chaetotaxy of male front leg as shown on Plate IV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with

vertex indented at least at lateral margins; greatest width of head six to seven times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis one half to two thirds the anterior width of vertex; along median longitudinal axis, head is one fourth to one third the length of pronotum; notocephalon slightly sulcate, with lateral margins variable in amount of divergence anterior to synthlipsis; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape (Pl. III, fig. 30) with teeth arranged in two longitudinal rows, one inner row of few, large teeth and one long outer row of smaller teeth; approximately four to nine small, lateral, toothlike setae near apex.

Nomenclatorial Notes: On examination of large series of specimens of the species known as B. antigone (Kirkaldy) and B. carinata (Champion), one finds many intergrades between the two. This fact was primary in assisting the author to conclude that we are dealing with one variable species divisible into two subspecies.

Comparative Notes: Superficially this species somewhat resembles B. tarsalis n. sp. Examination of the male, however,

will show distinct differences. This species differs from B. tarsalis in having synthlipsis wider, first tarsal segment of intermediate leg not emarginate, hind femur more robust, and differences in the rostral prong, femoral stridulatory area, and tibial comb.

Buenoa antigone antigone (Kirkaldy)

(Pl. IV, fig. 42)

1899. Anisops antigone Kirkaldy, G. W. The Entomologist, vol. XXXII, p. 30.
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1919. Buenoa antigone, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, p. 174 (brief note on synonymy).
1923. Buenoa antigone, Torre-Bueno, J. R. de la. Univ. of Iowa Studies in Nat. Hist., 10:3, p. 35.
1940. Buenoa antigone, Hungerford, H. B. Ent. Month. Mag., vol. LXXVI, p. 256 (ecological note).

Size: Male, length 7.80 mm. to 7.99 mm., greatest body width 2.46 mm. to 2.60 mm.; female, length 8.25 mm. to 8.51 mm.,

greatest body width 2.60 mm. to 2.79 mm.

Color: General facies testaceous. Head, pronotum, thoracic venter, and limbs testaceous. Scutellum usually ochraceous, brown at base. Abdominal dorsum testaceous to brown; venter brown to black with connexivum usually testaceous.

Male Structural Characteristics: As viewed from above, greatest width of head more than six times the anterior width of vertex; synthlipsis one half to two thirds the anterior width of vertex; notocephalon with margins almost parallel to moderately divergent anterior to synthlipsis; rostral prong (pl. IV, fig. 42b) with base originating laterally at proximal end of third rostral segment. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate, shallow depressions toward the middle and a large subtriangular, shallow depression on each side, thus appearing faintly tricarinate. Fore femur (pl. IV, fig. 42a) with triangular stridulatory area consisting of approximately fifteen to twenty-three sclerotized ridges. Fore tibia (pl. IV, fig. 42a) with stridulatory comb (pl. IV, fig. 42c) consisting of approximately forty-one teeth.

Female Structural Characteristics: As viewed from above, greatest width of head approximately six times the anterior width of vertex; synthlipsis slightly more than half the anterior width of vertex; along median longitudinal axis, head is approximately one third the length of pronotum; notocephalon with margins almost parallel to moderately divergent anterior to synthlipsis. Female ovipositor with approximately four or

five very small, lateral, toothlike setae near apex.

Nomenclatorial Notes: Mr. C. O. Bare labeled a long series of B. antigone as types and paratypes, using a manuscript name based on the country of origin, Paraguay. As such paratypes may have been widely distributed, it seems desirable to point out that the name has not been, and should not be, validated by publication.

Comparative Notes: This subspecies differs from B. antigone carinata (Champion) in being less robust, margins of notocephalon less divergent anterior to synthlipsis, and in the shape and number of sclerotized ridges in femoral stridulatory area.

Location of Types: The type female and two other female specimens labeled "St. Andrew, Jamaica, C. B. Taylor, 20/IX, 98" (type locality and determined by Kirkaldy) from the G. W. Kirkaldy Collection, are now in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from Mexico, Guatemala, West Indies (Cuba, Cayman Islands, Haiti, Jamaica, Puerto Rico, St. Croix Island), Brazil, Ecuador, Peru, Bolivia, Paraguay, and Argentina. Specimens from the following localities have been examined:

MEXICO: Tamaulipas: 5 m. S. Ciudad Victoria, Nov. 5, 1936, H. D. Thomas, 35 males, 49 females.

Veracruz: Minatitlán, Sept. 22, 1936, H. D. Thomas, 20 males, 18 females.

Chiapas: Hda. La Libertad, Sept. 1, 1937, H. D. Thomas, 2 males, 3 females; La Libertad, Jan. 1, 1938, Octavio Utrilla

Louis, 2 males, 4 females; Comitán, Jan. 18, 1938, Octavio Utrilla L., 25 males, 30 females.

Campeche: Hda. Encarnation, 12 m. S. Pital, Oct. 15, 1936, H. M. Smith, 11 males, 13 females.

GUATEMALA: El Salto, Escuintla, 1934, F. X. Williams, 1 male.

WEST INDIES: Cuba: Camagüey, July 2, 1923, J. Acuda, 1 male, 2 females; Soledad, Feb. 14, 1925, J. G. Myers, 1 male; Havana, Bot. Garden, Jan. 1925, P. J. Bermudez, 10 males; Havana Prov., Catalina, Nov. 27, 1933, P. J. Bermudez, 23 males, 16 females.

Cayman Islands: Cayman Brac, Earthquake hole, May 22, 1938, Lewis and Thompson (Oxford Univ. Bio. Exp.), 6 males, 6 females; Grand Cayman, Booby Creek, June 23, 1938, Lewis and Thompson (Oxford U. Bio. Exp.), 1 male; Grand Cayman, Cow-well, near Pedro Castle, Aug. 4, 1938, Lewis and Thompson (Oxford U. Bio. Exp.), 1 male, 1 female.

Haiti: Port au Prince, March 1927, G. N. Wolcott, 1 male, 4 females.

Jamaica: St. Andrew, Sept. 20, 1898, C. B. Taylor, 3 females; Claremont, Feb. 1928, Lilly G. Perkins, 41 males, 49 females; Baron Hill Trelawny, Feb. 1928, L. G. Perkins, 130 males, 196 females; Claremont, Baron Hill Trelawny, March and April, 1928, L. G. Perkins, 139 males, 248 females; Baron Hill Trelawny, Nov. and Dec., 1928, L. G. Perkins, 1 male, 1 female; Lumsden Tydenbam, St. Ann, Feb. 1928, L. G. Perkins, 4 males, 2 females.

Puerto Rico: Camuy-Isabela, May 12, 1935, Julio Garcia Diaz, 2 males, 4 females; Cabo Rojo, June 9, 1937, J. A. Ramos, 1 male, 2 females.

St. Croix: Christiansted, 1941, H. A. Beatty, 8 males, 5 females.

BRAZIL: Rio Grande do Norte: Ouro Branco, No. 258, Stillman Wright, 1 female; Caicó, No. 327, Stillman Wright, 1 female; Caicó, No. 12637, Stillman Wright, 7 females.

São Paulo: Rio S. Paulo, Dec. 26, 1944, Wygd., 1 male, 11 females; Oct., 1947, Fritz Plaumann, 1 male, 2 females.

Santa Catarina: Nova Teutonia, Dec. 1946, Fritz Plaumann, 1 male, 2 females; Nova Teutonia, May, 1948, Fritz Plaumann, 93 males, 113 females.

PERU: Dept. Junín, Prov. Tarma, Palmapaca Jungle, Oct. 19 to 26, 1940, F. Woytkowski, 17 males, 18 females; Dept. San Martín, Feb. 16, 1947, Felix Woytkowski, 101 males, 62 females, 3 nymphs.

PARAGUAY: Villarrica, May 16, 1923, Fran. Schade, 3 females; Sept. to Dec., 1923, Fran. Schade, 57 males, 108 females; Jan. to March, 1924, Fran. Schade, 40 males, 43 females; April 16, 1924, Fran. Schade, 10 females; July 8, 1924, Fran. Schade, 13 males, 6 females; Sept. 21, 1924, Fran. Schade, 23 males, 19 females; Jan., 1926, Fran. Schade, 1 male, 1 female; Oct. 29, 1929, Fran. Schade, 1 male, 1 female; Caraveni, June 15, 1924, F. Schade, 4 males, 6 females; Feb. 15, 1925, F. Schade, 3 males; Oct. 30, 1924, F. Schade, 4 males, 6 females; Feb. 16,

1925, F. Schade, 1 male, 12 females; Estero Grande, Nov. 1,
 1924, F. Schade, 6 males; Melinesque, June 20 to 28, 1935,
 F. Schade, 2 males, 9 females.

ARGENTINA: Prov. de Salta, Dept. Metau, 13 males, 9 females;
 Salta, 1 male, 1 female.

All specimens listed above are in the Francis Huntington
 Snow Entomological Collections, University of Kansas, Lawrence,
 Kansas.

The specimens collected in the states of Tamaulipas,
 Veracruz, and Chiapas, Mexico, overlap the area of B. antigone
carinata. However, this region along the Gulf of Mexico south
 through the State of Chiapas, shows a varied ecology and these
 records are not surprising.

Buenoa antigone carinata (Champion)

(Pl. IV, fig. 43)

1901. Anisops carinatus Champion, G. C. *Biologia*
Centrali Americana, Heteroptera, vol. II, p. 372,
 pl. 22, fig. 12.
1904. Anisops carinatus, Uhler, P. R. *Proc. U.S. Nat.*
Mus., vol. XXVII, p. 364 (listed).
1904. Buenoa carinata, Kirkaldy, G. W. *Wiener Ent. Zeit.*,
 vol. XXIII, pp. 122 & 134 (listed as synonym of
B. antigone).
1909. Buenoa carinata, Kirkaldy, G. W. and Torre-Bueno,
 J. R. de la. *Proc. Ent. Soc. Wash.*, vol. X, p. 200
 (catalogue).
1909. Buenoa carinata, Torre-Bueno, J. R. de la. Jr. *New*
York Ent. Soc., vol. XVII, p. 75 (listed).

1914. Buenoa carinata, Barber, H. G. Bull. Am. Mus. Nat. Hist., vol. XXXIII, p. 499 (listed).
1916. Buenoa carinata, Van Duzee, E. P. New York Ent. Soc., p. 51 (check list).
1917. Buenoa carinata, Van Duzee, E. P. Cat. Hemiptera Am. North of Mexico, p. 454 (catalogue).
1919. Buenoa carinata, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, pp. 174-175 (key and description).
1925. Buenoa carinata, Bare, C. O. Ent. News, vol. XXXVI, p. 228 (key).
1926. Buenoa carinata, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057-1058 (key and description).
1928. Buenoa carinata, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, No. 3, p. 268 (key).
1948. Buenoa carinata, Hynes, H.B.N. Trans. Roy. Ent. Soc. London, vol. XCIX, p. 354 (distribution note).

Size: Male, length 7.94 mm. to 8.97 mm., greatest body width 2.60 mm. to 2.79 mm.; female, length 8.77 mm. to 9.75 mm., greatest body width 2.92 mm. to 3.12 mm.

Color: General facies testaceous to dark brown. Head, pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum rufo-testaceous to testaceous with base brown to black; metathoracic dorsum brown to black. Abdomen usually black except ventral keel, margins of connexivum, and last two or three segments, testaceous. This subspecies somewhat variable in color with some specimens entirely sordid white to testaceous.

Male Structural Characteristics: As viewed from above, greatest width of head approximately five and one half times

the anterior width of vertex; synthlipsis approximately two thirds the anterior width of vertex; notocephalon with margins distinctly divergent anterior to synthlipsis; rostral prong (pl. IV, fig. 43b) with base originating laterally midway of third rostral segment. Pronotum with its median length approximately five ninths its humeral width; disk with two elongate depressions toward the middle and a large sub-triangular depression on each side, thus appearing distinctly tricarinate. Fore femur (pl. IV, fig. 43a) with subtriangular to oblong stridulatory area consisting of approximately twenty-nine to thirty-three sclerotized ridges. Fore tibia (pl. IV, fig. 43a) with stridulatory comb (pl. IV, fig. 43c) consisting of approximately fifty to fifty-two teeth.

Female Structural Characteristics: As viewed from above, greatest width of head approximately seven times the anterior width of vertex; synthlipsis slightly less than two thirds the anterior width of vertex; along median longitudinal axis, head is approximately one fourth the length of pronotum; notocephalon with margins distinctly divergent anterior to synthlipsis. Female ovipositor with approximately eight or nine small, lateral, toothlike setae near apex.

Comparative Notes: This subspecies differs from B. antigone antigone (Kirkaldy) in being more robust, margins of notocephalon more divergent anterior to synthlipsis, and in the shape and number of sclerotized ridges in femoral stridulatory area.

Location of Types: Type series is located at the British Museum, London. Homotype male, compared with type by H. B. Hungerford labeled "Colima, Vulcano, Mex., L. Conrad", now in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from United States (fide Uhler and Blatchley and doubtful), Mexico, Guatemala, and British Honduras (fide Champion). Specimens from the following localities have been examined:

MEXICO: Sonora: 2 mi. E. of Guirecoba, Apr. 30, 1939, C. Sibley, 1 male, 3 females.

Sinaloa: Badiraguato, Mar. 30, 1937, A. Dampf, 1 male, 1 female.

Durango: San Antonio near El Salto, June 10, 1937, Meldon Embury, 2 males.

Tamaulipas: 5 mi. S. Ciudad Victoria, Nov. 5, 1936, H. D. Thomas, 1 female.

Jalisco: 20 mi. S. Guadalajara, Sept. 10, 1938, H. D. Thomas, 2 males, 2 females; Chapala, Sept. 11, 1938, H. D. Thomas, 1 male, 1 female; Guadalajara-Tequila Rd., 28 mi. N. Jalisco, Sept. 13, 1938, H. D. Thomas, 1 female; 15 mi. S. W. Lake Chapala, Sept. 14, 1938, H. D. Thomas, 2 females; 15 mi. down Autlán Rd., Sept. 14, 1938, H. D. Thomas, 1 female; Tecolotlán, Sept. 15, 1938, H. D. Thomas, 5 males, 8 females; Unión de Tula, Sept. 16, 1938, H. D. Thomas, 1 female; Jct. Guadalajara Hwy. and road to Autlán, Sept. 17, 1938, H. D. Thomas, 11 males, 11 females.

Guajuato: 10 mi. N. E. León, Aug. 17, 1932, Hobart Smith, 3 females.

Veracruz: Jalapa, May 18, 1930, Creaser-Gordon, 1 male.

Michoacán: 10 mi. down Chinapa Rd., Sept. 5, 1938, H. D. Thomas, 6 males, 4 females; Zamora, Sept. 8, 1938, H. D. Thomas, 19 males, 20 females.

Colima: Vulcano, L. Conrad, 1 male.

Guerrero: Río Balsas, Jct. Acapulco Mex. Hwy., June 24, 1932, Hobart Smith, 2 females; Puente de Ixtla, July 12, 1937, H. D. Thomas, 4 females; Iguala, Oct. 7, 1936, H. D. Thomas, 9 males, 15 females; Palo Blanco, kil. 338 S. Mex. City, Oct. 10, 1936, H. D. Thomas, 1 female; Petaquillas, kil. 320 S. Mex. City, Oct. 21, 1936, H. D. Thomas, 1 male; Salto de Valadez, kil. 325 S. Mex. City, Oct. 30, 1936, H. D. Thomas, 12 males, 13 females; Tierra Colo., kil. 377 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 5 males, 6 females; Río Balsas, kil. 259 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 23 males, 16 females; Acapulco, kil. 442 S. Mex. City, Nov. 1, 1936, H. D. Thomas, 50 males, 63 females.

Morelos: Río Amacuzac, kil. 133 S. Mex. City, Oct. 14, 1936, H. D. Thomas, 6 males, 13 females; Cuernavaca, Oct. 1-17, 1936, H. D. Thomas, 1 male, 3 females; Acatlipa, kil. 84 S. Mex. City, Oct. 17, 1936, H. D. Thomas, 2 females.

Chiapas: Hda. La Libertad, Sept. 1, 1937, H. D. Thomas, 49 males, 39 females; La Libertad, Jan. 1, 1938, Octavio Utrilla Louis, 83 males, 96 females; San Vicente, Jan. 4, 1938, Octavio Utrilla Louis, 4 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa femoralis (Fieber)

(Pl. II, fig. 4; Pl. V, fig. 44)

1851. Anisops femoralis Fieber, F. X. Abhandlungen Kongl. Bohmischen Gesellschaft Wissenschaften, vol. VII, p. 483.
1904. Buenoa femoralis, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 120 & 134 (listed).
1909. Buenoa femoralis, Kirkaldy, G. W. and Torre-Buenoa, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 200 (listed).
1928. Buenoa femoralis, Jaczewski T. Ann. Mus. Zool. Polonici, vol. VII, pp. 123-125 (description and illustrations).
1939. Buenoa femoralis, Barber, H. G. New York Acad. Sci., vol. XIV, p. 420.

Size: Male, length 8.32 mm. to 8.64 mm., greatest body width 2.66 mm. to 2.73 mm.; female, length 8.72 mm. to 8.90 mm., greatest body width 2.60 mm. to 2.72 mm.

Color: General facies pale testaceous to nigro-violaceous. Head, portions of pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum, and portions of metathoracic dorsum and abdomen, black. Ventral abdominal keel, most of connexivum, and lateral portions of last two segments, testaceous. Posterior half of hemelytron, except for membrane, black. This species varies in color from specimens that are

entirely testaceous to specimens that are almost entirely nigro-violaceous.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately seven times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is slightly less than half the length of pronotum; tylus inflated; labrum with basal width almost twice its median length and apex bluntly rounded; rostral prong (pl. V, fig. 44b) much longer than third rostral segment, with base originating laterally midway of third rostral segment, and with apex moderately rounded. Pronotum with its median length less than three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large with median length distinctly greater than that of pronotum. Fore femur (pl. V, fig. 44a) slightly widened at apex; triangular stridulatory area consisting of approximately seventeen sclerotized ridges. Fore tibia (pl. V, fig. 44a) with stridulatory comb (pl. V, fig. 44c) consisting of approximately thirty-four or thirty-five teeth which are of same size and thickness. Chaetotaxy of male front leg as shown on Plate V. Male genital claspers normal. Spine from caudo-sinistral margin

of seventh abdominal tergite (pl. II, fig. 4) with apical half narrow and apex acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately seven times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is less than half the length of pronotum; tylus inflated. Pronotum with its median length slightly less than half its humeral width; disk only slightly impressed and occasionally not at all; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large with median length much greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one long outer row of smaller teeth; approximately seven or eight small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species closely resembles B. crassipes (Champion). Examination of the male, however, will show distinct differences. This species differs from B. crassipes in the shape and armature of the fore and hind femora, the shape of the tibial comb, and the lateral origin of the base of the rostral prong. Buena femoralis is a little larger than B. crassipes.

Location of Types: The type specimen, a somewhat damaged male, labeled "Porto Rico, Moritz", is located at the Berlin Museum.

Data on Distribution: Recorded from Puerto Rico, Brazil, and Peru. Specimens from the following localities have been examined:

PERU: Vicinity Sani Beni, muddy pool in shady jungle, Oct. 16, 1935, F. Woytkowski, 3 males, 4 females; vicinity Sani Beni, muddy pool in shady jungle, Oct. 17, 1935, F. Woytkowski, 38 males, 56 females; Oct. 24, 1935, F. Woytkowski, 111 males, 128 females; Dept. Ayacucho, Prov. La Mar., Sivia jungle, stagnant boggy pool, June 20-23, 1941, F. Woytkowski, 2 males, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa ida Kirkaldy

(Pl. V, fig. 45)

1904. Buenoa ida Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 121, 122 & 134.

1909. Buenoa ida, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 200 (catalogue).

Size: Male, length 9.16 mm. to 9.62 mm., greatest body width 2.73 mm. to 2.82 mm.; female, length 9.29 mm. to 9.94 mm., greatest body width 3.12 mm. to 3.25 mm.

Color: General facies fuscous. Head, pronotum, thoracic venter, and limbs testaceous. Scutellum brown to black with apex testaceous; metathoracic dorsum testaceous to brown. Abdomen black except ventral keel, margins of connexivum, and last one or two segments, testaceous. Posterior half of hemelytra, except membrane, usually black.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex usually slightly indented; greatest width of head slightly more than five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is approximately one third the length of pronotum; notocephalon slightly sulcate; tylus not inflated; labrum with basal width one third greater than its median length and apex bluntly rounded; rostral prong (pl. V, fig. 45b) longer than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately one half its humeral width; disk with two elongate, shallow depressions toward the middle and a large, subtriangular, shallow depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Fore femur (pl. V, fig. 45a) wide and somewhat thickened at apex; long, curved,

triangular stridulatory area consisting of approximately thirty-four or thirty-five sclerotized ridges. Fore tibia (pl. V, fig. 45a) with stridulatory comb (pl. V, fig. 45c) consisting of approximately twenty-two to twenty-four thick teeth; apical teeth slightly thicker than basal. Chaetotaxy of male front leg as shown on Plate V. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, head is laterally rounded, anteriorly truncate with vertex indented only at lateral margins; greatest width of head approximately five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly more than half the anterior width of vertex; along median longitudinal axis, head is approximately one fourth the length of pronotum; notocephalon sulcate; tylus not inflated. Pronotum with its median length slightly more than half its humeral width; disk usually unimpressed, occasionally with a feeble median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one long outer row of smaller teeth; approximately eight or nine small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species resembles B. antigone carinata (Champion). Examination of the male, however, will show distinct differences. This species differs from B. antigone carinata in the shape of the fore femur, the femoral stridulatory area, and the shape and number of teeth of the tibial comb. The pronotum of B. antigone carinata is more distinctly tricarinate than that of B. ida, and the size and coloration are different in the two species.

Location of Types: Dr. G. W. Kirkaldy states that the type is in his collection. The Kirkaldy Collection is now located in the Francis Huntington Snow Entomological Collections, University of Kansas, but the type has been lost or destroyed. A series of three specimens, 2 males and 1 female, were located in the remnants of the Kirkaldy Collection. Two of these are labeled "Uruguay", the type locality, and one is labeled "Guatemala". I have selected a male from Uruguay as a neoholotype.

Data on Distribution: Recorded from Mexico, Guatemala, and Uruguay. Specimens from the following localities have been examined:

MEXICO: Chiapas: L. Tepancuapan, Aug. 28, 1937, H. D. Thomas, 3 males, 7 females; Comitán, Jan. 18-20, 1938, Octavio Utrilla L., 12 males, 7 females.

GUATEMALA: No locality, Breddin (Kirkaldy Coll.), 1 female.

URUGUAY: No locality, E. Autran (Kirkaldy Coll.), 1 male, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa crassipes (Champion)

(Pl. II, fig. 9; Pl. VI, fig. 46)

1901. Anisops crassipes Champion, G. C. *Biologia Centrali Americana*, Heteroptera, vol. II, p. 374.
1904. Buenoa crassipes, Kirkaldy, G. W. *Wiener. Ent. Zeit.*, vol. XXIII, pp. 121 & 134 (listed).
1909. Buenoa crassipes, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. *Proc. Ent. Soc. Washington*, vol. X, p. 200 (catalogue).
1928. Buenoa crassipes, Jaczewski, T. *Annales Muséi Zoologici Polonici*, vol. VII, pp. 125-126 (description).

Size: Male, length 7.15 mm. to 7.67 mm., greatest body width 2.27 mm. to 2.40 mm.; female, length 7.28 mm. to 8.12 mm., greatest body width 2.27 mm. to 2.47 mm.

Color: General facies testaceous to a shining nigro-violaceous. Head, portions of pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum, metathoracic dorsum, and abdomen black, except for ventral keel, portions of connexivum and lateral portions of last two segments, testaceous. Basal portion of hemelytral membrane usually black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with

vertex indented; greatest width of head approximately six and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is approximately two fifths the length of pronotum; notocephalon medianly sulcate; tylus slightly inflated; labrum with basal width slightly greater than its median length, and apex bluntly rounded; rostral prong (pl. VI, fig. 46b) much longer than third rostral segment, with base originating laterally near distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length approximately three fifths its humeral width; disk almost unimpressed, not tricarinate; lateral margins slightly divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. VI, fig. 46a) wide and somewhat thickened at apex; triangular stridulatory area variable consisting of approximately ten wide or sixteen narrow sclerotized ridges. Fore tibia (pl. VI, fig. 46a) with wide stridulatory comb (pl. VI, figs. 46c, 46d) consisting of approximately thirty to thirty-four thick teeth; apical teeth much wider than basal, with width of comb somewhat variable. Chaetotaxy of male front leg as shown on Plate VI. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 9) with apical two thirds very narrow and apex extremely acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is slightly more than one third the length of pronotum; notocephalon medianly sulcate; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of large teeth, one outer row of small teeth, and a few small teeth intermingled with the two rows medianly; approximately seven or eight small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species closely resembles B. femoralis (Fieber). Examination of the male, however, will show distinct differences. This species differs from B. femoralis in the shape and armature of the fore and hind femora, the shape of the tibial comb, and the lateral origin of the base of the rostral prong. Buena crassipes is a little smaller than B. femoralis.

Location of Types: The original type series from Guatemala, is located at the British Museum, London.

Data on Distribution: Recorded from Guatemala, Costa Rica, Ecuador, and Brazil. Specimens from the following localities have been examined:

COSTA RICA: San José, Purchased June 1931, Heinrich Schmidt, 6 males, 20 females; San José, June & July 1931, Heinrich Schmidt, 10 males, 11 females; San José, Purchased 1932, Heinrich Schmidt, 58 males, 82 females; Rio Virilla, Dec. 26, 1931, Heinrich Schmidt, 21 males, 33 females; Rio Torres, Feb. 10, 1932, Heinrich Schmidt, 1 male, 1 female, 1 nymph; Río Sarapiquí, Heinrich Schmidt, 8 males, 8 females.

ECUADOR: Tungurahua Vale Baños, Jan. 1, 1923, F. X. Williams, 4 females, 22 nymphs; Tena, Feb. 28, 1923, F. X. Williams, 3 nymphs.

BRAZIL: Santa Catarina: Nova Teutonia, Dec. 1946, Fritz Plaumann, 34 males, 20 females; Nova Teutonia, May 1948, Fritz Plaumann, 23 males, 42 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa arizonis Bare

(Pl. II, fig. 10; Pl. III, figs. 29, 32;

Pl. VI, fig. 47)

1928. Buenoa arizonis Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, p. 342, pl. 54 (figured only).
1931. Buenoa arizonis, Bare, C. O. Pan-Pacific Ent., vol. VII, No. 3, pp. 115-118 (description).

1942. Buena arizonis, Hutchinson, G. E. American Jr. Sci., vol. CCXL, p. 336 (morphology note).

Size: Male, length 8.45 mm. to 8.80 mm., greatest body width 2.56 mm. to 2.73 mm.; female, length 8.45 mm. to 8.83 mm., greatest body width 2.68 mm. to 2.81 mm.

Color: General facies testaceous to dark brown. Head, pronotum, thoracic venter, and limbs testaceous. Scutellum black with lateral and hind margins yellowish; metathoracic dorsum brown to black. Abdomen usually entirely black except ventral keel, margins of connexivum, and last two to three segments, testaceous. Some specimens entirely sordid white to testaceous.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately as wide as anterior width of vertex; along median longitudinal axis, head is approximately one fifth the length of pronotum; notocephalon usually slightly sulcate; tylus strongly inflated with shallow median depression forming two lateral protuberances; labrum short, basal width almost twice its median length with apex bluntly rounded; rostral prong (pl. VI, fig. 47b) distinctly longer than third rostral segment, with base originating laterally near distal end of third rostral segment, and with apex bluntly rounded. Pronotum strongly convex with its median

length approximately one fifth greater than humeral width; disk with two elongate depressions toward the middle and a subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, very slightly concave medianly. Scutellum with median length approximately one fifth less than that of pronotum. Fore femur (pl. VI, fig. 47a) wide and somewhat thickened at apex; oblong stridulatory area consisting of approximately thirteen to fourteen sclerotized ridges. Fore tibia (pl. VI, fig. 47a) with stridulatory comb (pl. VI, fig. 47c) consisting of approximately forty-two to fifty teeth; apical teeth thicker and slightly narrower than basal. Chaetotaxy of male front leg as shown on Plate VI. Male genital claspers normal (pl. III, fig. 29). Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 10) with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately three fifths the anterior width of vertex; along median longitudinal axis, head is slightly more than one fifth the length of pronotum; notocephalon usually slightly sulcate; tylus not strongly inflated and without median depression. Pronotum strongly convex with its median length approximately two thirds its humeral width;

disk only slightly impressed and occasionally not at all; lateral margins divergent; posterior margin convex, very slightly concave medianly. Scutellum with median length slightly less than that of pronotum. Female ovipositor (pl. III, fig. 32) of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one long outer row of smaller teeth; approximately seven or eight small, lateral, tooth-like setae near apex.

Comparative Notes: This species is nearest in general appearance to B. antigone (Kirkaldy). Buenoa arizonis Bare differs from this species in the number and size of setae on hind femur, the form of the male pronotum, and in having the tylus of the male strongly inflated. Differences also occur in the fore leg of the male.

Location of Types: Holotype male (on slides) and allotype female, Superstition Mts., Arizona, Nov. 7, 1922, P. A. Glick, in the Francis Huntington Snow Entomological Collections. Paratypes distributed as follows: (1) 1 male, Superstition Mts., Arizona, Nov. 7, 1922, P. A. Glick; 3 males, 5 females, Baboquivari Mts., Arizona, F. H. Snow; 17 males, 49 females, Santa Cruz Co., Arizona, Aug. 4, 1927, P. A. Readio, R. H. Beamer, & L. D. Anderson; 11 males, 20 females, Gila Co., Arizona, July 6, 1927, P. A. Readio, R. H. Beamer, & L. D. Anderson; 1 female, Cochise Co., Arizona, July 29, 1927, R. H. Beamer; 1 male, Santa Rita Mts., Arizona, July 25, 1927, R. H. Beamer, in Francis Huntington Snow Entomological

Collections, University of Kansas, (2) 19 specimens in the C. O. Bare Collection, (3) 3 specimens in California Academy of Sciences Collection, and (4) 5 specimens in the U.S. National Museum.

Data on Distribution: Recorded from the United States and Mexico. In addition to type series, specimens from the following localities have been examined:

U.S.A.: Arizona: Tuscon, July 20, 1932, R. H. Beamer, 3 males, 1 female; Baboquivari Mts., Oct. 1934, Frank Blanchord, 1 male; Baboquivari Mts., July 18, 1932, R. H. Beamer & R. H. Beamer Jr., 4 males, 11 females; Baboquivari Mts., July 24, 1941, B. Hodgden, 27 males, 39 females; Arabaca, July 6, 1941, B. Hodgden, 1 female; Miami, July 6, 1941, E. L. Todd, 1 female; Sunnyside Canyon, Huachuca Mts., July 9, 1940, L. C. Kuitert, 2 males; Ruby, July 13, 1940, L. C. Kuitert, 18 males, 35 females; Ruby, July 27-28, 1941, B. Hodgden, 6 males, 28 females.

MEXICO: Sonora: San Bernardo, Río Mayo, Oct. 14, 1934, H. S. Gentry, 15 males, 5 females; Buropaco Dist., Alamos, Oct. 23, 1934, H. S. Gentry, 4 males; Conejos Dist., Alamos, Oct. 26, 1934, H. S. Gentry, 32 males, 28 females; Arroyo de los Mescales, Río Mayo, Feb. 16, 1935, H. S. Gentry, 44 males, 85 females; Salitrial, Río Mayo, Feb. 23, 1935, H. S. Gentry, 26 males, 56 females; Tepoca S. Charibo, Mar. 9, 1935, H. S. Gentry, 34 females; 2 mi. E. of Guerocoba, Apr. 30, 1939, C. Sibley, 5 females.

Chihuahua: Carimechi, Río Mayo, Dec. 12, 1934, H. S. Gentry, 63 males, 126 females; San Luis Babarocos, Dec. 30, 1934, H. S. Gentry, 35 males, 26 females.

Jalisco: Guadalajara, Tequila Rd., 28 mi. N. Jalisco, Sept. 13, 1938, H. D. Thomas, 28 females; 15 mi. S. W. of Lake Chapala, Sept. 14, 1938, H. D. Thomas, 1 male; Tecolotlán, Sept. 15, 1938, H. D. Thomas, 4 males, 41 females; 20 mi. S. Tecolotlán, Sept. 16, 1938, L. J. Lipovsky, 2 males, 5 females; Sept. 17, 1938, H. D. Thomas, 1 female.

Michoacán: 10 mi. down Chinapa Rd., Sept. 5, 1938, H. D. Thomas, 2 females; S. side L. Cuitzeo, July 7, 1947, T. H. Hubbell, 1 male, 1 female.

Puebla: Near Zapotitlán, July 26, 1932, Hobart Smith, 1 male, 1 female.

Morelos: Cuernavaca, Oct. 1-17, 1936, H. D. Thomas, 92 males, 185 females; Acatlipa, kil. 84 S. of Mex. City, Oct. 17, 1936, H. D. Thomas, 23 males, 34 females.

Guerrero: Río Balsas, Jct. Acapulco Mex. Hwy., June 24, 1932, Hobart Smith, 2 males, 11 females; Iguala, Oct. 7, 1936, H. D. Thomas, 42 males, 121 females; Palo Blanco, kil. 338 S. Mex. City, Oct. 10, 1936, H. D. Thomas, 1 female; Taxco, kil. 175 S. Mex. City, Oct. 10, 1936, H. D. Thomas, 26 males, 27 females; Salto de Valadez, kil. 325 S. Mex. City, Oct. 30, 1936, H. D. Thomas, 13 males, 20 females; Río Balsas, 259 kil. S. Mex. City, Oct. 31, 1936, H. D. Thomas, 161 males, 212 females; Tierra Colo., kil. 377 S. Mex. City, Oct. 31, 1936,

H. D. Thomas, 13 males, 19 females; Acapulco, kil. 4 $\frac{1}{2}$ S. of Mex. City, Nov. 1, 1936, H. D. Thomas, 20 males, 15 females; Sacacorjuca, kil. 216 S. Mex. City, H. D. Thomas, 15 males, 33 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa absidata n. sp.

(Pl. VII, fig. 48)

Size: Male, length 5.85 mm. to 6.56 mm., greatest body width 1.56 mm. to 1.75 mm.; female, length 5.78 mm. to 6.95 mm., greatest body width 1.56 mm. to 2.01 mm.

Color: General facies sordid white to gray. Head and pronotum sordid white to yellowish white. Thoracic venter and limbs pale testaceous to light brown; scutellum varies from entirely sordid white, to black with apex and lateral margins yellowish white; metathoracic dorsum yellowish white to mostly black. Abdomen black except ventral keel and portions of connexivum and dorsum, sordid white to testaceous. Some specimens entirely sordid white except abdomen, mostly black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex slightly protuberant; greatest width of head approximately five times the anterior width of vertex and slightly less than humeral width of

pronotum; synthlipsis half the anterior width of vertex; along median longitudinal axis, head is approximately one third the length of pronotum; notocephalon distinctly sulcate; tylus inflated; labrum with basal width slightly more than twice its median length and apex bluntly rounded; rostral prong (pl. VII, fig. 48b) long, distinctly longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex moderately rounded. Pronotum long, with its median length two thirds to three fourths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing distinctly tricarinate; lateral margins slightly divergent; posterior margin convex, medianly concave. Scutellum with median length distinctly less than that of pronotum. Fore femur (pl. VII, fig. 48a) wide and somewhat thickened at apex; long, triangular stridulatory area consisting of approximately seventeen to twenty-two sclerotized ridges. Fore tibia (pl. VII, fig. 48a) with stridulatory comb (pl. VII, fig. 48c) consisting of approximately thirty-nine to forty-two teeth; apical teeth thicker and slightly narrower than basal. Chaetotaxy of male front leg as shown on Plate VII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex slightly protuberant;

greatest width of head four and one half to five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is one third to two fifths the length of pronotum; notocephalon distinctly sulcate; tylus inflated. Pronotum with its median length slightly more than half its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length equal to or greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two irregular, longitudinal rows which merge in proximal third of ovipositor valve; one inner row of large teeth and one outer row of smaller teeth; approximately six or seven small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species somewhat resembles B. arizonis Bare. Examination of the male, however, will show distinct differences. This species differs from B. arizonis in its distinctly smaller size, in having head smaller in proportion to pronotum, tylus less inflated and not medianly depressed, and distinct differences in rostral prong and femoral stridulatory area.

Location of Types: Holotype male, allotype female, 26 male and 26 female paratypes, Dept. Lima, Lagunas Villa, Peru, June 8, to July 1, 1934, F. Woytkowski. The type series is

in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Peru. In addition to type series, specimens from the following localities have been examined:

PERU: Dept. Lima: Lagunas Villa, June 8, to July 15, 1934, F. Woytkowski, 37 males, 43 females; Lurín, Nov. 3-5, 1934, F. Woytkowski, 128 males, 146 females; vicinity Pacasmayo, May 19-20, 1936, F. Woytkowski, 26 males, 20 females; Chilca, Jan. 31, 1937, F. Woytkowski, 6 males, 42 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buena tarsalis n. sp.

(Pl. VII, fig. 49)

Size: This species varies considerably in size within the same population. Male, length 6.24 mm. to 7.15 mm., greatest body width 1.62 mm. to 1.95 mm.; female, length 6.30 mm. to 8.06 mm., greatest body width 1.95 mm. to 2.53 mm.

Color: General facies sordid white to testaceous. Head, pronotum, and most of thoracic venter and limbs, sordid white, portions of thoracic venter and limbs sometimes light brown to black. Scutellum sordid white to pale testaceous, occasionally with two anterolateral brown to black areas; metathoracic dorsum sordid white to light brown. Abdomen black

except ventral keel and portions of connexivum and dorsum, sordid white.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex slightly indented to continuous with that of eyes; greatest width of head five and one half to six times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is two fifths to one half the length of pronotum; notocephalon slightly sulcate; tylus inflated; labrum with its basal width more than twice its median length and apex bluntly rounded; rostral prong (pl. VII, fig. 49c) slightly longer than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex moderately to bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length slightly greater than that of pronotum. Fore femur (pl. VII, fig. 49a) relatively narrow at apex, not greatly thickened; oblong stridulatory area consisting of approximately seventeen to twenty-three sclerotized ridges. Fore tibia (pl. VII, fig. 49a) with stridulatory comb (pl. VII, fig. 49d) consisting of approximately thirty-two to forty

teeth; apical teeth thicker and slightly narrower than basal. Intermediate leg with first tarsal segment (pl. VII, fig. 49b) deeply emarginate on inner margin. Chaetotaxy of male front leg as shown on Plate VII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex usually continuous with that of eyes; greatest width of head approximately five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately two fifths the length of pronotum; notocephalon sulcate; tylus slightly inflated. Pronotum with its median length slightly less than half its humeral width; disk with two elongate depressions toward the middle forming a median carina, occasionally with a shallow, subtriangular depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge in proximal third of ovipositor valve; one inner row of large teeth and one outer row of smaller teeth; approximately seven to nine small, lateral, toothlike setae located in a row extending from apex to midway of ovipositor valve.

Comparative Notes: Superficially this species resembles B. antigone antigone (Kirkaldy). Examination of the male, however, will show distinct differences. This species differs from B. antigone antigone in having synthlipsis narrower, first tarsal segment of intermediate leg strongly emarginate, hind femur less robust, and differences in the rostral prong, femoral stridulatory area, and tibial comb.

Location of Types: Holotype male, allotype female, 18 male and 20 female paratypes, Rio Sao Paulo Road, State of Rio de Janeiro, Brazil, June 19, 1945, Wygodzinsky. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Brazil. In addition to type series, specimens from the following localities have been examined:

BRAZIL: Pará: Marco Belém, Jan. 1, 1947, L. & M. Deane, 16 males, 21 females, 5 nymphs.

Geará: Agua Verde, July 6, 1937, S. Wright, 17 males, 38 females; Fortaleza, Aug. 3, 1937, S. Wright, 1 female; Lavras, Artificial lake, Aug. 23, 1937, S. Wright, 1 male; Lagôa Frexeiras, Nr. Maranguape, Sept., 1937, S. Wright, 11 males, 5 females; Primavera, Oct. 28, 1937, S. Wright, 4 males, 8 females; Choró, Oct. 29, 1937, S. Wright, 2 males, 4 females; Maranguape, Nov. 3-4, 1937, S. Wright, 4 males, 8 females.

Rio Grande do Norte: Ouro Branco, No. 258, S. Wright, 3 females.

Parahiba: Campina Grande, Nos. 43 & 212, S. Wright, 3 males, 12 females; Pocinhos, Nos. 197 & 5582, S. Wright, 1 male, 6 females; Santa Luzia, No. 260, S. Wright, 1 male, 5 females; Souza, No. 5530, S. Wright, 14 males, 3 females.

Pernambuco: Caruaru, No. 403, S. Wright, 8 males, 14 females; Pesqueira, No. 434, S. Wright, 3 females; Rio Branco, No. 445, S. Wright, 4 females; Belém, No. 643, S. Wright, 5 males, 10 females; Itaparica, No. 818, S. Wright, 4 males, 3 females.

Rio de Janeiro: Rio Sao Paulo Road, June 19, 1943, Wygodzinsky, 19 females; Rio Sao Paulo Road, Feb., 1945, P. Wygodzinsky, 10 males, 26 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa rostra n. sp.

(Pl. VII, fig. 50)

Size: Male, length 5.78 mm. to 6.50 mm., greatest body width 1.62 mm. to 1.85 mm.; female, length 5.80 mm. to 6.21 mm., greatest body width 1.62 mm. to 1.88 mm.

Color: General facies sordid white to testaceous. Head, pronotum, thoracic venter, and limbs sordid white to pale testaceous. Scutellum sordid white to yellowish-white; metathoracic dorsum varies from entirely yellowish-white to mostly dark brown. Abdomen black except ventral keel and

portions of connexivum and dorsum, yellowish-white. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head five and one half to six and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis one third to one half the anterior width of vertex; along median longitudinal axis, head is one fourth to one third the length of pronotum; notocephalon sulcate; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostrum very robust; rostral prong (pl. VII, fig. 50b) distinctly longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex bluntly rounded. Pronotum large, with its median length approximately two thirds its humeral width; disk usually with two elongate depressions posteriorly and toward the middle and a subtriangular depression on each side, thus appearing tricarinate posteriorly; lateral margins almost parallel; posterior margin convex, medianly concave. Scutellum large but with median length less than that of pronotum. Fore femur (pl. VII, fig. 50a) wide and somewhat thickened at apex; subtriangular stridulatory area consisting of approximately fourteen to seventeen sclerotized ridges. Fore tibia (pl. VII, fig. 50a) with stridulatory comb (pl. VII, fig. 50c) consisting of approximately twenty-seven

to twenty-eight teeth; apical teeth thicker and slightly wider and taller than basal. Chaetotaxy of male front leg as shown on Plate VII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical third very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex slightly indented; greatest width of head five and one half to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis one third to one half the anterior width of vertex; along median longitudinal axis, head is approximately two fifths the length of pronotum; notocephalon sulcate; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge proximally to form a single irregular row; one inner row of large teeth and one outer row of smaller teeth; approximately seven or eight small, lateral, toothlike setae near apex.

Variation Within Species: This species varies considerably in the proportional size of the head, anterior width of vertex, and synthlipsis. The greatest contrast is shown between a series from Venezuela and one from Trinidad. The former is larger and usually darker than the latter.

Comparative Notes: Superficially this species somewhat resembles the pale form of B. crassipes (Champion). Examination of the male, however, will show distinct differences. This species differs from B. crassipes in its smaller size, in having the pronotum longer and more convex, and in the distinctly different rostral prong and tibial comb (pl. VII, figs. 50b, 50c).

Location of Types: Holotype male, allotype female, 3 male and 6 female paratypes, Trinidad, British West Indies, Sept. 27, 1931, W. E. Broadway. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from the West Indies (Trinidad) and Venezuela. In addition to type series, specimens from the following localities have been examined:

VENEZUELA: No locality, July 3, 1897, A. Speyer, 1 male, 1 female (F. H. Snow Coll.), 4 males, 8 females (Hamburg Mus.); San Esteban, Nov. 22, 1939, Pablo J. Anduze, 1 male, 3 females (F. H. Snow Coll.).

Buenoa margaritacea Torre-Bueno

(Pl. III, fig. 33; Pl. VIII, fig. 51)

1882. Anisops platycnemis, Uhler, P. R. Standard Nat. Hist., vol. II, p. 253.

1891. Anisops platycnemis, Summers, H. E. Bull. Agr. Exp. Sta. Tennessee, vol. IV, p. 82.

1902. Anisops platycnemis, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. X, p. 236 (description).
1904. Anisops platycnemis, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, p. 123 (description).
1908. Buenoa margaritacea Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVI, p. 238 (B. margaritacea nom. nov. = platycnemis, Uhler, Bueno, et auct., nec. Fieber).
1909. Buenoa margaritacea, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVII, pp. 75-77 (key, notes, and synonymy).
1910. Buenoa margaritacea, Smith, J. B. Cat. Insects New Jersey, edn. 3, p. 170 (catalogue).
1910. Buenoa margaritacea, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVIII, p. 33 (listed and ecological note).
1914. Buenoa margaritacea, Barber, H. G. Bull. American Mus. Nat. Hist., vol. XXXIII, p. 499 (listed).
1916. Buenoa margaritacea, Van Duzee, E. P. New York Ent. Soc., p. 51 (check list).
1917. Buenoa margaritacea, Van Duzee, E. P. Cat. Hemiptera Am. North of Mexico, p. 454 (catalogue).
1917. Buenoa margaritacea, Hungerford, H. B. Ent. News, vol. XXVIII, pp. 174-183 (biological notes).
1917. Buenoa margaritacea, Hungerford, H. B. Ent. News, vol. XXVIII, p. 271 (biological note).
1917. Buenoa margaritacea, Parshley, H. M. Occasional Papers of Boston Soc. Nat. Hist., vol. VII, p. 113 (listed).
1919. Buenoa margaritacea, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, pp. 1-328 (biology, taxonomy, and key).
1919. Buenoa margaritacea, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, pp. 329-333 (morphological note).
1922. Buenoa margaritacea, Parshley, H. M. South Dakota State College Tech. Bull., No. 2, p. 22.

1922. Buenoa margaritacea, Hungerford, H. B. Canadian Ent., vol. LXIV, pp. 262-263 (morphological note).
1923. Buenoa margaritacea, Torre-Bueno, J. R. de la. Guide to Insects of Connecticut, part 4, p. 407.
1923. Buenoa margaritacea, Hungerford, H. B. Ent. News, vol. XXXIV, pp. 150-151 (biological note).
1923. Buenoa margaritacea, Hale, H. M. Records South Australian Mus., vol. II, p. 399 (notes).
1923. Buenoa margaritacea, Torre-Bueno, J. R. de la. Connecticut State Geol. and Nat. Hist. Survey Bull., No. 34, p. 407 (key and notes).
1924. Buenoa margaritacea, Hungerford, H. B. Ann. Ent. Soc. Am., vol. XVII, pp. 223 & 325 (biology and taxonomic notes).
1925. Buenoa margaritacea, Bare, C. O. Ent. News, vol. XXXVI, pp. 225-228 (key and taxonomic notes).
1925. Buenoa margaritacea, Hungerford, H. B. and Beamer, R. H. Ent. News, vol. XXXVI, pp. 264 & 297 (listed and notes).
1926. Buenoa margaritacea, Bare, C. O. Ann. Ent. Soc. Am., vol. XIX, pp. 93-101 (biological notes).
1926. Buenoa margaritacea, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057-1058 (description and key).
1926. Buenoa margaritacea, Clark, L. B. Canadian Ent., vol. LVIII, pp. 203-204 (listed and distributional note).
1928. Buenoa margaritacea, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, pp. 265-349 (taxonomy, biology, and morphology).
1928. Buenoa margaritacea, Torre-Bueno, J. R. de la. Cornell Univ. Agr. Exp. Station, Memoir 101, p. 139 (listed).
1939. Buenoa margaritacea, Millspaugh, D. D. Field and Laboratory, vol. VII, p. 78.
1942. Buenoa margaritacea, Rice, L. A. Tennessee Acad. Sci., vol. XVII, pp. 55, 62, & 63 (listed and biology).

1942. Buena margaritacea, Hutchinson, G. E. American Jr. Sci., vol. CCXL, p. 336 (morphological note).

Size: This species varies considerably in size within the same population. Male, length 6.01 mm. to 7.36 mm., greatest body width 1.50 mm. to 2.14 mm.; female, length 6.63 mm. to 8.25 mm., greatest body width 1.95 mm. to 2.40 mm.

Color: General facies sordid white to dark brown. Head, pronotum, most of thoracic venter and usually metathoracic dorsum, and limbs, sordid white to testaceous; portions of thoracic venter and metathoracic dorsum often light brown to black; scutellum yellowish to testaceous, occasionally with two anterolateral black spots. Abdominal dorsum varying from testaceous anteriorly and black posteriorly to almost entirely black; abdominal venter black except keel, portions of connexivum, and sometimes last one or two segments, testaceous. This species varies considerably in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex occasionally indented at lateral margins; greatest width of head five and one half to six and one half times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is two fifths to three fifths the length of pronotum; notocephalon usually slightly sulcate dorsally; tylus not inflated; labrum with basal width approximately twice its median length and apex bluntly rounded;

rostral prong (pl. VIII, fig. 51c) short, shorter than third rostral segment, with base originating laterally at proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk often only laterally impressed, usually with two very shallow, elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length equal to or slightly greater than that of pronotum. Fore femur (pl. VIII, fig. 51a) narrow, not thickened at apex; subtriangular to oval stridulatory area consisting of approximately fifteen to eighteen sclerotized ridges. Fore tibia (pl. VIII, fig. 51a) with stridulatory comb (pl. VIII, fig. 51b) consisting of approximately twenty-three to twenty-six teeth which increase slightly in thickness from base to apex. Chaetotaxy of male front leg as shown on Plate VIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex occasionally indented at lateral margins; greatest width of head five to six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is approximately two

fifths the length of pronotum; notocephalon not sulcate; tylus not inflated. Pronotum with its median length approximately three fifths its humeral width; disk usually unimpressed, occasionally with a shallow, subtriangular depression on each side, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 33) of normal shape with teeth arranged in two longitudinal rows; one inner row of large teeth which merges proximally with long outer row of small teeth; approximately four small, lateral, toothlike setae near apex.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also considerable variation in the proportional size of the pronotum. This variation is not correlated with distribution and the variants occur within the same population.

Comparative Notes: Superficially this species closely resembles B. scimitra Bare. Examination of the male, however, will show distinct differences. This species differs from B. scimitra in the shape of the fore femur, the femoral stridulatory area, and the rostral prong. In general, B. margaritacea is slightly larger in size than the above mentioned species.

Nomenclatorial Notes: Mr. J. R. de la Torre-Bueno (1908) in designating B. margaritacea as a new name for "platycnemis,

Uhler, Bueno, et auct., nec Fieber" states that, "The Buena known to a generation of American entomologists as Anisops platycnemis was an undescribed species." He does not proceed to describe B. margaritacea but states that the descriptions by Uhler (1882), Bueno (1902) and Kirkaldy (1904) "will enable anyone to identify this species with certainty". The main distinguishing factor in the above mentioned descriptions is the size. Buena platycnemis Fieber is a small species whereas B. margaritacea is a relatively large species.

Location of Types: To the knowledge of this author, no types were designated by J. R. de la Torre-Bueno for B. margaritacea. If types were established, they have subsequently been lost or destroyed. A series of three specimens, 2 males, 1 female, were located in the remnants of the Bueno collection now in the Francis Huntington Snow Entomological Collections of the University of Kansas. These specimens are from Maryland, U.S.A., in the general vicinity of Bueno's collecting, and where Uhler states, "I have found it late in October". I have selected one of these males as a neoholotype and the female as a neallotype.

Data on Distribution: Recorded from Canada, United States, and Mexico. Specimens from the following localities have been examined:

U.S.A.: Minnesota: St. Paul, Sept. 23, 1918, R. F. Hussey, 1 female (U. of Mich.); St. Paul, June 19, 1921, H. B. Hungerford, 3 females; St. Paul, July 28-31, 1921, H. B. Hungerford, 4 males, 3 females.

Michigan: Berrien Co., Sept. 2, 1919, R. F. Hussey, 5 males, 8 females (U. of Mich.); Livingston Co., Aug. 9, 1938, I. J. Cantrall, 1 female (U. of Mich.).

South Dakota: Blunt, July 19, 1937, C. L. Johnston, 1 female; Brookings Co., Aug. 11, 1939, H. C. Severin and W. Eakins, 2 females.

New York: West Point, Apr. 19, 1909, W. Robinson, 2 females (U.S.N.M.).

Pennsylvania: Philadelphia, Oct. 18, 1908, G. M. Greene, 1 female (U.S.N.M.).

Illinois: Lake Forest, S. G. Needham, 2 females (U.S.N.M.); P. R. Uhler collection, 1 male, 1 female (U.S.N.M.).

Maryland: Patuxent, Aug. 2, 1879, P. R. Uhler, 1 male, 1 female (Bueno coll.); Baltimore, Sept. 4, 1897, P. R. Uhler, 1 male (Bueno Coll.).

Colorado: Lamar, July 22, 1927, P. A. Readio, 2 males, 8 females; Lamar, Aug. 20, 1927, P. A. Readio, 9 males; Hadley, Sept. 22, 1927, P. A. Readio, 1 male; Denver, P. R. Uhler collection, 1 female (U.S.N.M.).

California: Santa Ana, July 30, 1932, J. D. Beamer, 1 female, 1 nymph; Laguna Beach, July 25, 1933, R. H. Beamer, 3 males, 4 females; Idyllwild, Aug. 3, 1935, Jack Beamer, 1 female; Campo, June 18, 1940, R. H. Beamer, 1 male; Stanford University, March 16, 1915, 1 female.

Kansas: Doniphan Co., Aug. 23, 1921, W. J. Brown, 5 males, 1 female; Doniphan Co., Aug. 24-25, 1921, Robert Guntert, 2

males, 1 female; July 23, 1924, E. P. Breakey, 1 female; Atchison Co., July 15-17, 1924, E. P. Breakey, 8 males, 16 females; Atchison Co., July 15, 1924, Beamer, 4 males, 7 females; Pottawatomie Co., Crevecoeur, 1 female (U.S.N.M.); Leavenworth Co., June 1923, E. P. Breakey, 3 females; Shawnee Co., May 26, 1923, H. B. Hungerford, 3 females; Shawnee Co., June 27, 1923, H. B. Hungerford, 3 males; Douglas Co., April 7, 1909, 1 male; Douglas Co., Aug. 2, 1909, 3 males, 5 females; Douglas Co., 1916, H. B. Hungerford, 1 male, 1 female; Douglas Co., May 17, 1920, H. B. Hungerford, 5 males, 2 females; Douglas Co., Feb. 23, 1921, H. B. Hungerford, 1 female; Douglas Co., Apr. 8, 1921, H. B. Hungerford, 1 male, 4 females; Douglas Co., June 3, 1921, W. J. Brown, 1 male, 1 female; Douglas Co., Nov. 3, 1922, H. B. Hungerford, 1 female; Douglas Co., May 20, 1923, C. O. Bare, 15 males, 5 females; Douglas Co., Sept. 28, 1924, C. O. Bare, 59 males, 55 females; Douglas Co., Oct. 25, 1924, C. O. Bare, 11 males, 17 females; Douglas Co., Nov. 19-20, 1924, C. O. Bare, 85 males, 78 females; Douglas Co., Apr. 5, 1925, C. O. Bare, 4 males, 48 females; Douglas Co., May 6, 1925, C. O. Bare, 8 males, 2 females; Douglas Co., Beamer, 2 males, 48 females; Osage Co., June 1923, Beamer, 2 males, 5 females; Saline Co., July 14, 1923, L. C. Woodruff, 4 females; Saline Co., July 15-18, 1923, R. H. Beamer, 2 males, 8 females; Franklin Co., March 20, 1926, Wesley Clanton, 1 female (U. of Mich.); Lyon Co., June 14, 1923, C. O. Bare, 1 female; Lyon Co., June 15, 1923, W. J. Brown, 1 female; Lyon Co., June 18, 1923, H. Darby, 1 female; Linn Co., Apr. 14, 1923, H. B. Hungerford, 1 female; Bourbon Co., 1915, R. H.

Beamer, 1 male; Reno Co., Aug. 27, 1925, W. J. Brown, 2 males, 4 females; Reno Co., July 2, 1927, P. A. Readio, 1 male, 2 females; Reno Co., July 3, 1927, L. D. Anderson, 1 male; Gray Co., July 9-15, 1917, 1 female; Cherokee Co., Aug. 15, 1920, H. B. Hungerford, 1 female; Cherokee Co., Aug. 18, 1920, R. H. Beamer, 3 females; Montgomery Co., 1916, R. H. Beamer, 3 females; Comanche Co., June 19, 1927, H. B. Hungerford, 3 males, 2 females; Morton Co., Aug. 3, 1924, C. O. Bare, 1 male, 15 females.

Missouri: St. Louis, July 1910, J. F. Abbott, 1 male; St. Louis, Oct. 1911, F. J. Abbott, 1 female.

Virginia: Great Falls, Jan. 9, 1906, D. H. Clemons, 1 female (U.S.N.M.); Vienna, Sept. 19, 1931, P. W. Oman, 58 males, 61 females; Vienna, Sept. 19, 1931, P. W. Oman, 1 male, 3 females (U.S.N.M.).

Tennessee: Murfreesboro, Aug. 29, 1929, Greaser Becker, 1 female; Knoxville, 1 female (U.S.N.M.).

Oklahoma: Cimarron Co., July 5, 1926, T. H. Hubbell, 2 males, 24 females (U. of Mich.); Ardmore, Apr. 14, 1923, H. B. Hungerford, 1 male, 17 females; Osage Co., June 23, 1936, W. F. Blair, 1 female (U. of Mich.).

New Mexico: Torrance Co., June 1925, C. H. Martin, 9 males, 31 females; Torrance Co., July 19, 1925, C. H. Martin, 4 females; Torrance Co., Sept. 1925, C. H. Martin, 18 males, 16 females; Estancia, Aug. 25 to Sept. 6, 1925, C. H. Martin, 21 males, 25 females; Chaves Co., July 8, 1927, R. H. Beamer,

1 male, 2 females; Santa Cruz, Aug. 4, 1927, R. H. Beamer,
 1 male, 3 females; Santa Cruz, Aug. 4, 1927, P. A. Readio,
 6 males, 7 females; Santa Cruz, Aug. 20, 1927, L. D. Anderson,
 11 males, 4 females; Socorro Co., Aug. 8, 1927, P. A. Readio,
 1 male, 11 females; Otero Co., June 28, 1931, L. K. Gloyd,
 2 males, 5 females (U. of Mich.); Wagon Mound, July 18, 1936,
 M. B. Jackson, 2 females; Santa Fe, July 20, 1936, J. D.
 Beamer, 1 female.

Arizona: Cochise Co., July 29, 1927, R. H. Beamer, 7
 males, 30 females; Gila Co., Aug. 5, 1927, L. D. Anderson,
 2 males, 4 females; Gila Co., Aug. 5, 1927, R. H. Beamer, 5
 males, 19 females; Gila Co., Aug. 6, 1927, P. A. Readio, 6
 males, 3 females; Navajo Co., Aug. 15, 1927, Anderson and
 Readio, 6 males, 10 females; Navajo Co., Aug. 15, 1927, R. H.
 Beamer, 2 males, 1 female; Apache Co., Aug. 16, 1927, R. H.
 Beamer, 9 males, 11 females; Apache Co., Aug. 16, 1927, P. A.
 Readio, 10 males, 4 females; Apache Co., Aug. 16, 1927, L. D.
 Anderson, 2 females; Coconino Co., July 1, 1929, L. D.
 Anderson, 1 female; Baboquiviri Mts., July 16, 1932, R. H.
 Beamer, Jr., 5 males, 18 females; Baboquiviri Mts., July 24,
 1941, B. Hodgden, 12 males, 57 females; Tuscon, July 20,
 1932, R. H. Beamer, 2 males, 12 females; Douglas, Apr. 21, 1933,
 W. W. Jones, 1 female (U.S.N.M.); Douglas, Aug., F. H. Snow,
 1 male; Yavapai Co., June 9, 1937, L. K. Gloyd, 1 female
 (U. of Mich.); Ruby, July 13, 1940, D. E. Hardy, 1 male, 1
 female; Ruby, July 27, 1941, B. Hodgden, 2 females; Miami,

Aug. 6, 1941, E. L. Todd, 45 males, 20 females; Miami, Aug. 6, 1941, B. Hodgden, 20 males, 9 females; Fort Grant, H. G. Hubbard, 1 female (U.S.N.M.).

Arkansas: Scott Co., Aug. 23, 1928, R. H. Beamer, 3 females; Fayetteville, Apr. 23-28, 1930, 4 females; Saline Co., July 7, 1950, R. H. Beamer, 1 male.

South Carolina: Organsburg, Sept. 2, 1914, W. J. Brown, 1 female.

Georgia: Atlanta, March 14, 1933, P. W. Fattig, 1 female (U.S.N.M.).

Mississippi: Agricultural College, Oct. 1895, W. E. Weed, 1 female (P. R. Uhler Coll.); Agricultural College, June 20, 1919, J. B. Ray, 1 female; Fulton, July 14, 1930, R. H. Beamer, 1 female.

Louisiana: Baton Rouge, March 9, 1929, R. M. DeCoursey, 1 female.

Texas: Brownsville, June 5, 1904, H. S. Barber, 2 males, 1 female (U.S.N.M.); Brownsville, Aug. 1919, 2 females (U.S.N.M.); Kerrville, Apr. 12, 1907, F. C. Pratt, 1 female (U.S.N.M.); Victoria, Dec. 27, 1910, J. D. Mitchell, 1 female (U.S.N.M.); Eastland Co., May 12-26, 1921, Grace Wiley, 26 males, 29 females; Colorado Co., March 30, 1922, 4 females; Colorado Co., Apr. 3-24, 1922, Mrs. Grace Wiley, 3 males, 39 females; Colorado Co., May 5-19, 1922, Grace Wiley, 1 male, 7 females; Tulsa Co., March 16-21, 1922, Grace Wiley, 1 male, 4 females; Randall Co., July 7, 1927, R. H. Beamer, 4 males,

23 females; Valentine, July 13, 1927, R. H. Beamer, 13 males, 15 females; Valentine, July 12, 1938, D. W. Craik, 1 male, 1 female; Presidio Co., July 16, 1927, R. H. Beamer, 6 males, 17 females; El Paso Co., July 17, 1927, L. A. Anderson, 1 female; Sutton Co., July 20, 1928, J. G. Shaw, 3 males; Sutton Co., Aug. 20, 1928, A. M. James, 3 males, 5 females; Kendall Co., July 22, 1928, R. H. Beamer and J. G. Shaw, 1 male, 5 females; Jim Wells Co., July 24, 1928, R. H. Beamer, 6 males, 6 females; Alfred, July 24, 1928, R. H. Beamer, 1 male; Bee Co., July 25, 1928, R. H. Beamer, 1 male; Hidalgo Co., July 28, 1928, J. G. Shaw, 3 males; Hidalgo Co., July 30, 1928, R. H. Beamer, 1 male, 4 females; Hidalgo Co., Aug. 3, 1928, J. G. Shaw, 14 males, 9 females; Starr Co., July 30, 1928, J. G. Shaw, 33 males, 32 females, 3 nymphs; Cameron Co., Aug. 13, 1928, A. M. James, 1 female; Bowie Co., Aug. 16, 1928, R. H. Beamer, 1 male; Brewster Co., Apr. 15, 1930, O. C. Poling, 2 males (U. of Mich.); Fulfurrias, Nov. 2, 1932, L. D. Tuthill, 2 males; Sinton, Nov. 8, 1932, L. D. Tuthill, 1 male, 1 female; McAllen, Nov. 20, 1932, L. D. Tuthill, 1 male; McAllen, Dec. 30, 1945, R. H. Beamer, 2 females; Marathon, July 9, 1938, R. I. Sailer, 4 males, 6 females; Davis Mts., July 12, 1938, D. W. Craik, 2 males, 1 female; Cypress Mills, Chittenden, 1 female (U.S.N.M.); Texas, P. R. Uhler Collection, 2 females (U.S.N.M.).

MEXICO: Chihuahua: Juárez, June 18, 1931, Smith and Dunkie, 1 male.

Coahuila: Sotillo, Nov. 21, 1932, L. D. Tuthill, 7 males, 14 females.

Tamaulipas: San José, Apr. 1910, Bueno Collection, 1 male, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa scimitra Bare

(Pl. II, fig. 6; Pl. VIII, fig. 52)

1925. Buenoa scimitra Bare, C. O. Ent. News, vol. XXXVI, pp. 226-228.
1926. Buenoa scimitra, Bare, C. O. Ann. Ent. Soc. America, vol. XIX, p. 93 (biological note).
1926. Buenoa scimitra, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057-1059 (key and description).
1928. Buenoa scimitra, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, p. 268 (key).
1948. Buenoa scimitra, Hynes, H.B.N. Trans. Roy. Ent. Soc. London, vol. XCIX, p. 354 (distributional note).

Size: This species varies considerably in size within the same population. Male, length 5.46 mm. to 6.50 mm., greatest body width 1.56 mm. to 1.82 mm.; female, length 5.85 mm. to 7.50 mm., greatest body width 1.69 mm. to 2.15 mm.

Color: General facies sordid white to fuscous. Head, anterior portion of pronotum, most of thoracic venter, and limbs sordid white to testaceous. Posterior portion of

pronotum white to hyalin; scutellum orange to reddish yellow, occasionally with anterolateral portions black; metathoracic dorsum with lateral portions sordid white to testaceous, remaining area light brown to black. Abdomen black except ventral keel and portions of connexivum and dorsum, testaceous. Some specimens entirely sordid white to testaceous except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex indented, often at lateral margins only; greatest width of head six to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly more than one third the anterior width of vertex; along median longitudinal axis, head is two fifths to one half the length of pronotum; notocephalon sulcate dorsally; tylus inflated; labrum with basal width approximately twice its median length and apex bluntly rounded; rostral prong (pl. VIII, figs. 52b, 52c) shorter than third rostral segment, with base originating laterally at a point midway to near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large, subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length equal to or greater than that of pronotum. Fore femur

(pl. VIII, fig. 52a) wide and somewhat thickened at apex; large, sword-shaped stridulatory area consisting of approximately sixty fine, sclerotized ridges. Fore tibia (pl. VIII, fig. 52a) with stridulatory comb (pl. VIII, fig. 52d) consisting of approximately nineteen to twenty-two teeth; all teeth approximately same thickness. Chaetotaxy of male front leg as shown on Plate VIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 6) with apical half narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex indented at lateral margins; greatest width of head five to five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately two fifths the anterior width of vertex; along median longitudinal axis, head is two fifths to one half the length of pronotum; notocephalon sulcate dorsally; tylus slightly inflated. Pronotum with its median length approximately three fifths its humeral width; disk with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one

long outer row of smaller teeth; approximately three or four small, lateral, toothlike setae near apex.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also considerable variation in the proportional size of the pronotum. This variation is not due to distributional factors since it occurs within the same population. Due to the fact that all characters used in species determination are identical in these variable forms, no specific separation appears justified.

Comparative Notes: Superficially this species closely resembles B. margaritacea Torre-Bueno. Examination of the male, however, will show distinct differences. This species differs from B. margaritacea in having the fore femur distinctly wider at apex, the femoral stridulatory area long and sword-shaped, and the rostral prong longer.

Location of Types: Holotype male, allotype female, 20 male paratypes, Douglas Co., Kansas, May 20, 1923, Oct. 25, 1924, Nov. 19, 1924, G. O. Bare; other paratypes: 4 males, Colorado Co., Texas, May 19, 1922, Grace Wiley. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from the United States, Mexico, and the West Indies (Cuba, Jamaica, Puerto Rico). In addition to type series, specimens from the following localities have been examined:

U.S.A.: Kansas: Doniphan Co., Aug. 14, 1921, R. Guntert, 1 female; Doniphan Co., Aug. 23, 1921, W. J. Brown, 1 female; Atchison Co., July 15-17, 1924, E. P. Breakey, 2 males, 1 female; Shawnee Co., May 6, 1923, H. B. Hungerford, 2 females; Douglas Co., May 17, 1920, 1 male; Douglas Co., Nov. 3-7, 1922, H. B. Hungerford, 14 males, 44 females; Douglas Co., Nov. 3, 1922, R. Guntert, 5 males, 35 females; Douglas Co., May 20, 1923, C. O. Bare, 3 females; Douglas Co., Sept. 28, 1924, C. O. Bare, 115 males; 40 females; Douglas Co., Oct. 25, 1924, C. O. Bare, 60 males, 87 females; Douglas Co., Nov. 19-20, 1924, C. O. Bare, 38 males, 36 females; Douglas Co., Oct. 10, 1925, C. O. Bare, 1 male, 1 female; Saline Co., July 18, 1923, R. H. Beamer, 1 female; Cherokee Co., Aug. 1920, H. B. Hungerford and R. H. Beamer, 4 females; Cherokee Co., Dec. 1922, R. H. Beamer, 1 male, 1 female; Montgomery Co., 1916, R. H. Beamer, 1 male; Comanche Co., June 19, 1927, H. B. Hungerford, 2 males; Morton Co., July 20, 1924, C. O. Bare, 3 males, 3 females.

Virginia: New Church, July 15, 1934, L. D. Anderson, 1 male, 1 female.

California: Palo Alto, March 17, 1892, G. W. Kirkaldy Coll., 4 females; Lagoon Lake, Reade, Dec. 24, 1922, J. G. Needham, 6 females; Lagoon Lake, Aug. 24, 1925, J. G. Needham, 1 male; Lagoon Lake, Dec. 24, 1925, J. G. Needham, 10 males, 3 females; Calipatria, Apr. 4, 1924, Warewick Benedict, 4 females; Tehama Co., Apr. 14, 1928, Jean Linsdale, 1 male,

8 females; Holtville, July 2, 1929, Beamer and Anderson, 1 male, 3 females; San Diego Co., July 7, 1929, L. D. Anderson, 1 male; San Diego Co., Apr. 19, 1930, C. & D. Martin, 1 female; Marin Co., Aug. 3, 1929, L. D. Anderson, 12 males, 4 females; Campo, Aug. 25, 1932, H. W. Capps, 3 males, 3 females; Berkley, Apr. 26, 1933, Jean Linsdale, 5 males, 6 females; Laguna Beach, July 25, 1933, R. H. Beamer, 58 males, 85 females; Red Bluff, June 27, 1935, Jack Beamer, 13 males, 8 females; Red Bluff, June 27, 1935, Jean Russell, 2 males, 4 females; Anza, Aug. 6, 1935, R. H. Beamer, 1 female; El Centro, July 24, 1938, R. H. Beamer and D. W. Craik, 1 male, 6 females; Arroyo Seco, Aug. 8, 1938, R. I. Sailer, 2 males, 5 females; Jamesburg, Aug. 11, 1938, D. W. Craik, 2 males, 1 female.

Oklahoma: Tuko Co., Mar. 21, 1922, Grace Wiley, 2 males, 2 females.

Tennessee: Fentress Co., Aug. 17, 1922, T. H. Hubbell, 5 males, 4 females (U. of Mich.).

Arizona: Pima Co., July 27, 1927, R. H. Beamer, 1 male; Cochese Co., July 29, 1927, R. H. Beamer, 35 males, 41 females; Santa Cruz Co., Aug. 4, 1927, R. H. Beamer and L. D. Anderson, 5 males, 4 females; Santa Cruz Co., Aug. 4, 1927, P. A. Readio, 12 males, 5 females; Gila Co., Aug. 6, 1927, P. A. Readio, 1 male, 1 female; Yavapai Co., June 3, 1937, L. K. Gloyd, 2 females (U. of Mich.); Ruby, July 27, 1941, B. Hodgden, 2 males, 1 female; Arivaca, July 10, 1947, L. D. Beamer, 2 males, 1 female.

New Mexico: Socorro Co., Aug. 8, 1927, L. D. Anderson, 14 males, 7 females; Socorro Co., Aug. 18, 1927, P. A. Readio, 9 males, 9 females; Belen, July 20, 1936, W. D. Field, 3 males, 3 females.

Arkansas: Scott Co., Aug. 23, 1928, R. H. Beamer, 1 male, 21 females; Fayetteville, Apr. 24, 1930, 9 females; Arkansas Co., Sept. 4, 1930, D. Isely, 3 males, 7 females.

South Carolina: Orangeburg, Sept. 2, 1914, 1 male, 1 female.

Texas: Brownsville, 1875, 1 male, 3 females (Berlin Mus.); Brownsville, Feb. 27, 1895, C. H. T. Townsend, 1 male (U.S.N.M.); Brownsville, Dec. 29, 1945, R. H. Beamer, 1 male, 1 female; Victoria, July 7, 1915, J. D. Mitchell, 3 males, 4 females (U.S.N.M.); Eastland Co., May 23-24, 1921, Grace Wiley, 5 males, 9 females; Eastland Co., June 16, 1921, Grace Wiley, 1 male; Eastland Co., May 14-25, 1927, Grace Wiley, 4 males, 2 females; Colorado Co., Apr. 3-24, 1922, Grace Wiley, 38 males, 30 females; Colorado Co., May 16-19, 1922, Grace Wiley, 11 females; Presidio Co., July 16, 1927, P. A. Readio, 2 males, 3 females; Valentine, July 13, 1927, R. H. Beamer, 3 males, 2 females; Palo Pinto Co., July 14, 1928, R. H. Beamer, 1 female; Sutton Co., July 20, 1928, J. G. Shaw, 4 males, 1 female; Sutton Co., Aug. 20, 1928, A. M. James, 3 males, 11 females; Sutton Co., Aug. 20, 1928, J. G. Shaw, 1 female; Kendall Co., July 22, 1928, R. H. Beamer, 1 female; Kendall Co., July 22, 1928, J. G. Shaw, 6 males, 2 females; Jim Wells Co., July 24, 1928, R. H. Beamer, 19 males, 20 females;

Alfred, July 24, 1928, R. H. Beamer, 5 males, 7 females;
 Brooks Co., July 25, 1928, R. H. Beamer, 1 female; Bee Co.,
 July 25, 1928, R. H. Beamer, 3 females; Hidalgo Co., July 28,
 1928, J. G. Shaw, 3 females; Hidalgo Co., Aug. 3, 1928, J. G.
 Shaw, 1 male; Hidalgo Co., July 30, 1929, R. H. Beamer, 1
 male, 6 females; Hidalgo Co., Nov. 22, 1932, L. D. Tuthill,
 1 male; Starr Co., July 30, 1928, J. G. Shaw, 8 males, 15
 females; Starr Co., July 5, 1938, R. I. Sailer, 13 males, 10
 females; Cameron Co., Aug. 3, 1928, J. G. Shaw, 2 females;
 Cameron Co., Aug. 13, 1928, A. M. James, 3 males, 3 females;
 Brazoria Co., Aug. 12, 1928, L. D. Beamer, 25 males, 16
 females; Brown Co., Aug. 16, 1928, L. D. Beamer, 5 males, 9
 females; Leon Co., July 12, 1931, Delevan, 1 male (U. of Mich.);
 Falfurrias, Nov. 2, 1932, L. D. Tuthill, 34 males, 17 females;
 Falfurrias, Jan. 1, 1946, L. D. Beamer, 11 males, 10 females;
 Beasley, Nov. 7, 1932, L. D. Tuthill, 1 male, 4 females;
 Sinton, Nov. 8, 1932, L. D. Tuthill, 5 males, 5 females;
 McAllen, Nov. 20, 1932, L. D. Tuthill, 6 males, 7 females;
 Del Rio, 1937, H. D. Thomas, 2 males, 10 females; Peeler,
 June 22, 1938, D. W. Craik, 1 female; Progress, July 1, 1938,
 R. I. Sailer, 1 male; Marathon, July 9, 1938, R. I. Sailer,
 1 male, 1 female.

Louisiana: Winn Co., July 14, 1918, G. R. Pilate, 8 males,
 6 females, 6 nymphs (U. of Mich.); St. Tammany Co., Feb. 25,
 1923, T. H. Hubbell, 1 female (U. of Mich.); Creole, June 18,
 1948, E. L. Todd, 1 male, 2 females.

Mississippi: Vicksburg, July 19, 1921, C. J. Drake, 1 male, 1 female; Woodville, July 26, 1921, C. J. Drake, 1 male, 1 female.

Alabama: Crawford, July 24, 1930, Paul W. Oman, 2 males, 3 females.

Georgia: Baker Co., Feb. 12, 1928, C. H. Martin, 8 males, 8 females; Baker Co., Dec. 23, 1946, L. W. Morgan, 41 males, 39 females; Okefenokee Swp., July 30, 1934, P. M. McKinstry, 1 male, 18 females; Okefenokee Swp., Aug. 3, 1934, M. E. Griffith, 49 males, 52 females; Okefenokee Swp., Aug. 3, 1934, R. H. Beamer, Jr., 3 males, 10 females; Okefenokee Swp., Aug. 3, 1934, R. H. Beamer, 22 males, 20 females; Okefenokee Swp., July 25-27, 1939, R. H. and J. D. Beamer, 6 males, 20 females; Newton, Mar. 19, 1947, R. H. Beamer, 5 males, 12 females.

Florida: Coconut Grove, Aug. 9, 1930, R. H. Beamer and P. W. Oman, 35 males, 30 females; Ft. Meade, Aug. 13, 1930, R. H. Beamer, 8 males, 14 females; Wakulla Sprs. July 14, 1934, R. H. Beamer, 3 males, 7 females; Hilliard, July 28, 1934, R. H. Beamer, 1 male; Sanford, Aug. 8, 1939, J. D. Beamer, 2 males, 3 females; L. Matecumbe Key, Mar. 14, 1947, R. H. Beamer, 8 males, 6 females.

MEXICO: Tamaulipas: San José, Apr. 1910, 6 males, 2 females; Victoria, Nov. 5, 1936, H. D. Thomas, 2 males, 15 females.

Mexico: Mexico, July 11, 1938, L. J. Lipovsky, 2 males, 1 female.

WEST INDIES: Cuba: Havana, Jan. 25, 1932, P. J. Bermudez, 2 females.

Jamaica: Baron Hill Trelawny, Feb. 1928, L. G. Perkins, 5 males, 20 females; Baron Hill Trelawny, Dec. 24, 1928, L. G. Perkins, 1 female; Claremont, Baron Hill Trelawny, Mar. 4, 1928, L. G. Perkins, 1 female.

Puerto Rico: Cabo Rojo, June 9, 1937, J. A. Ramos, 4 males, 2 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buena uhleri n. sp.

(Pl. III, fig. 31; Pl. VIII, fig. 53)

Size: This species varies considerably in size within the same population. Male, length 6.50 mm. to 7.67 mm., greatest body width 1.82 mm. to 2.27 mm.; female, length 6.95 mm. to 8.19 mm., greatest body width 1.88 mm. to 2.47 mm.

Color: General facies sordid white to gray. Head, pronotum, most of thoracic venter, and limbs sordid white to pale testaceous. Scutellum usually orange with an irregular area of black at base; metathoracic dorsum black with lateral areas yellowish white. Abdominal venter light brown to black except keel and portions of connexivum, yellowish white; abdominal dorsum varies from black to mostly yellowish white with small light brown to black areas. Some

specimens entirely sordid white to pale testaceous except most of abdominal venter and portions of abdominal dorsum, light brown to black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes, occasionally indented at lateral margins; greatest width of head approximately five and one half times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis half the anterior width of vertex; along median longitudinal axis, head is approximately one fourth the length of pronotum; notocephalon sulcate; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. VIII, fig. 53b) slightly longer than third rostral segment, with base originating at proximal end of third rostral segment, and with apex bluntly rounded. Pronotum long, with its median length more than two thirds its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing distinctly tricarinate; lateral margins slightly divergent; posterior margin convex, medianly concave. Scutellum with median length distinctly less than that of pronotum. Fore femur (pl. VIII, fig. 53a) neither wide nor greatly thickened at apex; oblong stridulatory area consisting of approximately nineteen to twenty-four sclerotized ridges. Fore tibia (pl. VIII, fig. 53a) with stridulatory comb

(pl. VIII, fig. 53c) consisting of approximately thirty-five to thirty-eight teeth; apical teeth narrower and slightly taller than basal. Chaetotaxy of male front leg as shown on Plate VIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from broad base to acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes, occasionally vertex slightly protuberant; greatest width of head approximately five times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately one third the length of pronotum; notocephalon sulcate; tylus slightly inflated. Pronotum with its median length approximately three fifths its humeral width; disk usually with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate, occasionally with median carina only; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum with median length less than that of pronotum. Female ovipositor (pl. III, fig. 31) of normal shape with teeth arranged in two longitudinal rows which merge proximally; one inner row of few, large teeth and one long, outer row of smaller teeth; approximately two small, lateral,

toothlike setae near apex.

Comparative Notes: Superficially this species somewhat resembles B. margaritacea Torre-Bueno. Examination of the male, however, will show distinct differences. This species differs from B. margaritacea in having the fore femur wider and more robust, and in the form of the pronotum, rostral prong, femoral stridulatory area, and tibial comb. Buenoa uhleri is usually larger and more robust than B. margaritacea.

Nomenclatorial Notes: This species was first recognized as new by Mr. C. O. Bare who labeled a series as types and paratypes using the manuscript name B. uhleri. As such paratypes may have been widely distributed, it seems desirable to point out that the name was not validated by publication. However, to avoid confusion, the name suggested by C. O. Bare has been retained by this author.

Location of Types: Holotype male, allotype female, 27 male and 33 female paratypes, Michoacán, Mexico, Sept. 1-8, 1938, H. D. Thomas and L. J. Lipovsky, in the Francis Huntington Snow Entomological Collections, University of Kansas; other paratypes: 1 male and 1 female, Pénón, Mexico, D. F., Oct. 27, 1898, P. R. Uhler Collection, in the U.S. National Museum.

Data on Distribution: Known only from the United States and Mexico. In addition to type series, specimens from the following localities have been examined:

U.S.A.: California: Lagoon, Lake Reade, Aug. 17, 1925,
J. G. Needham, 1 male, 1 female.

Texas: Sanderson, Sept., 1937, H. D. Thomas, 18 males,
18 females.

MEXICO: Durango: Durango City, May 30, 1937, Meldon
Embury, 1 female.

Tamaulipas: Ciudad Victoria, Nov. 5, 1936, H. D. Thomas,
1 female.

Zacatecas: Los Potosí, Aug. 8, 1944, Henry Thomas, 9
males, 53 females.

San Luis Potosí: Cerritos, June 2, 1930, Creaser-Gordon,
1 male, 3 females (U. of Mich.); San Luis Potosí, Aug. 7-8, 1944,
H. D. Thomas, 7 males, 6 females.

Aguascalientes: 5 mi. S. Aguascalientes, July 16, 1934,
Smith and Dunkle, 2 males, 4 females; Aguascalientes, Aug. 9,
1944, Henry Thomas, 2 males, 30 females.

Jalisco: Jalisco, Sept. 14, 1938, H. D. Thomas, 11 males,
11 females; Tecolotlán, Sept. 5-17, 1938, H. D. Thomas, 2 males,
6 females.

Guanajuato: 10 mi. N. E. León, Aug. 17, 1932, Hobart
Smith, 1 male, 32 females.

Veracruz: Bilimek, 1883, 13 females (Berlin Mus.).

Hidalgo: Agua Fría, Aug. 27, 1944, Henry Thomas, 14 males,
16 females; Real del Monte, Sept. 23, 1938, H. D. Thomas, 2
males.

Michoacán: Pátzcuaro, Aug. 31, 1938, H. D. Thomas, 3
males, 4 females; Zacapu, Sept. 1, 1938, H. D. Thomas and

L. J. Lipovsky, 1 male, 45 females; Morelia, Sept. 3-4, 1938, H. D. Thomas, 27 males, 57 females; 10 mi. down Chinapa road, Sept. 5, 1938, H. D. Thomas, 1 male, 6 females; Carapán, Sept. 2-8, 1938, H. D. Thomas, 4 males, 80 females; L. Guitzeo, July 7, 1947, T. H. Hubbell, 8 males, 9 females.

Federal District: Mexico, Apr. 22-25, 1910, Bueno Collection, 3 males; Lago de Chapultepec, 1933, L. Ancona H., 1 male, 2 females; Xochimilco, June 21, 1934, H. Hinton, 5 females; Lake Texcoco, July 26, 1937, 5 females; Mexico, Sept. 17, 1938, 1 male, 1 female; Mexico, A. Dampf, 1 male, 1 female.

Puebla: Río Frió, July 26, 1932, Hobart Smith, 1 female; Tehuacán, July 18-25, 1937, H. D. Thomas, 2 males, 4 females; Tehuacán, Aug. 5-15, 1937, H. D. Thomas, 1 male, 2 females; Cacaloapan, July 22, 1937, H. D. Thomas, 14 males, 40 females; Puebla, July 25, 1937, H. D. Thomas, 3 males, 2 females; Puebla, Aug. 16, 1937, H. D. Thomas, 2 males, 7 females.

Guerrero: Petaquillas, Oct. 21, 1936, H. D. Thomas, 1 male, 3 females; Salto de Valadez, Oct. 30, 1936, H. D. Thomas, 10 males, 10 females.

Oaxaca: Posita, Aug. 24, 1937, H. D. Thomas, 4 females.

Chiapas: Hda. La Libertad, Sept. 1, 1937, H. D. Thomas, 1 male, 3 females; Tuxtla Gutiérrez, Aug. 27, 1939, H. D. Thomas, 1 male, 1 female; San Vicente, Jan. 4, 1938, Octavio Utrilla L., 1 male, 3 females.

All specimens listed above are in the Francis Huntington

Snow Entomological Collections, University of Kansas,
Lawrence, Kansas, unless otherwise indicated.

Buenoa albida (Champion)

(Pl. IX, fig. 54)

1901. Anisops albidus Champion, G. C. *Biologia Centrali Americana*, Heteroptera, vol. II, pp. 371 & 373, pl. 22, fig. 14.
1904. Buenoa albida, Kirkaldy, G. W. *Wiener Ent. Zeit.*, vol. XXIII, pp. 121 & 134 (listed and states "wahrscheinlich mit A. platycnemis identisch").
1909. Buenoa albida, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. *Proc. Ent. Soc. Washington*, vol. X, p. 200 (catalogue).
1909. Buenoa albida, Torre-Bueno, J. R. de la. Jr. *New York Ent. Soc.*, vol. XVII, p. 75 (listed).
1916. Buenoa albida, Van Duzee, E. P. *New York Ent. Soc.*, p. 51 (check list).
1917. Buenoa albida, Van Duzee, E. P. *Cat. Hemiptera America North of Mexico*, p. 454 (catalogue).
1919. Buenoa albida, Hungerford, H. B. *Univ. Kansas Sci. Bull.*, vol. XI, pp. 174-175 (key and description).
1923. Buenoa albida, Torre-Bueno, J. R. de la. *Univ. of Iowa Studies in Nat. Hist.*, 10:3, p. 35.
1935. Buenoa albida, Bare, C. O. *Ent. News*, vol. XXXVI, No. 8, p. 228 (key).
1939. Buenoa albida, Millsbaugh, D. D. *Field and Laboratory*, vol. VII, No. 2, p. 78.

Size: Male, length 5.85 mm. to 6.04 mm., greatest body width 1.69 mm. to 1.75 mm.; female, length 5.85 mm. to 6.50 mm., greatest body width 1.62 mm. to 1.82 mm.

Color: General facies sordid white. Head, thoracic venter, and limbs pale testaceous. Scutellum usually rufo-testaceous. Abdominal venter black with keel and connexivum pale testaceous; abdominal dorsum testaceous with transverse black bands or completely black with last two segments pale testaceous. Some specimens entirely sordid white.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex slightly indented; greatest width of head more than six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is approximately half the length of pronotum; tylus slightly inflated, with wide median depression forming two short, lateral carinae; labrum short, basal width twice its median length with apex bluntly rounded; rostral prong (pl. IX, fig. 54b) longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex sharply rounded. Pronotum with its median length slightly less than two thirds its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length slightly greater than that of pronotum. Fore femur (pl. IX, fig. 54a) neither wide nor greatly thickened at apex; oblong stridulatory area consisting of approximately thirty-five to

forty sclerotized ridges. Fore tibia (pl. IX, fig. 54a) with stridulatory comb (pl. IX, fig. 54c) consisting of approximately thirty-four to thirty-six teeth which increase slightly in height and thickness from base to apex. Chaetotaxy of male front leg as shown on Plate IX. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from broad base to acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded; greatest width of head approximately five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis less than half the anterior width of vertex; along median longitudinal axis, head is less than half the length of pronotum; tylus very slightly inflated and without median longitudinal depression. Pronotum with its median length less than two thirds its humeral width; disk only slightly impressed and occasionally not at all; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of larger teeth and one long outer row of smaller teeth; approximately four very small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species closely resembles B. scimitra Bare. Examination of the male, however, will show distinct differences. This species differs from B. scimitra in the shape of the rostral prong, in having the

tylus medianly depressed, and in the shape of the stridulatory area on the fore femur.

Location of Types: The original type series is located at the British Museum, London. Holotype male now on slides. Homotype male, compared with type by Dr. W. E. China of the British Museum, labeled "Mata Capestra, Ver., Mex., 10/1926, M. F. 1077, received from Dr. Dampf 1932", now in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from the United States, Mexico, and Puerto Rico. Specimens from the following localities have been examined:

MEXICO: Sonora: Salitral Río Mayo, Feb. 23, 1935, H. S. Gentry, 1 male.

Sinaloa: Mazatlán, May, 1934, H. Hinton, 5 males, 8 females, 2 nymphs.

Veraacruz: Mata Capestra, Oct., 1926, 1 male, 1 female.

Hidalgo: Agua Fría, Aug. 27, 1944, H. D. Thomas, 1 male.

Morelos: Cuernavaca, Oct. 5, 1936, H. D. Thomas, 1 male.

Guerrero: Salto de Valadez, Oct. 30, 1936, H. D. Thomas, 1 male, 1 female.

PUERTO RICO: Cabo Rojo, June 9, 1937, J. A. Ramos, 3 males, 2 females; Isabela, May 12, 1935, Julio Garcia Diaz, 17 males, 6 females; Río Piedras exp. sta., May 23, 1935, Julio Garcia Diaz, 5 nymphs; Cartagena Lagoon, Aug. 10, 1935, Julio Garcia Diaz, 1 male, 6 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa pallens (Champion)

(Pl. II, figs. 5, 11; Pl. IX, fig. 55)

1901. Anisops pallens Champion, G. C. *Biologia Centrali Americana, Heteroptera*, vol. II, p. 374.
1904. Buenoa pallens, Kirkaldy, G. W. *Wiener Ent. Zeit.*, vol. XXIII, pp. 121 & 134 (listed).
1909. Buenoa pallens, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. *Proc. Ent. Soc. Washington*, vol. X, p. 201 (catalogue).
1940. Buenoa pallens, Hungerford, H. B. *Ent. Monthly Mag.*, vol. LXXVI, p. 256 (listed and ecological note).

Size: This species varies considerably in size. Male, length 5.52 mm. to 6.89 mm., greatest body width 1.49 mm. to 1.56 mm.; female, length 5.98 mm. to 7.15 mm., greatest body width 1.75 mm. to 2.01 mm.

Color: General facies pale testaceous to nigro-violaceous. In pale specimens, head, thorax, and limbs sordid white to testaceous with abdomen black except ventral keel, portions of connexivum, and last one or two segments, testaceous. In dark specimens, head, anterior portion of pronotum, most of thoracic venter, and limbs sordid white to testaceous. Posterior portion of pronotum black; scutellum usually entirely black, occasionally with apex testaceous; metathoracic dorsum black. Abdomen black except ventral keel, portions of connexivum

and occasionally last one or two segments, testaceous. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis two fifths to three fifths the anterior width of vertex; along median longitudinal axis, head is two fifths to three fifths the length of pronotum; notocephalon sulcate dorsally at least; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. IX, figs. 55b, 55c) slightly variable, longer than third rostral segment, with base originating laterally midway of third rostral segment, and with apex moderately rounded. Pronotum with its median length approximately half its humeral width; disk usually unimpressed, occasionally with a shallow, subtriangular depression on each side, very seldom appearing tricarinate; lateral margins divergent; posterior margin convex medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Fore femur (pl. IX, fig. 55a) neither wide nor thickened at apex; triangular to subtriangular stridulatory area consisting of approximately sixteen to twenty-two sclerotized ridges. Fore tibia (pl. IX, fig. 55a) with stridulatory comb (pl. IX, figs. 55e, 55f) consisting of approximately twenty-four to thirty-eight teeth;

apical teeth thicker than basal. Chaetotaxy of male front leg as shown on Plate IX. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, figs. 5, 11), small, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is one third to one half the length of pronotum; notocephalon sulcate dorsally; tylus not inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed or occasionally with feeble median carina; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one outer row of smaller teeth; approximately three or four small and obscure, lateral, tooth-like setae near apex.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also some variation in the proportional size of the pronotum and head, and in the rostral prong and femoral

stridulatory area. The greatest contrast is shown between a series from Costa Rica and one from Ecuador. The former is a small form, the males seldom more than 5.70 mm. in length; the males of the latter form are approximately 6.80 mm. in length. It is the opinion of this author that these forms all belong to one variable species.

Comparative Notes: Superficially the dark form of this species closely resembles B. pallipes (Fabricius) and B. mutabilis n. sp. Examination of the male, however, will show distinct differences. This species differs from B. pallipes in having the fore femur narrow and not thickened at apex, rostral prong shorter and originating laterally midway of the third rostral segment, and pronotum shorter and not distinctly tricarinate. Buenoa pallens differs from B. mutabilis in having the notocephalon distinctly wider, and fore femur narrower and less thickened at apex. B. mutabilis is a smaller species.

Location of Types: The original type series from Guatemala, is located in the British Museum, London.

Data on Distribution: Recorded from Mexico, Guatemala, Costa Rica, West Indies (Islands of St. Thomas, St. Croix, Guadeloupe, Dominica, Grenada, and Trinidad), Colombia, Ecuador, Brazil, Peru, and Chile. Specimens from the following localities have been examined:

MEXICO: Colima: Colima, 1 female.

Morelos: Cuernavaca, Oct. 5-17, 1936, H. D. Thomas, 40 males, 126 females.

Oaxaca: Posita, Aug. 24, 1937, H. D. Thomas, 5 males, 6 females; Oaxaca, Aug. 25, 1937, H. D. Thomas, 11 males, 30 females.

Chiapas: Mt. Obando, Apr. 15, 1940, H. M. Smith, 2 males, 3 females.

Yucatan: Motul, July 26, 1932, E. R. Creaser, 1 female, (U. of Mich.); Yunca, July 29, 1932, E. P. Creaser, 1 male, 1 female, (U. of Mich.).

GUATEMALA: Petén, San Andrés Lake, Dec. 10, 1925, Dampf, 1 male; El Salto Escuintla, 1934, F. X. Williams, 3 males, 3 females.

COSTA RICA: San José, Purchased June 1931, Heinrich Schmidt, 4 males, 20 females; San José, June and July, 1931, Heinrich Schmidt, 6 males, 12 females; San José, Purchased 1932, Heinrich Schmidt, 6 males, 4 females; Río Virilla, Dec. 26, 1931, Heinrich Schmidt, 25 males, 14 females.

PANAMA: Tabernilla, June 20, 1907, Aug. Busck (U.S.N.M.), 1 female; Panama, Jan. 31, 1911, 1 male (U.S.N.M.); La Chorrera, May 15, 1912, Aug. Busck, 1 female (U.S.N.M.); Sona, May 1914, J. Zetek, 1 female.

WEST INDIES: St. Thomas: March 11, 1925, F5029, 2 females (A.M.N.H.).

St. Croix: Christiansted, June 1941, H. A. Beatty, 3 males, 12 females; 1941, H. A. Beatty, 4 males, 3 females (U.S.N.M.).

Guadeloupe: A Kirkaldy remnant, 1 female.

Dominica: Laudet, June 13, 1911, 7 males, 2 females
(A.M.N.H.).

Grenada: Mount Gay Est., H. H. Smith, 3 males (U.S.N.M.).

Trinidad: January, Aug. Busck, 1 male (U.S.N.M.).

COLOMBIA: Cali, 3 males, 2 females (U.S.N.M.).

ECUADOR: Baños, March 1936, Clarke McIntyre, 1 male, 3
females; Baños, Runtun Lake, June 1936, Clarke McIntyre, 3
males, 12 females.

BRAZIL: Amazonas: Ireng R. to Roraima, Aug. 13, 1911,
1 male (A.M.N.H.).

Minas Geraes: 1897, Fruhstorfer, 1 male (Berlin Mus.).

PERU: Dept. Cajamarca, May 26 to June 17, 1936, F.
Woytkowski, 117 males, 127 females; Dept. Amazonas, San
Ildefonso, July 29, 1936, F. Woytkowski, 12 males, 11 females;
Dept. Amazonas, Vic. Chachapoyas, Aug. 4-10, 1936, F. Woytkowski,
44 males, 46 females.

CHILE: Magdalena I., May 19, 1925, H. H. Keifer, 3
males, 1 female (Cal. Acad. Sci.).

All specimens listed above are in the Francis Huntington
Snow Entomological Collections, University of Kansas, Lawrence,
Kansas, unless otherwise indicated.

Buenoa pallipes (Fabricius)

(Pl. IX, fig. 56)

1803. Notonecta pallipes Fabricius, J. C. Systema
Rhyngotorum, p. 103.

1868. Anisops pallipes, Stal, C. Kongliga Svenska Vetenskaps-Akademien Handlingar, vol. VII, p. 137 (description).
1901. Anisops pallipes, Champion, G. C. Biologia Centrali Americana, Heteroptera, vol. II, pp. 371-372 (description and gives B. platycnemis as synonym of A. pallipes).
1904. Buenoa pallipes, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 123 & 134 (listed).
1909. Buenoa pallipes, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 201 (catalogue).
1909. Buenoa pallipes, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVII, p. 75 (listed).
1913. Buenoa pallipes, Perkins, R. C. L. Fauna Hawaiiensis, vol. I, p. cciii (ecology and distributional note).
1913. Buenoa pallipes, Kirkaldy, G. W. Fauna Hawaiiensis, vol. II, p. 555 (listed).
1939. Buenoa pallipes, Barber, H. G. New York Acad. Sci., vol. XIV, p. 421.
1939. Buenoa pallipes, Hungerford, H. B. Ann. Ent. Soc. America, vol. XXXII, p. 588 (recorded from Costa Rica).
1944. Buenoa pallipes, Williams, F. X. Proc. Hawaiian Ent. Soc., vol. XII, pp. 193-194 (biology note).
1948. Buenoa pallipes, Zimmerman, E. G. Insects of Hawaii, vol. III, pp. 232-233 (biology note).

Size: Male, length 5.52 mm. to 6.22 mm., greatest body width 1.56 mm. to 1.95 mm.; female, length 5.62 mm. to 6.50 mm., greatest body width 1.69 mm. to 1.95 mm.

Color: General facies sordid white to black. Head, pronotum, thoracic venter, and limbs sordid white to testaceous; pronotum occasionally black with anterior portion

testaceous and carinae rufescent. Scutellum usually black or fuscous, with apex more or less testaceous; metathoracic dorsum testaceous to black. Abdomen usually black except ventral keel, portions of connexivum, and terminal segment, testaceous. Pale specimens entirely sordid white to testaceous except abdominal venter, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex slightly indented, strongly indented just above tylus; greatest width of head six to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis quite narrow but approximately half the anterior width of vertex; along median longitudinal axis, head is slightly less than one third the length of pronotum; notocephalon sulcate dorsally; tylus inflated; labrum with basal width distinctly greater than its median length and apex bluntly rounded; rostral prong (pl. IX, fig. 56b) distinctly longer than third rostral segment, with base originating laterally near distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length approximately two-thirds its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing distinctly tricarinate; lateral margins slightly divergent; posterior margin convex, medianly concave. Scutellum with median length

distinctly less than that of pronotum. Fore femur (pl. IX, fig. 56a) wide and somewhat thickened at apex; oblong to subtriangular stridulatory area consisting of approximately seventeen sclerotized ridges. Fore tibia (pl. IX, fig. 56a) with narrow stridulatory comb (pl. IX, fig. 56c) consisting of approximately thirty-four teeth, apical teeth thicker than basal. Chaetotaxy of male front leg as shown on Plate IX. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex slightly indented, strongly indented just above tylus; greatest width of head approximately six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is one fourth to one third the length of pronotum; notocephalon slightly sulcate; tylus usually not inflated. Pronotum with its median length approximately half its humeral width; disk usually unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two irregular, longitudinal rows intermingling medianly; one inner row of large teeth and one outer row of

smaller teeth; approximately six or seven small, lateral, toothlike setae near apex.

Variation Within Species: As is indicated under measurements of length, this species varies somewhat in size; there is also some variation in the proportional size of the pronotum.

Comparative Notes: Superficially this species closely resembles B. platynemis (Fieber) and B. pallens (Champion). Examination of the male, however, will show distinct differences. This species differs from B. pallens in having the fore femur wide and thickened at apex, and the pronotum distinctly longer and tricarinate. Buenoa pallipes differs from B. platynemis in having the pronotum longer with posterior margin more concave medianly, the frons narrower, and slight differences in the fore femur and rostral prong. Buenoa platynemis is less robust.

Location of Types: The type is located at the Museum of Lund, Sweden.

Data on Distribution: Recorded from Hawaii (fide Zimmerman and Perkins), Mexico, Honduras, Costa Rica, Panama, West Indies (Jamaica, Puerto Rico, St. Thomas, Guadeloupe, St. Vincent), Columbia, Peru, and Paraguay. Specimens from the following localities have been examined:

MEXICO: Oaxaca: Papaloápan, Mar. 4, 1939, M. & E. Gordon, 1 male, 2 females (U. of Mich.).

Chiapas: San Vicente, Jan. 4, 1938, Octavio Utrilla L., 1 male, 2 females.

HONDURAS: Tela, Apr. 1, 1923, T. H. Hubbell, 4 males, 1 female (U. of Mich.); Tela, March 1-15, 1936, John Deal, 76 males, 93 females.

COSTA RICA: San Isidro del Gen., Feb. 1939, Dean L. Rounds, 1 male, 1 female.

WEST INDIES: Jamaica: Montego Bay, Mar. 11, 1911, 1 male (A.M.N.H.); Lumsden Tydenham, St. Ann, Feb., 1928, L. G. Perkins, 3 males, 7 females; Baron Hill Trelawny, Feb., 1928, L. G. Perkins, 2 males, 2 females; Claremont, Feb., 1928, L. G. Perkins, 1 male, 1 female; Bath St. Thomas, Mar. 29, 1937, Chester Roys, 8 males, 19 females; St. Andrew, Dec. 3, 1946, G. B. Thompson, 3 males, 2 females; St. Andrew, Apr. 15-16, 1947, G. B. Thompson, 1 male, 1 female, 1 nymph.

Puerto Rico: Coamo Springs, July 17-19, 1914, 3 males (A.M.N.H.).

St. Thomas: Sulphur River, Apr. 3, 1937, Chester Roys, 15 males, 40 females.

Guadeloupe: St. Anne, Louis Mesmin, 1 male, 1 female.

COLOMBIA: Cali, 1 male, 1 female (U.S.N.M.).

PERU: Dept. Amazonas, Vic. Guayabamba, Aug. 14-19, 1936, F. Woytkowski, 67 males, 70 females.

PARAGUAY: Villarrica, Dec. 6, 1923, Fran. Schade, 4 males; Villarrica, Oct. 9, 1924, Fran. Schade, 1 male; Villarrica, Dec. 16, 1924, Fran. Schade, 19 males; Villarrica, Nov. 20, 1929, Fran. Schade, 1 male, 1 female; Caraveni, June 15, 1924, Fran. Schade, 2 females; Estero Grande, Nov. 1,

1924, Fran. Schade, 3 males; Melinesque, Dept. Caruga, Dec.
 1925, Fran. Schade, 3 males; Melinesque, June 28, 1935,
 Fran. Schade, 3 males, 2 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa platycnemis (Fieber)

(Pl. X, fig. 57)

1851. Anisops platycnemis Fieber, F. X. Abhandlungen Kongl. Bohmischen Gesellschaft Wissenschaften, vol. VII, Series 5, p. 485.
1899. Anisops platycnemis, Kirkaldy, G. W. The Entomologist, vol. XXXII, p. 30.
1901. Anisops platycnemis, Champion, G. C. Biologia Centrali Americana, Heteroptera, vol. II, pp. 371-372 (gives A. platycnemis as synonym of B. pallipes).
1904. Buenoa platycnemis, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, p. 134 (listed and description of B. margaritacea under name B. platycnemis).
1905. ? Buenoa platycnemis, Snow, F. H. Trans. Kansas Acad. Sci., vol. XX, p. 153 (recorded from Texas).
1908. Buenoa platycnemis, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVI, p. 238 (listed).
1909. Buenoa platycnemis, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVII, pp. 75-77 (key, notes, and synonymy).
1914. Buenoa platycnemis, Van Duzee, E. P. Trans. San Diego Soc. Nat. Hist., vol. II, p. 33 (listed).
1916. Buenoa platycnemis, Van Duzee, E. P. New York Ent. Soc., p. 51 (check list).

1917. Buenoa platycnemis, Van Duzee, E. P. Cat. Hemiptera America North of Mexico, p. 455 (catalogue).
1917. Buenoa platycnemis, Hungerford, H. B. Ent. News, vol. XXVIII, p. 176 (key).
1919. Buenoa platycnemis, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, pp. 174 & 176 (description, key, and notes).
1923. Buenoa platycnemis, Torre-Bueno, J. R. de la. Connecticut State Geol. and Nat. Hist. Survey Bull., No. 34, p. 407 (key and notes).
1923. Buenoa platycnemis, Hungerford, H. B. Ent. News, vol. XXXIV, p. 151 (note).
1924. Buenoa platycnemis, Hungerford, H. B. Ann. Ent. Soc. America, vol. XVII, p. 225 (note on mistaken identification).
1925. Buenoa platycnemis, Bare, C. O. Ent. News, vol. XXXVI, p. 228 (distributional note).
1925. Buenoa platycnemis, Hungerford, H. B. and Beamer, R. H. Ent. News, vol. XXXVI, p. 297 (note).
1928. Buenoa platycnemis, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, p. 268 (note).
1928. ? Buenoa platycnemis, Torre-Bueno, J. R. de la. Cornell Univ. Agr. Experiment Station, Memoir 101, p. 139 (listed).
1939. ? Buenoa platycnemis, Millspaugh, D. D. Field and Laboratory, vol. VII, p. 78.

Size: This species varies considerably in size. Male, length 4.55 mm. to 5.35 mm., greatest body width 1.36 mm. to 1.62 mm.; female, length 5.00 mm. to 5.43 mm., greatest body width 1.49 mm. to 1.75 mm.

Color: General facies sordid white to black. Head, pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum sordid white to testaceous with base brown to black;

metanotum usually brown to black with portions testaceous. Abdominal dorsum usually brown to black with portions testaceous; abdominal venter black except keel, portions of connexivum, and last one or two segments, testaceous. Pale specimens entirely sordid white except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex usually slightly indented; greatest width of head five and one half to six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately two fifths the length of pronotum; notocephalon slightly sulcate; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. X, fig. 57b) long, much longer than third rostral segment, with base originating laterally and protruding anteriorly at distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length approximately two thirds its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly truncate. Scutellum with median length less than that of pronotum. Fore femur (pl. X, fig. 57a) wide and somewhat thickened at apex; oblong to subtriangular stridulatory area consisting of approximately eleven

to fourteen sclerotized ridges. Fore tibia (pl. X, fig. 57a) wide with stridulatory comb (pl. X, fig. 57c) consisting of approximately thirty to thirty-five teeth; apical teeth thicker and narrower than basal. Chaetotaxy of male front leg as shown on Plate X. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical one third very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex often indented at lateral margins; greatest width of head five to five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is one third to one half the length of pronotum; notocephalon sulcate; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed, occasionally with faint median carina; lateral margins divergent; posterior margin convex, usually medianly truncate. Scutellum large, with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of large teeth and one outer row of small teeth; approximately three small, lateral, tooth-like setae near apex.

Variation Within Species: As is indicated under measurements of length, this species varies considerably in size;

there is also some variation in the proportional size of head and pronotum.

Comparative Notes: Superficially this species closely resembles B. pallipes (Fabricius) and B. nitida n. sp. Examination of the male, however, will show distinct differences. This species differs from B. pallipes in having the pronotum shorter with posterior margin more truncate medianly, the frons wider, and slight differences in the fore femur and rostral prong. Buenoa platynemesis differs from B. nitida in having a tricarinate pronotum, more sclerotized ridges in the femoral stridulatory area, and in the form of the rostral prong, fore femur, and tibial comb. Buenoa platynemesis is smaller and less robust than the above mentioned species.

Nomenclatorial Notes: One finds in the literature and collections, many species masquerading under the name Buenoa platynemesis. This situation is primarily the result of misidentifications by several distinguished hemipterists. The confusion surrounding this species serves to illustrate the necessity for the worker to have access to type material.

Location of Types: The type, a male, labeled "Portorico St. Thomas Moritz", is located at the Berlin Museum.

Data on Distribution: Many United States records for this species have been erroneously cited in the literature. Buenoa platynemesis is, for the most part, a Neotropical species. From the study of a vast amount of material, this author finds that for the United States, only Texas and Florida are

represented in its distribution. Recorded also from Mexico, Panama, Canal Zone, Costa Rica, West Indies (Cuba, Grand Cayman, Haiti, Jamaica, Mona, Puerto Rico, St. Thomas, St. Croix, and Martinique), Pearl Island, Darien, Colombia, Venezuela, Brazil, and Peru. Specimens from the following localities have been examined:

U.S.A.: Texas: McAllen, Nov. 20, 1932, L. D. Tuthill, 6 males, 4 females; Brownsville, June 29, 1938, R. I. Sailer, 1 male; Progress, July 1, 1938, R. I. Sailer, 7 males, 5 females; Star Co., July 5, 1938, R. I. Sailer, 3 males 4 females; Fulfurrias, Jan. 1, 1946, L. D. Beamer, 2 males, 2 females.

Florida: L. Matecumbe Key, Mar. 14, 1947, R. H. Beamer and L. D. Beamer, 5 males, 6 females.

MEXICO: Sonora: Río Mayo, Arroyo de los Mescales, Feb. 16, 1935, H. S. Gentry, 8 males, 19 females.

Jalisco: Guadalajara, Sept. 13, 1938, H. D. Thomas, 1 female; 15 mi. down Autlán Rd., Sept. 14, 1938, H. D. Thomas, 2 males, 1 female; 15 mi. S. W. Lake Chapala, Sept. 14, 1938, H. D. Thomas, 1 male.

Veracruz: Carrizal, Aug. 6, 1932, A. Dampf, 1 female; Minatitlán, Sept. 22, 1936, H. D. Thomas, 7 females.

Michoacán: El Sabino Uruapan, July 30, 1936, H. D. Thomas, 19 males, 19 females; Zamora, Sept. 8, 1938, H. D. Thomas, 1 male; L. Cuitzeo, July 7, 1947, T. H. Hubbell, 2 males, 3 females.

Federal District: Xochimilco, June 21, 1934, H. Hinton, 1 male, 3 females; Mexico City, July 7, 1937, H. D. Thomas, 6 males, 16 females; Mexico City, 1937, H. D. Thomas, 6 males, 2 females.

Morelos: Cuernavaca, Oct. 5, 1936, H. D. Thomas, 4 males, 3 females.

Guerrero: Iguala, Oct. 7, 1936, H. D. Thomas, 8 males, 14 females; Palo Blanco, Oct. 10, 1936, H. D. Thomas, 1 male, 2 females; Tierra Colo., Oct. 31, 1936, H. D. Thomas, 4 males, 3 females; Río Agua, Oct. 31, 1936, H. D. Thomas, 1 male; Acapulco, Nov. 1, 1936, H. D. Thomas, 6 males, 19 females.

Chiapas: Huixtla, Nov. 9, 1932, A. Dampf, 1 female; Suchiate, Nov. 16-17, 1932, A. Dampf, 1 male, 3 females.

Campeche: Ciudad del Carmen, Sept. 18, 1936, H. D. Thomas, 6 males, 13 females; Hda. Encarnation, Oct. 15, 1936, H. D. Thomas, 6 males, 5 females.

Yucatan: Chichén-Itzá, June 6-27, 1932, E. P. Creaser, 1 male, 2 females, 2 nymphs (U. of Mich.); Chichén-Itzá, Aug. 29, 1936, H. D. Thomas, 2 males; Pisté, June 22, 1932, E. P. Creaser, 2 females (U. of Mich.); Mérida, Jalal Aguada, July 22, 1932, E. P. Creaser, 3 males, 5 females, 1 nymph (U. of Mich.); Mérida, July 28, 1932, E. P. Creaser, 10 males, 5 females, 2 nymphs (U. of Mich.).

PANAMA: Old Panama, Jan. 31, 1911, Aug. Busck, 3 females (U.S.N.M.); Soná, May 1914, J. Zetek, 3 males, 7 females (U.S.N.M.); Cano Saddle, Gatún L., Aug. 6, 1923, R. C. Shannon,

1 male (U.S.N.M.); Las Palmas, Dec. 21, 1944, A. W. Lindquist, 1 male, 2 females (U.S.N.M.); San Miguel, 1 male, 2 females (U.S.N.M.).

CANAL ZONE: Ft. Clayton, 1933, R. F. Edwards, 5 males, 2 females.

COSTA RICA: San Isidro del Gen., Feb. 1939, Dean L. Rounds, 4 males, 1 female.

WEST INDIES: Cuba: Soledad, Feb. 14, 1925, J. G. Myers, 2 males, 5 females; Habana Bot. Garden, Jan. 25, 1932, P. J. Bermudez, 6 males, 8 females; Habana, Casa Blanca, Dec. 20, 1933, P. J. Bermudez, 7 males, 11 females; Habana, 1933, P. J. Bermudez, 31 males, 14 females; Havana Prov., Catalina, Nov. 27, 1933, P. J. Bermudez, 1 female; Matanzas, Yumurí Valley, Dec. 9, 1933, P. J. Bermudez, 1 male; P. R. Uhler Collection, 1 male (U.S.N.M.).

Grand Cayman: Cow well near Pedro Castle, Oxford U. Bio. Exp., Aug. 4, 1938, Lewis and Thompson, 11 males, 11 females.

Haiti: Attelye, Oct. 22, 1925, W. A. Hoffman, 1 male, 1 female (U.S.N.M.); Jacmel, W. A. Hoffman, 2 females (U.S.N.M.).

Jamaica: Palm Beach, Montego Bay, March 11, 1911, 6 males, 2 females (A.M.N.H.); Montego Bay, Mar. 15, 1911, 2 males (A.M.N.H.).

Mona: Feb. 21-26, 1914, 1 male (A.M.N.H.).

Puerto Rico: Culebra, Feb. 1899, Aug. Busck, 2 males (U.S.N.M.); Coamo Springs, July 17-19, 1914, 2 males, 2 females (A.M.N.H.); Mayaguez, Oct. 16, 1930, J. Landrón, 1 male

(U.S.N.M.); Luquillo, July 7-8, 1932, J. Blanch, 2 males, 1 female; Luquillo, July 9, 1932, J. Blanch, 1 male, 1 female (U.S.N.M.); Iuebrada, Feb. 21, 1935, J. G. Diaz, 1 male, 2 females; Florida Road, Feb. 28, 1935, J. G. Diaz, 5 males, 10 females; Almirante Rd., March 9, 1935, J. G. Diaz, 5 males, 8 females; Tortuguero L., Mar. 20, 1935, J. G. Diaz, 3 males, 8 females; Near Isabelá, May 12, 1935, J. G. Diaz, 7 males, 2 females; Exp. Sta. Río Piedras, May 23, 1935, J. G. Diaz, 4 females; Cartagena Lagoon, Aug. 10, 1935, J. G. Diaz, 4 females; Luquillo Mts., Nov. 18, 1935, J. G. Diaz, 4 males, 8 females.

St. Thomas: Charlotte Amalie, June 2, 1917, H. Morrison, 2 males, 3 females (U.S.N.M.); St. Thomas, Mar. 11, 1925, 1 male (A.M.N.H.); St. Thomas, May 15, 1937, Chester Roys, 3 males, 3 females; St. Thomas, Feb., Aug. Busck, 1 female (U.S.N.M.); St. Thomas, Klug, 2 males (Leiden Mus.).

St. Croix: St. Croix, Apr. 4, 1925, F 5145C and F 5022, 1 male, 2 females (A.M.N.H.); St. Croix, 1941, H. A. Beatty, 2 females (U.S.N.M.); St. Croix, No. 744, H. A. Beatty, 1 male, 2 females (U.S.N.M.).

Martinique: Fort de France, June 27, 1911, 1 female (A.M.N.H.).

COLOMBIA: Villavieja, 1944, R. A. Stirton, 22 males, 26 females; Darien, Laguna de Pita, D: Festa, 1 male (U.S.N.M.).

VENEZUELA: San Esteban, Nov. 22, 1939, Pablo J. Anduze, 4 males, 5 females.

BRAZIL: Maranhão: Chapada, No. 2966, 2 males, 2 females.

PERU: Vic. Guayabamba, Aug. 18, 1936, F. Woytkowski, 28 males, 23 females; Fic. Rioja, Dept. San Martín, Sept. 9 to Oct. 3, 1936, F. Woytkowski, 11 males, 11 females; Satipo, Nov. 1942, Pedro Paprzyki, 6 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa omani n. sp.

(Pl. III, fig. 37; Pl. X, fig. 58)

Size: Male, length 5.72 mm. to 6.56 mm., greatest body width 1.62 mm. to 1.88 mm.; female, length 6.17 mm. to 6.69 mm., greatest body width 1.82 mm. to 2.08 mm.

Color: General facies sordid white to nigro-violaceous. Head, pronotum, most of thoracic venter, and limbs sordid white to pale testaceous. Scutellum black with apex and lateral margins yellow to orange; metathoracic dorsum, black. Abdomen black except ventral keel, and portions of connexivum and dorsum, sordid white to pale testaceous. Some specimens entirely sordid white except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, somewhat truncate anteriorly, with vertex slightly indented; greatest width of head seven and one half to eight times the anterior width of vertex and

equal to or slightly less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is one half to three fifths the length of pronotum; notocephalon narrow, sulcate dorsally; frons just above tylus, very narrow; tylus inflated; labrum with basal width approximately twice its median length and apex bluntly rounded; rostral prong (pl. X, fig. 58b) slightly longer than third rostral segment, with base originating laterally at proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length one half to four sevenths its humeral width; disk unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. X, fig. 58a) wide and thickened at apex; subtriangular stridulatory area consisting of four wide, sclerotized ridges. Fore tibia (pl. X, fig. 58a) with stridulatory comb (pl. X, fig. 58c) consisting of approximately sixteen teeth; apical teeth slightly thicker and usually taller than basal. Chaetotaxy of male front leg as shown on Plate X; male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex indented at lateral

margins; greatest width of head approximately six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis half the anterior width of vertex; along median longitudinal axis, head is two fifths to three fifths the length of pronotum; notocephalon narrow, sulcate dorsally; frons just above tylus, narrow; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 37) of normal shape with teeth arranged in two irregular, longitudinal rows which merge in proximal third of ovipositor valve; one inner row of large teeth and one outer row of smaller teeth; approximately seven or eight small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species resembles B. mutabilis n. sp. and B. alterna n. sp. Examination of the male, however, will show distinct differences. This species differs from B. mutabilis in having a narrower frons, wider synthlipsis, and distinctly different femoral stridulatory area and tibial comb. Buena omani differs from B. alterna in having fore femur wider at apex, femoral stridulatory area present, and different rostral prong and tibial comb.

Nomenclatorial Notes: This species was first recognized as new by Mr. C. O. Bare who labeled a series as types and paratypes using the manuscript name B. omani. As such

paratypes may have been widely distributed, it seems desirable to point out that the name was not validated by publication. However, to avoid confusion, the name suggested by Bare has been retained by this author.

Location of Types: Holotype male, allotype female, 2 male and 4 female paratypes, San Diego Co., California, July 4, 1929, L. D. Anderson; other paratypes: 1 male and 1 female, Santa Ana Co., California, July 30, 1932, J. D. Beamer; 1 male and 1 female, Alpine, California, July 9, 1929, Paul W. Oman; 1 male, Laguna Beach, California, July 25, 1933, R. H. Beamer; 1 male and 1 female, Durango, Mexico, May 30, 1937, Meldon Embury. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from United States and Mexico. In addition to type series, specimens from the following localities have been examined:

U.S.A.: California: Miramar, July 28, 1938, R. I. Sailer, 6 males, 5 females; Claremont, P. R. Uhler Collection, 3 males, 1 male (U.S.N.M.).

MEXICO: Sonora: Pocito, Ciudad Las Casas, Sept. 4, 1937, H. D. Thomas, 32 males, 25 females.

Tamaulipas: 5 m. N. of Ciudad Victoria, Nov. 5, 1936, H. D. Thomas, 2 males.

Jalisco: Guadalajara, 20 mi. on Tequila Rd., Sept. 13, 1938, H. D. Thomas, 1 female.

Hidalgo: Real del Monte, Sept. 23, 1938, H. D. Thomas, 2 males; Aguas Fria, Aug. 27, 1944, H. D. Thomas, 1 male.

Michoacán: Patzcuaro, Aug. 31, 1938, H. D. Thomas, 2 males, 6 females; Patzcuaro, Sept. 2, 1938, H. D. Thomas, 2 males, 2 females; Carapa, Sept. 2, 1938, H. D. Thomas, 2 males, 1 female; L. Cuitzeo, July 7, 1947, T. H. Hubbell, 2 males.

Federal District: Mexico, A. Dampf, 1 male, 1 female.

Morelos: Cuernavaca, May 21, 1898, P. R. Uhler Collection, 1 female (U.S.N.M.).

Puebla: Tehuacán, July 18-25, 1937, H. D. Thomas, 2 males, 1 female; Puebla, July 25, 1937, H. D. Thomas, 3 males, 11 females.

Oaxaca: Posita, Aug. 24, 1937, H. D. Thomas, 6 males, 8 females; Oaxaca, Aug. 25, 1937, H. D. Thomas, 1 male, 1 female.

Chiapas: San Cristóbal, Aug. 30, 1937; H. D. Thomas, 74 males, 43 females; San Cristóbal, Sept. 2, 1937, H. D. Thomas, 22 males, 13 females; San Vicente, Jan. 4, 1938, Octavio Utrilla L., 1 male.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa macrotrichia n. sp.

(Pl. X, fig. 59)

Size: Male, length 5.52 mm. to 5.85 mm., greatest body width 1.43 mm. to 1.62 mm.; female, length 5.59 mm. to 6.37 mm., greatest body width 1.49 mm. to 1.75 mm.

Color: General facies black. Head, anterolateral portions of pronotum, thoracic venter, and limbs sordid white to testaceous. Posterior portion of pronotum, scutellum, metathoracic dorsum, and abdomen black except ventral keel, portions of connexivum, and usually terminal segment, testaceous.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head six and one half to seven times the anterior width of vertex and less than humeral width of pronotum; synthlipsis narrow, slightly less than half the anterior width of vertex; along median longitudinal axis, head is slightly less than half the length of pronotum; notocephalon narrow, sulcate dorsally; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. X, fig. 59b) long, distinctly longer than third rostral segment, with base originating laterally and protruding anteriorly at point midway to near distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length approximately four sevenths its humeral width; disk occasionally with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. X, fig. 59a) wide and thickened at

apex, with several large setae on inner posterior margin; triangular stridulatory area consisting of approximately seven to nine sclerotized ridges. Fore tibia (pl. X, fig. 59a) with stridulatory comb (pl. X, fig. 59c) consisting of approximately thirty-one to thirty-four teeth; apical teeth thicker than basal. Chaetotaxy of male front leg as shown on Plate X. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex usually indented at lateral margins only; greatest width of head approximately five and one half times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis narrow, approximately two fifths the anterior width of vertex; along median longitudinal axis, head is slightly less than two fifths the length of pronotum; notocephalon narrow, slightly sulcate; tylus slightly inflated. Pronotum with its median length two fifths to one half its humeral width; disk unimpressed, occasionally with faint median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; inner row of large teeth merges proximally with outer row of smaller teeth; approximately six or seven small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species closely resembles B. mutabilis n. sp. and B. nitida n. sp. Examination of the male, however, will show distinct differences. This species differs from B. mutabilis in having the fore femur wider at apex, possessing several large setae on inner, posterior margin of fore femur, and in having fewer sclerotized ridges in femoral stridulatory area. Buenoa macrotrichia differs from B. nitida in having a narrower synthlipsis and notocephalon, a less robust pronotum, and in possessing the large setae on fore femur.

Location of Types: Holotype male, allotype female, 50 male and 50 female paratypes, vicinity of San Pedro, Peru, May 15-29, 1935, F. Woytkowski. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Peru. In addition to type series, specimens from the following localities have been examined.

PERU: Vic. Pampa Hermosa, May 1-5, 1935, F. Woytkowski, 21 males, 14 females; Vic. San Pedro, May 15-29, 1935, F. Woytkowski, 166 males, 215 females; Vic. Sani Beni, Oct. 24, 1935, F. Woytkowski, 1 female; Dept. Ayacucho, Prov. La Mar. Sivia, June 15-28, 1941, 33 males, 34 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa nitida n. sp.

(Pl. XI, fig. 60)

Size: Male, length 6.17 mm. to 6.82 mm., greatest body width 1.75 mm. to 1.82 mm.; female, length 6.50 mm. to 7.02 mm., greatest body width 1.95 mm. to 2.08 mm.

Color: General facies sordid white to black. Dark form with head, anterolateral portions of pronotum, most of thoracic venter, and limbs sordid white to testaceous. Posterior portion of pronotum, scutellum, metathoracic dorsum, and abdomen black, except ventral keel, portions of connexivum, and terminal segment, testaceous. Hemelytron colorless with a black band at base of membrane. Pale form usually entirely pale testaceous except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum; notocephalon slightly sulcate; tylus usually not inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XI, fig. 60b) long, almost twice as long as third rostral segment, with base originating laterally and protruding anteriorly at

point midway of third rostral segment, and with apex bluntly rounded. Pronotum wide and somewhat inflated, with its median length approximately three fifths its humeral width; disk with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins in pale form only slightly divergent, moreso in dark form; posterior margin convex, medianly truncate to slightly concave. Scutellum with median length less than that of pronotum in pale form, greater than that of pronotum in dark form. Fore femur (pl. XI, fig. 60a) wide and thickened at apex; triangular stridulatory area consisting of six to nine wide, sclerotized ridges. Fore tibia (pl. XI, fig. 60a) with stridulatory comb (pl. XI, fig. 60c) consisting of approximately thirty-one to thirty-three teeth; apical teeth thicker than basal. Chaetotaxy of male front leg as shown on Plate XI. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented at least at lateral margins; greatest width of head approximately six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis half the anterior width of vertex; along median longitudinal axis, head is approximately half the length of pronotum; notocephalon slightly sulcate; tylus not inflated. Pronotum with its

median length two fifths to one half its humeral width; disk unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; inner row of large teeth merges proximally with outer row of smaller teeth; approximately two or three small, lateral, toothlike setae near apex.

Variation Within Species: A slight amount of variation exists between the light and dark forms of this species. They differ primarily in the form of the pronotum and scutellum. The light form differs from the dark in having a more robust pronotum with lateral margins less divergent and a smaller scutellum. These two forms have been taken within the same population.

Comparative Notes: Superficially this species resembles B. macrotrichia n. sp. and B. platycnemis (Fieber). Examination of the male, however, will show distinct differences. This species differs from B. macrotrichia in having a wider synthlipsis and notocephalon, a more robust pronotum, and in lacking the large setae on the inner posterior margin of the fore femur. Buena nitida differs from B. platycnemis in having fewer sclerotized ridges in the femoral stridulatory area, pronotum more robust and not tricarinate, and in the form of the rostral prong, fore femur, and tibial comb.

Location of Types: Holotype male, allotype female, 13 male and 19 female paratypes, Dept. Amazonas, Peru, Aug. 14-19, 1936, F. Woytkowski; other paratypes: 5 males and 6 females, Valão de São Pedro Tereza Santa Estado de Esperito Santo, Feb. 2, 1948, Antenor Leitao de Carvalho. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Brazil and Peru. Specimens from the following localities have been examined:

BRAZIL: Valão de São Pedro Tereza Santa Estado de Esperito Santo, Feb. 2, 1948, Antenor Leitao de Carvalho, 5 males, 6 females.

PERU: Dept. Amazonas, Vic. Guayabamba, Aug. 14-19, 1936, F. Woytkowski, 15 males, 39 females; Dept. San Martín, Vic. Rioja, Sept. 9-Oct. 3, 1936, F. Woytkowski, 15 males, 25 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa mutabilis n. sp.

(Pl. XI, fig. 61)

Size: Male, length 5.20 mm. to 5.98 mm., greatest body width 1.43 mm. to 1.83 mm.; female, length 5.65 mm. to 6.30 mm., greatest body width 1.69 mm. to 1.88 mm.

Color: General facies pale testaceous to black. Head, anterior portion of pronotum, thoracic venter, and limbs sordid white to testaceous. Posterior portion of pronotum usually black; scutellum entirely black, occasionally with apex sordid white to testaceous; metathoracic dorsum light brown to black. Abdomen black except ventral keel, portions of connexivum, and last one or two segments, testaceous. Pale specimens entirely sordid white to testaceous except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis narrow, approximately one third the anterior width of vertex; along median longitudinal axis, head is one half to three fifths the length of pronotum; notoccephalon slightly sulcate; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XI, figs. 61b, 61c) variable, distinctly longer than third rostral segment, with base originating laterally and protruding anteriorly at point midway to near distal end of third rostral segment, and with apex moderately to sharply rounded. Pronotum with its median length one half to four sevenths its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly

concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XI, fig. 61a) not greatly thickened at apex; subtriangular stridulatory area consisting of approximately ten to eighteen sclerotized ridges. Fore tibia (pl. XI, fig. 61a) with stridulatory comb (pl. XI, fig. 61d) consisting of approximately thirty-three to thirty-eight teeth; apical teeth thicker than basal. Chaetotaxy of male front leg as shown on Plate XI. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, head laterally rounded, anteriorly truncate with vertex indented; greatest width of head approximately six times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis narrow, slightly less than half the anterior width of vertex; along median longitudinal axis, head is slightly less than half the length of pronotum; notocephalon slightly sulcate; tylus not inflated. Pronotum with its median length approximately half its humeral width; disk only faintly impressed and sometimes not at all, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one long inner row of large teeth and one long outer row of smaller teeth; approximately seven or eight small, lateral, toothlike setae near apex.

Variation Within Species: This species varies considerably in the form of the rostral prong; there is also some variation in the proportional size of the head and pronotum and in the form of the fore femur. The greatest contrast is shown between a series from Peru and one from Paraguay. The former is a small, pale form, the male with a relatively short, straight rostral prong; the latter is a larger, dark form, the male with a long, curved rostral prong.

Comparative Notes: Superficially this species closely resembles B. macrotrichia n. sp. and B. alterna n. sp., and somewhat resembles the dark form of B. pallens (Champion). Examination of the male, however, will show distinct differences. This species differs from B. macrotrichia in having the fore femur narrower at apex, lacking the large setae on inner, posterior margin of fore femur, and having more sclerotized ridges in femoral stridulatory area. It differs from B. alterna in having a femoral stridulatory area and a distinctly different rostral prong. Buenoa mutabilis differs from B. pallens in having the fore femur wider at apex, the notocephalon distinctly narrower, and the rostral prong protruding anteriorly on third rostral segment. Other minor differences also occur.

Location of Types: Holotype male, allotype female, 23 male and 19 female paratypes, vicinity of Rioja, Dept. San Martín, Peru, Sept. 9-Oct. 22, 1936, F. Woytkowski. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known from West Indies (Haiti), Venezuela, British Guiana, Peru, and Paraguay. In addition to type series, specimens from the following localities have been examined:

WEST INDIES: Haiti: Port au Prince, June, 1925, W. H. Hoffman, 3 females.

VENEZUELA: Surukum, June 1941, P. J. Anduze, 14 males, 7 females, 5 nymphs.

BRITISH GUIANA: Cartabo, Mrs. Brindley, 5 females.

PERU: Vic. Pampa Hermosa, May 1-5, 1935, F. Woytkowski, 5 males; Vic. San Pedro, May 15-29, 1935, F. Woytkowski, 18 males, 17 females; Vic. San Pedro, May 15-19, 1935, F. Woytkowski, 10 males, 6 females; Vic. Sani Beni, Aug. 5, 1935, F. Woytkowski, 5 males, 2 females; Vic. Sani Beni, Sept.-Oct., 1935, F. Woytkowski, 14 males, 21 females; Rio Negro, Oct. 30, 1935, F. Woytkowski, 3 males, 2 females; Dept. Huanuco, Vic. Tingo María, May 10, 1937, F. Woytkowski, 10 males, 9 females; Dept. Huanuco, Vic. of Afilador, June 3-9, 1937, F. Woytkowski, 29 males, 6 females; Dept. Huanuco, Vic. Leonpampa, Dec. 11-30, 1937, F. Woytkowski, 37 males, 26 females; Dept. Huanuco, Loc. Shapajilla, June 1-10, 1938, F. Woytkowski, 25 males, 11 females; Peru, Dec. 12-14, 1937, F. Woytkowski, 41 males, 30 females; Peru, Oct. 8, 1940, F. Woytkowski, 40 males, 43 females; Dept. Ayacucho, Prov. La Mar. Sivia, June 15-28, 1941, F. Woytkowski, 16 males, 7 females; Satipo, Oct., 1942, Pedro Paprzyki, 25 males, 26 females.

PARAGUAY: Villarrica, Jan. 7, 1923, F. Schade, 1 male, 1 female; Villarrica, June 7-15, 1923, F. Schade, 2 females; Villarrica, July 6, 1923, F. Schade, 3 females; Villarrica, Nov. 10, 1923, F. Schade, 1 female; Villarrica, Dec. 5-6, 1923, F. Schade, 3 males, 4 females; Villarrica, Jan. 12, 1924, F. Schade, 1 female; Villarrica, Mar.-Apr., 1924, F. Schade, 1 male, 6 females; Villarrica, July 8, 1924, F. Schade, 1 male, 4 females; Villarrica, Sept. 9-Nov. 16, 1924, F. Schade, 9 females; Villarrica, Dec. 16, 1924, F. Schade, 20 males, 50 females; Villarrica, Jan., 1926, F. Schade, 23 males, 31 females; Villarrica, Mar., 1926, F. Schade, 3 males, 2 females; Estero Grande, Nov. 1, 1924, F. Schade, 1 male, 2 females; Melinesque, Dec. 1925, F. Schade, 3 females; Melinesque, June 20-28, 1935, F. Schade, 4 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa arida n. sp.

(Pl. XI, fig. 62)

Size: Male, length 5.33 mm. to 5.91 mm., greatest body width 1.69 mm. to 1.95 mm.; female, length 5.95 mm. to 7.41 mm., greatest body width 2.01 mm. to 2.21 mm.

Color: General facies sordid white to slate. Head, pronotum, and limbs sordid white to pale testaceous. Thoracic venter testaceous to black; scutellum black with posterolateral

margins and apex sordid white to pale testaceous; metathoracic dorsum pale testaceous to black, usually appearing gray through hyalin hemelytra. Abdomen black except ventral keel and portions of connexivum and dorsum, yellowish white to pale testaceous. Hemelytra hyalin with posterior third black. Some specimens entirely sordid white except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded, vertex slightly indented; greatest width of head seven and one half to eight and one half times the anterior width of vertex and equal to or slightly less than humeral width of pronotum; synthlipsis approximately one half the anterior width of vertex; along median longitudinal axis, head is slightly more than half the length of pronotum; notocephalon sulcate dorsally; frons immediately above tylus, very narrow; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XI, fig. 62b) with length equal to that of third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length slightly more than half its humeral width; disk with two elongate depressions toward the middle forming a median carina; lateral margins slightly divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XI, fig. 62a) wide but not

greatly thickened at apex; large, subtriangular stridulatory area consisting of approximately sixty to sixty-five fine, sclerotized ridges. Fore tibia (pl. XI, fig. 62a) with stridulatory comb (pl. XI, fig. 62c) consisting of approximately nineteen to twenty-two teeth; apical teeth thicker and slightly taller than basal. Chaetotaxy of male front leg as shown on Plate XI. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex usually indented; greatest width of head six to six and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis one half to two thirds the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum; notocephalon sulcate dorsally; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk with two elongate depressions toward the middle forming a median carina; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge proximally; one inner row of large teeth and one outer row of smaller teeth; approximately three or four small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species somewhat resembles B. nitida n. sp. Examination of the male, however, will show distinct differences. This species differs from B. nitida in having head wider in relation to pronotum, frons just above tylus distinctly narrower, fore femur less robust, and differences in the rostral prong, femoral stridulatory area, and tibial comb.

Location of Types: Holotype male, Santa Rita Mts., Arizona, July 10, 1950, W. J. Arnold; allotype female, Santa Rita Mts. Arizona, July 9, 1947, L. D. Beamer; paratypes as follows: 3 males and 2 females, Oro Blanco Mts., Arizona, Apr. 3, 1937, Owen Bryant; 1 male, Gila Co., Arizona, Aug. 5, 1927, R. H. Beamer; 1 female, Santa Catalina Mts., Arizona, July 14, 1950, W. J. Arnold. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from the United States. In addition to type series, specimens from the following localities have been examined:

U.S.A.: Arizona: Santa Cruz Co., Aug. 4, 1927, P. A. Readio, 1 male; Huachuca Mts., July 8, 1932, R. H. Beamer, 1 female; Oro Blanco Mts., Apr. 3, 1937, Owen Bryant, 2 males, 1 female; Catalina Mts., Oct. 27, 1941, Victor Potter, 1 male (U. of Mich.); Catalina Mts., Sabino Canyon, Hubbard Coll., 1 male, 1 female (U.S.N.M.); Arizona, P. R. Uhler Collection, 2 males, 1 female (U.S.N.M.).

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa speciosa n. sp.

(Pl. XII, fig. 63)

Size: Male, length 8.38 mm. to 8.84 mm., greatest body width 2.40 mm. to 2.60 mm.; female, length 8.45 mm. to 9.10 mm., greatest body width 2.53 mm. to 2.66 mm.

Color: General facies pale testaceous to blackish gray. Head, pronotum, and limbs sordid white to pale testaceous. Thoracic venter testaceous to black; scutellum black with posterolateral margins and apex sordid white to testaceous; metathoracic dorsum testaceous to black, usually appearing gray through hyalin hemelytra. Abdomen black except ventral keel and portions of connexivum and dorsum, yellowish white to testaceous. Hemelytra hyalin with posterior third brown to black. Some specimens entirely sordid white to pale testaceous except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented; greatest width of head eight to ten times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis three fifths to four fifths the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum;

notocephalon narrow, sulcate dorsally; tylus inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XII, fig. 63c) unusual in shape, distinctly longer than third rostral segment, with base originating laterally near distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length slightly more than half its humeral width; disk with two shallow, elongate depressions toward the middle forming a faint median carina; usually a subtriangular depression on each side but not appearing tricarinate; lateral margins slightly divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length usually greater than that of pronotum. Fore femur (pl. XII, fig. 63a) wide and thickened at apex; small, triangular stridulatory area consisting of approximately eleven sclerotized ridges. Fore tibia (pl. XII, fig. 63a) with stridulatory comb (pl. XII, fig. 63b) consisting of approximately thirty-nine to forty-two teeth; apical teeth thicker, narrower, and taller than basal. Chaetotaxy of male front leg as shown on Plate XII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex indented only at lateral margins; greatest width of head seven to seven and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis three fifths to four fifths the

anterior width of vertex; along median longitudinal axis, head is slightly more than half the length of pronotum; notocephalon sulcate dorsally; tylus slightly inflated. Pronotum with its median length three sevenths to four sevenths its humeral width; disk usually unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge proximally; one inner row of large teeth and one outer row of smaller teeth; approximately seven or eight small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species resembles B. crassipes (Champion). Examination of the male, however, will show distinct differences. This species differs from B. crassipes in having the head with eyes distinctly larger, frons just above tylus narrower, and distinct differences in the rostral prong, femoral stridulatory area, and tibial comb.

Location of Types: Holotype male, allotype female, 3 female paratypes, 20 miles W. of San Luis Potosí, Mexico, Aug. 8, 1944, H. D. Thomas; other paratypes: 2 males and 1 female, San Luis Potosí, Mexico, Aug. 5, 1944, H. D. Thomas; 3 males and 1 female, Real del Monte, Hidalgo, Mexico, Sept. 23, 1938, H. D. Thomas. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from United States and Mexico. In addition to type series, specimens from the following localities have been examined:

U.S.A.: Texas: Ft. Davis, 1914, C. Thompson, 1 female (U. of Mich.); Alpine, June 5, 1927, 1 male (U.S.N.M.); Davis Mts., July 12, 1938, R. I. Sailer and D. W. Craik, 1 male, 2 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa gracilis n. sp.

(Pl. XII, fig. 64)

Size: Male, length 5.39 mm. to 6.04 mm., greatest body width 1.30 mm. to 1.49 mm.; female, length 5.52 mm. to 6.11 mm., greatest body width 1.36 mm. to 1.69 mm.

Color: General facies sordid white. Head, thoracic dorsum, most of thoracic venter, and limbs sordid white. Abdominal venter black except keel and portions of connexivum, sordid white to pale testaceous; abdominal dorsum yellowish white with irregular black area posteriorly.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head six to six and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis very narrow,

approximately one fourth the anterior width of vertex, often carinate; along median longitudinal axis, head is approximately half the length of pronotum; notocephalon sulcate dorsally; tylus inflated; labrum with basal width approximately twice its median length and apex bluntly rounded to almost truncate; rostral prong (pl. XII, fig. 64b) equal to or slightly shorter than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum long, with its median length two thirds to three fourths its humeral width; disk with two shallow, elongate depressions toward the middle and a deep, subtriangular depression on each side, thus appearing tricarinate posteriorly; lateral margins slightly divergent, occasionally parallel; posterior margin convex, distinctly concave medianly. Scutellum with median length distinctly less than that of pronotum. Fore femur (pl. XII, fig. 64a) relatively wide, not greatly thickened at apex; subtriangular stridulatory area consisting of approximately six to nine wide, sclerotized ridges. Fore tibia (pl. XII, fig. 64a) with stridulatory comb (pl. XII, fig. 64c) consisting of approximately twenty-five to twenty-eight teeth; apical teeth slightly thicker and narrower than basal; approximately four short, peg-like setae (pl. XII, fig. 64d) on inner surface of tibia at apex. Chaetotaxy of male front leg as shown on Plate XII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal

tergite normal, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes, occasionally slightly protuberant; greatest width of head approximately five times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis narrow, approximately one fourth the anterior width of vertex; along median longitudinal axis, head is one half to two thirds the length of pronotum; notocephalon sulcate dorsally; tylus slightly inflated. Pronotum with its median length slightly less than three fifths its humeral width; disk with two shallow, elongate depressions toward the middle and occasionally a large subtriangular depression on each side, thus sometimes appearing faintly tricarinate; lateral margins divergent; posterior margin convex, distinctly concave medianly. Scutellum with median length usually greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of large teeth and one irregular, outer row of smaller teeth; approximately six to ten small, lateral, toothlike setae near apex.

Variation Within Species: Occasionally specimens are found with flight wings not fully developed. These specimens have lateral margins of pronotum parallel, scutellum smaller, and hemelytra with claval sutures less evident and membranes

smaller than the form with fully developed flight wings.

Comparative Notes: Superficially this species somewhat resembles B. oculata n. sp. Examination of the male, however, will show distinct differences. This species is larger than B. oculata, has synthlipsis wider, femoral stridulatory area present, and first tarsal segment of intermediate leg not emarginate.

Location of Types: Holotype male, allotype female, 25 male and 25 female paratypes, Region of Tarapoda, Dept. San Martín, Peru, Feb. 16, 1947, Felix Woytkowski. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known from Mexico, Honduras, Panama, West Indies (Cuba, Jamaica, Puerto Rico, St. Croix, Grenada), and Peru. In addition to type series, specimens from the following localities have been examined:

MEXICO: Veracruz: Minatitlán, Sept. 22, 1936, H. D. Thomas, 15 males, 16 females.

Guerrero: Río Agua, Oct. 31, 1936, H. D. Thomas, 1 male; Acapulco, July 12, 1937, H. D. Thomas, 1 male, 10 females.

Oaxaca: Papaloápan, Feb. 20, 1939, Gordon and Atz, 3 males; Papaloápan, Feb. 22, 1939, Gordon and Atz, 2 females, 2 nymphs (U. of Mich.); Arroyo Zacatispan, Mar. 4, 1943, M. & E. Gordon, 1 female (U. of Mich.).

Chiapas: La Libertad, Jan., 1938, Octavio Utrilla L., 1 male; San Vicente, Jan. 4, 1948, Octavio Utrilla L., 2 females.

Campeche: Ciudad del Carmen, Sept. 1-18, 1936, H. D.

Thomas, 7 males, 14 females.

HONDURAS: Tela, La Fragua farm, March and April, 1923, T. H. Hubbell, 6 males, 3 females (U. of Mich.).

PANAMA: Soná, May 1914, J. Zetek, 1 male.

WEST INDIES: Cuba: Santiago, Sept. 20, 1912, J. M. Espin, 4 males, 3 females, 1 nymph (U.S.N.M.); San Carlos Guantánamo, Oct. 4-8, 1913, 2 males, 1 female, 4 nymphs (U.S.N.M.); Havana, Bot. Garden, Jan. 25, 1932, P. J. Bermudez, 17 males, 12 females.

Jamaica: Palm Beach, Montego Bay, Mar. 11, 1911, 11 males, 3 females, 1 nymph (A.M.N.H.).

Puerto Rico: Guayabla Reservoir, Feb. 20, 1934, S. Hildebrand, 6 males, 4 females (U.S.N.M.); Guinea Reservoir, Feb. 20, 1934, S. Hildebrand, 2 females (U.S.N.M.).

St. Croix: Slob Pond, 1937, H. A. Beatty, 1 male, 1 female (U.S.N.M.); St. Croix, 1941, H. A. Beatty, 2 males, 1 female (U.S.N.M.).

Grenada: Grenada, H. H. Smith, P. R. Uhler Collection, 1 male, 4 females (U.S.N.M.).

PERU: Vic. Sani Beni, Oct. 9-16, 1935, F. Woytkowski, 15 males, 11 females; Dept. San Martín, Region Tarapoto, Feb. 8, 1947, Felix Woytkowski, 24 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, unless otherwise indicated.

Buenoa communis n. sp.

(Pl. XII, fig. 65)

Size: Male, length 5.39 mm. to 6.04 mm., greatest body width 1.49 mm. to 1.75 mm.; female, length 5.91 mm. to 6.50 mm., greatest body width 1.62 mm. to 1.95 mm.

Color: General facies testaceous to rufescent. Head, pronotum, thoracic venter, and limbs sordid white to testaceous; pronotum occasionally with median and basal portions orange. Scutellum usually orange, often with two anterolateral brown to black areas; metathoracic dorsum usually light brown to black. Abdomen light brown to black except ventral keel, portions of connexivum, and last two segments testaceous. Hemelytron with rufescent area at humeral angle. This species somewhat variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head six to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis very narrow, one fifth to one fourth the anterior width of vertex, often carinate; along median longitudinal axis, head is two fifths to one half the length of pronotum; notocephalon narrow, slightly sulcate; tylus not inflated; labrum with basal width more than twice its median length and apex bluntly rounded; rostral prong (pl. XII, fig. 65b) slightly longer than third rostral segment, with base originating laterally near proximal

end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum with median length equal to or slightly less than that of pronotum. Fore femur (pl. XII, fig. 65a) neither wide nor strongly thickened at apex; oblong to subtriangular stridulatory area consisting of approximately twenty-six to thirty-one sclerotized ridges. Fore tibia (pl. XII, fig. 65a) with stridulatory comb (pl. XII, fig. 65c) consisting of approximately thirty-one to thirty-three teeth; apical teeth thicker and slightly narrower than basal. Chaetotaxy of male front leg as shown on Plate XII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical one third very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex usually continuous with that of eyes, occasionally indented at lateral margins; greatest width of head six to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis very narrow, approximately one fourth the anterior width of vertex, often carinate; along median longitudinal axis, head is one third to one half the length of pronotum; notocephalon narrow, slightly sulcate;

tylus not inflated. Pronotum with its median length slightly more than half its humeral width; disk with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate, occasionally with median carina only; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth that merges proximally with long outer row of smaller teeth; approximately four to seven small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species somewhat resembles B. platycnemis (Fieber) and B. mutabilis n. sp. Examination of the male, however, will show distinct differences. This species differs from B. platycnemis in having the fore femur narrower at apex, synthlipsis and notocephalon distinctly narrower, rostral prong shorter, and minor differences in the femoral stridulatory area and tibial comb. Buena communis differs from B. mutabilis in having the synthlipsis narrower, pronotum distinctly tricarinate, more sclerotized ridges in the femoral stridulatory area, and minor differences in the rostral prong and tibial comb.

Location of Types: Holotype male, allotype female, 50 male and 50 female paratypes, vicinity of João Pessoa, River Juruá, Brazil, July 10, to Sept. 20, 1936, A. M. Olalla. The

type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Brazil and Bolivia. Specimens from the following localities have been examined:

BRAZIL: Pará: Lago Grande, Feb. 1939, A. M. Olalla, 2 males, 2 females.

Parahiba: Vic. João Pessoa, River Juruá, July 10, to Sept. 20, 1936, A. M. Olalla, 117 males, 136 females.

BOLIVIA: Junction of Madre de Dios and Beni Rivers, Victoria, Oct. 1937, A. M. Olalla, 124 males, 142 females; R. Beni, Puerto Salinas, Nov. 1937, A. M. Olalla, 4 males, 7 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa artafrons n. sp.

(Pl. XIII, fig. 66)

Size: Male, length 5.20 mm. to 5.88 mm., greatest body width 1.49 mm. to 1.69 mm.; female, length 5.29 mm. to 5.98 mm., greatest body width 1.56 mm. to 1.75 mm.

Color: General facies sordid white to pale testaceous. Head, thorax, and limbs usually sordid white to testaceous. Scutellum occasionally with apex orange and two anterolateral black areas. Abdomen light brown to black except ventral keel and portions of connexivum and dorsum, pale testaceous.

Thoracic and abdominal venter and limbs often entirely light brown to black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex indented; greatest width of head approximately nine times the anterior width of vertex and usually slightly greater than humeral width of pronotum; synthlipsis narrow, approximately half the anterior width of vertex; along median longitudinal axis, head is more than two thirds the length of pronotum; notocephalon narrow, sulcate dorsally; frons immediately above tylus, very narrow; tylus slightly inflated; labrum with basal width twice its median length and apex bluntly rounded; rostral prong (pl. XIII, fig. 66b) slightly longer than third rostral segment, with base originating laterally at a point midway to near proximal end of third rostral segment, and with apex moderately to bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing distinctly tricarinate; lateral margins slightly divergent; posterior margin convex, medianly concave. Scutellum with median length equal to that of pronotum. Fore femur (pl. XIII, fig. 66a) neither wide nor greatly thickened at apex; subtriangular stridulatory area consisting of approximately seven wide, sclerotized ridges. Fore tibia (pl. XIII, fig. 66a) with stridulatory comb (pl. XIII, fig. 66c) consisting of

approximately twenty-five to twenty-seven teeth; all teeth approximately same size and thickness. Chaetotaxy of male front leg as shown on Plate XIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to strongly acuminate apex.

Occasionally specimens are found with flight wings more fully developed. These specimens have head narrower than humeral width of pronotum, lateral margins of pronotum more divergent, and scutellum larger. Both forms have claval sutures present in hemelytra but in the form with more fully developed flight wings, membranes are larger.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes, occasionally indented at lateral margins; greatest width of head approximately seven times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis narrow, approximately half the anterior width of vertex; along median longitudinal axis, head is slightly more than three fifths the length of pronotum; notocephalon narrow, sulcate dorsally; tylus slightly inflated. Pronotum with its median length approximately four sevenths its humeral width; disk usually with two shallow, elongate depressions toward the middle and a shallow, sub-triangular depression on each side, thus appearing faintly tricarinate, occasionally with median carina only; lateral

margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge midway of ovipositor valve; one inner row of large teeth and one outer row of smaller teeth; approximately four or five small, lateral, toothlike setae near apex.

Occasionally specimens are found with flight wings more fully developed. These specimens have head distinctly narrower than humeral width of pronotum, lateral margins of pronotum more divergent, and scutellum larger. Both forms have claval sutures present in hemelytra but in the form with more fully developed flight wings, membranes are larger.

Comparative Notes: Superficially this species resembles B. albida (Champion). Examination of the male, however, will show distinct differences. This species differs from B. albida in having frons just above tylus narrower, tylus without a median depression, rostral prong distinctly shorter, and differences in the femoral stridulatory area and tibial comb.

Location of Types: Holotype male, allotype female, 8 male and 14 female paratypes, Cocoanut Grove, Florida, Aug. 9, 1930, R. H. Beamer and Paul W. Oman; other paratypes: 11 males and 6 females, Wildwood, Florida, Aug. 2-9, 1930, R. H. Beamer and Paul W. Oman. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from the United States.

In addition to type series, specimens from the following localities have been examined:

U.S.A.: Georgia: Okefenokee Swp., July 30, 1934, R. H. Beamer, P. McKinstry, and M. E. Griffith, 15 males, 7 females.

Florida: Sanford, Aug. 4, 1930, Paul W. Oman, 2 males, 1 female; Cocconut Grove, Aug. 9, 1930, R. H. Beamer and Paul W. Oman, 1 male, 19 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa macrotibialis Hungerford

(Pl. III, fig. 38; Pl. XIII, fig. 67)

1924. Buenoa macrotibialis Hungerford, H. B. Ann. Ent. Soc. America, vol. XVII, No. 2, p. 225.
1925. Buenoa macrotibialis, Bare, C. O. Ent. News, vol. XXXVI, No. 8, p. 228 (key).
1926. Buenoa macrotibialis, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057 & 1060(key and description).
1928. Buenoa macrotibialis, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, No. 3, p. 268 (key).
1942. Buenoa macrotibialis, Hutchinson, G. E. American Jr. Sci., vol. CCXL, p. 336 (morphological note).

Size: This species varies considerably in size within the same population. Male, length 5.85 mm. to 6.50 mm., greatest body width 1.49 mm. to 1.69 mm.; female, length 5.91 mm.

to 7.00 mm., greatest body width 1.75 mm. to 2.08 mm.

Color: General facies sordid white to testaceous. Head and limbs testaceous to black. Prothorax sordid white with a smoky to black area on each side above the margin; scutellum testaceous to colorless; metathoracic dorsum and thoracic venter testaceous with portions light brown to black. Abdominal dorsum testaceous with a light brown to black area usually located posteriorly; abdominal venter black with keel, portions of connexivum, and occasionally last segment, testaceous. Hemelytron sordid white with black band covering humeral angle and extending along anterior margin of wing for approximately one fourth its length and occasionally another very small smoky to black area at tip of corium limited usually to edge of wing. This species somewhat variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head approximately six and one half times the anterior width of vertex and usually equal to humeral width of pronotum; synthlipsis half, or slightly less than half, the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum; notocephalon slightly sulcate dorsally; tylus inflated; labrum small, with basal width more than twice its median length and apex bluntly rounded; rostral prong (pl. XIII, fig. 67b) long, much longer than third rostral segment, with base originating laterally at

distal end of third rostral segment causing this segment to protrude anteriorly over terminal segment, and with apex bluntly rounded. Pronotum with its median length approximately three fourths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins slightly divergent; posterior margin convex, medially truncate to slightly concave. Scutellum relatively small, elevated, but depressed near anterior margin by a transverse groove; median length distinctly less than that of pronotum. Fore femur (pl. XIII, fig. 67a) wide and somewhat thickened at apex; obscure, triangular stridulatory area consisting of approximately seven to nine irregular, sclerotized ridges. Fore tibia (pl. XIII, fig. 67a) with stridulatory comb (pl. XIII, fig. 67c) consisting of approximately fifty-four to fifty-six teeth; apical teeth thicker and narrower than basal. Chaetotaxy of male front leg as shown on Plate XIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from broad base to acuminate apex.

A single macropterous form has been seen by this author. This specimen has head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes or slightly indented at lateral margins; greatest width of head approximately six times the anterior width of vertex and usually equal to humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately two thirds the length of pronotum; notocephalon slightly sulcate dorsally; tylus inflated. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate with median carina distinct; lateral margins divergent; posterior margin convex, medianly truncate. Scutellum relatively small, elevated, but depressed near anterior margin by a shallow transverse groove; median length less than that of pronotum. Female ovipositor (pl. III, fig. 38) of normal shape with teeth arranged in two longitudinal rows; one short inner row of few, large teeth and one long outer row of small teeth with a few teeth located medianly and intermingled with the two rows; approximately six or seven small, lateral, toothlike setae near apex.

No macropterous female forms have been seen by this author. This form undoubtedly exists, however, and one would assume that it differs from the brachypterous form in the same characteristics as mentioned for the male.

Comparative Notes: Superficially this species resembles B. limnocastoris Hungerford and B. confusa n. sp. Examination of the male, however, will show distinct differences. This species differs from B. limnocastoris and B. confusa in the shape and chaetotaxy of the fore femur and tibia, the femoral stridulatory area and the shape and length of rostral prong. It also differs from B. limnocastoris in having the pronotum not inflated, tylus not as prominent, and scutellum not as reduced. It differs also, from B. confusa, in that the eyes are not as close together.

Location of Types: Holotype male, allotype female, Bryant's Bog, Douglas Lake, Michigan, Aug. 1-3, 1923, H. B. Hungerford; paratypes as follows: 1 male and 6 females, Pelican Rapids, Minnesota, Aug. 22, 1922, H. B. Hungerford; 2 males and 6 females, Bryant's Bog, Douglas Lake, Michigan, Aug. 3-17, 1923, H. B. Hungerford; 5 males and 6 females, Bryant's Bog, Douglas Lake, Michigan, July 29, 1923, H. B. Hungerford. The above series is in the Francis Huntington Snow Entomological Collections, University of Kansas. Other paratypes collected by H. B. Hungerford are located at University of Michigan, University of Minnesota, U.S. National Museum, and in the following private collections: J. R. de la Torre-Buenoa (now at the University of Kansas), C. J. Drake, W. E. Hoffmann, H. B. Hungerford (now in the Francis Huntington Snow Entomological Collections), R. F. Hussey, and H. M. Parshley.

Data on Distribution: Recorded from Canada, and United States. In addition to the type series, specimens from the following localities have been examined:

CANADA: Manitoba: Cowan, Aug. 7, 1937, H. T. Peters, 1 male brachypterous.

Quebec: Aqueduc Lake, July 23, 1949, Howard Loeb, 1 male and 1 female brachypterous.

Nova Scotia: July 28, 1947, D. Livingston, 2 male brachypterous.

U.S.A.: Minnesota: Minnehaha Creek, Hennepin Co., July 9, 1921, H. B. Hungerford, 1 female brachypterous; Pelican Rapids, Aug. 22, 1922, H. B. Hungerford, 1 female brachypterous; Benson, Aug. 23, 1922, H. B. Hungerford, 5 males and 2 females brachypterous.

Michigan: Cheboygan Co., July 27, 1918, R. F. Hussey, 3 females brachypterous (U. of Mich.); Cheboygan Co., Aug. 14, 1918, R. F. Hussey, 2 females brachypterous (U. of Mich.); Huron Co., Sand Point, June 22, 1922, R. F. Hussey, 6 males and 4 females brachypterous, 1 nymph (U. of Mich.); Douglas Lake, Bryant's Bog, July 17, 1923, H. B. Hungerford, 1 female brachypterous; Douglas Lake, Bryant's Bog, Aug. 1, 1923, H. B. Hungerford, 2 females brachypterous; Douglas Lake, Bryant's Bog, Aug. 3, 1923, H. B. Hungerford, 11 females brachypterous; Douglas Lake, Bryant's Bog, July 30, 1924, H. B. Hungerford, 1 male brachypterous; Douglas Lake, Aug. 6, 1924, H. B. Hungerford, 5 males and 43 females brachypterous;

Douglas Lake, Bryant's Bog, July 24, 1925, H. B. Hungerford, 1 male and 9 females brachypterous; Douglas Lake, Bryant's Bog, Aug. 8, 1925, H. B. Hungerford, 1 male and 9 females brachypterous.

South Dakota: Weta, July 18, 1937, R. H. Beamer and C. L. Johnston, 1 male macropterous, 1 male brachypterous.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa limnocastoris Hungerford

(Pl. II, fig. 8; Pl. III, fig. 40; Pl. XIII, fig. 68)

1923. Buenoa limnocastoris Hungerford, H. B. Ent. News, vol. XXXIV, No. 5, pp. 150-152.
1924. Buenoa limnocastoris, Hungerford, H. B. Ann. Ent. Soc. America, vol. XVII, No. 2, pp. 223-227 (discussion of biology and taxonomy).
1925. Buenoa limnocastoris, Bare, C. O. Ent. News, vol. XXXVI, No. 8, p. 228 (key).
1926. Buenoa limnocastoris, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057, 1059 & 1060 (key and description).
1928. Buenoa limnocastoris, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, No. 3, p. 268 (key).

Size: This species varies considerably in size from its most northern range, Quebec, Canada, to its most southern range, Florida. Male, length 4.77 mm. to 6.17 mm., greatest body width 1.30 mm. to 1.62 mm.; female, length 5.00 mm. to 6.37 mm., greatest body width 1.50 mm. to 1.95 mm.

Color: General facies sordid white to testaceous. Head and limbs testaceous to black. Prothorax sordid white with a smoky to black area on each side above the margin; scutellum sordid white to colorless; metathoracic dorsum and thoracic venter testaceous with portions light brown to black. Abdominal dorsum testaceous with a light brown to black area located posteriorly; abdominal venter testaceous, with portions of connexivum black or black with keel and portions of connexivum testaceous. Hemelytron sordid white with black band covering humeral angle and extending along anterior margin of wing for approximately one third its length and another large sub-triangular black area at tip of corium, extending across wing. This species somewhat variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with lateral margins of vertex slightly indented; greatest width of head approximately five and one half times the anterior width of vertex and greater than humeral width of pronotum; synthlipsis approximately one third the anterior width of vertex; along median longitudinal axis, head is slightly less than half the length of pronotum; notocephalon slightly sulcate dorsally; tylus inflated; labrum very short, basal width approximately three times its median length with apex bluntly rounded; rostral prong (pl. XIII, fig. 68b) distinctly longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex bluntly rounded. Pronotum with its

median length equal to its humeral width; in lateral view, strongly arched and inflated with a deep depression laterally near posterior margin; disk with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly truncate. Scutellum small, elevated, but depressed near anterior margin by a transverse groove; median length much less than that of pronotum. Fore femur (pl. XIII, fig. 68a) widened but with anterior margin sharply curved at apex; obscure, subtriangular stridulatory area consisting of approximately six or seven sclerotized ridges. Fore tibia (pl. XIII, fig. 68a) with stridulatory comb (pl. XIII, fig. 68c) consisting of approximately forty to forty-five teeth; apical teeth thicker and narrower than basal. Chaetotaxy of male front leg as shown on Plate XIII. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal (pl. II, fig. 8), tapering gradually from broad base to acuminate apex; length variable.

Macropterous forms are occasionally found. These specimens have head narrower than humeral width of pronotum; pronotum not as strongly inflated; scutellum much larger and without transverse depression near anterior margin; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Female Structural Characteristics: As viewed from above, outline of head rounded with lateral margins of vertex slightly

indented; greatest width of head five to six times the anterior width of vertex and usually equal to or greater than humeral width of pronotum; synthlipsis approximately one third the anterior width of vertex; along median longitudinal axis, head is approximately one half the length of pronotum; notocephalon slightly sulcate dorsally; tylus inflated. Pronotum with its median length approximately two thirds its humeral width; not strongly arched or inflated as in male and without lateral depression near posterior margin; disk usually faintly tricarinate, occasionally with only median carina; lateral margins divergent; posterior margin convex, medianly truncate. Scutellum small, elevated, but depressed near anterior margin by a shallow transverse groove; median length distinctly less than that of pronotum. Female ovipositor (pl. III, fig. 40) of normal shape with teeth arranged in two longitudinal rows; one very short inner row of few, large teeth and one long, irregular outer row of small teeth with a few teeth located medianly and intermingled with the two rows; one or two small, lateral, toothlike setae near apex.

Macropterous forms are occasionally found. These specimens have head distinctly narrower than humeral width of pronotum; pronotum wider and stronger; scutellum much larger with its median length greater than that of pronotum and without transverse depression near anterior margin; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also some variation in the proportional size of the pronotum. The greatest contrast is shown between several series from Canada, Minnesota, and Michigan, and a series from Florida. The former is a large form, the males seldom less than 6 mm. in length; the males of the latter form are approximately 5 mm. in length.

Comparative Notes: Superficially this species somewhat resembles B. macrotibialis Hungerford. Examination of the male, however, will show distinct differences. This species differs from B. macrotibialis in the shape and chaetotaxy of the fore femur and tibia, the femoral stridulatory area, the shape and length of rostral prong, and in having the pronotum strongly inflated. The latter character, especially, will also separate this species from B. confusa n. sp., which it also somewhat resembles.

Location of Types: Described from a series taken near Maple Hill, Cook County, Minnesota, Aug. 12, 1922 by H. B. Hungerford. Holotype male in University of Minnesota Collection, allotype female in the Francis Huntington Snow Entomological Collections, University of Kansas, and paratypes at University of Minnesota, University of Kansas, U.S. National Museum, and the following private collections: J. R. de la Torre-Bueno (now at University of Kansas), C. J. Drake, W. E. Hoffmann, H. B. Hungerford (now in Francis Huntington Snow

Entomological Collections), R. F. Hussey, and H. M. Parshley.

Data on Distribution: Recorded from Canada and the United States. In addition to type series, specimens from the following localities have been examined:

CANADA: Quebec: Beattie Lake, Aug. 11, 1949, H. Loeb, 1 male and 1 female brachypterous.

U.S.A.: Minnesota: Cook County, Beaver Dam, Aug. 12, 1922, H. B. Hungerford, 1 male and 1 female macropterous, 5 females brachypterous; Cook Co., Beaver Dam, Aug. 12, 1922, W. E. Hoffmann, 3 male brachypterous; Pelican Rapids, Aug. 22, 1922, H. B. Hungerford, 1 female macropterous.

Michigan: Cheboygan Co., July 29, 1918, 1 male brachypterous (U. of Mich.); Cheboygan Co., Aug. 19, 1918, R. F. Hussey, 1 male and 6 females brachypterous (U. of Mich.); Huron Co., Sand Point, June 22, 1922, R. F. Hussey, 2 males and 1 female brachypterous, 1 nymph (U. of Mich.); Douglas Lake, June 29, 1923, H. B. Hungerford, 1 male brachypterous; Douglas Lake, Sedge Point Pool, July 3-24, 1923, H. B. Hungerford, 20 males and 38 females brachypterous; Douglas Lake, Bessey Creek, July 18, 1923, H. B. Hungerford, 2 males brachypterous; Douglas Lake, Mud Lake, July 31, 1923, H. B. Hungerford, 1 female brachypterous; Douglas Lake, Sedge Point Pool, Aug. 15, 1923, H. B. Hungerford, 1 male and 4 females brachypterous, 1 nymph; Douglas Lake, Bryant's Bog, Aug. 17, 1923, H. B. Hungerford, 1 female brachypterous; Douglas Lake Nickols pond, July 22, 1924, H. B. Hungerford, 2 females

brachypterous; Douglas Lake, July 27 to Aug. 8, 1924, H. B. Hungerford, 19 males and 45 females brachypterous; Douglas Lake, Bryant's Bog, July 30, 1925, H. B. Hungerford, 1 female brachypterous; Douglas Lake, July 29, 1926, H. B. Hungerford, 1 male macropterous, 1 male and 2 females brachypterous.

Maine: Bridgton, Aug. 20, 1934, R. H. Beamer, 1 male brachypterous.

New Jersey: P. R. Uhler Collection, 1 female brachypterous (U.S.N.M.).

Virginia: Virginia Beach, Aug. 11, 1934, M. E. Griffith, 1 male and 1 female brachypterous.

Georgia: Okefenokee Swamp, Aug. 3, 1934, M. E. Griffith, 1 male macropterous; Okefenokee Swamp, July 27, 1931, J. D. Beamer, 1 male brachypterous.

Florida: Ponce de Leon, July 13, 1934, R. H. Beamer, 1 male and 1 female macropterous, 5 males and 12 females brachypterous; Wakulla Springs, July 14, 1934, P. A. McKinstry and R. H. Beamer, 1 male and 1 female macropterous.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buena confusa n. sp.

(Pl. II, fig. 20; Pl. III, fig. 34; Pl. XIV, fig. 69)

1894. Anisops elegans, Uhler, P. R. Proc. California Acad. Sci., vol. IV, p. 293 (distributional note).
1894. Anisops elegans, Uhler, P. R. Proc. Zoological Soc. London, p. 223 (descriptive and distributional note).

1908. Buenoa elegans, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVI, p. 238 (listed).
1909. Buenoa elegans, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 200 (catalogue).
1909. Buenoa elegans, Torre-Bueno, J. R. de la. Jr. New York Ent. Soc., vol. XVII, pp. 75-77 (key and notes).
1910. Buenoa elegans, Smith, J. B. Catalogue Insects New Jersey, edn. 3, p. 170.
1912. Buenoa elegans, Torre Bueno, J. R. de la. Canadian Ent., vol. XLIV, p. 213 (listed).
1914. Buenoa elegans, Parshley, H. M. Psyche, vol. XXI, p. 140 (listed).
1916. Buenoa elegans, Van Duzee, E. P. New York Ent. Soc., p. 51 (check list).
1917. Buenoa elegans, Hungerford, H. B. Ent. News, vol. XXVIII, p. 176 (key).
1917. Buenoa elegans, Parshley, H. M. Occasional Papers Boston Soc. Nat. Hist., vol. VII, p. 113 (listed).
1917. Buenoa elegans, Van Duzee, E. P. Catalogue Hemiptera America North of Mexico, p. 455.
1919. Buenoa elegans, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, pp. 173-176 (description and key).
1919. Buenoa elegans, Hungerford, H. B. Univ. Kansas Sci. Bull., vol. XI, p. 332 (figure).
1921. Buenoa elegans, Parshley, H. M. Proc. British Columbia Ent. Soc., no. 18, p. 24.
1923. Buenoa elegans, Torre-Bueno, J. R. de la. Guide to Insects of Connecticut, part 4, p. 407.
1923. Buenoa elegans, Hungerford, H. B. Ent. News, vol. XXXIV, pp. 150-152 (notes).
1923. Buenoa elegans, Torre-Bueno, J. R. de la. Connecticut State Geol. and Nat. Hist. Survey Bull., no. 34, p. 407 (key and notes).
1924. Buenoa elegans, Hungerford, H. B. Ann. Ent. Soc. America, vol. XVII, pp. 225-226 (notes).

1925. Buenoa elegans, Hungerford, H. B. and Beamer, R. H. Ent. News, vol. XXXVI, pp. 272 & 297 (notes).
1925. Buenoa elegans, Bare, C. O. Ent. News, vol. XXXVI, pp. 225 & 228 (key and note).
1926. Buenoa elegans, Bare, C. O. Ann. Ent. Soc. America, vol. XIX, pp. 96-97 (biological note).
1926. Buenoa elegans, Blatchley, W. S. Heteroptera or True Bugs of Eastern North America, pp. 1057 & 1059 (key and description).
1928. Buenoa elegans, Torre-Bueno, J. R. de la. Cornell Univ. Agricultural Exp. Station, Memoir 101, p. 139 (listed).
1928. Buenoa elegans, Bare, C. O. Univ. Kansas Sci. Bull., vol. XVIII, pp. 268 & 241-243 (key and figures).
1940. Buenoa elegans, Hungerford, H. B. Ent. Monthly Magazine, vol. LXXVI, p. 256 (note).
1942. Buenoa elegans, Rice, L. A. Tennessee Acad. Sci., vol. XVII, pp. 55 & 63 (notes).
1942. Buenoa elegans, Hutchinson, G. E. American Jr. Sci., vol. CCXL, pp. 335-338 (notes and figures).
1948. Buenoa elegans, Hynes, H. B. N. Trans. Royal Ent. Soc. London, vol. XCIX, p. 35⁴ (distributional note).

Size: This species varies considerably in size from its most northern range, Manitoba, Canada, to its most southern range, Florida and the Cayman Islands. Male, length 4.16 mm. to 5.78 mm., greatest body width 1.10 mm. to 1.49 mm.; female, length 4.29 mm. to 7.00 mm., greatest body width 1.30 mm. to 1.62 mm.

Color: General facies sordid white to pale testaceous. Head, pronotum, scutellum, most of thoracic venter, and limbs sordid white to testaceous. Metathoracic dorsum usually sordid

white with a light brown to black, longitudinal stripe on each side. Abdominal venter light brown to black except keel and portions of connexivum, pale testaceous; abdominal dorsum usually sordid white to testaceous with a lateral, light brown to black area near posterior end. Hemelytron hyalin, usually with a black band covering humeral angle and extending along anterior margin of wing for approximately one fourth its length, and a light brown to black area at tip of corium. This species somewhat variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; head large with eyes prominent; greatest width of head seven to seven and one half times the anterior width of vertex and greater than humeral width of pronotum; synthlipsis narrow, approximately one third the anterior width of vertex; along median longitudinal axis, head is five sevenths to six sevenths the length of pronotum; notocephalon narrow, slightly sulcate dorsally; tylus inflated; labrum with basal width approximately twice its median length and apex bluntly rounded; rostral prong (pl. XIV, fig. 69b) distinctly longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately two thirds its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate;

lateral margins divergent; posterior margin convex, medianly truncate. Scutellum elevated but depressed near anterior margin by a transverse groove; median length less than that of pronotum. Fore femur (pl. XIV, fig. 69a) wide, somewhat thickened at apex; obscure, subtriangular stridulatory area consisting of approximately five or six sclerotized ridges. Fore tibia (pl. XIV, fig. 69a) with stridulatory comb (pl. XIV, fig. 69c) consisting of forty to fifty teeth; apical teeth thicker and narrower than basal. Chaetotaxy of male front leg as shown on Plate XIV. Male genital claspers (pl. II, fig. 20) normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from broad base to acuminate apex; length variable.

Macropterous forms are occasionally found. These specimens have head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; eyes prominent; greatest width of head six to six and one half times the anterior width of vertex and slightly greater than humeral width of pronotum; synthlipsis narrow, approximately one third the anterior width of vertex; along median longitudinal axis, head is approximately five sixths the length of pronotum; notocephalon narrow, slightly

sulcate dorsally; tylus slightly inflated. Pronotum with its median length approximately three fifths its humeral width; disk usually with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin convex, medianly truncate. Scutellum slightly elevated but depressed near anterior margin by a shallow, transverse groove; median length equal to or slightly greater than that of pronotum. Female ovipositor (pl. III, fig. 34) of normal shape with teeth arranged in three longitudinal rows; one very short inner row of few, large teeth, one median row of normal teeth, and one long outer row of smaller teeth which merges proximally with median row; approximately four or five small, lateral, toothlike setae near apex.

Macropterous forms are occasionally found. These specimens have head distinctly narrower than humeral width of pronotum; pronotum wider and stronger with lateral margins more divergent; scutellum much larger with its median length distinctly greater than that of pronotum and without transverse depression near anterior margin; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also some variation in the proportional size of the pronotum and head. The greatest contrast is shown between

two series from Manitoba, Canada and Storrs, Connecticut and several series from Florida and the Cayman Islands. The former is a large form, the male seldom less than 5.75 mm. in length; the males of the latter form are approximately 4.50 mm. in length. Due to the fact that all characters used in species determination are identical in these two forms, no specific separation appears justified. It is the opinion of this author that the immediate environment, including such factors as food source, temperature of water, salinity of water, etc. are responsible for these variations.

Comparative Notes: Superficially this species resembles B. macrotibialis Hungerford. Examination of the male, however, will show distinct differences. This species differs from B. macrotibialis in having a narrower synthlipsis, distinctly shorter pronotum, a much less robust front leg, and differences in the femoral stridulatory area and rostral prong.

Nomenclatorial Notes: One finds in the literature and collections that this species has been masquerading under the name Buena elegans (Fieber). On examining notes and sketches accumulated on Fieber's type (Berlin Museum) by Dr. H. B. Hungerford in 1928, the validity of B. elegans appeared to be questionable. Through the kindness of Dr. S. V. Keler of the Berlin Museum, the type specimen, a male, was made available to me for study. Anisops elegans Fieber is a good Anisops species. The Buena known to a generation of entomologist as Buena elegans (Fieber) was, therefore, an

undescribed species. The confusion surrounding this species serves to illustrate the necessity for the worker to have access to type material. The A. elegans type was sent to Dr. George T. Brooks who determined the specimen as A. apicalis Stol, an African species. In Fieber's original description, he gives the locality as "Aus Amerika". The type is labeled "Brasil Coll. Germ.". Due to the fact that Anisops is an Old World genus and the type has been determined A. apicalis, an African species, it would seem that the label on Fieber's type specimen is in error.

Location of Types: Holotype male, allotype female, 23 male and 24 female paratypes, Douglas Co., Kansas, Nov. 3-7, 1922, H. B. Hungerford and Robert Guntert. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from Canada, United States, Mexico (fide Uhler), and West Indies (Grand Cayman, Grenada). In addition to type series, specimens from the following localities have been examined:

CANADA: Alberta: Red Deer R., Aug. 3, 1937, H. T. Peters, 4 males and 5 females brachypterous.

Manitoba: Cowan, Aug. 7, 1937, R. H. Beamer, H. T. Peters, and C. L. Johnston, 12 males and 7 females macropterous.

U.S.A.: North Dakota: Fargo, July 26, 1937, C. L. Johnston, 1 male macropterous.

South Dakota: Weta, July 18, 1937, R. H. Beamer, H. T. Peters, and C. L. Johnston, 1 male and 1 female brachypterous,

7 males and 4 females macropterous; Waubay, Blue Dog Lake, Sept. 14, 1939, H. C. Severin, 1 male and 1 female brachypterous.

Minnesota: Cook Co., Aug. 12, 1922, H. B. Hungerford, 2 males brachypterous, 1 female macropterous; Benson, Aug. 23, 1922, H. B. Hungerford, 4 males and 2 females brachypterous.

Michigan: Cheboygan Co., July 27, to Aug. 14, 1918, R. F. Hussey, 2 males and 3 females brachypterous (U. of Mich.); Cheboygan Co., July 27, 1936, H. B. Hungerford, 1 male and 1 female brachypterous; Berrien Co., June 30, 1919, R. F. Hussey, 2 males and 1 female brachypterous (U. of Mich.); Berrien Co., Sept. 2, 1919, R. F. Hussey, 5 males and 5 females brachypterous (U. of Mich.); Ann Arbor, July 30, 1921, R. F. Hussey, 1 male and 1 female brachypterous (U. of Mich.); Douglas L., Bryant's Bog, July 3-31, 1923, H. B. Hungerford, 28 males and 18 females brachypterous, 2 nymphs; Douglas L., Bryant's Bog, Aug. 1-17, 1923, H. B. Hungerford, 36 males and 57 females brachypterous, 2 nymphs; Douglas L., Bryant's Bog, July 30, 1924, H. B. Hungerford, 1 male brachypterous; Douglas L., Bryant's Bog, H. B. Hungerford, July 24, 1925, 9 males and 15 females brachypterous; Douglas L., Bryant's Bog, Aug. 12, 1925, H. B. Hungerford, 7 males and 6 females brachypterous; Douglas L., Sedge Point Pool, Aug. 15, 1923, 1 male brachypterous.

New York: Huntington, May, 1909, Bueno Collection, 1 male brachypterous; White Plains, Sept. 28, 1924, J. R. de la Torre-Bueno, 1 male and 1 female brachypterous.

Connecticut: Storrs, Aug. 13, 1946, R. H. Beamer, 6 males and 7 females brachypterous.

New Jersey: Ft. Lee Dist., Sept. 18, 1904, 1 male and 2 females brachypterous; Rancoca, Aug. 29, 1927, E. M. Becton, 2 females brachypterous, 1 nymph.

District of Columbia: Washington, Aug. 20, 1893, P. R. Uhler, 1 female brachypterous (U.S.N.M.).

Kansas: Douglas Co., Nov. 3-7, 1922, H. B. Hungerford and Robert Guntert, 1 male and 5 females brachypterous, 2 nymphs; Douglas Co., Nov. 3, 1922, H. B. Hungerford, 1 male brachypterous; Douglas Co., Sept. 28, 1924, C. O. Bare, 1 male brachypterous; Cherokee Co., Larson's Creek, Aug. 18, 1923, R. H. Beamer, 8 males and 10 females brachypterous; Atchison Co., July 15, 1924, E. P. Breaky, 1 female brachypterous; Doniphon Co., July 20, 1924, R. H. Beamer, 2 males brachypterous.

Virginia: Great Falls, Jan. 9, 1906, D. H. Clemons, 1 female macropterous (U.S.N.M.).

Texas: Cedar Lane, Aug. 9, 1928, R. H. Beamer, 1 male and 1 female macropterous; Orange Co., Aug. 14, 1928, R. H. Beamer, 1 female macropterous; Rockport, Jan. 1, 1946, L. D. Beamer, 2 male brachypterous.

Louisiana: Baton Rouge, June 1905, A. W. Morrill, 1 female macropterous (U.S.N.M.); Creole, June 18, 1948, E. L. Todd, 7 males and 26 females macropterous.

Mississippi: Shuqualak, July 16, 1930, Paul W. Oman, 1 male brachypterous; Bay St. Louis, July 9, 1934, R. H. Beamer,

3 females macropterous.

Alabama: Grand Bay, July 11, 1934, R. H. Beamer and P. A. McKinstry, 3 males and 4 females brachypterous.

Georgia: Okefenokee Swp., July 30, 1934, J. D. Beamer, M. E. Griffith, and P. McKinstry, 4 males and 15 females brachypterous, 1 male and 2 females macropterous; Okefenokee Swp., Aug. 3, 1934, R. H. Beamer, 26 males and 15 females brachypterous, 1 male macropterous, 3 nymphs; Okefenokee Swp., July 25-27, 1939, R. H. and J. D. Beamer and E. G. Wegenek, 5 males and 9 females brachypterous, 4 males and 2 females macropterous, 1 nymph; Okefenokee Swp., Aug. 1, 1939, J. D. Beamer, 1 female brachypterous.

Florida: Archer, July 31, 1930, R. H. Beamer, Paul W. Oman, and J. Nottingham, 6 males and 12 females brachypterous, 7 males and 11 females macropterous; Yankeetown, July 31, 1930, R. H. Beamer, J. Nottingham, and L. D. Tuthill, 3 males and 3 females brachypterous, 3 males and 3 females macropterous; Inverness, Aug. 1, 1930, Paul W. Oman and J. Nottingham, 3 males and 4 females brachypterous, 1 male and 3 females macropterous; Wildwood, Aug. 2, 1930, R. H. Beamer, Paul W. Oman, and L. D. Tuthill, 34 males and 29 females brachypterous, 3 males and 2 females macropterous; Sanford, Aug. 4, 1930, R. H. Beamer and Paul W. Oman, 26 males and 17 females brachypterous, 1 male and 2 females macropterous, 3 nymphs; Cocoanut Grove, Aug. 9, 1930, R. H. Beamer and Paul W. Oman, 14 males and 10 females brachypterous, 2 males and 5 females macropterous, 8 nymphs; Ft. Mead, Aug. 13, 1930, Paul W. Oman,

4 males and 3 females brachypterous, 3 nymphs; Plant City, Aug. 15, 1930, Paul W. Oman, 1 female brachypterous; Plant City, July 14, 1939, P. B. Lawson and R. H. Beamer, 6 males and 4 females macropterous; Hilliard, July 28, 1934, R. H. Beamer, 2 males and 3 females macropterous; Old Town, July 11, 1939, P. B. Lawson, 1 female macropterous; La Belle, July 16, 1939, P. B. Lawson and R. H. Beamer, 6 males and 3 females macropterous; Lacoochee, Aug. 9, 1939, J. D. Beamer, 1 female brachypterous, 1 female macropterous.

WEST INDIES: Grand Cayman: Georgetown, Apr. 17, 1926, C. B. Lewis and G. H. Thompson, 1 male and 2 females macropterous.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa fuscipennis (Berg)

(Pl. II, fig. 7; Pl. III, fig. 28; Pl. XIV, fig. 71)

1879. Anisops fuscipennis Berg, C. Hemiptera Argentina, pp. 198-199 (described from Argentina).
1899. Anisops nalias Kirkaldy, G. W. Entomologist, vol. XXXII, p. 194 (described from Chile). New Synonymy.
1904. Buenoa nalias, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 120 & 134 (listed). New Synonymy.
1904. Buenoa fuscipennis, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 120 & 134 (listed).
1909. Buenoa nalias, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 200 (catalogue).

1909. Buenoa fuscipennis, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 200 (catalogue).
1928. Buenoa dentipes Jaczewski, T. Ann. Musei Zoologici Polonici, vol. VII, pp. 127-129 (described from Brazil). New Synonymy.
1935. Buenoa naias, De Carlo, J. A. Revista Chilena de Historia Natural, p. 110 (catalogue).

Size: Male, length 6.82 mm. to 7.21 mm., greatest body width 1.82 mm. to 2.01 mm.; female, length 7.02 mm. to 7.28 mm., greatest body width 1.95 mm. to 2.08 mm.

Color: General facies testaceous to fuscous. Head, thoracic dorsum, portions of thoracic venter, and abdominal dorsum, and limbs, testaceous. Portions of thoracic venter and abdominal dorsum light brown to black. Abdominal venter black except ventral keel, posterior margins of segments, and portions of connexivum, testaceous.

Male Structural Characteristics: As viewed from above, outline of head rounded with lateral margins of vertex indented; greatest width of head approximately five times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately half the length of pronotum; tylus inflated; labrum short, basal width approximately a third greater than its median length with apex moderately rounded; rostral prong (pl. XIV, fig. 71b) shorter than third rostral segment, with base originating laterally at proximal end of third rostral

segment, and with apex bluntly rounded. Pronotum with its median length slightly more than half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Trochanter of fore leg with prominent tubercle on posterior margin. Fore femur (pl. XIV, fig. 71a) neither wide nor thickened at apex; without stridulatory area but with row of short, thick, setae on posterior margin of inner surface. Fore tibia (pl. XIV, fig. 71a) with stridulatory comb (pl. XIV, fig. 71c) consisting of approximately eleven thick teeth of uniform size. Chaetotaxy of male front leg as shown on Plate XIV. Intermediate tibia with row of short, thick setae located parallel with inner, anterior margin in apical half. Male genital claspers (pl. III, fig. 28) abnormal in shape. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 7) short and thick, tapering gradually from broad base to acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex slightly protuberant; greatest width of head approximately four and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately half the anterior width of vertex; along median longitudinal axis, head is more than half the length of pronotum; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed; lateral margins divergent; posterior

margin convex, medianly concave. Scutellum large with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in three longitudinal rows; one short inner row of larger teeth, one outer row of smaller teeth, and one median row of relatively large teeth which originates in apical fourth of valve and intermingles with outer row proximally; approximately eight or nine small, lateral, toothlike setae near apex in an irregular row.

Comparative Notes: Superficially this species somewhat resembles B. margaritacea Torre-Bueno and B. scimitra Bare. Examination of the male, however, will show distinct differences. This species differs from B. margaritacea and B. scimitra in having a tubercle on the trochanter of the front leg, in having a row of short, thick setae on the intermediate tibia, and in lacking a stridulatory area on the femur of the front leg.

Nomenclatorial Notes: A small series of specimens from Argentina, compared with the types of B. fuscipennis by Dr. J. A. De Carlo, assisted the author to conclude that B. naias Kirkaldy and B. dentipes Jaczewski are identical with this species. Buenoa naias and B. dentipes are hereby placed in synonymy with B. fuscipennis (Berg) 1879.

Location of Types: The original type series from Argentina, is located at the Museo de La Plata, Argentina. Homotype male, "Prov. Buenos Aires, Oct. 27, 1898. S. Venturi," compared with the type by Dr. J. A. De Carlo of the Museo

Argentino de C. Naturales, is now in the Francis Huntington Snow Entomological Collection, University of Kansas.

Data on Distribution: Recorded from Venezuela (fide Kirkaldy & Bueno), Brazil, Bolivia, Chile, Paraguay, Uruguay, and Argentina. Specimens from the following localities have been examined:

BRAZIL: Nova Teutonia, May 1948, Fritz Plaumann, 1 male.

BOLIVIA: Villa Montes, Nov. 1917, 1 female.

CHILE: Icaño-Río Salado, Santiago del Estero, 1865, 1 male, 1 female; Viña del Mar, Nov. 15, 1920, 3 females; Viña, 1921, Alfredo Faz, 1 female; Santiago, Quinto Normal, Aug. 30, 1922, Alfredo Faz, 20 males, 28 females; Quinta Normal, Oct. 26, 1922, Alfredo Faz, 1 male, 3 females; Santiago, Laguna de la Quinta Normal, Dec. 20, 1922, Alfredo Faz, 28 males, 24 females; Santiago, Sept. 2, 1923, Alfredo Faz, 16 males, 10 females; Santiago, Alfredo Faz, 6 males, 4 females; Termas Cauquenes, Dec. 15, 1922, Alfredo Faz, 217 males, 186 females.

PARAGUAY: Villarrica, Jan. 7, 1923, Fran. Schade, 11 females; Villarrica, June 6-15, 1923, Fran. Schade, 8 males, 10 females; Villarrica, Dec. 15, 1923, Fran. Schade, 1 female; Villarrica, Sept. 20, 1924, Fran. Schade, 2 males, 4 females; Villarrica, July 8, 1924, Fran. Schade, 1 male; Villarrica, Sept. 26, 1931, Fran. Schade, 2 males, 1 female; Estero Grande, Nov. 1, 1924, Fran. Schade, 1 female.

URUGUAY: Maldonado, 1885, C. Darwin, 2 females (British Mus.); Paso de arriera, Rivera, Jan. 13, 1933, C. S. Carbonell, 1 male (U.S.N.M.).

ARGENTINA: Argentina, Apr. 13, 1897, G. Wiengreen, 1 female (Hamburg Mus.); Prov. Buenos Aires, Oct. 27, 1898, S. Venturi, 1 male, 1 female; Buenos Aires, Oct. 15, 1920, P. Frank, 2 males, 1 female, 1 nymph (Hamburg Mus.); Córdoba, June 5, 1907, 2 males; Dept. de Luján San Luis, Sept. 1934, 2 males; Carcaraña, 1 male; Esperanza, Bred., 1 female (Kirkaldy Coll.); Salta, 1 male, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa amnigenus (White)

(Pl. III, fig. 36; Pl. XIV, fig. 70)

1879. Anisops amnigenus White, F. B. Trans. Ent. Soc. London, Pt. IV, p. 271.
1904. Buenoa amnigenus, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 120 & 134 (listed and states "die Type ist verloren gegangen").
1909. Buenoa amnigenus, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, No. 3-4, p. 200 (listed).

Size: Male, length 4.77 mm. to 5.39 mm., greatest body width 1.26 mm. to 1.40 mm.; female, length 4.81 mm. to 5.85 mm., greatest body width 1.37 mm. to 1.54 mm.

Color: General facies sordid white. Head, thorax, and abdominal dorsum testaceous. Limbs testaceous to brown. Abdominal venter black with connexivum light brown to black.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex protuberant; greatest width of head approximately five times the anterior width of vertex and less than humeral width of pronotum; inner margins of eyes contiguous posteriorly; along median longitudinal axis, head is approximately two thirds the length of pronotum; frons wide; tylus not inflated; labrum very short, basal width more than twice its median length with apex bluntly rounded; rostral prong (pl. XIV, fig. 70c) slightly longer than third rostral segment, with base originating laterally at proximal end of third rostral segment, and with apex sharply rounded. Pronotum with its median length slightly more than half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XIV, fig. 70a) neither wide nor greatly thickened at apex; stridulatory area absent. Fore tibia (pl. XIV, fig. 70a) with stridulatory comb (pl. XIV, fig. 70b) consisting of approximately twenty-eight to thirty teeth which increase in height from base to apex. Chaetotaxy of male front leg as shown on Plate XIV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite tapering, with apical half very narrow and apex acuminate.

Brachypterous forms are occasionally found. These specimens have pronotum narrower, scutellum smaller, and hemelytra that lack claval sutures.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex slightly protuberant; greatest width of head approximately four times the anterior width of vertex and less than humeral width of pronotum; synthlipsis very narrow, approximately one twentieth the anterior width of vertex; along median longitudinal axis, head is more than half the length of pronotum; frons wide; tylus not inflated. Pronotum with its median length approximately half its humeral width; disk unimpressed; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 36) of normal shape with teeth arranged in three longitudinal rows; one inner row of large teeth, one short outer row of smaller teeth, and one median row of relatively large teeth which originates in apical fourth of valve rather than at apex; approximately seven small, lateral, toothlike setae near apex.

Brachypterous forms are occasionally found. These specimens have pronotum narrower, scutellum smaller, and hemelytra that lack claval sutures.

Comparative Notes: This species is nearest in general appearance to B. gracilis n. sp. Examination of the male, however, will show distinct differences. This species differs from B. gracilis in having the eyes contiguous posteriorly in the male, in lacking the stridulatory area on the fore femur, and in having the frons immediately above the tylus wide.

Location of Types: Dr. G. W. Kirkaldy (1904) states that "die Type ist verloren gegangen", however, Dr. H. B. Hungerford in 1928, examined the holotype male at the British Museum, London. Dr. Hungerford states that there are two specimens, male and female, which belong to the Perthshire Museum, Scotland. The holotype male bears the label "Manáos, on board at light, Aug. 1875". Homotype male, compared with type by Dr. H. B. Hungerford of the University of Kansas, labeled "Paraguay S. A., Villarrica, Loma, 7/6/23, Fran. Schade", now in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from British Guiana, Brazil, Peru, Bolivia, and Paraguay. Specimens from the following localities have been examined:

BRITISH GUIANA: Georgetown Demerara, Botanic Gardens, July 26, 1932, S. Harris, 1 female brachypterous.

BRAZIL: Amazonas: Manáos, Manacapuru, Mar. 1928, S. M. Klages, 14 males and 26 females macropterous, 10 males and 28 females brachypterous; Manáos region, Rio Negro, Oct. 1935, A. M. Olalla, 60 males and 36 females macropterous, 18 males and 11 females brachypterous, 2 nymphs; Manáos, July 29, 1924, Flores (Bueno Coll.), 3 males and 1 female macropterous; Reg. de Itacoatiara, Jan. 3, 1936, A. M. Olalla, 35 males and 19 females macropterous; Reg. de Itacoatiara (Nrte.), Jan., 1936 to Apr., 1936, A. M. Olalla, 8 females macropterous; Vic. João Pessoa (São Phelipe), River Juruá, July 10, 1936 to Sept. 20, 1936, A. M. Olalla, 28 males and 44 females

macropterous, 14 males and 13 females brachypterous; Castanha region, Rio Purús, Sept., 1935, A. M. Olalla, 18 males and 16 females macropterous, 8 males and 30 females brachypterous; Vic. Santo Antônio, River Eiru, Sept. 25, 1936 to Oct. 7, 1936, A. M. Olalla, 27 females macropterous, 8 males and 12 females brachypterous.

Ceará: Bom Acud Successo nr. Maranguape, Nov. 4, 1937, Stillman Wright, 3 females brachypterous; Artificial Lake nr. Russas, July 22, 1937, Stillman Wright, 6 females macropterous, 1 male and 3 females brachypterous; Roadside pool nr. Primavera, Oct. 28, 1937, Stillman Wright, 1 female brachypterous; Roadside pool nr. Sobral, Oct. 26, 1937, Stillman Wright, 1 female macropterous; Pacatuba, Acude Piripaú, Aug. 1937, Stillman Wright, 1 male and 1 female brachypterous.

Rio Grande do Norte: Caico, No. 327, Stillman Wright, 2 males and 1 female macropterous, 3 males and 11 females brachypterous.

Parahiba: Souza, Stillman Wright, 2 females macropterous, 1 female brachypterous; Alagoa do Monteiro, Stillman Wright, 2 females macropterous, 18 females brachypterous; Areia, Stillman Wright, 10 females brachypterous; Santa Luzia, Stillman Wright, 1 female macropterous, 7 females brachypterous.

Pernambuco: Vila Bela, No. 5467, Stillman Wright, 3 males brachypterous.

Matto Grosso: Corumbá, March, Lowland, 1 male macropterous.

Paraná: Lago Grande, Feb. 1939, A. M. Olalla, 4 females macropterous, 24 males and 23 females brachypterous.

PERU: Dept. Huánuco, Loc. Shapajilla, July, 1938, F. Woytkowski, 5 males, brachypterous.

BOLIVIA: Victoria, R. Beni, Junction of Madre de Dios and Beni rivers, Oct., 1937, A. M. Olalla, 1 male and 2 females macropterous; El Consuelo, R. Beni, Jan., 1938, A. M. Olalla, 4 males and 10 females macropterous, 12 males and 16 females brachypterous; Las Pampas, R. Beni, Mojos, April, 1938, A. M. Olalla, 1 male and 1 female macropterous, 7 males and 3 females brachypterous; Las Pampas, R. Beni, Mojos, May, 1938, A. M. Olalla, 1 male and 1 female macropterous, 8 males and 3 females brachypterous; Santa Ana del Yacuma, Feb., 1938, A. M. Olalla, 1 male macropterous, 2 males and 2 females brachypterous; Prov. del Sara, Nov. 30, 1912, Steinbach, 1 male macropterous.

PARAGUAY: Villarrica, Loma, July 6, 1923, Fran. Schade, 1 male macropterous.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buena incompta n. sp.

(Pl. XIV, fig. 73)

Size: Male, length 5.00 mm. to 5.20 mm., greatest body width 1.30 mm. to 1.36 mm.; female, length 5.39 mm. to 5.78 mm.,

greatest body width 1.36 mm. to 1.49 mm.

Color: General facies sordid white to pale testaceous. Head and pronotum sordid white. Thoracic venter and limbs sordid white to brown. Scutellum sordid white, often with two anterolateral brown areas; metathoracic dorsum pale testaceous to light brown. Abdominal venter black except keel and portions of connexivum sordid white; abdominal dorsum yellowish white with irregular areas of black.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head approximately five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis very narrow, approximately one fifth the anterior width of vertex, often carinate; along median longitudinal axis, head is one half to three fifths the length of pronotum; notocephalon slightly sulcate dorsally; tylus slightly inflated; labrum with basal width not quite twice its median length and apex moderately rounded; rostral prong (pl. XIV, fig. 73b) equal to or slightly longer than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large but with median

length less than that of pronotum. Fore femur (pl. XIV, fig. 73a) neither wide nor greatly thickened at apex; without stridulatory area. Fore tibia (pl. XIV, fig. 73a) with stridulatory comb (pl. XIV, fig. 73c) consisting of approximately twenty-seven to thirty teeth; apical teeth thick and both apical and basal teeth wider and taller than those in center. Fore tarsus with claws more slender and less dissimilar than usual. Chaetotaxy of male front leg as shown on Plate XIV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half very narrow and apex strongly acuminate.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head five and one half to six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis very narrow, one sixth to one fifth the anterior width of vertex, often carinate; along median longitudinal axis, head is approximately half the length of pronotum; notocephalon slightly sulcate dorsally; tylus not inflated. Pronotum with its median length slightly more than half its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length slightly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge proximally;

one inner row of few, large teeth and one long, outer row of smaller teeth; approximately three or four small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species resembles B. communis n. sp. Examination of the male, however, will show distinct differences. This species differs from B. communis in its smaller size, in having synthlipsis narrower, and in lacking femoral stridulatory area.

Location of Types: Holotype male, allotype female, 26 male and 26 female paratypes, Vicinity of João Pessoa, River Juruá, Brazil, July 10, to Sept. 20, 1936, A. M. Olalla. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Brazil and Bolivia. In addition to type series, specimens from the following localities have been examined:

BRAZIL: Amazonas: Vic. Santo Antonio, Sept. 25, to Oct. 17, 1936, A. M. Olalla, 8 males, 9 females.

Parahiba: Vic. João Pessoa, River Juruá, July 10, to Sept. 20, 1936, A. M. Olalla, 45 males, 67 females.

BOLIVIA: Victoria, Rio Beni, October, 1937, A. M. Olalla, 40 males, 37 females; Las Pampas, Rio Beni, April, 1938, A. M. Olalla, 1 male, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buena oculata n. sp.

(Pl. III, fig. 26; Pl. XIV, fig. 72)

Size: Male, length 4.74 mm. to 5.13 mm., greatest body width 1.17 mm. to 1.30 mm.; female, length 4.81 mm. to 5.33 mm., greatest body width 1.23 mm. to 1.36 mm.

Color: General facies sordid white. Head, most of pronotum, thoracic venter, and limbs sordid white. Pronotum often with median and posterior portions orange; scutellum varies from sordid white to orange; metathoracic dorsum sordid white to pale testaceous. Abdominal venter black except keel, portions of connexivum, and last one or two segments, sordid white; abdominal dorsum yellowish white with a median, irregular black area.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head approximately five and one half times the anterior width of vertex and equal to or slightly greater than humeral width of pronotum; synthlipsis extremely narrow, approximately one fifteenth the anterior width of vertex; along median longitudinal axis, head is approximately three fourths the length of pronotum; notocephalon slightly sulcate dorsally; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XIV, fig. 72b) slightly longer than third rostral segment, with base originating laterally at a point midway to near

proximal end of third rostral segment, and with apex moderately to bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two shallow, elongate depressions toward the middle forming a faint median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XIV, fig. 72a) neither wide nor greatly thickened at apex; without stridulatory area. Fore tibia (pl. XIV, fig. 72a) with stridulatory comb (pl. XIV, fig. 72c) consisting of approximately twenty-four to twenty-seven teeth; apical teeth slightly wider, taller, and thicker than basal. Intermediate leg with first tarsal segment (pl. XIV, fig. 72d) slightly emarginate on inner margin. Chaetotaxy of male front leg as shown on Plate XIV. Male genital claspers (pl. III, fig. 26) normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head five and one half to six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis extremely narrow, approximately one fifteenth the anterior width of vertex; along median longitudinal axis, head is three fourths to four fifths the length of pronotum; notocephalon slightly sulcate dorsally; tylus not inflated. Pronotum with

its median length approximately half its humeral width; disk usually unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of few, large teeth and one long outer row of smaller teeth; approximately two or three small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species closely resembles B. amnigenus (White). Examination of the male, however, will show distinct differences. This species differs from B. amnigenus in having the eyes not quite holoptic, frons just above tylus narrower, tylus slightly inflated, and intermediate leg with first tarsal segment emarginate on inner margin.

Location of Types: Holotype male, allotype female, 6 male and 3 female paratypes, Vicinity of Rioja, Dept. San Martín, Peru, Sept. 9, to Oct. 3, 1936, F. Woytkowski; other paratypes: 1 male and 4 females, Boquerón del Padre Abad, Dept. Loreta, Peru, Aug. 3-8, 1946, F. Woytkowski. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from type series.

Buena salutis Kirkaldy

(Pl. III, fig. 39; Pl. XV, fig. 74)

1904. Buena salutis Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, p. 124.
1909. Buena salutis, Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, vol. X, p. 201 (catalogue).
1928. Buena mallochi Jaczewski, T. Ann. Musei Zoologici Polonici, vol. VII, pp. 129-130 (described from Brazil), New synonymy.

Size: Male, length 3.38 mm. to 3.70 mm., greatest body width 1.07 mm. to 1.17 mm.; female, length 3.70 mm. to 4.35 mm., greatest body width 1.10 mm. to 1.30 mm.

Color: General facies sordid white to pale testaceous. This species entirely sordid white to testaceous except abdomen mostly brown to black. Metathoracic dorsum often with a light brown to black, longitudinal stripe on each side. Hemelytra hyalin, often with a light brown to black area at tip of corium.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex protuberant; greatest width of head approximately three and one half times the anterior width of vertex and equal to or slightly less than humeral width of pronotum; synthlipsis very narrow, less than one tenth the anterior width of vertex; along median longitudinal axis, head is slightly less than the length of pronotum; notocephalon wide, sulcate dorsally; tylus flat, not inflated; labrum short, with basal width more than twice

its median length and apex moderately to bluntly rounded; rostral prong (pl. XV, figs. 74b, 74c) variable, equal to or slightly longer than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex moderately to bluntly rounded. Pronotum with its median length two fifths to one half its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina; lateral margins slightly divergent; posterior margin slightly convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Fore femur (pl. XV, fig. 74a) narrow and not thickened at apex; without stridulatory area. Fore tibia (pl. XV, fig. 74a) with stridulatory comb (pl. XV, fig. 74d) consisting of approximately eighteen to twenty teeth; teeth approximately same size and thickness. Chaetotaxy of male front leg as shown on Plate XV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from broad base to acuminate apex.

Macropterous forms are occasionally found. These specimens have head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex protuberant; greatest

width of head approximately three and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis very narrow, one ninth to one seventh the anterior width of vertex; along median longitudinal axis, head is approximately equal to the length of pronotum; notocephalon wide, usually sulcate dorsally; tylus flat, not inflated. Pronotum with its median length approximately two fifths its humeral width; disk usually unimpressed, occasionally with a faint median carina; lateral margins divergent; posterior margin slightly convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 39) of normal shape with teeth arranged in three longitudinal rows; one inner row of large teeth, one median row of normal teeth, and one outer row of smaller teeth; approximately four to seven small, lateral, toothlike setae near apex.

Macropterous forms are occasionally found. These specimens have head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum much larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Variation Within Species: As is indicated under measurements of length, this species varies somewhat in size; there is also considerable variation in the proportional size of notocephalon, synthlipsis, and pronotum. The greatest contrast is shown between a series from Itaquaquetupa, Brazil and one from San Esteban, Venezuela. The former

is a larger form, with a slightly wider synthlipsis, and a less curved rostral prong.

Comparative Notes: This is our smallest Buenoa species. Superficially it somewhat resembles B. amnigenus (White). Examination of the male, however, will show distinct differences. This species differs from B. amnigenus in having a wider notocephalon, and in the form of the rostral prong, fore femur, and tibial comb. Buenoa salutis is much smaller than B. amnigenus.

Nomenclatorial Notes: Mr. C. O. Bare labeled a series of B. salutis as types and paratypes, using a manuscript name based on the state of origin, Amazonas, Brazil. As such paratypes may have been widely distributed, it seems desirable to point out that the name has not been, and should not be, validated by publication.

Examination of large series of B. salutis has led to the conclusion that B. mallochi Jaczewski is a variant of this species and is therefore placed in synonymy with B. salutis.

Location of Types: The type, a macropterous female, labeled "I. du Salut, Mus. Paris, Gayane, Pingi 1882", is located at the Paris Museum. A cotype, also a macropterous female and labeled as above, is now in the Francis Huntington Snow Entomological Collection, University of Kansas.

Data on Distribution: Recorded from Venezuela, British Guiana, French Guiana, Brazil, Bolivia and Paraguay. Specimens from the following localities have been examined:

VENEZUELA: San Esteban, Jan. 15, 1940, Pablo J. Anduze, 4 males and 5 females brachypterous, 1 nymph.

BRITISH GUIANA: Lamaha Conservancy, Demerara, July 23, 1932, S. Harris, 12 males and 12 females brachypterous, 22 males and 25 males macropterous, 5 nymphs; Georgetown Bot. Gardens, Oct. 23, 1937, S. Harris, 5 females macropterous; Georgetown Bot. Gardens, Nov. 6, 1937, S. Harris, 4 males macropterous.

FRENCH GUIANA: Iles du Salut, 1882, Pingi, 1 female macropterous; Ile Royale, April 1913, Planchon, 1 male brachypterous, 1 male macropterous; Charvein, July, Coll. Le Mout, 1 male and 2 females macropterous (U.S.N.M.); Charvein, September, Coll. Le Mout, 1 female macropterous (U.S.N.M.).

BRAZIL: Amazonas: Manacapuru, Manaus, March, 1928, S. M. Klages, 2 males and 3 females brachypterous, 4 females macropterous; Rio Negro, Manaus, Oct. 1935, A. M. Olalla, 9 males and 12 females brachypterous, 1 male and 3 females macropterous.

Pará: Santarém, Dec. 11, 1909, No. 4043, 2 females macropterous (Carnegie Mus.).

Ceará: Nr. Icó, artificial Lake, July 22, 1937, S. Wright, 1 male brachypterous; Lagoa, Fortaleza, Aug. 3, 1937, S. Wright, 1 male brachypterous.

Parahiba: Santa Luzia, No. 245 & 260, S. Wright, 3 males and 2 females brachypterous; Vic. João Pessoa, River Juruá, July 10, and Sept. 20, 1936, A. M. Olalla, 1 male and 5 females brachypterous.

Pernambuco: Triunfo, No. 5475, 11017, and 11395, S. Wright, 9 males and 2 females brachypterous, 1 male macropterous.

São Paulo: São Paulo, Aug. 7, 1927, E. D. Townsend, 4 females brachypterous; São Paulo, Nov., 1928, E. D. Townsend, 3 females brachypterous; Itaquiáquecetupa, July, 1933, W. O. Townsend, 16 males and 46 females brachypterous; Itaquiáquecetupa, E. Townsend, 105 males and 130 females brachypterous, 4 females macropterous, 7 nymphs; Ypirango, R. Spitz, 2 females brachypterous; Pirassununga water reservoir, July 30, 1940, H. Kleerekoper, 7 males and 4 females brachypterous.

Rio Grande do Sul: Porto Alegre, July 1941, H. Kleerekoper, 13 males and 8 females brachypterous; near Porto Alegre, Aug., 1941, H. Kleerekoper, 4 males and 4 females brachypterous.

BOLIVIA: Prov. del Sará, Nov. 3, 1912, Steinbach, 1 female macropterous; Río Beni, Victoria, Oct. 1937, A. M. Olalla, 2 males brachypterous, 1 male macropterous; Río Beni, Consuelo, Jan., 1938, A. M. Olalla, 2 females macropterous; Río Beni, Las Pampas, Mojos, Apr. & May, 1938, A. M. Olalla, 7 males and 4 females brachypterous, 9 males and 2 females macropterous; Santa Ana del Yacuma, Feb., 1938, A. M. Olalla, 3 males and 5 females brachypterous; Santa Rosa del Yacuma, Feb., 1938, A. M. Olalla, 2 males and 2 females brachypterous, 1 female macropterous; Puerto Suárez, No. 3844, J. Steinbach, 3 males and 3 females macropterous (Carnegie Mus.).

PARAGUAY: Villarrica, Dec., 1923, Fran. Schade, 1 male and 1 female brachypterous; Villarrica, Apr. 16, 1924, Fran. Schade, 1 male macropterous; Albovena Srojoguasi, Dec., 1926, Fran. Schade, 1 male and 4 females brachypterous, 1 nymph; Reimoser, Centurión, 3 females macropterous (Berlin Mus.).

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa thomasi n. sp.

(Pl. III, fig. 25; Pl. XV, fig. 76)

Size: Male, length 5.26 mm. to 5.72 mm., greatest body width 1.49 mm. to 1.69 mm.; female, length 5.46 mm. to 6.04 mm., greatest body width 1.69 mm. to 1.82 mm.

Color: General facies sordid white to gray. Head, pronotum, most of thoracic venter, and limbs sordid white to pale testaceous. Scutellum usually pale testaceous, occasionally with base brown to black; metathoracic dorsum pale testaceous to black. Abdomen black except ventral keel and portions of connexivum and dorsum, sordid white to testaceous. Some specimens entirely sordid white to testaceous except portions of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head rounded with vertex usually indented at lateral margins; greatest width of head approximately five to five and one half times the anterior width of vertex and less than

humeral width of pronotum; synthlipsis one third to one half the anterior width of vertex; along median longitudinal axis, head is one half to two thirds the length of pronotum; notocephalon usually sulcate dorsally; tylus slightly inflated; labrum with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XV, fig. 76c) equal to or longer than third rostral segment, with base originating laterally midway of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately three fifths its humeral width; disk with two elongate depressions toward the middle and a large subtriangular depression on each side, thus appearing tricarinate; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum with median length equal to or greater than that of pronotum. Fore femur (pl. XV, fig. 76a) relatively narrow and not greatly thickened at apex; without stridulatory area. Fore tibia (pl. XV, fig. 76a) with stridulatory comb (pl. XV, fig. 76b) consisting of approximately twenty-four to thirty-six teeth; apical teeth thicker than basal; ten to seventeen short, stout, club-shaped setae (pl. XV, fig. 76d) on inner surface of tibia at apex. Chaetotaxy of male front leg as shown on Plate XV. Male genital claspers (pl. III, fig. 25) normal. Spine from caudo-sinistral margin of seventh abdominal tergite tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with vertex usually indented at lateral

margins; greatest width of head five to five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis one third to one half the anterior width of vertex; along median longitudinal axis, head is three fifths to two thirds the length of pronotum; notocephalon sulcate dorsally; tylus slightly inflated. Pronotum with its median length approximately half its humeral width; disk with two shallow, elongate depressions toward the middle and a shallow, subtriangular depression on each side, thus appearing faintly tricarinate, often with median carina only; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows which merge in proximal half of ovipositor valve; one inner row of large teeth and one outer row of smaller teeth; approximately four to six small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species resembles B. platycnemis (Fieber). Examination of the male, however, will show distinct differences. This species differs from B. platycnemis in having an area of short, stout, club-shaped setae on inner surface of fore tibia at apex, in lacking a femoral stridulatory area, and in the form of the rostral prong and tibial comb.

Location of Types: Holotype male, allotype female, 18 male and 3 female paratypes, San Luis Babarocos (= Barbacoas ?),

Chihuahua, Mexico, Dec. 30, 1934, H. S. Gentry; other paratypes: 7 males and 6 females, Carimechi, Río Mayo, Chihuahua, Mexico, Jan. 6, 1935, H. S. Gentry. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded for Mexico and known only from type series.

Buena alterna n. sp.

(Pl. III, fig. 35; Pl. XV, fig. 77)

Size: Male, length 5.65 mm. to 5.98 mm., greatest body width 1.56 mm. to 1.62 mm.; female, length 6.30 mm. to 6.76 mm., greatest body width 1.88 mm. to 2.08 mm.

Color: General facies sordid white to gray. Head, pronotum, thoracic venter, and limbs sordid white to testaceous. Scutellum with basal portion black, apical portion yellow to orange; metathoracic dorsum usually black with broad, median, transverse yellow to orange band, occasionally entirely black. Abdomen black except ventral keel and portions of connexivum and dorsum, sordid white to testaceous. Hemelytra colorless but with black portions of thorax and abdomen shining through giving a gray appearance to the specimen. Some specimens entirely sordid white to testaceous except portions of abdomen, black.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex

continuous with that of eyes, occasionally indented at lateral margins; greatest width of head six to six and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis narrow, approximately half the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum; notocephalon narrow, slightly sulcate dorsally; tylus not inflated; labrum with basal width slightly more than twice its median length and apex bluntly rounded; rostral prong (pl. XV, fig. 77b) short, shorter than third rostral segment, with base originating laterally at proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length slightly more than half its humeral width; disk usually with two shallow, elongate depressions toward the middle forming a faint median carina, not tricarinate; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XV, fig. 77a) neither wide nor strongly thickened at apex; without stridulatory area. Fore tibia (pl. XV, fig. 77a) with stridulatory comb (pl. XV, fig. 77c) consisting of approximately fifteen to nineteen teeth; apical teeth slightly thicker than basal. Chaetotaxy of male front leg as shown on Plate XV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite tapering gradually from base to strongly acuminate apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head five and one half to six times the anterior width of vertex and less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is one half to three fifths the length of pronotum; notocephalon slightly sulcate dorsally; tylus not inflated. Pronotum with its median length slightly less than half its humeral width; disk usually unimpressed, occasionally with faint median carina; lateral margins divergent; posterior margin convex, medianly truncate to slightly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 35) of normal shape with teeth arranged in three longitudinal rows which merge proximally; one inner row of large teeth, one short median row of normal teeth, and one long outer row of small teeth; approximately five or six small, lateral, tooth-like setae near apex.

Comparative Notes: Superficially this species resembles B. mutabilis n. sp. and B. omani n. sp. Examination of the male, however, will show distinct differences. This species differs from B. omani in having tylus not inflated, frons just above tylus wider, fore femur narrow at apex, and in lacking a femoral stridulatory area. Buenoa alterna differs from B. mutabilis in having a distinctly different rostral

prong and in lacking a femoral stridulatory area.

Location of Types: Holotype male, allotype female, 6 male and 5 female paratypes, Puebla, Mexico, July 25, 1937, H. D. Thomas; other paratypes: 4 males, Hda. La Libertad, Chiapas, Mexico, Sept. 1, 1937, H. D. Thomas; 1 male and 4 females, Los Potosí, Zacatecas, Mexico, Aug. 8, 1944, H. D. Thomas. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from Mexico. Specimens from the following localities have been examined:

MEXICO: Zacatecas: Los Potosí, Aug. 8, 1944, Henry Thomas, 4 males.

Hidalgo: Real del Monte, Sept. 23, 1938, H. D. Thomas, 1 male, 2 females.

Puebla: Puebla, July 25, 1937, H. D. Thomas, 7 males, 6 females.

Chiapas: Hda. La Libertad, Sept. 1, 1937, H. D. Thomas, 1 male, 4 females.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas.

Buenoa unguis n. sp.

(Pl. XV, fig. 78)

Size: This species varies considerably in size within the same population. Male, length 5.90 mm. to 7.07 mm.,

greatest body width 1.49 mm. to 1.75 mm.; female, length 5.85 mm. to 7.10 mm., greatest body width 1.62 mm. to 1.88 mm.

Color: General facies sordid white to pale testaceous. Head, thorax, and limbs sordid white to pale testaceous; scutellum occasionally with two anterolateral brown to black areas. Abdominal venter black except keel and portions of connexivum, yellowish white; abdominal dorsum brown to black with anterior portion usually yellowish white to pale testaceous.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex slightly indented to continuous with that of eyes; greatest width of head four and one half to five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis narrow, one sixth to one fifth the anterior width of vertex; along median longitudinal axis, head is approximately three fifths the length of pronotum; notocephalon sulcate; tylus flat, depressed longitudinally forming distinct lateral carinae; labrum with basal width more than twice its median length; rostrum with a distinct, median, longitudinal carina; rostral prong (pl. XV, fig. 78c) short, distinctly shorter than third rostral segment, with base originating laterally at proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length approximately four sevenths its humeral width; disk with two elongate depressions toward the middle forming a median carina,

occasionally with a shallow, subtriangular depression on each side, appearing faintly tricarinate; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XV, fig. 78a) narrow, somewhat thickened at apex; without stridulatory area. Fore tibia (pl. XV, fig. 78a) with stridulatory comb (pl. XV, fig. 78b) consisting of approximately nineteen to twenty teeth, with four or five long setae at apex; apical teeth are slightly thicker than basal. Fore tarsus (pl. XV, fig. 78d) robust with unusual tarsal claws. Chaetotaxy of male front leg as shown on Plate XV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite normal, tapering gradually from base to a curved, strongly acuminate, apex.

Female Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; greatest width of head four and one half to five times the anterior width of vertex and less than humeral width of pronotum; synthlipsis narrow, one seventh to one fifth the anterior width of vertex; along median longitudinal axis, head is two fifths to three fifths the length of pronotum; notocephalon slightly sulcate; tylus flat, depressed longitudinally forming faint lateral carinae. Pronotum with its median length slightly less than half its humeral width; disk with two, shallow elongate depressions toward the middle forming a faint median carina; lateral

margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one inner row of large teeth and one outer row of smaller teeth; approximately three or four small, lateral, toothlike setae near apex.

Comparative Notes: Superficially this species somewhat resembles B. albida (Champion) and B. gracilis n. sp. Examination of the male, however, will show distinct differences. This species differs from B. albida and B. gracilis in having a distinctly shorter rostral prong, rostrum with a median carina, fore femur without stridulatory area, and distinct differences in the tibial comb, fore tarsus and tarsal claws.

Location of Types: Holotype male, allotype female, 40 male and 40 female paratypes, Vicinity of Rioja, Dept. San Martín, Peru, Sept. 9, to Oct. 3, 1936, F. Woytkowski. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known from Brazil, Peru, Bolivia, Paraguay, and Argentina. In addition to type series, specimens from the following localities have been examined:

BRAZIL: Pará: Lago Grande, Feb., 1939, A. M. Olalla, 7 males, 5 females.

Ceará: Agua Verde, July 6, 1937, S. Wright, 16 males, 13 females; Russas, July 22, 1937, S. Wright, 2 males, 2 females; Sobral, Oct. 26, 1937, S. Wright, 3 males, 12 females;

Primavera, Oct. 28, 1937, S. Wright, 2 males, 18 females;
 Choró, Oct. 29, 1937, S. Wright, 2 females; Maranguape, Nov. 3,
 1937, S. Wright, 2 males, 1 female; Bom Acude Sucesso, Nov. 4,
 1937, S. Wright, 3 males, 10 females; Sobral, Nov. 26, 1937,
 S. Wright, 3 males, 19 females.

Rio Grande do Norte: Ouro Branco, No. 258, S. Wright, 2
 males; Caico, No. 327, S. Wright, 1 male.

Perahiba: Souza, No. 5530, S. Wright, 1 male, 1 female.

Pernambuco: Belém, No. 643, S. Wright, 1 male; Itapissuma,
 Oct. 25, 1946, F. S. Barbosa, 2 males, 2 females.

Minas Geraes: Bello Horizonte, Apr., 1935, D. M. Cochran,
 3 males, 1 female (U.S.N.M.).

Rio de Janeiro: São Paulo Road, June 19, 1945, Wygod-
 zinsky, 1 male, 1 female.

PERU: Vic. Rioja, Dept. San Martín, Sept. 9, to Oct. 3,
 1936, F. Woytkowski, 37 females.

BOLIVIA: Junction of Madre de Dios and Beni Rivers,
 Victoria, Oct., 1937, A. M. Olalla, 32 males, 45 females;
 Santa Ana del Yacuma, Feb., 1938, A. M. Olalla, 17 males, 15
 females; Río Beni, Las Pampas, Mojos, April and May, 1938,
 A. M. Olalla, 8 males, 4 females.

PARAGUAY: Estancia Postillón, Puerto Max a. Río
 Paraguay, Mar. 9, 1905, Louis Des Arts, 2 males, 1 female
 (Hamburg Mus.).

ARGENTINA: Chaco, No. 7726, 1 male.

All specimens listed above are in the Francis Huntington

Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buena excavata n. sp.

(Pl. II, fig. 12; Pl. XV, fig. 75)

Size: Male, length 4.55 mm., greatest body width 1.30 mm.; known only from the male.

Color: General facies sordid white. Head, pronotum, most of thoracic venter, and scutellum sordid white. Portions of thoracic venter orange to brown; metathoracic dorsum colorless to sordid white. First two pairs of legs testaceous to nigro-violaceous; hind legs mostly yellowish white. Abdomen black with anterior portion of connexivum orange. Hemelytron colorless except for nigro-violaceous band covering humeral angle and extending along anterior margin of wing for approximately one third its length and a large black area at tip of corium.

Male Structural Characteristics: As viewed from above, outline of head rounded with anterior margin of vertex continuous with that of eyes; eyes almost holoptic; greatest width of head approximately five and one half times the anterior width of vertex and slightly less than humeral width of pronotum; synthlipsis extremely narrow, approximately one fifteenth the anterior width of vertex; along median longitudinal axis, head is distinctly longer than pronotum; notocephalon indented at synthlipsis, sulcate anterodorsally;

tylus deeply excavate with a short antero-medial ridge; labrum distinctly inflated, with basal width more than twice its median length and apex truncate; rostral prong (pl. XV, fig. 75b) as long as third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex moderately rounded. Pronotum short, with its median length approximately two fifths its humeral width; disk unimpressed, not carinate; lateral margins divergent; posterior margin convex, slightly concave medianly. Scutellum large, with median length distinctly greater than that of pronotum. Fore femur (pl. XV, fig. 75a) neither wide nor greatly thickened at apex; without stridulatory area. Fore tibia (pl. XV, fig. 75a) angulate anteriorly, with stridulatory comb (pl. XV, fig. 75c) consisting of approximately seventeen teeth; apical teeth thicker than basal; a swollen area on inner surface of tibia at apex, densely covered with fine setae. Chaetotaxy of male front leg as shown on Plate XV. Male genital claspers normal. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 12) unusually wide for most of length; apical one fourth narrow and apex strongly acuminate.

Only the brachypterous male is known for this species.

Comparative Notes: This species is quite distinct and its relationship to the other species of the genus is obscure. The deeply excavate tylus, the inflated labrum, and the form of the fore tibia separates B. excavata from all other species.

Location of Types: Holotype male (brachypterous), Santa Elena Boquerón Padre Abad, Dept. Loreto, Peru, Aug. 8, 1946, F. Woytkowski. Holotype is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from type.

Buenoa macrophthalma (Fieber)

(Pl. II, fig. 3; Pl. III, fig. 27; Pl. XVI, fig. 79)

1851. Anisops macrophthalmus Fieber, F. X. Abhandlungen Kongl. Böhmischen Gesellschaft Wissenschaften, vol. VII, Folge 5, pp. 482-483.
1904. Buenoa macrophthalma, Kirkaldy, G. W. Wiener Ent. Zeit., vol. XXIII, pp. 121-122, & 134 (taxonomic notes).
1930. Buenoa macrophthalma, Wolcott, G. N. Jr. Agriculture Univ. Puerto Rico, vol. XX, p. 149.
1939. Buenoa macrophthalma, Barber, H. G. New York Acad. Sci., vol. XIV, p. 420.

Size: This species varies considerably in size due to the larger macropterous forms. Male, length 8.51 mm. to 10.85 mm., greatest body width 2.47 mm. to 3.18 mm.; female, length 9.10 mm. to 9.75 mm., greatest body width 2.73 mm. to 2.92 mm.

Color: The brachypterous and macropterous forms vary in color as well as in other characteristics. The general facies of the former is sordid white to testaceous while the latter is black. The body of the brachypterous form is entirely sordid white to testaceous except for abdominal venter,

portions of connexivum, and laterally above connexivum on dorsum of abdomen, black. The macropterous form has head, anterior portions of pronotum, thoracic venter, and limbs, mostly testaceous to light brown. Scutellum, metathoracic dorsum, and abdomen black except for ventral keel and margins of connexivum, testaceous. Hemelytron black except for an area behind humeral angle and a wide band along the claval suture, colorless.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented especially at its lateral margins; greatest width of head approximately five and one half times the anterior width of vertex and usually slightly less but occasionally equal to or greater, than humeral width of pronotum; synthlipsis less than one third the anterior width of vertex; along median longitudinal axis, head almost as long as pronotum; notocephalon sulcate dorsally; tylus strongly inflated with median depression forming two lateral protuberances; labrum with basal width approximately two thirds greater than its median length and apex bluntly rounded; rostral prong (pl. XVI, fig. 79a) extremely long, much longer than third rostral segment, with base originating laterally at distal end of third rostral segment, and with apex moderately rounded. Pronotum with its median length slightly more than half its humeral width; disk usually with two elongate depressions toward the middle and a shallow, subtriangular

depression on each side, thus appearing faintly tricarinate; lateral margins divergent; posterior margin slightly convex, medianly concave. Scutellum with median length distinctly greater than that of pronotum. Fore femur (pl. XVI, fig. 79b) wide and thickened at apex; without stridulatory area. Fore tibia (pl. XVI, fig. 79b) with stridulatory comb (pl. XVI, fig. 79b) consisting of approximately seventeen thick teeth of uniform size. Chaetotaxy of male front leg as shown on Plate XVI. Male genital claspers (pl. III, fig. 27) abnormal in shape. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 3) relatively short and thick, tapering gradually from broad base to acuminate apex.

Macropterous forms are occasionally found. These specimens are black and larger in size than the brachypterous forms. They have head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex indented only at lateral margins; greatest width of head five to five and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis approximately one third the anterior width of vertex; along median longitudinal axis, head almost as long as pronotum; notoccephalon sulcate dorsally; tylus inflated. Pronotum with

its median length less than half its humeral width; disk only slightly impressed, usually not tricarinate; lateral margins divergent; posterior margin slightly convex, medianly concave. Scutellum with median length distinctly greater than that of pronotum. Female ovipositor of normal shape with teeth arranged in two longitudinal rows; one very short inner row of approximately seven large teeth and one long outer row of small teeth; approximately four or five small, lateral, toothlike setae near apex.

Macropterous forms are occasionally found. These specimens are black and larger in size than the brachypterous forms. They have head distinctly narrower than humeral width of pronotum; pronotum with lateral margins more divergent; scutellum larger; hemelytra with claval sutures present and large membranes; fully developed flight wings.

Variation Within Species: As is indicated under measurements of length, this species varies a great deal in size; there is also some variation in the proportional size of the pronotum. The greatest contrast is shown between males of series from Jamaica, B.W.I., and Cuba. The former is a small form, the males are seldom more than 8.50 mm. in length, lack a short longitudinal carina on inner surface of intermediate tibia at the base, and have normal and similar claws on intermediate tarsus; the males of the latter form are approximately 10 mm. in length, have a short longitudinal carina on inner surface of intermediate tibia at the base, and have one long,

narrow, distorted claw and a short, broad, flat claw on intermediate tarsus. Due to the fact that all important and constant characters used in species determination are identical in these two forms, no specific separation appears justified.

Comparative Notes: Superficially this species resembles B. hungerfordi n. sp. Examination of the male, however, will show distinct differences. The form of the rostral prong alone will serve to distinguish this species from all others. It differs from B. hungerfordi not only in the form of the rostral prong, but also in having a strongly inflated tylus, the fore femur greatly thickened at apex, a distinct tibial stridulatory comb, and a difference in the form of the tarsal claws on fore and intermediate legs.

Location of Types: The type specimen, a male, from Port au Prince, Haiti, is located at the Berlin Museum. This specimen is leucochromatic and I assume therefore, a brachypterous form. Homotype male, labeled "Adjuntas, P. R., June 8-13, 1915", compared with type by Dr. H. B. Hungerford, University of Kansas, now located in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Recorded from West Indies (Cuba, Haiti, Jamaica, and Puerto Rico). Specimens from the following localities have been examined:

WEST INDIES: Cuba: Cuba, Feb. 2, 1932, Ernesto Pujals y de Quesada, 1 male and 2 females macropterous, 2 males and 1 female brachypterous.

Jamaica: St. Andrew, Shooters Hill, Dec. 3, 1946, G. B. Thompson, 1 female brachypterous; St. Andrew, Hermitage, Feb. 14, 1947, G. B. Thompson, 1 male brachypterous.

Puerto Rico: Adjuntas, June 8-13, 1915, 1 male macropterous; Maricao R., Stn. Maricao, Feb. 20, 1934, S. Hildebrand, 1 female macropterous, 1 male brachypterous (U.S.N.M.); Ponce, Río Finca, July 12, 1934, R. G. Oakley, 1 female macropterous (U.S.N.M.); Lares Guajataca R., Mar. 22, 1935, Julio Garcia Diaz, 1 female macropterous, 1 male and 3 females brachypterous, 2 nymphs.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa hungerfordi n. sp.

(Pl. II, figs. 14, 21; Pl. III, figs. 23, 41;

Pl. XVI, fig. 80)

Size: Male, length 10.01 mm. to 10.79 mm., greatest body width, 2.99 mm. to 3.12 mm.; female, length 9.94 mm. to 10.20 mm., greatest body width 3.12 mm. to 3.51 mm.

Color: General facies yellowish white to black. Head, most of pronotum, thoracic venter, and limbs yellowish white to pale testaceous. Pronotum usually with a median, subtriangular, light brown to black area; scutellum usually black with posterolateral margins yellowish white; metathoracic dorsum light brown to black. Abdomen black except ventral

keel and portions of connexivum and dorsum, yellowish white. Hemelytra hyalin with posterior half light brown to black. Some specimens entirely yellowish white to pale testaceous except most of abdomen, black. This species variable in color.

Male Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex protuberant; greatest width of head four and one half times the anterior width of vertex and less than humeral width of pronotum; synthlipsis wide, approximately two thirds the anterior width of vertex; along median longitudinal axis, head is slightly less than half the length of pronotum; notocephalon wide, sulcate dorsally; tylus inflated, distinctly pilose; labrum pilose, with basal width not quite twice its median length and apex bluntly rounded; rostral prong (pl. XVI, fig. 80b) short, distinctly shorter than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex moderately to bluntly rounded. Pronotum with its median length slightly less than half its humeral width; disk with two shallow, elongate depressions toward the middle forming a faint median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length greater than that of pronotum. Fore femur (pl. XVI, fig. 80a) neither wide nor greatly thickened at apex; without stridulatory area. Fore tibia with stridulatory comb (pl. XVI, fig. 80a) consisting

of approximately fifteen to seventeen thick teeth; all teeth approximately same size and thickness. Tarsal claws of fore leg dissimilar; one with narrow, acuminate apex and the other with blunt, slightly bifurcate apex. Chaetotaxy of male front leg as shown on Plate XVI. Male genital claspers (pl. III, fig. 23) abnormal in shape. Spine from caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 14) broad, sickle-shaped, lying horizontally rather than in usual vertical position.

Female Structural Characteristics: As viewed from above, outline of head laterally rounded, anteriorly truncate with vertex protuberant; greatest width of head three and one half times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis wide, approximately half the anterior width of vertex; along median longitudinal axis, head is slightly more than half the length of pronotum; notocephalon wide, sulcate dorsally; tylus inflated, not pilose. Pronotum with its median length approximately two fifths its humeral width; disk with two shallow, elongate depressions toward the middle forming a faint median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Female ovipositor (pl. III, fig. 41) abnormal in shape with teeth arranged in a long, irregular, curved row; approximately two or three small, lateral, toothlike setae.

Variation Within Species: Occasionally specimens are found with flight wings not fully developed. These specimens are pale in color with pronotum narrower and lateral margins less divergent, scutellum smaller, and hemelytral membranes smaller than the form with fully developed flight wings. Both forms have claval sutures present in the hemelytra.

Comparative Notes: Superficially this species resembles B. macrophthalma (Fieber) and B. distincta n. sp. Examination of the male, however, will show distinct differences. This species differs from B. macrophthalma in having the tylus less inflated, rostral prong much shorter, fore femur narrower at apex, and differences in the tibial comb and tarsal claws. Buenoa hungerfordi differs from B. distincta in having the tylus distinctly more pilose, spine from caudo-sinistral margin of seventh abdominal tergite sickle-shaped, differences in the genital capsule as shown on Plate II, and in its larger size.

Location of Types: Holotype male, allotype female, 1 male and 2 female paratypes, Conejos, Dist. Alamos, Sonora, Mexico, Oct. 26, 1934, H. S. Gentry; other paratypes: 2 males and 3 females, Arroyo S. Marcial, District Alamos, Sonora, Mexico, Oct. 28, 1934, H. S. Gentry; 1 male, L. Tepancuapan, Chiapas, Mexico, Aug. 28, 1937, H. D. Thomas; 1 male, Sabino Canyon, Arizona, U.S.A., July 12, 1932, R. H. Beamer. The type series is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from United States and Mexico. In addition to type series, specimens from the following localities have been examined:

U.S.A.: Arizona: Catalina Mts., Sept. 29, 1941, Victor Potter, 2 males, 2 females (U. of Mich.).

MEXICO: Chihuahua: Carimechi, Río Mayo, Dec. 12, 1934, H. S. Gentry, 1 female; San Luis Babarocos (= Barbacoas ?), Dec. 30, 1934, H. S. Gentry, 1 female.

All specimens listed above are in the Francis Huntington Snow Entomological Collections, University of Kansas, Lawrence, Kansas, unless otherwise indicated.

Buenoa distincta n. sp.

(Pl. II, figs. 13, 22; Pl. III, fig. 24;

Pl. XVII, fig. 81)

Size: Male, length 8.45 mm., greatest body width 2.27 mm.; known only from the male.

Color: General facies gray. Head, pronotum, most of thoracic venter, and limbs sordid white to pale testaceous. Scutellum black with apex and lateral margins yellowish white; metathoracic dorsum black, appearing gray through hyalin hemelytra. Abdomen black except ventral keel and portions of connexivum and dorsum, yellowish white. Hemelytra hyalin with membrane light brown to black.

Male Structural Characteristics: As viewed from above,

outline of head laterally rounded, anteriorly truncate with vertex protuberant; greatest width of head approximately four and one half times the anterior width of vertex and distinctly less than humeral width of pronotum; synthlipsis slightly less than half the anterior width of vertex; along median longitudinal axis, head is approximately four sevenths the length of pronotum; notocephalon wide, sulcate dorsally; tylus slightly inflated; labrum with basal width not quite twice its median length and apex moderately rounded; rostral prong (pl. XVII, fig. 81c) short, shorter than third rostral segment, with base originating laterally near proximal end of third rostral segment, and with apex bluntly rounded. Pronotum with its median length slightly less than half its humeral width; disk with two elongate depressions toward the middle forming a median carina; lateral margins divergent; posterior margin convex, medianly concave. Scutellum large, with median length distinctly greater than that of pronotum. Fore femur (pl. XVII, fig. 81a) neither wide nor greatly thickened at apex; without stridulatory area. Fore tibia (pl. XVII, fig. 81a) with stridulatory comb (pl. XVII, fig. 81b) consisting of approximately fourteen thick teeth; all teeth approximately same size and thickness. Tarsal claws of fore leg dissimilar; one with narrow, acuminate apex and the other with blunt, slightly bifurcate apex. Chaetotaxy of male front leg as shown on Plate XVII. Male genital claspers (pl. III, fig. 24) abnormal in shape. Spine from

caudo-sinistral margin of seventh abdominal tergite (pl. II, fig. 13) sword-shaped, lying horizontally rather than in usual vertical position.

Comparative Notes: Superficially this species resembles *B. hungerfordi* n. sp. Examination of the male, however, will show distinct differences. This species differs from *B. hungerfordi* in having the tylus distinctly less pilose, spine from caudo-sinistral margin of seventh abdominal tergite straight and sword-shaped, differences in the genital capsule as shown on Plate II, and in its smaller size.

Location of Types: Holotype male, Acapulco, Gro., Mexico, July 12, 1937, H. D. Thomas. The holotype is in the Francis Huntington Snow Entomological Collections, University of Kansas.

Data on Distribution: Known only from type.

Buenoa paranensis Jaczewski

(Pl. XVII, fig. 82)

1928. *Buenoa paranensis* Jaczewski, T. Ann. Mus. Zoologici Polonici, vol. VII, pp. 126-127.

This species was not present in the material at my disposal. Dr. T. Jaczewski's types which were located at the Warsaw Museum, Poland, have been destroyed. The following is a copy of the original description and copies of Jaczewski's figures are included among the illustrations.

"Colour yellowish white, eyes dark, abdomen partly black beneath and above."

"Head with eyes distinctly wider than pronotum in front, as wide as posterior width of the latter [Fig. 82f] .
Synthlipsis about 3 times narrower than the greatest width of the notocephalon. Frontal arch very feebly convex, not projecting between the eyes. Eyes strongly convex and prominent in both sexes. Notocephalon in front with two distinct longitudinal swellings and a shallow median groove between them. Prongs of the third rostral joint of the ♂♂ comparatively long, straight, gradually tapering towards their end [Fig. 82e] .

"Pronotum about 1 1/2 times longer than the head, and about 1 2/3 times as wide as long. Scutellum somewhat (about 1/6) longer than pronotum. Pronotum in both sexes evenly convex, without any longitudinal keels. Claval orifice about 3/7 of the length of the scutellum.

"Relative length of the various parts of the legs, measured in percentages of the length of the corresponding femora, as follows:

	Femur	Tibia	Tarsus 1+2	Tarsus 3
Front legs ♂ :	100	116,7	57,4	31,1
Front legs ♀ :	100	126,5	58,5	32,1
Int. legs :	100	79,5	34,2	27,2
Hind legs :	100	84,1	31,1	30,6

"The ratio of length of the femora of the three pairs of legs appears as follows:

"Fr. fem.: Int. fem.: Hind fem. = 100: 160,4: 246,3.

"Front legs of the ♂♂ shaped as shown on fig. [82d].

Femora with a triangular stridulatory area about the middle of their anterior surface. Tibial prong with about 25 setaceous teeth.

"Lateral (sinistral) spine of the seventh abdominal tergite of the ♂♂ moderately long [Fig. 82c], thick in its basal portion, very thin and strongly pointed towards the apex.

"Gonapophyses of the ♂♂ shaped as shown on fig. [82].

"Length 6-6, 25 mm.

"Rio da Areia, a fairly large pond in the forest; 27.III. 1922, 45 ad., 9 larvae. A slide prepared of one of the ♂♂ is chosen as the type.

"This species differs at once from the two preceding ones by its smaller size, by the more slender body and by the sexual characters of the ♂♂."

Dr. Jaczewski refers in the above paragraph to B. crassipes (Champion) and B. femoralis (Fieber).

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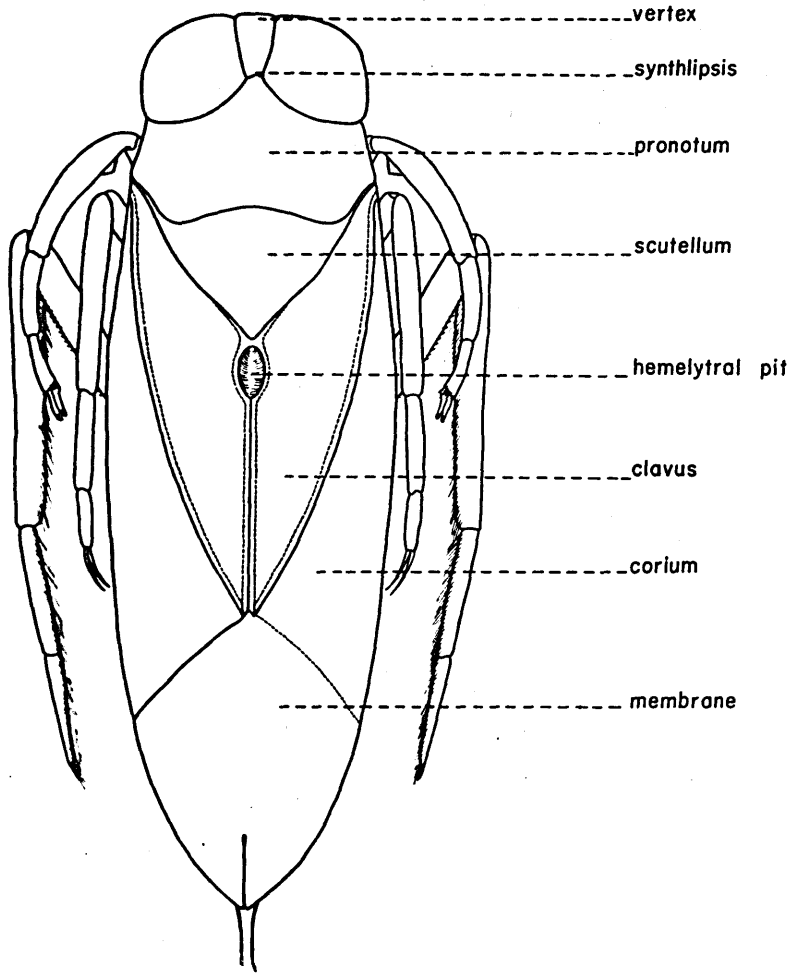
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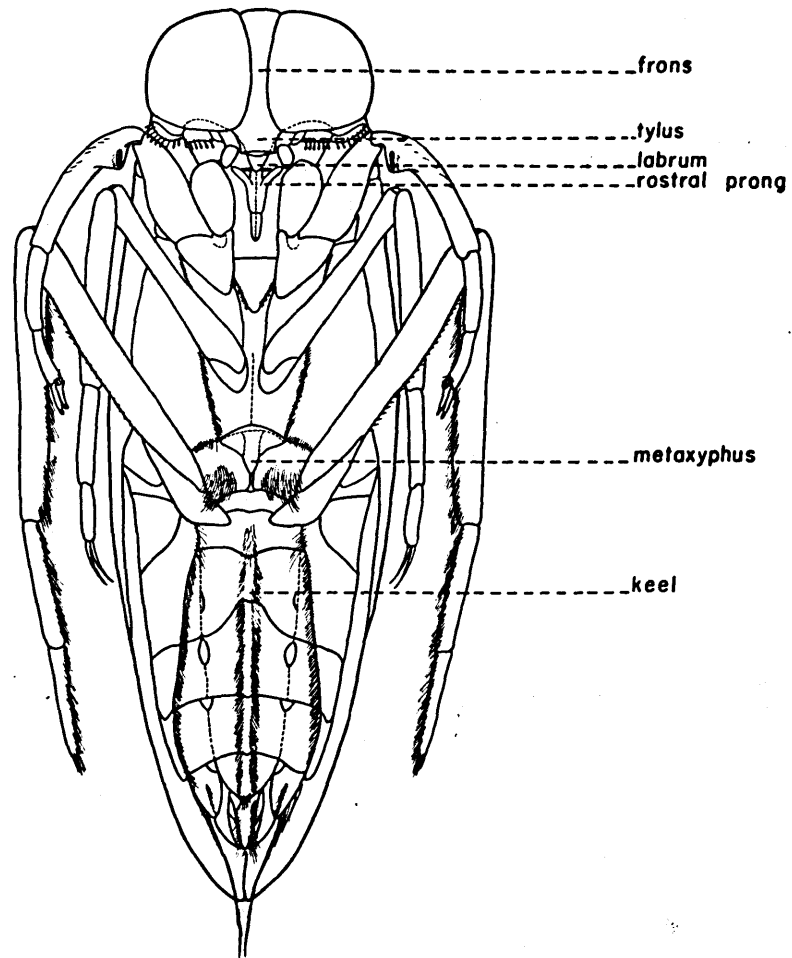
PLATE I

Figure 1. Male Buena - dorsal aspect.

Figure 2. Male Buena - ventral aspect.



1. Male Bueno (dorsum)



2. Male Bueno (venter)

PLATE II

- Figure 3. Buenoa macrophthalma (Fieber). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 4. Buenoa femoralis (Fieber). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 5. Buenoa pallens (Champion). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 6. Buenoa scimitra Bare. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 7. Buenoa fuscipennis (Berg). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 8. Buenoa limnocastoris Hungerford. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 9. Buenoa crassipes (Champion). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 10. Buenoa arizonis Bare. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 11. Buenoa pallens (Champion). Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 12. Buenoa excavata n. sp. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 13. Buenoa distincta n. sp. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- Figure 14. Buenoa hungerfordi n. sp. Spine from caudo-sinistral margin of seventh abdominal tergite of male.

PLATE II
(continued)

- Figure 15. Cephalic aspect showing wide interocular cephalic space.
- Figure 16. Cephalic aspect showing narrow interocular cephalic space.
- Figure 17. Diagram showing method of measuring rostral prong.
- Figure 18. Diagram showing method of measuring width of head, vertex, and synthlipsis.
- Figure 19. Diagram showing method of measuring length of fore femur and width at apex.
- Figure 20. Buenoa confusa n. sp. Male genital capsule.
- Figure 21. Buenoa hungerfordi n. sp. Male genital capsule.
- Figure 22. Buenoa distincta n. sp. Male genital capsule.



3. *B. macrophthalma*



4. *B. femoralis*



5. *B. pallens*



6. *B. scimitra*



7. *B. fuscipennis*



8. *B. limnocastoris*



9. *B. crassipes*



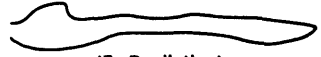
10. *B. arizonis*



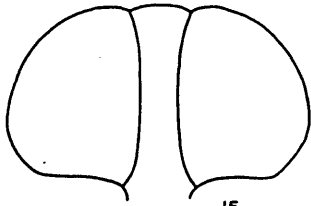
11. *B. pallens*



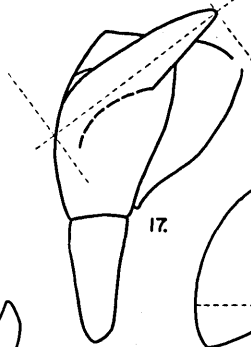
12. *B. excavata*



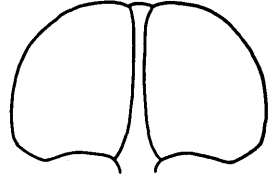
13. *B. distincta*



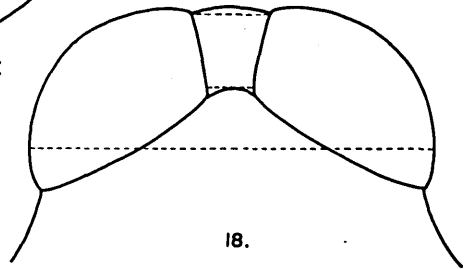
15.



17.



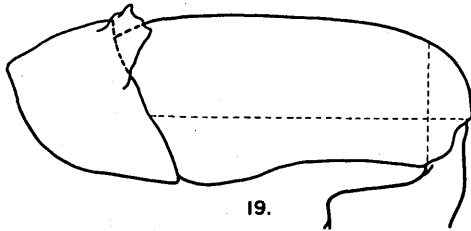
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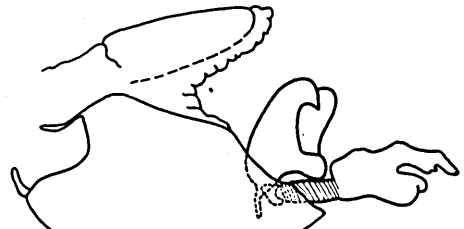
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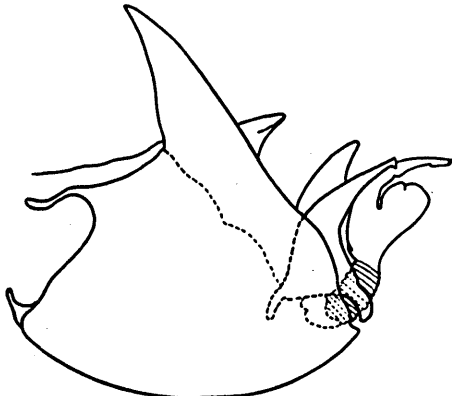
14. *B. hungerfordi*



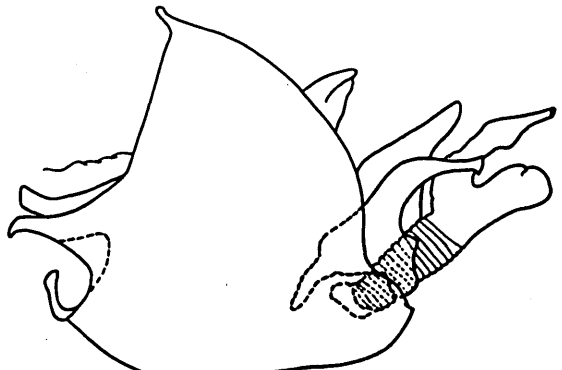
19.



20. *B. confusa*



21. *B. hungerfordi*



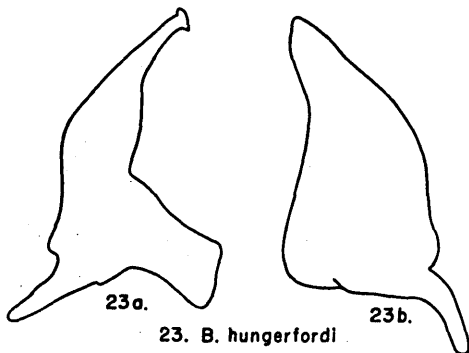
22. *B. distincta*

PLATE III

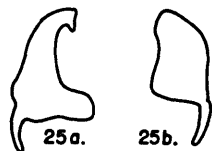
- Figure 23. Buenoa hungerfordi n. sp.
23a. Left genital clasper.
23b. Right genital clasper.
- Figure 24. Buenoa distincta n. sp.
24a. Left genital clasper.
24b. Right genital clasper.
- Figure 25. Buenoa thomasi n. sp.
25a. Left genital clasper.
25b. Right genital clasper.
- Figure 26. Buenoa oculata n. sp.
26a. Left genital clasper.
26b. Right genital clasper.
- Figure 27. Buenoa macrophthalma (Fieber).
27a. Left genital clasper.
27b. Right genital clasper.
- Figure 28. Buenoa fuscipennis (Berg).
28a. Left genital clasper.
28b. Right genital clasper.
- Figure 29. Buenoa arizonis Bare
29a. Left genital clasper.
29b. Right genital clasper.
- Figure 30. Buenoa antigone (Kirkaldy). Laterodorsal view
of left ovipositor valve.
- Figure 31. Buenoa uhleri n. sp. Laterodorsal view of
left ovipositor valve.
- Figure 32. Buenoa arizonis Bare. Laterodorsal view of
left ovipositor valve.

PLATE III
(Continued)

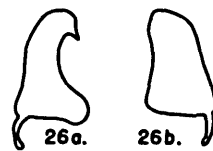
- Figure 33. Buenoa margaritacea Torre-Bueno. Laterodorsal view of left ovipositor valve.
- Figure 34. Buenoa confusa n. sp. Laterodorsal view of left ovipositor valve.
- Figure 35. Buenoa alterna n. sp. Laterodorsal view of left ovipositor valve.
- Figure 36. Buenoa amnigenus (White). Laterodorsal view of left ovipositor valve.
- Figure 37. Buenoa omani n. sp. Laterodorsal view of left ovipositor valve.
- Figure 38. Buenoa macrotibialis Hungerford. Laterodorsal view of left ovipositor valve.
- Figure 39. Buenoa salutis Kirkaldy. Laterodorsal view of left ovipositor valve.
- Figure 40. Buenoa limnocastoris Hungerford. Laterodorsal view of left ovipositor valve.
- Figure 41. Buenoa hungerfordi n. sp. Laterodorsal view of left ovipositor valve.



23. *B. hungerfordi*



25. *B. thomasi*



26. *B. oculata*



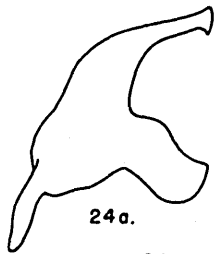
27. *B. macrophthalma*



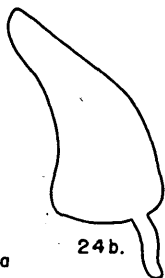
27b.



29. *B. arizonis*



24. *B. distincta*



24b.



28. *B. fuscipennis*



28b.



29b.



30. *B. antigone*



31. *B. uhleri*



32. *B. arizonis*



33. *B. margaritacea*



34. *B. confusa*



35. *B. alterno*



36. *B. omnigenus*



37. *B. omani*



38. *B. macrotibialis*



39. *B. salutis*



40. *B. limnocastoris*



41. *B. hungerfordi*

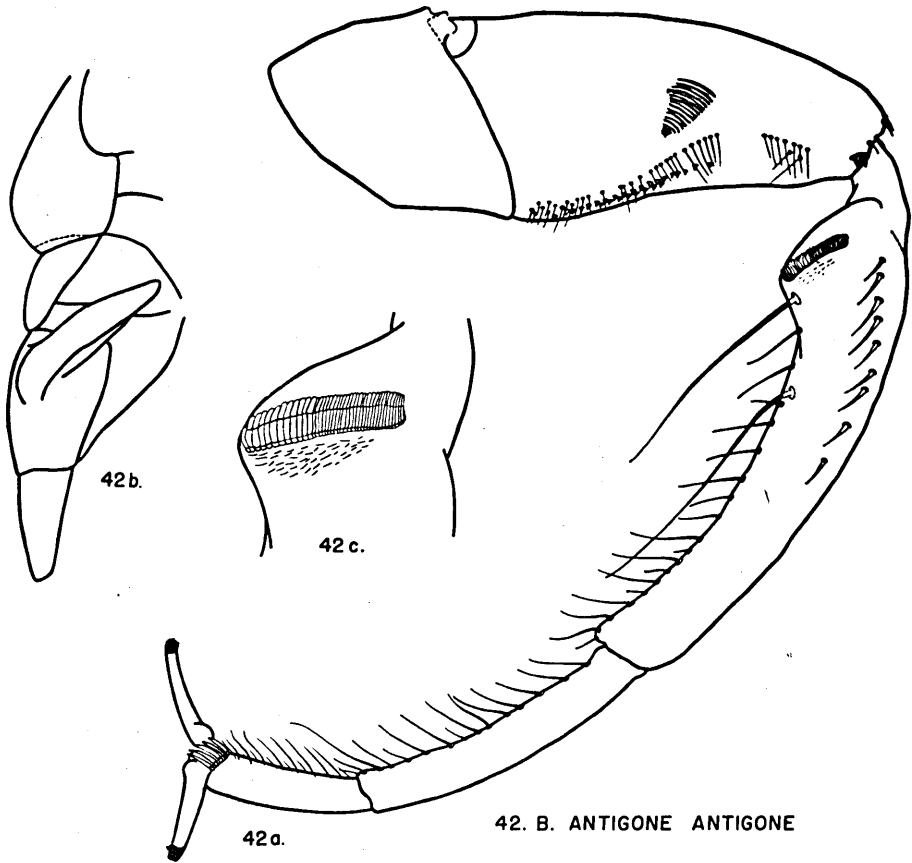
PLATE IV

Figure 42. Buena antigone antigone (Kirkaldy).

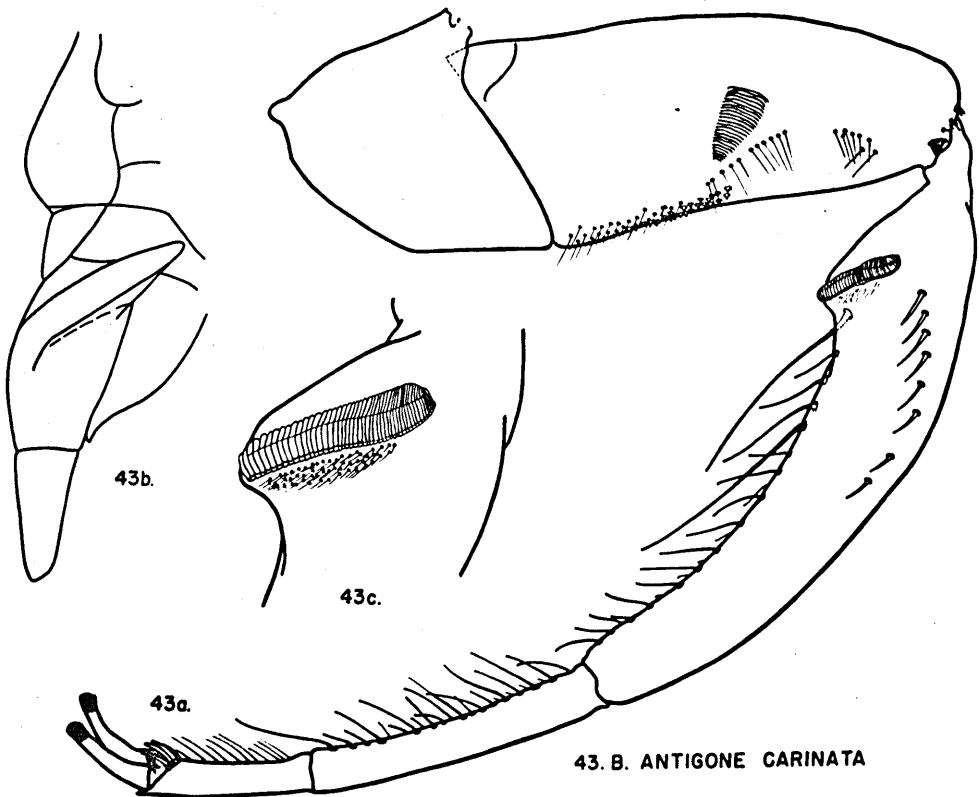
- 42a. Inner surface view of male left fore leg.
- 42b. Left lateral view of male rostrum and tylus.
- 42c. Enlarged view of left tibial stridulatory comb.

Figure 43. Buena antigone carinata (Champion).

- 43a. Inner surface view of male left fore leg.
- 43b. Left lateral view of male rostrum and tylus.
- 43c. Enlarged view of left tibial stridulatory comb.



42. B. ANTIGONE ANTIGONE



43. B. ANTIGONE CARINATA

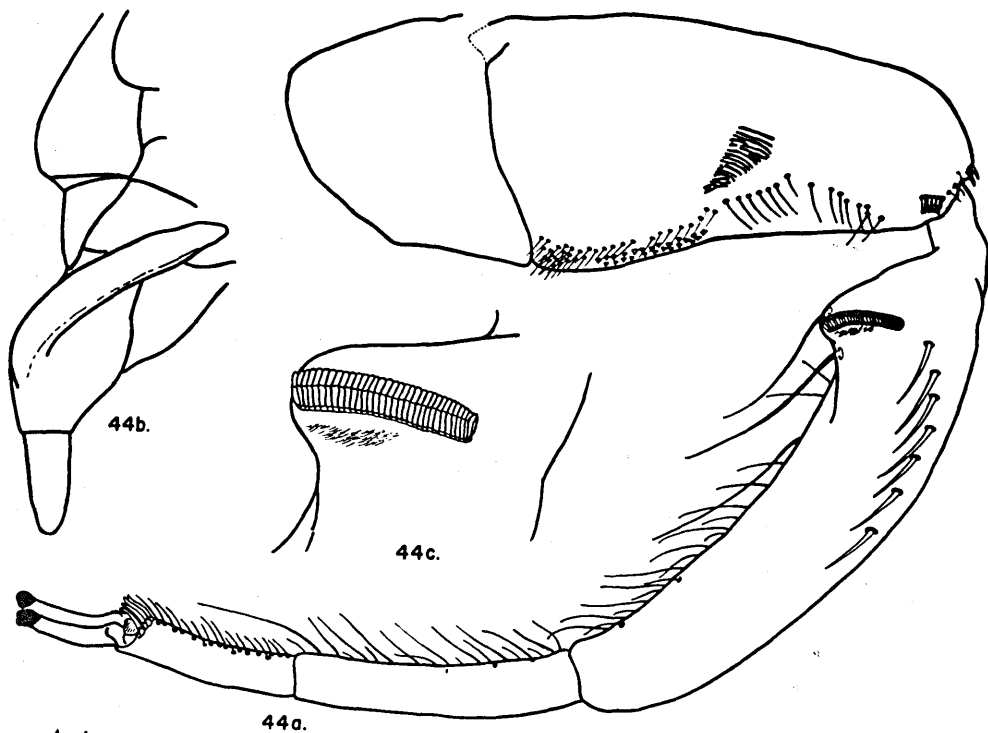
PLATE V

Figure 44. Buenoa femoralis (Fieber).

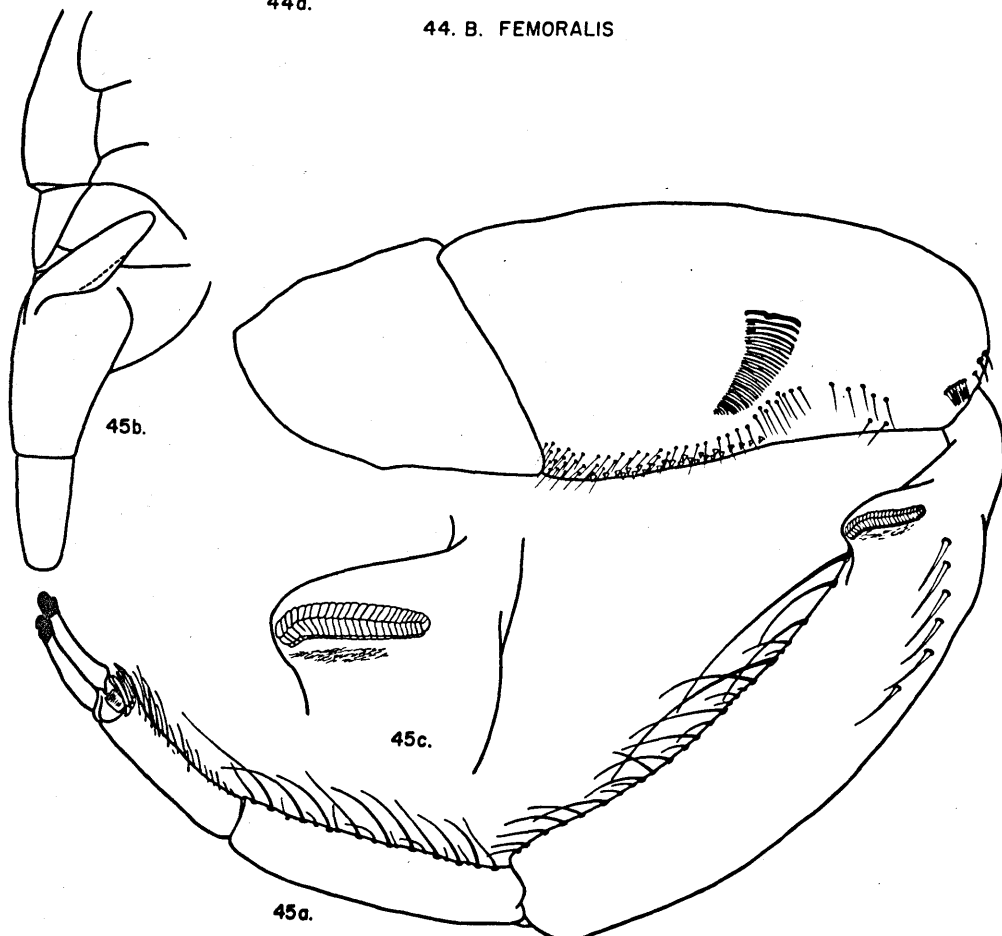
- 44a. Inner surface view of male left fore leg.
- 44b. Left lateral view of male rostrum and tylus.
- 44c. Enlarged view of left tibial stridulatory comb.

Figure 45. Buenoa ida Kirkaldy.

- 45a. Inner surface view of male left fore leg.
- 45b. Left lateral view of male rostrum and tylus.
- 45c. Enlarged view of left tibial stridulatory comb.



44. B. FEMORALIS



45. B. IDA

PLATE VI

Figure 46. Buenoa crassipes (Champion).

- 46a. Inner surface view of male left fore leg.
- 46b. Left lateral view of male rostrum and tylus.
- 46c. Enlarged view of left tibial stridulatory comb.
- 46d. Enlarged view of variable form of femoral stridulatory area.
- 46e. Enlarged view of variable form of tibial stridulatory comb.

Figure 47. Buenoa arizonis Bare.

- 47a. Inner surface view of male left fore leg.
- 47b. Left lateral view of male rostrum and tylus.
- 47c. Enlarged view of left tibial stridulatory comb.

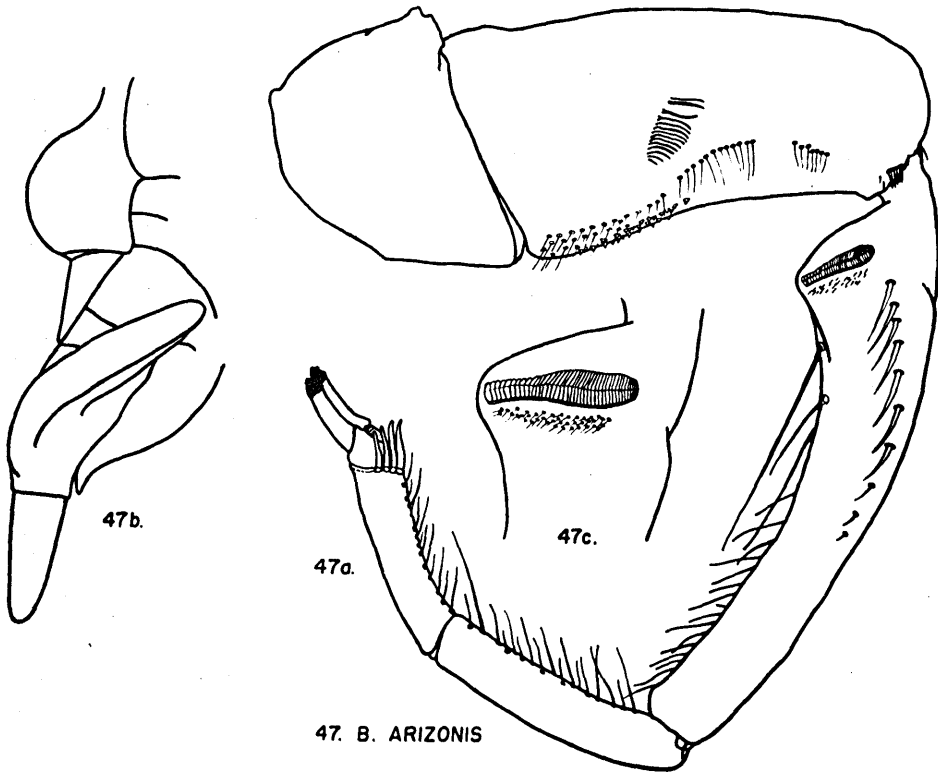
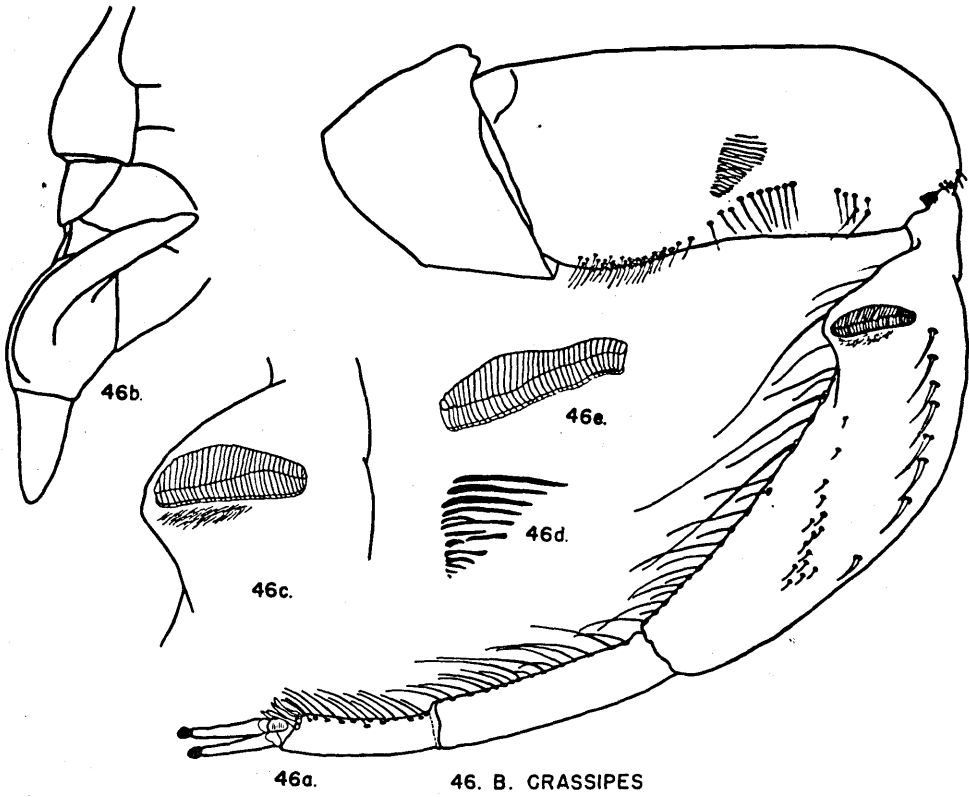


PLATE VII

Figure 48. Buenoa absidata n. sp.

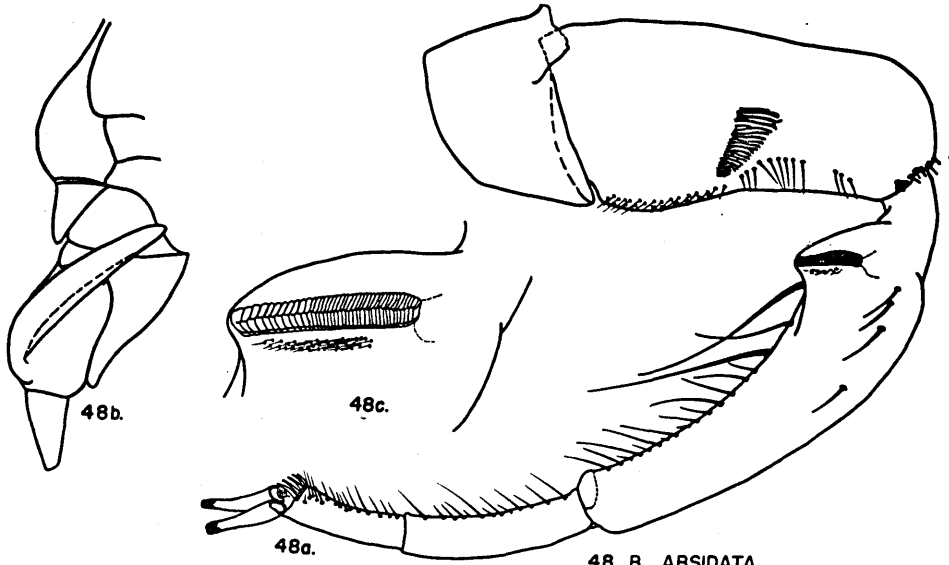
- 48a. Inner surface view of male left fore leg.
- 48b. Left lateral view of male rostrum and tylus.
- 48c. Enlarged view of left tibial stridulatory comb.

Figure 49. Buenoa tarsalis n. sp.

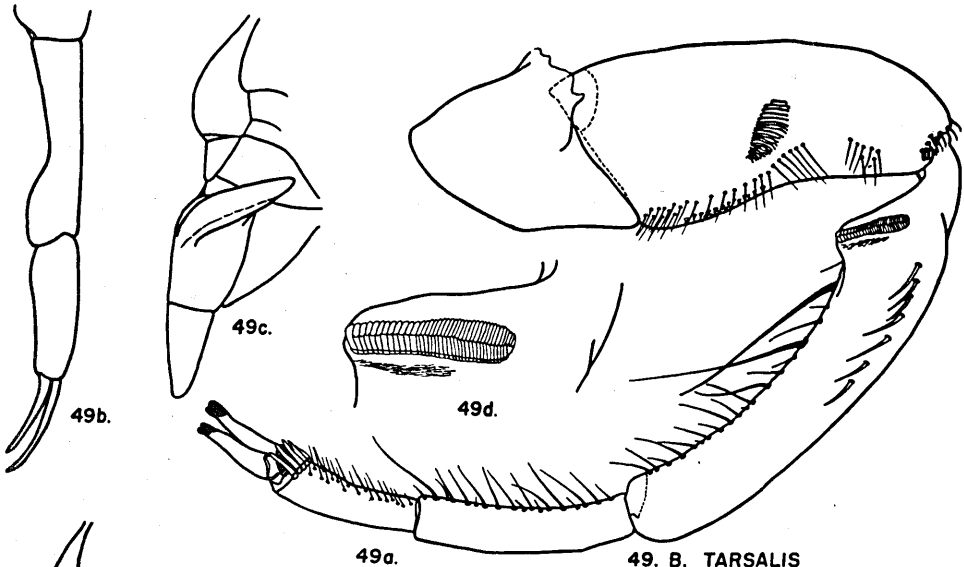
- 49a. Inner surface view of male left fore leg.
- 49b. Inner surface view of intermediate tarsus of male.
- 49c. Left lateral view of male rostrum and tylus.
- 49d. Enlarged view of left tibial stridulatory comb.

Figure 50. Buenoa rostra n. sp.

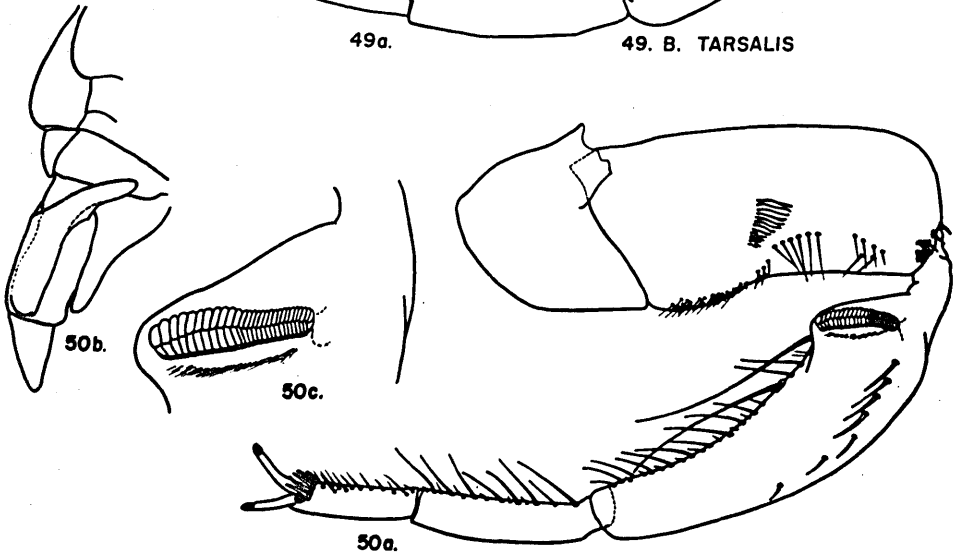
- 50a. Inner surface view of male left fore leg.
- 50b. Left lateral view of male rostrum and tylus.
- 50c. Enlarged view of left tibial stridulatory comb.



48. B. ABSIDATA



49. B. TARSALIS



50. B. ROSTRA

PLATE VIII

Figure 51. Buenoa margaritacea Torre-Bueno.

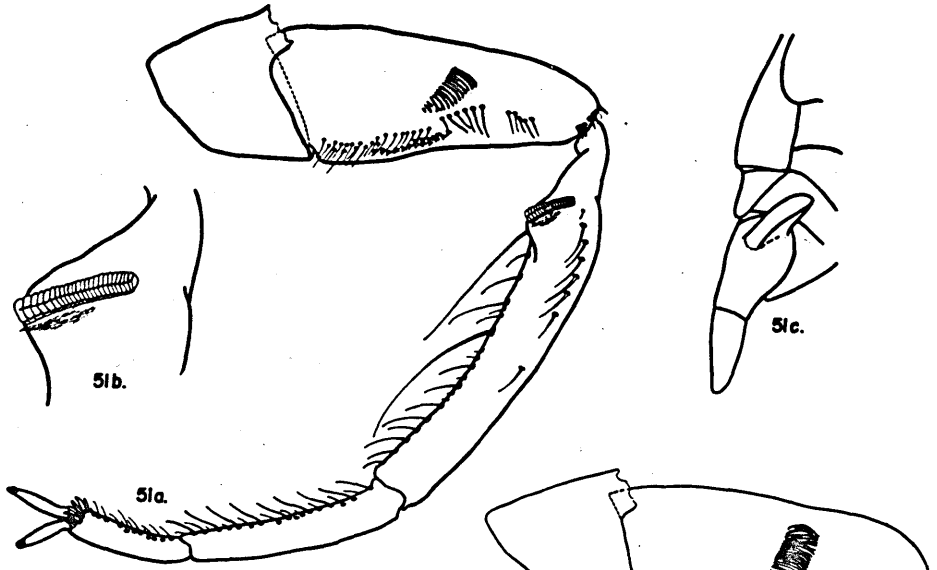
- 51a. Inner surface view of male left fore leg.
- 51b. Enlarged view of left tibial stridulatory comb.
- 51c. Left lateral view of male rostrum and tylus.

Figure 52. Buenoa scimitra Bare.

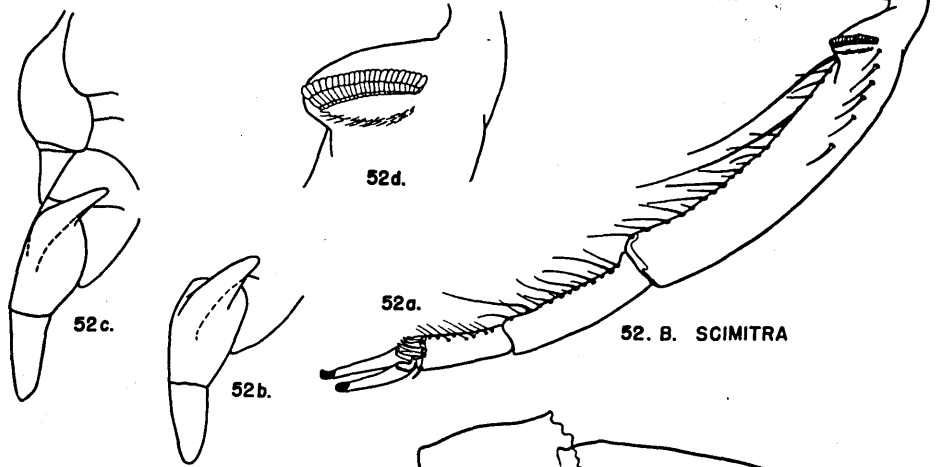
- 52a. Inner surface view of male left fore leg.
- 52b. Left lateral view of variable form of male rostral prong.
- 52c. Left lateral view of male rostrum and tylus.
- 52d. Enlarged view of left tibial stridulatory comb.

Figure 53. Buenoa uhleri n. sp.

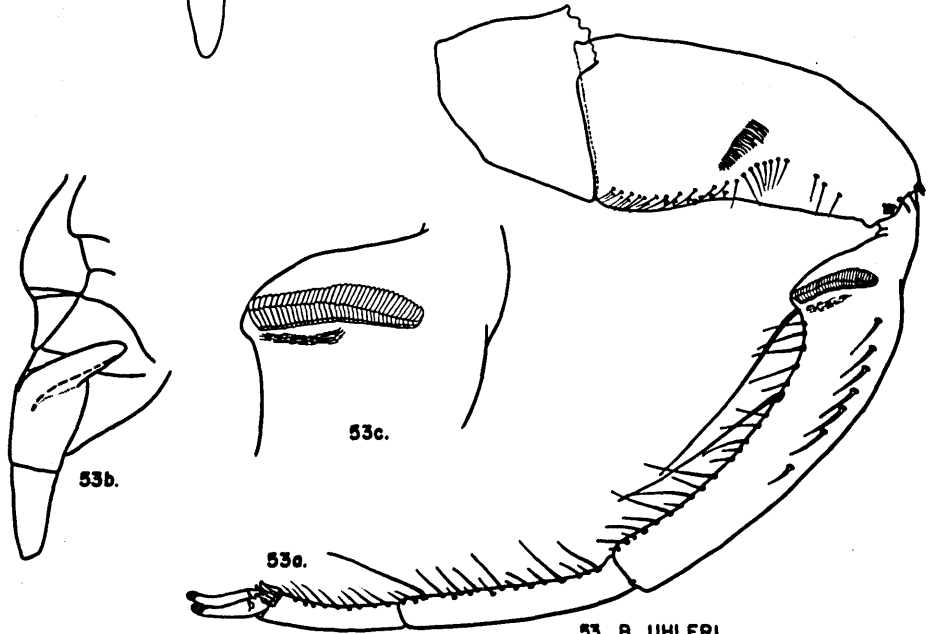
- 53a. Inner surface view of male left fore leg.
- 53b. Left lateral view of male rostrum and tylus.
- 53c. Enlarged view of left tibial stridulatory comb.



51. B. MARGARITAGEA



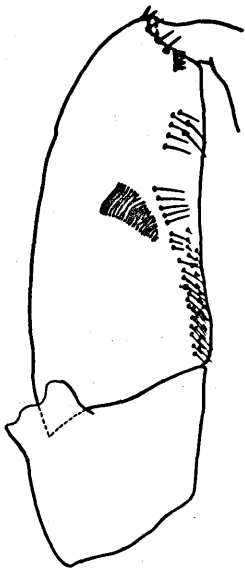
52. B. SCIMITRA



53. B. UHLERI

PLATE IX

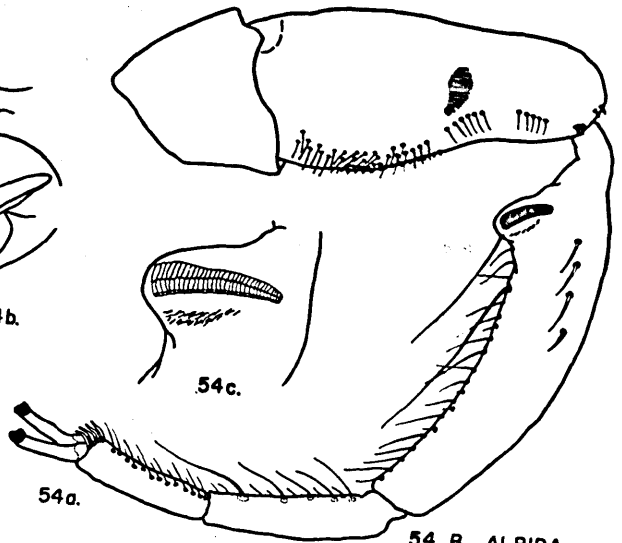
- Figure 54. Buena albida (Champion).
- 54a. Inner surface view of male left fore leg.
 - 54b. Left lateral view of male rostrum and tylus.
 - 54c. Enlarged view of left tibial stridulatory comb.
- Figure 55. Buena pallens (Champion).
- 55a. Inner surface view of male left fore leg.
 - 55b. Left lateral view of male rostrum and tylus.
 - 55c. Left lateral view of variable form of male rostral prong.
 - 55d. Inner surface view of variable form of male fore femur.
 - 55e. Enlarged view of left tibial stridulatory comb.
 - 55f. Enlarged view of variable form of tibial stridulatory comb.
- Figure 56. Buena pallipes (Fabricius).
- 56a. Inner surface view of male left fore leg.
 - 56b. Left lateral view of male rostrum and tylus.
 - 56c. Enlarged view of left tibial stridulatory comb.



55d.



54b.



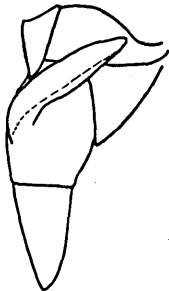
54c.

54a.

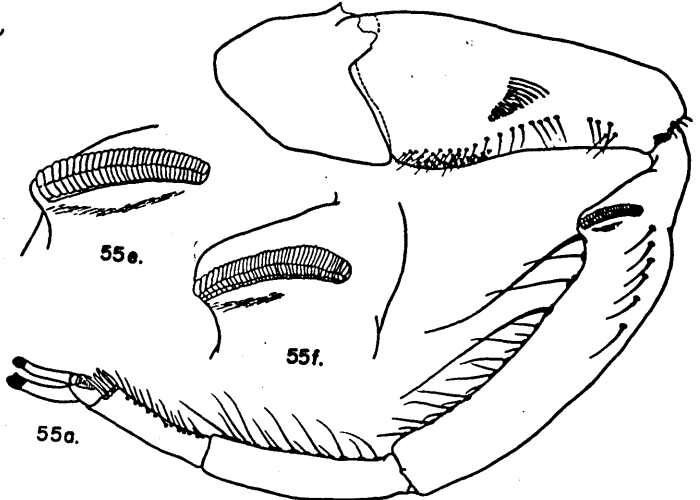
54. B. ALBIDA



55b.



55c.

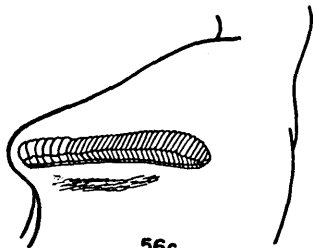


55e.

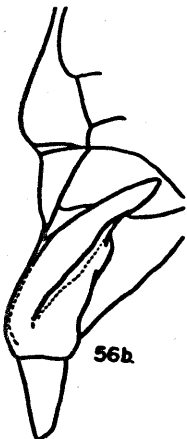
55f.

55a.

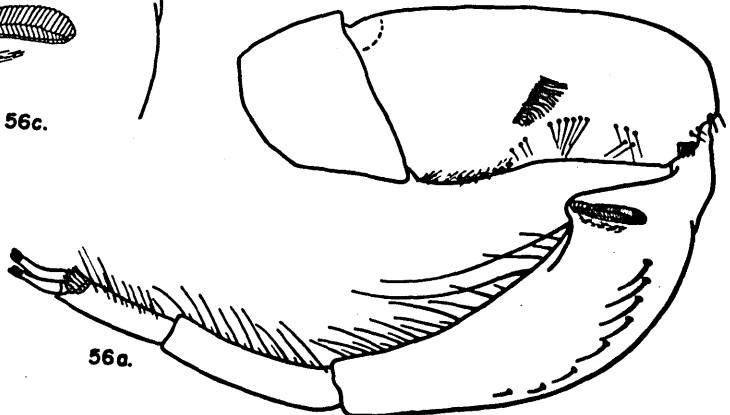
55. B. PALLENS



56c.



56b.



56a.

56. B. PALLIPES

PLATE X

Figure 57. Buenoa platycnemis (Fieber).

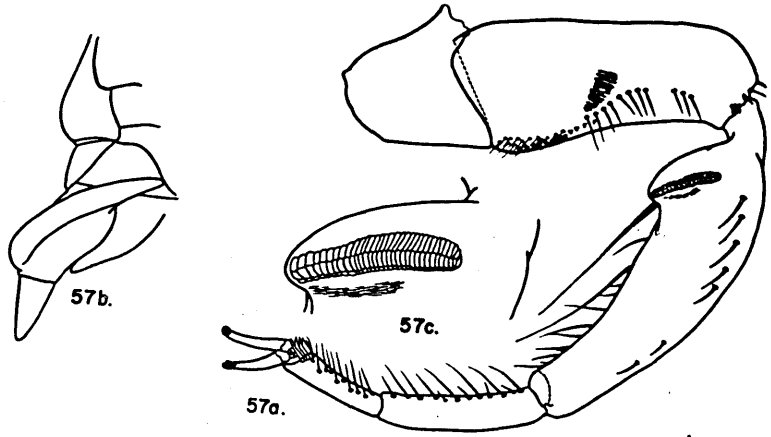
- 57a. Inner surface view of male left fore leg.
- 57b. Left lateral view of male rostrum and tylus.
- 57c. Enlarged view of left tibial stridulatory comb.

Figure 58. Buenoa omani n. sp.

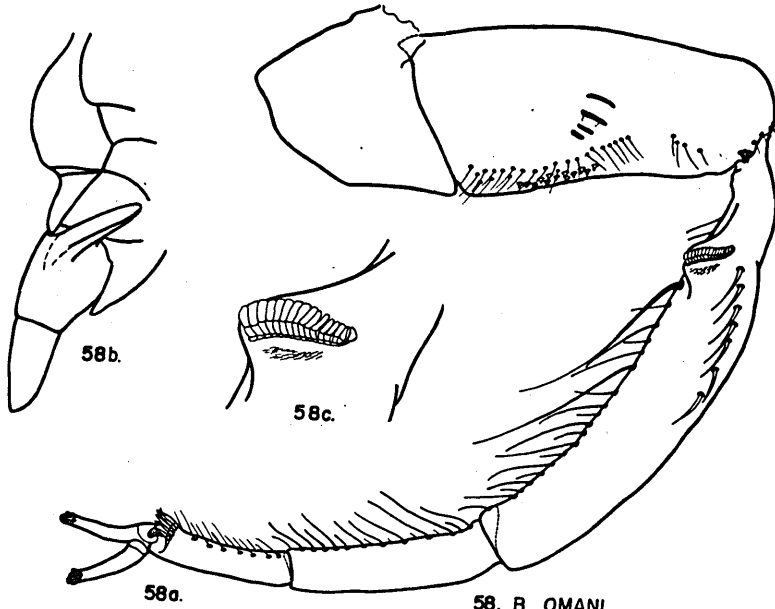
- 58a. Inner surface view of male left fore leg.
- 58b. Left lateral view of male rostrum and tylus.
- 58c. Enlarged view of left tibial stridulatory comb.

Figure 59. Buenoa macrotrichia n. sp.

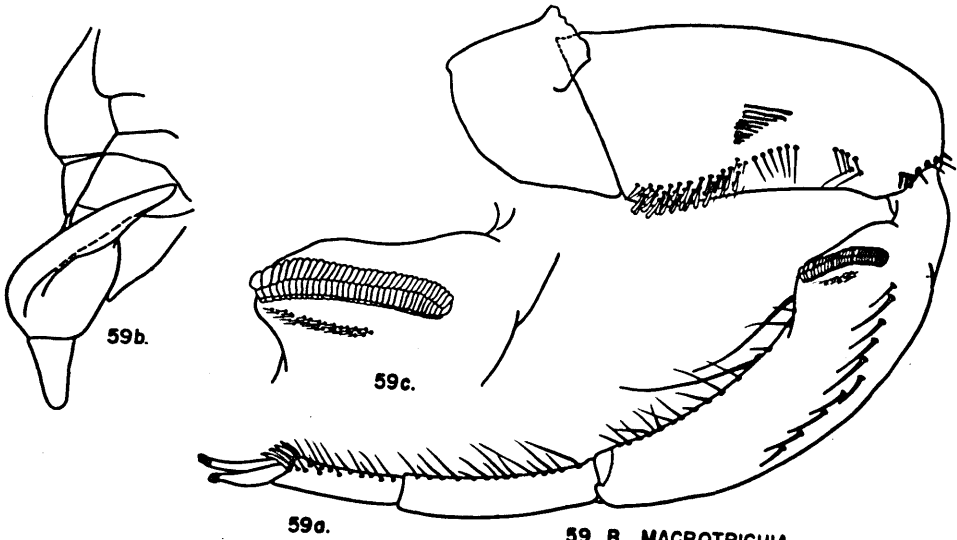
- 59a. Inner surface view of male left fore leg.
- 59b. Left lateral view of male rostrum and tylus.
- 59c. Enlarged view of left tibial stridulatory comb.



57. B. PLATYCNEMIS



58. B. OMANI



59. B. MACROTRICHIA

PLATE XI

Figure 60. Buenoa nitida n. sp.

- 60a. Inner surface view of male left fore leg.
- 60b. Left lateral view of male rostrum and tylus.
- 60c. Enlarged view of left tibial stridulatory comb.

Figure 61. Buenoa mutabilis n. sp.

- 61a. Inner surface view of male left fore leg.
- 61b. Left lateral view of male rostrum and tylus.
- 61c. Left lateral view of variable form of male rostral prong.
- 61d. Enlarged view of left tibial stridulatory comb.

Figure 62. Buenoa arida n. sp.

- 62a. Inner surface view of male left fore leg.
- 62b. Left lateral view of male rostrum and tylus.
- 62c. Enlarged view of left tibial stridulatory comb.

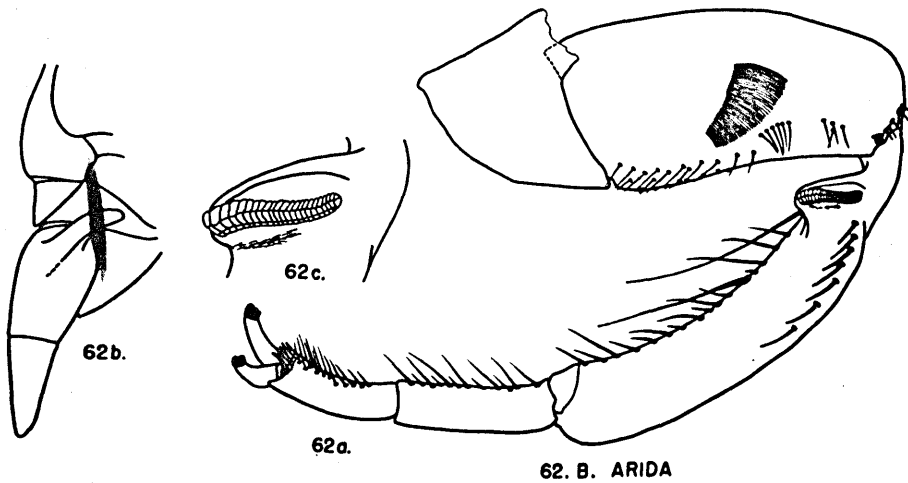
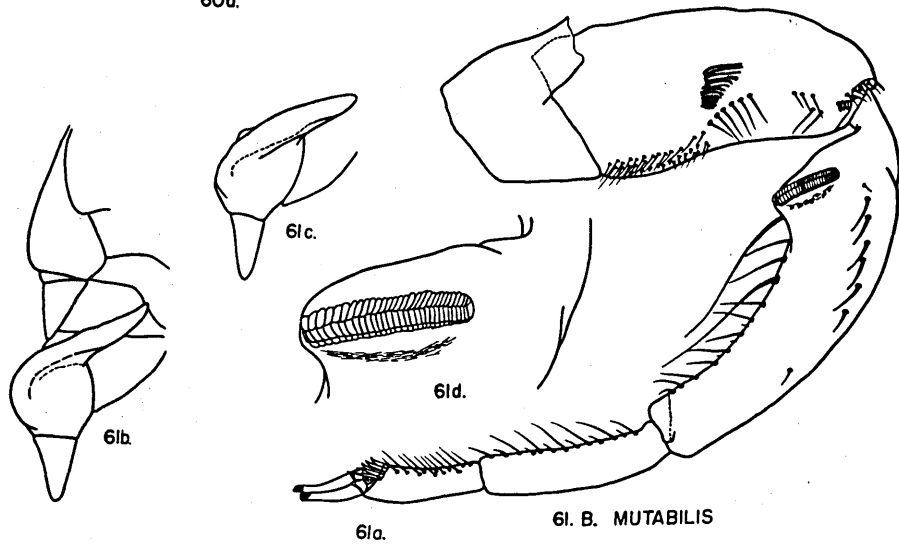
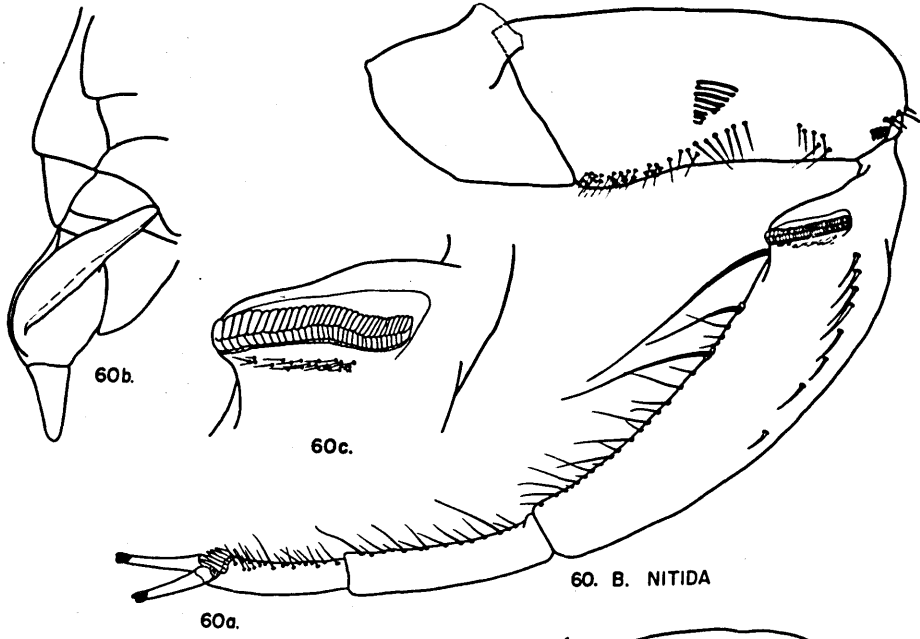


PLATE XII

Figure 63. Buenoa speciosa n. sp.

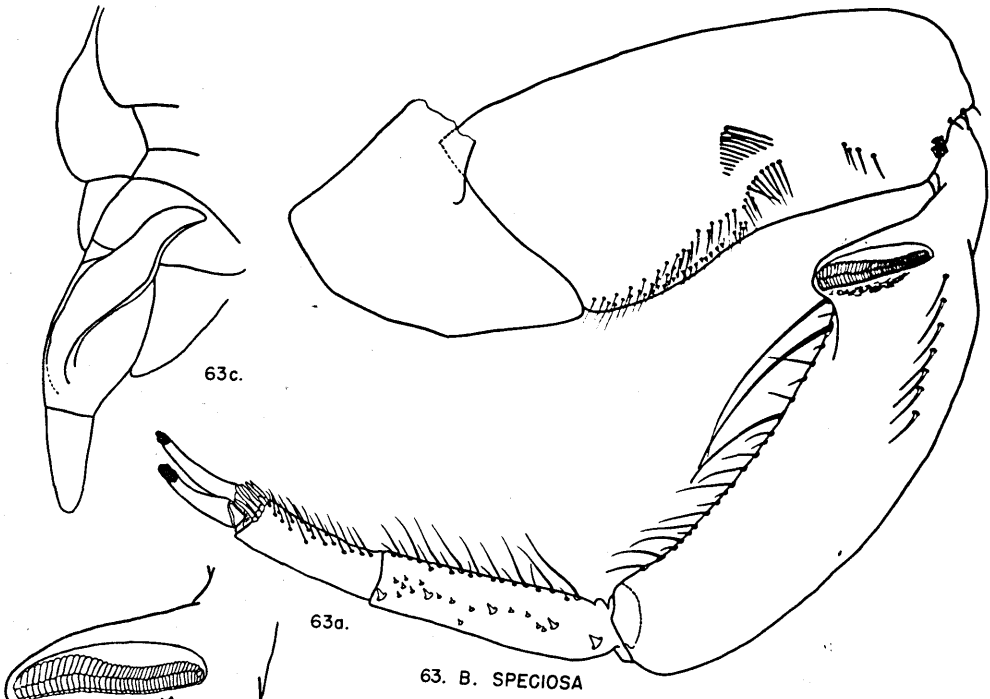
- 63a. Inner surface view of male left fore leg.
- 63b. Enlarged view of left tibial stridulatory comb.
- 63c. Left lateral view of male rostrum and tylus.

Figure 64. Buenoa gracilis n. sp.

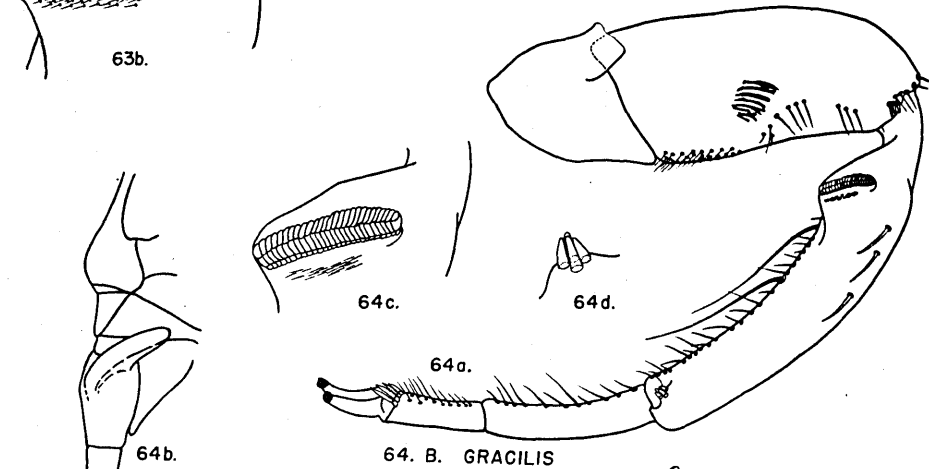
- 64a. Inner surface view of male left fore leg.
- 64b. Left lateral view of male rostrum and tylus.
- 64c. Enlarged view of left tibial stridulatory comb.
- 64d. Enlarged view of peg-like setae on inner surface of fore tibia.

Figure 65. Buenoa communis n. sp.

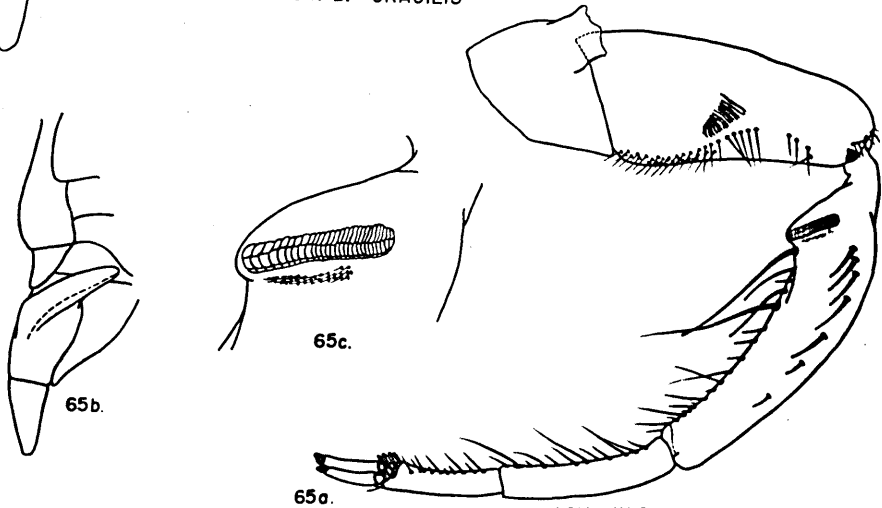
- 65a. Inner surface view of male left fore leg.
- 65b. Left lateral view of male rostrum and tylus.
- 65c. Enlarged view of left tibial stridulatory comb.



63. *B. SPECIOSA*



64. *B. GRACILIS*



65. *B. COMMUNIS*

PLATE XIII

Figure 66. Buenoa artafrons n. sp.

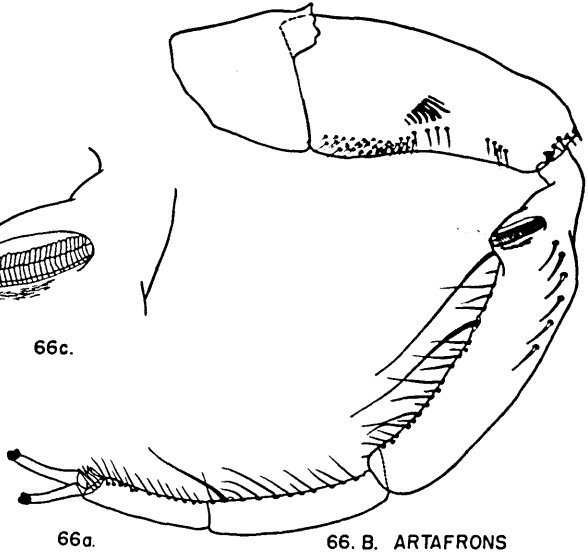
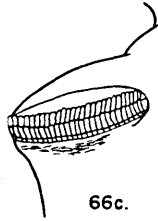
- 66a. Inner surface view of male left fore leg.
- 66b. Left lateral view of male rostrum and tylus.
- 66c. Enlarged view of left tibial stridulatory comb.

Figure 67. Buenoa macrotibialis Hungerford.

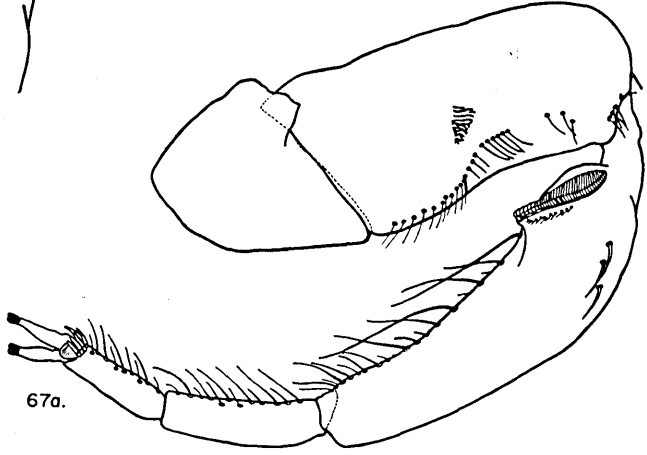
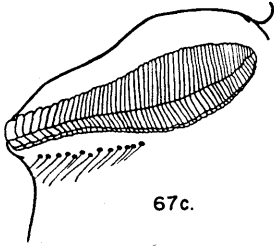
- 67a. Inner surface view of male left fore leg.
- 67b. Left lateral view of male rostrum and tylus.
- 67c. Enlarged view of left tibial stridulatory comb.

Figure 68. Buenoa limnocastoris Hungerford.

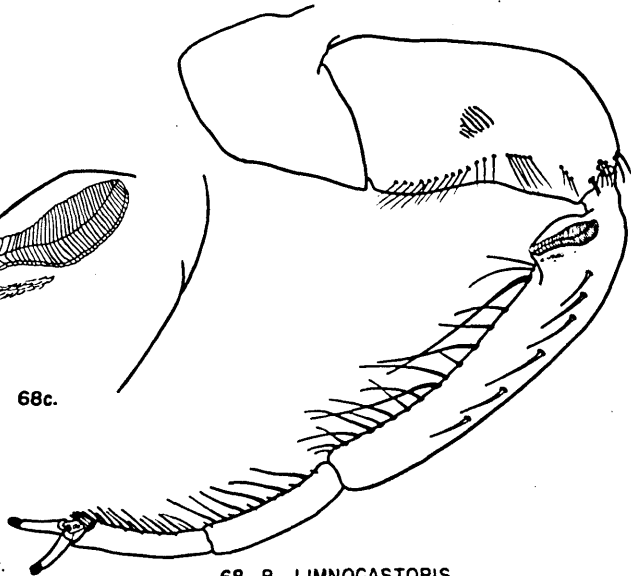
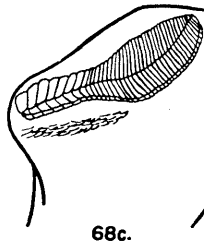
- 68a. Inner surface view of male left fore leg.
- 68b. Left lateral view of male rostrum and tylus.
- 68c. Enlarged view of left tibial stridulatory comb.



66. B. ARTAFRONS



67. B. MACROTIBIALIS



68. B. LIMNOCASTORIS



PLATE XIV

Figure 69. Buena confusa n. sp.

- 69a. Inner surface view of male left fore leg.
- 69b. Left lateral view of male rostrum and tylus.
- 69c. Enlarged view of left tibial stridulatory comb.

Figure 70. Buena amnigenus (White).

- 70a. Inner surface view of male left fore leg.
- 70b. Enlarged view of left tibial stridulatory comb.
- 70c. Left lateral view of male rostrum and tylus.

Figure 71. Buena fuscipennis (Berg).

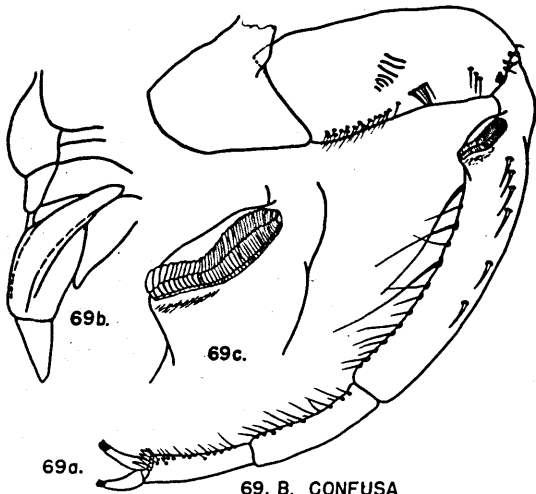
- 71a. Inner surface view of male left fore leg.
- 71b. Left lateral view of male rostrum and tylus.
- 71c. Enlarged view of left tibial stridulatory comb.

Figure 72. Buena oculata n. sp.

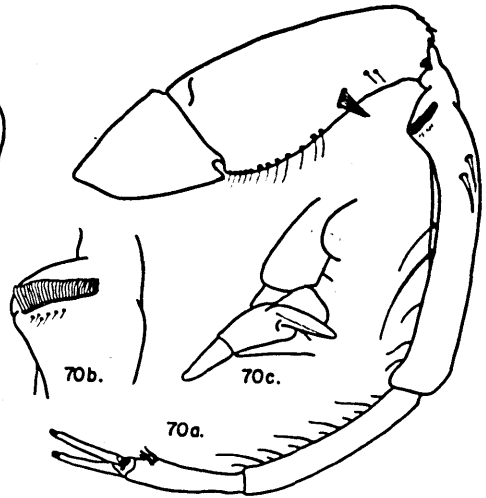
- 72a. Inner surface view of male left fore leg.
- 72b. Left lateral view of male rostrum and tylus.
- 72c. Enlarged view of left tibial stridulatory comb.
- 72d. Inner surface view of intermediate tarsus of male.

Figure 73. Buena incompta n. sp.

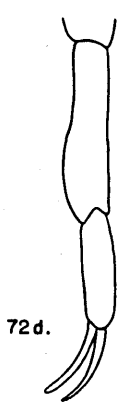
- 73a. Inner surface view of male left fore leg.
- 73b. Left lateral view of male rostrum and tylus.
- 73c. Enlarged view of left tibial stridulatory comb.



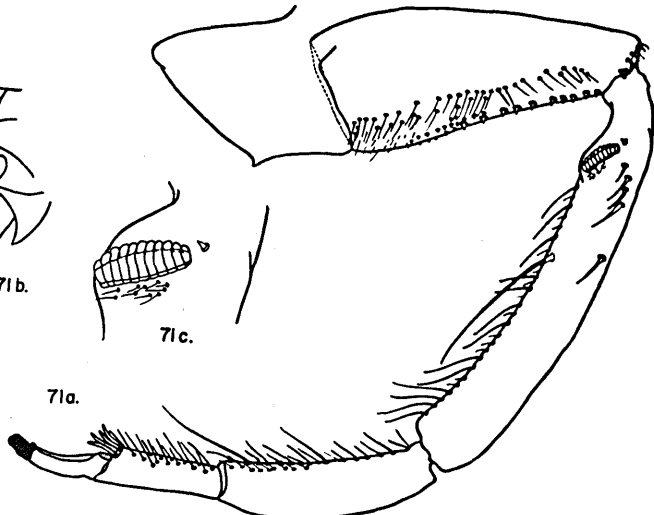
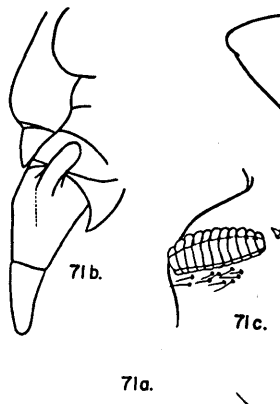
69. B. CONFUSA



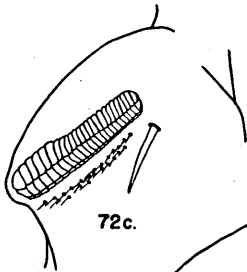
70. B. AMNIGENUS



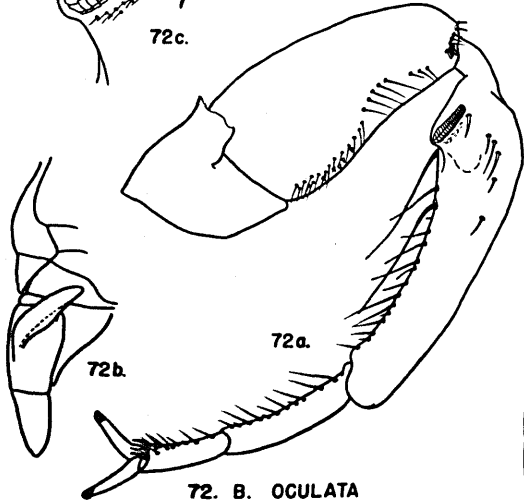
72d.



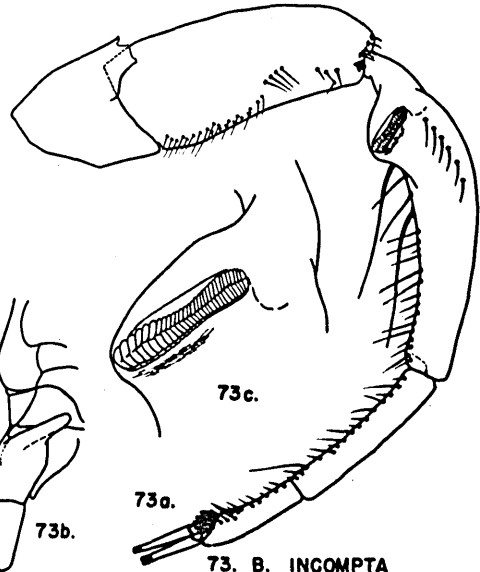
71. B. FUSCIPENNIS



72c.



72. B. OCLATA



73. B. INCOMPTA

PLATE XV

Figure 74. Buenoa salutis Kirkaldy.

- 74a. Inner surface view of male left fore leg.
- 74b. Left lateral view of male rostrum and tylus.
- 74c. Left lateral view of variable form of male rostral prong.
- 74d. Enlarged view of left tibial stridulatory comb.

Figure 75. Buenoa excavata n. sp.

- 75a. Inner surface view of male left fore leg.
- 75b. Left lateral view of male rostrum and tylus.
- 75c. Enlarged view of left tibial stridulatory comb.

Figure 76. Buenoa thomasi n. sp.

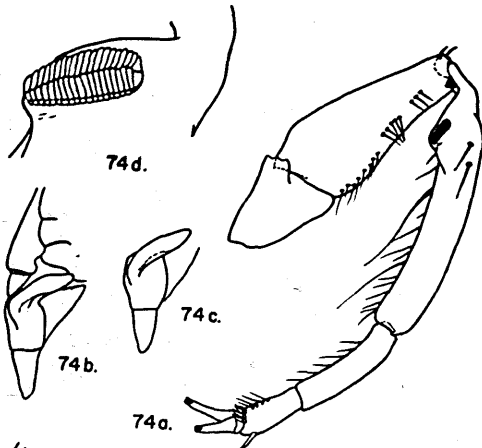
- 76a. Inner surface view of male left fore leg.
- 76b. Enlarged view of left tibial stridulatory comb.
- 76c. Left lateral view of male rostrum and tylus.
- 76d. Enlarged view of club-like setae on inner surface of fore tibia.

Figure 77. Buenoa alterna n. sp.

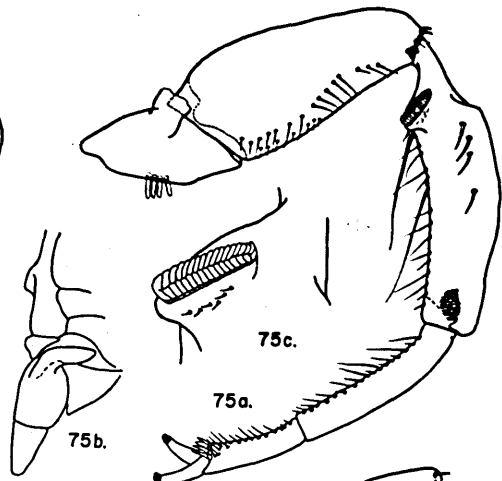
- 77a. Inner surface view of male left fore leg.
- 77b. Left lateral view of male rostrum and tylus.
- 77c. Enlarged view of left tibial stridulatory comb.

Figure 78. Buenoa unguis n. sp.

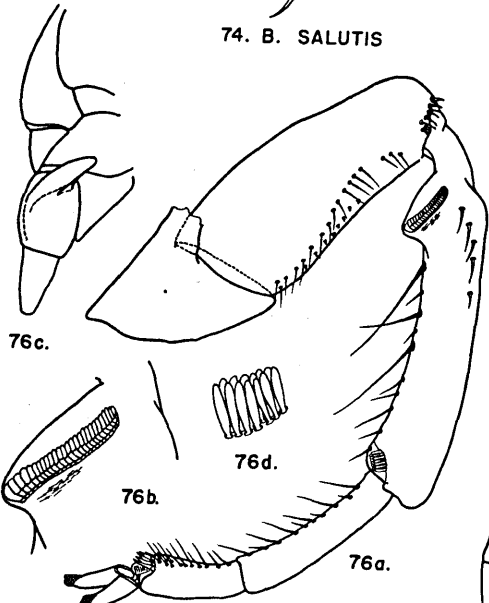
- 78a. Inner surface view of male left fore leg.
- 78b. Enlarged view of left tibial stridulatory comb.
- 78c. Left lateral view of male rostrum and tylus.
- 78d. Enlarged view of male fore tarsus.



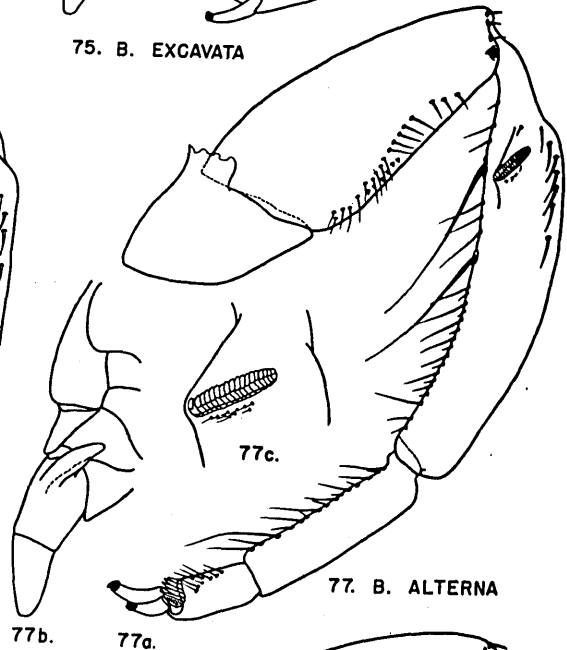
74. *B. SALUTIS*



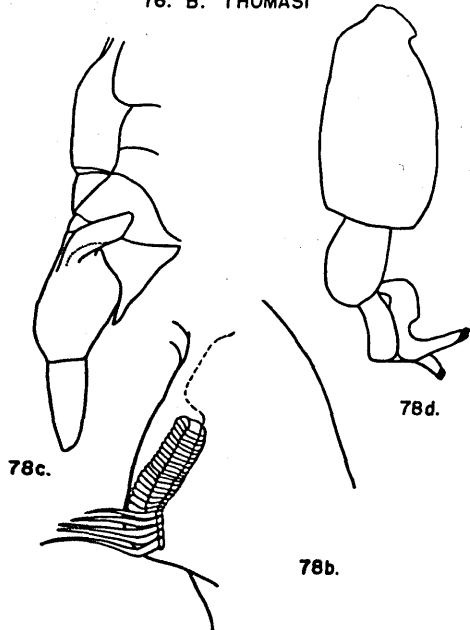
75. *B. EXCAVATA*



76. *B. THOMASI*



77. *B. ALTERNA*



78. *B. UNGUIS*

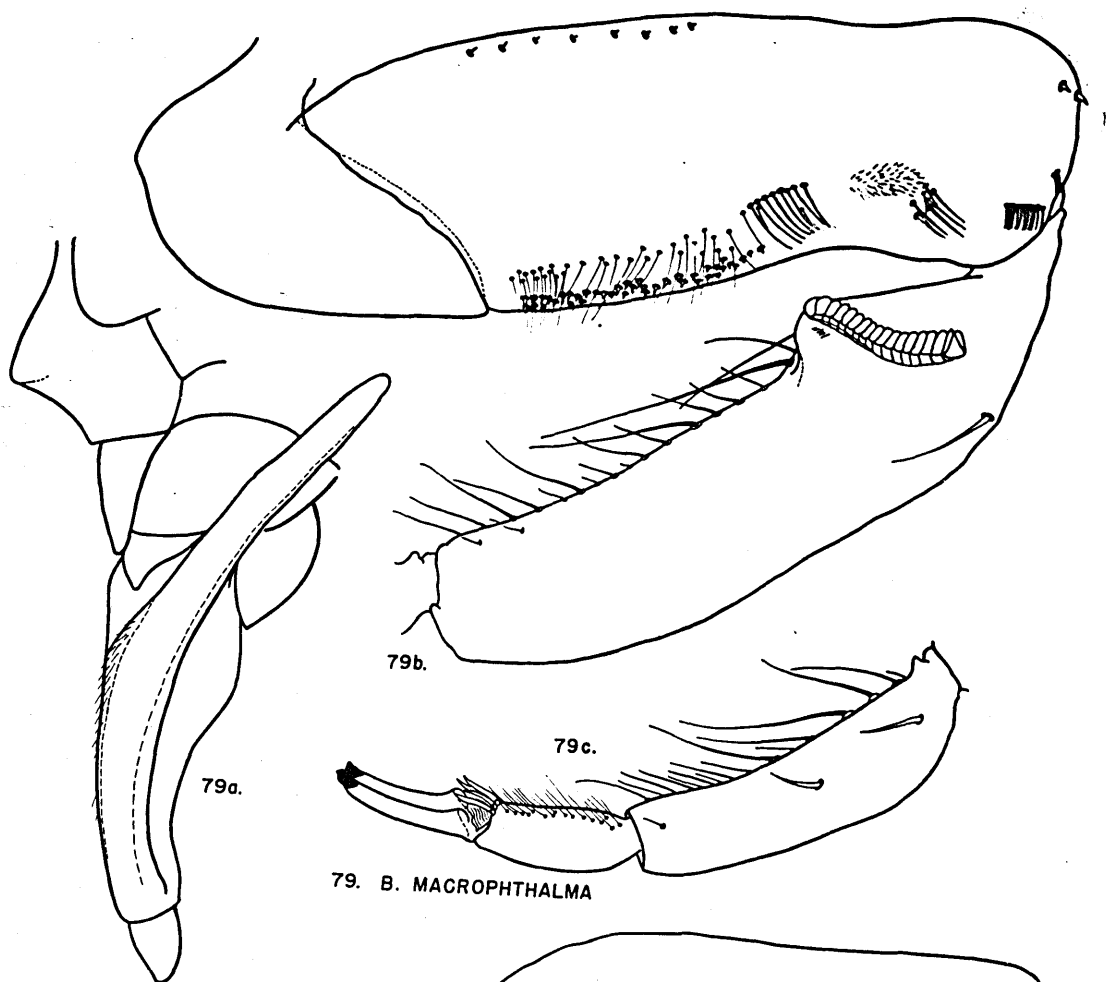
PLATE XVI

Figure 79. Buenoa macrophthalma (Fieber).

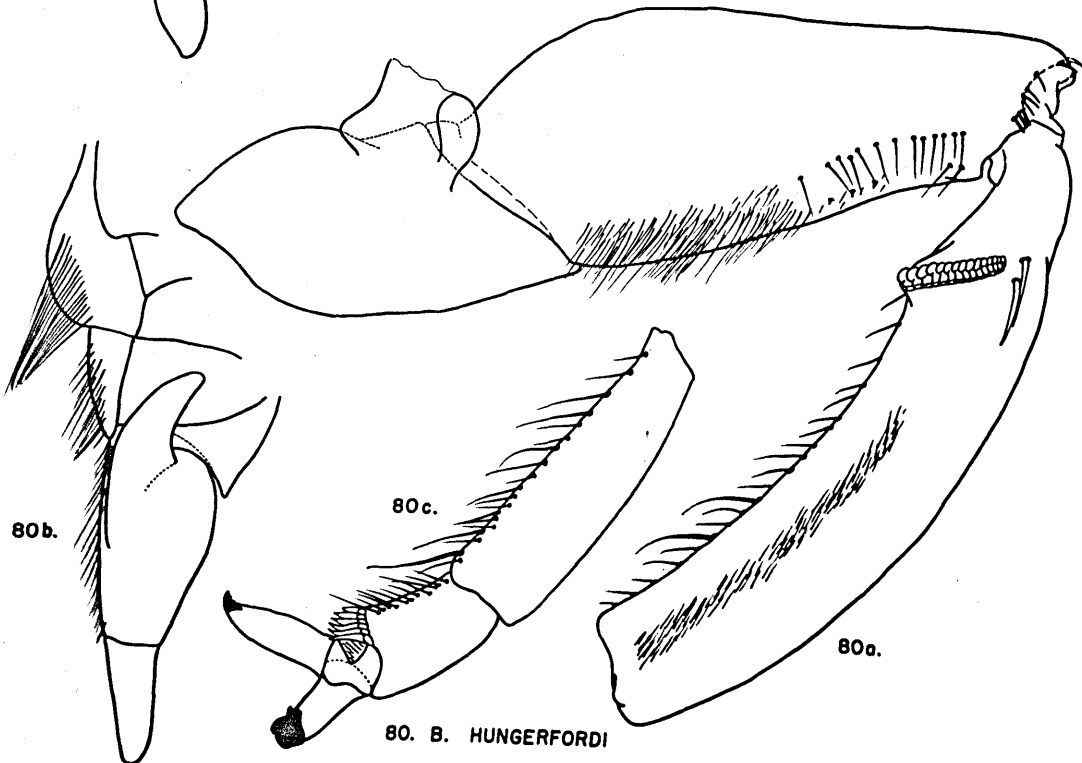
- 79a. Left lateral view of male rostrum and tylus.
- 79b. Inner surface view of femur and tibia of male fore leg.
- 79c. Inner surface view of male fore tarsus.

Figure 80. Buenoa hungerfordi n. sp.

- 80a. Inner surface view of femur and tibia of male fore leg.
- 80b. Left lateral view of male rostrum and tylus.
- 80c. Inner surface view of male fore tarsus.



79. *B. MACROPHTHALMA*



80. *B. HUNGERFORDI*

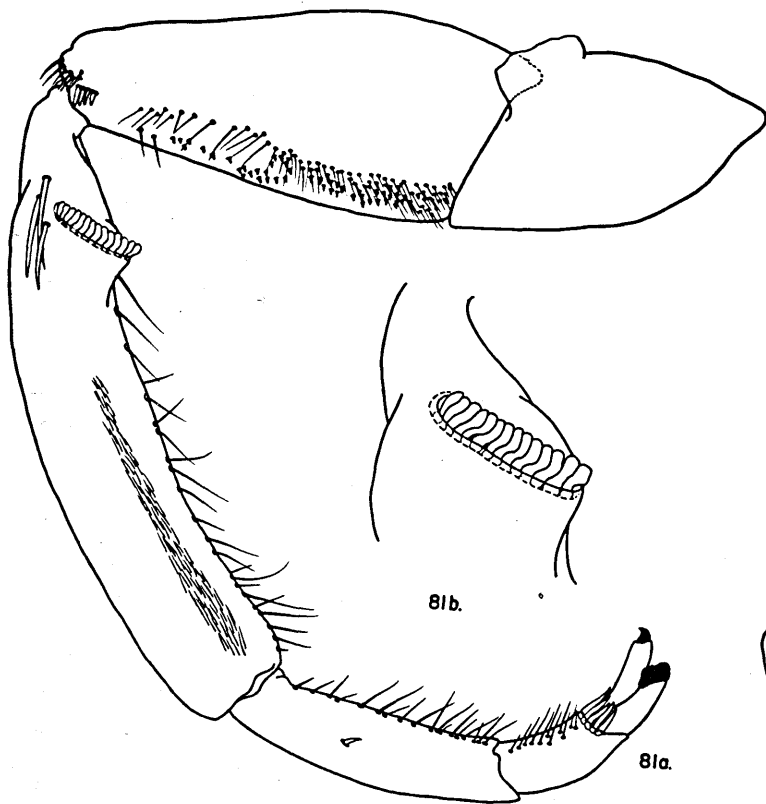
PLATE XVII

Figure 81. Buenoa distincta n. sp.

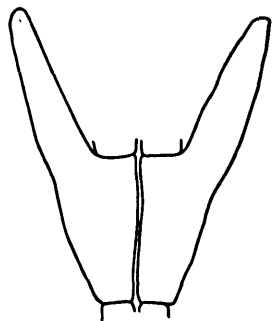
- 81a. Inner surface view of male right fore leg.
- 81b. Enlarged view of right tibial stridulatory comb.
- 81c. Left lateral view of male rostrum and tylus.

Figure 82. Buenoa paranensis Jaczewski.

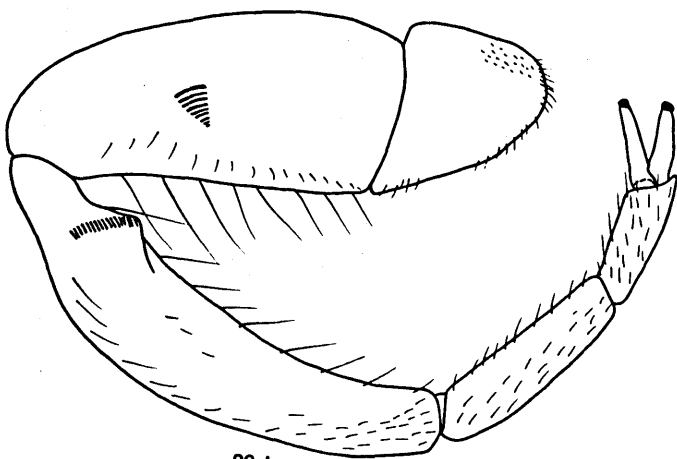
- 82a. Right genital clasper of male.
- 82b. Left genital clasper of male.
- 82c. Spine from caudo-sinistral margin of seventh abdominal tergite of male.
- 82d. Inner surface view of male right fore leg.
- 82e. Frontal view of male third rostral segment.
- 82f. Dorsal view of head, pronotum, and scutellum.



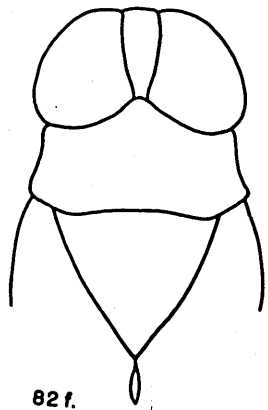
81. B. DISTINCTA



82e.



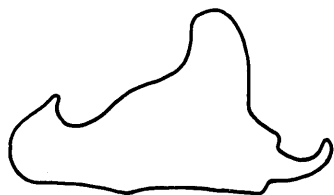
82d.



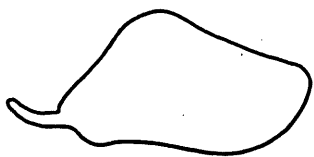
82f.



82c.



82b.



82a.

82. B. PARANENSIS